DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE
2012-2013 ANNUAL REPORT

TABLE OF CONTENTS

DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE
FACULTY AND TRAINEE ROSTER
2012-2013

Chair
J. Charles Jennette, M.D., Brinkhous Distinguished Professor and Chair

Vice Chair
Herbert C. Whinna, M.D., Ph.D., Associate Professor, Vice Chair for Clinical Services, and Director of McLendon Laboratories

Associate Chair for Administration
Nancy H. Nye

Distinguished Professors
Dwight A. Bellinger, D,V.M., Ph.D. (Fred C. and Lelia B. Owen Distinguished Professor)
Joe W. Grisham, M.D. (Kenan Distinguished Professor, Emeritus)
Nobuyo N. Maeda, Ph.D. (Robert H. Wagner Distinguished Professor)
Marjorie S. Read, Ph.D. (Fred C. & Lelia B. Owen Prof., Emeritus)
Oliver Smithies, D.Phil. (Kay M. & Van L. Weatherspoon Eminent Distinguished Professor)
Richard R. Tidwell, Ph.D. (Kenan Distinguished Professor)

Professors
C. Robert Bagnell, Jr., Ph.D.
Thomas W. Bouldin, M.D.
Debra A. Budwit, M.D.
Frank C. Church, Ph.D.
William B. Coleman, Ph.D.
Marila Cordeiro-Stone, Ph.D.
Leslie G. Dodd, M.D.
Rosann A. Farber, Ph.D.
William K. Funkhouser, M.D., Ph.D.
Peter H. Gilligan, Ph.D.
Virginia L. Godfrey, D.V.M.,
Ph.D.
M. David Goodman, M.D. (12/31/12)
Pamela A. Groben, M.D.
Margaret L. Gulley, M.D.
Catherine A. Hammett-Stabler, Ph.D.
H. Michael Jones, M.D.
Kathleen A. Kaiser-Rogers, Ph.D.
David G. Kaufman, M.D., Ph.D.
William K. Kaufmann, Ph.D.
Hyung-Suk Kim, Ph.D.
Susan J. Maygarden, M.D.
Volker R. Nickeleit, M.D.

Judith N. Nielsen, D.V.M.
Howard M. Reisner, Ph.D.
John L. Schmitz, Ph.D.
Harsharan K. Singh, M.D.
Scott V. Smith, M.D.
Joan M. Taylor, Ph.D.
Michael D. Topal, Ph.D.
Karen E. Weck, M.D.
Bernard E. Weissman, Ph.D.
John T. Woosley, M.D., Ph.D.

Associate Professors
Jessica K. Booker, Ph.D.
Arlene S. Bridges, Ph.D.
Brian C. Cooley, Ph.D.
Georgette A. Dent, M.D.
David A. Eberhard, M.D., Ph.D.
Craig A. Fletcher, D.V.M., Ph.D.
Susan C. Hadler, M.D., M.S.
Tracy M. Heenan, D.V.M.
Jonathon W. Homeister, M.D., Ph.D.
Masao Kakoki, M.D., Ph.D.
Mehmet Kesimer, Ph.D.
Ruth A. Lininger, M.D.
Christopher P. Mack, Ph.D.
C. Ryan Miller, M.D., Ph.D.
Melissa B. Miller, Ph.D.
Leigh B. Thorne, M.D.
Cyrus Vaziri, Ph.D.
Monte S. Willis, M.D., Ph.D.
Alisa S. Wolberg, Ph.D.
Hong Xiao, M.D.
Maimoona B. Zariwala, Ph.D.

Assistant Professors
Claudia M. Brady, M.H.S.
Megan J. DiFurio, M.D.
George Fedoriw, M.D.
Adil Hussein Gasim, M.D.
Oleg V. Gorkun, Ph.D.
Kevin E. Greene, M.D.
Johann D. Hertel, M.D.
Peiqi Hu, M.D.
Nichole L. Korpi-Steiner, Ph.D.
Jiandong Liu, Ph.D.
Rommel Lu. M.D. (2/12/13)

Stephanie P. Mathews, M.D.
Vincent J. Moylan, Jr., M.S.
Li Qian, Ph.D.
Siobhan M. O'Connor, M.D.
Yara A. Park, M.D.
Jay S. Raval, M.D.
Ashley Rivenbark, Ph.D. (2/28/13)
Arlin B. Rogers, D.V.M., Ph.D. (5/31/13)
Lori R, Scanga, M.D., Ph.D.
Dennis A. Simpson, Ph.D.
Dimitri G. Trembath, M.D., Ph.D.
Julia W. Whitaker, M.S., D.V.M.
Scott Williams, Ph.D.
Xianwen Yi, M.D., Ph.D. (5/13/13)
Qing Zhang, Ph.D.

Lecturer
Gayle C. McGhee

Instructor
Steven C. Holmes, B.S., M.H.S.
April E. Kemper, M.S., M.H.S.
Tracie L. Wagner, P.A.

Clinical Faculty (Medical Examiners)
Sandra C. Bishop-Freeman, Ph.D.
Justin O. Brower, Ph.D.
Clay A. Nichols, M.D.
Deborah L. Radisch, M.D.
Samuel D. Simmons, M.D.
Ruth E. Winecker, Ph.D.

Faculty Emeritus
Stuart A. Bentley, M.D.
John D. Butts, M.D.
John F. Chapman, Dr.P.H.
Myra L.Collins, M.D., Ph.D.
Robert E. Cross, Ph.D.
Frederic G. Dalldorf, M.D.
Cora-Jean S. Edgell, Ph.D.
James D. Folds, Ph.D.
Donald T. Forman, Ph.D.
Joe W. Grisham, M.D.
John E. Hammond, Ph.D.
Susan T. Lord, Ph.D.
Nadia N. Malouf, M.D.

William W. McLendon, M.D.
James R. Pick, D.V.M.
Marjorie S. Read, Ph.D.
Kinuko I. Suzuki, M.D.

Jointly Appointed Faculty
Diane Armao, M.D. (Radiology)
Gregory Bianchi, M.D. (Surgery)
Nizar Chahin, M.D. (Neurology)
Claire M. Doerschuk, M.D. (Medicine)
Ronald J. Falk, M.D. (Medicine)
Susan A. Fiscus, Ph.D. (Microbiology)
Nigel S. Key, M.D., Ch.B. (Medicine)
Nigel Mackman, Ph.D. (Medicine)
Valerie A. Murrah, D.M.D., M.S. (Dentistry)
Timothy C. Nichols, M.D. (Medicine)
Charles M. Perou, Ph.D. (Genetics)
Kathleen W. Rao, Ph.D. (Pediatrics)
Harold R. Roberts, M.D. (Medicine)
Darrel W. Stafford, Ph.D. (Biology)
James A. Swenberg, D.V.M., Ph.D. (Environmental Sciences and Engineering)
Melissa Troester, Ph.D. (Epidemiology)
Young E. Whang, M.D., Ph.D. (Medicine)
Elizabeth Wilson, Ph.D. (Pediatrics)
Daniel Zedek, M.D. (Dermatology)

Adjunct Faculty
Araba N. Afenyi-Annan, M.D.
William A. Ahrens, M.D. (Carolina Pathology Group)
Peter M. Banks, M.D. (Ventana-Roche Corporation)
Gary A. Boorman, D.V.M., Ph.D. (NIEHS)
Mark E. Brecher, M.D. (Laboratory Corporation of America)
Robert C. Brown, M.D. (Emeritus)
Shu Huey Chaing, Ph.D. (State Dept of Health and Human Services)
Cherie H. Dunphy, M.D. (Laboratory Corporation of America)
Jeffrey Everitt, D.V.M. (GlaxoSmithKline)
Thomas H. Fischer, Ph.D.
Dana M. Fowlkes, M.D., Ph.D. (Green Spring Technology)
Kim R. Geisinger, M.D. (Piedmont Pathology Group)
Delores J. Grant, Ph.D. (North Carolina Central University)
Christopher W. Gregory, Ph.D. (Voyager Pharmaceutical)
Heike Hunt, M.D. (Baystate Medical Center)
John P. Hunt, M.D. (Baystate Medical Center)
Wendell D. Jones, Ph.D. (Expression Analysis/Quintiles)
Scott Kilpatrick, M.D. (Forsyth Medical Center)
Suzanne L. Kirby, M.D., Ph.D.

Joe N. Kornegay, D.V.M., Ph.D. (Texas A&M University)
Myla Lai-Goldman, M.D. (Laboratory Corporation of America, Retired)
Thomas G. Lightfoot, Ph.D. (American Red Cross Blood Services)
Chad A. Livasy, M.D. (Carolinas Pathology Group)
Roger L. Lundblad, Ph.D.
Amil E. Mandal, M.D. (Medical Specialists of St. Augustine)
Keith V. Nance, M.D. (Rex Hospital)
Thomas M. O'Connell, Ph.D. (LipoScience)
William R. Oliver, M.D. (East Carolina University)
Richard S. Paules, Ph.D. (NIEHS)
Ashley L. Rivenbark, Ph.D. (American Journal Experts, Oxford Science Editing, ASIP)
Dennis W. Ross, M.D., Ph.D. (Forsyth Medical Center, Retired)
Tara C. Rubinas, M.D. (Laboratory Corporation of America)
W. Eugene Sanders, M.D.
Gary J. Smith, Ph.D. (Roswell Park Cancer Institute)
Nobuyuki Takahashi, M.D., Ph.D. (Tohuku University, Sendai, Japan)
Paul A. Wade, Ph.D. (NIEHS)
Ruth F. Walters, M.D. (Laboratory Corporation of America)
Douglas C. Wolf, Ph.D., D.V.M. (EPA)

Clinical Fellows
Kevin A. Alby, Ph.D. (Microbiology)
Rachel Cianciolo, D.V.M. (Nephropathology)
Jason Clark, M.D. (Cytopathology)
Kristy R. Crooks, Ph.D. (Clinical Molecular Genetics)
Melissa A. Hayden, Ph.D. (Cytogenetics)
Daniel Kenan, M.D. (Nephropathology)
Andrew P. Laramore, M.D. (Surgical Pathology)
Marshall A. Mazepa, M.D. (TMS)
Denise M. Milhorn, Ph.D. (Clinical Chemistry)
Georgina L. Murray, M.D. (Cytopathology)
Nirali Patel, M.D. (Molecular Genetic Pathology)
Marian Rollins-Raval, M.D. (Coagulation)
Lauren C. Scott, M.D. (Forensic Pathology)
Roger W. Stone, M.D. (Surgical Pathology)
Eric T. Weimer, Ph.D. (Immunology)
Kimberly Woodward, M.D. (Hematopathology)

Co-Chief Residents
Lea L. Bardy, M.D. (PGY IV) Co-Chief Resident
Jayson R. Miedema, M.D. (PGY IV) Co-Chief Resident
Olga Speck, M.D. (PGY IV) Co-Chief Resident

Residents
Lea L. Bardy, M.D. (PGY IV)
Christine E. Bookout, M.D. (PGY I)

Shannon A. Covey, M.D. (PGY III)
Daniel L. Duncan, M.D. (PGY III)
Kimberly E. Janssen, M.D. (PGY II)
Lindsey E. Matthews, M.D. (PGY I)
Jayson R. Miedema, M.D. (PGY IV)
Nathan D. Montgomery, M.D. (PGY II)
Alexis R. Peedin, M.D. (PGY I)
Avani A. Pendse, MBBS, (PGY II)
Brooke S. Rambally, M.D. (PGY III)
Spencer L. Rusin, M.D. (PGY II)
Bart B. Singer, M.D. (PGY I)
Olga Speck, M.D., Ph.D. (PGY IV)
Sara E. Wobker, M.D. (PGY III)

Research Associates
Chastain, Paul, Ph.D. (Dr. David Kaufman)
Feng Li, Ph.D. (Dr. Oliver Smithies)
Donald A. Patrick, Ph.D. (Dr. Richard Tidwell)
Weihua Tang, M.D. (Dr. Margaret Gulley)

Postdoctoral Research Fellows
Xue Bai, Ph.D. - Dr. Joan Taylor
Rui Cao, Ph.D. – Dr. Mehmet Kesimer
Michelle Casad, Ph.D. – Dr. Joan Taylor
Zhaokang Cheng, Ph.D. – Dr. Joan Taylor
Yukako Kayashima, Ph.D. – Dr. Nobuyo Maeda
Marlon Lawrence, Ph.D. – Dr. Oliver Smithies
Yuanli Li, Ph.D. – Dr. Mehmet Kesimer
Kota Matsuki, Ph.D. – Dr. Nobuyo Maeda
Georgia Radicioni, Ph.D. – Dr. Mehmet Kesimer
Chantelle Rein-Smith, Ph.D. – Dr. Frank Church
Yuliy Rozenberg, Ph.D. – Dr. Christopher Mack
Yang Yang, Ph.D. – Dr. Cyrus Vaziri

Graduate Students
Maria M. Aleman – Dr. Alisa Wolberg
Patricia Casbas-Hernandez – Dr. Melissa Troester
Dinuka M. DeSilva – Dr. Young Whang
Michael L. Durando – Dr. Cyrus Vaziri
Meghan E. Free – Dr. Ronald Falk
Julia E. Geddings – Dr. Nigel Mackman
Britta E. Jones - Dr. Ronald Falk
Kaitlin C. Lenhart – Dr. Joan Taylor
Pamela Lockyer – Dr. Cam Patterson
Lantz C Mackey – Dr. Jonathon Homeister
Kevin D. Mangum - Dr. Christopher Mack

Robert McNeill – Dr. Ryan Miller
Adam D. Pfefferle – Dr. Charles Perou
Amanda L. Rinkenbaugh – Dr. Albert Baldwin
Kristine M. Wadosky – Dr. Monte Willis
Bethany L. Walton – Dr. Alisa Wolberg
Laura M. Weise Cross – Dr. Christopher Mack

RESEARCH AND SCHOLARLY ACCOMPLISHMENTS

Over the past year an excellent record of achievement in research has resulted in 248 publications of original papers and book chapters (abstracts not included). Excellence in research and training has attracted outstanding faculty, residents, postdoctoral fellows, and graduate students, has advanced the understanding of disease, and has enhanced the reputation of the department and institution.

C. ROBERT BAGNELL, JR., Ph.D.

Robert Bagnell, Ph.D.'s research laboratory has in the past 12 months in the light microscope facilities logged 6,762 hours of use, electron microscope facilities logged 2,050 hours of use and the laboratory performed 442 electron microscopy specimen preparations. The laboratory served 152 principal investigators from 27 departments and centers.

Based on a 2000 hour work year, the transmission electron microscope, (which has the vast majority of EM use) is occupied almost continuously and the same is true of the four most heavily utilized light microscopes.

The lab averaged 9 EM preparations per week. However, of the 442 preparations done this year 32 were Immuno-EM "projects". These projects extend out over many weeks to months and typically involve the following processes: 1) Consultation with the investigator to determine a – if the antibody has been verified by light microscopy, and b – whether pre or post embedding methods are to be used, 2) Establish the proper fixation method for the given specimen type and antibody, 3) Titer the antibody and optimize the fixation protocol – this can require an entire week of concentrated effort, 4) Image and evaluate the result – this usually requires the laboratory to work with the investigator at the microscope since many of these preparations are notoriously difficult to interpret without years of experience, and 5) repeat to optimize the protocol and decide if antigen retrieval is required. This work has resulted in Mrs. Madden being included as a co-author on two peer-reviewed papers this year, one of which is in Nature.

MSL underwent an audit by the Office of Sponsored Research. This is standard practice for core laboratories and happens about every two years. As a result of the audit some of MSL's fees have changed.

An NIH Shared Instrumentation Grant was submitted for a Transmission Electron Microscope. Dr. Monte Willis is the PI. Funding information about this grant will be available in October 2013.

MSL added a scanning-transmission electron detector to the Zeiss Supra 25 field emission SEM. This provides backup for the TEM and has proved superior to the TEM for evaluation of AAV particles for immune-therapy.

The energy dispersive x-ray spectrometer system of the FESEM suffered a damaged window. A request has been made to SOM for funding to have the system repaired.

Steven Ray, the laboratory's Research Specialist, left the laboratory for a position in RTP. The open position was advertised and, after an extended search, was accepted by Kristen White. Kristen earned her M.S. degree in Pathology from UNC. She brings knowledge of modern molecular and cellular pathology to the MSL that will help us shape the kinds of imaging services provided to clients. She began her new position on June 22, 2013.

MSL continues to provide free image analysis software in the form of macros and plug-ins for the NIH ImageJ platform. In the year past MSL posted to it's web page a revised version of the Comet Assay macro for determination of DNA damage. This Assay has proved to be very popular.

Live cell imaging is in high demand along with methods to analyze the vast amounts of resulting data. MSL is adding analytical tools to help investigators interpret this data.

Considerable time and effort will be utilized to bring MSL's new employee up to speed with all the various laboratory instruments, functions, and techniques.

DWIGHT A. BELLINGER, D.V.M., Ph.D.

Dr Bellinger's research interests remain in the area of hematology and cardiovascular disease. Swine models have been used for studying atherosclerosis for many years in this laboratory. A colony of familial hypercholesterolemic pigs is maintained to study the role of hyperlipidemia on atherosclerosis, wound healing, and renal disease.

Grant funds continue for the maintenance of the hemophilia A and B and von Willebrand disease dogs at the FOBRL as a national resource. Recently dogs with deficiency in factor VII and dogs with Glanzmann's thromboblasthenia have been added to the colony. The dogs continue to be an effective model to test various gene therapies and other strategies to correct these inherited bleeding disorders. Studies using this model have resulted in human trials.

JESSICA K. BOOKER, Ph.D.

Dr. Booker's research draws from her expertise in clinical molecular genetics and instrumentation to collaborate with colleagues on a diverse range of projects. Current projects include the identification and characterization of novel *BRCA1* and *BRCA2* mutations, including silent and missense sequence variants that result in truncated proteins. A new project will expand the panel of genes tested in hereditary cancer syndrome patients using next-generation sequencing. As Scientific Director of the Clinical Molecular Genetics Laboratory, Dr. Booker works closely with the research analysts and clinical fellows as they develop new assays for acquired and inherited diseases. New assays currently under development include PML-RARα, skewed X-inactivation, and Fragile X methylation. Newly developed assays now clinically available include PIK3CA, quantitative NPM1, NRAS, and custom sequencing. Dr. Booker is actively involved in the NCGENES project investigating the clinical implementation of next-generation sequencing.

THOMAS W. BOULDIN, M.D.

For the coming year, Dr. Bouldin will continue to be heavily involved in all aspects of diagnostic neuropathology, providing service for surgical neuropathology, autopsy neuropathology, the nerve biopsy service, and ophthalmic pathology.

CLAUDIA M. BRADY, M.H.S.

Ms. Brady's current clinical activities include instructing PGY1 through PGY4 pathology residents and second year Pathologists' Assistant students from Duke University in the Gross Room. Training includes preparation of biopsy specimens through dissection, examination, and dictation of larger and more complex surgical excisions. Emphasis is placed on thoroughness including acquiring all relevant clinical information about the case prior to dissection, proper triage, prioritization of caseload, and efficiency without compromising quality. She enjoys training all levels of PGY pathology residents and medical students on all benches in Surgical Pathology. Claudia believes with the current faculty PAs providing all the training for the residents, they will develop good habits and mentality with a methodical approach to every surgical pathology specimens that they lay their hands on.

ARLENE S. BRIDGES, Ph.D.

Arlene Bridges, Ph.D., Director of the ADME Mass Spectrometry Center, her role is to provide study design assistance, bioanalytical support, and data interpretation to preclinical and clinical studies conducted by scientists at UNC and beyond. Quantitative and qualitative assays of pre-clinical and clinical samples by triple-quadrupole, ion trap, and time-of-flight mass spectrometry are specialties of the Center. This past year, the Center developed a wide array of assays that include quantitation of 30 amino acids in a single injection, identification of drug metabolites and degradation products, and quantification of 7 isomeric flavonolignans found in milk thistle (silymarin). Dr. Bridge's goals are three-fold. First, she hopes to continue to increase interest in the ADME Mass Spectrometry Center with continued marketing and by continuing to adapt to the metabolomic needs of the users. Second, she also hopes to continue to acquire new equipment, either by donation, lease-purchase, or instrumentation grants. Third, Dr. Bridges hopes to encourage more users to cite the use of the Core in their publications and grant proposals.

DEBRA A. BUDWIT, M.D.

Dr. Debra Budwit recently completed an institutional review of discordance in estrogen receptor, progesterone receptor and HER2 status between breast primary cancers and respective recurrences. Ongoing other projects in which she currently participates as a co-investigator include follow-up and evaluation of management strategies for patients with a diagnosis of cervical intraepithelial neoplasia 2 (CIN 2), efficacy of 5-fluorouracil treatment in young women with CIN 2, clinical trial of a novel manual monolayer cytology Pap slide system, and the utility of sentinel lymph node biopsy in patients with breast cancer status post neoadjuvant chemotherapy. She also engages in clinicopathologic studies of interest in the areas of breast and gynecologic pathology.

FRANK C. CHURCH, Ph.D.

The research area of Frank Church, PhD is concerned with proteases and their inhibitors in human biology and in various disease processes, focused in the arena of hemostasis-thrombosis, vascular biology and cancer biology. For more than 20 years they have performed structure to activity studies with heparin-binding serpins (serine protease inhibitors) and the serine protease thrombin, where they were involved in identifying the heparin-binding sites in thrombin, antithrombin, heparin cofactor II and protein C inhibitor, and the role of thrombomodulin to accelerate thrombin inhibition by protein C inhibitor. They are using mouse models of vascular and tissue injury (saphenous vein thrombosis and IVC stasis models, and cutaneous wound healing model) to understand the link between senescence ($p16^{INK4a}$), aging obesity, diabetes, wound healing, and venous thrombosis. HUVEC, THP-1, and HepG2 cells are being used to study the mechanism relating aging and obesity to promote thrombosis. They are characterizing the Tidwell Library of di-cationic compounds ("pentaminidine like") for potential therapeutic anticoagulant activities. Separately, they study signaling systems supported by PAI-1 in breast cancer to promote breast cancer cell motility, how breast adipocytes modulate PAI-1 expression, and how these interactions contribute to changes in the breast tumor microenvironment.

WILLIAM B. COLEMAN, Ph.D.

For the last few years, William Coleman's laboratory has focused on molecular mechanisms (genetic and epigenetic) of neoplastic transformation in breast, and implications for breast cancer treatment and prevention. They have investigated epigenetic mechanisms underlying human breast cancer development by examining breast cancers that exhibit high rates of gene expression loss due to hypermethylation defects and those that lack methylation-dependent loss of gene expression. Their results suggest that ER-negative breast cancers (triple-negative breast cancers) exhibit a higher magnitude of methylation-dependent gene silencing than ER-positive breast cancers. Further, the hypermethylation defect expressed by ER-negative breast cancers is associated with overexpression of DNMT3b protein and elevated DNMT activity leading to concurrent aberrant methylation of numerous genes. This hypermethylator breast cancer type is strongly associated with the basal-like and claudin-low molecular subtypes of triple-negative breast cancer. The mechanism accounting for overexpression of DNMT3b in hypermethylator cell lines and primary basal-like breast cancers is related to concurrent loss of several microRNAs that normally regulate DNMT3b mRNA post-transcriptionally.

MARILA CORDIERO-STONE, Ph.D.

The research program directed by Dr. Cordeiro-Stone is focused on molecular mechanisms underlying the responses of human cells to DNA damage induced by solar radiation. The component of sunlight that is most damaging to the skin, potentially leading to cancer development, is represented by the wavelengths of UV that penetrate the Earth atmosphere (UVB and UVA). Recent findings indicate that (i) the density of cyclobutane pyrimidine dimers, the most common DNA photoproduct, is the best predictive marker for UV-induced biological effects in human cells, regardless of the range of wavelengths used; (ii) the DNA damage-dependent activation of the intra-S checkpoint is important for the protection of fork stability and the replication of the genome, but does not reduce the probability of UV-induced mutagenesis, as

previously predicted, at least at loci that are replicated during early-mid S phase; (iii) cells lines representing different types of melanomas, in terms of the genetic mutations driving the carcinogenic process, still maintain intra-S checkpoint proficiency. Reporting these findings and continuing to explore their relevance for cancer prevention and treatment will be the top priorities of this laboratory.

GEORGETTE A. DENT, M.D.

Dr. Dent is working with the American Medical Association (AMA) on a collaborative research project known as Innovative Strategies to Transform the Education of Physicians (ISTEP). The primary objective of the project is to study the educational learning environment of medical schools using instruments that access the values, feelings, and perspectives of students as related to their education. The goal of the project is to determine the factors that are most influential in the professional development of medical students and physicians. Almost fifty medical schools are participating in this project

.

MEGAN J. DiFURIO, M.D.

Dr. DiFurio's goals include the following: (1) Orient the new Program Coordinator, (2) Orient her replacement Residency Program Director, (3) Finish or at least re-designate people for her roles in many GYN Oncology Research Projects.

LESLIE G. DODD, M.D.

Dr. Dodd has a contract for "Atlas of neoplastic Bone and Soft tissue Pathology" with Demos publishing. Estimated completion date for the publisher is June 2014. In addition, she is looking forward to taking on additional responsibility within the cytology section

DAVID A. EBERHARD, M.D., Ph.D.

Dr. Eberhard directs the Pre-Clinical Genomic Pathology Core in the LCCC, supporting the UNCseq Next-Generation Sequencing (NGS) Cancer Genomics program. In the past 1.5 yrs he has built, from ground zero, a lab comprised of 6 people (and still growing) that provides automated medium-throughput sample processing and analysis capabilities for massively parallel DNA and RNA sequencing, Nanostring gene expression and Sequenom mass-spectometry genotyping to UNC cancer researchers. Our ongoing UNCseq efforts have generated tumor mutational data on over 300 patients to date. In the coming year they will work together with UNC Pathology to develop and implement translational cancer NGS capabilities and to develop research questions that capitalize on the UNCseq tumor mutation findings ; to complete and publish collaborative projects on digital analysis of neovascularization in tumors, and on integration of digital histomorphology analysis and genomic data in tumors; and to address tumor genomic heterogeneity by analyzing enriched fractions of cellular subtypes isolated from FFPE tumor samples.

ROSANN A. FARBER, Ph.D.

Dr. Farber's interests are in cancer genetics and the molecular diagnosis of hereditary disorders. Her research is focused on cancers associated with Lynch syndrome, which is a genetic predisposition to colorectal carcinoma, endometrial cancer, and several other less common types of tumors. Lynch syndrome cancers result from germline defects in genes coding for mismatch-repair (MMR) proteins; the hallmark of these MMR-deficient tumors is instability of simple-sequence repeats, known as microsatellites. Although Lynch syndrome is rare, up to 15% of sporadic tumors of the same types exhibit microsatellite instability as the result of somatic inactivation of the *MLH1* MMR protein by promoter methylation. In the area of diagnostics, her focus has also been on fragile X syndrome, which is an inherited disorder resulting from large expansions of a trinucleotide repeat. She is Director of the UNC American Board of Medical Genetics Postdoctoral Training Programs and Associate Chair of the Department of Genetics for Faculty Affairs.

GEORGE FEDORIW, M.D.

Dr. Fedoriw's research, in collaboration with Dr. Sarantopoulos (Department of Medicine), is primarily focused on further defining the role of the B cell activating factor (BAFF) in chronic graft versus host disease (cGVHD) after allogeneic bone marrow transplantation. Findings from his work were recently published, and he is currently investigating the bone marrow microenvironment in relation to B cell reconstitution after transplant. He has also investigated pathways of B cell activation in HIV associated lymphomas (funded through the UNC Center for AIDS Research), and is working to identify relevant B cell subsets in human cGVHD (funded through the NC TraCS Institute). Dr. Fedoriw also actively provides research support for collaborators in the Lineberger Cancer Center and the School of Pharmacy in the area of antiretroviral drug distribution. His goals for the upcoming year include applying for additional funding for independent research work.

CRAIG A. FLETCHER, D.V.M., Ph.D.

Craig A. Fletcher, Director of DLAM and Assistant Dean of Animal Research Resources continues to provide oversight of veterinary and husbandry care for the research animals at UNC as his primary function. Dr. Fletcher will continue to develop DLAM's processes and metrics that embrace and move forward the university's research goals. UNC has maintained accreditation for the entire campus with the Association for the Assessment and Accreditation of Laboratory Animal Care, International (AAALAC International) since 1989. In the summer 2014, AAALAC International site visitors will visit UNC to determine if full accreditation will be continued. Most of this year will be dedicated to the preparation of this site visit.
UNC has a certified residency training program in laboratory animal medicine. ACLAM requires supervision by an ACLAM-boarded veterinarian for the didactic training of residents. In 2011, ACLAM approved the regional Research Triangle Laboratory Animal Training Program (RT LATP), which is made up of partnering organizations who all participate in the training of the RT LATP residents. The participating organizations are UNC, Duke, NCSU, Glaxo Smith Kline, and NIEHS. The UNC residents attend the RT LATP seminar held once a week for 2-4 hours, and the organizations share and rotate the teaching responsibilities of the

course. As one of the 5 laboratory animal veterinarians in DLAM at UNC, Dr. Fletcher is one of the providers of this didactic teaching. Since Sept of 2009, Dr. Fletcher has Co-chaired the Southeastern location of the International Mock Board Exam Coalition for the ACLAM board exam, which is offered to laboratory animal veterinarians at 11 sites in the US and 4 internationally for those who are taking the ACLAM board specialty exam. It is given as part of the North Carolina Association of Laboratory Animal Medicine Workshop in Laboratory Animal Medicine. There were 57 laboratory animal veterinarians who took the mock exam in the Southeastern location in May 2013. While the exam site is the Southeast region, this meeting is a national meeting and registrants come from across the US to attend the workshop and take the mock exam. In addition, Dr. Fletcher is also collaborating with Dr. Julia Whitaker and Dr. Sheryl Moy to study the effect of caging environment on mouse reproduction and behavior. Dr. Fletcher will also continue to pursue his research on the role of genetic variants in regulating systemic inflammation and platelet activation in the development of atherosclerosis. Thus far, his research collaboration has performed a comprehensive genetic screen of 4 genes (CX3CL1, CX3CR1, CXCR3 and PF4), and report PF4 locus variants associated with the modulation of serum PF4 and TNFα levels. The next step will be to understand the relationships between the PF4 variants and their control of vascular reactivity and inflammation.

WILLIAM K. FUNKHOUSER, M.D., Ph.D.

Dr. Funkhouser recently completed a collaboration as a funded Pathologist with the Baric research group on lung morphologic changes in SARS respiratory virus vaccination models in mice. Dr. Funkhouser collaborates (unfunded) with Dr. Olshan in Public Health Epidemiology on followup studies derived from the previously funded CHANCE study on risk factors for head and neck carcinoma in the state of North Carolina. Dr. Funkhouser collaborates (unfunded) with Drs. Grilley-Olson and Hayes (Medical Oncology) at the LCCC on projects related to inter-observer reproducibility of morphologic diagnosis of non-small cell lung carcinoma (NSCLC) and molecular subsets of the different types of NSCLC. Dr. Funkhouser collaborates (unfunded) with Dr. Coleman of the Department of Pathology and Laboratory Medicine on molecular methods for determination of neoplastic clonality unique to each neoplasm in a given individual. Dr. Funkhouser collaborates with Dr. Niethammer (Computer Science), Dr. Carson (Pediatrics) and Dr. Leigh (Pediatrics), on developing computer image analysis tools for transmission EM diagnosis of primary ciliary dyskinesia. Dr. Funkhouser plans a new collaboration with Dr. Sherry at NCSU related to viral infections of heart allografts.

PETER H. GILLIGAN, Ph.D.

Studies on the molecular epidemiology of Mycobacterium abscessus are being done in conjunction with Cambridge University and Sanger Center. Whole genome sequencing is planned for over 100 clinical isolates. One of the goals to determine if spread of this organism occurs between pateints. Secondly the genome will be compared with other pathogens to see if there are sequences that represent putative virulence factors in this organism. The multinational study on the natural history of chronic lung infections continues in the laboratory.

VIRGINIA L. GODFREY, D.V.M., Ph.D.

Dr. Godfrey's scholarly efforts are based on collaborative, multi-disciplinary teams utilizing animal models of human disease to investigate basic mechanisms as well as pre-clinical models of therapeutic interventions. She provides support to essential research core facilities at UNC such as the Division of Laboratory Medicine, Animal Histopathology lab, Animal Tumor Models core, Mutant Mouse Regional Resource Center, and the National Gnotobiotic Rodent Resource. Current projects include characterization of two new mouse models of spontaneous colitis in the Collaborative Cross, joints lesions in a mouse model of mammary carcinoma arising from aberrant transgene expression, and pre-clinical trials of a novel chemotherapeutic agent in a mouse model of bladder transitional cell carcinoma.

OLEG V. GORKUN, Ph.D.

Dr. Oleg Gorkun research is in the study of alternative plasmas to fresh frozen human plasma or FFP are being introduced and developed to improve safety and availability of plasma therapy. These include solvent detergent treated and dehydrated, reconstituted forms of plasma. Solvent-detergent treated plasma provides a better consistency of product than single unit fresh frozen plasma. If solvent-detergent treated plasma preparations were available in dehydrated form then the storage/shipment of the product could be enhanced several-fold allowing a deployment in even austere or remote environments where it is not feasible to maintain the cold chain dependency of fresh frozen plasma for transfusion. The complexity of the coagulation system makes measuring levels and activities of individual plasma proteins impractical for diagnosing and managing states of hypo- or hyper-coagulation. Classical clotting assays only probe the initiating phase of coagulation. Therefore, they cannot measure the global state of coagulation. In contrast, the thrombin generation assay probes not only the initiation phase but also the propagation phase (where the majority of thrombin is generated) and the termination phase, when thrombin formation and activity is stopped through the anticoagulant pathway. Normal termination of thrombin activity is very important. Otherwise, lingering thrombin can wreak chaos in hemostasis. The most advanced method for monitoring thrombin generation is calibrated automated thrombography, or CAT. In CAT, the thrombin activity in plasma is monitored by fluorescence produced when thrombin reacts with a low-affinity fluorogenic substrate. Dr. Gorkun's goal is to assess the coagulation potential in solvent detergent treated spray dry plasma. Initial comparison of the clotting factors levels in spray dried plasma preparation to its predicate solvent-detergent treated plasma has shown little difference. He uses CAT to examine thrombin generation in spray dry solvent detergent plasma. The initial results suggest that spray drying has not altered the fundamentals of thrombin generation of solvent-detergent treated plasma and thus support the notion that reconstituted plasma powder, the product of spray-drying, will share the same efficacious safety record as solvent-detergent treated plasma once in clinical use.

KEVIN G. GREENE, M.D.

Dr. Greene is a subinvestigator in an ongoing multicenter clinical trial studying the effects of everolimus in liver transplant recipients. In the second half of 2011, UNC Health Care began performing universal screening of all colorectal adenocarcinomas for mismatch repair protein

expression loss by immunohistochemistry and microsatellite instability by molecular testing in order to identify more patients with Lynch syndrome. Over the next 1-2 years, Dr. Greene will evaluate the cost effectiveness of this practice and determine whether any cases of Lynch syndrome would have been missed using the previous screening criteria. Recently, UNC received pilot grant funds to perform a clinical trial studying PET/MRI as a predictor of response to preoperative chemoradiation in patients with resectable rectal cancers. The purpose of this study is to determine if PET/MRI can identify a subset of rectal cancer patients who can be treated with chemoradiation alone, sparing them from morbid surgical resections. Dr. Greene will perform the pathologic evaluation of all resections performed on patients enrolled in the study and will co-author the manuscript. This clinical trial has begun.

PAMELA A. GROBEN, M.D.

Dr. Groben collaborates with Dr. Nancy Thomas in Dermatology (Principle investigator). The research concerns DNA methylation profiles of Melanoma and other melanocytic lesions. BRAF mutations in melanoma are also an area of study. Dr. Groben reviews slides and selects appropriate tissues for study. She also performs laser capture microdissection to isolate small samples for study. This research is ongoing, and she will continue to be involved, but to a lesser extent next year.

MARGARET L. GULLEY, M.D.

Dr. Margaret L. Gulley's research is aimed at 1) understanding the molecular basis of Epstein-Barr virus (EBV)-related malignancy, and 2) developing novel laboratory tests to help manage affected patients. In the past year there has been substantial progress towards these goals. They validated the Nanostring gene expression profiling system to measure panels of coding and non-coding RNAs in paraffin embedded tissue. They are now working to refine methods to measure circulating disease markers (including microRNA) in plasma and serum, along with pertinent quality control processes. Next generation sequencing assays are envisioned to target DNA and RNA in paraffin embedded tissue and matched plasma, with potential clinical validation work aimed at early diagnosis, risk stratification, and monitoring disease burden. In work of a more general nature, Dr. Gulley leads a TraCS team of clinical researchers and staff to improve biobanking services for campus investigators. Within McLendon Clinical Labs, they are validating the next wave of modern molecular technologies including next generation sequencing on two platforms for use in clinical trials and ultimately for routine patient care. This work builds on basic science discoveries that are being translated to the clinical realm, reinforcing the important role of pathologists in advancing medical practice using modern laboratory tools. In the coming year, they will refine standard operating procedures, including quality assurance measures, as part of their analytic and clinical validation work. Trainees are involved in these projects to ready them for practicing molecular pathology and to help them feel confident in directing lab and research services and to provide laboratory services to patients. Further work is needed on the bioinformatics pipeline to promote accurate interpretation and reporting of complex multi-analyte sequencing assay results. They continue to maximize productivity of local clinical investigators (faculty, med students, residents and fellows) by making tissue/lab/pathologist resources available for team science.

SUSAN C. HADLER, M.D., M.S.

Susan Hadler, M.D., M.S.'s efforts in the Medical School are centered around teaching and curriculum. She is involved in teaching 1st, 2nd and 4th year medical students in multiple courses, as well as Pathology and Toxicology graduate students and Physical Therapy graduate students. She serves on a number of medical school curriculum related committees. Her efforts in the Dental School are also centered on teaching; she teaches 1st year dental students in multiple courses. She also serves on the Dental School's admissions committee.

CATHERINE A. HAMMETT-STABLER, Ph.D.

Dr. Hammett-Stabler's focus is in the improvement of clinical laboratory services and patient safety: She is currently engaged in two initiatives toward the development of practice guidelines related to the laboratory support of pain management and addiction programs (one evidence-based, the other consensus based). These activities will continue into 2015. She and Dr. Rambally have continued collaborations with Maternal-Fetal Medicine to develop an algorithm to predict risk of respiratory distress syndrome based upon lamellar body counts as performed on the Advia Hematology analyzer. This study is expected to be concluded by the end of 2013.

TRACY M. HEENAN, D.V.M.

The Office of Animal Care and Use, Directed by Tracy Heenan will continue to provide excellent service to animal research community, ensuring humane animal care and use, facilitating the application review process, providing exemplary training of research personnel, and conducting fair and thorough investigations of animal welfare concerns and noncompliance while still working to establish rapport with researchers and fostering animal research. The necessity of providing fair and thorough customer service is one of Office of Animal Care and Use (OACU) guiding principles. With escalating compliance-related responsibilities, such as increased investigator-managed animal facilities as well as offsite facilities, it will most likely be necessary to add an additional T/C Coordinator position in the next five years. OACU, like everyone on campus, has had to plan for budgetary cuts. The office has made monumental strides in reducing the amount of paper as well as the associated costs by moving to an electronic review process. The office continues to find new ways to eliminate the voluminous paper copies of meeting information. Members review applications and the 1000 plus page semi-annual facility report electronically. The office has fully implement the position responsible for Grant Application/IACUC Application congruency. IACUC applications are being compared with grant applications and faculty training is ongoing. This will be a process requiring cooperation and buy-in from research faculty. During the next several years the office will continue to educate and advise faculty, students, research personnel, IACUC, Division of Laboratory Animal Medicine (DLAM) personnel, and Department of Environment Health and Safety (EHS) representatives regarding proper animal care and use policies and practices. The Director will continue to serve as an integral link between the IACUC and the Office of the Vice Chancellor for Research (VCR), DLAM, EHS, and the University Employee Occupational Health Clinic and will work to enhance all levels of communication between these groups.

JOHANN D. HERTEL, M.D.

Dr. Hertel is focused on clinical and translational research on anal squamous cell carcinoma. Currently, anal pap smears are used to screen high risk populations for anal squamous dysplasia and carcinoma. Dr. Hertel is working to evaluate the utility and accuracy of anal pap smears as a screening tool and evaluate additional immunohistochemical and molecular tests to improve the performance of anal carcinoma screening programs. Dr. Hertel is also collaborating with other researchers on campus to investigate the molecular mechanisms of anal squamous cell carcinoma.

STEVEN C. HOLMES, M.H.S.

Steven Holmes' area of expertise is in surgical pathology and gross anatomy. With this knowledge he is able to fulfill his role as an instructor to residents, medical students, prospective applicants and Pathologists' Assistant students. His instruction includes but not limited to indentifying and proper orientation of specimens as well as proper conduct and safety training in the laboratory. These skills are needed for handling simple biopsies up to complex surgical resections. Due to the high volume of specimens, his training also includes proper time management without adversely affecting patient care. Within the past few years he has been able to become a more confident teacher. This confidence stems from a year at private practice and years as an instructor/recruiter at Duke University Medical Center. In the upcoming year, Mr. Holmes envisions an even more hands on role with the departmental staff regarding staff instruction through laboratory bench work, conference planning and via meetings. He also plans to take a more active role in the frozen section room and learn the connection amongst the other labs with surgical pathology. Throughout the year, the growth, maturation, and improved skill level of residents in the surgical pathology laboratory is a reflection of his success as a clinical instructor. He has accomplished my goals at becoming a more effective/leader in the gross room. In addition, he has improved his efficiency in the frozen section laboratory. During the upcoming year, he would like to improve the work flow within the lab and continue with organizing gross conferences. Moreover, he will take on a more active role in the education of visiting personnel (prospective students) in regards to the everyday operations of the lab.

JONATHON W. HOMEISTER, M.D., Ph.D.

The research of Jonathon Homeister, M.D., Ph.D. has two major goals. The first is to utilize leukocyte lineage-specific transgenic gene expression and leukocyte lineage-specific gene targeting in murine experimental models to investigate α(1,3)-fucosyltransferase (FUT) gene function in the development of atherosclerotic cardiovascular disease. They are using these mice and other mice made deficient in FUT-IV and FUT-VII in all tissues to define a role for the selectin adhesion molecules and their fucosylated ligands in the development and progression of atherosclerosis. These mouse strains will be used to continue their studies that define the selectin-dependent contribution of several leukocyte lineages to the atherosclerotic disease process, as well as to homeostasis of the circulating counts of granulocytes and monocytes. The second goal is to determine the mechanisms whereby the FUTs regulate hemostasis and thrombosis. These studies are to elucidate the mechanisms whereby fucosylation of selectin ligands and/or other blood molecules alters coagulation and thrombosis. These studies also

utilize the mouse strains described above to modulate generalized and leukocyte lineage-specific FUT expression.

