

**DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE
2009-2010 ANNUAL REPORT**

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**DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE
FACULTY AND TRAINEE ROSTER
2009-2010**

Chair

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

Vice Chairs

Thomas W. Bouldin, M.D., Professor and Vice Chair for Faculty and Trainee Development

William K. Funkhouser, M.D., Ph.D., Professor and Director of Anatomic Pathology and
Associate Director of McLendon Clinical Laboratories

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

David G. Kaufman, M.D., Ph.D., Professor and Vice Chair for Research Development

Associate Chair for Administration

Nancy H. Nye

Distinguished Professors

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 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.

Dwight A. Bellinger, D.V.M., Ph.D.

John F. Bradfield, D.V.M., Ph.D. (1/31/10)

Debra A. Budwit, M.D.

John F. Chapman, Dr.P.H.

Frank C. Church, Ph.D.

William B. Coleman, Ph.D.

Marila Cordeiro-Stone, Ph.D.

Cherie H. Dunphy, M.D.

Rosann A. Farber, Ph.D.

Virginia L. Godfrey, D.V.M., Ph.D.

M. David Goodman, M.D.

Margaret L. Gulley, M.D.

J. Ed Hall, Ph.D.

Catherine A. Hammett-Stabler, Ph.D.

H. Michael Jones, M.D.

William K. Kaufmann, Ph.D.

Hyung-Suk Kim, Ph.D.

Joe N. Kornegay, D.V.M., Ph.D.

Susan T. Lord, Ph.D.

Nadia N. Malouf, M.D.

Susan J. Maygarden, M.D.
Volker R. Nিকেleit, M.D.
Judith N. Nielsen, D.V.M.
Howard M. Reisner, Ph.D.
John L. Schmitz, Ph.D.
Scott V. Smith, M.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.
Georgette A. Dent, M.D.
Thomas H. Fischer, Ph.D.
Craig A. Fletcher, D.V.M., Ph.D.
Susan C. Hadler, M.D.
Tracy M. Heenan, D.V.M.
Kathleen A. Kaiser-Rogers, Ph.D.
Ruth A. Lininger, M.D.
Chad A. Livasy, M.D. (1/31/10)
Christopher P. Mack, Ph.D.
Melissa B. Miller, Ph.D.
Harsharan K. Singh, M.D.
Nobuyuki Takahashi, M.D., Ph.D. (4/30/10)
Joan M. Taylor, Ph.D.
Cyrus Vaziri, Ph.D.

Assistant Professors

Araba N. Afenyi-Annan, M.D.
George Fedoriw, M.D.
Oleg V. Gorkun, Ph.D.
Jonathon W. Homeister, M.D., Ph.D.
Peiqi Hu, M.D.
John P. Hunt, M.D.
Karou Inoue, Ph.D.
Masao Kakoki, M.D., Ph.D.
Christopher R. McCudden, Ph.D.
C. Ryan Miller, M.D., Ph.D.
Yara A. Park, M.D.
Arlin B. Rogers, D.V.M., Ph.D.
Tara C. Rubinas, M.D. (12/31/09)
Dennis A. Simpson, Ph.D.
Leigh B. Thorne, M.D.
Dimitri G. Trembath, M.D., Ph.D.
Heike Varnholt, M.D.
Lisa J. Weinstein, M.D. (7/9/10)

Julia W. Whitaker, D.V.M.
Monte S. Willis, M.D., Ph.D.
Alisa S. Wolberg, Ph.D.
Hong Xiao, M.D.
Xianwen Yi, M.D., Ph.D.
Maimoona B. Zariwala, Ph.D.

Lecturer

Gayle C. McGhee

Instructor

Kirsten M. Boland, M.H.S. (7/30/10)
Claudia M. Brady, M.H.S.
Vincent J. Moylan, M.S., P.A. (ASCP)
Tracie L. Wagner, P.A.

Clinical Faculty (Medical Examiners)

John D. Butts, M.D. (6/30/10)
Thomas B. Clark III, M.D. (6/30/10)
Deborah L. Radisch, M.D.
Ruth E. Winecker, Ph.D.

Faculty Emeritus

Stuart Bentley, M.D.
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.
William D. Huffines, M.D.
William W. McLendon, M.D.
James Pick, D.V.M.
Katherine Pryzwansky, Ph.D.
Marjorie S. Read, Ph.D.
Kinuko I. Suzuki, M.D.

Jointly Appointed Faculty

Harry R. Brashear Jr., M.D. (Surgery) (Deceased March 28, 2010)
Claire M. Doerschuk, M.D. (Medicine)
Ronald J. Falk, M.D. (Medicine)
Susan A. Fiscus, Ph.D. (Microbiology)
Peter H. Gilligan, Ph.D. (Microbiology)
Thomas R. Griggs, M.D. (Medicine)
Pamela A. Groben, M.D. (Dermatology)

Nigel Mackman, Ph.D. (Medicine)
Valerie Murrah, D.M.D., M.S. (Dental)
Timothy C. Nichols, M.D. (Medicine)
Charles M. Perou, Ph.D. (Genetics)
Gloria A. Preston, Ph.D. (Medicine)
Kathleen W. Rao, Ph.D. (Pediatrics)
Allen C. Rinas, M.S. (Medical Allied Health)
Harold R. Roberts, M.D. (Medicine)
Darrel W. Stafford, Ph.D. (Biology)
James Swenberg, D.V.M., Ph.D. (Environmental Sciences and Engineering)
Young E. Whang, M.D., Ph.D. (Medicine)
Elizabeth Wilson, Ph.D. (Pediatrics)

Adjunct Faculty

William A. Ahrens, M.D. (Carolina Pathology Group)
Peter M. Banks, M.D. (Carolinas Medical Center)
Gary A. Boorman, D.V.M., Ph.D. (NIEHS)
Mark E. Brecher, M.D. (Laboratory Corporation of American)
Robert C. Brown, M.D. (Emeritus)
Byron E. Butterworth, Ph.D. (CIIT)
Shu Huey Chaing, Ph.D. (State Dept of Health and Human Services)
Jeffrey Everitt, D.V.M. (GlaxoSmithKline)
Dana M. Fowlkes, M.D., Ph.D. (Green Spring Technology)
Delores J. Grant, Ph.D. (North Carolina Central University)
Christopher Gregory, Ph.D. (Voyager Pharmaceutical)
Wendell D. Jones, Ph.D. (Constella Health Sciences/Expression Analysis)
Scott Kilpatrick, M.D. (Forsyth Medical Center)
Suzanne L. Kirby, M.D., Ph.D.
Myla Lai-Goldman, M.D. (Laboratory Corporation of America, Retired)
Chad A. Livasy, M.D. (Carolinas Pathology Group)
Roger L. Lundblad, Ph.D.
Amil E. Mandal, M.D. (Medical Specialists of St. Augustine)
Robert R. Maronpot, D.V.M. (NIEHS)
Keith V. Nance, M.D. (Rex Hospital)
William R. Oliver, M.D. (East Carolina University)
Richard S. Paules, Ph.D. (NIEHS)
Dennis W. Ross, M.D., Ph.D. (Forsyth Medical Center)
Tara C. Rubinas, M.D. (Laboratory Corporation of America)
W. Eugene Sanders, M.D.
Gary J. Smith, Ph.D. (Roswell Park Cancer Institute)
Charles H. Wallas, M.D.
Douglas C. Wolf, Ph.D., D.V.M. (EPA)