PEIQI HU, M.D.

Dr. Hu's research efforts are focused on elucidating the pathogenic mechanism of immune mediated glomerular and vascular damage. His current approaches consist of 1) Microarray based gene expression analysis on the mouse strains susceptible or resistant to anti-myeloperoxidase antibody (anti-MPO) induced crescentic glomerulonephritis to identify candidate genes responsible for the disease susceptibility. 2) Using animal model to dissect the mechanism of anti-MPO induced extravascular inflammation and tissue injury such as granuloma. 3) Epitope excision and mass-spec-based epitope mapping for identifying specific epitopes that are targeted by pathogenic anti-MPO antibodies. 4) Investigating the role of kinin receptors and their inhibitors in pathogenesis and therapeutic interventions of ANCA disease. 5) Developing a mouse models of minimal change nephrotic syndrome (MCNS) by IL-8 or factors derived from MCNS patient's T-cells, which will facilitate further investigation for the mechanism of MCNS disease.

J. CHARLES JENNETTE, M.D.

Dr. Jennette's research focuses on elucidating the clinical and pathologic features, pathogenesis and etiology of immune mediated vascular inflammation, especially vasculitis and glomerulonephritis induced by anti-neutrophil cytoplasmic autoantibodies (ANCA), with the goal of translating new knowledge into therapeutic and prognostic advances for patients with ANCA disease.

H. MICHAEL JONES, M.D.

Dr. Jones' research activities are primarily within the area of the history of medicine. After completing a video documentary last year on the life of William MacNider of UNC, the Health Care System has asked him to produce a similar project on another aspect of the medical history of the institution. He is currently researching and filming material regarding the history of the coagulation research done at UNC over the last 60 years that have been instrumental in achieving international recognition for the research and clinical activities of the Univeristy of North Carolina Medical School. This activity is buttressed by active enrollment in the certificate program of the Duke University Center for Documentary Studies. His functions as a research support pathologist with the Translational Pathology Laboratory, assisting in the selection and quality assurance for pathologic materials that form the basis of molecular and genetic studies for other principal investigators across the campus. These services are provided on demand.

KATHLEEN A. KAISER-ROGERS, Ph.D.

Dr. Kathleen Kaiser-Rogers continues to characterize the chromosome rearrangements of some of the more interesting patients referred to the UNC Hospitals Cytogentics Laboratory using both traditional and molecular cytogenetic techniques including fluorescence *in situ* hybridization (FISH) and chromosome microarray analysis (CMA). The rearrangements and corresponding

phenotypes observed in four such patients were reported at the March 2013 American College of Medical Genetics meeting, and a manuscript involving a 5th patient has been accepted for publication in Prenatal Diagnosis. Additionally she is currently on the Board of Directors for the The Cytogenetic Array Group Database (CAGdb). This group has been tasked with developing a platform-independent database of microarray findings that will be shared across multiple institutions to aid in laboratory data management, interpretation of copy number changes, and submission to ISCA/NCBI ClinVar datasets. Dr. Kaiser-Rogers is also currently a serving as a member on the CAP Cytogenetic Resource Committee, Chairing the ABMG Nominating Committee and Co-chairing the ACMG Salary Survey Work Group.

MASAO KAKOKI, M.D., Ph.D.

Dr. Masao Kakoki has recently generated mice with low expression of TGFα1 (approximately 10% of the mRNA abundance of wildtype) by the targeted replacement of the 3' untranslated region (UTR) of *Tgfb1* with that of *Fos* on a pure C57BL/6 genetic background. He has found that the TGFα1 hypomorphic mice develop hypertension, impaired diuresis/natriuresis with normal creatinine clearance, primary aldosteronism (published this April), aneurysm in the ascending aorta and dilated cardiomyopathy (manuscript in preparation). All of these unexpected results elucidate important novel roles of TGFα1 in the cardiovascular homeostasis. He plans to study the mechanisms whereby low TGFα1 levels cause these cardiovascular diseases and will apply for grant support for this purpose. Dr. Kakoki is also studying the effect of the genetically low levels of TGFα1 on diabetic nephropathy, using Akita male mice, a mouse model of type I diabetes. The TGFα1 insufficiency does not significantly change glucose or insulin levels in the plasma, but it normalizes urinary output of albumin in Akita mice. He plans to study the mechanisms for this finding, hypothesizing that the glomerular filtration is decreased and/or the uptake of albumin is increased in proximal tubules.

DAVID G. KAUFMAN, M.D., Ph.D.

Dr. Kaufman is working on a translational research study to determine the efficacy of chemotherapy in women undergoing drug therapy for breast cancer based on DNA damage in circulating cancer cells recovered from the patients. He has developed a method to quantify DNA damage significantly extended DNA fibers from as few as 5 cells. He also shown that they can recover circulating tumor cells from mice bearing transplanted human breast cancers and that they can detect excess DNA damage in these cells if the mice were treated with chemotherapeutic drugs. Because these methods originally were time consuming they have automated the three steps of the analysis yielding a much reduced analysis time. Concurrently they are trying to develop a microfluidic technique to make these measurements in continuous flow mode that would be suitable for use in a clinical pathology lab at much lower cost and much shorter turn-around time. This latter work is being done in collaboration with Dr. Steven Soper from the Department of Biomedical Engineering. A further elaboration of this process being developed is an effort to separate tumor cell subtypes in heterogeneous cancers and evaluating these subtypes separately. They have already shown that two tumor subtypes can be separated by this approach. This work is currently supported by an NC TraCS grant and applications for UCRF, NIH, and DOD grants have been submitted. They are also doing a translational research study to try to find a histochemical test to distinguish functional endometrial hyperplasias from

premalignant endometrial intraepithelial neoplasia (EIN). The morphology of hyperplasia and EIN are sufficiently similar to be incorrectly diagnosed with notable frequency. Morphometric studies have shown that EIN has quantitatively less stroma between glands than typical hyperplasias. Since most surgical pathologists do not use morphometry in routine diagnosis, a simple immunohistochemistry test would be a valuable aid to diagnosis. They have analyzed gene expression in co-cultures of endometrial epithelial and stromal cells where the ratio of stromal to epithelial cells was varied to resemble hyperplasias and EIN. They are now doing immunohistochemical studies of tissue microarrays of normal, hyperplastic and neoplastic endometrium targeting the gene products of the relatively few (and related) gene products found in the gene expression study. This study was supported by an NC TraCS grant.

WILLIAM K. KAUFMANN, Ph.D.

Dr. William Kaufmann's research is currently focused on two projects, one to determine the mechanisms of enhanced UV-clastogenesis in melanoma cell lines expressing oncogenic BRAF, the other to apply duplex deep-sequencing to quantify UV-induced mutations in human melanocytes. His other activities include completion of a manuscript describing chromosomal instability in melanoma cell lines and preparation of sections of a competitive renewal application for the Center for Environmental Health and Susceptibility. Dr. Kaufmann will be traveling to Shanghai, China to explore collaborative projects and provide consultation. He also will attend council meetings for the Environmental Genomics and Mutagenesis Society in September, organize the Fall meeting of the Genetics and Environmental Mutagenesis Society, and preside over the Grisham Professor Search committee.

APRIL E. KEMPER, M.H.S.

This year, Ms. Kemper has continued to focus her efforts on one-on-one resident teaching and training in the surgical pathology laboratory. Her work with the residents and medical students is very rewarding. She is also especially proud when she sees the residents progressing through their training, developing their own style of grossing and appreciating her teaching efforts. Additionally, this year, Ms. Kemper was able to lead several of the gross/microscopic Pathology labs for the 2nd year medical students. She also participated in the Respiratory diseases and Urologic and GU malignances courses headed by Dr. Funkhouser and Dr. Maygarden. She really enjoyed teaching the medical students and would very much like to participate again next year.

MEHMET KESIMER, Ph.D.

Dr. Mehmet Kesimer has currently formed a rapidly growing research group to establish his own practical research activities, which has already permitted him to make unique contributions to the CF and respiratory research field. His laboratory is not only playing a key role in research focusing on mucin/mucus and innate defense of the lung, it is also playing a key role in the training of the next generation of students, postdoctoral and medical fellows. His current and future goals, as a primary investigator with two NIH R01 and one P01 grants and other research funds, is to understand how airway mucus and periciliary gel layers are organized and maintained and how mucins, globular proteins, and structural organizations (exosome like vesicles) work together to protect the lung and thus help design better therapies targeting mucus clearance in chronic lung

diseases. Hopefully, Dr. Kesimer will start lecturing in BIOC 707, Cellular Metabolism & Human Disease, effective Fall 2013 in BBSP. He is actively seeking graduate students and planning to have at least two graduate students in the near future.

HYUNG-SUK KIM, Ph.D

To study complex genetic diseases, various animal models for cardiovascular diseases have been generated by gene targeting techniques. Resulting animals have shown the genetic factors to play a key role, specifically in the renin-angiotensin-aldosterone system. To understand homeostatic response to the genetic changes, molecular phenotyping procedures have been developed by gene expression study using high-throughput real time RT-PCR methods. Dr. Kim's results have shown in his entire published works (40 papers), its power for recognizing subtle phenotypic changes in animals even with minimal genetic differences. Using this powerful technique, currently he, as a core director of gene expression study, has been collaborating with many researchers in many fields, mainly cardiovascular diseases with Drs. Smithies and Maeda group, kidney problems with Drs. Arendshorst, Coffman (Duke Univ.), Williams (Temple Univ.), Luther (Vanderbilt Univ.), and Sharma (UCSD). Heart failure with Dr. Meissner, neurogical disease with Dr. Hand (UNC) and Dr. O'Connor (UCSD). Dr. Kim's goal is for more development in procedures of molecular and physiological phenotype for characterization of animal models.

NICHOLE L. KORPI-STEINER, Ph.D.

Dr. Nichole Korpi-Steiner's goals include establishing and developing translational research collaborations within and outside UNC as well as to focus on promoting patient safety through point-of-care clinical testing quality improvement initiatives. As part of her translational research efforts, in the coming year she plans to participate in a multi-center study to evaluate the effect of hemoglobin variants (HbAS and HbAC) on HbA1c result reproducibility/reliability. Discussions with colleagues are ongoing to further establish translational research studies. Additionally, point-of-care testing will be focusing on quality assessment of the total testing process (preanalytic, analytic, postanalytic phases) including the value of current quality indicators as well as evaluation and development of new quality indicators.

RUTH A. LININGER, M.D.

Dr. Lininger provides clinical anatomic pathology diagnostic services as a surgical pathologist subspecializing in gynecologic and breast pathology. She teaches residents, medical students, and graduate students and works with medical colleagues in multidisciplinary conferences as part of a multidisciplinary clinical team providing state of the art health care in a tertiary care setting. Her research interests are largely clinical, functioning as a pathologist in collaborative studies, primarily in gynecologic research on molecular markers in endometrial cancer and infertility states. She also provides private outside consult service focusing on gynecologic and breast pathology and is the major consultant for difficult gynecologic and breast pathology cases for several regional reference laboratories. She also participates in the business and fiscal aspects of surgical pathology billing and coding.

JIANDONG LIU, Ph.D.

Congenital heart diseases are one of the most common birth defects in humans, and these arise from developmental defects during embryogenesis. Many of these diseases have a genetic component, but they might also be affected by environmental factors such as mechanical forces. Dr. Liu's research goal is to study the molecular mechanisms that link mechanical forces and genetic factors to the morphogenesis of the heart. Their studies using zebrafish as a model system serve as the basic foundation to address the key questions in cardiac development and function, and could provide novel therapeutic interventions for cardiac diseases. Dr. Liu's plan for the coming year is to publish two peer-reviewed articles, apply for an NIH R01 grant, participate in departmental and MHI seminars/activities, and continue serving on various committees.

CHRISTOPHER P. MACK, Ph.D.

The overall goal of Dr. Mack's laboratory is to identify the signaling pathways and transcription mechanisms that regulate smooth muscle cell (SMC) differentiation. They have recently shown that nuclear localization of the myocardin family of SRF co-factors by RhoA signaling is an important mechanism by which extrinsic factors regulate SMC-specific transcription. Their current studies are focused on identifying the signaling pathways upstream and downstream of RhoA that regulate SMC transcription with a particular focus on the role of this pathway in the nucleus. The Mack lab recently received a new R01 to study the epigenetic control of SMC-specific transcription. They will be examining the role of histone and DNA methylation on the control of SMC-specific gene expression and will be attempting to identify the specific chromatin modifying enzymes and chromatin readers that mediate these effects. They hope that their *in vitro* and *in vivo* studies will lead to therapeutic targets for several cardiovascular pathologies that involve altered SMC phenotype.

NOBUYO N. MAEDA, Ph.D.

Dr. Nobuyo Maeda's laboratory is interested in the genetics and molecular pathology of atherosclerosis, a complex multi-factorial vascular disease and the major cause of death and disabilities in modern societies. They have developed apolipoprotein E-deficient mice as a model of human atherosclerosis. Using the spontaneous and human-like atherosclerosis in these mice as a basis, they have explored whether and how other factors modify plaque development. Based on a hypothesis that certain combinations of "genetic variations", each of which has only a small effect, determine atherosclerosis risk of human individuals, they also developed "humanized" mice producing human proteins in place of mouse proteins. Their studies revealed complex gene-gene and gene-environmental interactions affecting atherogenesis and other common disease conditions such as insulin resistance, diabetes and hypertension. The current focus is on the genetic risk factors that influence plaque development at the different vascular sites of apoE-deficient mice, which are influenced by their genetic backgrounds. Using quantitative trait loci (QTL) mapping in two F2 populations of mice, they have detected several loci determining the plaque size in the aortic arch. These loci are completely independent of QTLs that determine plaque size at the aortic root. Interestingly, one of the two significant QTL peaks on chromosome 1 determining the plaque size in the aortic arch overlaps with that determining the shape of aortic arch, suggesting a possible interaction between atherosclerosis

and the vascular geometry. During the coming years, they will aim to identify genetic risk factors that influence susceptibility to plaque development at some locations of blood vessels but not other locations, or vice versa, by taking advantage of mouse genetics and genomics.

TRACIE L. MASSEY, B.S., P.A.

Tracie Massey's primarily responsible is triaging and banking specimens for the Tissue Procurement Facility. She has increased the amount of specimens banked from about 20% to 60-80%. Her goal is to have 95-98% of the cases consented banked. Tracie has also implemented the banking of prostate cancer from prostatectomy specimens, which before she came, were not getting banked at all. Ms. Massey has become the clinical instructor of the Frozen Section Room. She has standardized the work flow and implemented the lean concept. She is now the sole instructor responsible for training all first year residents as well as assisting/training 2nd-4th year residents and fellows in the frozen section room. She is also responsible for the upkeep and training/trouble shooting for the new Zeiss microscope. Ms. Massey covers the frozen section bench to allow the resident on service to be trained for renal biopsies and for the RISE exam.

STEPHANIE P. MATHEWS, M.D.

Over the past several months Dr. Mathews has maintained focus on clinical efforts. She has identified several interesting cases for possible publication or as starting points for more involved projects and has gotten involved in translational research. She has given a continuing education lecture as part of Lab Week and gave another for UNC's annual CME event. In addition, she will give several resident and fellow level lectures in the coming months.

SUSAN J. MAYGARDEN, M.D.

Dr. Maygarden conducts clinical research in fine needle aspiration of the thyroid, lung pathology, and GU pathology. Significant plans for the coming year include taking over the directorship of the anatomic and clinical pathology residency.

GAYLE C. McGHEE

Gayle McGhee's responsibilities for this year included provision of gross organs for all of the organ blocks in the 2nd year Medical School sequence, Graduate Courses, First Year Dental Pathology and various other 'one-time" requests such as the provision of lungs and heart for anti-smoking lectures in local high schools. The work is being made more complicated this year by the necessity to rearrange the library of gross organs in the recently renovated Autopsy Suite. Unfortunately, the available space has been rearranged and compressed making this into a difficult project.
Provision of gross specimens is a multistep process as follows;

- Selection of appropriate organ specimens with the assistance of Drs. Hadler, Reisner and other faculty
- Careful examination of specimens and washing overnight
- Draining specimens and arraying on appropriate display trays with supplies of towels, and gloves.

- Moving specimens to the various teaching rooms and placing them on desks/tables
- After use specimens are returned, inspected and replaced in new formalin
- Collection maintenance is an ongoing process which involves discarding old, damaged specimens and consultation with Mr. Moylan and others to replace organ sets and enhance our collection

Another major component of Ms. McGhee's work is the scanning of microscope slides for use in Virtual Microscopy. To some extent this is a "hands-on" process which requires knowledge and experience in the use of the Aperio system and includes the ability to trouble shoot common problems. Scanning is done for teaching and in house research needs at no cost. In addition they scan for non-departmental faculty as a fee for service. The proceeds are used to support the yearly contract for service and upgrades for the Aperio slide-scanner. Additionally, Ms. McGhee helps in the organization of various teaching blocks by acquisition of teaching material and more importantly-by helping to organize and enter material for the Medical School on-line examination system. In the absence of Dr. Reisner, she serves as a delegate to the CC2 Course Directors meeting and help to prepare surveys as needed by Dr. Reisner for his role on that committee. For the coming year Ms. McGhee plans to help implement changes that are required to make Pathology teaching an excellent experience for the students. She wants to provide more help toward lectures and lab preparation.

C. RYAN MILLER, M.D., Ph.D.

Dr. Miller's current activities are focused on translational research involving comparative genomics analysis of glioblastomas (GBM) from both humans and genetically-engineered mice (GEM). The main goals of this work are to 1) define the impact of engineered genetic alterations on astrocytoma transcriptomal subtype-specification in GEM, 2) define the genetic alterations acquired during malignant progression and their effects on astrocytoma transcriptomes, 3) define the genetic alterations required to transform adult murine astrocytes into astrocytomas, and 4) determine molecular signatures of GEM GBM after TMZ-XRT therapy.

MELISSA B. MILLER, Ph.D.

Melissa Miller, PhD's major interests reside in the use of molecular technology to improve clinical infectious disease testing and, further, to use these technologies to explore the epidemiology of viral infections and antimicrobial resistance in bacterial infections. She is employing and comparing a variety of molecular technologies, including microarrays, sequencing and mass spectrometry, in the clinical diagnosis and epidemiology of infectious diseases. She continues to investigate and publish on the molecular epidemiology of MRSA and heteroresistant VISA, respiratory viral infections and mycobacterial infections. Dr. Miller's laboratory serves as the core laboratory for the molecular characterization of MRSA isolated from cystic fibrosis patients in two collaborative multi-center studies with Dr. Muhlebach in the Department of Pediatrics.

VINCENT J. MOYLAN, JR., M.S., P.A. (ASCP)

Vincent Moylan is currently involved in four research activities. He is a co-investigator in a recently funded NCTracs research grant entitled *Characterization of Brain White Matter Development using High Resolution Diffusion Tensor Imaging with Histologic Confirmation.* He will be assisting be assisting Drs. Joe Kornegay, Hongyu An, and Diane Armao. The second project is the *LCCC Tumor Donation Program.* This is a rapid autopsy program headed up by Drs. Lisa Carey and Leigh Thorne. This research program involves breast cancer patients that have previously consented to autopsy upon their death. The third project is a second rapid autopsy program similar to the above mentioned cancer study, except the study participants have metastatic melanoma. This program is headed by Dr. Stergios Moschos. The fourth and final project is the *CIMA (Comprehensive Individual Molecular Atlas) project* that is being coordinated through the Carolina Center for Genome Sciences. This project involves harvesting and dissection of all human body organs from a previously consented donor. Also, Mr. Moylan continues to work closely with Dr. Nickeleit and the Nephropathology division handling all of the medical kidney specimens, and assisting the surgical PA's by processing and photographing select explant cases (cardiac, hepatic, lungs). He looks forward to his continuing work with Drs. Hadler, Reisner, and Aylsworth on other medical student related teaching projects as they become available.

VOLKER R. NICKELEIT, M.D.

The research activities of Volker Nickeleit, M.D. focus on different aspects of renal allograft pathology. 1) Adjunct assays (in particular electron microscopy and C4d staining) for the diagnosis of cellular and antibody mediated rejection in kidney and liver transplants are under investigation. 2) A major research effort addresses polyomavirus infections in kidney allograft recipients. Dr. Nickeleit is the chair of the "Banff-working group" on polyomavirus nephropathy aiming at defining diagnostic guidelines. A new and exciting line of investigation focuses on non-invasive diagnostic strategies to establish a diagnosis of "polyomavirus nephropathy" without (invasive) biopsy (in close cooperation with H. K. Singh, M.D.). In pilot analyses negative staining electron microscopy on voided urine samples and the detection of three-dimensional polyomavirus clusters, termed "Haufen", has proven to be a robust diagnostic method with negative and positive predictive values of greater than 90%. Extended prospective studies are currently conducted in order to validate the initial findings further. These efforts are in part funded by extra-mural support from Astellas Pharmaceuticals. In addition a mouse animal model of "polyomavirus nephropathy" is being characterized. Dr. Nickeleit and his team succeeded in mimicking polyomavirus induced tubular injury typical for human disease in the mouse model and could identify urinary "Haufen" in diseased mice. Further studies are being conducted to validate the mouse model (in part supported by Astellas Pharmaceuticals).

SIOBHAN M. O'CONNOR, M.D.

Dr. Siobhan O'Connor has completed the project "Hormone Receptor and HER2/neu Immunohistochemistry in Multifocal/Multicentric Invasive Breast Carcinoma" and the abstract was presented at USCAP in March 2013. The paper is currently being written by two residents and is expected to be completed by the end of May. A subset of cases from this study will be

evaluated in Dr. Perou's lab to determine molecular similarity among foci. She is working on a case report regarding a gastric glomus tumor diagnosed on FNA. She is the pathologist on the following projects: Comparison of the diagnostic accuracy of digital mammography to digital breast tomosynthesis with respect to lesion characterization in breast tissue biopsy specimens; Diffusion-weighted MR imaging for assessment of axillary lymph node metastases in patients with breast carcinomas: A pilot study; Using novel *in situ* hybridization techniques to detect infections within placental tissue; Prevalance of chronic granulomatous mastitis in hispanic women, and various studies within the Breast SPORE.

YARA A. PARK, M.D.

Dr. Park's research focuses on thrombotic thrombocytopenic purpura (TTP), specifically the causes and exacerbating factors. Currently, she is investigating the role of infection in both the initial presentation of TTP as well as exacerbations during treatment. Recently, Dr. Park also studied the levels of thrombopoietin in TTP patients undergoing treatment. Additionally, Dr. Park is the co-PI for the UNC site of the Transfusion Medicine and Hemostasis Clinical Trials Network grant. Future projects are focused on other potential markers of TTP.

LI QIAN, Ph.D.

Dr. Qian's research focuses on developing novel therapeutic approaches for cardiovascular disease, with a particular emphasis on cellular reprogramming technology. Her goal is to further understand the basic mechanisms underlying cardiac differentiation and maturation and apply them to improve the efficiency and clinical applicability of reprogramming. For the coming year Dr. Qian plans to publish two more peer-reviewed articles, apply for NIH Director's New Innovator Award (DP2) and other new investigator awards/grants such as Searle Scholar and Pew Scholar, participate in departmental and MHI seminars/activities and continue serving on various committees.

KATHLEEN W. RAO, Ph.D.

Goals for the coming year fall into two catagories. 1) Goals for the Clinical Cytogenetics laboratory are to continue to provide state of the art clinical services to UNC Healthcare Patients. During this past year, the Laboratory validated SNP microarray analysis for pediatric and adult acute lymphoblastic leukemia. The laboratory goal for next year is to increase the number of cancers for which this high resolution genomic assay can be offered clinically. This past year the laboratory also validated an enhanced tissue culture method for chronic lymphocytic leukemia (CLL) samples that allows traditional cytogenetic analysis of the complex clones that characterize this disease. Continued enhancement or improvement of currently offered services is a constant goal for the laboratory. 2) A second set of goals relate to the Children's Oncology Group Cytogenetics Committee. The Committee has undertaken the goal of preparing the member laboratories (approximately 110 world-wide) to submit data from genomic assays for central review and inclusion in the cooperative group's databank. To that end, the Committee's semi-annual Workshop (February 22-23, 2013 in St. Louis) featured multiple presentations on CGH, SNP, and expression array data and its interpretation. During the coming year the goal is to produce both a bed-file for interpretation of CGH and SNP array data that can be used by all of the laboratories for these assays and a means of recording the data for future analysis.

JAY S. RAVAL, M.D.

Dr. Jay Raval has actively worked with colleagues in Transfusion Medicine to advance our further knowledge in the treatment of thrombotic thrombocytopenic purpura. Analysis of the institution's historical data in terms of plasmapheresis efficacy in this disease, complications during treatments, and types of immunosuppression utilized have all been conducted, and future avenues of translational exploration are underway in conjunction with Benign Hematology and the Proteomics Core Facility. Addtionally, much headway has been made in the collaboration with Dr. Joseph DeSimone regarding artificial red blood cells. *In vitro* studies have been encouraging to date, and a shift has been made into *in vivo* studies. Multiple projects in evidence-based transfusion medicine and apheresis are also being actively conducted, such as risk of circulatory overload after platelet transfusion, efficacy of different medications in treating allergic transfusion reactions, and investigations into plasmapheresis for humoral rejection of lung allografts. It has been a pleasure for Dr. Raval to teach the Pathology residents and Transfusion Medicine fellow thus far this year; the enthusiasm and strong work ethic by these individuals have made education of the house staff an exciting part of clinical time on service. Last but not least, the clinical service itself continues to impress – with the volume, variety, and complexity of apheresis, immunohematology, and blood bank cases that present here at UNC, along with the excellence of the technologists/nurses in the division, clinical service work continues to be exciting and challenging. Dr. Raval looks forward to the many opportunities this upcoming academic year.

HOWARD M. REISNER, Ph.D.

Dr. Reisner enjoys teaching and the preparation of course related material. The ability to design and execute a course on one's own (such as the Dental General Pathology and the Undergraduate Mechanisms of Disease Class) allows for creativity, some degree of authority along with the responsibility. One is likely to deserve the student comments one receives (and his have continued to be been quite good). He is presently in discussions with colleagues in the Medical School to play a role in the redesign of the first and second year Medical School curriculum, particularly in regard to using Pathology as a link between the preclinical and clinical portions. His work with the Aperio Image Analysis platform has led to collaboration in a project with Dr. Nancy Thomas, Drs. Singh and Nickeleit, and others.

LORI R. SCANGA, M.D., Ph.D.

Dr. Scanga's clinical activities in anatomic pathology include both surgical pathology and cytopathology service. Her primary areas of clinical service are cytology and gynecological surgical pathology. Dr. Scanga has multiple areas of active research. She has a current IRB to study the use of cytology procedures in the diagnosis of renal lesions. She is currently writing a manuscript to submit this work to a cytopathology journal. Dr. Scanga has also established multiple research collaborations with the UNC Otolaryngology/Head and Neck Surgery faculty. She is collaborating with Dr. Zdanski, Dr. Shores, and Dr. Serody to study Myeloid-Derived Suppressor Cells in Head and Neck Cancer (MDSC clinical trial). This research will be presented as an abstract at the ASCO 2013 Annual Meeting in Chicago. This research is

ongoing, and two manuscripts are being written for submission this year. Dr. Scanga is active in teaching medical students, residents, and fellows. Dr. Scanga was appointed the Course Director of MEDI 244 Reproductive Medicine for academic year 2012-2013. This role includes planning the schedule, developing and organizing pathology course material including lectures, small groups, and reference and reading materials on the Sakai site, teaching lectures and small groups, and examination development including creating and selecting questions. This role is ongoing and Dr. Scanga will continue to serve as the course director next year.

JOHN L. SCHMITZ, Ph.D.

Dr. Schmitz is director of the UNC Center for AIDS Research (CFAR) Immunology Core Laboratory. This facility supports numerous HIV and other researchers carrying out Immunologic studies of HIV, cancer, autoimmune, and infectious diseases. The laboratory is in its second 5 year project period. Over the next year, Dr. Schmitz plans to enhance core services by upgrading flow cytometric equipment. In collaboration with renal transplant colleagues, Dr. Schmitz is characterizing the incidence of donor specific antibodies in the UNC renal transplant cohort. Over the next year Dr. Schmitz will assess additional characteristics of these antibodies, such as isotype, complement fixing ability and antigenic specificity. In collaboration with Hematopathology faculty, the flow cytometry laboratory will continue improvements in immunophenotypic analysis of leukemias and lymphomas. Finally, the HLA laboratory is beginning development of next generation sequencing capabilities for eventually application to clinical testing.

DENNIS A. SIMPSON, Ph.D.

Dr. Simpson's research has linked oncogenic BRAF expression to clastogenesis and sensitivity to UVB exposure. This is an important finding in the understanding of how nevi progress to melanoma. This research has also shown that contrary to current models, UVB does not induce apoptosis in melanocytes. The final component of current research is to aid in the mathematical modeling of cell cycle processes that have been ongoing (see Kesseler et al). A software package was written by Dennis Simpson that greatly simplifies the annotation of these models while helping to explain them. The site is http://top2a.med.unc.edu/model and the id is Guest and the password is GuEst38.

HARSHARAN K. SINGH, M. D.

The focus of Dr. Singh's research that culminated in the characterization and development of a novel, non-invasive, diagnostic test, the urine PV Haufen test, to diagnose a major infectious complication post kidney transplantation known as polyomavirus nephropathy continues and is being confirmed in a prospective study with unrestricted funding from Astellas Pharma, US Inc. through the end of 2014. Dr. Singh is now also working to develop an ELISA based test for the identification of urinary PV Haufen, thereby taking the work out of an electron microscopy based test to one that can be used easily around the world. Dr. Singh is also working with her colleague, Dr. Volker Nickeleit, as the lead investigators with centers participating from the US, Canada, and Europe in developing an International Consensus Classification of Polyomavirus nephropathy to be presented this year at the 12th BANFF conference on allograft pathology. Dr.

Singh's future goal is to further strengthen the leadership role of the UNC Nephropathology Division nationally and internationally, in the arena of transplant pathology and to support its mission as a major center for the study and evaluation of kidney diseases.

SCOTT V. SMITH, M.D.

Dr. Smith is the Associate Director of Surgical Pathology and Director of Pediatric Pathology for UNC Hospitals. Dr. Smith's clinical activities are focused in surgical pathology with broad emphasis in pediatric, ENT, cardiac, pulmonary, gastrointestinal, genitourinary, prostate, pancreaticobiliary, endocrine, cardiovascular, bone and soft tissue pathology. An integral part of these endeavors is the instruction of pathology residents and fellows to facilitate their professional development. His teaching activities are substantial within the medical center including ongoing lecture series within the Schools of Medicine, Dentistry, and Public Health. Dr. Smith works in collaborative research with Dr. Julie Blatt and Dr. Ian Davis in Pediatric Hematology Oncology.

OLIVER SMITHIES, D. PHIL.

Over the past 20 years Dr. Smithies' research has been focused on identifying genetic factors that control blood pressure. Recently, its emphasis has shifted towards understanding factors that cause some pregnant women to develop pre-eclampsia, which is characterized by hypertension and proteinuria. This transition has been facilitated by his learning that his main research grant, which is now focused on this problem, has been funded. Indeed it was rated in the top 1% of proposals reviewed by the study section. The work has already led to a potential trial of a novel, safe and inexpensive dietary supplement that may enable mothers with pre-eclampsia to avoid or delay the need to have early delivery of their babies. Pre-eclampsia accounts for about 20,000 premature births in the United States each year. A second research area that is occupying his attention concerns the way that the kidney glomerulus discriminates between large proteins, which do not cross the glomerular barrier, from small proteins, which do. This work has also been recognized by its being awarded a grant from a UNC fund (TraCS) that encourages new basic research likely to have a translational impact on clinical practice.

JOAN M. TAYLOR, Ph.D.

The long-term goal of Dr. Taylor's research is to identify signaling mechanisms that contribute to normal and pathophysiological cell growth in muscle (smooth, cardiac, and skeletal). They are interested in studying cardiac and vascular development as well as mechanisms involved in heart failure, hypertension, and muscle degenerative diseases. The current directions of the Taylor lab are to characterize components of the integrin signaling cascade in these specialized cell types and to target disruption of these regulatory molecules *in vivo* in an effort to determine their precise role in cardiovascular growth and disease. They also seek to design therapeutics to target relevant pathways.

LEIGH B. THORNE, M.D.

Dr. Thorne will continue to work with the LCCC Tissue Procurement Facility to bank tissue for research as well as to facilitate the collaboration with the NCI/Cancer Genome Atlas. Dr. Thorne is also involved in the Carolina Breast Cancer Study Phase 3 and is assisting Jeanette Benson in the LCCC Cancer Survivorship group on text mining pathology data. Dr. Thorne continues her collaboration with Dr. Lisa Carey on her tumor donation protocol (rapid autopsy). Clinically, Dr. Thorne continues to rotate on the Molecular and Autopsy services.

RICHARD R. TIDWELL, Ph.D.

Dr. Tidwell will continue the collaboration with the Genomics Institute of Novartis Research Foundation (GNF). This collaboration has allowed the Tidwell led Consortium for Parasitic Drug Development (CPDD) to access to a library of over 300,000 small molecules to screen and optimize for development as treatments for late stage human African trypanosomiasis (HAT). An NIH R01 entitled "Drug Discovery for Human African Trypanosomiasis" was submitted in collaboration with the University of Washington. The proposal received a priority score of 1% and the funding is expected to begin Sept. 1, 2013. They continue collaboration with Bayer Animal Health and GALVmed to jointly research new drugs to treat animal diseases. Finally they are in the research stage of writing a book entitled "US Encounter with Tropical Disease". The book will detail how infectious diseases have impacted the United States throughout its history.

MICHAEL D. TOPAL, Ph.D.

Dr. Topal's research focuses on genomic instability, DNA damage, and proteins that cleave and rearrange DNA sequence. His present work is focused on a gene evolution study of the herpes virus h-CMV. Dr. Topal has significant experience in genomic instability and DNA enzymology and with the technologies used for genomics research. He has been Faculty Director of the UNC Genomics Microarray Core Facility since 2003, Faculty Director of the UNC Mammalian Genetics Core Facility since 2004, and Assistant Dean for Core Technologies at UNC SOM since 2008. The focus of Dr. Topal's efforts is to strengthen the research infrastructure within UNC and the UNC School of Medicine and to make this infrastructure more available to a wide range of researchers. Towards his end, Dr. Topal chairs committees involved in developing HR policy concerning core directors and staff, working to consolidate core facilities on campus and provide centralized management of the facilities, and working to implement parts of the SOM Strategic Plan dealing with core facilities.

DIMITRI G. TREMBATH, M.D., Ph.D.

Dr. Trembath signs out general surgical pathology, covering the GI Small and GI Large benches. Dr. Trembath, in conjunction with Drs. Tom Bouldin and Ryan Miller, is responsible for covering the surgical neuropathology service. These duties include teaching residents, covering frozen sections for both services and signing out the in-house and outside cases assigned to that bench. In conjunction with Drs. Bouldin and Dr. John Wright of Ophthalmology, Dr. Trembath is also responsible for covering the ophthalmologic pathology service. Dr. Trembath has an

increasingly busy consult service, reviewing neuropathology cases from outside hospitals and pathology groups. In terms of research, Dr. Trembath is involved in several collaborative efforts. With Dr. Stergios Moschos of Hematology-Oncology, Dr. Trembath is developing genetic signatures for melanoma brain metastasis to determine genes involved in the metastatic process as well as genes important for prognosis and response to therapy. In collaboration with Drs. James Crowley and Patrick Sullivan of the Department of Genetics, Dr. Trembath is analyzing a mouse model of tardive dyskinesia to understand how the drug haloperidol produces this condition. Dr. Trembath is also aiding the laboratory of Dr. Adrienne Cox of the Cancer Biology Division in their research of ECT2's role in ovarian carcinogenesis. New collaborations have also developed with Dr. Adam Zanation of the UNC Otolaryngology Service to investigate the role of HPV in Schneiderian papillomas and with Dr. Jen Jen Yeh of the UNC investigating pancreas tumor biology. Finally, Dr. Trembath is collaborating with Dr. David Eberhard and the team of UNCseq to verify mutations found in sequencing of patient material and to understand how those mutations relate to tumor biology.

CYRUS VAZIRI, Ph.D.

Dr. Vaziri's major goals are to publish results of ongoing research projects in high quality journals in order to maintain existing grants and to provide additional funding opportunities. Another goal is to identify novel areas for future research and to initiate new projects that will provide vehicles for extramural funding. To this end, trans-disciplinary studies are ongoing with several colleagues at UNC including Dr. Bill Janzen (School of Pharmacy), Dr. Buddy Weissman (Pathology), Dr. Ben Major (LCCC), Dr. Yuri Fedoriw (Pathology), and Dr. Angelique Whitehurst (Pharmacology). The collaborative drug discovery project with Dr. Janzen has resulted in an R01 application that was reviewed favorably scoring in the top 6th percentile, and is likely to be funded. Joint proposals with colleagues at UNC (and at other institutions) are being prepared for submission to the NIH and other agencies.

KAREN E. WECK, M.D.

The goals of the research of Dr. Karen Weck are to translate novel molecular tests into a CLIA-certified laboratory setting for clinical diagnostic and prognostic testing and to investigate the clinical utility of novel molecular testing. Major areas of focus in the past year include somatic mutation testing in a variety of tumor types to identify response or resistance to specific pathway inhibitors and support of broad-scale next-generation human exome sequencing efforts to identify mutations in genetic diseases and cancer. Dr. Weck has research collaborations with Lineberger Comprehensive Cancer Center, the Department of Genetics and the Renaissance Computing Institute (RENCI) to translate large-scale genomic sequencing (next generation sequencing) results to patient care at UNC. Dr. Weck is Co-Principal Investigator on a project called North Carolina Genomic Evaluation by Next-generation Exome Sequencing (NCGENES), funded by a NHGRI U01. The overall goals of the UNC NCGENES project are to evaluate the use of whole exome sequencing (WES) as a diagnostic tool in selected clinical conditions with a likely genetic etiology, evaluate the use and impact of incidental sequence information, develop a clinically-oriented structure for interpretation, storage and reporting of WES data, and implement WES in traditionally underserved populations throughout North Carolina. Work on this project to date has resulted in data analysis, identity confirmation, confirmatory sequencing

analysis and reporting of confirmed next generation sequencing results in 33 patients with a likely genetic etiology of disease. Significant efforts in the past year have been made to support the UNCSeq cancer project, supported by the University Cancer Research Fund. The goals of UNCSeq are to identify potentially medically actionable somatic mutations in UNC patients with cancer through massively parallel sequencing of ~250 genes in druggable pathways. In the past year, Dr. Weck has overseen confirmatory testing in the CLIA-certified Clinical Molecular Genetics Laboratory of somatic mutations identified through Illumina next generation sequencing and reporting of results in the electronic medical record in 48 cancer patients at UNC. In addition, in the past year UNC Clinical Molecular Genetics Laboratory has developed several new clinical genomic assays for use in patient care: 1) Expansion of the clinical testing menu for detection of somatic mutations in cancer, including hotspot mutation detection in the *PIK3CA* and *NRAS* genes; 2) Validation of testing for skewed X-linked inactivation in female carriers of X-linked inherited disease; and 3) Design and validation of improved assays for DNA fingerprinting for bone marrow engraftment analysis and Warfarin response genotyping.
The goals of Dr. Weck's research in the next year are to validate next generation sequencing technology to detect a panel of somatic mutations in tumors in the clinical molecular genetics laboratory in a CLIA-certified, CAP-accredited environment for use in patient care and to continue work on the UNCSeq and NCGenes projects to utilize next generation sequencing for clinical care at UNC in the areas of cancer and genetic disease.

BERNARD E. WEISSMAN, Ph.D.

Dr. Weissman's research focuses upon the role of aberrant chromatin remodeling in disease development. Specifically, his laboratory has concentrated upon loss of activity of the SWI/SNF chromatin remodeling complex in the development of 2 deadly cancers- non-small lung carcinoma, a common adult malignancy and malignant rhabdoid tumor, a rare pediatric cancer. Previous studies from Dr. Weissman's laboratory have shown that inactivation of individual components of the complex alter gene expression through changes in chromatin organization and through destabilizing the complex. Furthermore, the loss of SWI/SNF complex may induce epigenetic instability in cancer cells leading to gene silencing via a mechanism independent of DNA methylation. The SWI/SNF complex also plays a direct role in regulating cellular responses to these processes by virtue of its interactions with the NFκB pathway, the p53 pathway, the KEAP1/NURF2 pathway and histone acetylation complexes. During the next year, Dr. Weissman will continue to focus on dissecting on how the loss of SWI/SNF complex activity fuels the development of these specific cancers and the development of specific reagents to treat the subset of cancers with mutations in these genes.

HERBERT C. WHINNA, M.D., Ph.D.

Clinical Research: Dr. Whinna will continue collaborative research efforts in Transfusion Medicine and Clinical Coagulation, focusing especially on clinical testing for new oral anticoagulant agents.
Translational Research: Dr. Whinna has started research collaborations with several Biomedical Engineering faculty members, including Dr. Richard Superfine, to develop new miniaturized clinical testing platforms.

Basic Research: Dr. Whinna continues using his mouse models of hemostasis/thrombosis to investigate basic mechanisms of hemostasis.

JULIA W. WHITAKER, M.S., D.V.M.

Dr. Whitaker continues to provide veterinary clinical care for the research animals on campus and to supervise the Surgical and Clinical areas of Veterinary Services as her primary function. The clinical case load continues to increase, and she supervises this area as Associate Director of Veterinary Services. She continues to pursue research on the effect of caging environment on mouse reproduction and behavior, in collaboration with Dr. Sheryl Moy in the Department of Psychiatry, and they, along with Dr. Craig Fletcher, completed a project in 2012- 2013 with additional collaboration with Charles River Laboratories. They plan to analyze the data from this study in the summer of 2013, with the goal of preparing an article to submit for publication in the fall. Her interest and specialty training in aquatic animal medicine will continue to be used to support the aquatic research species on campus. She will continue to be involved in teaching and training of laboratory animal residents in the Research Triangle area through the new Research Triangle Laboratory Animal Training Program seminar, and through individual teaching of the UNC laboratory animal residents. She will continue to co-chair the Southeastern location of the International Mock Board Exam Coalition for the ACLAM board exam.

SCOTT E. WILLIAMS, Ph.D.

Since arriving at UNC on April 1st, Dr. Williams has been working on getting the lab up and running: recruiting personnel, ordering equipment and supplies, preparing safety plans and animal protocols, and networking with faculty in the Department and throughout the SOM. He has a first-year BBSP student, Kendall Lough, who will be joining the lab July 1 for a summer rotation, and has hired a technician, Thomas Anthony Curtis, who will be starting in mid-July. Several other incoming students have expressed an interest in doing a rotation in his lab and he expects to take at least one additional BBSP student on in the fall, along with 1-2 undergraduate work study students.

Following a discussion with his mentoring committee on April 24th, it was decided that he will target February 2014 for his first NIH R01 submission. In the meantime, he plans to apply for an American Cancer Society Research Scholar Grant and a Department of Defense Peer Reviewed Cancer Idea Grant this fall. Shelley Earp and Scott Magnussen have also suggested that he apply for the Pew or Searle Scholar next fall and they have agreed to support his candidacy at that time, when he expects to have additional peer-reviewed journal articles published.

His research goals for the coming year are first and foremost to wrap up the remaining studies from his postdoctoral lab. He plans to submit this manuscript very shortly to *Developmental Cell*, and is also coauthoring a review article for *Current Opinion in Cell & Developmental Biology* with Elaine Fuchs, which will be submitted by the end of June. His highest priorities for the research to be done in his lab at UNC are 1) establish and characterize the oral epithelia as a model system for studying development and squamous cell carcinomas, 2) develop a human epithelial culture system to complement our *in vitro* and *in vivo* mouse models, 3) get the *in utero* lentiviral gene modification system that he helped develop as a post-doc up and running

here at UNC to facilitate the analysis of novel genes that may regulate asymmetric cell divisions in skin and oral epithelia.

MONTE S. WILLIS, M.D., Ph.D.

Dr. Willis is director of the Campus Health Services Laboratory, director of sweat testing at UNC hospitals, and assistant director of the core (clinical chemistry) laboratory. His laboratory investigates the role of novel ubiquitin ligases in the pathophysiology of common cardiac diseases, including myocardial infarction (heart attack) and heart failure. Starting in January 2012, his laboratory additionally has started an international collaboration investigating the role of proteotoxicity in heart failure, supported by a five year Leducq funded project entitled "Proteotoxicity: an unappreciated mechanism of heart disease and its potential for novel therapeutics". The goal of this collaboration is to identify novel mechanisms of protein quality control in heart disease and in parallel identify and test novel therapeutics in pre-clinical trials targeting these mechanisms (http://www.fondationleducq.org/nivel2.aspx?idsec=1195). The long-term goal of this 6-team trans-Atlantic collaboration will be to identify therapies, which can be tested in human clinical trials.

ALISA S. WOLBERG, Ph.D.

The major goal of Alisa Wolberg, Ph.D., is to examine cellular, biochemical, and biophysical mechanisms that modulate procoagulant activity and fibrin formation during hemostasis and thrombosis. Dr. Wolberg's group has made substantial progress towards both goals during this year. They have used *in vitro* assays and developed novel *in vivo* models of thrombosis and thrombolysis to examine how plasma hypercoagulability and vessel injury promotes thrombus formation. Their studies suggest pathogenic roles for cell-derived microvesicles in thrombosis and cancer, correlate vascular injury with thrombus formation and stability, and demonstrate specific pathophysiologic mechanisms that differentiate arterial and venous thrombosis. Their techniques for measuring fibrin formation and stability may provide important information on the therapeutic dosing window of novel thrombolytic and hemostatic agents.

JOHN T. WOOSLEY, M.D., Ph.D.

Dr. Woosley has a productive ongoing research program with Dr. Evan Dellon (Gastroenterology) with the goal of defining basic pathologic mechanisms and therapeutic opportunities for the newly described esophageal diseases – eosinophilic and lymphocytic esophagitis. Dr. Woosley also has a productive research relationship with Dr. Richard Semelka (Radiology) to further refine radiographic criteria for the diagnosis of primary and metastatic liver tumors.

HONG XIAO, M.D.

Dr. Xiao's research aims at understanding of molecular mechanisms of immune mediated kidney diseases with emphasis on antineutrophil cytoplasmic autoantibody (ANCA) induced glomerulonephritis and small vessel vasculitis (ANCA disease). Her recent efforts are focused on 1) Strain based genetic analysis for genetic loci, trying to identify candidate genes and their

protein products that modulate the diseases severity in experimental MPO-ANCA disease, which might be new markers for disease activity and potential targets for novel therapeutic strategy in humans. 2) Using recombinant mouse/human MPO chimeric molecules to map pathogenic epitopes that are targeted by pathogenic anti-MPO antibodies. 3) Investigating the involvement of receptors on neutrophil such as FcrR, C5R and kinin receptors in pathogenesis of ANCA disease and testing therapeutic interventions with inhibitors in ANCA disease model.

MAIMOONA B. ZARIWALA, Ph.D.

The major goals of Dr. Zariwala's research are: (1) Decipher possible genetic causes of Primary ciliary dyskinesia by using, a) Next generation sequencing technologies, b) Testing novel candidate genes, c) Testing new patients for known gene mutations, (2) Continue to expand the CLIA approved clinical genetic test panel for Primary Ciliary Dyskinesia, (3) Provide consultation and ongoing support to the Molecular Pathology Lab for clinical genetics test panel for Primary Ciliary Dyskinesia, and (4) Decipher possible genetic causes of idiopathic bronchiectasis that is not related to the CF or environmental causes. Dr. Zariwala's laboratory has made significant progress towards each of these goals in the last year. The work on *CCDC39* and *CCDC40* mutation profiling has been published in collaboration with Dr. Omran, Germany & Dr. Mitchison, UK. The work on Amish Mennonite families on the known gene mutations in *DNAH5* has been published as well as on the novel *HEATR2* gene identification in the same cohort has been published in collaboration with Dr. Ferkol's group at Washington University. Additionally, novel founder mutation in patients with Primary Ciliary Dyskinesia was identified in the known *RSPH4A* that has been accepted for publication. Ongoing collaboration with the national and international laboratories through the Primary Ciliary Dyskinesia consortia, additional patient material is acquired and tested for known genes and mutations, as well as for defining novel mutations. In collaboration with Drs. Shendure, Nickerson and Bamshad at Seattle Genomic Sequencing Center, work on Whole-Exome sequencing of 24 unrelated PCD patients is continued. Through these efforts, two novel genes were defined, of which work on *CCDC114* has been published and manuscript is under revision for the other gene. Furthermore, with the same collaborators, Dr. Zariwala carried out Whole-exome sequencing in 24 affected belonging to 17 unrelated families with non-CF bronchiectasis that yielded two novel cilia related genes and further characterization is underway. Collaboration with Dr. Hildebrandt (Harvard Medical School) on whole-exome sequencing has identified 3 novel PCD-causing genes and manuscript for one is under revision. Collaboration with Dr. Omran (Germany) yielded 2 novel genes, of which one (*ARMC4*) has been accepted for publication and another is under revision. Characterization and additional mutation profiling work is underway. Briefly, novel cilia related genes are continuing to be identified exome sequencing efforts and work is ongoing to find new targets for PCD and non-CF bronchiectasis. The success of this test will open the door for expanded clinical tests as early diagnosis will allow early intervention and will improve clinical outcome of classic and non-classic PCD as well as idiopathic bronchiectasis. This study will also represent a significant step forward in the application of new approaches to genetically heterogeneous disorders in humans.

QING ZHANG, Ph.D.

Dr. Zhang's research focuses on understanding how hypoxia signaling/prolyl hydroxylase pathways contribute to breast cancer and renal cell carcinoma. His ultimate goal is to develop selective strategies to target key signaling pathway in hypoxia signaling involved in cancer. His plan for the coming year is to publish at least 2-3 peer-reviewed research articles. He has one paper in preparation and another paper close to writing. After paper submission, he is planning to apply for some new investigator awards/grants such as V foundation, Pew or Searle Scholar. In the mean time, he will apply for some breast cancer foundation/kidney cancer foundation grants. He will also be actively participating in departmental and Lineberger Cancer Center seminar/symposium events and will continue to serve on committees for graduate students.

PROGRAMS AND SERVICES

TEACHING
HOWARD M. REISNER, Ph.D.

MEDICAL:
Second Year Medical School Involvement: Pathology content provided by our department is incorporated into 10 of the 11 blocks which comprise the second year curriculum. The blocks are predominantly organ system based. However, two blocks, an introductory "Tools" block and a Clinical Medicine Cases Block, serve special functions to be discussed. The only organ system in which the department does not play a strong role is the Musculoskeletal/Dermatology block which supplies its own expertise from Dermatology. However, we support the block in providing virtual scanned images for use. Each organ system block is represented by a member of this department serving on a "block committee". Several committees are chaired by departmental faculty members including the Tools Block (Reisner) and Integrated Clinical Case blocks (Hadler). Each block attempts to integrate pathology and abnormal physiology/medicine into a single course with a single syllabus (all presented on-line). Different blocks have taken somewhat different approaches but, in general, independent pathology lectures remain relatively intact and are usually broken into small units. The tendency for "independent" pathology laboratory sessions to be used in several of the blocks (including respiratory, GI, endocrine, female reproductive, and renal/urinary) has continued and receives excellent student comments. This year medical residents have worked along with Pathology Faculty and Residents in several of these laboratory sessions. These "mini-pathology" lab sessions are most successful when presented before the more medical sections of the laboratory (when such exist) and are designed to complement other material presented. The availability of laboratory staff that participate in multiple blocks (particularly Dr. Hadler) allows students to get to know our faculty members across several organ system blocks and student attendance in laboratories continues to be excellent. In addition, an introduction to Pathology as a medical career has been added and several of our junior faculty have been used this as an opportunity to meet students. Twelve video podcasts presenting overviews of introductory laboratory material continue to be used in the first block and were noted as helpful by students. The availability of gross organ specimens in the much improved facilities of Bondurant Hall proved to be an extremely positive development in laboratory/small group sessions and the department is pleased that such specimens were available for and heavily used this academic year. Although not perfect in it's implementation AIMS based quizzes have been used in the tool block and will be modified and expanded next year.

The Tools Block (Block 1) includes the entire Introduction to Pathology (General Pathology) sequence and has been accompanied by a substantial increase in hours available to this department. The Clinical Case Block was founded by Dr. Clark of this department and continues to provides a series of integrated cases in which pathology and clinical laboratory medicine play an important role.

Dr. Reisner has aided in preparation of teaching material with the assistance of Ms. McGhee and they have concentrated on making virtual microscopy slides easily available as part of the syllabi. All blocks used computer based virtual microscopy rather than glass slides and

microscopes to present histopathological material and the availability of the Aperio scanner with 40X capabilities has allowed the extension of VM technology to the area of hematopathology. Images are provided online via a specialized image server which also serves as the repository for image files. Student acceptance continues to be excellent and a far greater interest in histopathology was noted to be present during laboratory sessions. The Aperio viewer (Imagescope) continues to be preferred by students to a virtual slide viewer used in histology. However, Dr Reisner has now modified all laboratory sessions to allow Virtual Microscopy using Macs and Linux based computers.

General Pathology Sequence (in Block I): The course was initially designed by Dr. Scott Smith and consisted of eight lecture sessions covering general pathology and five laboratory sessions using virtual microscopy and gross organ demonstrations. Laboratories were staffed by both Ph.D. and M.D. faculty so as to afford students the opportunity to meet both research and clinical faculty. Virtual microscopy images were presented using the image server. It is believed that these changes provided a more coherent introduction to aspects of pathology necessary for an understanding of subsequent material. The examination format (revised last year to have a "practical component") was again somewhat modified to fit the integrated second year examination paradigm. Each laboratory session included a short quiz done in lab to help reinforce major points in the lecture and laboratory. These will be somewhat modified for next year in response to student comments.

DENTAL:

First Year Dental School Teaching: Pathology 127: Dr. Reisner (Course Director) provided a series of nine one hour lectures which cover all essential aspects of general pathology. Because much of this material is not reviewed in subsequent courses in systemic medical and dental pathology, a good deal of attention to details and use of the textbook (Rubin's Essentials of Pathology 5th Edition) was encouraged. All lecture material was presented as PowerPoints which are made available to students before the lecture. There are seven laboratories covering general aspects of histopathology which are supervised by Drs. Hadler (who comments on gross organ pathology) and Reisner and the expanded use of introductory laboratory "podcasts" has proven both useful and popular. This has been made easier by incorporating access into the Sakai system. Two multiple choice exams were used as evaluation tools along with short "extra credit" exercises expanded this year to a surprising degree of enthusiasm. Although grading such short answer material is very time consuming it is repaid by student interest. In general, course comments and ratings have continued to be excellent.

Second Year Dental School Teaching (Pathology 214): The course is currently a series of eleven lectures designed to cover most areas of systemic pathology by invited Pathology Clinical Faculty with Dr. Reisner filling in where necessary. Because of this format we continue to reduce the variability between sessions. The lack of a laboratory de-emphasizes histopathology and the use of fixed organ material. Lectures are now much more standardized and *apropos* the needs of the Dental students. Given the availability of virtual microscopy short self-directed laboratory modules may also be included in the future. One sample podcast (in pulmonary pathology) has been produced for testing purposes.

*Several of our newer faculty including Drs. Fedoriw, Homeister, and Ryan Miller took an active role which will continue next year as a result of enthusiastic student comments.

MOLECULAR AND CELLULAR PATHOLOGY GRADUATE PROGRAM

JONATHON W. HOMEISTER, M.D., Ph.D., DIRECTOR OF GRADUATE STUDIES
CYRUS VAZIRI, Ph.D., ASSOCIATE DIRECTOR OF GRADUATE STUDIES

In August of 2012, the administrative leadership of the Molecular and Cellular Pathology Graduate Program changed. William Coleman, Ph.D., who served as Director for the previous six years, stepped down and was replaced by Jonathon W. Homeister, M.D., Ph.D., the previous Associate Director. At the same time, Cyrus Vaziri, Ph.D. assumed the role of Associate Director. These changes represent the usual intermittent changes in leadership that have been characteristic for the program in recent history. The graduate student body of the Molecular and Cellular Pathology Graduate Program individually and collectively accumulated a number of significant accomplishments during the past year. Three students successfully completed the Ph.D. program (Patricia Casbas-Hernandez, Michael Durando, and Meghan Free). Michael Durando earned the Ph.D. degree as part of his training in the M.D./Ph.D. program of the medical School. With these graduates, the Molecular and Cellular Pathology Graduate Program has produced 176 total graduates and 129 Ph.D. graduates since 1954. Meghan will continue her professional development through postdoctoral research. Patricia is enrolled in a program to earn a Masters of Public Health, and Michael returned to medical school to finish his M.D. degree. The Biological and Biomedical Sciences Program (BBSP) continues to admit excellent graduate students, many of whom are interested in the Molecular and Cellular Pathology Graduate Program. During Summer 2012, Fall 2012, and Spring 2013, faculty members associated with the Molecular and Cellular Pathology Ph.D. Program hosted 12 laboratory rotation experiences for 10 individual students (among 8 faculty laboratories). This is more laboratory rotations compared to last year. During the 2011-2012 academic year, our faculty hosted 6 laboratory rotation experiences for 4 individual students, during 2010-2011 our faculty hosted 18 laboratory rotation experiences for 11 individual students. This partly reflects an increased number of opportunities to host students among our newly recruited faculty laboratories during the most recent year. In September 2012, Britta Jones joined the Molecular and Cellular Pathology Ph.D. Program to work with Dr. Ron Falk. In addition, Kim Bird, Ashley Fuller, and James Byrnes matriculated into our program from the BBSP in June of 2013. Kim and Ashley will work with Li Qian, and James will work with Alisa Wolberg. As of July 1, 2013, the Molecular and Cellular Pathology graduate program has a total of 17 students (15 from the BBSP and 2 from the M.D.-Ph.D. Program). In the period spanning 2012-2013, graduate students contributed to numerous publications in peer-reviewed journals and published abstracts, many with a graduate student as first author, and several with multiple graduate students as co-authors. In addition, several graduate students were recognized for their research excellence with awards. At the 2012 Molecular and Cellular Pathology Annual Research Symposium (September 2012), Maria Aleman and Lantz Mackey received awards for best presentations by a graduate student. Amanda Rinkenbaugh received the Trainee's Choice Award from her colleagues. Bethany Walton received the 2013 Graduate Education Advancement Board IMPACT Award for her research project entitled "*The Contribution of Gamma Prime Fibrinogen to Arterial*

Thrombosis." Lantz Mackey and Kristine Wadosky received Student Travel Awards from the American Society for Investigative Pathology (to attend Experimental Biology 2013). Kristine also received a Travel Award from the American Physiological Society to attend the same meeting. Kaitlin Lenhardt, Maria Aleman, Kim Bird, and Laura Weise-Cross all received Sabin Travel Awards from the UNC McAllister Heart Institute. Maria Aleman received a Young Investigator Award to travel to the International Society for Thrombosis and Hemostasis annual meeting in Amsterdam. Research support for students in Molecular and Cellular Pathology was provided by several sources. Kaitlin Lenhardt, Lantz Mackey, Laura Weise-Cross, and Bethany Walton were supported by the Integrative Vascular Biology Training Program. In addition, several students received extramural predoctoral fellowships from the American Heart Association, or the NIH. Kristine Wadosky was awarded a predoctoral fellowship from the American Heart Association. Michael Durando and Maria Aleman were supported by predoctoral fellowships from the NIEHS and NHLBI, respectively. In addition, several students were supported by funds from the Department of Pathology and Laboratory Medicine. During 2012-2013, Amanda Rinkenbaugh and Robbie McNeill received continuing support as Robert H. Wagner Scholars in Molecular and Cellular Pathology. Four Molecular and Cellular Pathology Ph.D. students including Amanda Rinkenbaugh, Bethany Walton, Britta Jones, and Robbie McNeill are HHMI Fellows participating in the Program in Translational Medicine. Kim Bird was selected as an HHMI Fellow beginning in 2013. Patricia Casbas-Hernandez and Meghan Free were awarded the Certificate in Translational Medicine concurrent with their graduation from the Molecular and Cellular Pathology Ph.D. Program in recognition of their completion of the Program in Translational Medicine.

On May 16-18, the Office of Graduate Education (OGE) sponsored the first ever Carolina Biosciences Alumni Reunion to honor and celebrate the alumni of the biologic and biomedical sciences graduate programs. Our department hosted nineteen graduates of the Molecular and Cellular Pathology Graduate Program for the three-day event. On Thursday, May 16, the department organized scientific and meet and greet sessions for our graduates and current students. Oral presentations were given by graduates Tracey Dawson Cruz, Liisa Smith, Matthew Medlin, Timothy Heffernan, Dean Straus, Mehmet Karaca, Delores Grant, and Paula Oliver. Scientific posters were presented by alumni Rupinder Sandhu, Arti Patel Varanasi, and our graduate students. The afternoon sessions were followed by an evening pig pickin'. The day provided a unique and fun celebration of our alumni, and the opportunity to catch up with old friends, and make new ones. The events of Friday and Saturday. May 17 and 18 were planned by the OGE, and included presentations to the greater university community by a number of UNC graduate alumni, and included presentations by Pathology graduates Timothy Heffernan, and Tracey Dawson Cruz.

During the last year, the Graduate Student Seminar Series (that began in Fall of 2001) continued to showcase the excellent research of the graduate trainees. During Spring 2007, the seminar series was moved to Tuesday at noon and became a luncheon seminar to enhance attendance. This modification of seminar schedule has been very successful. The Spring 2013 Seminar Series featured presentations by eight Molecular and Cellular Pathology Ph.D. students and one postdoctoral fellow from the Department. Beyond our Tuesday seminar series, graduate students from our program participated in numerous other research symposia on campus. Graduate students were also featured in a Pathology Grand Rounds session in Spring 2013. Laura Weise-

Cross (from Dr. Chris Mack's laboratory) gave a presentation entitled "The role of the Diaphanous-Related Formins mDia1 and mDia 2 in Smooth Muscle Cell Differentiation," and Kristine Wadosky (from Dr. Monte Willis' laboratory) gave a presentation entitled "Muscle RING Finger-1-dependent Cardiomyoctye Hypertorphy and Akt Activity by Inhibiting c-Jun." This series provides a valuable opportunity for students, faculty, and staff to learn more about graduate student research ongoing in the department. The Marc J. Mass, Ph.D., Memorial Distinguished Lecture Committee continues to plan speaker events. The last Lecture was in Fall 2012, titled "The Many Roles of VEGF in the Adult," and given by Patricia D'Amore, Ph.D., M.B.A. In the summer of 2012, the graduate students selected Dr. William B. Coleman as the 2012 recipient of the Joe W. Grisham Award for Excellence in Graduate Student Teaching. The award was presented in September 2012 at the home of Dr. J. Charles Jennette. In other activities, the graduate students have continued to have regular outings to local restaurants for informal discussions related to the graduate program and their research, as well as fun social events.

RESIDENCY TRAINING PROGRAM IN PATHOLOGY
MEGAN J. DiFURIO, M.D., DIRECTOR

The Department of Pathology & Laboratory Medicine currently sponsors a residency training program in Anatomic Pathology (AP) and Clinical Pathology (CP). Our program is fully accredited by the American Council on Graduate Medical Education (ACGME); a complete description of our program, curriculum and current trainees is available on the departmental web site: https://www.med.unc.edu/pathology/residency.

The educational goals and philosophy of the residency program are:

1. Provide a flexible, broad-based training program for physicians that includes training in anatomic, clinical and experimental pathology
2. Encourage trainees to participate in research
3. Provide an educational experience sufficient to ensure that all residents develop skill levels expected of a new practitioner in the six ACGME-defined competencies (patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism and systems-based practice).

We offer a four-year combined AP and CP residency with a total complement of 16 residents, offering ample opportunities for research and post-residency fellowship training in a wide range of subspecialty areas in Pathology. The first three years of our program are focused on core training in AP and CP. The curriculum is organized to blend AP and CP core rotations within each of the first three years of training. The fourth year of training permits the trainee great flexibility – there are six months of elective rotations in AP, CP or Pathology research, so that the resident can concentrate on his/her particular interests. Overall there are eight months of elective rotations interspersed throughout the four year training program. All residents in our training program are provided with an individual study carrel, microscope, and computer fully loaded with appropriate software, connected to the internet and fully supported by the UNC Hospitals' ISD staff.

For the academic year July 1, 2012, through June 30, 2013, we had a total of 15 residents (one resident was granted AP only status and graduated after three years in the program), six fellows in ACGME-accredited fellowship programs and three post-doctoral trainees in Clinical Laboratory Medicine fellowships (accredited by other agencies). Eight of our graduating class of 2013 were named as Pathology faculty at UPenn, Ohio State, UNC-CH, and North Carolina Office of the Chief Medical Examiner; one locum tenens settling in Fayetteville, NC; one went into private practice in Tennessee and four continued their graduate medical education in fellowships.

There were over 400 applicants to our residency program via ERAS for the 2013-2014 academic year; 39 individuals were interviewed, 33 individuals were ranked and we secured four positions in our top ten ranked.

While we anticipated an external site visit by the ACGME in October of this year, communication dated July 1, 2013, from Linda Thorsen, MA, Executive Director of the Residency Review Committee for Pathology reports that our regularly scheduled visit is being replaced with a Self-Study Visit in October 2017. The details of the format of the self-study visit are currently under development by the ACGME. More information to follow as it becomes available.

Megan DiFurio MD, the Associate Program Director from July 1, 2011 through June 30, 2012 and Program Director from July 1, 2012 through June 30, 2013 stepped down effective June 30, 2013. Susan Maygarden MD stepped down as the Program Director for Cytopathology fellowship effective June 30, 2013 and assumed the Residency Program Director position effective July 1, 2013. Herb Whinna MD PhD remains the Associate Program Director for the Pathology Residency Program.

SUBSPECIALTY FELLOWSHIP TRAINING PROGRAM

CLINICAL CHEMISTRY FELLOWSHIP 2012-13
CATHERINE A. HAMMETT-STABLER, Ph.D., DIRECTOR
DENISE M. MILHORN, Ph.D., FELLOW, 2012-2014
(http:www.pathology.unc.edu/fellowship/clinchem.htm)

Begun in 1972, this COMACC-accredited postdoctoral training program has a rich history of producing leaders within the field of Clinical Chemistry. Following two-years of intensive training in both the analytical and clinical aspects of clinical chemistry, fellows are prepared to enter laboratory medicine in clinical service, educational, or research roles. Maj Denise Milhorn, PhD (Deputy Director, Medical Research Materiel Command, FT Detrick, MD.) joined the program in August 2012 following deployment to the Field Assistance of Science and Technology Team in Kandahar, Afghanistan. She has contributed to multiple manuscripts and is presenting at AACC in July. The program had a record 92 applications for the position beginning July 1, 2013. Dr. Hanan F. Mohammad from the ComACC accredited-doctoral program at Cleveland State University was selected to become the program's 29th trainee. The Clinical Chemistry Fellowship is directed by Catherine Hammett-Stabler, Ph.D., DABCC, FACB.

CLINICAL MICROBIOLOGY FELLOWSHIP
PETER H. GILLIGAN, Ph.D., DIRECTOR
KEVIN A. ALBY, Ph.D., FELLOW, 2012-2013

The Department of Pathology and Laboratory Medicine and UNC Hospitals sponsors the Clinical Microbiology Training Fellowship, which is a two-year training program accredited by the Committee on Post-doctoral Education Programs of the America College of Microbiology. The Clinical Microbiology Fellowship is directed by Peter H. Gilligan, Ph.D. The major objective of this program is to train individuals to direct clinical and public-health-microbiology laboratories. The fellows' training includes five areas: (1) Technical training to become proficient at performing and interpreting the laboratory procedures offered in the clinical microbiology laboratory; (2) Administrative training in the various aspects of laboratory management and administration, including budgeting, personnel, quality control, protocol preparation, safety regulations, and CLIA and OSHA requirements; (3) Clinical training enabling the trainee to interface effectively with infectious-disease clinicians; (4) Research in clinical microbiology; and (5) A three week external rotation at the State Laboratory of Public Health. On June 21, 2013, Kevin Alby PhD completed a highly successful fellowship in this program. He played a major role in establishing Mass Spectroscopy as the standard technique in our laboratory for identifying bacterial and yeast. He also developed new methods for detecting multi-drug resistant organisms. He published 2 book chapters, one first author publication and has two additional first author publications submitted. He also has six published abstracts. He will begin a position as the Associate Director of the Microbiology Laboratory at the Hospital of the University of Pennsylvania and as an Assistant Professor of Pathology and Laboratory Medicine at the University of Pennsylvania School of Medicine On July 1, 2013.

CLINICAL MOLECULAR GENETICS FELLOWSHIP
JESSICA K. BOOKER, Ph.D., DIRECTOR
KRISTY RAE-COLLINS CROOKS, Ph.D., FELLOW, 2011-2013

The Department of Pathology and Laboratory Medicine and UNC Hospitals sponsors a Clinical Molecular Genetics fellowship, which is a one- or two-year training program in laboratory aspects of clinical molecular genetics. The program is accredited by the American Board of Medical Genetics. The Molecular Diagnostic Laboratory at UNC Hospitals provides experience with tests including cystic fibrosis, fragile X mental retardation, hemochromatosis, factor V Leiden and prothrombin, α 1-antitrypsin deficiency, MCAD deficiency, connexin 26 and 30 mutations, Prader-Willi and Angelman syndromes, primary ciliary dynskinesia, EBV, CMV, and BK viral loads, hereditary cancers, acquired mutations in cancer, chromosomal breakpoints in leukemias, pharmacogenetics, and monitoring of bone marrow transplants with polymorphic microsatellite markers. State-of-the-art technologies and instrumentation are used in all of these tests. The clinincal aspects of the training program are complemented by a strong research foundation. The Clinical Molecular Genetics Fellowship is directed by Jessical Booker, Ph.D. There was one fellow in the training program in 2012-2013.

CLINICAL MOLECULAR PATHOLOGY FELLOWSHIP

MARGARET L. GULLEY, M.D., DIRECTOR
NIRALI PATEL, M.D., FELLOW, 2012-2013
(http://www.pathology.unc.edu/fellowsp/molecular_path.htm)

The Department of Pathology and Laboratory Medicine and University of North Carolina Hospitals sponsors a one-year fellowship in Molecular Genetic Pathology. Trainees gain a working knowledge of molecular procedures including DNA sequencing (including next generation sequencing, Sanger, and pyrosequencing), protein truncation test, DNA amplification (such as PCR), tissue macrodissection and other cell enrichment procedures, Southern blot, *in situ* hybridization/FISH, and array technologies including gene expression profiling and single nucleotide polymorphism (SNP) chips. These modern molecular technologies are applied in a wide spectrum of clinical settings including cancer, heritable disease, infectious disease, HLA-typing, identification, and pharmacogenetics. The fellow analyzes and interprets molecular data from clinical cases and composes reports used in patient management. The fellow learns to design and carry out research aimed at understanding the molecular basis of disease and translating fundamental discoveries into laboratory assays that improve patient care. Ethical issues, quality assurance, and lab administration are discussed as they relate to clinical practice. UNC has the longest track record of board certifications among all ACGME-accredited molecular genetic pathology training programs in the nation. The program is directed by Margaret L. Gulley, MD with support from many faculty and staff. More information is found at, http://www.med.unc.edu/pathology/residency/fellowships/mgp

COAGULATION FELLOWSHIP

GEORGE FEDORIW, M.D., DIRECTOR
MARIAN ROLLINS-RAVAL, M.D., M.P.H., FELLOW, 2012-2013

The Department of Pathology and Laboratory Medicine sponsored a one-year training program in Coagulation. The program provides advanced-level experience in the diagnosis and monitoring of disorders of thrombosis and hemostasis. The fellow has the opportunity to work in a cutting-edge coagulation laboratory, where he/she becomes and active participant in the workflow and clinical interactions. In addition to reviewing the common coagulation disorders, the fellow acts as a consultant to the clinical teams, recommending appropriate work-up and testing of a complex patient population. This year's fellow, Dr. Marian Rollins-Raval, exceptionally supported the clinical mission of our Department. During her fellowship, Marian worked closely with the Special Coagulation Laboratory to bring in a new diagnostic assay, and provided a valuable educational resource to the Pathology Residency Program.

CYTOGENETICS FELLOWSHIP

KATHLEEN W. RAO, Ph.D., DIRECTOR
MELISSA A. HAYDEN, Ph.D., FELLOW

The McLendon Clinical Laboratories of UNC Hospitals and the Department of Pathology and Laboratory Medicine sponsor a fully accredited training program in Clinical Cytogenetics, which leads to eligibility for certification by the American Board of Medical Genetics (ABMG). The usual training period is two years. Upon successful completion of the program and ABMG Certification, the fellow will be qualified to direct a clinical Cytogenetics laboratory. The

Cytogenetics Fellowship Program is part of a comprehensive ABMG training program that includes Medical Genetics Residents, Clinical Molecular Fellows, Clinical Biochemical Fellows, and Molecular Genetic Pathology Fellows. All trainees and faculty involved in these programs participate regularly in multiple clinical and educational conferences, and Fellows have opportunities to teach in Medical Student and Resident courses. The UNC Cytogenetics laboratory is a full service laboratory, processing over 4000 specimens on which more than 6000 tests are performed annually for both constitutional and oncology diagnostics. Sample types include CVS, amniocentesis, products of conception, peripheral blood, bone marrow, lymph nodes, solid tumors, tissue biopsies, and paraffin sections. Fellows are trained in result interpretation and in a variety of techniques, including tissue culture, chromosome banding and analysis, FISH, and high resolution SNP microarray. The UNC Cytogenetics Laboratory is an approved Children's Oncology Group Laboratory and Cancer and Leukemia Group B Laboratory and actively participates in both of these national cancer cooperative groups. The Clinical Cytogenetics Fellowship is directed by Kathleen W. Rao, Ph.D.

CYTOPATHOLOGY FELLOWSHIP

SUSAN J. MAYGARDEN, M.D., DIRECTOR
JASON A. CLARK, M.D., FELLOW, 2012-2013
GEORGINA L. MURRAY, M.D., FELLOW, 2012-2013

The department sponsors two very competitive fellowships in cytopathology accredited by the ACGME. The fellowship is directed by Dr. Susan Maygarden, and the fellows train with 8 board certified cytopathologists. Fellows have the opportunity to participate in fine needle aspirations from all body sites, and the fellows both perform superficial aspirates and assist in adequacy assessments from deep procedures. Approximately 1800 aspirations, 5000 non-gynecologic fluid specimens and 16000 pap smears are accessioned in the laboratory each year. During 2012-13 there were two fellows in the laboratory, Dr. Jason Clark and Dr. Georgina Murray.

FORENSIC PATHOLOGY FELLOWSHIP

DEBORAH L. RADISCH, M.D., MPH, DIRECTOR

The Office of the Chief Medical Examiner (OCME) in conjunction with the Department of Pathology and Laboratory Medicine and UNC Hospitals, offers a one-year fellowship in forensic pathology. The program is accredited by the Accreditation Council for Graduate Medical Education (ACGME) and is under the direction of the Chief Medical Examiner of the State of North Carolina. The trainee in forensic pathology performs approximately 250 forensic autopsies during the course of the one-year fellowship. Consultations in subspecialty areas, including neuropathology, pediatric pathology, forensic odontology, and forensic radiology are available within the Department of Pathology and Laboratory Medicine and the School of Dentistry. Ancillary laboratory studies, including clinical chemistry, microbiology, and special histology are provided by the in-house toxicology laboratory and Rex Hospital Department of Pathology. Forensic anthropology, crime lab technology, and other training experiences are also provided at designated sites, including North Carolina State University and the NC Crime Lab. The forensic pathology fellowship is directed by Deborah L. Radisch, MD, MPH. One fellow completed the training program in 2012-2013.

HEMATOPATHOLOGY FELLOWSHIP
GEORGE FEDORIW, M.D., DIRECTOR
KIMBERLY WOODWARD, M.D., FELLOW, 2012-2013

The Department of Pathology and Laboratory Medicine (McLendon Clinical Laboratories) and the UNC Hospital sponsors a broadly based, one-year training program in hematopathology. The program is directed by full-time hematopathologists and is fully accredited by the ACGME. We have been highly successful in attracting high-quality applicants with a broad range of backgrounds, interests, and career goals. Our Fellowship is organized in such a way as to provide appropriate training in all areas of hematopathology, while also providing flexibility to address personal needs, interests, and objectives of the individual fellows. Trainees gain experience in the management and medical supervision of a high volume hematology laboratory, the evaluation of peripheral blood smears, bone marrow, and lymph node biopsies, coagulation testing, and hemoglobinopathy diagnosis. The Hematopathology fellows have been very active in scholarly activities with resultant journal publications. The fellowship retained Dr. Kimberly Woodward from our AP/CP Pathology Residency. Kimberly was a tremendous asset to the work in our division, and functioned as a necessary member of the clinical team.

NEPHROPATHOLOGY FELLOWSHIP
VOLKER R. NICKELEIT, M.D., DIRECTOR
AKANSHA GUPTA, M.D., FELLOW
DANIEL KENAN, M.D., FELLOW
JIMENEZ CARLOS, M.D., FELLOW

The Department of Pathology and Laboratory Medicine sponsors a one-year fellowship in renal pathology in the Division of Nephropathology. Up to three fellows may be accepted into the program. The fellows are directly involved in the diagnostic evaluation of over 1900 renal biopsies/nephrectomies (both native and transplant cases) examined annually. All fellows are integrative members of the nephropathology team and receive intensive training. They prepare cases for sign out by the faculty using all standard techniques (light microscopy, immunofluorescence microscopy, immunohistochemistry and electron microscopy). Part of the fellows' responsibility is to organize clinico-pathologic and biopsy review conferences for medical faculty and housestaff, and to teach renal pathology to medical students, residents and fellows. Teaching conferences and continuous education series offered by the nephrology and transplant divisions at UNC provide additional ample learning opportunities. Although emphasis is placed on the development of diagnostic skills, fellows are expected to carry out clinico-pathological and/or basic research projects and to present their data at national meetings, such as the ASN or USCAP. Research projects focus on the pathogenesis of glomerulonephritides, allograft rejection and polyomavirus infections. All state-of-the-art facilities (including laser microdissection) are available in the department. Appropriate research studies are funded by intramural support. Clinico-pathological studies are facilitated by the Glomerular Disease Collaborative Network, which is a well established network of over 200 nephrologists participating in clinical data collection. The division of nephropathology and the fellowship training program is directed by V. Nickeleit, M.D (<www.uncnephropathology.org>).

SURGICAL PATHOLOGY FELLOWSHIP

WILLIAM K. FUNKHOUSER, M.D., Ph.D., DIRECTOR
ROGER W. STONE, MD, FELLOW
ANDREW P. LARAMORE, MD, FELLOW

The Department of Pathology and Laboratory Medicine sponsors a one-year fellowship in diagnostic Surgical Pathology. The training program focuses on surgical pathology, with correlative exposure to cytopathology, cytogenetics, electron microscopy, immunohistochemistry, and molecular genetic pathology. During the first 6 months, the fellow reviews and dictates inside cases on all SP service benches for 4 months, reviews /dictates outside cases and gives associated conferences for 1 month, and has 1 month of elective time. The fellow is credentialed by the hospital during the fall, and repeats the 6 month cycle above as a faculty Instructor, now with independent sign-out responsibilities. We have received uniformly good feedback on this training format from our Fellows/Instructors as they have competed for, and been hired as, independent practicing Pathologists in the academic or private practice workforce.

TRANSFUSION MEDICINE FELLOWSHIP

YARA A. PARK, M.D., DIRECTOR
MARSHALL A. MAZEPA, M.D., FELLOW, 2012-2013

The Department of Pathology and Laboratory Medicine and McLendon Clinical Laboratories of UNC Hospitals sponsor a comprehensive one-year fellowship program in Blood Banking/Transfusion Medicine that is fully accredited by the Accreditation Council of Graduate Medical Education (ACGME). The training program provides didactic and practical training in advanced immunohematology, therapeutic and donor apheresis, blood component donation, testing, preparation and storage, clinical coagulation, histocompatibility, hematopoietic progenitor cell collections and processing, and clinical support for an academic tertiary care hospital. Supported clinical programs include transplant programs in marrow/stem cells, liver, heart, lung and kidney; a Level I trauma program; and a neonatal intensive care unit. Ongoing projects include the epidemiology and pathogenesis of thrombotic thrombocytopenic purpura (TTP) and the use of apheresis in lung transplant rejection. The current fellow, Dr. Marshall Mazepa, will be joining the Pathology Department as an assistant professor upon completing his fellowship in July 2013.

PATHOLOGY AND LABORATORY MEDICINE GRAND ROUNDS - 2012-13

Grand Rounds Organizing Committee: Monte S. Willis, M.D., Ph.D., Chair
Members: David G. Kaufman, M.D., Ph.D. and J. Charles Jennette, M.D.

As has been the case in years past, the Department of Pathology and Laboratory Medicine Grand Rounds seminar series was well attended during the academic year 2012-13. The primary goals of this series is twofold: 1) to provide a venue for the dissemination of current basic science and clinical research information relevant to departmental academic activities and 2) to promote interaction and the opportunity for collaboration between Pathology faculty, residents, postdoctoral fellows, graduate students, and clinical fellows, and other members of the UNC community. Additionally, Grand Rounds is used as a venue for faculty presentations needed as

part of promotion and post-tenure reviews and as a forum for announcements and discussion of items of interest and importance to faculty and trainees.

To accommodate speaker and audience needs, Grand Rounds follows a flexible format. The presenters may choose a traditional format in which there is a single presenter; or when appropriate, as when integrating basic and clinical research or two or more disciplines, some choose to share the time with a collaborator or trainee. Presentations are usually 45 minutes, followed by a question-and-answer session. The committee strives to assure a range of experimental, clinical and surgical pathology subjects are appropriated and evenly covered. The topics are dependent upon speaker availability and while many presentations are usually related to the presenter's research interests, some include scientific reviews of pertinent areas in clinical medicine, translational research, and/or basic science. The following list of 2012-13 presenters, their affiliations and topics demonstrate that both internal and external speakers are sought. Category 1 CME credit is offered for seminar participation. We provide an opportunity for the speakers to have their presentation formally evaluated, as required of all CME activities. Written comments and questions concerning the quality of the presentations are requested. Prior to each Grand Rounds seminar, refreshments are provided. This encourages a collegial atmosphere, and it also provides an opportunity for the attendees to visit and discuss science, medicine, and research.

FALL2012

DATE	SPEAKER/AFFILIATION	TITLE
09/13/2012	Stefanie Sarantopoulos, MD, PhD Assistant Professor of Medicine, Division of Hematology and Oncology; Member, Lineberger Comprehensive Cancer Center, UNC-CH	"BAFF And B Cell Pathology after Stem Cell Transplantation"
09/27/2012	J. Charles Jennette, MD Brinkhous Distinguished Professor and Chair of Pathology and Laboratory Medicine; Professor of Medicine UNC-CH	"Pathogenesis of Vasculitis and Glomerulonephritis caused by Anti-Neutrophil Cytoplasmic Autoantibodies (ANCA): Confluence of Serendipity/ Luck and Exceptional Collaborators"
09/27/2012	Chad A. Livasy, MD Carolinas Pathology Group, Levine Cancer Institute, Charlotte; Adjunct Professor of Pathology and Laboratory Medicine, UNC-CH	"Problems and Challenges in the Classification and Management of Breast Cancer Precursors"

FALL2012

DATE	SPEAKER/AFFILIATION	TITLE
10/04/2012	Jiandong Liu, PhD Assistant Professor of Pathology and Laboratory Medicine; Member, McAllister Heart Institute, UNC-CH	"The Cellular Basis of Cardiac Morphogenesis: From Cellular Signaling to Mechanosensing"
10/18/2012	Sudha K. Shenoy, PhD Associate Professor of Medicine Duke University Medical Center, Durham	"7TMR and α-arrestin Ubiquitination: Impact on Signaling and Physiology"
11/08/2012	William Y. Kim, MD Assistant Professor of Medicine and of Genetics; Member, Lineberger Comprehensive Cancer Center, UNC-CH	"The Hypoxia-Inducible Factors in Tumorigenesis"
11/29/2012	Jean G. Cook, PhD Associate Professor of Biochemistry & Biophysics and of Pharmacology; Member, Curriculum in Genetics and Molecular Biology, UNC-CH	"Cell Cycle Control of Genome Stability"
12/06/2012	Li Qian, PhD Assistant Professor of Pathology and Laboratory Medicine; Member, McAllister Heart Institute, UNC-CH	"How to Mend a Broken Heart?"
12/13/2012	Bob Duronio, PhD Professor of Biology and Genetics; Director, Program in Molecular Biology and Biotechnology, UNC-CH	"Developmental Control of the Cell Cycle"

SPRING 2013

01/17/2013	Kevin L. Gardner, MD, PhD Senior Investigator, Genetics Branch National Cancer Institute, National Institutes of Health, Bethesda	"Molecular Linkages between Race, Obesity and Human Breast Cancer"
01/24/2013	Satdarshan (Paul) Singh Monga, MD Endowed Chair for Experimental Pathology, Professor, Departments of Pathology and of Medicine The University of Pittsburgh	"β-catenin Signaling and Liver Regeneration: A Wnt-Wnt Situation!"