Clinical Fellows

Edward P. Ager, Ph.D. (Microbiology)
Turki Alhussain, M.D. (Nephropathology)
Karen J. Fritchie, M.D. (Surgical Pathology)
Kevin E. Greene, M.D. (Forensic Pathology)

Adil Hussen-Gasim, M.D. (Nephropathology)
Sara C. Koenig, M.D. (Transfusion Medicine Service)
Stephanie P. Mathews, M.D. (Hematopathology)
Karissa McCall-Culbreath, Ph.D. (Microbiology)
Kenneth L. Muldrew, M.D., Ph.D. (Molecular Genetic Pathology)
Michael J. Papez, M.D. (Surgical Pathology)
Eric M. Pryor, M.D. (Hematopathology)
Lori R. Scanga, M.D., Ph.D. (Cytopathology)
Cherry E. Starling, M.D. (Cytopathology)
Ferrin Wheeler, Ph.D. (Cytogenetics)

Co-Chief Residents

Alexander J. Finn, M.D., Ph.D. (PGY IV) Co-Chief Resident
Daniel T. Kleven, M.D. (PGY IV) Co-Chief Resident
Kristin A. Pierce, M.D. (PGY IV) Co-Chief Resident

Residents

Dana D. Baker, M.D. (PGY II)
Natalie O. Banet, M.D. (PGY II)
Lea L. Bardy, M.D. (PGY I)
Gregory D. Bianchi, M.D. (PGY I)
Alexander J. Finn, M.D. (PGY IV)
Christopher J. Gordon, M.D. (PGY III)
Daniel T. Kleven, M.D. (PGY IV)
Andrew P. Laramore, M.D. (PGY III)
Jayson R. Miedema, M.D. (PGY I)
Stacey S. O'Neill, M.D. (PGY III)
Kristen A. Pierce, M.D. (PGY IV)
Jessica L. Poisson, M.D. (PGY II)
Jonathon D. Privette, M.D. (PGY IV)
Olga Speck, M.D. (PGY I)
Kimberly J. Woodward, M.D. (PGY II)

Research Associates

Stanislav A. Bakunov, Ph.D. (Dr. Tidwell)
Svetlana M. Bakunova, Ph.D. (Dr. Tidwell)
Bruna P. Brylawski, Ph.D. (Dr. Kaufman) (6/13/10)
Paul D. Chastain, Ph.D. (Dr. Kaufman)
Stephanie M. Cohen, Ph.D. (Dr. Kaufman)
Feng Li, Ph.D. (Dr. Smithies)
Kumar R. Pandya, Ph.D. (Dr. Smithies)
Donald A. Patrick, Ph.D. (Dr. Tidwell)

Postdoctoral Research Fellows

Ayoola Aboyade-Cole, Ph.D. – (Postdoctoral Trainee) - Dr. David Kaufman
Jose Arbones-Mainar, Ph.D. - (Postdoctoral Research Associate) – Dr. Nobuyo Maeda
Barbara Cardinali, Ph.D. – (Postdoctoral Research Associate) – Dr. Susan Lord
Rebecca Frum, Ph.D. – (Postdoctoral Trainee) – Dr. David Kaufman

Sunil Kumar, Ph.D. – (Postdoctoral Research Associate) – Dr. Hyung-Suk Kim
John McNulty, Ph.D. – (Postdoctoral Trainee) – Dr. Cordeiro-Stone
Xin Ming, Ph.D. – (Postdoctoral Research Associate) – Dr. Richard Tidwell
Brante Sampey, Ph.D. – (Postdoctoral Trainee) – Dr. David Kaufman
Stephanie Smith-Roe, Ph.D. – (Postdoctoral Trainee) – Dr. Marila Cordeiro-Stone
Dean Staus, Ph.D. – (Postdoctoral Research Associate) - Dr. Christopher Mack
Weihua Tang, M.D. – (Postdoctoral Research Associate) – Dr. Margaret Gulley
Hirofumi Tomita, Ph.D. – (Postdoctoral Research Associate) – Dr. Nobuyo Maeda
Huili Wang, Ph.D. – (Postdoctoral Research Associate) – Dr. Jonathon Homeister
Hui Yang, Ph.D. – (Postdoctoral Research Associate) – Dr. Volker Nickeleit
Xuebin Yang, Ph.D., M.D. – (Postdoctoral Trainee) – Dr. William Coleman

Graduate Students

Maria M. Aleman - (Fellow Trainee) – Dr. Alisa Wolberg
Diane E. Bender-Neal – Dr. Dwight Bellinger
Jessica C. Cardenas – (Fellow Trainee) – Dr. Frank Church
David A. Detwiler – Dr. Joe Kornegay
Dinuka M. DeSilva – Dr. Young Whang
Jason T. Doherty – (Fellow Trainee) - Dr. Joan Taylor
Michael L. Durando – Dr. Cyrus Vaziri
Rachel E. Goldsmith – Dr. Richard Tidwell
Mark W. Gramling – (Robert H. Wagner Scholar) – Dr. Frank Church
Olguitza Guzman – (Fellow Trainee) – Dr. Ryan Miller (3/13/10)
Lance A. Johnson – Dr. Nobuyo Maeda
Mehmet Karaca – (Fellow Trainee) - Dr. Young Whang
Kaitlin C. Lenhart – Dr. Joan Taylor
Kellie Rae Machlus – Dr. Alisa Wolberg
Troy A. McEachron – Dr. Frank Church and Dr. Nigel Mackman
Matthew D. Medlin – Dr. Christopher Mack
Elizabeth P. Merricks – Dr. Timothy Nichols
Avani A. Pendse – Dr. Nobuyo Maeda
Amanda L. Rinkenbaugh – (Robert H. Wagner Scholar/Fellow Trainee) – Dr. Albert Baldwin
Jessica Rodriguez - (Fellow Trainee) – Dr. Monte Willis
Aleeza J. Roth - (Fellow Trainee) – Dr. Ronald Falk
Lisa L. Samuelson – Dr. David Gerber
Rupsander Sandhu – Dr. William B. Coleman
Christopher M. Scull – Dr. Thomas Fischer
Chih-Hong Wang – Dr. Nobuyuki Takahashi

RESEARCH AND SCHOLARLY ACCOMPLISHMENTS

Over the past year an excellent record of achievement in research has resulted in 250 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.

ARABA N. AFENYI-ANNAN, M.D.

Dr. Araba Afenyi-Annan's research is focused on improving transfusion therapy for sickle cell disease patients through 1) uniformity of blood bank practices, 2) identification of patients at risk for red cell immunization, and 3) development of a matched patient-donor red cell program for pediatric sickle cell patients.

ROBERT C. BAGNELL, Ph.D.