SPRING 2013

DATE	SPEAKER/AFFILIATION	TITLE
02/07/2013	Channing J. Der, PhD Professor of Pharmacology, UNC-CH Sarah Graham Kenan Professor of Pharmacology	"Targeting Ras for Cancer Treatment: Is There a Needle in the Haystack?"
02/14/2013	Leslie Parise, PhD Professor of Biochemistry and Biophysics UNC-CH	"CIB1 Regulation of Cell Life and Death: Novel Cancer Target?"
02/21/2013	Christopher Mack, PhD Associate Professor of Pathology and Laboratory Medicine UNC-CH	"Epigenetic Regulation of Smooth Muscle Cell Differentiation"
02/28/2013	Andra R. Frost, MD Professor of Pathology University of Alabama at Birmingham	"Targeting Gli1 and Gli-mediated Transcription in Breast Cancer"
03/14/2013	W. Kimryn Rathmell, MD, PhD Associate Professor of Hematology and Oncology and of Genetics Alexander Professor of Translational Research Member, Lineberger Comprehensive Cancer Center UNC-CH	"Molecular Biology of Renal Cell Carcinoma"
03/21/2013	David A. Eberhard, MD, PhD Associate Professor of Pathology and Laboratory Medicine Member, Lineberger Comprehensive Cancer Center UNC-CH	"UNCseq: Next-Generation Clinical Cancer Genomics"
03/28/2013	Xiao Xiao, PhD Fred Eshelman Distinguished Professor of Gene Therapy Eshelman School of Pharmacy UNC-CH	"A Small Virus with a Big Heart: AAV Vectors for Muscle-Directed Gene Therapy"
04/04/2013	Graduate Student Research Day: Laura Weise Cross, BS Christopher P. Mack Monte S. Willis, Advisor	"The role of the Diaphanous-Related Formins mDial and mDia2 in Smooth Muscle Cell Differentiation"

SPRING 2013

DATE	SPEAKER/AFFILIATION	TITLE
	Kristine Wadosky, BS Monte S. Willis, Advisor	"Muscle RING Finger-1 Represses 1GF-1-Dependent Cardiomyocyte Hypertrophy and Akt Activity by Inhibiting c-Jun"
04/11/2013	Jeff Sekelsky, PhD Professor of Biology, Department of Biology UNC-CH	"The Many Functions of Bloom Syndrome Helicase in Promoting Genome Stability"
04/18/2013	Jonathan C. Schisler, MS, PhD Clinical Instructor in Cardiology Department of Medicine UNC-CH	"The Bridge Between Protein Quality Control and Metabolic Homeostasis During Cardiac Pressure Overload"
05/16/2013	Megan DiFurio, MD Pathology Residency Program Director, Clinical Assistant Professor UNC-CH	"Vulvar Squamous Cell Carcinoma: Mechanisms and Margins"
05/23/2013	Alan S. Fanning, PhD Research Associate Professor Department of Cell Biology and Physiology UNC-CH	"New Roles for the Tight Junction Scaffolds ZO-1 and -2 in Epithelial Barrier Formation"
05/30/2013	Mehmet Kesimer, PhD Associate Professor of Pathology and Laboratory Medicine UNC-CH	"Dissecting the Role of Mucins in Airway Mucosal Protection and Pathogenesis"
06/06/2013	Andrew C. Dudley, PhD Assistant Professor of Cell Biology & Physiology, UNC-CH	"The Impact of Vascular Heterogeneity on Anti-Angiogenic Therapy in Cancer"

CLINICAL SERVICES

BACKGROUND McLENDON CLINCAL LABORATORIES
HERBERT C. WHINNA, M.D., Ph.D., DIRECTOR

McLendon Clinical Laboratories provides laboratory and pathology services to physicians in support of excellent patient care at UNC Hospital. Each laboratory section maintains fiscal accountability for revenue generated and expense required to produce clinical test results. The revenue contribution from the laboratory has continued to grow, despite the difficult financial climate facing health care as a whole. The directors of each laboratory, working closely with the assistant administrative directors, develop short and long range plans to assure that the laboratories are supporting the testing needs of the hospital, while continuing to provide the medical staff with cutting edge technologies. For FY 12-13, the laboratory is projected to contribute 70 million dollars to UNC Hospital's operating margin.

The largest laboratory wide initiatives continue to be renovation of our physical space to best accommodate the changing technologies and the growing clinical needs. This has involved renovation in the Cytogentic Laboratory, Microbiology, and Surgical Pathology laboratories. Our test volumes continue to increase as does the complexity of our patient population. The laboratory is heavily involved in Lean and Six Sigma projects to ensure that we are making the best use of our space and our personnel resources. McLendon Laboratories is also participating in the hospital wide conversion to EPIC as the HIS. Although the laboratory is not transitioning at this time, we must be able to interface all of our software with the EPIC system.

SURGICAL PATHOLOGY (Histology/Special Procedures Labs)
WILLIAM K. FUNKHOUSER, Jr., M.D., Ph.D., DIRECTOR

UNC Surgical Pathology generates diagnoses on UNCH specimens, on specimens to be reviewed because of patient referral to UNC hospitals, and on outside expert consultation specimens. In 2012, 28,800 cases were diagnosed, including 2700 outside cases, a stable year-over-year faculty caseload. The DPLM now trains 16 AP/CP residents. Gross room training of these residents is performed by the gross room Pathologists' Assistants. Cases route to 7 Surgical Pathology benches (not including Derm or Neuropath) benches (Breast, Benign Ob/Gyn, Gyn Onc, GI/Liver biopsies, GI/Liver resections, GU/Bone/ST, and ENT/Thor/Vasc). Junior residents gross all cases, preview resections, and sign out all cases real-time. Senior residents independently diagnose/dictate all cases, and gross 2 cases/day. Junior and senior residents also rotate through the Frozen Section room. SP Fellows independently diagnose/dictate all of their cases in the Fall, and serve as credentialed Instructors with independent sign-out responsibility in the Spring. Organ-specific lectures are presented by faculty, fellows, and residents in didactic and unknown formats. Fellows or Chief Residents rotate through a Conferences/Consult service during which they staff 5 of the multi-disciplinary conferences each week. Overall, these approaches are designed to offer graded responsibility, with the opportunity to become skilled at grossing, frozen section diagnosis, permanent section diagnosis, reporting, and teaching.

New faculty members joined us in 2012, including sign-out faculty (Drs. Hertel and Dodd). Dr. Hertel signs out the Cytopathology, Breast, and GI/Liver resection benches. Dr. Dodd signs out the Cytopathology, GU, and ENT benches.

The UNCH Histology laboratory is commensurately busy. We are fortunate that the Laboratory is well-led by Ms. Deloney, and that it is well-managed by Ms. Crook. This laboratory and its upstream accessioning personnel are critical to an efficient, error-free service. Block volume increases have been met with increased productivity, Lean analysis, improved instrumentation, and budget approval for seamless barcoding of specimens from accessioning to case sign-out. Error records are returned to the Histology laboratory for management follow-up and quality monitoring. Challenges for 2013 are to automatically measure block volumes, case TATs, and error rates, and to correlate these data with staffing type and levels, in order to define optimal technical staffing.

Overall, continuing increases in workload have been met by continuing increases in effort, ingenuity, and efficiency. The management and leadership skills of Dr. Whinna, the Director of the McLendon Clinical Laboratories, and of Dr. Jennette, Chair of the Department of Pathology and Laboratory Medicine, are perceived as critical to the improvements and successes described above.

CYTOPATHOLOGY
SUSAN J. MAYGARDEN, M.D., DIRECTOR

The cytopathology laboratory service volume remained stable in 2012-13. Services provided include gynecologic cytology, non-gynecologic fluid cytology, and fine needle aspirations. Gynecologic cytology is performed using thinprep with imaging for >99% of cases. HPV testing is currently performed in conjunction with Rex Hospitals. Fine needle aspirations are primarily performed by radiology, GI procedures, endocrinology, and pulmonary medicine/CT surgery, with cytology assisting for evaluation of adequacy. Superficial masses are aspirated by the cytology fine needle aspiration team. A wide array of special studies can be performed on cytology specimens, including immunohistochemical stains, molecular testing and flow cytometry.

The laboratory continues to have 5 cytotechnologist employees and two temporary employees that assist in gynecologic and non-gynecologic specimen preparation. There are two fellows/year In 2012-13 Drs. Jason Clark and Georgina Murray completed training. There are eight attending pathologists. On June 30, 2013 directorship of the laboratory transitioned to Dr. Leslie Dodd with the reassignment of Dr. Maygarden to residency program director.

AUTOPSY PATHOLOGY
LEIGH B. THORNE, M.D., DIRECTOR

The UNCH Autopsy Service continues to provide valuable information to clinicians and families of patients. In 2012, a total of 123 autopsies were performed and 129 in the 2012-13 fiscal year (as of 7/15/13). We currently have six faculty participating in the autopsy service in addition to the full time autopsy Pathologist's Assistant and two part-time autopsy technicians. The Decedent Care program was officially begun January 2012. The mission is to improve not only

the autopsy services provided to families of deceased patients but to improve the process from the time the patient passes to release of the body to the funeral home. The program is under the oversight of Cathy Holleman, Administrative Director of McLendon Labs. Pam Thorner, who has been on the Autopsy service for 9 years moved into the Decedent Care program and acts as the Decedent Care Coordinator. Heidi Dodson has also joined the team and covers the service on weekends. In addition to our clinical mission, the service continues to serve as an important resource for researchers at UNC. We continue to participate in the breast cancer rapid autopsy program with support provided through grants from Dr. Lisa Carey. Dr. Leigh Thorne, Vincent Moylan, PA, and Claudia Brady, PA, have been the primary collaborators. We have also assisted several other research projects in need of postmortem tissue. We continue to assist the Office of the Chief Medical Examiner with postmortem examinations as needed. We have also maintained contracts with 2 other small hospitals in the area.

MOLECULAR PATHOLOGY
MARGARET L. GULLEY, M.D., DIRECTOR

The Molecular Genetics Laboratory performs assays on DNA and RNA to help in diagnosis, monitoring, and treatment of infectious disease, cancer, and heritable conditions. A test menu with description of each clinical service is found on our website: http://labs.unchealthcare.org/directory/molecular_pathology/index_html. Newly implemented are quantitation of the NPM1 mutation in acute leukemia patients, NRAS mutation detection in melanoma tissue, and modernized assays for Epstein-Barr virus and cytomegalovirus quantification. Underway is validation of next generation sequencing genomic panels for cancer and heritable disease.

An important component of our clinical and academic mission to advance healthcare using modern molecular technologies. Our training programs educate physicians, medical students, post-doctoral fellows, genetic counseling students, and clinical laboratory science students. Our fellowship training program in Molecular Genetic Pathology was the first in the nation to educate a board-certified physician in this subspecialty. We offer a month-long course in Molecular Diagnostics and Cytogenetics targeted at pathology residents and open to other interested medical professionals. Further information on our clinical, educational and research work is found at: http://www.med.unc.edu/pathology/faculty/biosketch-of-dr-margaret-gulley
Molecular pathology is growing rapidly as clinicians increasingly use molecular tools for diagnosis and management. Increasingly we are using panels of genomic tests that simultaneously detect or analyze multiple DNA or RNA targets at once, aimed at identifying a profile or a rare event that predicts disease status or outcome. We thank UNC Hospitals, the TraCS Institute, the University Cancer Research Fund, and the Department of Pathology and Laboratory Medicine for making available the resources to implement modern molecular technologies and to validate multiple novel and informative assays. Learn more in a document entitled "Validating assays for use in clinical trials" at http://labs.unchealthcare.org/directory/molecular_pathology/index_html.

Major Equipment in the clinical molecular genetics lab: Illumina MiSeq and Life Technologies Ion Torrent next gen sequencers, Roche LightCycler 2.0 and 480 real-time PCR instruments, Abbott m2000, Roche MagnaPure extractor and MagnaLyser, Perkin Elmer Janus Robotic Pipettor; Qiagen EZ1, Qiacube, and QiaSymphony extractors; Applied Biosystems 9700, 9800,

7500, and 7900 PCR instruments; two ABI Veriti thermocyclers, Idaho Technologies LightScanner, three ABI 3130xl capillary gel electrophoresis instruments, Biotage Pyromark MD pyrosequencer, Agilent array scanner, Affymetrix array scanner, RoboSep cell separator, and UVP gel documentation system.

Faculty are Margaret L. Gulley MD, Karen Weck MD, Bill Funkhouser MD PhD, Leigh Thorne MD, Jessica Booker PhD, Nirali Patel MD (former fellow), and Rosann Farber PhD. Fellows include Amy Treece MD, Kristy Crooks PhD, and Melissa Hayden PhD. Our excellent staff includes six medical technologists, three research scientists, a supervisor, and an office support assistant.

TRANSFUSION MEDICINE, APHERESIS, TRANSPLANT SERVICES

TRANSFUSION MEDICINE (Blood Bank, Platelet Donor Program, Apheresis)

YARA A. PARK, M.D., DIRECTOR

The Transfusion Medicine Service (TMS) had a steady workload and transfused 38,000 products in the last year. In an effort to inform clinical teams about the clinical significance of red cell antibodies, an interpretive report is now being completed on all newly identified antibodies. These reports are put into the electronic medical record so that all providers will have easy access to the information. Additionally, this allows practical experience for our residents and fellows in antibody interpretation. TMS completed a Green Belt Project to reduce blood product wastage throughout the institution. The project was able to reduce the number of units of blood that were discarded each month with significant savings to the institution. The Green Belt Project also fostered excellent working relationships with multiple other departments throughout the hospital.

Apheresis also experienced an increase in number of procedures performed in the year. In February, the Extracorporeal Photopheresis (ECP) program was begun for the treatment of graft versus host disease in bone marrow transplant patients and cutaneous T-cell lymphoma. The ECP program is growing rapidly.

The Blood Donation Center (BDC) had maintained an outstanding collection rate of close to 3000 units of platelets per year. Multiple donor drives were done including hospital volunteers and intramural sports clubs. The BDC completed an extensive computer upgrade which has greatly streamlined operations.

All of TMS was inspected and re-accredited by CAP and AABB.

CLINICAL MICROBIOLOGY, IMMUNOLOGY LABORATORIES

PETER H. GILLIGAN, Ph.D., DIRECTOR

The Clinical Microbiology/Immunology Laboratory has continued to expand its test menu and test volumes through the addition of new assays and new instrumentation. We have been able to enhance service to our clinicians and patients while maintaining our training mission.

Microbiology Section

The Microbiology lab has instituted several new initiatives within the last year. The most notable being the introduction of mass spectrometry for organism identification in the bacteriology

section. This new instrumentation allows the laboratory to identify cultured microorganisms within minutes vs. hours or days with older methods. Another added benefit is the extremely low cost of this technology (less than $2 per isolate). In October of 2012, the lab began using this technology to identify aerobic organisms and has now expanded to anaerobes and yeast. Validations are currently underway to include mycobacteria as well as fungi. Being able to use this method for all identifications will consolidate laboratory workflow, drastically reduce laboratory costs, and improve turnaround times.

Based on our success with the urine reflex testing in the Emergency Department (e.g. screen out the negatives by urinalysis), we expanded this initiative house-wide. This effort has been met with great enthusiasm by the medical staff and has streamlined laboratory resources. We also validated and implemented susceptibility testing for *Nocardia* and are validating susceptibility testing for rapidly growing mycobacteria. Previously, these susceptibility tests were sent to a reference lab, and physicians were displeased with the turnaround time. Bringing the testing in-house decreased the turnaround time by 1-2 weeks. The laboratory also validated lactoferrin testing to replace fecal white blood cell staining which is a more sensitive test and eliminates the need for outlying facilities to transport the stool within 2 hours of collection. Previously the laboratory cancelled many of these tests due to this transport requirement.

The Microbiology lab also underwent a workflow analysis performed by a third party vendor that resulted in significant changes in workflow. The lab increased the number of culture readings per day on several benches to expedite turnaround time of culture results. The lab was also involved in a Kaizen project which changed the physical layout of the lab. The purpose of the change was to consolidate tasks into one work area to reduce motion required by the technologists. This has greatly increased technologist efficiency.

Molecular Microbiology Section

In Molecular Microbiology, we continue to improve our respiratory viral diagnostic testing. This year we compared four commercially available molecular platforms that are able detect 12-20 respiratory viruses simultaneously from one specimen. The results demonstrated a newer test was superior to the one currently being offered in the laboratory. Validation and implementation of the new molecular respiratory panel, which includes additional viruses such as coronaviruses and parainfluenza 4, was completed prior this past year's respiratory season.

In support of our infection prevention colleagues, and in an effort to limit the spread of highly resistant organisms in our institution, we revised our protocol for surveillance screening in the burn unit for carbapenem resistant Gram negative bacilli. This revision included the development and validation of a KPC (gene that encodes carbapenem resistance) PCR. Implementation of a PCR-based screening method allows us to more quickly and accurately identify patients carrying potential multi-drug resistant organisms.

Two tests were validated this past year that will be implemented in the 2014 fiscal year. The first is a molecular test for the rapid identification of select Gram positive organisms (*Streptococcus/Enterococcus*) directly from positive blood culture bottles, including detection of vancomycin resistance. This testing will be performed at the time of the positive blood culture Gram stain and will provide an identification, and possible resistance information, 1-2 days

sooner than traditional methods. An outcome study is planned and funded to measure the impact on patient care and hospital cost savings of implementing this rapid blood culture test. The second test validation was a molecular panel for gastrointestinal pathogens. Molecular detection of select bacterial, viral and parasitic infections is not only more sensitive than traditional methods, but also provides results days sooner than traditional methods. Implementation of this test will allow the discontinuation of bacterial stool cultures (which are very laborious), fluorescent parasitic screens, and traditional rotavirus testing. In addition, our laboratory will now have the capability to diagnose norovirus infections, which has been shown to be a source of both community and health care-associated infections.

Immunology Section

During the past year the Immunology Laboratory enhanced clinical services in several ways. Three new tests were implemented resulting in decreased referral laboratory costs and improved turn-around-times. The new tests implemented include HTLV-I/II antibody, anti-mitochondrial antibody, and thyroid peroxidase antibody. In addition 28 new allergens were added to the existing menu bringing the total number offered by the laboratory to 97. The laboratory also implemented a major change to the HIV antibody testing algorithm. The Bio-Rad Multispot HIV-1/2 rapid test replaced the HIV-1 Western blot assay as the supplemental test for reactive 4th generation HIV antibody screen results. The use of the Multispot assay along with the 4th generation screening test implemented during the previous reporting period enhances HIV testing by decreasing turn-around-time for a positive HIV antibody result from up to 7 days to 24 hours (M-F); differentiates HIV-1 from HIV-2 antibodies which has important clinical significance; and allows detection of acute (seronegative) HIV infection. Improvements to two existing assays were implemented. Because of inconsistent reagent availability, we changed vendors for our RMSF IFA slides thus reducing the risk for backorders and interruption of RMSF testing. We also updated our HBsAg assay to a new version that has fewer false positives thus necessitating fewer confirmatory neutralization assay runs.

The Immunology Laboratory continues to have a significant teaching role. Both the Immunology and Microbiology Fellows, Pathology Residents, CLS students and Allergy/Immunology Clinical Fellows rotate in the laboratory. Significant updates were made to CLS training in the Immunology Laboratory. The rotation time was shortened to 2 days to accommodate training in other areas and the content of the training was updated to include new testing. A rotation pre-test was implemented to assess existing knowledge and the end-of-rotation exam was updated and made available on-line. This format allows us to better assess the success of our teaching efforts. Finally, the competency assessment program for Clinical Immunology technologists was improved. Competency documentation was simplified by revision of the existing sign-off sheets. Quarterly quizzes were implemented as well in order to ensure adherence to standards related to competency assessment.

The Clinical Microbiology/Immunology Laboratory continued their training of Clinical Laboratory Science students at both the BS and MS levels. Training was also provided for clinical Pathology residents and fellows in both Medical Microbiology and Medical Laboratory Immunology. The Medical Microbiology fellowship program was inspected this year and received re-accreditation. The lab also continued daily rounds with the Infectious Disease service and twice weekly training of pediatric residents.

PHLEBOTOMY SERVICES
PETER H. GILLIGAN, Ph.D., DIRECTOR

Phlebotomy Services completed the 2013 fiscal year well. In the month of February 2013, scores for the question "courtesy of the person who took blood" on the Press-Ganey patient survey rose to 91.4% earning Phlebotomy Services the Heart of Carolina Care Award of Excellence. The patient satisfaction annual scores to date average 89.6%. In order to further improve scores, on June 1, 2013, Phlebotomy Services implemented a new approach to the 4AM draw. Only patients on surgical service units who have 4AM lab orders are collected before 5AM. All other units (medicine, cardiology, orthopedics, neurology, pediatrics, etc.) are not started until 5AM in order to allow the patients more time to rest. Between July 1, 2012 and May 31, 2013 the service averaged 66.5% of the test results from the 4AM draw available by 6AM, 92.6% by 7AM and 98.9% by 8AM. Data for the first 30 days after service modification shows results from the 4AM draw available by 6AM are 48%, 79% by 7AM, and 95.9% by 8AM. We will modify staff schedules again in August 2013 to continue to improve this process. Blood culture contamination rate report became suspiciously low in November of 2012. It was determined that the microbiology laboratory made an organism identification change that inadvertently skewed the report. The reports are being modified. All reports will be rerun using the updated reporting criteria. The phlebotomists continue to exhibit the quality of their work. The following annual specimen rejection rates are indicators of this fact: Clotted, 0.02%, Hemolyzed, 0.18%, and QNS, 0.06%.

CORE LABORATORY (Chem/UA/Coag/Hem/Tox/Endo)
CATHERINE A. HAMMETT-STABLER, Ph.D., DIRECTOR

The Core Laboratory services include coagulation, clinical chemistry, hematology, urinalysis, and referral testing. The Laboratory receives 4000-5000 samples daily and performs >5 million tests annually. The Laboratory's service areas continue to seek improvements to improve patient care and safety for staff and patients. The blood gas/body fluid/smear review/urinalysis areas were redesigned and renovated to expand the open-lab concept to enhance workflow. Newly introduced services and tests include LCMSMS confirmation of benzodiazepines and metabolites and immunoassay-based CA 19-9 and ST2. Testing for serum 1,25-Vitamin D (LCMSMS) is under development. In addition the Laboratory has met reagent recalls and shortages by developing/adapting alternate methods using the 5600's open channels to minimize disruption to patient care for several immunoassay-based tests (haptoglobin, methotrexate, etc.). Instrument and method validations are currently underway to replace the current routine coagulation analyzers with two ACL Top Cts 700 instruments (Instrumentation Laboratory, Inc). This year, Referral Testing expanded director review to include requests for molecular diagnostics resulting in significant costs savings for the institution. Similarly, a porphyria algorithm developed by Dr. Nate Montgomery was published to facilitate test ordering by providers and has streamlined the workup of these patients.

Quality performance initiatives for the year included the introduction of real time turn-around-time monitoring with a new alert system for critical tests that are approaching defined thresholds, additional workflow standardization efforts across all three shifts, revisions to the reagent management systems in place, and a focus on education, training, and competency assessment.

The latter has involved a range of individuals including the education coordinator, key senior technologists, and the MT1 Advisory Board. Their efforts include a more formal series of presentations by faculty directors, staff, and guest speakers, as well as revision of associated training checklists and tests. The Laboratory continues the transition of moving procedures and communications into *SharePoint*, introduced last year. The Laboratory has expanded the use of the Bio-Rad Unity quality assurance system to more areas and is demonstrating that the system can be used for non-routine methods such as mass spectrometry to monitor instrument parameters.

Nine technologists are currently taking the AACC LCMSMS certificate program. Four technologists have earned LEAN-Six Sigma green belts, one a purple belt, and the associate administrative director and director each earned blue belts. The green belt project has been accepted for poster presentation at the upcoming ASCLS meeting in Houston, TX. Our successes in developing the Ambassador Program and in conducting various LEAN-Six Sigma projects have also been the focus of several presentations given by Connie Bishop at CLMA, ASCP and the Executive War College. The Laboratory achieved Tier I for the 2012 EOS surveys. The Laboratory implemented the MCL Career Ladder program with four technologists achieving recognition: Chrysa Zachary, Shirley Carson, Jamie Blankenship, and Sam Leggett. Rebecca Tauber was selected to receive this year's Care Award. The area is busy preparing for Epic.

HEMATOPATHOLOGY
GEORGE FEDORIW, M.D., DIRECTOR

The volume and complexity of cases has continued to increase in the Division and we now have two diagnostic services running in parallel. The primary Hematopathology service is responsible for all in-house peripheral blood, bone marrow, and tissue diagnostics, while the second service covers body fluid examination, referrals, and consult cases sent for expert review. We continue to work closely with the flow cytometry lab, and have added several new panels. Incorporation of these data, along with cutting-edge testing from the Cytogenetic and Molecular Laboratories, provides a comprehensive diagnostic interpretation for our patients. The Division of Hematopathology now also supports a biopsy clinic in the North Carolina Cancer Hospital, which streamlines sample acquisition, processing, and communication with the clinical teams.

We have added two additional hematopathologists to promote and support our clinical and academic efforts: David Williams, M.D., PhD is an NIH-funded structural biologist from Virgina Commonwealth University, and Marian Rollins-Raval, M.D., MPH, who has completed her fellowship in Hematopathology at the University of Pittsburgh and most recently completed a coagulation fellowship within our Department.

SPECIAL COAGULATION LABORATORY
HERBERT C. WHINNA, M.D., Ph.D., DIRECTOR

The Special Coagulation Laboratory provides access to esoteric testing of hemostasis for both UNC and community physicians. This past year we have validated screening testing for Activated Protein C Resistance that will allow for broader sensitivity as well as reduced testing

costs and validating Ristocetin Cofactor Activity to our new platelet aggregometer. The laboratory continues performing special studies testing for equipment companies generating additional revenue, as well as assisting colleagues with research projects. Faculty and staff also continue to regularly participate in the Friday Hematology Conference sponsored by the Division of Hematology & Oncology; Department of Medicine where hematology and coagulation issues on patients seen by the Hem/Onc Consult Service are discussed.

CLINCIAL CYTOGENETICS
KATHLEEN W. RAO, Ph.D., DIRECTOR
KATHLEEN A. KAISER-ROGERS, Ph.D., CO-DIRECTOR

During the past fiscal year, one of the most significant changes in the Cytogenetics Lab has been the in-house validation of the Affymetrix CytoScan HD SNP microarray platform for use with Acute Lymphoblastic Leukemia samples. This platform, which contains 2.7 million markers, is capable of detecting copy number changes that are below the level of resolution obtained by karyotyping, as well as regions of homozygosity that are associated with loss of hererozygosity (LOH). The laboratory currently processes approximately 500 constitutional microarray cases annually. In the near future, we plan to offer this technology for our products of conception, and cancer samples.

The caseload continued to increase in the Cancer Cytogenetics section of the laboratory through 2012 during which over 2000 oncology samples were received and 3200 tests performed, with increases seen in requests for both conventional karyotyping and FISH assays. At the current time, the laboratory offers over 30 different interphase FISH assays, most of which are designed to diagnose or monitor specific genetic abnormalities associated with various cancers. The laboratory currently offers two FISH assays that are considered "companion diagnostics" for drugs that target specific molecular features in tumors. A positive result on the HER2 assay (amplification of the ERBB2 locus) is required for a breast cancer patient to qualify for the drug herceptin, and a positive result for rearrangement of the ALK locus is required for non-small cell lung cancer patients to qualify for the drug crozotinib. Both assays use FISH technology on paraffin embedded tumor tissue. Overall the laboratory has seen a 70% increase in paraffin FISH testing in the past 2 years.

The Cytogenetics Laboratory continues to participate in the cancer cooperative groups (CALGB and COG). Dr. Rao, as Chair of the COG Cytogenetics Committee, hosted a Pediatric Cancer Cytogenetics Workshop in February (St. Louis) for over 200 Cytogeneticists from across the US and Canada. In collaboration with researchers at St. Jude's, Drs. Melissa Hayden (the Cytogenetics Fellow) and Rao, co-authored a proof of principle paper on a newly recognized rearrangement between PDGFRB and EBF1 in a child with Ph-like high risk ALL who had a dramatic and positive response to treatment with imatinib. Dr. Hayden studied the rearrangement with a high resolution SNP array which demonstrated that the gene fusion was likely to produce a tyrosine kinase of the type that would respond to the drug. This case was recently published (e-pub ahead of print) on-line in the Journal of Clinical Oncology. Also in 2012, the 3rd edition of The Principles of Clinical Cytogenetics was published in which Drs Kaiser-Rogers and Rao co-authored a chapter on Structural Chromosome Rearrangements, which has been part of this popular textbook since its first edition. Dr. Rao also collaborated

with Dr. Fedoriw and Dr. Nathan Montgomery (first author) in reviewing and publishing the largest series of cytogenetic analyses to date of reactive lymph nodes, which appeared in the journal, Cancer Genetics (e-pub ahead of print) in April.

LABORATORY INFORMATION SERVICES
HERBERT C. WHINNA, M.D., Ph.D., DIRECTOR

Activities for Lab Information Services for this past fiscal year mostly revolved around implementation of the RCM e-Services system for Outreach billing and other services. This involved significant expansion of the SCC system to include SoftWeb for web based orders and results, SoftExpress for courier management and call tracking and SoftAR for billing. SoftReports was also added to enhance the appearance of patient reports. These systems went live on 6/30/2013 after an extensive building and testing period. Also this year, we saw the beginnings of the Epic implementation. We have been closely working with various teams on this project as well as giving up one LIS position to be a full-time Epic Core Team member. The coming year provides many challenges for LIS with the arrival of Epic and Meaningful Use Stage 2. We have already begun upgrading CoPath to their 2012 version in preparation for Epic/MU2, and are scheduled for go-live in August. Soon we will begin an upgrade to the SCC system to their MU2 compliant version. This is a significant upgrade that will go live on the same day as Epic here at UNCH. These projects, along with the many other changes required to systems and workflow, promise a year of tough challenges and tight timelines into 2014.

NEPHROPATHOLOGY LABORATORY
VOLKER R. NICKELEIT, M.D., DIRECTOR

The Division of Nephropathology in the Department of Pathology and Laboratory Medicine is one of few highly specialized centers in the U.S. that provides expert diagnostic evaluation of medical renal diseases and transplant related disorders. More than 1,900 renal specimens (native & transplant biopsies and nephrectomies) from over 200 nephrologists throughout the state, region and the world are analyzed annually. During the 2012 calendar year, the Division evaluated close to 500 cases from UNC Hospitals, and the remainder from outside institutions. Over 90% of specimens are routinely evaluated not only by light microscopy at multiple levels of section with different stains, but also by immunofluorescence microscopy utilizing a panel of antibodies, electron microscopy, and occasionally additionally by immunohistochemistry. Thus, the actual number of procedures that are performed on renal specimens by far exceeds 6000 per year. The Division of Nephropathology is involved in clinical, translational and basic research on renal diseases, especially glomerulonephritides and diseases seen in renal allografts. The research activities are supported by extramural grants and are facilitated by an extensive database and archival system that currently includes data from approximately 40,000 renal specimens, 15,000 serum samples, and 1500 urine samples. Currently, one US pathologist and two pathology post doctoral research associates from Columbia and India are being trained on how to manage and organize a nephropathology laboratory. The UNC nephropathology faculty is also heavily engaged in continuous education series enhancing the diagnostic skills of pathologists and nephrologists, such as short courses at the annual USCAP meetings, the Columbia Presbyterian post graduate course on nephropathology in New York, or the 'Nephropathologiekurs VolhardFahr' in Mannheim,

Germany. The 7th edition of 'Heptinstall's Pathology of the Kidney' is prepared with heavy editorial input from the UNC nephropathology division that is closely allied with the UNC Kidney Center and the Glomerular Disease Collaborative Network (GDCN). The GDCN has been in operation for over two decades and is a consortium of academic and community nephrologists; it has the goal to enhance knowledge of renal diseases and treatment strategies.

QUALITY MANAGEMENT GROUP
HERBERT C. WHINNA, M.D., Ph.D., DIRECTOR

The Quality Management Group provided excellent leadership in the successful completion of the College of American Pathologists (CAP) bi-annual survey of laboratory operations. The laboratory experienced the most successful survey to date with many positive comments provided by the inspectors. The QM group continues to grow in their expertise in Lean and Six Sigma. Several members of the group have received their purple (Lean) belt certification. The rapid Kaizen projects have resulted in the redesign of the HLA and Stem Cell Laboratories, improvements in the Surgical Pathology Store Room, and redesign of space in special microbiology laboratory. The improvements have freed up space for better work cells, less walking for technologists, more and better organized storage, and an opportunity for teamwork within units to develop. The group has also supported the opening of a new facility, the Hillsborough Medical Office Building Laboratory.

NEUROPATHOLOGY SERVICE AT UNC HOSPITALS
THOMAS W. BOULDIN, M.D., DIRECTOR

The diagnostic services in neuropathology at UNC Hospitals are provided by C. Ryan Miller, MD, PhD; Dimitri G. Trembath, MD, PhD; and Thomas W. Bouldin, MD. Dr. Bouldin is director of the Division of Neuropathology. Neuropathology services include diagnostic surgical neuropathology, autopsy neuropathology, ophthalmic pathology, and the interpretation of peripheral nerve biopsies. The case load from the surgical service and autopsy service is sufficient to allow the Department of Pathology and Laboratory Medicine to provide a rich training experience in diagnostic neuropathology for the Department's residents in anatomical and clinical pathology. The volume of surgical neuropathology cases has continued to increase and become more complex each year, as the Neuro-Oncology programs at UNC Hospitals continue to grow. The Neuropathology faculty members attend and are active participants in clinical conferences at UNC Hospitals. The clinical conferences conducted by the neuropathology faculty are as follows:

Brain Cutting Conference (Autopsy Service)	Weekly
Clinical Neurosciences Conference	Monthly

OUTREACH LABORATORY SERVICES
HERBERT C. WHINNA, M.D., Ph.D., DIRECTOR

McLendon Laboratory's Outreach Service operates as the primary interface between the diagnostic testing services of the hospital laboratory and a variety of facilities located throughout North Carolina that require clinical laboratory testing. Some of these are physicians' offices,

UNC hospital based clinics, UNC P&A clinics, UNCPN clinics, skilled nursing facilities, home health agencies, community hospitals, dialysis centers (transplant patients), and other community services. The service has grown to serve over 82 clients in the research triangle area. Support is provided primarily in the areas of diagnostics, assistance with regulatory compliance and maintenance of point of care competency, training and testing. Forty-three of the serviced providers perform some level of point of care testing (from waived to moderately complex) and four of the clinics are CAP accredited. Last year Outreach served over 105,000 patients ordering and processed over one-half million tests.

Outreach manages three off-site laboratories; Ambulatory Care Center, Carolina Point 2 and the Hillsborough Medical Office Building. The ACC laboratory supports the operating rooms by providing rapid turn-around for parathyroid hormone testing. Both the CP2 and HMOB laboratories provide a moderately complex test menu including hematology, general chemistries and urinalysis. Also, the CP2 and HMOB sites also accept walk-in patients providing a much needed service for off-campus specimen collection.

Outreach has restructured staffing so that the off-site laboratories and processing section have a Lead Technologist available to directly support staff, answer questions and assist in customer service concerns. The Business Development and Account Liaison's role has expanded to include supporting those hospital based clinics that are continually to relocate off of 101 Manning Drive and into the surrounding community. The call center continues to operate M-F 7:30 am – 8 pm answering incoming calls, adding tests to previous orders and calling critical values for both the hospital and off-campus laboratories.

In the coming year, Outreach will be focusing on implementing a software package (Soft Express) capable of managing supply distribution, specimen tracking and customer concerns. The impact of EPIC could be substantial as a large number of the facilities and clinics off-campus that Outreach supports will be moving to an electronic order entry system allowing them to no longer need paper requisitions. With a common system in place many of the current procedures in the processing area will change and work-flow will be substantially reduced due to specimens arriving already registered, ordered, and barcoded.

<u>TRANSPLANT LABORATORIES</u> (HLA and Flow Cytometry)
JOHN L. SCHMITZ, Ph.D., DIRECTOR

The Histocompatibility Laboratory implemented several changes over the last fiscal year to enhance efficiency and achieve more complete solid organ donor HLA typing. A significant advance in efficiency of HLA antibody screening and flow cytometry crossmatching was realized with the validation and implementation of a new Becton Dickenson flow cytometer (FACSCantoII) with a high throughput sampler (HTS). The HTS on the new flow cytometer allows more stream-lined assay set up and walk-away acquisition of HLA antibody screening samples and flow crossmatches with the use of 96 well plates instead of individual test tubes. Further shortening of the turn-around-time for flow cytometry crossmatches was achieved with the validation and implementation of a shortened peripheral blood mononuclear cell isolation procedure in addition to the HTS. Enhancements were made to pre- and post-analytic aspects of HLA antibody testing with revision of the dialysis center HLA requisitions and implementation

of a phone notification policy when patients with post-transplant donor specific antibodies are identified. Transplant coordinators are notified immediately upon identification of donor specific antibodies in post-transplant sera submitted to the laboratory. The laboratory validated HLA-DQA1 HLA typing for solid organ transplant donors. With the realization in the field that HLA-DQA1 antibodies are relatively common, it has become important to type donors for DQA1 to facilitate appropriate donor allocation. Finally, the HLA laboratory validated and implemented DNA isolation from buccal swab samples on the EZ-1 Advance system that previously had to be performed in the molecular pathology laboratory. Acquisition of this instrument has facilitated more timely buccal extractions and oversight of instrument maintenance with relocation to the HLA Laboratory. The HLA Laboratory has continued its significant teaching responsibilities by hosting CLS students, Clinical Immunology, Allergy/Immunology and Nephrology Fellows.

The Flow Cytometry Laboratory has enhanced its technology with the addition of a third laser to each of the BD FACSCanto II's resulting in an upgraded from 6 to 8-color capability. This upgrade allowed the laboratory to validate and implement an 8-color antibody combination for hematopathology testing. Addition of this tube enhances the ability to get useful immunophenotypic information on samples with limited cellularity. Two additional 4-color combinations were validated and implemented as well in response to Hematopathology needs. The Rituxan monitoring antibody panel was modified from a two tube 4-color panel to a 1 tube 6-color panel, again, making better use of the multi-color capabilities of the BD instruments. A major effort in laboratory efficiency was started in June in the context of a Kaizan event. All of the background planning was completed in June for the Kaizan event to take place in the second week of July. This effort is expected to result in increased laboratory efficiency via optimized workflow resulting from reorganization of the laboratory workspace and streamlined inventory control. This effort will ultimately enhance the laboratories ability to accommodate increased test volume and new tests. The Flow Cytometry Laboratory continued its teaching activities with the hosting of CLS students, Pathology Residents, Laboratory Immunology, and Allergy/Immunology Clinical fellows completing rotations or receiving lectures.

HUMAN PROGENITOR CELL LABORATORY
YARA A. PARK, M.D., DIRECTOR

The Hematopoietic Progenitor Cell (HPC) Lab underwent a Kaizen event this year which optimized our current space as well as creating discrete work areas. With the work areas, multiple HPC products can be processed without the technologists crossing paths to reduce risk of cross-contamination. Additionally, an oxygen monitoring system was installed to ensure the safety of the staff while working with liquid nitrogen. The lab was inspected and re-accredited by CAP and AABB.

CORE AND SERVICE LABORATORIES

MICROSCOPY SERVICES LABORATORY
C. ROBERT BAGNELL, Jr., Ph.D., DIRECTOR

Microscopy Services Laboratory is a UNC core facility for electron and light microscopy. The laboratory is also the Light Microscopy Core facility for the Lineberger Comprehensive Cancer Center. Additionally, it provides clinical electron microscopy services. During this reporting period the laboratory supported research by 152 principal investigators from 27 departments and centers at UNC-CH, and other area institutions. The total number of active laboratory clients now stands at greater than 1000.

In addition to its research roll, the laboratory serves as the primary electron microscope facility for ultrastructural clinical diagnosis for UNC Hospitals and for Dr. Charles Jennette's renal pathology referral service. The laboratory also serves as an alternate for UNC Hospitals clinical electron microscopy specimen preparation service and for Dr. Charles Jennette's renal pathology referral service.

In the past 12 months the light microscope facilities logged 6,762 hours of use, electron microscope facilities logged 2050 hours of use and the laboratory has performed 442 electron microscopy specimen preparations of which 32 were Immuno-EM projects. This work has resulted in Mrs. Madden being included as a co-author on two peer-reviewed papers this year, one of which is in Nature.

MSL underwent an audit by the Office of Sponsored Research. This is standard practice for core laboratories and happens about every two years. As a result of the audit some of MSL's fees have changed.

An NIH Shared Instrumentation Grant was submitted for a Transmission Electron Microscope. Dr. Monte Willis is the PI. Funding information about this grant will be available in October 2013.

MSL added a scanning-transmission electron detector to the Zeiss Supra 25 field emission SEM. This provides backup for the TEM and has proved superior to the TEM for evaluation of AAV particles for immune-therapy.

The energy dispersive x-ray spectrometer system of the FESEM suffered a damaged window. A request has been made to SOM for funding to have the system repaired.

Steven Ray, the laboratory's Research Specialist, left the laboratory for a position in RTP. The open position was advertised and, after an extended search, was accepted by Kristen White. Kristen earned her MS in Pathology from UNC. She brings knowledge of modern molecular and cellular pathology to the MSL that will help us shape the kinds of imaging services we provide our clients. She will began her new position on June 22, 2013.

MSL continues to provide free image analysis software in the form of macros and plug-ins for the NIH ImageJ platform. In the year past MSL has posted to it's web page a revised version of the Comet Assay macro for determination of DNA damage. This Assay has proved to be very popular.

LASER CAPTURE MICRODISSECTION CORE FACILITY
C. ROBERT BAGNELL, Jr., Ph.D., DIRECTOR

This facility is part of the Microscopy Services Laboratory. LCM is a method for collecting very small regions of tissue or specific cells for use in "omic" analyses. The facility houses a Zeiss PALM LCM and an Arcturus PIX-Cell II LCM, a Leica CM 1850 cryostat, and a ventilation hood for staining and dehydration. Over the past 12 months, the LCM systems were utilized a total of 256.5 hours.

TRANSLATIONAL PATHOLOGY LABORATORY (TPL)
C. RYAN MILLER, M.D., Ph.D., DIRECTOR

The Translational Pathology Laboratory continues to meet the needs of clinical, basic, and population scientists who require the analysis of human tumors for their research. Utilization of this Core allows clinical investigators to perform innovative clinical trials using molecular correlates and endpoints. It also serves population scientists with large numbers of samples requiring morphologic or tissue-based assays.