The Bagnell laboratory - 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 **327** principal investigators from **53** departments and centers at UNC-CH, Duke, NIEHS, USEPA, Hamner Institute, and Pathology Associates. The total number of active laboratory clients now stands at **868**. In the past 12 months the light microscope facilities logged **8,774** hours of use, electron microscope facilities logged **2,009** hours of use and the laboratory has performed **1,026** electron microscopy specimen preparations. In addition to its research role, 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.

The laboratory participated in an NIH Shared Instrumentation Grant for a new transmission electron microscope. This grant requested an amount of \$500,000. This grant was not funded. The NIH Shared Instrumentation Grant for a new transmission electron microscope was re-submitted with a requested amount of \$422,000. Results will be available in February 2011. The laboratory received \$25,000 in funding from the School of Medicine to purchase a service contract for the Zeiss LSM 710 spectral CLSM and to add an additional image processing station. The laboratory received \$100,000 from the Department of Pathology and Laboratory Medicine to add x-ray microanalysis and backscatter detectors to the Zeiss Supra25 FESEM, to purchase a glow-discharge system, and to upgrade the preparative microwave system.

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

Dr. Bellinger's research interests remain in the area of hematology and cardiovascular disease. They have used a swine model for studying atherosclerosis for many years. They are using their colony of familiar hypercholesterolemic pigs to study the role of hyperlipidemia and insulin resistance 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. These 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.

Recent literature with a mouse KO model of factor XII indicates this coagulation protein has importance in arterial thrombosis. They are using a naturally occurring cat model deficient in factor XII to further investigate the role of factor XII in thrombosis and inflammation.

Work with Dr. Fischer continues to characterize and evaluate the usefulness of preserved platelets as well as other potential hemostatic products.

JESSICA K. BOOKER, Ph.D.

Dr. Jessica Booker's research draws from unusual results in clinical testing as well as the use of 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 collaboration with Drs. Coleman and Funkhouser utilizes DNA fingerprinting to help distinguish new primary tumors from metastases in lung and neck cancers. As Scientific Director of the Clinical Molecular Genetics Laboratory she is working closely with her research analysts and clinical fellows as they develop new assays for acquired and inherited diseases. New assays currently under development include IgK clonality, PML-RAR α , IDH1 and IDH2. □ Assays being redesigned for improved efficiency or sensitivity include automated nucleic acid extraction, EBV, CMV and BK quantitative viral loads, and a Fragile X assay that will ultimately eliminate the need for Southern blotting.

THOMAS W. BOULDIN, M.D.

In the coming year, Dr. Bouldin will continue to be very heavily involved in all aspects of diagnostic neuropathology, providing service for surgical neuropathology, autopsy neuropathology, the nerve biopsy service, and ophthalmic pathology. He will also be heavily involved as program director of the Department's residency training program in anatomic and clinical pathology.

CLAUDIA M. BRADY, M.H.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.

Ms. Brady is looking forward to the added challenge of training all levels of PGY pathology residents and medical students on all benches in Surgical Pathology in conjunction with the arrival of a third gross room Pathologists' Assistant.

ARLENE S. BRIDGES, Ph.D.

Dr. Bridges' current research activities in collaboration with Dr. Tidwell, involve translational drug development. Primary research activities involve analysis of antiparasitic agents (in collaboration with Dr. Richard R. Tidwell, Director of the UNC Consortium for Parasitic Drug Development), anti-HIV agents (in collaboration with Dr. Ron Swanstrom, Director of the UNC Center for AIDS Research), and anticancer nanoparticles (in collaboration with Dr. William Zamboni, Director of the UNC Center for Experimental Therapeutics). As 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 not only these three research groups, but to other scientists at UNC and beyond.

Her goals for the coming year are three-fold. First, she hopes to continue to increase interest in the ADME Mass Spectrometry Center. She also hopes to continue to acquire new equipment, either by donation, lease-purchase, or instrumentation grants. Second, she hopes to continue to be active in bringing the new GLP bioanalytical laboratory online. Third, she hopes to pay-off the amount owed on the lease-purchase of one of the mass spectrometers in Brinkhous-Bullitt.

DEBRA A. BUDWIT, M.D.

Dr. Budwit's areas of subspecialty interest include gynecologic and breast surgical pathology and cytopathology. In addition to providing clinical diagnostic and teaching services in these areas, she also engages in related clinicopathologic studies of interest. She has completed a review of her institutional experience with the diagnostic accuracy and clinical utility of fine needle aspiration biopsy of deep pelvic masses, and a study on the characterization of carcinoma in situ associated with metaplastic breast carcinomas. Data from both of these studies were presented at national meetings, and the respective manuscripts are in progress. Other ongoing projects in which she participates include establishing bench marks for adequate lymph node dissections for gynecologic cancers, evaluation of current medical management protocols for endometrial hyperplasia/well differentiated carcinoma, evaluation of management strategies for patients with a diagnosis of cervical intraepithelial neoplasia 2 (CIN 2), and the utility of sentinel lymph node biopsy in patients with breast cancer status post neoadjuvant chemotherapy.

JOHN F. CHAPMAN, Dr. P.H.

Dr. Chapman's responsibilities and activities at UNC continue to be primarily associated with service functions in point of care testing at UNCH as well as McLendon Clinical Laboratories. Since beginning phased retirement he has remained an active investigator in clinical trials sponsored by in-vitro diagnostic (IVD) manufacturers. He recently completed an external validation trial for several new CLASS III assays (hepatitis and HIV). The results of this trial were instrumental in enabling the company to gain 501k approval from the FDA. His plans are to continue developmental work with IVD manufacturers in test/instrument development. In this regard, he will be the PI for an external validation of a new test offering for iPTH scheduled for second quarter 2010. Dr. Chapman plans to remain actively engaged in translational research directed by clinical laboratory problems and/or needs.

FRANK C. CHURCH, Ph.D.

The research area of Frank Church, Ph.D., is concerned with proteases and their inhibitors in human biology and in various disease processes (including thrombosis/vascular biology and tumor cell migration/invasion/signal transduction). His laboratory has an extensive interest in the biological principles of proteolysis and they take a two-pronged approach to research: In the first approach, Dr. Church's lab performs structure to activity studies with heparin-binding serpins (serine protease inhibitors; heparin cofactor II, protein C inhibitor, antithrombin, and plasminogen activator inhibitor-1) and the serine protease thrombin and activated protein C. They have made substantial progress in identifying specific residues in these serpins that are important for glycosaminoglycan binding and for protease recognition. In the second approach, they are applying basic biological techniques (in vivo, ex vivo, and in vitro) to investigate newly emerging principles of proteases in biological processes, especially in venous thrombosis and breast cancer. Part of this research is directed at using mouse models of cancer and thrombosis, in an attempt to better understand Trousseau's Syndrome, the link between venous thrombosis and cancer by understanding the roles of plasminogen activator inhibitor-1 (PAI-1), urokinase, PAR-1 and PAR-2, and factor VIIa/tissue factor. Part of this work is trying to use mice genetically altered in their expression of p16^{INK4a} and its relationship to senescence/aging and venous thromboembolism. Finally, they are focused on understanding the role of PAI-1 in breast cancer and the microenvironment (breast adipocytes) and the signaling systems supported by PAI-1 and by PAI-1-urokinase complex.

WILLIAM B. COLEMAN, Ph.D.

Dr. Coleman's laboratory is focused on molecular mechanisms (genetic and epigenetic) of chronic injury and neoplastic transformation in (i) liver, (ii) breast, and (iii) lung. (i) Their recent investigations identified *SYT13* as a human liver tumor suppressor gene that compliments chromosomal defects induced in rat liver cells by MNNG exposure. They are now exploring potential effector pathways for *SYT13*-mediated tumor suppression that are altered in environmental hepatocarcinogenesis in humans. (ii) They have focused efforts on elucidation of epigenetic mechanisms underlying human breast cancer development by examining breast cancers that exhibit high rates of gene expression loss due to hypermethylation defects (which are ER-negative) and those that lack high rates of methylation-dependent gene loss (which are ER-positive). They found that ER-negative breast cancers exhibit a hypermethylation defect characterized by overexpression of DNMT3b protein and elevated DNMT activity leading to concurrent aberrant methylation of numerous genes, and that this group significantly corresponds (~75%) to the basal subtype of breast cancer. (iii) They have examined genomic damage induced by environmental agents in patients that are affected by both lung SCC and HNSCC utilizing a PCR-based approach. The results suggest that different forms of genomic damage (and specific chromosomal losses) drive tumorigenesis in lung and head and neck (possibly due to tissue-specific differences in proliferation pathways) despite common risk factors and/or etiologic agents.

MARILA CORDIERO-STONE, Ph.D.

Dr. Cordeiro-Stone's research experience has been on molecular mechanisms underlying the response of human cells to DNA damage induced by solar radiation. Normal human fibroblasts exposed to low fluences of UVC (254 nm) is the experimental model system they have used

most often, due primarily to availability of karyotypically stable and highly proliferative cultures and efficiency of DNA photoproduct formation by the short wavelengths of ultraviolet light. Currently, an important goal of the laboratory is to expand the basic information gathered from studies with UVC and normal fibroblasts to melanocytes, melanoma cells, and keratinocytes exposed to UVB and UVA wavelengths represented in ambient sunlight. Dr. Cordeiro-Stone is a member of a collaborative group that includes basic scientists, molecular epidemiologists, oncologists and pathologists working together to understand mechanisms underlying initiation and progression of melanoma. The etiology of skin melanomas and carcinomas are strongly connected to sun exposure. Studying the function(s) of proteins involved in the regulation of DNA replication and the network of pathways that protect the human genome from genotoxic effects of DNA damage is essential for a better understanding of the pathogenesis of skin cancers with an environmental etiology.

GEORGETTE A. DENT, M.D.

Dr. Dent's scholarly activities are focused on medical education related to medical student career planning and hematology. She co-authored a chapter on laboratory hematology that was published last year in the Third Edition of the American Society of Hematology Self-Assessment Program (ASH-SAP) and is currently updating the fourth edition for publication next year. This publication is designed to help fellows prepare for their subspecialty boards. She is also collaborating with the School of Public Health and the Sheps Center to study the impact of training in public health on physician practice patterns and career satisfaction. A preliminary report of this work was published in the April 2008 volume of Academic Medicine.

CHERIE H. DUNPHY, M.D.

The development of distinguishing markers of diffuse large B-cell lymphoma, double-hit lymphomas, and Burkitt lymphoma by full gene expression profiling with extrapolation of immunohistochemical markers and correlation with clinical outcomes.

Collaboration with Dr. Ken Young, Wisconsin, regarding gene expression profiling of diffuse large B-cell lymphoma.

Collaboration with Dr. Sandeep Dave, Duke University, regarding gene expression profiling of diffuse large B-cell lymphoma and Burkitt lymphoma.

Collaboration with Dr. Kristy Richards, UNC, regarding diffuse large B-cell lymphoma.

Collaboration with Dr. Kristy Richards, UNC, and Matthew Breen, NC State University, regarding FISH of dog lymphomas.

Correlation of CD14 and CD33 by immunohistochemistry with evaluation by flow cytometry in monocytic disorders.

Continue Editorship/Autorship of E-Medicine Pathology textbook for liquid and solid Hematopathology/Hematology.

Authoring and editing textbook entitled Frozen Section: Lymph Node.

Authoring Chapter regarding Hematopathology for Medical School textbook.

Preparing and moderating Society for Hematopathology Symposium at USCAP, 2010 entitled: Atypical and Reactive Lymphoid Proliferations Mimicking Malignant Lymphoma.

ROSANN A. FARBER, Ph.D.

Dr. Farber no longer carries out bench research in her lab, although a manuscript is in preparation on the studies they completed in 2009 on instability of CG- and AT-repeat sequences in normal fibroblasts and mismatch-repair-deficient cancer cell lines. Her efforts in the EPA Environmental Bioinformatics Center include compiling annual reports and acting as Quality Assurance Manager, which entails conducting annual QA audits of each project group. Future plans include putting together a postdoctoral training grant in Genetics (as proposed at the Pathology Retreat).

GEORGE FEDORIW, M.D.

Dr. Fedoriw's research goals/interests have been substantially focused. Likely, the most productive and lucrative is the work with the B-cell activating factor, BAFF, and its relation to human disease. He applied and received a Center for AIDS Research development award in December 2009, and is currently working on defining BAFF's role in HIV associated lymphomagenesis. The work will certainly yield at least one publication and an abstract for their hematopathology or other national meeting. The role of BAFF in other immunologically mediated processes is also being investigated and he is currently working on identifying the cellular source of BAFF in ITP and chronic GVHD. He has been successful in writing/co-authoring (first or last author of) seven clinical cases that have been accepted for publication, and has submitted or is completing several other cases and reviews (with residents and fellows) for publication in the next year. He will likely try to decrease (but still continue) this line of work to focus on the immunology-based research activities described above.

THOMAS H. FISCHER, Ph.D.

The research program of Dr. Fischer focuses on three closely related areas. First, the basic mechanisms that connect inflammatory, hemostatic and hemorrhagic processes are being investigated. This program has led to the development of a rehydrated, lyophilized (RL) platelet that is being advanced through the FDA system as an infusion therapeutic for the control of active bleeding. Secondly, RL platelets are also being bioengineered to carry nanoparticles that contain anti-inflammatory therapeutics (e.g., genes) to macrophages at sites of vascular inflammation. This area of research is driven by the fact that macrophage activation is closely associated with or is the underlying cause of vascular damage for hemorrhage in a wide range of disorders. Bleeding disorders that are associated with inflammation occur with hemorrhagic fever, traumatic brain injury, inflammatory bowel disease, hemorrhagic transformation in stroke, multiple organ failure syndrome after hemorrhagic shock and many other pathologies. A native function of macrophages is to phagocytize platelets that have adhered to sites of vascular injury. Thus, we are developing methods of using RL platelets to deliver anti-inflammatory therapeutics to macrophages at sites of vascular injury. Third, research is being carried out to better understand how foreign materials activate hemostatic systems. This effort involves elucidating basic mechanisms of how contact of blood components with materials accelerates hemostasis. This information is being used for the rational design of products for surface (topical) hemostasis and wound healing.

CRAIG A. FLETCHER, D.V.M.