In 2012 TPL purchased the Definiens Tissue Studio and Developer XD software package and the Leica Bond fully automated immunostainer.

During 2012 TPL provided 71,684 service units to 87 UNC investigators: the Lab pulled 999 diagnostic slides and FFPE blocks from the UNCH Surgical Pathology archives; produced 25475 unstained sections, 5138 TMA cores and tissue scrolls, 7016 H&E, 8135 chromogenic and 1645 fluorescent IHC slides; developed staining protocols for 83 new antibodies and dual staining protocols for 23 antibody pairs; processed and embedded 897 tissues and cell lines, and constructed 38 new TMA blocks. TPL Spectrum Plus image and data management software at https://tpl-spectrum.med.unc.edu/ currently holds 63,183 digital images; of these, 18,016 were scanned in 2012. Our services were featured in 14 peer-reviewed publications in 2012 and have been included in over 21 grant applications.

ANIMAL CLINICAL LABORATORY FACILITY
HYUNG-SUK KIM, Ph.D., DIRECTOR

The Major change was that a new Animal Blood Chemical Analyzer, VetScan VS2 Chemistry Analyzer was added for animal blood chemistry with VT350 analyzer. VetScan VS2 analyzer requires only 100ul whole blood (or plasma or serum) for many group tests, such as entire liver or kidney profiles. The Luminex MAGPIX system, using magnetic bead-based multi-analytes provides a complete solution for rapid, accurate biomarker quantitation in a variety of sample matrices, has been successfully operated during this fiscal year with more than 20 PIs. This affordable system can perform up to 50 tests simultaneously in a single reaction volume, greatly

reducing sample input (10-20ul/sample), reagents, and labor while improving productivity. The MILLIPLEX magnetic bead-based multi-analyte panels from EMD Millipore Company (see below kits) enable researchers to gain more information faster without compromising reliability. Furthermore, an automated microplate washer from BioTek Company can enhance magnetic bead assays by complete plate biomagnetic separation during washing. We now offer multiplexed biomarker immunoassays for Cytokine/Chemokine detection, metabolism, toxicity, cancer biomarkers, and many other disease states.

The facility performs blood chemistry tests, urinalysis, and hematological tests in animal samples, to characterize physiological and clinical phenotypes in animal models. For clinical tests, 44 different chemicals including general health tests, liver function tests, and kidney function tests are currently available with an automated chemical analyzer, Ortho-Clinical Diagnostics Johnson & Johnson's VT350 (purchased in 2008), which can measure one test with 5 - 10 μl sample volume. For hematological tests, the animal blood counter (HESKA's CBC Diff, Veterinary Hematology System) can measure WBC#, Lym%, Lym#, Mon%, Mon#, Gra%, Gra#, RBC#, HGB, HCT, MCV, MCH, MCHC, RDW, PLT, MPV, and 3 distribution curves of WBC, RBC, and PLT with 20μl whole blood sample. Since we have various data accumulated for long period from normal or abnormal values, discussion with us will help to interpret clinical results. More than thirty principal investigators from the UNC-CH campus use these services for their research.

GENE EXPRESSION FACILITY
HYUNG-SUK KIM, Ph.D., DIRECTOR

The facility provides services for gene expression studies using quantitative real time RT-PCR by ABI 7500 and 7300 Sequence Detection Systems and high throughput preparation of total RNA and genomic DNA by ABI Prism 6100. Currently more than 2,000 disease-related genes have been developed to detect their expression levels in mice, human, and rat, including various house-keeping genes. In addition, a service for mouse genotyping analysis has been well established with a high throughput performance based on detecting differences of gene copy number, with a less than two-day turn-around time. This genotyping process can exclude many laborious procedures, such as preparation of genomic DNA, PCR, gel running, Southern blot analysis. Currently we are genotyping more than three thousand mice monthly. We can also provide a full service which includes all the steps necessary for designing and synthesizing Taqman probes and primers, preparing RNA samples, and quantitative analysis. Through full service, we are collaborating with many PIs for gene expression research. More than thirty principal investigators from ten different departments are currently using this research core facility.

DNA SYNTHESIZING FACILITY
HYUNG-SUK KIM, Ph.D., DIRECTOR

The facility serves more than 50 investigators from a variety of campus-wide departments in its function of producing oligonucleotides for use in genetic research. Three DNA Synthesizers can produce ten oligonucleotides simultaneously. During this fiscal year, about three thousand oligonucleotides have been synthesized. The fluorescent oligonucleotide TaqMan probes with

5’ fluorescein (6-FAM) and 3’ quencher tetramethyl rhodamine (TAMRA) are successfully prepared for users of real time RT-PCR.

ADME MASS SPECTROMETRY CENTER
ARLENE S. BRIDGES, Ph.D., DIRECTOR
RICHARD R. TIDWELL, Ph.D., CHAIR, ADVISORY BOARD

The ADME Mass Spectrometry Center is a recharge facility that specializes in small—molecule analysis. Located on the UNC-Chapel Hill campus, the Center is open to all investigators, regardless of field of study or university affiliation. The goal of the Center is to assist scientists performing both classic and pioneering ADME-TOX experiments involved with drug discovery and development. We offer assistance and training in preclinical and clinical study design, sample preparation, bioanalytical techniques (method development, method validation, sample analysis), data interpretation, grant writing, and publication editing. We welcome the opportunity to work with and train technicians, graduate students, and research fellows.

The Center has the technology and expertise to provide both quantitative and qualitative support to its users. With regards to equipment, the Center maintains:

1. AB Sciex 5600 TripleTOF mass spectrometer
2. Applied Biosystems API4000 triple quadrupole mass spectrometer
3. Applied Biosystems API3000 triple quadrupole mass spectrometer
4. Thermo-Scientific Quantum Ultra triple quadrupole mass spectrometer
5. Agilent 1100 MSD ion trap mass spectrometer
6. five Agilent HPLC-DAD-FLDs

The most exciting recent upgrade to the Center was the installation of a state-of-the-art high-resolution mass spectrometer with the software required for metabolomics studies. This unique technology is essential in identifying unique biomarkers of disease progression and susceptibility. A short list of techniques offered by the Center include:

1. quantitation by triple quadrupole mass spectrometry
2. molecular weight and structural determination by ion trap mass spectrometry
3. targeted identification of analytes by UV, fluorescence, and mass spectrometry
4. unbiased population metabolomics by high-resolution mass spectrometry

As the available technology and techniques continue to grow, it is best to contact the Director for the most up-to-date list of available analyses. Please contact Dr. Bridges directly at 919-370-6818 or argoyle@email.unc.edu.

FACULTY AND SENIOR STAFF CHANGES

Dwight A. Bellinger, D.V.M, Ph.D, was named the Fred C. and Lelia B. Owen Distinguished Professor effective July 1, 2013.

Thomas W. Bouldin, M.D., resigned his tenured position as Professor effective June 30, 2012, to enter Phased Retirement.

Brian C. Cooley, Ph.D., was appointed Research Associate Professor and Member, McAllister Heart Institute, effective May 1, 2013.

Marila Cordeiro-Stone, Ph.D., resigned her tenured position as Professor effective June 30, 2012, to enter Phased Retirement.

Leslie G. Dodd, M.D., was appointed Professor effective September 1, 2012. She serves as attending pathologist in Surgical Pathology.

M. David Goodman, M.D. resigned his part-time position effective December 31, 2012 to return to retirement.

Oleg V. Gorkun, Ph.D., was appointed Research Assistant Professor effective March 1, 2013.

Johann D. Hertel, M.D., was appointed Assistant Professor effective July 1, 2012. He serves as attending pathologist in Surgical Pathology.

Mehmet Kesimer, Ph.D., joined the Department Pathology and Laboratory Medicine as Associate Professor on October 1, 2012. He previously served in the Department of Biochemistry and Biophysics.

Nichole L. Korpi-Steiner, Ph.D., was appointed Assistant Professor effective January 1, 2013. She serves as clinical scientist in Clinical Chemistry.

Jiandong Liu, Ph.D., was appointed Assistant Professor and Member, McAllister Heart Institute, effective August 1, 2012.

Rommel Lu, M.D., resigned his position of Assistant Professor effective February 12, 2013, to accept a position in private practice.

Stephanie P. Mathews, M.D., was appointed Assistant Professor effective July 1, 2012. She is an attending pathologist in Hematopathology.

Marshall A. Mazepa, M.D., was appointed Assistant Professor effective July 1, 2013. He is an attending physician in Transfusion Medicine.

C. Ryan Miller, M.D., Ph.D., was promoted to Associate Professor with tenure effective April 1, 2013.

Vincent J. Moylan, Jr., M.S., P.A.(ASCP), was promoted to Clinical Assistant Professor effective September 1, 2012.

Nancy H. Nye, Associate Chair for Administration, announced retirement effective September 1, 2013. Mrs. Nye has served as Chief Administrator in the Department of Pathology and Laboratory Medicine for 23 years and previously as Administrative Manager of the Department of Biochemistry and Biophysics for 21 years.

Nirali Patel, M.D., was appointed Clinical Assistant Professor and Member, Lineberger Comprehensive Cancer Center, effective July 1, 2013. She is an attending pathologist in Molecular Pathology with major interest in translational research.

Li Qian, Ph.D., was appointed Assistant Professor and Member, McAllister Heart Institute, effective August 1, 2012.

Jay S. Raval, M.D., was appointed Assistant Professor effective July 1, 2012. He is an attending physician in Transfusion Medicine.

Ashley G. Rivenbark, Ph.D.'s appointment at Research Assistant Professor ended February 28, 2013.

Arlin B. Rogers, D.V.M., Ph.D., resigned his appointment effective May 31, 2013, to accept a position at Tufts-Cummings School of Veterinary Medicine in Massachusetts.

Roger W. Stone, M.D., was appointed Clinical Assistant Professor effective July 1, 2013. He is attending pathologist in Surgical Pathology.

Joan M. Taylor, Ph.D., was promoted to Professor effective January 1, 2013.

Julia W. Whitaker, M.S., D.V.M., was promoted to Research Associate Professor effective July 1, 2013.

David C. Williams, M.D., Ph.D., was appointed Associate Professor effective July 1, 2013. He is a physician scientist with clinical specialty in Hematopathology.

Scott E. Williams, Ph.D., was appointed Assistant Professor and Member, Lineberger Comprehensive Cancer Center, effective April 1, 2013.

Hong Xiao, M.D., was promoted to Research Associate Professor effective September 1, 2012.

Qing Zhang, Ph.D. was appointed Assistant Professor and Member, Lineberger Comprehensive Cancer Center effective February 1, 2013.

SPECIAL HONORS AND AWARDS

CLAUDIA M. BRADY

The Frederic B. Askin Award for Excellence in Teaching Anatomic Pathology, June 2013

WILLIAM B. COLEMAN, Ph.D.

ASIP Outstanding Investigator Award, American Society for Investigative Pathology, April 2013

Joe W. Grisham Award for Excellence in Graduate Student Teaching, Department of Pathology and Laboratory Medicine, University of North Carolina School of Medicine, September 2012

PETER H. GILLIGAN, Ph.D.

Visiting Professor, Department of Pathology and Laboratory Medicine, Kansas University School of Medicine, November 12, 2012.

Philip Blatt Award for Excellence in Teaching Laboratory Medicine, June 2013

KEVIN E. GREENE, M.D.

Frederic Dalldorf Teaching Excellence Award for Health Affairs Students, June 2013

The Sophomore Basic Science Course Award, August 2012.

SUSAN C. HADLER, M.D., M.S.

Sophomore Basic Science Teaching Award, Awarded by the UNC Medical Class of 2015.

J. CHARLES JENNETTE, M.D.

Keynote Fokko Van Der Woude Memorial Lecture, 16th International Vasculitis & ANCA Workshop, Paris, France, 2013

Andrew Herzenberg Memorial Lecture, University Health Network, University of Toronto, 2012

WILLIAM W. McLENDON, M.D.

2013 Distinguished Faculty Award, UNC School of Medicine

C. RYAN MILLER, M.D., Ph.D.

Adult Basis Science Award, Society for Neuro-Oncology

Lucien J. Rubenstein Award, American Association of Neuropathologists

Brain Tumor Research Award, UNC Weatherspoon Family

VINCENT J. MOYLAN, JR., M.S., PA

Honorable Mention, Art of Science Photography Competition, Biological and Biiomedical Sciences Program, May 17, 2013.

YARA A. PARK, M.D.

Selected for ACCLAIM (Academic Career Leadership Academy in Medicine) Program, September 2012.

LI QIAN, Ph.D.

Ellison Medical Foundation New Scholar Award in Aging

JAY S. RAVAL, M.D.

Junior Investigator Award, American Society for Apheresis

JOHN L. SCHMITZ, Ph.D.

Selected to be a volume editor for the 8th edition of the Manual of Molecular and Clinical Laboratory Immunology.

OLIVER SMITHIES, Ph.D.

3rd Annual Oliver Smithies Nobel Symposium, April 19, 2013

Charter Fellow, National Academy of Inventors

Fellow, AACR Academy

ALISA S. WOLBERG, Ph.D.

Special Recognition Award in Thrombosis, American Association Council on Arteriosclerosis, Thrombosis, and Vascular Biology, 2012

JOHN T. WOOSLEY, M.D., Ph.D.

Michele Raible Distinguished Teaching Award, Under Graduate Medical Education, Association of Pathology Chairs, July 2012

ELECTED LEADERSHIP POSITIONS

JESSICA A. BOOKER, Ph.D.

Elected in July to the Board of Directors of the American Board of Medical Genetics, a six year term that begins January 1, 2013.

WILLIAM B. COLEMAN, Ph.D.

Secretary-Treasurer, The American Society for Investigative Pathology
Finance Committee Chair, The American Society for Investigative Pathology

WILLIAM K. FUNKHOUSER, M.D., Ph.D.

Council, Assoc Dir Anat Surg Path (ADASP)

PETER H. GILLIGAN, Ph.D.

Council Policy Committee, American Society for Microbiology

CATHERINE A. HAMMETT-STABLER, Ph.D.

AACC North Caroliina Section, Executive Committee

J. CHARLES JENNETTE, M.D.

College of American Pathologists (CAP) Renal Pathology Working Group
Glomerular Disease Advisory Group, American Society of Nephrology
Advocacy Committee, Association of Pathology Chairs
Practice and Management Committee, Association of Pathology Chairs
EULAR/ACR Working Group on the Definition and Classification of Vasculitis
International Society Nephrology Commission for Global Advancement of Nephrology
International Society of Nephrology Committee on Renal Pathology
International Organizing Committee, 16th Vasculitis & ANCA Workshop, Paris

HARVEY MICHAEL JONES, M.D.

Board of Govenors, American Osler Society

DAVID G. KAUFMAN, M.D., Ph.D.

Past President of Society of Toxicology: Scientific Liaison Committee

WILLIAM K. KAUFMANN, Ph.D.

Council Member, Environmental Genomics and Mutagenesis Society
President-elect, Genetics and Environmental Mutagenesis Society

NICHOLE L. KORPI-STEINER, Ph.D.

AACC Critical and Point of Care Testing Division, Member-at-Large, 2013 - 2015
AACC North Carolina Local Section, House of Delegate Representative, 2013 – 2015

HOWARD M. REISNER, Ph.D.

Councilor, UMED, 2011-2013

JOHN L. SCHMITZ, Ph.D.

Past President, Association of Medical Laboratory Immunologists

HARSHARAN K. SINGH, M.D.

Secretary, Renal Pathology Society

OLIVER SMITHIES, Ph.D.

Charter Fellow, National Academy of Inventors

ALISA S. WOLBERG, Ph.D.

Council, International Fibrinogen Research Society

LEADERSHIP POSITIONS

WILLIAM B. COLEMAN, Ph.D.

Council, The American Society for Investigative Pathology, July 2004-Present
Finance Committee, Federation of American Societies for Experimental Biology, July 2009-Present
Publications Committee, The American Society for Investigative Pathology, July 2007-Present
Divisional Oversight Committee, The American Society for Investigative Pathology, March 2009-Present
Membership Committee, The American Society for Investigative Pathology, July 2004-Present
Education Committee, The American Society for Investigative Pathology, April 2002-Present
North Carolina Congressional Liaison Committee, The Coalition for Life Sciences, April 1999-Present
Medical Research Committee, Blue Faery: The Adrienne Wilson Liver Cancer Association, December 2004-Present

GEORGETTE A. DENT, M.D.

Member, Advisory Committee, Association of American Medical Colleges (AAMC), Electronic Residency Application Service (ERAS)
Member, Committee on Promoting Diversity, American Society of Hematology (ASH)
Member, Awards Committee, American Society of Hematology (ASH)
Ex officio Member, Alliance for Academic Internal Medicine (AAIM)

LESLIE G. DODD, M.D.

Member, Program Directors Committee, American Society of Cytopathology

WILLIAM K. FUNKHOUSER, JR., M.D., Ph.D.

Member, Molecular Oncology Committee, CAP

PETER H. GILLIGAN, Ph.D.

Chair, Professional Practice Committee, American Society of Microbiology

MARGARET L. GULLEY, M.D.

Alliance for Clinical Trials in Oncology, Member, Translational Research Program Executive Committee
Technology Committee Task Force for Biospecimen Annotation
College of American Pathologists (CAP), Member, Personalized Healthcare Rapid Response Workgroup, Council on Government and Professional Affairs
Chair, Alliance for Clinical Trials in Oncology

TRACY M. HEENAN, D.V.M.

Member, Certification of Professional IACUC Administrators (CPIA), CPIA Council member
CCPIA, Leadership Committee
Chair, CCPIA , Recertification Committee
Ad hoc consultant, Association for the Assessment and Accreditation for Laboratory Animal Care International (AAALAC)

JONATHON W. HOMEISTER, M.D., Ph.D.

Member, ASIP Programming Committee
Member, ASIP Education Committee
Member, ASIP Meetings and Task Force Committee

J. CHARLES JENNETTE, M.D.

Member, College of American Pathologists (CAP) Renal Pathology Working Group

Member, Glomerular Disease Advisory Group, American Society of Nephrology
Member, Advocacy Committee, Association of Pathology Chairs
Member, Practice and Management Committee, Association of Pathology Chairs
Member, EULAR/ACR Working Group on the Definition and Classification of Vasculitis
Member, International Society Nephrology Commission for Global Advancement of Nephrology
Member, International Society of Nephrology Committee on Renal Pathology
Member, International Organizing Committee, 16th Vasculitis & ANCA Workshop, Paris

H. MICHAEL JONES, M.D.

Chair, American Osler Society, Publications Committee
Chair, American Osler Society, Program Committee

KATHLEEN A. KAISER-ROGERS, Ph.D.

Member, College of American Pathologists Cytogenetics Resource committee
Member, Advisory Board of Directors for the Cytogenetics Array Group Copy Number Variant Database
Chair, American Board of Medical Genetics Nominating Committee
Co-chair, American College of Medical Genetics Salary Survey Committee

NICHOLE L. KORPI-STEINER, Ph.D.

Member. AACC SYCL Executive Committee. 2012-2017
Chair, SYCL360 Subcommittee, 2012-present

C. RYAN MILLER, M.D., Ph.D.

Member, National Cancer Institute, The Cancer Genome Atlas (TCGA), Glioblastoma Analysis Working Group (AWG)
Member, National Cancer Institute, The Cancer Genome Atlas (TCGA), Low Grade Glioma Disease Working Group (DWG)
Member, Scientific Advisory Committee, National Functional Genomics Center
Member, American Association of Neuropathologists Awards Committee
Member, Neuro-Oncology Committee, NCI Alliance for Clinical Trials in Oncology
Co-Chair, Neuropathology Committee, NCI Alliance Trials in Oncology

MELISSA B. MILLER, M.D.

Member, ASM, Committee on Laboratory Practices
Member, ASM, Scherago-Rubin Award Nominating Committee

VINCENT J. MOYLAN, JR., M.S., PA

Appointed Medical Examiner for Orange County, NC, December 2012

VOLKER R. NICKELEIT, M.D.

Member, Organizing Committee, 2nd International Conference on Nephrology & Therageutics (Nephro 2013), Las Vegas, NV (USA), July 2013
President, Renal Pathology Society
Chair, Banff – Group: Chair of Working Group/Task Force in "Polyomavirus Nephropathy Classification"
Reviewer Chair, The Americal Society of Nephrology (ASN), Kidney Week 2013 (abstract review board): basic/experimental inflammation
Session Chair, Egyptian Society of Nephrology and Renal Transplantation; Cairo Congress 2013: chair of two clinical case presentation sessions.

YARA A PARK, M.D.

Chair, American Society for Apheresis, Chair, HPC Donor Subcommittee
Chair, Abstracts Committee, American Society for Apheresis (ASFA)
Chair, Plenary Abstract Session, American Society for Apheresis Annual Meeting, May 2013

KATHLEEN W. RAO, Ph.D.

Chair, Children's Oncology Group, Cytogenetics Group
Member, International Standing Committee, Human Cytogenetics Nomenclature

JAY S. RAVAL, M.D.

Chair, American Society for Apheresis Education Committee
Chair, American Society for Apheresis Practitioner Subcommittee
Chair, American Society for Apheresis Webinar Subcommittee
Chair, American Society for Apheresis Journal Club Subcommittee
Chair, American Society for Apheresis Online Resources Subcommittee

JOHN L. SCHMITZ, Ph.D.

Member, ASHI Directors Affairs Committee
Member, AMLI Constitution and Bylaws Committee

JOAN M. TAYLOR, Ph.D.

Chair, American Heart Association, Early Career Development Committee

DIMITRI G. TREMBATH, M.D., Ph.D.

Member, AANP Annual Meeting, Awards Committee

KAREN E. WECK, M.D.

Chair, Biochemical and Molecular Genetics Resource Committee, College of American Pathologists

JULIA W. WHITAKER, M.S., D.V.M.

Co-Chair, International Mock Board Exam Coalition for the American College of Laboratory Animal Medicine Board Exam Review

MONTE S. WILLIS, M.D., Ph.D.

Panelist, Introduction to NIH, Fellowship Applications, and Peer Review. FASEB / MARC (Federation of American Societies for Experimental Biology / Maximizing Access to Research Careers). April 20, 2013. Experimental Biology, Boston, MA.
Chair, Der Schadenklub (Cell Injury Scientific Interest Group) Poster Discussion and Networking Session. April 23, 2013. American Society of Investigative Pathology. Experimental Biology, Boston, MA.
Chair, Pathophysiology of Cardiac Disease Symposium. April 23, 2013. American Society of Investigative Pathology. Experimental Biology, Boston, MA.
Councilor, Society of Cardiovascular Research. Term: March, 2013-February 2016.
International Society for Heart Research, North American Section, Cardiac Metabolism Special Interest Group Steering Committee. Elected Dec 2011. Term: 2012-2014.
Immediate Past Chair, North Carolina Section, American Association of Clinical Chemistry (AACC). January 1, 2012-December 31, 2013.
Councilor, American Society of Investigative Pathology (ASIP), July 2011-present (4 year term total). Serve on ASIP Council, Program, and Education Committees as Chair of the Committee for Career Development Women and Minorities.
Secretary-Treasurer (Elected), Member/Steering Committee, Endocrinology & Metabolism Section, American Physiology Society, April 2011-April 2014.
Chair, Committee for Career Development, Women and Minorities (CCDWM), American Society of Investigative Pathology (ASIP), July 2011-present (Elected 4 year term total). Will serve on ASIP Council, Program, and Education Committees in this capacity.

ALISA S. WOLBERG, Ph.D.

Member, American Society for Hematology (ASH) Scientific Subcommittee on Thrombosis and Vascular Biology
Coordinating Reviewer, 54th Annual Meeting of the *American Society of Hematology.*

MEMBER OF BOARD OF DIRECTORS OF NATIONAL/INTERNATIONAL ACCREDITATION AGENCY

JESSICA K. BOOKER, Ph.D.

Member, American Board of Medical Genetics

FRANKC. CHURCH, Ph.D.

Board of Directors, Mid-Atlantic Affiliate of the American Heart Association

GEORGETTE A. DENT, M.D.

Member. Liaison Committee on Medical Education (LCME)

MELISSA B. MILLER, Ph.D.

Member, Board of Governors, American College of Microbiology

KATHLEEN W. RAO, Ph.D.

Member, American College of Medical Genetics (ACMG)

JOHN L. SCHMITZ, Ph.D.

Member, American Society for Histocompatibility and Immunogenetics Accreditation Review Board
Member, American Board of Medical Laboratory Immunology
Member, American College of Microbiology

JULIA W. WHITAKER, M.S., D.V.M.

Board of Directors, North Carolina Academy of Laboratory Medicine

MONTE S. WILLIS, M.D., Ph.D.

Vice President, Board of Directors, Myocarditis Foundation (myocarditisfoundation.org) January 1, 2013 – December 31, 2014.
Master of Business Administration (MBA) Executive Program (Fall 2012-Summer 2014), Kenan-Flagler Business School, UNC-CH. Emphasis: Healthcare and Entrepreneurship.

MEMBER OF FDA, CDC OR COMPARABLE COMMITTEE

CATHERINE A. HAMMETT-STABLER, Ph.D.

FDA, Center for Devices and Radiological Health Medical Devices Advisory Committee, Clinical Chemistry and Clinicnal Toxicology Devices Panel
Member, Clinical and Laboratory Standards Institute Committee, Pain Management Support

MELISSA B. MILLER, Ph.D.

FDA, Microbiology Devices Panel

C. RYAN MILLER, M.D., Ph.D.

Member, National Cancer Institute, The Cancer Genome Atlas (TCGA), Glioblastoma Analysis Working Group (AWG)
Member, National Cancer Institute, The Cancer Genome Atlas (TCGA), Low Grade Glioma Disease Working Group (DWG)
Member, Scientific Advisory Committee, National Functional Genomics Center
Member, American Association of Neuropathologists Awards Committee
Member, Neuro-Oncology Committee, NCI Alliance for Clinical Trials in Oncology

YARA A. PARK, M.D.

Member, American Society for Clinical Pathology, Pathologist Recertification Individualized Self-Assessment Examination (PRISE) Committee
Member, AABB, Cellular Therapy Product Collection and Clinical Practices Subsection
Member, American Society for Apheresis, Annual Meeting Organizing Committee
Member, College of American Pathologists, Transfusion Medicine Resource Committee
Member, American Society for Apheresis, Applications Committee

KATHLEEN W. RAO, Ph.D.

Member, Children's Oncology Group, Infant Leukemia Committee
Member, Cancer and Leukemia Group B (CALGB) Cytogenetics Review Review Committee

JAY S. RAVAL, M.D.

Member, AABB Therapeutic Apheresis Subsection
Member, AABB Cellular Therapy Product Collection and Clinical Practices Subsection
Member, American Society for Apheresis Clinical Applications Committee
Organizing Member, International Conference on Hematology and Blood Disorders

KAREN E. WECK, M.D.

Member, Molecular and Clinical Genetics Devices Panel, FDA Medical Devices Advisory Committee

MEMBER OF NIH OR COMPARABLE STUDY SECTION

FRANK C. CHURCH, Ph.D.

Member, Thrombosis-1 Review Committee, American Heart Association

WILLAM B. COLEMAN, Ph.D.

ad hoc, External Grant Reviewer for the National Institutes of Health, Cancer Diagnostics and Treatment SBIR/STTR Study Section, June 2013
ad hoc, External Grant Reviewer for the National Cancer Institute, National Institutes of Health, Omnibus R21/R03 Study Section, March 2013
ad hoc, External Grant Reviewer for the National Institutes of Health, Cancer Diagnostics and Treatment SBIR/STTR Study Section, March 2013
ad hoc, External Grant Reviewer for the National Cancer Institute, National Institutes of Health, NCI-F Manpower and Training Study Section, February 2013
ad hoc, External Grant Reviewer for the National Institutes of Health, Special Emphasis Panel (P01 Study Section), February 2013
ad hoc, External Grant Reviewer for the National Cancer Institute, National Institutes of Health, NCI-F Manpower and Training Study Section, October 2012

CRAIG A. FLETCHER, D.V.M., Ph.D.

Member, NIMHD Biological and Genetic Research and Clinical and Translational Research related Health Disparities Research (R01); Term of Appointment: Special Emphasis Panel *Ad Hoc* (November 15-16, 2012)

MARGARET L. GULLEY, M.D.

Member, NCI The Cancer Genome Atlas (TGCA) Stomach-Esophagus Analysis Working Group, Leader of the Viral Pathogen Workgroup

CATHERINE A. HAMMETT-STABLER, Ph.D.

Member, United States Army Military Operational Medical Research Program, Grant Reviewer

HOWARD M. REISNER, Ph.D.

Member, ITRS Final Review panel Louisiana Board of Regents

MONTE S. WILLIS, M.D., Ph.D.

Study Section Reviewer, Ammerican Heart Association, Cardiac Bio Reg/DVD Clinical Section. October 1, 2012.

SERVICE AS EDITOR OR ON EDITORIAL BOARDS

FRANK C. CHURCH, PH.D.

Editorial Board, The Journal of Biological Chemistry
Editorial Board, Journal of Thrombosis and Haemostasis
Editorial Board, Thrombosis

WILLIAM B COLEMAN, Ph.D.

Editorial Board, Current Pathobiology Reports (S.S. Monga, Editor-in-Chief), May 2012-Present
Editorial Board, Laboratory Investigation (G.P. Siegel, Editor-in-Chief), July 2007-Present
Editorial Board, Archives of Pathology and Laboratory Medicine (P.T. Cagle, Editor-in-Chief), April 2007-Present
Editorial Board, Experimental and Molecular Pathology (J.M. Cruse, Editor-in-Chief), January 2007-Present
Editorial Board, The American Journal of Pathology (K.A. Roth, Editor-in-Chief), January 2007-Present
Editorial Board, Clinica Chimica Acta (C.-W. Lam, Editor-in-Chief), August 2000-Present
Associate Editor, PLoS ONE (D. Pattinson, Executive Editor), December 2011-Present
Associate Editor, BMC Cancer (M. Norton, Editor-in-Chief), February 2010-Present

LESLIE G DODD, M.D

Editorial Board, Journal of American Society of Cytopathology
Editorial Board, Diagnostic Cytopathology

WILLIAM K. FUNKHOUSER, JR., M.D., Ph.D.

Section Editor, Molecular Pathology Section, Arch Path Lab Med

PETER H. GILLIGAN, Ph.D

Associate Editor, Journal of Clinical Microbiology
Associate Editor, Clincial Microbiology Reviews
Associate Editor, Mbio

MARGARET L. GULLEY, M.D.

Editorial Board, American Journal of Surgical Pathology

Editorial Board, Diagnostic Molecular Oathology
Editorial Board, PLOS Currents: Evidence for Genomic Applications

CATHERINE A. HAMMETT-STABLER, Ph.D.

Associate Editor, Clinical Biochemistry

TRACY M. HEENAN, D.V.M.

Associate Editor, Lab Animal Journal, Adequate Veterinary Care: A Researcher Training Manual. March, 2013.

JONATHON W. HOMEISTER, M.D., Ph.D.

Editorial Board, Journal of Molecular and Cellular Cardiology
Editorial Board, Cardiovascular Pathology

J. CHARLES JENNETTE, M.D.

Editorial Board, Americal Journal of Kidney Disease, Kidney Biopsy Advisory Board
Editorial Board, Journal of Rheumatology
Editorial Board, Laboratory Investigation
Editorial Board, Clinical Nephrology
Editorial Board, Pathology Case Reviews

DAVID G KAUFMAN, M.D., Ph.D.

Editorial Board, Experimental and Molecular Pathology
Editorial Board, Frontiers of Biosciences
Editorial Board, Translational OncoGenomics
Editorial Board, Clinical Medicine: Pathology
Editorial Board, The Open Reproductive Science Journal

CHRISTOPHER P. MACK, Ph.D.

Editorial Board, Arteriosclerosis, Thrombosis, and Vascular Biology

MELISSA B. MILLER, Ph.D.

Editorial Board, Journal of Clinical Microbiology (ASM Press)
Editorial Board, Diagnostic Microbiology and Infectious Disease (Elsevier)

C. RYAN MILLER, M.D., Ph.D.

Editorial Board, Brain Pathology
Editorial Board, Brain Research Bulletin

VOLKER R. NICKELEIT, M.D,

Editorial Board, World Journal of Transplantation
Editorial Board, Kidney and Blood Pressure Research
Editorial Board, Journal of Transplantation & Stem Cell Biology (JTSCB)
Editorial Board, Nephroligy Dialysis Transplantation Educational eTOC

JAY S. RAVAL, M.D.

Editorial Board, International Blood Research and Reviews
Editorial Board, The Journal of ExtraCorporeal Technology
Editorial Board, International Journal of Blood Transfusion and Immunohematology
Editorial Board, Journal of Blood Disorders and Transfusion

JOHN L. SCHMITZ, Ph.D.

Section Editor, Current Allergy and Asthma Reports. 2013 Volume 13
Editorial Board, Clinical and Vaccine Immunology
Editorial Board, Journal of Immunologic Methods

JOAN M. TAYLOR, Ph.D.

Editorial Board, ISRN Cell Biology

DIMITRI G. TREMBATH, M.D., Ph.D.

Editorial Board, Journal of Neuropathology and Experimental Neurology

KAREN E. WECK, M.D.

Associate Editor, Genetics in Medicine
Associate Editor, Molecular Genetics and Pharmacogenomics
Editorial Board, Journal of Molecular Diagnostics
Editorial Board, Expert Review of Molecular Diagnostics

BERNARD E. WEISSMAN, Ph.D.

Editorial Board, Journal of Cellular Physiology
Editorial Board, Genetics Research International

MONTE S. WILLIS, M.D., Ph.D.

Editorial Board, Cardiovascular System, Herbert Open Access Journals. Dec. 2012-present.
Section Editor, Archives of Pathology & Laboratory Medicine, Clinical Effectiveness and Economics, September 1, 2012-present.
Editorial Board, American Journal of Physiology – Endocrine and Metabolism, July 1, 2012-present.

Editorial Board, Expert Opinion on Medical Diagnostics. March 1, 2012-present (1 year term).
Editorial Board, Cardiovascular Pathology. January 1, 2012-present (3 year term).
Editorial Board, Journal of Hypertension: Open Access. October 2011-present.
Editorial Board, American Journal of Pathology. July 2011-present (3 year term).
Associate Editorial Board, American Journal of Cardiovascular Disease, March 2011-present.
Editorial Board, Journal of Molecular and Cellular Cardiology, January 1, 2011-December 31, 2013.
Editorial Board, American Journal of Physiology – Heart and Circulatory Physiology, January 1, 2011-December 31, 2013.
Editorial Board, Skeletal Muscle, July 2010-present.
Editorial Board, Journal of Microbial & Biochemical Technology, November, 2010-present.
Editorial Board, World Journal of Hypertension, December 2010-present.

ALISA S. WOLBERG, Ph.D.

Editorial Board, Arterioscl, Thromb, Vasc Biol
Advisory Board, J Thromb Haemost

JOHN T. WOOSLEY, M.D., Ph.D.

Editorial Board, Human Pathology

INVITED LECTURES AT STATE/NATIONAL AND INTERNATIONAL MEETINGS

ARLENE S. BRIDGES, M.D.

Invited to present a seminar entitled "Metabolomics" to the May 2, 2013 Symposium: From Genome to Proteome, Carolina Center for Genome Sciences on the University of North Carolina campus.

WILLIAM B COLEMAN, Ph.D.

American Society for Investigative Pathology, Annual Meeting, April 2013, Boston, MA
Outstanding Investigator Award Lecture: "Targeting the epigenome for improved treatment of triple-negative breast cancer." W.B. Coleman (Presenter)
American Society for Investigative Pathology, Annual Meeting, April 2013, Boston, MA
Pathobiology for Basic Scientists – Neoplasia Oral Presentation: "Basic concepts in cancer biology." W.B. Coleman (Presenter)
American Society for Investigative Pathology, Annual Meeting, April 2013, Boston, MA
Breast Cancer Workshop Oral Presentation: "Biology of HER2+ breast cancer." A.G. Rivenbark and W.B. Coleman (Presenter)
American Society for Investigative Pathology, Annual Meeting, April 2013, Boston, MA
Pathobiology for Basic Scientists – Neoplasia

MEGAN J. DIFURIO, M.D.

Epithelial Overian Cancer Arising from Ectopic Ovarian Tissue, 2012 Armed Forces District American College of Obstetricians and Gynecologists, Las Vegas

LESLIE G. DODD, M.D.

"Sarcoma", NC State University, Department of Veterinary Pathology, February 20, 2013
American Society of Cytopathology, "How to Intregrate active learning pedagogies into Cytology Education: A practical guide to a Lerner Centered approach", November 2, 2012, Las Vegas, NV
American Society of Cytopathology, "Fine needle aspiration and core biopsy of bone and soft tissue neoplasms", November 5, 2012, Las Vegas, NV

DAVID A. EBERHARD, M.D., Ph.D.

Eberhard DA. "Bringing Cancer Genomics From The Lab To The Clinic", RTP Illumina Users Group Meeting, March 12, 2013.
Eberhard DA. "Molecular and Genomic Pathology at UNC", Association of Directors of Anatomic and Surgical Pathology Annual Meeting, Baltimore MD, March 02, 2013.
Eberhard DA. Session Discussant, ASCO-EORTC-NCI Molecular Markers in Cancer meeting, October 11-13, Hollywood, FL 2012.

CRAIG A. FLETCHER, D.V.M., Ph.D.

International Mock Board Exam Coalition for the American College of Laboratory Animal Medicine Board exam review. The North Carolina Association of Laboratory Animal Medicine Workshop in Laboratory Animal Medicine, Thursday, May 20, 2012, Co-chair for Southeast region. 2010-pres.

PETER H. GILLIGAN, Ph.D

New Technologies to Identify Pathogens in CF Lung Disease. 13th Irish Cystic Fibrosis Conference Jan 2013
Case Studies. First Coast Clinical Microbiology and Infectious Diseases Conference, St. Augustine Fl. Feb 2013
How to get your blood culture contamination rate below 1%. American Society for Microbiology-Hot Topics. April 2013
Clinical Microbiology Update. SEACM Spring Meeting Charlotte, NC April 2013
ASM quiz. American Society for Microbiology General Meeting of the American Society for Microbiology May 2013
Use of algorithms in the laboratory diagnosis of Clostridium diffiicle infections and The complexity of bactrtial microflora in chronic lung infection in patients with cystic fibrosis. Kansas University Medical Center, November 5, 2012

KEVIN E. GREENE, M.D.

UNC Pathology CME Course Lecture, May 2013

MARGARET L. GULLEY, M.D.

"Molecular Surgical Pathology for the Practicing Pathologist", 9 lectures in a continuing medical education course, American Society for Clinical Pathology, Charleston, April 15-17, 2013.
"Emerging Evidence of Infectious Pathogens in TCGA Gastric Cancers", NCI's The Cancer Genome Atlas Stomach and Esophageal Cancer Workgroup. Seattle, April 29, 2013.

CATHERINE A. HAMMETT-STABLER, Ph.D.

Understanding Biological Testing to detect maternal drug Use and the unexpected Interference of Baby Wash Products with a Cannabinoid (THC) Immunoassay. North Carolina Child Medical Evaluation Program webinar. October 23, 2012.
Sample Quality – Key to Success or Failure. 4th International Leaders in Biobanking Congress 2012; Chapel Hill, NC. October 2, 2012.
When Worlds Collide: Resolving Research Needs with Patient Care. 4th International Leaders in Biobanking Congress 2012; Chapel Hill, NC. October 2, 2012
Unexpected Interference of Baby Wash Products with a Cannabinoid (THC) Immunoassay. NC Society of Clinical Lboratory Scientists; Raleigh, NC. September 29, 2012
Case Studies in Using DAU Testing. Anesthesiology Faculty and Fellows. December 18, 2012.
Troponins: What You Thought You Knew, But Were Afraid to Ask. Cardiology Trainees Core Curriculum. July 12, 2012.
The ABC's of Urine Toxicology Testing in the Controlled Substance Prescribing Setting. Addiction Medicine Conference. Governor's Institute on Substance Abuse. Asheville, NC. April 13, 2013.
The Sample – Often Forgotten, but Critical to the Result. Keynote presentation. Sample Prep and Target Enrichment in Molecular Diagnostics. Cambridge Healthtech Institute; Boston, MA. April 10, 3013.
Laboratory Support of Pain Management. AACC Webinar Series. April 9, 2013.
Immunosuppressant Drug Monitoring using LC Tandem Mass Spectrometry. Elsevier Webinar Series. March 21, 2013
Clinical Research Ethics. Duke-UNC 2013 Ethical Frontiers in Research. Duke-Carolina Undergraduate Bioethics Society; Durham, NC. February 16, 2013.

TRACY M. HEENAN, D.V.M.

Research Triangle Laboratory Animal Training Program 2012 Fall Didactic: RTP, NC; Presenter, Animal Ethics and Animal Use with Case Studies. September 17, 2012
2013 Public Responsibility in Medicine and Research (PRIM&R) IACUC Conference: Baltimore, MD. Served as Faculty Speed Mentor. March 18, 2013.
2013 Public Responsibility in Medicine and Research (PRIM&R) IACUC Conference: Baltimore, MD; Presenter and Facilitator Didactic Session and Workshop C14: Program Review and Facility Inspections: The Gifts That Keep on Giving [Us a Lot of Problems] (Program Oversight Track), March 19, 2013.

ADIL HUSSEIN GASIM, M.D.