Dr. Fletcher's current research interest is to assess serum biomarkers of systemic inflammation and platelet activation and whether polymorphisms in Fractalkine receptor (CX3CR1) alter these serum markers. The biomarkers to be measured are: Soluble Fractalkine, Soluble platelet-selectin (P-Selectin), Platelet Factor 4 (PF4) and Tumor necrosis factor-alpha (TNF-alpha). The overall goal of this study is to test the hypothesis that race differences in similar socio-environmental exposure lead to a pro-inflammatory predisposition which can in turn lead to an increased risk of cardiovascular disease.

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

Dr. Funkhouser collaborates as a funded co-PI (Core C director) with Dr. Tepper and other LCCC PIs on the GI SPORE. He re-wrote the portions of the renewal grant application relevant to tissue procurement and analysis, and revised the faculty membership from DPLM participating on this grant. The renewal application was submitted in Fall 2009. Dr. Funkhouser collaborates 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. Hayes at the LCCC on projects related to interobserver reproducibility of morphologic diagnosis of non-small cell lung carcinoma (NSCLC) and molecular subsets of the different types of NSCLC. These projects are attempting to define more accurate criteria for making the diagnoses of the different types of NSCLC, and identifying molecular subsets with statistically different natural histories or responses to therapies. Dr. Funkhouser collaborates (unfunded) with Dr. Coleman of the DPLM on two projects. The first is to define molecular methods for determination of neoplastic clonality unique to each neoplasm in a given individual. Such a method would allow distinction of two morphologically similar neoplasms from one another, e.g. distinguishing a solitary pulmonary metastasis from a new lung carcinoma. The second is a technical project, with a goal of creating a durable, reusable solid phase cDNA library in a microscale bioreactor.

PETER H. GILLIGAN, Ph.D.

Dr. Gilligan's research focuses on three broad themes, improved diagnostics for *Clostridium difficile*, better understanding of agents that are involved in chronic lung infection of cystic fibrosis, and improved detection and understanding the epidemiology of multi-drug resistant bacteria. Currently, they are refining their test algorithm for *C. difficile* to include PCR for detection of toxin genes. They are also involved in clinical studies to understand the role of rapidly growing mycobacterium in CF lungs disease. Thirdly, they are completing studies looking at the value of novel isolation media for the detection of MDR-*Acinetobacter*.

They recently completed a study to be presented at the American Society for Microbiology General Meeting on testing algorithms for detection of *Clostridium difficile*. Based on the findings of the study they have changed their clinical practice into the laboratory offering testing which has an improved turn-around-time as well as increased diagnostic accuracy. Dr. Gilligan is beginning an NIH sponsored study on the role of anaerobic bacterial in cystic fibrosis chronic lung infection. They currently are working to develop new testing strategies for detecting important pathogens. They currently are examining their culture techniques for detecting vancomycin resistant enterococci and Group B streptococci.

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

Dr. Godfrey will continue to provide collaborative pathology evaluations for colleagues in the Medical School faculty, particularly members of the Lineberger Comprehensive Cancer Center. Recent and continuing projects include morphologic evaluations of: 1) pig models of atherosclerosis and Type II diabetes (Nichols), 2) Brg 1 mutant mice (Bultman), 3) spontaneous neuroaxonal dystrophy in mice (Koller), 4) mouse models of prostate cancer (Earp) and 5) dog models of hemophilia (Nichols). She will assist in characterization of new mouse models through the interactions with the National Gnotobiotic Rodent Resource (B Sartor), the Mutant Mouse Regional Resource Center (MMRRC) at UNC (Magnusson), and the Collaborative Cross (Pardo Manuel de Villena).

OLEG V. GORKUN, Ph.D.

Among other proteins of coagulation system, fibrinogen evolved to function in dynamic environment of blood, where its molecule is a subject of external forces, exerted by flow and tissue movement. Dr. Gorkun in collaboration with Dr. Lord is using atomic force microscopy (AFM) as a tool to investigate the effect of physical force on fibrin-fibrin polymerization interactions and fibrin molecule structure. Their experiments (simulating a situation in which two interacting molecules of fibrin are forcefully disunited) demonstrated that forced dissociation of the major fibrin-fibrin polymerization interaction is associated with complex structural changes in the fibrin molecules. They hypothesize that observed structural changes are the part of mechanical mechanism helping fibrinogen to cope with external stress during its normal functioning in blood. To test this hypothesis they will be using AFM “force clamp” method to study the lifetime and reversibility of unfolding occurring in the fibrinogen molecule during forced rupture of ‘A-a’ bond. An understanding of the nanomechanical properties of fibrinogen/fibrin could be used to develop mathematical models which can predict clot behavior under varying conditions of blood flow (virtual clots) and in devising approaches to influence or manipulate fibrin network stability in blood.

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 malignancies and 2) developing new laboratory tests to assist in diagnosis and management of affected patients. In the past year there has been substantial progress towards these goals. In a gastric adenocarcinoma model system, they showed that EBV infection alters gene methylation and transcription. In Burkitt lymphoma, they provided the first clinical evidence of EBV replication in response to chemotherapy, which has implications for improving therapy by synergistic targeting of actively infected cells. In work of a more general nature, they teamed with researchers campus-wide to improve biobanking services for local investigators. They validated novel array-based assays for use in clinical trials. They also validated and introduced multiple new molecular assays to benefit patient care. This work builds on basic science discoveries and brings them into clinical settings using modern molecular tools, and it reinforces the important role of pathologists in translational research and advancing medical practice. In the coming year, they hope to win more funding to continue the most promising of these lines of research. They will continue to maximize productivity of local clinical investigators by making tissue/lab/pathologist resources available and by teaming to make progress on specific projects.

J. ED HALL, Ph.D.

Dr. Hall's research for the past 15 years has focused primarily upon examining basic mechanisms of cellular and tissue uptake and bioactivation of prodrugs of aromatic dicationic compounds with potent antimicrobial activity, mechanisms underlying the selective action of the dications against specific eukaryotic parasites and specific mechanisms of toxicity postulated for the dicationic compounds. The practical goal of their research has been the development of safe and effective new drugs to treat important, but neglected tropical parasitic diseases such as African sleeping sickness. Their research, however, was always driven by the basic science underlying the projects and the hope of actually developing new drugs seemed only an idealized, unachievable goal. In 2000, however, they were very fortunate to be able to receive substantial Gates Foundation funding for their project. This profoundly affected the focus of all their research efforts. Dr. Hall hopes to end his research career by significantly contributing to development of a safe and effective new drug, discovered in the course of their basic science research efforts, to treat central nervous stages of human African trypanosomiasis and one new drug to treat visceral leishmaniasis. During the upcoming year, he hopes to continue to contribute to moving their lead candidate drug, DB868, for trypanosomiasis and their lead, DB1960, for leishmaniasis into formal preclinical ADME/Toxicity testing, on the road to planned Phase I clinical trials in 2011. If either of these candidates fail important ongoing efficacy/toxicity tests during the next several months, then he plans to retire at the end of the year.

CATHERINE A. HAMMETT-STABLER, Ph.D.

Dr. Hammett-Stabler continues collaborations with Dr. Margaret Gourlay investigating the relationships between osteoporosis and various biomarkers. Although the relationship between declining estrogen concentrations in osteoporosis is well established, less is known about the contributions of other hormonal variables during the pre- and peri-menopausal periods on bone turnover. Data analysis will begin once testing is complete for 90 subjects (85 have been enrolled to date). In addition, work with Dr. Robert Aris continues in which they are studying the uptake and metabolism of immunosuppressant drugs by lung cells. Earlier studies, in which they demonstrated uptake and transport of cyclosporine, have lead to additional studies in the use of an aerosolized delivery mechanism in lung transplant patients.

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

The research of Jonathon W. 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 $\alpha(1,3)$ -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. The second goal is to determine the mechanisms whereby the FUTs regulate hemostasis and thrombosis. These studies are determining the mechanisms whereby fucosylation of selectin ligands and/or other blood cell surface molecules alters platelet function and aggregation. These

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

PEIQI HU, M.D.

In collaboration with Dr. Charles Jennette, Dr. Hu's current research has focused on 1) investigating involvement of genetic factors in pathogenesis of ANCA induced glomerulonephritis. They recently found that anti-MPO IgG caused different severity of ANCA disease in different strains of mice, which mimics disease variation in ANCA patients. Next, they will test the ANCA-mediated disease induction in eight different founder strains and try to explore genetic basis responsible for variations in severity of disease, and hopefully to find out candidate genes and their protein products that involved in pathogenesis of the disease. 2) trying to identify specific epitopes that are targeted by pathogenic anti-MPO IgG. They have already created recombinant mouse/human MPO chimeric molecules and will use them to detect the portion of mouse MPO that is responsible for the disease induction. 3) generating PR3-ANCA disease mouse model. Success with this model would advance our understanding of mechanism of PR3-ANCA disease.

JOHN HUNT, M.D.

Dr. Hunt is currently a participant on a protocol evaluating sentinel lymph nodes after adjuvant chemotherapy (Z 1071).

KAORU INOUE, Ph.D.

Expression of human Vitamin K epoxide reductase: Vitamin K epoxide reductase (VKOR) is the target of warfarin, the most widely prescribed anticoagulant for thromboembolic disorders. VKOR catalyzes the conversion of Vitamin K epoxide (KO) to Vitamin K (K) which is one of the steps to regenerate Vitamin K hydroquinone for the carboxylation of blood coagulation factors. In January, the crystal structure of bacterial homologue of vitamin K epoxide reductase was published in Nature (Weikai *et al.* Nature 2010 Vol 463 507-513). Although this structure gave them several clues to help decipher the function of this enzyme, it is still very important to solve the structure of human VKOR. This is critical because 1) the bacterial homologue didn't possess the enzymatic activity to convert KO to K while most of the amino acids which are essential for enzymatic activity are conserved in the bacterial VKOR homologue, and 2) the homologue protein has about 150 extra amino acids (AA) at the C-terminal region compared to that of humans. Dr. Inoue in collaboration with Dr. Stafford has tried to express human VKOR in *E. coli*. Only the N-terminal 40 AA peptide fragment is expressed very well and she is making an antibody against this peptide now. Full length of human VKOR was expressed in *E. coli* but the amount of purified protein was too low for crystallography. Currently, they are collaborating with Dr. Bill Studier at Brookhaven to develop an over-expression system of human VKOR in *E. coli* for crystal study and biochemical analysis of this enzyme.

J. CHARLES JENNETTE, M.D.

A major portion of Dr. Jennette's recent basic research has utilized an animal model of ANCA disease discovered in his laboratory that is induced by i.v. injection of mouse anti-myeloperoxidase (anti-MPO) IgG antibodies or anti-MPO lymphocytes into mice that is

mediated primarily by activation of neutrophils. Activation of the alternative complement pathway is critically involved in the pathogenesis of disease in this model. ANCA-activated neutrophils release factors that activate complement, which in turn primes neutrophils for further activation by ANCA. These effects and other ANCA-mediated pathogenic events depend on generation of C5a by alternative pathway activation and on engagement of C5a receptors on neutrophils. Blockade of this critical pathogenic step abrogates disease induction, which suggests a possible novel therapeutic strategy in humans. Recent ongoing studies using this mouse model as well as patient samples indicate that Fc gamma receptors are involved in pathogenesis and in the modulation of disease phenotype. Genetic variations among mouse strains have a dramatic influence on disease severity. Genomic studies are underway to identify the genes responsible for these differences in disease severity. Candidate genes or genetic polymorphisms will be studied in parallel in patients with ANCA disease. Bone marrow transplant studies of anti-MPO disease have demonstrated that these genetic influences act primarily on and through bone marrow derived cells. Experiments are underway to assess the induction of disease by antibodies against specific MPO sense and anti-sense peptides. Pathogenic epitopes are being mapped using human-mouse chimeric molecules. In the mouse model, antibodies against recombinant mouse MPO are pathogenic but antibodies against recombinant human MPO are not. The Lab is preparing chimeric molecules from clones that have various segments of the murine MPO gene mixed with segments of the human MPO gene. The hypothesis is that one or more, but not all of these chimeric molecules will induce antibodies that cause disease, thus identifying the portion of the MPO molecule that is the target of pathogenic antibodies.

HARVEY MICHAEL JONES, M.D.

Dr. Jones teaches in various medical school student labs: respiratory, urologic, breast.

KATHLEEN A. KAISER-ROGERS, Ph.D.

Research in their clinical cytogenetics laboratory involves the use of both traditional and molecular cytogenetic techniques including fluorescence in situ hybridization (FISH) and microarray comparative genomic hybridization (array CGH) to identify and characterize rearrangements found in their patient population. During the first half of 2010, their laboratory will be adding the small nucleotide polymorphism (SNP) microarray technology to our repertoire of tests. Additionally, the cytogenetics laboratory is actively involved in cancer cooperative group studies through CALGB and COG and they frequently serve as a resource for researchers on campus who are interested in applying cytogenetic techniques to their research projects. They are currently helping two separate research groups within the UNC system utilize FISH and G-band analysis to identify chromosome instability.

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

Dr. Kakoki's current research in collaboration with Drs. Smithies and Maeda aims at finding ways to prevent diabetic complications. Recently he found that the phenotypes and the underlying mechanisms of diabetic complications mimic those of normal aging. In the coming year(s), he will generate and analyze several sorts of genetically modified mice which are relevant to aging/diabetic complications.

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

Previous studies showed that cells are most susceptible to transforming effects of carcinogens when the treatments occur in the earliest part of S phase, so they have been studying the features of early S phase that determine this susceptibility. They showed that DNA replication during the S phase is a temporally ordered. They cloned DNA replicated in this interval, sequenced it and mapped it to the human genome map. They found that genes in the apoptosis, Wnt, and base excision repair pathway, all of which are involved in cancers, are the gene families most represented in early S DNA. Using extended DNA fibers they found that replication in early S phase most commonly involves the activation of single DNA replication origins; replication at these sites pauses for an interval of about 15 minutes shortly after replication begins and thereafter resumes replication. They have developed methods to study chromatin in single extended fibers which allows them to detect proteins present at sites of DNA replication. These methods have allowed them to show that GINS and Brg1 proteins are present during activation of replication and they and other proteins are present at sites that are to be activated. Their goal is to find chromatin markings that determine the temporal order of replication. They are also using studies of extended DNA fibers to enable them to find the locations of origins activated in early S phase. They have quantified sites of DNA damage on extended DNA fibers and shown the relationship between damage and DNA replication sites; they now seek to explain the clustering of DNA damage sites. Using massive DNA sequencing methods, they seek to determine replication order and sites of DNA origins.