Invited Participant, NEPTUNE Investigators and Research Coordinators April 21 – 22, 2013, Pier 5 Hotel, 711 Eastern Ave, Baltimore, MD, USA.
Invited Instructor, "A Practical Approach to Renal Pathology," National Kidney Foundation Spring Clinical Meetings, April 2-6, 2013, Orlando, FL
Platform Presenter and Participant, "A Proposed Pathologic Classification System for ANCA-Associated Glomerulonephritis is not Effective in Patients with Estimated Glomerular Filtration Rate of <15 at Presentation, 102nd Annual Meeting of the United States and Canadian Association of Pathologists (USCAP), March 2-8, 2013, Baltimore, MD
Invited Presenter and participant, Short Course on Renal Biopsy, Clinical Correlations Microscope Room, American Society of Nephrology Kidney Week 2012, October 30 – November 4, 2012, San Diego, CA, USA

J. CHARLES JENNETTE, M.D.

Asociated Vasculitis: Observations, Theories and Speculations", 16th International Vasculitis ANCA Workshop, Paris, France, April 14, 2013
Invited Lecture: 16th International Vasculitis & ANCA Workshop, "What can we expecfrom th revised Chapel Hill consensus conference nomenclature of vasculitis? Paris, France, April 14, 2013
Visiting Professor, Nephrology Division, Renal Grand Grounds, "Pathogenesis of ANCA Vasculitis and Glomerulonephritis", Albert Einstein College of Medicine, New York, NY, May 30, 2013
Andrew Herzenberg Memorial Lecture, "The Pathogenesis of ANCA Vasculitis", University Health Network, University of Toronto, Toronto, Canada, May 1, 2013
Invited Lecture, Pathology Grand Rounds, "Clinical and Pathologic Diagnosis of Systemic Vasculitis", University Health Network, University of Toronto, Toronto, Canada, May 1, 2013
Visiting Professor, Nephrology/Rheumatology/Pathology Departments, "Clinicopathologic Case Discussion Conference", University Health Network, University of Toronto, Toronto, Canada, May 1, 2013
American Society of Nephrology Annual Meeting, "Curing Autoimmunity", San Diego, CA, November 2, 2012
American Society of Nephrology Annual Meeting, "Histopathologic Classification of ANCA GN", San Diego, CA, November 1, 2012
American Society of Nephrology Annual Meeting, "Curing Autoimmunity", San Diego, CA, November 2, 2012
Four Lectures: American Society of Nephrology Renal Week Postgraduate Education Course: Basic Renal Pathology – from Bedside to Bench, "IgA Nephropathy," "Diabetic Glomeruloscherosis," "Crescentric Glomerulonephritis," and "Vasculitis," San Diego, CA October 30-31, 2012.
Two Lectures: American Society of Nephrology Renal Week Postgraduate Education Course: Glomerulonephritis Update: "Pathology of Radidly Progessive Glomerulonephritis" and "Pathology and Classification of Lupus Nephritis and IgA Nephropathy", San Diego, CA, October 31, 2012

Three Lectures: Cleveland Nephrology Update, "Alternatative Complement Pathway Activation in Glomerular Diseases: Diagnostic and Therapeutic Relevance", "2012 Chapel Hill Consensus Conference Nomenclature of Systemic Vasculitis", "Clinicopathologic Case Presentations", September 28-29, 2012, Cleveland, OH
A mouse model of Vascluitis and Glomerulonephritis Cause by Anti-nephrophil Cytoplasmic Autoantibiodies", Sixth RTP Rodent Pathology Course, September 17, 2012, Reseaarch TrianglePark, NC
2 lectures: Columbia University Postgraduate Review Course: Renl Biopsy in Medical Disease of the Kidney, "Rapidly Progressive Glomerulonephritis and ANCA" and "IgA Nephropathy and IgA Vasculitis", New York, NY, August 1, 2012.
Visiting Professor, Stanford University Department of Pathology, "Pathogenesis of Vascular Inflamation Induced by Anti-Neurophil Cytoplasmic Autoantibodoes:, San Diego, CA, September 2, 2012, Palo Alto, CA
Session Co-Chair and Co-Organizer, American Society of Nephrology Annual Meeting, Renal Biopsy Clinical Correlation Conference, San Diego, November 4, 2012.

KATHLEEN A. KAISER-ROGERS, Ph.D.

"Structural Chromosome Rearrangements" UNC-Greensboro Genetic Counseling students, 2 x
Problem solving conference, UNC-Greensboro Genetic Counseling students, February 21, 2013
"Molecular Cytogenetics" UNC-Greensboro Genetic Counseling students, February 2013
Problem solving conference, UNC-Greensboro Genetic Counseling students, February 28, 2013

WILLIAM K. KAUFMANN, Ph.D.

American Society of Photobiology annual meeting. Montreal, Canada, 2012. "Solar radiation melanomagenesis: development of a UV-mutator phenotype".
BIT Lifescience's 3rd Annual World Congress on Molecular and Cell Biology, Suzhou, China, June 14-16, 2013, "Mechanisms of a UV-mutator in melanoma",

NICHOLE L. KORPI-STEINER, Ph.D.

Clinical utility of HbA1c in diabetes: Proceed with educated caution. Carolinas Clinical Connection Conference; Myrtle Beach, SC. April 11, 2013.
Monitoring quality and the role of risk management. Online patient safety certificate course. American Association for Clinical Chemistry. May 2013. (www.aacc.org)

MEHMET KESIMER, Ph.D.

Invited symposium speaker, "Airway Mucins'. Temple University School of Medicine Center for Inflammation, Translational and Clinical Lung Research & Department of Physiology. ATS satellite meeting, 22 May 2013, Philadelphia, PA.
Symposium Speaker, Introduction and overview Light Scattering Technologies. Exosomes and Microvesicles 2012, Sept 29-Oct 2th Orlando, FL.
Session Chair: Physical characterization of extracellular membrane vesicles,
Exosomes and Microvesicles 2012, Sept 29-Oct 2th Orlando, FL

NOBUYO N. MAEDA, Ph.D.

"Mouse Models of Atherosclerosis", Jiao-Tong University, Shanhai, China Oct 17, 2012
"Mouse Models of Atherosclerosis", Nan-Jing University, Nanjin, China Oct 19, 2012
"Mouse Models of Atherosclerosis", University of Rochester, NY, Apr 10, 2013
"Genetic Risk Factors for Atherosclerosis at Different Vascular Locations: Looking Through Mouse Genetics", University of Minho, Porto, Portugal June 21, 2013

SUSAN J. MAYGARDEN, M.D.

USCAP meeting, Baltimore, MD, Cytopathology evening speciality conference, March 4, 2013.

MELISSA B. MILLER, Ph.D.

American Society for Microbiology, 113th General Meeting, Symposium, "Peaks and valleys: exploring clinically-relevant MALDI-TOF and molecular reporting," Denver, CO, May 20, 2013.
American Society for Microbiology, 113th General Meeting, Workshop, "Matrix assisted laser desorption ionization time-of-flight mass spectrometry in clinical microbiology," Denver, CO, May 18, 2013.
Pan American Society for Clinical Virology, 29th Annual Clinical Virology Symposium, Corporate Workshop (GenMark Dx), "Multiplex respiratory viral testing: analytical and clinical considerations," Daytona Beach, FL, April 29, 2013.
Pan American Society for Clinical Virology, 20th Annual Molecular Virology Workshop, "What does it take to validate/verify highly multiplexed molecular assays?" Daytona Beach, FL, April 26, 2013.
Southeastern Association for Clinical Microbiology, Virginia Spring Meeting, "The power and promise of MALDI-TOF in the clinical microbiology laboratory," Charlottesville, VA, April 19, 2013.
American Society for Microbiology, New York City Branch, Annual Spring Meeting, "Epidemiology and diagnosis of perinatal group B streptococcal disease: Where are we now?" New York, NY, April 5, 2013.
American Society for Microbiology, Molecular Webinar Series: Molecular Diagnosis of Infectious Disease: A Practical Course for Practitioners, "Sequencing- the next molecular generation," March 26, 2013.
American Society for Microbiology, Molecular Webinar Series: Molecular Diagnosis of Infectious Disease: A Practical Course for Practitioners, "Use of Molecular Methods in Clinical Bacteriology," February 26, 2013.
Southeastern Association Association for Clinical Microbiology, 34th Annual Meeting, "Hepatitis C: the Latest Update on Diagnosis and Treatment," Charlotte, NC November 9, 2012
Eastern Pennsylvania Branch of the American Society for Microbiology, 42nd Annual Symposium, "Comparison of Expanded Multiplex PCR Assays for the Detection of Common and Emerging Viral Respiratory Pathogens,: Philadelphia, PA, November 8, 2012.
South Central Association for Clinical Microbiology, 2012 Audio Conference Series, "Hepatitis C: the Latest Update on Diagnosis and Treatment," September 5, 2012.

21st Annual Symposium on Molecular Pathology, Beaumont Health System, "Hepatitis C: the Latest Update on Diagnosis and Treatment," Troy, MI, September 20, 2012.
Southwestern Association of Clinical Microbiology 31st Annual Meeting, Challenging Cases in Clinical Microbiology." St/ Louis, MO, September 6th, 2012.
UNC, School of Nursing, Continuing Education Program: Pediatric Sexual Assault Nurse Training, December 13, 2013.

C. RYAN MILLER, M.D., Ph.D.

Genetically-engineered mouse models of low grade gliomas. Accelerate Brain Cancer Cure Low Grade Glioma Conference. San Francisco, CA, January 24, 2013
Schmid RS, Bash RE, Werneke AM, White KK, Miller CR. Cortical GFAP+ astrocytes as a potential cellular origin of GBM. Society for Neuro-Oncology, Washington, DC. November 15-18, 2012
Dissecting the cellular and molecular requirements for astrocytoma initiation and progression using genetically-engineered mouse models. Brain Tumor Immunotherapy Program, Duke University, Department of Neurogurgery. Durham, NC, August 27, 2012

VOLKER R. NICKELEIT, M.D,

Glomerular-Disease Collaborative Network meeting (GDCN 27th annual conference): "Polyomavirus Nephropathy in Man and Mouse". March 2013, Chapel Hill, NC, USA
Glomerular-Disease Collaborative Network meeting (GDCN 27th annual conference): "Renal biopsy case discussions: an interactive forum". March 2013, Chapel Hill, NC, USA
Egyptian Society of Nephrology and Renal Transplantation; Congress 2013: "Updates on Polyomavirus Nephropathy: Screening and Monitoring." Cairo, Egypt , February 2013
Grand Rounds, Weill Cornell Medical College-New York Presbyterian Hospital; "Polyomavirus Nephropathy", June 2013, New York City, USA

YARA A. PARK, M.D.

Invited Lecturer, Massive Transfusion, 24th Annual May Day Trauma Conference, University of North Carolina, 2013
Use of Apheresis for Malignant Pertusis, National Institutes of Health, State of the Science in Apheresis, November 2012
Massive Transfusion, North Carolina Society of Clinical Laboratory Scientists, Fall Focus Continuing Education Progran, September, 2012
Apheresis Overview and its Use in Renal Transplantation, University of North Carolina Hospitals, Department of Surgery, Transplant Educational Conference Series, September 2012
Massive Transfusion, University of North Carolina Hospitals, Department of Surgery, Trauma Learning Series, August 2012

LI QIAN, Ph.D.

Keynote lecture: Directed Reprogramming Technology, The 3rd EACTS-meeting on Cardiac and Pulmonary Regeneration, Berlin, Germany, November, 2012

KATHLEEN W. RAO, Ph.D.

You Do the Review!, Children's Oncology Group Cytogenetics Workshop,
St. Louis, MO Feb 23, 2013

LORI R. SCANGA, M.D., Ph.D.

"Utility of Fine Needle Aspiration and Core Biopsy with Touch Prep in the Diagnosis of Renal Lesions" The Department of Pathology and Laboratory Medicine of the University of North Carolina at Chapel Hill and the Carolinas HealthCare joint annual CME event: "Practical Updates in Surgical Pathology and Cytopathology", May 4, 2013.

JOHN L. SCHMITZ, Ph.D.

Clinical Microbiology Lab Result Reporting?and I Thought Getting the Right Answer was the Hard Part! American Society for Microbiology Annual Meeting. May 20, 2013

HARSHARAN K. SINGH, M.D.

Polyomavirus Nepropathy from Man to Mouse – Annual Meeting of the Glomerular Disease Collaborative Network. Chapel Hill, NC March 9-10, 2013.
Renal Biopsy Case Presentations – Annual Meeting of the Glomerular Disease Collaborative Network. Chapel Hill, NC May 9-10, 2013.

SCOTT V. SMITH, M.D.

Practical Updates in Surgical Pathology and Cytopathology, The Department of Pathology and Laboratory Medicine, UNC School of Medicine, May 4, 2013; "Beyond Wilm's Tumor: Other Diagnostic Considerations for Malignant Pediatric Renal Tumors"

OLIVER SMITHIES, D.Phil.

Ithaca, New York, Cornell University Leadership Program, July 30, 2012
Harvard Medical School, Department of Systems Biology, Boston, Massachusetts, Theory Lunch Chalk Talk, September 21, 2012
AstraZeneca Nobel Medicine Initiative (AZNMI) Lecture Tour, Shanghai and Nanjing, China, October 12-24, 2012:
AstraZeneca, Shanghai, October 15, 2012, "On Being a Scientist for 60 Years"
Jiao Tong University, October 16, 2012, "Turning Pages: From Gels to Genes"
Nanjing, October 18, 2012, "Turning Pages: From Gels to Genes"
Seoul, Korea, October 19, 2012, "On Being a Scientist for 60 Years"

Brooklyn, New York, Hugh J. Carroll Memorial Lecture in Physiology and Medicine, New York Methodist Hospital, Brooklyn, New York, May 24, 2013, "Where Do Ideas Come From?"
ARVO 2013 Annual Meeting, Seattle Washington, May 24, 2013, Keynote Speaker "On Being a Scientist for 60 Years"
University of Minho, Porto, Portugal, June 21, 2013, "You Are Never Too Young to be a Scientist"
Little Scientists Network, Grand Annual Science Fair, Porto, Portugal, June 22, 2013, "You Are Never Too Young to be a Scientist"
A Nobel Day, Lisbon, Portugal, June 25, 2013, "Where Do Ideas Come From?"

LEIGH B THORNE, M.D.

Invited speaker, UNC CME, Practical Updates in Surgical Pathology & Cytopathology 5/4/13

BERNARD E. WEISSMAN, Ph.D.

Co-Chair and Invited Speaker, 4th International Conference of Tumor Targeted Therapy, Suzhou, PRC. Nov. 9^{th}-12^{th}, 2012

MONTE S. WILLIS, M.D., Ph.D.

Cancer Cachexia Conference/Society of Sarcopenia, Cachexia, and Wasting Disorders. Boston, MA. "Mechanisms of cardic atrophy in cancer". September 23, 2012
University of North Carolina Department of Internal Medicine, Section of Encocrinology Research Conference. Chapel Hill, NC "The role of ubiquitin proteasome system in regulating PPARα-mediated energy metabolism and cardiac mass". August 23, 2012.
NIEHS Receptor Machanisms Discussion Group, Research Triangle Park, NC. "The regulation pf nuclear receptors and physiological hyper trophy by the ubiquitin proteasine system". July 3, 2012.
Pediatric Academy of Sciences Annual Meeting. Washington, DC. Talk entitled: Regulation of Protein Turnover in the Heart and its Relationship to Cardiac Hypertrophy. Symposium: Mechanisms of Fetal and Neonatal Cardiac Growth. May 4, 2013.

ALISA S. WOLBERG, Ph.D.

"Contributions of Tissue Factor (TF)-Positive and (TF)-Negative Microparticles to Thrombosis", American Association of Blood Banking Annual Meeting, Boston, MA, October 6, 2012.
"Using in vitro Thrombin Generation Assays to Inform *in vivo* Observations", 2^{nd} Maastricht Summer School on Thrombin Generation and its Application, Maastricht, Netherlands, October 4, 2012.
"Hormones and Fibrin Structure", NIH Working Group on Mechanistic Perspectives on Hormone-Induced Thrombosis in Women, Rockledge, NY, September 13, 2012

JOHN T. WOOSLEY, M.D., Ph.D.

"Liver Pathology", American College of Gastroenterology Imaging and Pathology Course, October 19, 2012

DIRECTOR OF CONTINUING EDUCATION COURSES

GEORGE FEDORIW, M.D.

Director, ASCP Educational Course, "Practical and Effective Hematopathology", May 20-23, 2013

WILLIAM K. FUNKHOUSER, JR., M.D., Ph.D.

Director, Molecular Surg Path, ASCP Education Course, April 15-17, 2013, Charleston, SC

J. CHARLES JENNETTE, M.D.

Course Director, UNC DPLM Annual CME Event, "Practical Updates in Surgical Pathology and Cytopathology", Chapel Hill, NC, May 4, 2013
Course (CME), National Kidney Foundation Spring Clinical Meeting, "A Practical Approach to Renal Pathology", Lectures on Basic Approach to Renal Biopsy, Lupus Glomerulonephritis, Crescentic Glomerulonephritis and Thrombotic Microangiopathy, Orlando, FL, April 2, 2013
Course Co-Director, 27th Annual Meeting of the Glomerular Disease Collaborative Network, Lectures of C3 Glomerulopathy, Thrombotic Microangiopathies, Minimal Change Glomerulopathy, and Focal Segmental Glomerulosclerosis, March 9-10, 2013, Chapel Hill, NC
Course (CME), United States and Canadian Academy of Pathology Annual Meeting, "Short Course (CME), United States and Canadian Academy of Pathology Annual Meeting, "Pathology of Blood Vessels: Vasculitides, Vasculopathies and Coagulopathies", Vancouver, Canada, March 7, 2013

MELISSA B. MILLER, Ph.D.

Southwestern Association of Clinicnal Microbiology, 31st Annual Meeting, "What's New in Molecular Diagnostics for Infectious Diseases?" St. Louis, MO, September 5, 2012.

KAREN E. WECK, M.D.

"Genetic Testing in the Era of Personalized Medicine," North Carolina Society of Pathologists Annual Meeting, Asheville, NC, April 5, 2013
"Laboratory Performance on Molecular Genetic Proficiency Testing," College of American Pathologists Workshop, American College of Medical Genetics Annual Meeting, Phoenix, AZ, March 19, 2013.
"Clinical Genomic Testing in the Era of Personalized Medicine," Research Symposium, Department of Microbiology and Immunology, Emory University, February 16, 2013.

"Advances on Molecular Diagnostic Cancer Testing," Next Generation Diagnostics Summit, Washington, DC, August 29, 2012

MONTE S. WILLIS, M.D., Ph.D.

Continuing education lectures to Medical Technicians, focusing on new aspects of the diagnosis of disease and the related clinical management of disease.

"Bedbugs in the 21st century" – The re-emergnce of an old foe", May 18, 2012
"Human Ehrlichiosis and Anaplasmosis", June 1, 2012
"Sickle Cell Trait and Athletic Screening Programs", July 13, 2012
"Microbiology, Pathogenesis, and Epidemiology of Anthrax", August 31, 2012
"West Nile Virus: Epidemiology, Pathogenesis, Treatment and Prevention", September 28, 2012

HONG XIAO, M.D.

Invited lecture titled "The role of genetic background in an animal model of ANCA-associated vasculitis". 16th International Vasculitis & ANCA Workshop, April 14-17, 2013, Paris, France

MAIMOONA B. ZARIWALA, Ph.D.

Zariwala M. Status of current PCD genetics. PCD Foundation: Family Education Day, June 29-July 1, 2012, Durham, NC, USA.

SERVICE ON UNC AND UNCH COMMITTEE

DWIGHT A. BELLINGER, D.V.M., Ph.D.

Member, Institutional Biosafety Committee
Member, Institutional Animal Care and Use Committee

ARLENE S. BRIDGES, Ph.D.

Chair, UNC Health Sciences Library Advisory Committee, quarterly
Member, University Library System Advisory Committee, monthly
Member, UNC TraCS Core Directors Committee, quarterly
Member, Committee to Develop HR Tracks for Core Facility Personnel, intermittent/varies

FRANK C. CHURCH, Ph.D.

Member, Strategic Priority Group 1 (met several times 2012)
Member, Morehead-Cain Foundation, Central Selection Committee (3-day weekend in spring)
Member, University Research Council Grants Review Panel (review grants twice per year)
Member, 2nd year Course Directors Committee (CC2) (meets once per month)
Member, Medical School Admissions Committee, interview 2-3 student applicants each week

during the fall and early part of the spring semesters (Sept-March) meets between 3-4 times per month.
Member, Academy of Distinguished Teaching Scholars, UNC-CH
Fellow, Academy of Educators, UNC-CH School of Medicine
Member, Teaching Champions

WILLIAM B. COLEMAN, Ph.D.

Member, BBSP Pathogenesis Admissions Committee, November 2012-Present
Chair, Preliminary Examination Committee, Molecular and Cellular Pathology PhD Program, July 2012-Present

MARILA CORDEIRO-STONE, Ph.D.

Member, Executive Committee of the Curriculum in Toxicology
Member, Executive Committee of the Biological and Biomedical Science Program
Member, Graduate School Planning Committee for the design, approval and implementation of Professional Science Master Program(s) at UNC-CH
Member, Graduate School Administrative Board and Academic Policy Committee
Member, Graduate School Review Committee: selection of UNC-Chapel Hill applicants to Howard Hughes Medical Institute in the national competition for individual international graduate student fellowship; review of assigned applications and participation in a 2 h meeting for selection of the top candidates

GEORGETTE A. DENT, M.D.

Member, 1st Year Course Directors Committee
Member, 2nd Year Course Directors Committee
Member, 3rd and 4th Year Course Directors Committee
Member, Student Promotions Committee
Member, Curriculum Operations Committee
Director, Accessibility Resources and Service Search Committee
Member, Educations Committee
Chair, Infection Control Committee
Ex officio Member, Student Admissions Committee

DAVID A. EBERHARD, M.D., Ph.D.

Member, UNC Tissue Procurement Facility (TPF) External Advisory Committee
Member, UNC Heme-Onc Tissue Procurement Committee (HOTPC)
Member, UNC Committee for the Communication of Genetic Research Results (CCGR)
Chair, UNCseq (LCCC1108) Pathology Committee

ROSANN A. FARBER, Ph.D.

Member, University APT Committee

Member, SOM Conflict of Interest Committee
Member, COI monitoring committees
Member, Department of Genetics Advisory Committee
Chair, Dept of Genetics Search Committee
Chair, Confidential Inquiry Committee

GEORGE FEDORIW, M.D.

Member, UNC Cancer Sequencing Project: Pathology Committee (Lineberger LCCC)
Member, UNC Heme/onc tissue procurement committee (HOTPC :Lineberger LCCC)

CRAIG A. FLETCHER, D.V.M., Ph.D.

Member, UNC-CH Institutional Animal Care and Use Committee
Member, UNC-CH Institutional Biosafety Committee
Member, IACUC Subcommittee on Animal Concerns
Member, ad hoc SOM/DLAM Space Committee
Member, DLAM Advisory Committee
Member, University-wide Laboratory Animal Strategic Planning/Stakeholder Committee
Member, SOM Office of Research

PETER H. GILLIGAN, Ph.D.

Member, MD/PhD Selection Committee
Member, SOM Admissions Committee

VIRGINIA L. GODFREY, D.V.M., Ph.D.

Member, Fixed Term Faculty Promotion
Member, IACUC
Member, IACUC-DLAM

MARGARET L. GULLEY, M.D.

Member, UNC Clinical Genetics Advisory Group to University Cancer Research Fund
Member, Executive Director's Advisory Group, UNCH McLendon Labs
Chair, UNC Clinical Translational Science Award, Section Leader of Novel Methodology/Biobanking
Member UNCH RAM Lab Clinical Genetics Advisory Group to University Cancer Research Fund

KEVIN E. GREENE, M.D.

Member, MS2 GI Block Planning Committee
Member, 2nd Year Curriculum Committee (CC2)

SUSAN C. HADLER, M.D.

Member, 2nd Year Curriculum Committee (Medical School)
Member, 4th Year Clinical Capstone Course (Medical School)
Interview MS 2 Students for Ashville Program (Medical)
Member, Dental School Admissions Committee
Member, Dental School 1st Year Teaching Committee
Member, Assessment Revision Committee (Dental School)
Chair, 2nd Year Medical School Peer Evaluation

CATHERINE A. HAMMETT-STABLER, Ph.D.

Member, Clinical Documentation Committee
Member, CDC, Documents Sub-Committee
Member, MS2 Course Directors
Chair, IRB Committee B

TRACY M. HEENAN, D.V.M.

Member, Faculty Council
Member, DLAM Advisory Committee
Member, IACUC Animal Concern
Member, IACUC
Senior Staff Member, Vice Chancellor for Research
Chair, IACUC/DLAM Leadership Committee
Chair, Vice Chancellor for Research Compliance Task Force
Co-Chair, Network of Laboratory Animal Coordinator (NLAC) Steering Committee, Founder

JONATHON W. HOMEISTER, M.D., Ph.D.

Member, BBSP Executive Committee
Member, Department of Pathology and Laboratory Medicien Research Advisory Committee

J. CHARLES JENNETTE, M.D.

Member, UNC Health Care System Executive Council
Member, Dean's Advisory Committee of the UNC School of Medicine
Member, UNC Faculty Physicians Board
Member, Medical Staff Executive Committee
Member, UNC Faculty Physicians Payor Relations Committee
Member, NC TraCS Institute/CTSA Translational Science Advisory Board (TSAB)
Chair, Search Committee for Chair of Dept Allied Health Sciences
Chair, 5 Year Review, Chair of Biochemistry and Biophysics
Member, (EMR) System Selection Executive Steering Committee

DAVID G. KAUFMAN, M.D., Ph.D.

Chair, UNC Radiation Safety Committee
Chair, UNC SOM, Jefferson Pilot and Woods Award Selection Committee

WILLIAM K. KAUFMANN, Ph.D.

Research Advisory Committee, DPLM

JIANDONG LIU, Ph.D.

Member, Zebrafish Aquaculture Core Mentoring Committee

CHRISTOPHER P. MACK, Ph.D.

Member, UNC McAllister Heart Institute executive committee
Member, McAllister Heart Institute seminar series coordinator
Member, IVB Training Grant executive committee
Member, MHI faculty search committee

NOBUYO N. MAEDA, Ph.D.

Chair, DLAM Advisory Committee
Member, Pathology Research Advisory Committee
Member, Pathology Junior Faculty Search Committee
Member, Pathology Metabolomics Search Committee
Member, Pathology Grisham Professor Search Committee

SUSAN J. MAYGARDEN, M.D.

Member, GME Committee

MELISSA B. MILLER, Ph.D.

Member, Anti-infective Subcommittee of the Pharmacy and Therapeutics Committee, UNC Health Care
Member. Hospital Infection Control Committee, UNC Health Care
School of Medicine, Associate Professor Appointments, Promotions and Tenure Committee, 2012 – present

C. RYAN MILLER, M.D., Ph.D.

Member, Lineberger Comprehensive Cancer Center, Clinical Genomics
Member, Lineberger Comprehensive Cancer Center, Sequencing Pathology Committee

YARA A. PARK , M.D.

Member, Pharmacy and Therapeutics Committee
Member, Graduate Medical Education Committee

LI QIAN, Ph.D.

Member, Human Stem Cell Core Mentoring Committee
Member, Pathology Department Preliminary Exam Committee

KATHLEEN W. RAO, Ph.D.

Member, Education Committee for MS Curriculum
Member, Curriculum Operations Committee
Member, Block 9 course committee
Co-Chair, 2nd Year Curriculum

JAY S. RAVAL, M.D.

Member, Living Donor Kidney Transplant Committee
Member, Pulmonary Transplant Committee
Member, Bone Marrow/Hematopoietic Progenitor Cell Transplant QA/QI Committee
Member, Transfusion Medicine Service and Transplant Service Laboratories QA Committee
Member, Transfusion Safety Committee

HOWARD M. REISNER, Ph.D.

Member, Student Promotions Committee
Member, Medical School Admissions Committee
Member, 2nd Year Course Directors Committee
Member, University Hearings Board

JOAN M. TAYLOR, Ph.D.

Chair, Search Committee Asst/Assoc. Professor, Pathology
Chair, Animal Models Cores Oversight Committee
Chair, Search Committee, Cell Biology and Physiology
Member, Core Facilities Advisory Committee
Member, Animal Models Core Oversight Committee
Member, Department of Pathology, Research Advisory Committee
Member, School of Medicine Strategic Planning Committee (SP3)
Member, McAllister Heart Institute, Executive Committee
Member, School of Medicine Conflict of Interest Committee
Member, Integrative Vascular Biology Training Program Admissions Committee

RICHARD R. TIDWELL, Ph.D.

Member, Pathology and Lab Medicine Research Advisory Council
Member, UNC-CH Aids Clinical Trials Group
Member, UNC-CH Advisory Board for the Centers for Infectious Disease
Chair, Carolina Center for Clinical Drug Development Advisory Board

MICHAEL D. TOPAL, Ph.D.

Chair, UNC Core Facilities Advocacy Committee
Chair, UNC Office of Translational Technologies
Chair, UNC Office of Research Technologies
Member, Vice Dean of Research Management Team
Chair, UNC Regional Genomics Facility Committee, 2011 (monthly)
Chair, Committee to Establish Fixed-Term Faculty Positions for Core Directors
Chair, Strategic Plan Implementation 3, Initiative 1 Committee
Member, Biobanking Committee 2012

CYRUS VAZIRI, Ph.D.

Member, Research Advisory Committee (Dept of Pathology)
Member, Faculty Search Committee (Dept of Pathology)
Member, UCRF Pilot Project Award Review Committee
Member, Pathology Department Faculty Evaluation Committee
Member, Pathology Qualifying exam Committee
Member, GMB Program Qualifying exam Committee
Member, Curriculum in Toxicology Executive Committee
Member, Pathogenesis Admissions Committee
Member, Junior Faculty Mentoring meeting for Scott Williams

KAREN E, WECK, M.D.

Member, Department of Pathology Research Advisory Committee

BERNARD E. WEISSMAN, Ph.D.

Member, DPLM Graduate Education Committee
Member, Curr. in Toxicology Executive Committee
Chair, Tissue Culture Facility Advisory Committee
Chair, Animal Procedures Core Advisory Committee

HERBERT C. WHINNA, M.D., Ph.D.

Member, UNCH POC Committee
Member, UNCH Transfusion Committee
Member, UNCH MSEC
Member, UNCH Credentials Committee

JULIA W. WHITAKER, M.S., D.V.M.

Member, Institutional Animal Care and Use Committee (IACUC)

ALISA S. WOLBERG, Ph.D

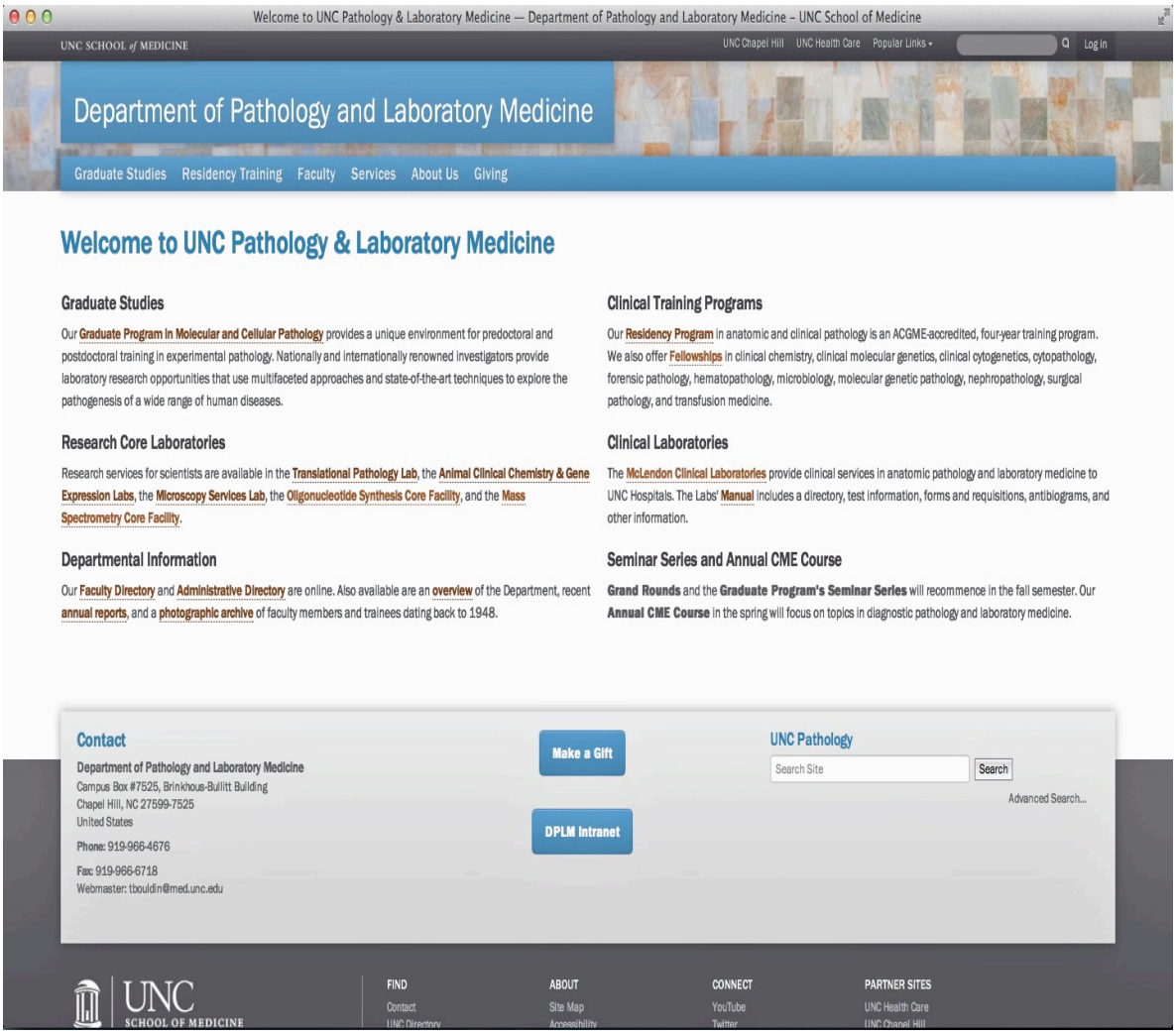
Member, UNC Thrombosis and Hemostasis Program Seminar Series
Member, UNC Molecular and Cellular Pathology Graduate Program Qualifying Exam
Member, Faculty Search Committee, UNC Pathology and Laboratory Medicine and MHI
Member, McAllister Heart Institute Executive Committee (Member)
Member, MHI Sabin Travel Award Committee, McAllister Heart Institute (Member)

DEPARTMENT FACULTY HANDBOOK

The Department of Pathology and Laboratory Medicine has established an online faculty handbook. The handbook is updated regularly as new information becomes available. The idea for this handbook came from the faculty, who wished to have a centralized, easily accessible source of information on topics of interest for new and established faculty members. The Faculty Handbook provides our faculty members with detailed and up-to-date information on such topics as faculty appointments and promotion, purchasing, grant proposals, human resources, equipment available within the Department, core research services available within the University, and policies of the School of Medicine. The handbook also provides an introduction and overview of the process of faculty orientation. The Department of Pathology and Laboratory Medicine's Faculty Handbook is accessible to faculty members through the Departmental intranet

DEPARTMENT WEB SITE

The Departmental web site (http://www.med.unc.edu/pathology) was inaugurated in 1995 as a means of making potential applicants more aware of our graduate, postdoctoral, and residency training programs. Today, the web site is a comprehensive, detail-rich resource for those seeking information about the educational, research, and clinical training programs of the Department. The web site includes information on the Department, including its history and recent annual reports, the graduate program in molecular and cellular pathology, the residency training program and eleven fellowship programs, the five research core service laboratories available to scientific investigators, a faculty directory with links to faculty- member profiles, and a listing of upcoming Departmental events. The web site also affords access to the Department's intranet. The web site is on a server maintained by the UNC School of Medicine. Dr. Thomas Bouldin is the webmaster. Web pages for the graduate program are authored by Dr. Jonathon Homeister, and web pages for the residency and fellowship programs are authored by Dr. Bouldin.



PUBLICATIONS

Department of Pathology and Laboratory Medicine
School of Medicine
University of North Carolina at Chapel Hill
July 1, 2012 – June 30, 2013

C ROBERT BAGNELL, JR., Ph.D.

Willis MS, Homeister JW, Rosson GB, Annayev Y, Holley D, Holly SP, Madden VJ, Godfrey V, Parise LV, Bultman SJ. Functional redundancy of SWI/SNF catalytic subunits in maintaining vascular endothelial cells in the adult heart. Circ Res. 2012 Aug 17;111(5):e111-22.

Feng Z, Hensley L, McKnight KL, Hu F, Madden V, Ping L, Jeong SH, Walker C, Lanford RE, Lemon SM. A pathogenic picornavirus acquires an envelope by hijacking cellular membranes. Nature. 2013 Apr 18;496(7445):367-71.

JESSICA K. BOOKER, Ph.D.

Cancer Genome Atlas Network. Comprehensive Molecular Portraits of Human Breast Tumors. Nature.2012 Oct 4;490(7418):61-70.

ARLENE S. BRIDGES, Ph.D.

Hertz D, Walko C, Bridges A, Hull H, Herendeen J, Rollings K, Clarke S, Watkins P, Dees E. Pilot study of rosiglitazone as an in vivo probe of paclitaxel exposure. Br J Clin Pharmacol. 2012 Jul;74(1):197-200. PMID 22680343.

Joy M, La M, Wang J, Bridges A, Hu Y, Hogan S, Frye R, Blaisdell J, Goldstein J, Dooley M, Brouwer K, Falk R. Cyclophosphamide and 4-hydroxycyclophosphamide pharmacokinetics in patients with glomerulonephritis secondary to lupus and small vessel vasculitis. Br J Clin Pharmacol. 2012 Sep;74(3):445-455. PMID 22380171.

Hurt J, Coleman, J, Fitzpatrick B, Taylor-Blake B, Bridges A, Vihko P, Zylka M. Prostatic acid phosphatase is required for the antinociceptive effects of thiamine and benfotiamine. PLoS One. 2012 Oct;7(10):e48562. PMID 23119057.

Gonzalez-Perez V, Connolly E, Bridges A, Wienkers L, Paine M. Impact of organic solvents on cytochrome P450 probe reactions: filling the gap with (S)-Warfarin and midazolam hydroxylation. Drug Metab Dispos. 2012 Nov;40(11):2130-2142. PMID 22896727.

Harrill A, Desmet K, Wolf K, Bridges A, Eaddy J, Kurtz C, Hall J, Paine M, Tidwell R, Watkins P. A mouse diversity panel approach reveals the potential for clinical kidney injury due to D289

not predicted by classical rodent models. Toxicol Sci. 2012 Dec;130(2):416-426. PMIC 22940726.

Chu K, Hasan W, Rawal S, Walsh M, Enlow E, Luft J, Bridges A, Kuijer J, Napier M, Zamboni W, Desimone J. Plasma, tumor and tissue pharmacokinetics of Docetaxel delivered via nanoparticles of different sizes and shapes in mice bearing SKOV-3 human ovarian carcinoma xenograft. Nanomedicine. 2012 Dec;S1549-0634(12)00691-0. PMID 23219874.

Generaux C, Ainslie G, Bridges A, Ismail M, Boykin D, Tidwell R, Thakker D, Paine M. Compartmental and enzyme kinetic modeling to elucidate the biotransformation pathway of a centrally acting antitrypanosomal drug. Drug Metab Dispos. 2013 Feb;41(2):518-528. PMID 23223498.

Dufek M, Knight B, Bridges A, Thakker D. P-glycoprotein increases portal bioavailability of loperamide in mouse by reducing first-pass metabolism. Drug Metab Dispos. 2013 Mar;41(3):642-650. PMID 23288866.

Coulter D, Walko C, Patel J, Moats-Staats B, McFadden A, Smith S, Khan W, Bridges A, Deal A, Oesterheld J, Davis I, Blatt J. Valproic acid reduces the tolerability of temsirolimus in children and adolescents with solid tumors. Anticancer Drugs. 2013 Apr;24(4):415-412. PMID 23328074.

Thuita J, Wolf K, Murilla G, Liu Q, Mutuku J, Chen Y, Bridges A, Mdachi R, Ismail M, Ching S, Boykin D, Hall J, Tidwell R, Paine M, Brun R, Wang M. Safety, pharmacokinetic, and efficacy studies of oral DB868 in a first stage vervet monkey model of human African Trypanosomiasis. PLoS Negl Trop Dis. 2013Jun;6(7). PMID 23755309.

Usary J, Zhao W, Barr D, Roberts P, Liu M, Balleta L, Karginova O, Jordan J, Combest A, Bridges A, Prat A, Cheang M, Herschkowitz J, Rosen J, Zamboni W, Sharpless N, Perou C. Predicting drug responsiveness in human cancers using genetically engineered mice. Clinical Cancer Research [Accepted, March 2013]

DEBRA A. BUDWIT, M.D.

Bleeker E, Koehler E, Smith J, Budwit D, Rahangdale L. Outcomes after management of young women with cervical intraepithelial neoplasia (CIN) 2 with 6 month observation protocol. Journal of Lower Genital Tract Disease 2013:18.1: in press.

Lim MY, Chandramouleeswaran S, Zagar TM, Budwit D, Anders CK. Isolated cranial mononeuropathy: and unusual initial presentation and disease progression of metastatic carcinoma of the breast. Journal of Clinical Oncology. 2013:31:e294-6. Published ahead of print on May 13, 2013 as 10.1200/JCO.2012.47.3322.

FRANK C. CHURCH, Ph.D.

Cardenas, J.C., M.M. Aleman, J.G. Wang, H.C. Whinna, A.S. Wolberg and F.C. Church (2013) Murine models do not recapitulate the pathophysiology of age-related venous thrombosis in humans. J. Thromb. Haemost.11(5):990-992. PMID: 23480546.

Rein, C.M. and F.C. Church, Vascular response to injury and disease in "On Disease: A Modern Approach to Pathology." McGraw Hill- Accepted with a publication date of 2013.

WILLIAM B. COLEMAN, Ph.D.

Rivenbark, A.G., O'Connor, S.M., and Coleman, W.B. (2013) Breast cancer personalized medicine – Challenges and opportunities. *Am. J. Pathol.* (In Press).

Rivenbark, A.G. and Coleman, W.B. (2012) Field cancerization in mammary carcinogenesis – Implications for prevention and treatment of breast cancer. *Exp. Mol. Pathol.* 93:391-398.

Sandhu, R. Rivenbark, A.G., and Coleman, W.B. (2012) Loss of post-transcriptional regulation of DNMT3b by microRNAs accounts for the hypermethylation defect observed in a subset of breast cancers. *Int. J. Oncol.* 41:721-732.

Sandhu, R., Rivenbark, A.G., and Coleman, W.B. (2012) Enhancement of chemotherapeutic efficacy in hypermethylator breast cancer cells through targeted and pharmacologic inhibition of DNMT3b. *Breast Cancer Research and Treatment* 131:385-399.

Coleman, W.B and Grisham, J.W. (2013) The molecular basis of liver cancer. In: The Molecular Basis of Human Cancer, Second Edition, W.B. Coleman and G.J. Tsongalis (eds.), Humana Press, Totowa, NJ, (In Press).

Coleman, W.B and Tsongalis, G.J. (2013) The role of genomic instability in the development of human cancer. In: The Molecular Basis of Human Cancer, Second Edition, W.B. Coleman and G.J. Tsongalis (eds.), Humana Press, Totowa, NJ, (In Press).

Coleman, W.B and Tsongalis, G.J. (2013) Cancer epidemiology: Incidence and etiology of human neoplasms. In: The Molecular Basis of Human Cancer, Second Edition, W.B. Coleman and G.J. Tsongalis (eds.), Humana Press, Totowa, NJ, (In Press).

Rivenbark, A.G. and Coleman, W.B. (2013) Disease and the genome: Genetic, developmental, and neoplastic disease. In: On Disease: A Modern Approach to Pathology, H.M. Reisner (ed.), McGraw-Hill, New York, (In Press).