Studies of the biology of human endometrial cells have progressed to the point where they can effectively reconstruct the functional human tissue in the form of co-cultures of human endometrial stromal and epithelial cells. The reconstructed endometrial tissue has been found to simulate the menstrual cycle in vitro in response to hormonal variations like those that occur in women during the menstrual cycle. Ongoing studies are attempting to distinguish the roles of estrogen receptors alpha and beta in regulating proliferation and differentiation of endometrial epithelial cells, determining the role of proteins in the IGF-signaling pathway in mediating stromal cell control of epithelial proliferative responses to estrogen, and the ameliorating effects of the phytoestrogen, genistein, on estrogen driven effects in the endometrium. They are seeking to identify an immunohistochemical marker for endometrial intraepithelial neoplasia (EIN) based on gene expression changes correlated with changes in the quantitative relationship between epithelial and stromal cells in co-culture like those that distinguish normal endometrium from EIN in vivo. Finally, they are attempting to determine whether they can simulate embryonic implantation in their co-cultures as a means of testing for environmental estrogens that disrupt implantation. At present his major focus is on obtaining renewed funding for his research and for successful renewal of their training grant.

WILLIAM K. KAUFMANN, Ph.D.

Dr. Kaufmann was informed in February that NIEHS will not be supporting program project grants, so their NIEHS program project in melanoma will have to find other means of support in 2012. The plan is to break the program into smaller R01's of less than \$500,000. His specific research interests continue to focus on the mechanisms of chromosomal instability in melanoma and how sunlight-induced DNA damage causes interstitial deletions of tumor suppressor genes. He is also trying to develop a collaboration with systems biologists at MIT which could lead to support by the integrated cancer biology grant mechanism. His job as Research Navigator in the

Center for Environmental Health and Susceptibility will include responsibility for organizing yearly center retreats. He is thinking about ways to use the CEHS to enhance training in environmental health on campus and especially the Environmental Pathology training grant. He will be joining Cancer Etiology Study Section as a permanent member in October, 2010.

HYUNG-SUK KIM, Ph.D.

Dr. Kim's research, in collaboration with Drs. Smithies and Maeda, has concentrated on the study of hypertension with particular emphasis on the rennin-angiotensin-angiotensin-aldosterone system in mice. Essential hypertension is characterized by an elevated blood pressure without ascertained cause. Genetic and environmental factors are important in its etiology.

To study complex genetic disease, various animal models have been generated by gene targeting techniques, gene disruption and duplication. Resulting animals have shown the genetic factors to play a key role. To understand homeostatic response to the genetic changes, he developed a molecular phenotyping procedure by the gene expression studying using high-throughput real time RT-PCR method. The results showed its power for recognizing subtle phenotypic changes in animals even with minimal genetic differences.

Dr. Kim, the core director of the gene expression study, uses this powerful technique and has collaborated with many researchers in many fields: mainly cardiovascular diseases with Drs Smithies and Maeda; kidney problems with Drs. Arendshorst, Coffman (Duke Univ.), O'Connor (UC-San Diego), and Sharma (UC-San Diego); cancer research with Dr. Patel; and stem-cell research with Dr. Malouf. His future goal is continued development searching surrogate markers in many other diseases using gene expression research and more collaboration is possible.

JOE N. KORNEGAY, D.V.M., Ph.D.

Independent of the NCDMD, whose funding is now jeopardized, Dr. Kornegay plans to continue his own hypothesis-driven projects, focusing particularly in three areas: (1) Use of autologous cells that have been corrected using a lentivirus-minidystrophin construct to treat GMRD dogs. In the context of these studies, they have developed a strong collaboration with Nancy Allbritton, the chair of biomedical engineering focused on use of a unique micropallet technology to isolate muscle and other stem cells. An Association Francaise contre les Myopathies grant was submitted earlier this year and is still pending (as alluded to briefly above, this grant includes a salary for my graduate student, David Detwiler. (2) Genomic-phenotypic correlation in GRMD dogs to better characterize the basis for phenotypic variation. They will continue to collaborate with Eric Hoffman at Children's National Medical Center in DC and Scott Schatzberg at the University of Georgia. Dr. Schatzberg submitted MDA and NIH grants for these studies. Both are pending. (3) Mechanisms contributing to muscle hypertrophy in GRMD dogs. They submitted an ARRA RC24 grant in collaboration with Dr. Kathryn Wagner at Johns Hopkins to support these studies.

RUTH A. LININGER, M.D.

Dr. Lininger is focused heavily on clinical work at this juncture in her academic career, given the heavy clinical responsibilities in surgical pathology as a clinical tract faculty, and given the

heavy workload on the Gyn and Breast surgical pathology benches. Since they are hiring three new junior faculty, two of which will be signing out on the Gyn and Breast surgical pathology benches, and given that she is the senior breast pathologist and will be the only full time senior Gyn pathologist, she anticipates being busy reviewing consults for Gyn and Breast cases for the new faculty as well as the other faculty already at UNC, and also the fellows that will be signing out in the Spring. Administrative activities include scheduling and coordinating surgical pathology billing issues that come up. She has inherited many collaborative Gyn research projects that were formerly Dr. Livasy's which she is carrying out, and also working on the Gyn chapter for Dr. Reisner's concise pathology textbook for medical students. Her research focus is largely on Gyn pathology translational research at this time. Other activities include growing her gynecologic and breast pathology private outside consult service (Dr. Lininger is the gynecologic pathology expert consultant for Spectrum Laboratory in Greensboro, NC, which has increased her volume, and, she plans to advertise her clinical consult services in the coming year, assuming the volume on the Gyn and Breast services is redistributed with the addition of a new bench, since the current heavy service volume precludes taking on any additional outreach service at this time).

CHAD A. LIVASY, M.D.

Dr. Livasy's collaborative translational breast cancer research projects included continuation of the CALGB 150007 study (predicting response to neoadjuvant chemotherapy with molecular markers), clinical validation of the PAM50 RT-PCR assay for breast cancer, and identification of novel angiogenesis targets. Published book chapters, published this year, included a chapter on "Triple-Negative Breast Cancers" for the Surgical Pathology Clinics issue of "Current Concept in Breast Pathology" and pathology section for 12 chapters in the book "Gynecologic Cancer Management: Identification, Diagnosis and Treatment." Significant invited lectures over the last 6 months include chairing and lecturing at a symposium on triple-negative breast cancers in Marseille, France and presenting Grand Rounds at Memorial Sloan Kettering Cancer Center. Goals for the upcoming year included a comparison of intrinsic tumor subtype and CGH in matched DCIS and invasive breast cancer specimens and evaluation of rare triple-negative histologic subtypes of breast cancer with the PAM50 breast cancer assay.