Rivenbark, A.G. and Coleman, W.B. (2012) Epigenetic biomarkers in cancer detection and diagnosis. In: Toxicology and Epigenetics, S.C. Sahu (ed.), John Wiley and Sons, Chichester, West Sussex, pp. 317-338.

MARILA CORDEIRO-STONE, Ph.D.

Smith-Roe SL, Patel SS, Zhou Y, Simpson DA, Rao S, Ibrahim JG, Cordeiro-Stone M, Kaufmann WK. Separation of intra-S checkpoint protein contributions to DNA replication fork protection and genome stability in normal human fibroblasts. *Cell Cycle*, 2013 Jan 15; 12(2):332-45. (PMID: 23255133); PMCID: PMC3575462 (available on 2014/01/15)

Nikolaishvili-Feinberg N, Cordeiro-Stone M: Assays of bypass replication of genotoxic lesions in cell-free extracts. In *DNA Repair Protocols*, Lotte Bjergbaek (ed.), Human Press, *Methods Mol. Biol*. 2012;920:503-28 (PMID: 22941625).

GEORGETTE A. DENT, M.D.

Dent GA. The Student Becomes a Patient. Virtual Mentor. September 2012, Volume 14, Number 9:701-704.
http://virtualmentor.ama-assn.org/2012/09/ecas3-1209.html. Accesses August 30, 2012

MEGAN J. DIFURIO, M.D.

Duncan DL, Rambally BS, Lininger RA, DiFurio MJ. Displaces Granulosa Cells in the Fallopian Tube Mistaken for Metastatic Granulosa Cell Tumor. Int J. Gynecol Pathol. 2013 Jan;32(1):35-7

LESLIE G. DODD, M.D.

Mito JK, Min HD, Ma Y, Carter JE, Brigman BE, Dodd L, Dankort D, McMahon M, Kirsch DG. Oncogene-dependent control of miRNA biogenesis and metastatic progression in a a model of undifferentiated pleomorphic sarcoma. J Pathol 2013; Jan 229(1):132-140.

Dodd, LG, Bedrossian CW. Sarcoma redux: past, present, and future. Diagn Cytopathol. 2012 Aug;40 Suppl 2:E81-5. Doi: 10.1002/dc.22907.PubMed PMID:22927296.

Wickham MQ, Youens KE, Dodd, LG. Acral myxionflammatory fibroblastic sarcoma fine needle aspiration; a case report. Diagn Cytopathol. 2012 Aug;40 Suppl 2:E144-8. Doi: 10.1002/dc.21721. Epub 2011 May 4. PubMed PMID: 21548124.

Didolkar MM, Malone AL, Nunley JA, Dodd LG, HELms CA. Pseudotear of the peroneus longus tendon on MRI, secondary to a fibrocartilaginous node. Skeletal Radiol. 2012 Nov;41(11);1419-25. Epub 2012 Feb 15.PubMed; 22349597.

Cuneo KC, Riedel RF, Dodd LG, Harpole DH Jr, Kirsch DG. Pathologic complete response of a malignant peripheral nerve sheath tumor in the lung treated with neoadjuvant I fosfamide and radiation therapy, J Clin Oncol. 2012 Oct 1;30(28):e291-3. Epub 2012 Aug 6. PubMed PMID: 22869889.

Radkowski CA, Dodd LG, Johnson JL, Harrelson JM, Brigman BE. Leiomyosarcoma of the somatic soft tissues. J Surg Orthop Adv. 2012 Summer;21(2):96-101. PubMed PMID:22995359.

Vinson EN, Braga-Baiak A, Dodd LG, Martinez S. Imaging of recurrent intramuscular granulomatous masses induced by depot injection of leuprorelin. Skeletal Radiol. 2012 Mar;41(3):347-52. Epub 2011 Aug 23. PubMed PMID: 21861209.

Cardona DC, Dodd LG. Cytology of Bone Tumors. In Surgical Pathology Clinics of North America "Current Concepts in Bone Pathology" Reith JD (Ed) March 2012, vol 5 p. 79-100.

DAVID A. EBERHARD, M.D., Ph.D.

Potts SJ, Krueger J, Landis N, Eberhard DA, Young G, Schmechel S, Lange H. Evaluating tumor heterogeneity in immunohistochemistry stained breast cancer tissue. Lab Invest 92:1342-57, 2012.

Potts SJ, Huff S, Lange H, Zakhorov V, Eberhard DA, Krueger JS, Hicks DG, Young GD, Johnson T, Whitney-Miller CL. Tissue pattern recognition error rates and tumor heterogeneity in gastric cancer. Applied Immunohistochem Mol Morphol 21:21-30, 2013.

GEORGE FEDORIW, M.D.

Montogomery N, Moobery M, Dunphy CH, Park S, Laramore A, Foster MC, Fedoriw Y. Diagnostic complexities of eosinophilia. Archives of Pathology and Laboratory Medicine. (accepted for publication 1/6/2012; pages: 26)

Fedoriw Y, Samulski TD, Deal AM, Dunphy CH, Sharf A, Shea TC, Serody JS, Sarantopoulos S. Bone Marrow B-cell Precursor Number after Allogeneic Stem Cell Transplantation and GVHD Development. Biology of Blood and Bone Marrow Transplantation. 2012 Mar 20. [Epub ahead of print]

Poisson J, Fedoriw Y, Henderson MP, Hainsworth S, Tucker K, Uddin Z, McCudden CR. Performance evaluation of the Helena V8 capillary electrophoresis system. Clinical Biochemistry. 2012 Mar 19. [Epub ahead of print]

Ren R, Fedoriw Y, Willis MS: The molecular pathophysiology, differential diagnosis, and treatment of myeloperoxidase deficiency. Journal of Clinical and Experimental Pathology. 2012, in press.

Montgomery N, Mathews S, Rao KW, Fedoriw Y. Cloncal karyotypic abnormalities associated with reactive lymphoid hyperplasia. Cancer Genetics. 2013 Apr 24. [epub ahead of print], 2013

Weston BW, Hayden MA, Roberts KG, Bowyer S, Hsu J, Fedoriw Y, Rao KW, Mullighan CG. Tyrosine kinase inhibitor therapy induces remission in a patient with refractory EBF-PDGFRB positive acute lymphoblastic leukemia. Journal of Clinical Oncology (accepted for publication), 2013.

Karpinich NO, Kechele DO, Espenschied ST, Willcockson HH, Fedoriw Y, Caron KM. Adrenomedullin gene dosage correlates with tumor and lymph node lymphangiogenesis. FASEB J. 2012 Oct 25 [Epub ahead of print]

Bender LM, Fedoriw Y. Evaluation of digital images for identification and characterization of monoclonal immunoglobulins by immunofixation. Clinical Biochemistry. 10/22/2012

Buckner TW, Dunphy CH, Fedoriw Y, Foster MC, Richards KL, Park S. Complete spontaneous remission of diffuse large B-cell lymphoma of the maxillary sinus after concurrent infections. Clinical Lymphoma, Myeloma, and Leukemia. (accepted for publication 6/2/2012; pages 11)

Tamburro KM, Yang D, Poisson J, Fedoriw Y, Roy D, Lucas A, Sin SH, Malouf N, Moylan V, Damania B, Moll S, van der Horst C, Dittmer DP. Vironome of Kaposi sarcoma associated herpesvirus-inflammatory cytokine syndrome in ADIS patient reveals co-infection of human herpesvirus 8 and human herpesvirus 6A. Virology. 2012 Aug 24 [Epub ahead of print]

Tang W, Fan H, Schroeder J, Dunphy CH, Bryant RJ, Fedoriw Y, Gulley ML. Atypical Epstein-Barr viral genomic structure in lymphoma tissue and lymphoid cell lines. Diagnostic Molecular Pathology. (accepted for publication 7/30/2012; pages 16)

Dunphy CH, Fedoriw GD, Hunt JP, Head D. Myelodysplastic syndromes. In: Dunphy CH, ed. Neoplastic Hematopathology: an Atlas and Concise Guide. Demos Medical Publishing: New York, NY. 2013 pp. 107-126.

CRAIG A. FLETCHER, D.V.M., Ph.D.

Bhatnagar P, Lu X, Evans MK, LaVeist TA, Zonderman AB, Carter DL, Fletcher CA. Genetic varients in Platelet Factor 4 modulate inflammatory and platelet activation biomarkers. Circ Cardiovasc Genet. 2012 Aug1;5(4):412-21.

WILLIAM K. FUNKHOUSER, JR., M.D., Ph.D.

Zhao N, et al., Different cellular p16(INK4a) localisation may signal different survival outcomes in head and neck cancer. Br J Cancer 107:482, 2012.

Wilkerson M, et al., Differential pathogenesis of lung adenocarcinoma subtypes involving sequence mutations, copy number, chromosomal instability, and methylation. PLOS One 7:e36530, 2012.

Stingone J, Funkhouser W, Weissler M, Bell M, Olshan A. Racial differences in the relationship between tobacco, alcohol, and squamous cell carcinoma of the head and neck. Cancer Causes Control 2012

ASIP Milestones article, “Fleming and Mitosis”, Nov 2012.

Grilley-Olson JE, Hayes DN, Moore DT, Leslie KO, Wilkerson MD, Qaqish BF, Hayward MC, Cabanski CR, Yin X, Socinski MA, Stinchcombe TE, Thorne LB, Allen TC, Banks P, Beasley MB, Borczuk A, Cagle PT, Christensen R, Colby TV, Deblois G, Elmberger G, Graziano P, Hart C, Jones KD, Maia DM, Miller CR, Nance K, Travis WD, Funkhouser WK. Validation of

Interobserver agreement in Lung Cancer Assessment: Hematoxylin & Eosin Diagnostic Reproducibility for Non-Small Cell Lung Cancer: The 2004 World Health Organization Classification and Therapeutically Relevant Subsets. Arch Pathol Lab Med. 137: 32, 2013.

The Cancer Genome Atlas Research Network. Comprehensive genomic characterization of squamous cell lung cancers. Nature 489: 510, 2012.

Fried D, Zanation AM, Huang B, Hayes DN, Morris DE, Rosenman J, Varia M, Funkhouser W, Weissler M, Hera BS. Management of Non-Esthesioneuroblastoma Sinonasal Malignancies with Neuroendocrine Differentiation. Laryngoscope 122:2210, 2012.

Walter V, Yin X, Wilkerson MD, et al. Molecular subtypes in head and neck cancer exhibit distinct patterns of chromosomal gain and loss of canonical cancer genes. PLoS One. 2013;8(2):e56823.

PETER H. GILLIGAN, Ph.D

Culbreath, K., E. Ager, R.J. Nemeyer, A. Kerr and P.H. Gilligan 2012. Evolution of testing algorithms at a university hospital for the detection of Clostridium difficile infections. J. Clin. Microbiol. 50:3075-9.

Gilligan PH. Blood Culture Contamination: A Clinical and Financial Burden. Infect. Control Hosp. Epidemiol 2013,34:23-23.

Alby K, Gilligan PH. Identification of Clinical Relevant Bacteria: Conventional Methods in Rosenberg, Delong E, Strackebrandt EF, Thompson E. The Prokaryotes 4th Edition Springer, New York (In Press) 2012

Lobo, L. L. Chang, C. Esther, P. Gilligan, Z. Tulu, and P. Noone. 2013. Lung transplant outcomes in cystic fibrosis patients with pre-operative Mycobacterium abscessus respiratory infections. Clin. Transplant (in press)

Surawicz, C.M., L.J. Brandt, D. G. Binion, A. N. Snanthakrishnan, S. R. Curry, P. H. Gilligan**,** L. V. McFarland, M. Mellow, B. S. Zuckerbraun 2013. Guidelines for Diagnosis, Treatment and Prevention of Clostridium difficile Infections. Am J Gastroenterol. 108:478-98

Gilligan PH. Laboratory Diagnosis of Clostridum Difficile. In K Weiss and G. Tillotson (Ed) In Advance In Clostridium Defficile Future Science Group, London, 2013

OLEG V. GORKUN, Ph.D.

Nathan E. Hudson, Feng Ding, Igal Bucay, E. Timothy O'Brien III, Oleg V. Gorkun, Richard Superfine, Susan T. Lord, Nikolay V. Dokholyan, Michael R. Falvo, Sub-millisecond elastic recoil reveals molecular origins of fibrin fiber mechanics. *Biophysical Journal,* 104(12), p. 2671-2680, 2013.

An engineered fibrinogen variant AαQ328,366P does not polymerise normally, but retains the ability to form α cross-links. Park R, Ping L, Song J, Seo JY, Choi TY, Choi JR, Gorkun OV, Lord ST. *Thromb Haemost.* 2013 Feb;109(2):199-206.

The assembly of nonadhesive fibrinogen matrices depends on the αC regions of the fibrinogen molecule. Yermolenko IS, Gorkun OV, Fuhrmann A, Podolnikova NP, Lishko VK, Oshkadyerov SP, Lord ST, Ros R, Ugarova TP. *J Biol Chem*. 2012 Dec 7;287(50):41979-90.

Fibrinogen residue γAla341 is necessary for calcium binding and 'A-a' interactions. Park R, Ping L, Song J, Hong SY, Choi TY, Choi JR, Gorkun OV, Lord ST. Thromb Haemost. 2012 May;107(5):875-83.

KEVIN E. GREENE, M.D.

Sigmon L, Greene K, Hansen JJ. IV Cyclosporine to Treat Refractory CVID Enteropathy. Scand J Gastroenterol. 2012 Nov; 47(11): 1396-7.

PAMELA A. GROBEN, M.D.

Culton DA, Lachiewicz AM, Miller BA, Miller MB, Mackuen C, Groben P, White B, Cox GM, Stout JE. Nontuberculous mycobacterial infection after fractionated CO(2) laser resurfacing. Emerg Infect Dis. 2013 Mar;19(3):365-70.

MARGARET L. GULLEY, M.D.

Tang W, Fan H, Schroeder J, Dunphy CH, Bryant RJ, Fedoriw Y, Gulley ML: Atypical Epstein-Barr Viral Genomic Structure in Lymphoma Tissue and Lymphoid Cell Lines. Diagn Molec Pathol, 22(2):91-101, 2013.

Olson D, Gulley ML, Tang W, Wokocha C, Mechanic O, Hosseinipour M, Gold S, Nguluwe N, Mwansambo C, Shores C: Phase I clinical trial of valacyclovir and standard of care cyclophosphamide in children with endemic Burkitt lymphoma in Malawi. Clin Lymphoma, Myeloma Leuk, 3:112-8, 2013.

Tang W, Morgan DR, Myers MO, Dominguez RL, Martinez E, Kakudo K, Kuan PF, Banet N, Muallem H, Woodward K, Speck O, Gulley ML: Epstein-Barr Virus Infected Gastric Adenocarcinoma Expresses Latent and Lytic Viral Transcripts and has a Distinct Human Gene Expression Profile. Infectious Agents and Cancer, 2012, 7:21.

Ryan JL, Shen YJ, Morgan DR, Thorne LB, Kenney SC, Dominguez RL, Gulley ML: Epstein-Barr virus infection is common in inflamed gastrointestinal mucosa. Digestive Diseases and Sciences, 2012, 57:1887-1898

Ma SD, Yu X, Mertz JE, Gumperz JE, Reinheim E, Zhou Y, Tang W, Burlingham WJ, Gulley ML, Kenney SC: An Epstein-Barr virus (EBV) mutant with enhanced BZLF1 expression causes lymphomas with abortive lytic EBV infection in a humanized mouse model. J Virol, 2012, 86: 7976-7987.

Chen SS, Hai S, Gulley ML, Luthra R: Epstein-Barr virus and cytomegalovirus viral load monitoring by quantitative real time polymerase chain reaction. In Modern Clinical Molecular Techniques. P Hu, M Hegde, PA Lennon (eds), Springer, New York, 2012, Chapter 12, pp.171-186.

Singh Z, Gulley ML: Acute Leukemia. In Pediatric Neoplasia: Advances in Molecular Pathology and Translational Medicine. AC Mackinnon (ed), Springer-Verlag New York, LLC, 2012, Chapter 2, pp.21-52.

Singh Z, Gulley ML: Molecular Techniques Used in the Evaluation of Pediatric Acute Leukemia. In Pediatric Neoplasia: Advances in Molecular Pathology and Translational Medicine. AC Mackinnon (ed), Springer-Verlag New York, LLC, 2012, Chapter 3, pp.53-74.

Singh Z, Gulley ML: Myelodysplasia and Myeloid Proliferations. In Pediatric Neoplasia: Advances in Molecular Pathology and Translational Medicine. AC Mackinnon (ed), Springer-Verlag New York, LLC, 2012, Chapter 4, pp.75-100.

Singh Z, Patel NM, Gulley ML: Childhood Lymphoma. In Pediatric Neoplasia: Advances in Molecular Pathology and Translational Medicine. AC Mackinnon (ed), Springer-Verlag New York, LLC, 2012, Chapter 5, 101-124.

O'Neill SS, Gulley ML: Molecular Pathology Reporting. In Molecular Genetic Patholo1gy. L Cheng, DY Zhang, JN Eble (eds), Springer, New York, 2013.

CATHERINE A. HAMMETT-STABLER, Ph.D.

McCudden CR, Senior BA, Hainsworth S, Bruns DE, Hammett-Stabler CA. Cerebrospinal Fluid Leak Detection by High Resolution Gel Beta2-Transferrin Immunofixation. Clin Chem Lab Med. 2012; 28:1-5. Doi: 10.1515/cclm-2012-0408.

Response to Mays and McCarthy. Hammett-Stabler CA, Cotton SW, Duncan DL, Burch EA, Seashore CJ. Clin Biocehm. 2012,45:1267. Doi:10.1016/j.clinbiochem.2012.08.009.

JONATHON W. HOMEISTER, M.D., Ph.D.

Willis MS, Homeister JW, Rosson GB, Annayev Y, Holley D, Holly SP, Madden VJ, Godfrey V, Parise LV, Bultman SJ. Functional Redundancy of SWI/SNF Catalytic Subunits in Maintaining Vascular Endothelial Cells in the Adult Heart. Circ Res. 2012;111:e111-e112. PMCID: to be assigned

Pi X, Lockyer P, Dyer L, Schisler J, Carey S, Sweet DT, Chen Z, Tzima E, Willis MS, Homeister JW, Moser M, Patterson C. Bmper inhibits endothelial inflammation and protects against atherosclerosis. Arterioscler Thromb and Vasc Biol. 2012;32:2214-2222. PMCID: to be assigned

Wang H, Morales-Levy M, Rose J, Mackey LC, Bodary P, Eitzman D, Homeister JW. α(1,3)-Fucosyltransferases FUT4 and FUT7 control murine susceptibility to thrombosis. Am J Pathol. 2013; in press. PMCID: to be assigned

Duan J, Lee Y, Jania C, Gong J, Rojas M, Burk L, Homeister J, Tilley S, Rubin J, Deb A. Rib fractures and death from deletion of osteoblast bcatenin in adult mice is rescued by corticosteroids. PLoS One 8(2) e55757. Doi: 10.1371/journal.pone.0055757. Epub 2013 Feb 5. PMCID: in process

PEIQI HU, M.D.

Jennette JC, Xiao H, Hu P. Complement in ANCA-Associated Vasculitis. Seminars Nephrol 2013; in press

Xiao H, Ciavatta D, Aylor DL, Hu P, de Villena FP, Falk RJ, Jennette JC. Genetically determined severity of anti-myeloperoxidase glomerulonephritis. Am J Pathol. 2013 Apr; 182(4):1219-1226

Jennette JC, Falk RJ, Hu P, and Xiao H. Pathogenesis of Antineutrophil Cytoplasmic Autoantibody–Associated Small-Vessel Vasculitis. Annu. Rev. Pathol. Mech. Dis. 2013; 8:139–60

ADIL HUSSEIN-GASIM, M.D.

Laurin L, McGregor JAG, Derebail VK, Hogan SL, Poulton CJ, Gasim AMH, Jennette JC, Falk RJ, Nachman PH. Role of Immunosuppressive Therapy in Renal Survival in Collapsing Focal Segmental Glomerulosclerosis (FSGS). J Am Soc Nephrol 2012;23:724A.

Barisoni L, Nast CC, Jennette JC, Hodgin JB, Herzenberg AM, Lemley KV, Conway CM, Kopp J, Kretzler M, Lienczewski C, Avila-Casado C, Bagnasco S, Sethi S, Tomaszewski J, Gasim AH, Hewitt SM. The NEPTUNE Digital Pathology Protocol for Evaluation of Nephrotic Syndrome. American Society of Nephrology Annual Meeting, 2012.

J. CHARLES JENNETTE, M.D.

Jennette JC. What Can We Expect from the Revised Chapel Hill Consensus Conference Nomenclature of Vasculitis? Quart J Med, Presse Med 2013; 42(4 Pt 2):550-5.

Jennette JC, Falk RJ. Pathogenesis of ANCA-Associated Vasculitis: Observations, Theories and Speculations. Quart J Med, Presse Med 2013, 42(4 Pt 2):493-8.

Xiao H, Ciavatta D, Aylor DL, Hu P, Pardo-Manuel de Villena F, Falk RJ, Jennette JC. Genetically determined severity of anti-myeloperoxidase glomerulonephritis. Am J Pathol 2013; 8:139-60.

D'Agati VD, Alster JM, Jennette JC, Thomas DB, Pullman J, Savino DA, Cohen AH, Gipson DS, Gassman JJ, Radeva MK, Moxey-Mims MM, Friedman AL, Kaskel FJ, Trachtman H,

Alpers CE, Fogo AB, Greene TH, Nast CC. Association of Histologic Variants in FSGS Clinical Trial with Presenting Features and Outcomes. Clin J Am Soc Nephrol. 2013;8:399-406.

Roth AJ, Ooi J, Hess JJ, van Timmeren MM, Berg EA, Jennette CE, McGregor JA, Burkart M, Hogan SL, Hu Y, Winnik W, Nachman PH, Stegeman CA, Niles J, Heeringa P, Kitching AR, Holdsworth S, Jennette JC, Preston GA, Falk RJ. ANCA Epitope Specificity Determines Pathogenicity, Detectability and Clinical Predictive Value. J Clin Invest 2013; 123:1773-83

Free ME, Bunch DO, Berg EA, Burkart M, Hogan S, Hu Y, Preston G, Jennette JC, Falk RJ, Su M. ANCA Disease Patients Have Defective Treg Function Exacerbated by Expansion of a Suppression-Resistant Effector Population. Arthritis Rheum 2013; [Epub ahead of print]

Poulton CJ, Nachman PH, Hu Y, McGregor JG, Jennette JC, Falk RJ, Hogan SL. Pathways to renal biopsy and diagnosis among patients with ANCA small-vessel vasculitis. Exp Rheumatol. 2013; [Epub ahead of print]

Barisoni L, Nast CC, Jennette JC, Hodgin JB, Herzenberg AM, Lemley KV, Conway CM, Kopp J, Kretzler M, Lienczewski C, Avila-Casado C, Bagnasco S, Sethi S, Tomaszewski J, Gasim AH, Hewitt SM. Digital Pathology Evaluation in the Multi-Center NEPTUNE Study of Nephrotic Syndrome. Clin J Am Soc Nephrol 2013; [Epub ahead of print]

Jennette JC, Falk RJ: Necrotizing Arteritis and Small Vessel Vasculitis in The Autoimmune Diseases, 5th Edition, Rose NR and Mackay IR, Elsevier, London, 2013, Chapter 65, in press.

Jennette JC, Falk RJ, McGregor JG: Renal and Systemic Vasculitis in Comprehensive Clinical Nephrology, 4th Edition, RJ Johnson and J Feehally (eds), Mosby, London, 2013, in press

McGregor JG, Nachman PH, Jennette JC, Falk RJ. in Diseases of the Kidney and Urinary Tract, 9th ed, Schrier RW, Neilsen E, Molitoris B, Coffman T, Falk RJ (eds), Lippincott Wilkins and Williams, 2013; Chapter 48:1325-1363

Homeister J, Jennette JC, Falk RJ: Immunologic Mechanisms of Vasculitis in The Kidney: Physiology and Pathophysiology, 5th Ed., Alpern RJ and Heber SC, Elsevier, 2013, Chapter 83, 2817-2846.

Jennette JC, Falk RJ, Hu P, Xiao H. Pathogenesis of Anti-neutrophil Cytoplasmic Autoantibody Associated Small Vessel Vasculitis. Annu Rev Pathol Mech Dis 2013; 8:139–60

Weening, Jennette JC: Historical milestones in renal pathology, Virchows Arch 2012; 461(1):3-11.

Jennette JC, Falk RJ, Bacon PA, Basu N, Cid MC, Ferrario F, Flores-Suarez LF, Gross WL, Guillevin L, Hagen EC, Hoffman GS, Jayne DR, Kallenberg CGM, Lamprecht P, Langford CA, Luqmani RA, Mahr AD, Matteson EL, Merkel PA, Ozen S, Pusey CD, Rasmussen N, Rees AJ, Scott DGI, Specks U, Stone JH, Takahashi K, Watts RA. Revised International Chapel Hill Consensus Conference Nomenclature of the Vasculitides. Arthritis Rheum 2013, 65:1-11. [Epub ahead of print]

Lionaki S, Blyth ER, Hoganarrangements in Gersen SL. SL, Hu Y, Senior JBA, Jennette CE, Nachman PH, Jennette JC, Falk RJ. Classification of antineutrophil cytoplasmic autoantibody vasculitides: The role of antineutrophil cytoplasmic autoantibody specificity for myeloperoxidase or proteinase 3 in disease recognition and prognosis. Arthritis Rheum 2012;64:3452-62

Barisoni L, Jennette JC, Colvin R, Sitaraman S, Bragat A, Castelli J, Walker D, Boudes P. Novel Quantitative Method to Evaluate Globotriaosylceramide Inclusions in Renal Peritubular Capillaries by Virtual Microscopy in Patients With Fabry Disease. Arch Pathol Lab Med 2012; 136:816-24

Cao Y, Yang JJ, G Preston, Hogan SL, Hu Y, Jennette CE, Berg EA, Zhang Y, Jennette JC, Falk RJ. High basal activity of the PTPN22 gain-of-function variant blunts leukocyte responsiveness negatively effecting IL-10 production in ANCA vasculitis. PLoS ONE 2012; 7:e42783

KATHLEEN A. KAISER-ROGERS, Ph.D.

Kaiser-Rogers K, Rao KW: Translocations and Other Structural Rearrangements in Gersen SL, Keagle MB (eds), Principals of Clinical Cytogenetics; 3rd Edition, Springer, New York, 2013, Chapter 9, pp.139-174.

Van Mater D, Knelson E H, Kaiser-Rogers K A, Armtstrong MB. Neuroblastoma in a Pediatric Patient with a Microduplication of 2p involving the *MYCN* locus. Am J Med Genet. Accepted Nov, 2012.

Rosenfeld JA, Traylor RN, Schaefer GB, McPherson EW, Ballif BC, Klopocki E, Mundlos S, Shaffer LG, Aylsworth AS; 1q21.1 Study Group/Collaborators (68):Abuelo D, Anderson I, Angle B, Ardinger H, Asamoah A, Atkin JF, Axelrod J, Bader P, Blout C, Brasington C, Briere LC, Brock PL, Burton B, Chitayat D, Cushman LJ, Earl DL, El-Khechen D, Escobar LF, Hamati A, Harris DJ, Herman G, Hoover J, Jackson KE, Kaiser-Rogers KA, Kaplan LC, Klemsz A, Lacassie Y, Ladda R, Lamb AN, Lund MM, Lyon H, MacDonald GP, Madan-Khetarpal S, Marble M, Mark PR, Martin LS, Martin N, McConnell JS, McCracken E, McDonald M, McGuire M, Mendoza-Londono R, Miller AN, Moeschler J, Noyes AG, Platky K, Powell CM, Putnam A, Roberts V, Sanger WG, Schultz RA, Sell S, Senturias Y, Shashi V, Shur N, Siriwardena K, Sommer A, Spence JE, Stavropoulos J, Stevens CA, Strenk ME, Tarnopolsky M, Thomas E, Thomas MJ, Torchia BS, Venter A, Weaver DD, Wilson WG. Proximal microdeletions and microduplications of 1q21.1 contribute to variable abnormal phenotypes. Eur J Hum Genet. 2012 Jul;20(7):754-61.

MASAO KAKOKI, M.D., Ph.D.

Kakoki M, Pochynyuk OM, Hathaway CM, Tomita H, Hagaman JR, Kim HS, Zaika OL, Mamenko M, Kayashima Y, Matsuki K, Hiller S, Li F, Xu L, Grant R, Bertorello AM, Smithies O. Proc Natl Acad Sci U S A. 2013 Apr 2;110(14):5600-5.

Vashistha H, Singhal PC, Malhotra A, Husain M, Mathieson P, Saleem MA, Kuriakose C, Seshan S, Wilk A, Delvalle L, Peruzzi F, Giorgio M, Pelicci PG, Smithies O, Kim HS, Kakoki M, Reiss K, Meggs LG. Am J Physiol Renal Physiol. 2012 Dec 15;303(12):F1629-40.

DAVID G. KAUFMAN, M.D., Ph.D.

Kaufman, D.G. Estrogens and Progestrons. Monograph 100A. International Cancer Research, 2013

Schlemmer SR and Kaufman DG: Re-establishment of Gap-Junction Intercellular Communication in Human Endometrial Carcinoma Cells by Prostaglandin E2. Experimental and Molecular Pathology 93:441-446 2012, epublished, in press. http://dx.doi.org/10.1016/j.yexmp.2012.10.009

Kaufman DG, Ridpath J, Chastain PD. Oxidative DNA Clusters as Potential Precursors to Cancer, Aging, And Age-Related Diseases. Introduction to Sequence and Genome Analysis II. iConcept Press, 2012, in press, ISBN: 978-14775549-1-3.

WILLIAM K. KAUFMANN, Ph.D.

Lakhter AJ, Sahu RP, Sun Y, Kaufmann WK, Androphy EJ, Travers JB, Naidu SR. (2013) Chloroquine Promotes Apoptosis in Melanoma Cells by Inhibiting BH3 domain Mediated PUMA Degradation. J Invest Dermatol. 2013 Jan 31. [Epub ahead of print] PMID:23370537

Omolo B, Carson C, Chu H, Zhou Y, Simpson DA, Hesse JE, Paules RS, Nyhan KC, Ibrahim JG, and Kaufmann WK. (2013) A prognostic signature of G2 checkpoint function in melanoma cell lines. Cell Cycle 12:1-12. PMID:23454897

Kesseler KJ, Blinov ML, Elston TC, Kaufmann WK and Simpson DA. (2013) A predictive mathematical model of the DNA damage G2 checkpoint. J Theor Biol. 320:159-69. PMID:23266715

Smith-Roe SL, Patel SS, Zhou Y, Simpson DA, Rao S, Ibrahim JG, Cordeiro-Stone M and Kaufmann WK. (2013). Separation of intra-S checkpoint protein contributions to DNA replication fork protection and genomic stability in normal human fibroblasts. Cell Cycle. 12(2):332-45. PMID:23255133

Yang Y, Durando M, Smith-Roe S, Sproul C, Greenwalt A, Kaufmann WK. Oh S, Hendrickson E, and Vaziri C. (2013) Cell Cycle Stage-Specific Roles of Rad18 in Tolerance and Repair of Oxidative DNA Damage. Nucleic Acids Res. 41(4):2296-2312. PMID: 23295675

Prasad RY, Chastain PD, Nikolaishvili-Feinberg N, Smeester LM, Kaufmann WK, Fry RC.(2012) Titanium dioxide nanoparticles activate the ATM-Chk2 DNA damage response in human dermal fibroblasts. Nanotoxicology. 2012 Jul 9. [Epub ahead of print] PMID:22770119

Kaufmann, WK and Anderson, CW. (2013) Compensation, crosstalk and sequestering: The currency of checkpoints in cancer. Cell Cycle, in press.

Kaufmann, WK. (2012) Mutational showers during carcinogenesis. Pigment Cell and Melanoma Research. Sep;25(5):566-8

MEHMET KESIMER, Ph.D.

Cao, R; Wang, T; DeMaria, G; Sheehan, JK; and Kesimer, M. Mapping the Protein Domain Structures of the Respiratory Mucins: a proteome coverage study. Journal of Proteome Research, 2012 Aug 3; 11(8): 4013-23.

Gercel-Taylor, C.; Atay, S.; Tullis, R. H.; Kesimer, M.; Taylor, D. D. Nanoparticle analysis of circulating cell-derived vesicles in ovarian cancer patients. Analytical biochemistry 2012 Sept 1; 428(1): 44-53.

Xiumei Guo, Mehmet Kesimer, Gokhan Tolun, Xunhai Zheng, Kristin Dittenhafer-Reed, John M. Denu, John K. Sheehan, Jack D. Griffith, and Xiaoling Li. The NAD^+-dependent protein deacetylase activity of SIRT1 is regulated by its oligomeric status. Scientific Reports 2012; 2:640.

Brian Button, Liheng Cai, Camille Ehre, Mehmet Kesimer David B. Hill, John K. Sheehan, Richard C. Boucher and Michael Rubinstein :" A Periciliary Brush Promotes the Lung Health by Separating the Mucus Layer from Airway Epithelia". 2012 Science 337(6097) 937-941. (featured as cover article and press release)

Mehmet Kesimer, Camille Ehre, Kimberly Burns, C William Davis, john K. Sheehan and Raymond J. Pickles. Molecular Organization of the Mucins and Glycocalyx Underlying Mucus Transport over Human Airway Epithelium. Mucosal Immunology, 2013 Mar 6 (2); 379-92. (featured as cover article)

HYUNG-SUK KIM, Ph.D.

Yi X, Xu L, Hiller S, Kim HS, Maeda N. Reduced alpha-lipoic acid synthase gene expression exacerbates atherosclerosis in diabetic apolipoprotein E-deficient mice. Atherosclerosis, 2012, 223 (1): 137-143

Luther JM, Luo P, Kreger MT, Brissova M, Dai C, Whitfield TT, Kim HS, Wasserman DH, Powers Ac, Brown NJ. Aldosterone deficiency and mineralocorticoid antagonism prevent angiotensin II-induced cardiac, renal, and vascular injury. Kidney Int. 2012, 82(6): 643-651

Mbewe-Campbell N, Wei Z, Zhang K, Friese RS, Mahata M, Schork AJ, Rao F, Chiron S, Biswas N, Kim HS, Mahata SK, Waalen J, Nievergelt CM, Hook VY, O'Connor DT. Genes and environment: novel, functional polymorphism in the human cathepsin L (CTSL1) promoter disrupts a xenobiotic response element (XRE) to alter transcription and blood pressure. J Jypertens. 2012, 30(10): 1961-1969

Vashistha H, Singhal PC, Malhotra A, Husain M, Mathieson P, Saleem MA, Kuriakose C, Seshan S, Wilk A, Delvalle L, Peruzzi F, Giorgio M, Pelicci PG, Smithies O, Kim HS, Kakoki M, Reiss K, Meggs LG. Null mutations at the p66 and bradykinin 2 receptor loci induce divergent phenotypes in the diabetic kidney. Am J Physiol Renal Physiol. 2012, 303(12): F1629-1640

Wei Z, Zhang K, Wen G, Balasubramanian K, Shih PA, Rao F, Friese RS, Miramontes-Gonzalez JP, Schmid-Schoenbein GW, Kim HS, Mahata SK, O'Connor DT. Heredity and cardiometabolic risk: naturally occurring polymorphisms in the human neuropeptide Y(2) receptor promoter disrupt multiple transcriptional response motifs. J Hypertens. 2013, 31(1): 123-133

Johnson LA, Kim HS, Knudson MJ, Nipp CT, Yi X, Maeda N. Diabetic atherosclerosis in APOE*4 mice: synergy between lipoprotein metabolism and vascular inflammation. J Lipid Res. 2013, 54(2): 386-396

Kakoki M, Pochynyuk OM, Hathaway CM, Tomita H. Hagaman JR, Kim HS, Zaika OL, Mamenko M, Kayashima Y, Matsuki K, Hiller S, Li F, Xu L, Grant R, Bertorello AM, Smithies O. Primary aldosteronism and impaired natriuresis in mice underexpressing TGFβ1. Proc Natl Acad Sci USA. 2013, 110(14): 5600-5605

Luo P, Dematteo A, Wang Z, Zhu L, Wang A, Kim HS, Pozzi A, Stafford JM, Luther JM. Aldosterone deficiency prevents high-fat-feeding-induced hyperglycaemia and adipocyte dysfunction in mice. Diabetologia. 2013, 56(4): 901-910

Friese RS, Altshuler AE, Zhang K, Miramontes-Gonzalez JP, Hightower CM, Jirout ML, Salem RM, Gayen JR, Mahapatra NR, Biswas N, Cale M, Vaingankar SM, Kim HS, Courel M, Taupenot L, Ziegler MG, Schork NJ, Pravenec M, Mahata SK, Schmid-Schonbein GW, O'Connor DT. MicroRNA-22 and promoter motif polymorphisms at the Chga locus in genetic hypertension: functional and therapeutic implications for gene expression and the pathogenesis of hypertension. Hum Mol Genet. 2013 May 21.

NICHOLE L. KORPI-STEINER, Ph.D.

Malkani S, Korpi-Steiner NL, Rao LV. Reducing analytical variation between point-of-care and laboratory HbA1c testing within a healthcare system. J Diabetes 2013; 5(2):192-196.

Korpi-Steiner NL. Will lead screening by POC be effective given the newly recommended < 5 mcg/dL reference value? NACBlog 2013 (http://www.aacc.org/members/nacb/NACBBlog/Lists/Posts/Post.aspx?ID=109#).

RUTH A. LININGER, M.D.

Duncan DL, Rambally BS, Lininger RA, DiFurio MJ. Displaced granulosa cells in the fallopian tube mistaken for metastatic granulosa cell tumor. Gynecol Pathol. 2013 Jan;32(1):35-7.

JIANDONG LIU, Ph.D.

Samsa LA, Yang B, Liu J. Embryonic cardiac chamber maturation: Trabeculation, conduction, and cardiomyocyte proliferation. Am J Med Genet C Semin Med Genet. 2013 (in press)

ROMMEL LU, M.D.

Lu RP, Lin FC, Ortiz-Pujols S, et al. Blood utilization in patients with burn injury and association with clinical outcomes. Transfusion, in press, for December publication.

Mooberry M, Lu RP and Key NS: Management of Acute Hemorrhage in Victor J. Marder, William C. Aird, Joel S. Bennett, Sam Schulman, and Gilbert White II (eds), Hemostasis and Thrombosis: Basic Principles and Clinical Practice, 6th Edition, Lippincott Williams & Wilkins, November 19, 2012, Chapter 76.

CHRISTOPHER P. MACK, Ph.D.

Li M, Schwerbrock NMJ, Lenhart PM, Fritz-Six KL, Kadmiel M, Christine KS, Kraus DM, Espenschied TS, Willcockson HW, Mack CP, Caron KM. Fetal-derived adrenomedullin enables maternal vascular adaptation to pregnancy by controlling the innate immune milieu of the placenta. J Clin Invest. In press 2013.

O'Neil TJ, Mack CP, Taylor JM. Germline deletion of FAK-related non-kinase delays post-natal cardiomyocyte mitotic arrest. J Molecular Cellular Cardiology. 2012; 53(2):156-64.

Mack CP. Fibroblasts. In: Atherosclerosis (Wang and Patterson, editors) Wiley and Sons Inc. Hoboken, NJ, 2013

NOBUYO N. MAEDA, Ph.D.

Johnson LA, Kim HS, Knudson MJ, Nipp CT, Yi X, Maeda N. Diabetic atherosclerosis in APOE*4 mice: Synergy between lipoprotein metabolism and vascular inflammation. J Lipid Res. 2013 Feb;54(2):386-96. PMCID: PMC3389794

Tomita H, Wait JMS, Burk L, Lu J, Zhou O, Maeda N, Lee YL. Detection of aortic arch calcification in apolipoprotein E-null mice using carbon nanotube based micro-CT system. J Am Heart Assoc. 2013 Feb 22;2(1):e003358. PMCID: PMC3603263

Bürzle M, Suzuki Y, Ackermann D, Miyazaki H, Maeda N, Clémençon B, Burrier R, Hediger MA. The sodium-dependent ascorbic acid transporter family SLC23. Mol Aspects Med. 2013 Apr-Jun;34(2-3):436-54.

Wölkart G , Beretta M, Wenzl MV, Stessel H, Schmidt K, Maeda N, Mayer B, Schrammel A. Tolerance to Nitroglycerin Through Proteasomal Downregulation of Aldehyde Dehydrogenase-2 in a Genetic Mouse Model of Ascorbate Deficiency. Br J Pharmacol. 2013 Apr;168(8):1868-77. PMCID: PMC3623057

Muller-Borer B, Esch G, Aldina R, Woon W, Fox R, Bursac N, Hiller S, Maeda N, Shepherd N, Jin JP, Hutson M, Anderson P, Kirby ML, Malouf NN. Calcium Dependent CAMTA1 in Adult Stem Cell Commitment to a Myocardial Lineage PLoS One. 2012;7(6):e38454 . PMCID: PMC3371086

Pendse AA, Johnson LA, KimHS, McMair M. Nipp CT, Wilhelm C, Maeda N. Pro- and Antiatherogenic effects of a dominant-negative P465L mutation of peroxisome Proliferator-Activated Receptor-γ in apolipoprotin E-null mice. Arterioscler Thromb Vasc Biol. 2012 Jun;32(6):1436-44. PMCID: PMC3389794

STEPHANIE P. MATHEWS, M.D.

Montgomery ND, Mathews SP, Coward WB, Rao KW, Fedoriw Y. Clonal karyotypic abnormalities associated with reactive lymphoid hyperplasia. Cancer Genetics. 2013 April.

MELISSA B. MILLER, Ph.D.

Popowitch EB, O'Neill SS, Miller MB. Comparison of four multiplex assays for the detection of respiratory viruses: BioFire FilmArray RP, Genmark eSensor RVP, Luminex xTAG RVPv1 and Luminex xTAG RVP FAST. J Clin Microbiol, 2013, 51:1528-1533.

Champion EA, Miller MB, Popowitch EB, Hobbs MM, Saiman L, Muhlebach MS. Antimicrobial susceptibility and molecular typing of MRSA in cystic fibrosis. Ped Pulmonol, 2013; in press, pp. 1-50.

Culton DA, Lachiewicz AM, Miller BA, Miller MB, MacKuen C, Groben P, White B, Cox GM, Stout JE. Two cases of nontuberculous mycobacterial infection following fractionated carbon dioxide laser resurfacing. Emerg Infect Dis, 2013, 19:365-370.

Alby K, Popowitch EB, Miller MB. Comparative evaluation of the Nanosphere Verigene RV+ assay with the Simplexa Flu A/B & RSV Kit for the detection of influenza and respiratory syncytial viruses. J Clin Microbiol, 2012; in press.

Balakrishnan N, Jawanda JS, Miller MB, Breitschwerdt EB. Bartonella henselae infection in a man with hypergammaglobulinemia, splenomegaly and polyclonal plasmacytosis. J Med Microbiol, 2012 Nov 1 [Epub ahead of print, PMID: 23118473].

C. RYAN MILLER, M.D., Ph.D.

Vitucci M*, Karpinich NO*, Bash RE, Werneke AM, Schmid RS, White KK, McNeill RS, Huff B, Wang S, Van Dyke T, Miller CR. Cooperativity between MAPK and PI3K signaling activation is required for glioblastoma pathogenesis. Neuro-oncology. Accepted April 28, 2013. DOI 10.1093-neuonc-not084.

Schlegel J, Sambade MJ, Sather S, Moschos SJ, Tan AC, Winges A, DeRyckere D, Carson CC, Trembath DG, Tentler JJ, Eckhardt SG, Kuan PF, Hamilton RL, Duncan LM, Miller CR,

Nikolaishvili-Feinberg N, Midkiff BR, Liu J, Zhang W, Yang C, Wang X, Frye SV, Earp HS, Shields JM, Graham DK. MERTK receptor tyrosine kinase is a therapeutic target in melanoma. Journal of Clinical Investigation. Apr 2013. DOI: 10.1172/JCI67816. PMID: 23585477

Hanna SC, Krishnan B, Bailey ST, Moschos SJ, Kuan PF, Shimamura T, Osborne LD, Siegel MB, Duncan LM, O'Brien ET, Superfine R, Miller CR, Simon MC, Wong KK , Kim WY. HIF1α and HIF2α independently activate SRC to promote melanoma metastases. Journal of Clinical Investigation. Apr 2013. DOI: 10.1172/JCI66715. PMID: 23563312

Raghunathan A, Wani K, Armstrong TS, Ver-Bolanos E, Fouladi M, Gilbertson R, Gajjar A, Goldman S, Lehman NL, Metellus P, Mikkelsen T, Necesito-Reyes MJ, Omuro A, Packer RJ, Partap S, Pollack IF, Prados MD, Robins HI, Soffietti R, Wu J, Miller CR, Gilbert MR, Aldape KD, Collaborative Ependymoma Research Network. Histological predictors of outcome in ependymoma are dependent on anatomic site within the central nervous system. Brain Pathology. Mar 2013. DOI: 10.1111/bpa.12050. PMID: 23452038

Di L, Byun JS, Wong MM, Wakano C, Taylor T, Bilke S, Baek S, Hunter K, Yang H, Lee M, Zvosec C, Khramtsova G, Cheng F, Perou CM, Miller CR, Raab R, Olopade OI, Gardner K. Genome-wide profiles of CtBP link metabolism with genome stability and epithelial reprogramming in breast cancer. Nature Communications. 4:1449. Mar 2013. PMID: 23385593

Gershon TR, Crowther AJ, Garcia IC, Annis R, Tikunov A, Macdonald J, Miller CR, Olson J, Deshmukh M. Hexokinase-2 mediated aerobic glycolysis is integral to cerebellar neurogenesis and required for pathogenesis of medulloblastoma. Cancer and Metabolism. 1:2. Jan 2013. DOI:10.1186/2049-3002-1-2. PMID: 22710714

Dellon ES, Chen X, Miller CR, Woosley JT, Shaheen NJ. Diagnostic utility of major basic protein, eotaxin-3, and leukotriene enzyme staining in eosinophilic esophagitis. American Journal of Gastroenterology. DOI: 10.1038/ajg.2012.202. Jul 2012. PMID: 22777338.

Garcia I, Crowther AJ, Gama V, Miller CR, Deshmukh M, Gershon TR. Bax-deficiency prolongs cerebellar neurogenesis, accelerates medulloblastoma formation and paradoxically increases both malignancy and differentiation. Oncogene. DOI: 10.1038/onc.2012.248. 2012 Jun. PMID: 22710714.

Liu W, Monahan KB, Pfefferle AD, Shimamura T, Sorrentino J, Chan KT, Roadcap DW, Ollila DW, Thomas NE, Castrillon DH, Miller CR, Perou CM, Wong KK, Bear JE, Sharpless NE. LKB1/STK11 inactivation leads to expansion of a pro-metastatic tumor sub-population in melanoma. Cancer Cell. 21(2):751-764 Jun 2012. PMID: 22698401.

Wilkerson MD, Yin X, Walter V, Zhao N, Cabanski CR, Hayward MC, Miller CR, Socinski MA, Parsons AM, Thorne LB, Haithcock BE, Veeramachaneni NK, Funkhouser WK, Randell SH, Bernard PS, Perou CM, Hayes DN. Differential pathogenesis of lung adenocarcinoma subtypes involving sequence mutations, copy number, chromosomal instability, and methylation. PloS ONE. 7(5):e36530 May 2012. PMID: 22590557

Grilley-Olson JE, Hayes DN, Moore DT, Leslie KO, Wilkerson MD, Qaqish BF, Hayward M, Cabanski C, Yin X, Socinski MA, Stinchcombe TE, Thorne LB, Allen TC, Banks PM, Beasley MB, Borczuk AC, Cagle PT, Christensen R, Colby TV, Deblois GG, Elmberger G, Graziano P, Hart CF, Jones KD, Maia DM, Miller CR, Nance KV, Travis WD, Funkhouser WK. Validation of interobserver agreement in lung cancer assessment hematoxylin and eosin diagnostic reproducibility for non-small cell lung cancer - The 2004 World Health Organization classification and therapeutically relevant subsets. Archives of Pathology & Laboratory Medicine. DOI: 10.5858/arpa.2012-0033-OA. May 2012. PMID: 22583114

VINCENT J. MOYLAN, JR., MS, PA (ASCP)

Tamburro KM, Yang D, Poisson J, Fedoriw Y, Roy D, Lucas A, Sin SH, Malouf N, Moylan V, Damania B, Moll S, van der Horst C, Dittmer DP. Vironome of Kaposi sarcoma associated Herpesvirus 8 and human herpesvirus 6A. Virology, 433(1):220-5, 2012.

VOLKER R. NICKELEIT, M.D.

Jennings SH, Wise AG, Nickeleit V, Maes RK, Cianciolo RE, Del Piero F, Law JM, KimY, McCalla AC, Breuhaus BA, Roberts MC, Linder KE. Polyomavirus associated nephritis in 2 horses. Vet Pathol (in press)

Sharma SG, Nickeleit V, Herlitz LC, de Gonzalez AK, Stokes MB, Singh HK, Markowitz GS, D'Agati VD. BK polyoma virus nephropathy in the native kidney. Nephrol Dial Transplant (in press)

Liapis G, Singh HK, Derebail VK, Gasim AMH, Kozlowski T, Nickeleit V. Diagnostic Significance of Peritubular Capillary Basement Membrane Multilaminations in Kidney Allografts: Old Concepts Revisited. Transplantation 94 (6):620-629, 2012

Kozlowski T, Andreoni K, Schmitz J, Hayashi PH, Nickeleit V. Sinusoidal C4d deposits in liver allografts indicate an antibody mediated response: Diagnostic considerations in the evaluation of liver allografts. Liver Transpl 18(6):641-658, 2012

Nickeleit V, True K, Detwiler R, Kozlowski T, Singh HK. Risk assessment for Polyomavirus Nephropathy using urine cytology and the detection of decoy-cells: cheap and efficient. Transplantation 94(7):e42-e44, 2012

Gilbert MR, Wagner NJ, Jones SZ, Wisz AB, Roques JR, Krum KN, Lee SR, Nickeleit V, Hulbert C, Thomas JT, Gauld SB, Vilen BJ. Autoreactive pre-plasma cells break tolerance in the absence of regulation by dendritic cells and macrophages. J Immunol 189(2):711-720, 2012

Salvatore SP, Barisoni LMC, Herzenberg AM, Chander PN, Nickeleit V, Seshan SV. Collapsing Glomerulopathy in 19 Patients with Systemic Lupus Erythematosus or Lupus-Like Disease. Clin J Am Soc Nephrol 7(6):914-925, 2012

YARA R. PARK, M.D.

Poisson JL, Low A, Park YA. The treatment of Nephrogenic Systemic Fibrosis with therapeutic plasma exchange. J Clin Apheresis 2013 doi: 10.1002/jca.21253.

Alexander T, Iglesia E, Park YA**,** Duncan D, Peden D, Sheikh S, Ferris M. DRESS and PLEX: Quo Vadis? Severe DRESS syndrome managed with therapeutic plasma exchange. *Pediatrics* 2013;131(3): e945-e949.

LI QIAN, Ph.D.

Qian L. and Srivastava D. Direct Cardiac Reprogramming: From Developmental Biology to Cardiac Regeneration. Circ. Res. 2013 (in press)

Qian L., Berry E.C., Fu J.D., Ieda M., and Srivastava D. Reprogramming of mouse fibroblasts into cardiomyocyte-like cells in vitro. Nat Protoc. 2013, 8, 1204-15 (highlighted as the "Featured Protocol")

Guo C., Patel K. and Qian L. Direct somatic cell reprogramming: treatment of cardiac diseases. Curr Gene Ther. 2013, 13, 133-138.

Srivastava D, Ieda M, Fu J, Qian L. Cardiac repair with thymosin β4 and cardiac reprogramming factors. Ann N Y Acad Sci. 2012, 1270,66-72.

KATHLEEN H. RAO, Ph.D.

Montgomery ND, Mathews SP, Coward WB 4th, Rao KW, Fedoriw Y.Clonal kaaaryotypic abnormalities associated with reactive lymphoid hyperplasia. Cancer Genet. 2013 Apr 24. Doi:pii: S2210-7762(13)00040-9. 10. 1016/j.cancergen.2013.3.003. [Epub ahead of print]

Kaiser-Rogers, K. and Rao, K.W.:Structural Chromosome Rearrangements. In: The Principals of Clinical Cytogenetics. 3rd ed, Springer, New York, 139-174, 2013.

JAY S. RAVAL, M.D.

Peitzman, Jay S. Raval. "Use of a Massive Transfusion Protocol in Nontrauma Patients: Activate Away." Journal of the American College of Surgeons. doi:pii: S1072-7515(13)00150-6. 10.1016/j.jamcollsurg.2013.02.008. *Co-first authors.

Jay S. Raval, Robert L. Redner, Joseph E. Kiss. "Plateletpheresis for post-splenectomy rebound thrombocytosis in a patient with chronic immune thrombocytopenic purpura on romiplostim." Journal of Clinical Apheresis. doi:10.1002/jca.21254

Matthew D. Neal*, Jay S. Raval*, Darrell J. Triulzi, Richard L. Simmons. "Innate Immune Activation after Transfusion of Stored Red Blood Cells." Transfusion Medicine Reviews. 2013;27(2):113-8. *Co-first authors.

Jay S. Raval*, Jorge Fontes*, Uddyalok Banerjee*, Mark H. Yazer, Eric Mank, Andre F. Palmer. Ascorbic acid improves membrane fragility and decreases hemolysis during red blood cell storage." Transfusion Medicine. 2013;23(2):87-93. *Co-first authors.

Jay S. Raval, Jonathan H. Waters, Darrell J. Triulzi, Mark H. Yazer. "Complications following an unnecessary peri-operative plasma transfusion and literature review." The Korean Journal of Hematology. 2012;47:298-301

.

Jay S. Raval, Joel B. Nelson, Elen Woldemichael, Darrell J. Triulzi. "Intraoperative cell salvage in radical prostatectomy does not appear to increase long term biochemical recurrence, metastases, or mortality." Transfusion. 2012;52(12):2590-3.

Jay S. Raval, Mark H. Yazer. "TRALI and Other Nonallergic Reactions to Platelet Transfusion" (2013). In Joe Sweeney and Miguel Lozano (Eds.). Platelet Transfusion Therapy. AABB Press: Bethesda, MD, USA. Chapter 17.

Raval JS, Koch E, Donnenberg AD. Real time monitoring of nonviable airborne particles correlates with airborne colonies and represents an acceptable surrogate for daily assessment of cell processing cleanroom performance. Cytotherapy. 2012 Oct; 14(9): 1144-50.

Raval JS, Wearden PD, Orr RA, Kiss JE. Plasma exchange in a 13 year-old male with acute intravascular hemolysis and acute kidney injury after placement of a ventricular assist device. Journal of Clinical Apheresis. 2012 Nov; 27(5): 274-7.

Rollins-Raval MA, Raval JS, Contis LC. Experience with CellaVision DM96 for peripheral blood differentials in a large multi-center academic hospital system. Journal of Pathology Informatics. 2012 Aug; 3: 29.

Lang RS, Gorantla VS, Esper SA, Montoya M, Losee J, Hilmi IA, Sakai T, Lee WPA, Raval JS, Kiss JE, Shores JT, Brandacher G, Planinsic RM. Anesthetic Management in Upper Extremity Transplantation – The Pittsburgh Experience. Anesthesia and Analgesia. 2012 Sep; 115(3): 678-88.

HOWARD M. REISNER, Ph.D.

Reisner HM (Editor) Pathology, A Modern Case Study. 1st edition. McGraw-Hill Company Inc. In preparation for target publication Fall 2013. This book incorporates chapters written by experts in Pathology from the UNC system.

Rubin E, and Reisner HM. (Editors) Essentials of Pathology, 6th Edition. Lippincott, Williams & Wilkins, (publication Spring 2013) This is the second time I have prepared a new version of the Essentials working with Dr Rubin.

JOHN L. SCHMITZ, Ph.D

Gandhi RT, Bosch RJ, Aga E, Bedison MA, Bastow B, Schmitz JL, Siliciano JD, Siliciano RF, Eron JJ, Mellors JW; the ACTG A5173 team. Residual plasma viremia and infectious HIV-1 recovery from resting memory CD4 cells in patients on antiretroviral therapy: results from ACTG A5173. Antivir Ther. 2013 [Epub ahead of print] PubMed PMID: 23411421.

Lobo LJ, Aris RM, Schmitz J, Neuringer IP. Donor-specific antibodies are associated with antibody-mediated rejection, acute cellular rejection, bronchiolitis obliterans syndrome, and cystic fibrosis after lung transplantation. J Heart Lung Transplant. 2013. 32:70-7.

Kozlowski T, Andreoni K, Schmitz J, Hideo Hayashi P, Nickeleit V. Sinusoidal C4d deposits in liver allografts indicate an antibody-mediated response: Diagnostic considerations in the evaluation of liver allografts. Liver Transpl. 2012;18:641-58.

DENNIS A. SIMPSON, Ph.D.

Omolo, B., Carson, C., Chu, H., Zhou, Y., Simpson, D.A., Hesse, J.E., Paules, R.S., Nyhan, K.C., Ibrahim, J.G., Kaufmann,A Prognostic of G(2) Checkpoint Function in Melanoma Cell Lines. (2013) Cell Cycle 12(7):1071-82.

Smith-Roe, S. L., Patel, S. S., Zhou, Y. C., Simpson, D. A., Rao, S., Ibrahim, J. G., Cordeiro-Stone, M., Kaufman, W. K. . Separation of intra-S checkpoint protein contributions to DNA replication fork protection and genome stability in normal human fibroblasts. (2013) Cell Cycle 12(7):332-45.

Kesseler, K.J., Blinov, M.L., Elston, T.C., Kaufmann, W.K., Simpson, D.A. A predictive mathematical model of the DNA damage G2 checkpoint. (2013) Journal of Theoretical Biology. 320:159-69.

HARSHARAN K. SINGH, M.D.

Volker Nickeleit, Karin True, Randal Detwiler, Tomasz Kozlowski, and Harsharan K. Singh. Risk Assessment for Polyomavirus Nephropathy using Urine Cytology and the Detection of Decoy-Cells: Cheap and Efficient. Transplantation. 2012 Oct 15;94(7):e42-4; author reply e45.

Sharma S, Nickeleit V, Herlitz L, Gonzalez A, Stokes MB, Singh HK, Markowitz G, D'Agati V. BK Polyomavirus Nephropathy in the native kidney. Nephrol. Dial. Transplant. 2013, 28(3): 620-631.

Nickeleit V, Singh HK. Vascular Pathology in Anatomic Pathology Board Review edited by Lefkowitch JH, 2nd ed. Saunders Elsevier, 2012; in press (55 pages).

SCOTT V. SMITH, M.D.

Coulter DW, Walko C, Patel J, Moats-Staats BM, McFadden A, Smith SV, Khan WA, Bridges AS, Deal AM, Oesterheld J, Davis IJ, Blatt J: Valproic acid reduces the tolerability of temsirolimus in children and adolescents with solid tumors. Anticancer Drugs. 24 (4): 415-421, 2013.

OLIVER SMITHIES, D.Phil.

Primary aldosteronism and impaired natriuresis in mice underexpressing TGFβ1. Kakoki M,Hathaway CM, Tomita H, Pochynyuk OM, Kim H-S, Zaika OL, Mamenko M, Bertorello AM, Smithies O. Proc. Natl. Acad. Sci. U.S.A. 2013; 110(14):5600-5, PMID: 23503843

Null Mutations at the p66 and Bradykinin 2 Receptor Loci Induce Divergent Phenotypes in the Diabetic Kidney. Vashistha H, Singhal PC, Malhotra A, Husain M, Mathieson PW, Saleem MA, Kuriakose C, Seshan S, Wilk A, Delvalle L, Peruzzi F, Giorgio M, Pelicci PG, Smithies O, Kim HS, Kakoki M, Reiss K, Meggs LG.Am J Physiol Renal Physiol. 2012 Dec 15; 303(12):F1629-40 PMID:23019230

Distribution of histone3 lysine 4 trimethylation at T3-responsive loci in the heart during reversible changes in gene expression. Pandya K, Kohro T, Mimura I, Kobayashi M, Wada Y, Kodama T, Smithies O.Gene Expr. 2012;15(4):183-98.PMID: PMC3607203

JOAN M. TAYLOR, Ph.D.

Charpentier MS, Christine KS, Amin NM, Dorr KM, Kushner EJ, Bautch VL, Taylor JM, and Conlon FL CASZ1 Promotes Vascular Assembly and Morphogenesis Through the Direct Regulation of a EGFL7/RhoA-mediated pathway. Developmental Cell 2013 Apr 29;25(2):132-43. PMID:23639441

Tandon P, Conlon FL, Taylor JM. ROCKs cause SHP-wrecks and broken hearts. Small GTPases. 2012 Oct-Dec;3(4):209-12. PMID:22858643

O'Neill TJ, Mack CP, Taylor JM. Germline deletion of FAK-related non-kinase delays post-natal cardiomyocyte mitotic arrest. J. Mol Cell Cardiology. 2012 53(2):156-64. Epub 2012 Aug 25 PMID:22555221

LEIGH B. THORNE, M.D.

Cancer Genome Atlas Network (was listed as one of the contributing tissue sites). Comprehensive molecular portraits of human breast tumours. .Nature. 2012 Oct 4;490(7418):61-70. doi: 10.1038/nature11412. Epub 2012 Sep 23.PMID:23000897.

Cancer Genome Atlas Research Network, Hammerman PS, Hayes DN, Wilkerson MD, Schultz N, Bose R, Chu A, Collisson EA, Cope L, Creighton CJ, Getz G, Herman JG, Johnson BE, Kucherlapati R, Ladanyi M, Maher CA, Robertson G, Sander C, Shen R, Sinha R, Sivachenko A, Thomas RK, Travis WD, Tsao MS, Weinstein JN, Wigle DA, Baylin SB, Govindan R, Meyerson M. (was listed in a larger list of collaborators) Comprehensive genomic characterization of squamous cell lung cancers. Nature. 2012 Sep 27;489(7417):519-25. doi: 10.1038/nature11404. Epub 2012 Sep 9.PMID:22960745.

Grilley-Olson JE, Hayes DN, Moore DT, Leslie KO, Wilkerson MD, Qaqish BF, Hayward MC, Cabanski CR, Yin X, Socinski MA, Stinchcombe TE, Thorne LB, Allen TC, Banks PM, Beasley MB, Borczuk AC, Cagle PT, Christensen R, Colby TV, Deblois GG, Elmberger G, Graziano P, Hart CF, Jones KD, Maia DM, Miller CR, Nance KV, Travis WD, Funkhouser WK. Validation of Interobserver Agreement in Lung Cancer Assessment Hematoxylin-Eosin Diagnostic Reproducibility for Non-Small Cell Lung Cancer-The 2004 World Health Organization Classification and Therapeutically Relevant Subsets. Arch Pathol Lab Med. 2012 May 14. [Epub ahead of print] PMID: 22583114.

Cancer Genome Atlas Network, Kandoth C, Schultz N, Cherniack AD, Akbani R, Liu Y, Shen H, Robertson AG, Pashtan I, Shen R, Benz CC, Yau C, Laird PW, Ding L, Zhang W, Mills GB, Kucherlapati R, Mardis ER, Levine DA.Nature (listed as one of contributors). Integrated genomic characterization of endometrial carcinoma. 2013 May 2; 497(7447):67-73. doi:10.1038/nature12113. PMID:23636398.

Walter V, Yin X, Wilkerson MD, Cabanski CR, Zhao N, Du Y, Ang MK, Hayward MC, Salazar AH, Hoadley KA, Fritchie K, Sailey CG, Weissler MC, Shockley WW, Zanation AM, Hackman T, Thorne LB, Funkhouser WD, Muldrew KL, Olshan AF, Randell SH, Wright FA, Shores CG, Hayes DN. Molecular subtypes in head and neck cancer exhibit distinct patterns of chromosomal gain and loss of canonical cancer genes. PLoS One. 2013;8(2):e56823. doi:10.1371/journal.pone.0056823. Epub 2013 Feb 22. PMID:23451093.

Koves TR, Sparks LM, Kovalik JP, Mosedale M, Arumugam R, Debalsi KL, Everingham K, Thorne L, Phielix E, Meex RC, Kien CL, Hesselink MK, Schrauwen P, Muoio DM. PPARγ coactivator-1α contributes to exercise-induced regulation of intramuscular lipid droplet programming in mice and humans. J Lipid Res. 2013 Feb;54(2):522-34. doi:10.1194/jlr.P028910. Epub 2012 Nov 21. PMID: 23175776.

RICHARD R. TIDWELL, Ph.D.

Patrick DA, Bakunov SA, Bakunova SM, Jones SK, Wenzler T, Barszcz T, Kumar A, Boykin DW, Werbovetz KA, Brun R, Tidwell RR. Synthesis and antiprotozoal activities of benzyl phenyl ether diamidine derivatives. Accepted for publication, June 2013. Eur J of Med Chem.

Patrick DA, Ismail MA, Arafa RK, Wenzler T, Zhu X, Pandharkar T, Jones SK, Werbovetz KA, Brun R, Boykin DW, Tidwell RR. Synthesis and Antiprotozoal Activity of Dicationic m-Terphenyl and 1,3-Dipyridylbenzene Derivatives. Accepted for publication, June 2013. J. of Med Chem.

Varkevisser R, Houtman MJC, Linder T, deGit CG, Beekman HDM, Tidwell R, Ijzerman L, Stary-Weinzinger A, Vos MA. Structure-activity relationships of pentamidine-affected ion channel trafficking and dofetilide mediated rescue. Accepted for publication, April 2013. British Journal of Pharmacology. doi: 10.1111/bph.12208

Stary-Weinzinger A, Tidwell RR, van der Heyden M AG. Efficient and specific cardiac IK1 inhibition by a new pentamidine analogue. Accepted for publication, April 2013. Caridovascular Research.

Thuita JK, Wolf KK, Murilla GA, Liu Q, Nutuku JN, Chen Y, Bridges AS, Mdachi RE, Ismail MA, Ching S, Boykin DW, Hall JE, Tidwell RR, Paine MF, Brun R, Wang MZ. Safety, pharmacokinetic, and efficacy studies of oral DB868 in a first stage Vervet monkey model of Human African Trypanosomiasis. 2013. PLOS Negl Trop Dis. 7(6):32230.

Ju W, Ansede JH, Stephens CE, Bridges AS, Voyksner RD, Ismail MA, Boykin DW, Tidwell RR, Hall JE, Wang MZ. CYP1A1 and CYP1B1-medicated biotransformationof the antitrypanosomal methamidoxime prodrug DB844 forms novel metabolites through intramolecular rearrangement. Accepted for publication. March 2013. J Pharm Sci. PMC Journal.

Generaux GN, Ainslie GR, Bridges AS, Ismail MA, Boykin DW, Tidwell RR, Thakker DR, Paine MF. Compartmental and enzyme kinetic modeling to elucidate the biotransformation pathway of a centrally acting antitrypanosomal prodrug. 2013. Drug Metab Disppos. 41(2):518-528.

Thuita JKJ, Wang MZ, Kagira JM, Denton CL, Paine MF,m Mdachi RE, Murilla GA, Ching S, Boykin DW, Tidwell RR, Hall JE, Brun R. Pharmacology of DB844, an orally active aza analogue of pafuramidine, in a monkey model of second stage human African trypanosomiasis. 2012. PLOS Negl Trop Dis. 6(7):31734.

Harrill, AH, Desmet KD, Wolf KK, Bridges AP, Eaddy JS, Kurtz CL, Hall JE, Paine MF, Tidwell RR, Watkins PB. A mouse diversity panel lapproach reveals the potential for clinical kidney injury due to DB289 not predicted by classical rodent models. 2012. Toxicol Sci. Dec;130(2):416-26

MICHAEL D. TOPAL, Ph.D.

Cancer Genome Atlas Research Network, Kandoth C, Schultz N, Cherniack AD, Akbani R, Liu Y, Shen H, Robertson AG, Pashtan I, Shen R, Benz CC, Yau C, Laird PW, Ding L, Zhang W, Mills GB, Kucherlapati R, Mardis ER, Levine DA. Integrated genomic characterization of endometrial carcinoma. Nature. 2013 May 2;497(7447):67-73. PMID: 23636398.

Cancer Genome Atlas Network. Comprehensive molecular portraits of human breast tumours. Nature. 2012 Oct 4;490(7418):61-70. PMID: 23000897

Cancer Genome Atlas Research Network. Comprehensive genomic characterization of squamous cell lung cancers. Nature. 2012 Sep 27;489(7417):519-25. doi: 10.1038/nature11404. 8;491(7423):288. Rogers, Kristen [corrected to Rodgers, Kristen]. PubMed PMID: 22960745.

Cancer Genome Atlas Network. Comprehensive molecular characterization of human colon and rectal cancer. Nature. 2012 Jul 18;487(7407):330-7. PMID: 22810696.

CYRUS VAZIRI, Ph.D.

Durando M, Tateishi S, Vaziri C. (2013) A non-catalytic role of DNA polymerase η in recruiting Rad18 and promoting PCNA monoubiquitination at stalled replication forks. Nucleic Acids Res. 41(5):3079-93.

Yang Y, Durando M, Smith-Roe SL, Sproul C, Greenwalt AM, Kaufmann W, Oh S, Hendrickson EA, Vaziri C. (2013) Cell cycle stage-specific roles of Rad18 in tolerance and repair of oxidative DNA damage. Nucleic Acids Res. 41(4):2296-312.

KAREN E. WECK, M.D.

Scheuner MT, Hilborne L, Brown J, Lubin IM; members of the RAND Molecular Genetic Test Report Advisory Board. A report template for molecular genetic tests designed to improve communication between the clinician and laboratory. Genet Test Mol Biomarkers. 2012 Jul;16(7):761-9.

Mackinnon AC, Wang YL, Sahota A, Yeung CC, Weck KE. Certification in Molecular Pathology in the United States: An Update from the Association for Molecular Pathology Training and Education Committee. J Mol Diagn 14(6):541-549, 2012.

BERNARD E. WEISSMAN, Ph.D.

Kuwahara, Y., Wei, D., Durand, J. and Weissman, B.E. hSNF5 reexpression in malignant rhabdoid tumors regulates the transcription of NOXA and $p21^{CIP1/WAF1}$ by recruitment of SWI/SNF complexes and RNAPII to their promoters. Molecular Cancer Research, 2013, 11:251-260. (featured in Highlights in Brief)

Kuwahara, Y., Mora-Blanco, E. L., Banine, F., Rogers, A., Fletcher, C., Larry S. Sherman, L. S., Roberts, C. W. M., and Weissman, B. E. Establishment and Characterization of MRT Cell Lines from Genetically Engineered Mouse Models and the Influence of Genetic Background on Their Development. Intl. J. of Cancer 2013,132:2767-2777.

HERBERT C. WHINNA, M.D., Ph.D.

Murine Models Do Not Recapitulate the Pathophysiology of Age-Related Venous Thrombosis In Humans. Cardenas JC, Aleman MM, Wang JG, Whinna HC, Wolberg AS, Church FC. J Thromb Haemost. 2013 Mar 10. doi: 10.1111/jth.12189. [Epub ahead of print]

Blood utilization in patients with burn injury and association with clinical outcomes. Lu RP, Lin FC, Ortiz-Pujols SM, Adams SD, Whinna HC, Cairns BA, Key NS. Transfusion. 2012 Dec 24. doi: 10.1111/trf.12057. [Epub ahead of print]

JULIA WHITAKER, M.S., D.V.M.

Fletcher C, Whitaker JW, LeVine DN, Rogala AR: The Laboratory Dog in Kurtz DM, Prescott JS, Travlos GS (eds), The Clinical Chemistry of Laboratory Animals, 3rd Edition, Taylor and Francis, Boca Raton, Chapter 4- submitted to the editor (2012).

MONTE S. WILLIS, M.D., Ph.D.

Willis MS, Homeister JW, Rosson GB, Annayev Y, Holley D, Holly SP, Madden VJ, Godfrey V, Parise LV, Bultman SJ: Functional redundancy of SWI/SNF catalytic subunits in maintaining vascular endothelial cells in the adult heart. Circ Res. 2012; 111(5):e111-122. (PMID 22740088).

Levtzow CB, Willis MS: Reducing laboratory billing defects using six sigma principles. Lab Medicine. 2012, in press.

Willis MS, Dyer LA, Ren R, Lockyer P, Moreno-Miralles, Schisler JC, Patterson C: BMPER regulates cardiomyocyte size and vessel density in vivo. Cardiovascular Pathology. 2012, in press.

Willis MS, Patterson C: Proteotoxicity and Cardiac Dysfunction: Alzheimer's Disease of the Heart? N Engl J Med. 2012, in press.

Pi X, Lockyer P, Dyer L, Schisler J, Carey S, Sweet DT, Chen Z, Tzima E, Willis MS, Homeister JW, Moser M, Patterson C: Bmper inhibits endothelial inflammation and protects against atherosclerosis. Arterioscler Thromb Vasc Biol. 2012; 32(9):2214-2222. (PMID 22772758).

Warren SA, Briggs LE, Zeng H, Chuang J, Chang EI, Terada R, Li M, Swanson MS, Lecker SH, Willis MS, Spinale FG, Maupine-Furlow J, McMullen JR, Moss RL, Kasahara H: Myosin light chain phosphorylation is critical for adaptation to cardiac stress. Circulation. 2012 Oct 24. [Epub ahead of print] (PMID 23095280).

Bender LM, Cotten SW, Fedoriw Y, Willis MS, McCudden CR: Evaluation of digital images for identification and characterization of monoclonal immunoglobulins by immunofixation. Clin Biochem. 2012. Nov 2. doi:pii: S0009-9120(12)00609-1. 10.1016/j.clinbiochem.2012.10.030. [Epub ahead of print] (PMID: 23127385).

Willis MS, Patterson C: Proteotoxicity and cardiac dysfunction. N Engl J Med. 2013; 368(18):1755 (PMID 23635068).

Makivić B, Djordjević-Nikić M, Willis MS: Heart rate variability (HRV) as a tool for diagnostic and monitoring performance in sport and physical activities. J Exerc Physiol Online. 16(3):116-144 (in press).

Williams KM, Wilson BA, O'Connor WG, Willis, MS: Ernest Everett Just, PhD: Pioneer in Ecological Developmental (Eco-Devo) Biology. J South Carolina Acad Sci. 2013, in press.

Willis MS, Wadosky KM, Rodríguez JE, Schisler JC, Lockyer P, Hilliard EG, Glass DJ, Patterson C: Muscle Ring Finger 1 (MuRF1) and MuRF2 are necessary but functionally redundant during

developmental cardiac growth and regulate E2F1-mediated gene expression in vivo. Cell Biochem Funct. 2013 Mar 20. doi: 10.1002/cbf.2969. [Epub ahead of print] (PMID 23512667).

Willis MS, Min J, Wang S, McDonough H, Lockyer P, Wadosky KM, Patterson P: Carboxyl terminus of Hsp70-interacting protein (CHIP) is required to modulate cardiac hypertrophy and attenuate autophagy during exercise. Cell Biochem Funct. 2013 Apr 2. doi: 10.1002/cbf.2962 [Epub ahead of print] (PMID 23553918).

Willis MS, Cairns BA, Purdy A, Bortsov AV, Jones SW, Ortiz-Pujols S, Willis TMS, Joyner BL: Persistent lactic acidosis after chronic topical application of silver sulfadiazine in a pediatric burn patient: a review of the literature. Int J Burns Trauma. 2012;3(10):1-8 (PMID: 23386980).

O'Connor WG, Willis MS, Sheikh A: Enhanced 2-deoxy-2-(18F)fluoro-D-glucose (FDG) Uptake on PET-CT Due to a Benign Condition and Hodgkin's Lymphoma. J Nuc Med Rad Therapy. 2013, in press.

O'Neal WT, Griffin WF, Dries JL, Kent SD, Chen J, Willis MS, Virag JA: Ephrin-Eph Signaling as a Potential Therapeutic Target for the Treatment of Myocardial Infarction. Med Hypotheses. 2013 Apr 4. doi:pii: S0306-9877(13)00109-6. 10.1016/j.mehy.2013.02.024. [Epub ahead of print] (PMID 23562676).

Duan J, Lee Y, Jania C, Gong J, Rojas M, Burk L, Willis M, Homeister J, Tilley S, Rubin J, Deb A: Rib fractures and death due to deletion of osteoblast βcatenin in adult mice is rescued by corticosteroids. Plos One. 2013; 8(2): e55757l.

Der-Torossian H, Wysong A, Shadfar S, Willis MS, McDunn J, Couch ME: Metabolic derangements in the gastrocnemius and the effect of Compound A therapy in a murine model of cancer cachexia. J Cachexia Sarcopenia Muscle. 2013, Jan 24 [Epub ahead of print] (PMID 23344889).

Der-Torossian H, Asher SA, Winnike JH, Wysong A, Yin X, Willis MS, O'Connell TM, Couch ME: Cancer cachexia's metabolic signature in a murine model confirms a distinct entity. Metabolomics. 2012, in press.

ALISA S. WOLBERG, Ph.D.

Dargaud Y, Wolberg AS, Luddington R, Regnault V, Spronk H, Baglin T, Lecompte T, Ten Cate H, Negrier C. 2012. Evaluation of a standardized protocol for thrombin generation measurement using the calibrated automated thrombogram: an international multicentre study. *Thromb Res*, 130(6):929-34. PMID: 22909826

Wu G, Krebs CR, Lin FC, Wolberg AS, Oldenburg AL. High sensitivity micro-elastometry: applications in blood coagulopathy. *Ann Biomed Eng*. In press.

Cardenas JC, Aleman MM, Wang JG, Whinna HC, Wolberg AS, Church FC. 2013. Murine models do not recapitulate the pathophysiology of age-related venous thrombosis in humans. *J Thrombi Haemost*. 11(5):990-2. PMID: 23480546

Aleman MM, Wolberg AS. 2013. Tick spit shines a light on the initiation of coagulation. *Circulation*, in press.

Aleman MM, Walton BL, Byrnes JR, Wang JG, Heisler MJ, Machlus KR, Cooley BC, Wolberg AS. 2013. Elevated prothrombin promotes venous, but not arterial, thrombosis in mice. *Arterioscl, Thromb Vasc Biol*. In press. PMID: 23723374

JOHN T. WOOSLEY, M.D., Ph.D.

de Campos RO, Semelka RC, Azevedo RM, Ramalho M, Heredia V, Armao DM, Woosley JT. Combined hepatocellular carcinoma-cholangiocarcinoma: Report of MR appearance in eleven patients. J Magn Reson Imaging. 2012 Jul 10

Miedema J, Marron JS, Niethammer M, Borland D, Woosley J, Coposky J, Wei S, Reisner H, Thomas NE. Image and statistical analysis of melanocytic histology. Histopathology. 2012 Jun 11

Dellon ES, Chen X, Miller CR, Woosley JT, Shaheen NJ. Diagnostic utility of major basic protein, eotaxin-3, and leukotriene enzyme staining in eosinophilic esophagitis. Am J Gastroenterol. 2012 Oct;107(10):1503-11.

Kim BS, Hayashi PH, Kim SH, Angthong W, Srirattanapong S, Woosley JT, Semelka RC. Outcomes of Patients with Elevated α-Fetoprotein Level and Initial Negative Findings at MR Imaging. Radiology. 2013 Feb 7

HONG XIAO, M.D.

Jennette JC, Xiao H, Hu P. Complement in ANCA-Associated Vasculitis. Seminars Nephrol 2013; in press

Xiao H: The role of genetic background in an animal model of ANCA-associated vasculitis. La Presse Médicale April 2013;Vol 42 (4), Part 2, 517–520.

Xiao H, Ciavatta D, Aylor DL, Hu P, Pardo-Manuel de Villena F, Falk RJ, Jennette JC. Genetically determined severity of anti-myeloperoxidase glomerulonephritis. Am J Pathol 2013; 8:139-60.

Jennette JC, Falk RJ, Hu P, Xiao H. Pathogenesis of Anti-neutrophil Cytoplasmic Autoantibody Associated Small Vessel Vasculitis. Annu Rev Pathol Mech Dis 2013; 8:139–60

MAIMOONA B. ZARIWALA, Ph.D.

Hjeij R, Lindstrand A, Francis R, Zariwala MA, Liu X, Li Y, Damerla R, Dougherty GW, Abouhamed M, Olbrich H, Loges NT, Pennekamp P, Davis EE, Carvalho CM, Pehlivan D, Werner C, Raidt J, Koehler G, Haeffner K, Reyes-Mujica M, Lupski JR, Leigh MW, Rosenfeld

M, Morgan LC, Knowles MR, Lo C, Katsanis N, Omran H. ARMC4 mutations cause primary ciliary dyskinesia with randomization of left/right body asymmetry. Am J Hum Genet. (In Press).

Daniels ML, Leigh MW, Davis SD, Armstrong MC, Carson JL, Hazucha M, Dell SS, Erickson M, Collins FS, Knowles MR, Zariwala MA. Founder mutation in RSPH4A identified in patients of Hispanic descent with primary ciliary dyskinesia. Hum Mutat. (in Press).

Funkhouser WK III, Niethammer M, Carson JL, Burns KA, Knowles MR, Leigh MW, Zariwala MA, Funkhouser WK. A new tool improves diagnostic test performance for transmission EM evaluation of axonemal dynein arms. Ultrastructural Pathology (In Press).

Knowles MR, Daniels LA, Davis SD, Zariwala MA, Leigh MW. Primary ciliary dyskinesia: Recent advances in diagnostics, genetics and characterization of clinical disease. Am J Respir Crit Care Med. Review. (In press).

Ferkol T, Puffenberger E, Lie H, Helms C, Strauss K, Bowcock A, Carson J, Hazucha M, Morton H, Patel A, Leigh M, Knowles M, Zariwala M. Primary ciliary dyskinesia causing mutations in Amish and Mennonite communities. J Pediatr. 2013 Mar 7 S0022-3476(13)00136-4.

Antony D*, Becker-Heck A*, Zariwala MA*, Schmidts M, Onoufriadis A, Forouhan M, Wilson R, Taylor-Cox T, Dewar A, Jackson C, Goggin P, Loges NT, Olbrich H, Jaspers M, Jorissen M, Leigh MW, Wolf WE, Daniels ML, Noone PG, Ferkol TW, Sagel SD, Rosenfeld M, Rutman A, Dixit A, O'Callaghan C, Lucas JS, Hogg C, Scambler PJ, Emes RD, Uk10k, Chung EM, Shoemark A, Knowles MR, Omran H, Mitchison HM. Mutations in CCDC39 and CCDC40 are the major cause of primary ciliary dyskinesia with axonemal disorganization and absent inner dynein arms. Hum Mutat. 2013 Mar;34(3):462-72. [Epub ahead of print]. *Co-equal first authors.

Knowles MR, Leigh MW, Ostrowski LE, Huang L, Carson JL, Hazucha MJ, Yin W, Berg JS, Davis SD, Dell SD, Ferkol TW, Rosenfeld M, Sagel SD, Milla CE, Olivier KN, Turner EH, Lewis AP, Bamshad MJ, Nickerson DA, Shendure J, Zariwala MA; Genetic Disorders of Mucociliary Clearance Consortium. Exome sequencing identifies mutations in CCDC114 as a cause of primary ciliary dyskinesia. Am J Hum Genet. 2013 Jan 10;92(1):99-106.

Horani A, Druley TE, Zariwala MA, Patel AC, Levinson BT, Van Arendonk LG, Thornton KC, Giacalone JC, Albee AJ, Wilson KS, Turner EH, Nickerson DA, Shendure J, Bayly PV, Leigh MW, Knowles MR, Brody SL, Dutcher SK, Ferkol TW. Whole-exome capture and sequencing identifies HEATR2 mutation as a cause of primary ciliary dyskinesia. Am J Hum Genet. 2012 Oct 5;91(4):685-93.

Zariwala MA, Knowles MR, Leigh MW. Primary Ciliary Dyskinesia: In: Pagon RA, Bird TD, Dolan CR, Stephens K, Adam MP, editors. GeneReviews™ [Internet]. Seattle (WA): University of Washington, Seattle; 1993-. 2007 Jan 24 [updated 2013 Feb 28]. Review. Available at http://www.genetests.org.

QING ZHANG, Ph.D,

Zhang Q, Yang H. The roles of VHL-dependent ubiquitination in signaling and cancer. Frontiers in Oncology, 2012; 2:35.

Chen X, Zhang Q*, Iliopoulos D*, Tang Q*, Greenblatt MB, Hatziapostolou M, Ni M, Chen Y, Lim E, Hu DZ, Hu B, Song M, Brown M, Liu XS, and Glimcher LH (2013). XBP1 sustains tumor-initiating cells in human triple negative breast cancer through regulation of the hypoxia response. *Nature* in revision. (*: equal contribution)

Lu G, Zhang Q, Song J, Tomaino R, Bronson RT, Gygi SP, Richardson AL, Signoretti S, Kaelin WG. Phosphorylation of ETS1 by Src family kinase member prevents its recognition by the COP1 tumor suppressor. *Cancer Cell* in review.
2013.