SUSAN T. LORD, Ph.D.

Dr. Lord's research is focused on the coagulation protein fibrinogen. Their studies aim to provide insight into the molecular mechanisms that mediate fibrinogen's functions with the long term goal of providing basic information relevant to the prevention, diagnosis or treatment of disease. Their current studies examine the mechanisms that control fibrin clot formation. This year they focused on the interactions that mediate the second step in fibrin formation, the step called lateral aggregation. They have developed new techniques to address this question, including dynamic light scattering. Data from these experiments has not yet provided an answer to this question. They also continued to examine the role of FXIII in controlling clot formation. They have developed the assays and reagents to monitor the kinetics and thermodynamics of these reactions.

Their studies on the strength and elasticity of fibrin clots and fibrin fibers continue to be productive. Michael Falvo, in the Department of Physics at UNC-Chapel Hill, and Dr. Lord have submitted proposals to both the NIH and NSF. In these studies they measure the forces needed to stretch and break individual fibrin fibers and small networks. Their studies have

shown that the remarkable mechanical properties of fibrin likely stem from an unfolded region of fibrinogen, called the α C region. They have synthesized variant fibrinogens to test the hypothesis that changes in specific segments within this region will lead to changes in the elasticity and extensibility of fibrin fibers.

CHRISTOPHER P. MACK, Ph.D.

The overall goal of the Mack lab is to identify the signaling pathways and transcription mechanisms that regulate SMC differentiation. They have recently shown that nuclear localization of the myocardin family SRF co-factors by RhoA/Diaphanous signaling is an important mechanism by which extrinsic factors regulate SMC-specific transcription. Their current studies on the RhoA signaling mechanisms involved are focused in the following areas; 1) involvement of the RGS-RhoGEFs in the activation of RhoA in SMC; 2) the activation of the downstream RhoA effector, mDia2, by phosphorylation; 3) The regulation of nuclear actin polymerization and its effects on SMC-specific transcription. The Mack lab is also studying several other molecules and pathways that affect SRF/myocardin factor-dependent transcription. Of particular interest is their demonstration that the myocardin factors are regulated by ubiquitin-mediated degradation, and that the LIM protein, FHL2, inhibits this mechanisms. They also identified the histone demethylase, *jmjd1a*, as an MRTF-A interacting protein, and a relatively new and exciting research focus is on the epigenetic control of SMC-specific transcription through modifications to chromatin structure. They hope to further characterization of the mechanisms that regulate SMC differentiation using *in vitro* and *in vivo* models which should lead to therapeutic targets for several cardiovascular pathologies that involve altered SMC phenotype.

NOBUYO MAEDA, Ph.D.

Dr. Maeda's general plan for the coming year is to gradually shift the work on animals *in vivo* back to her deep interest on genomic/genetic aspects of science. For example, in collaboration with Dr. Malouf, they have begun to analyze epigenomic changes associated with cardiac cell differentiation from embryonic stem cells and from adult stem cells. The first step towards this is to secure research funding and she is trying.

Summary of current research: Apolipoprotein E plays a central role in lipoprotein metabolism and is required for the efficient receptor-mediated clearance from plasma of chylomicron remnants and VLDL-remnants by the liver. ApoE deficient mice as well as mice expressing human apoE isoforms instead of mouse apoE have provided them tools to develop a deep understanding of the genetic factors underlying atherosclerosis for some years. During the last year, they have made two very important findings. The first is that the apoE^{-/-} mice in two inbred strains (C57BL and 129) atherosclerotic plaques at different rates at different locations of their aorta. There are also differences in geometric parameters of aorta between these strains. To test a hypothesis that genetic factors determining aortic geometry determines susceptibility to plaque development, they characterized F2 mice between 129,B6 apoE^{-/-} mice. SNP analyses revealed angle of aortic curvature is determined by a genetic locus that maps to the same region of chromosome 1 with the loci that determines the plaque size in aortic arch, while the plaque size in aortic root was determined an independent locus on chromosome 9. To narrow the chromosomal regions, they will be analyzing F2 mice between 129 and DBA apoE^{-/-} mice in the coming year. The second significant finding is that the mice with human apoE4 isoform are resistant to high fat-induced obesity compared to mice with apoE3. However, adipose tissues in

mice with apoE4 show reduced functionality, and mice develop diet-induced insulin resistance earlier than apoE3 mice. Moreover effect of rosiglitazone, an insulin sensitizer, is blunted in mice with apoE4 than with apoE3. Humans with apoE4 have increased LDL-cholesterol and increased cardiovascular incidents compared to those with apoE3. They will continue to investigate how susceptibility to diet-induced insulin resistance in the mice with apoE4 impact to their susceptibility to cardiovascular disease.

NADIA N. MALOUF, M.D.

Dr. Malouf's research focuses on understanding the mechanisms underlying the plasticity of adult-derived stem cells in acquiring a cardiac phenotype. They recently found that Ca²⁺ oscillations in stem cells transmitted from adjacent cardiomyocytes activate Ca²⁺ signaling that involves the Ca²⁺-calcineurin-NFAT pathway. They had previously demonstrated that the expression of a novel calcium binding transcription activator, CAMTA1, is significantly up-regulated in human Mesenchymal Stem Cells (hMSC) co-cultured with cardiomyocytes early on in co-culture and before the hMSCs acquired a cardiomyocyte phenotype. They hypothesize that CAMTA1 has a key role in the commitment of stem cells acquisition of a cardiomyocyte phenotype. They are presently using loss-of-function studies to investigate and confirm their hypothesis. In a separate study, they are collaborating with Dr. Nobuyo Maeda in their department to investigate whether mouse MSCs from mouse bone marrow acquire a cardiac phenotype in co-culture with cardiomyocytes. These mice have been genetically engineered to express respectively fluorescent cardiac specific alpha or beta Myosin Heavy Chain proteins. Their preliminary studies indicate that these mMSCs acquire a cardiac phenotype when placed in a cardiac microenvironment as they start expressing these cardiac specific fluorescent proteins about a week after they are in culture. They will manipulate the environment so as to optimize the efficiency of this process.

SUSAN J. MAYGARDEN, M.D.

Dr. Maygarden's collaboration with the prostate group at UNC/LSU/Roswell Park is continuing. She maps prostate biopsies and prostatectomy specimens for cancer so they may be microdissected and arrays constructed, and assign Gleason grades to the tumors. She also has a longstanding collaboration with the Carolina Mammography Registry. Their current project is identification of false positive mammography cases. She abstracts pathology reports and serves as a consultant to the registry.

Her clinical service is in surgical pathology and cytology, and the clinical research she engages in is associated with the services she attends on. She worked on a project with one of the current cytopathology fellows, Dr. Lori Scanga, on the diagnostic yield of renal fine needle aspirations, and they submitted an abstract to the upcoming American Society of Cytopathology meeting. She contributed to projects with UNC radiologists on the role of immediate interpretations in thyroid FNAs. She is completing a manuscript on the pathologic features of screen vs. interval breast cancers in white and African American women from the Carolina mammography registry.

CHRISTOPHER R. McCUDDEN, Ph.D.

Dr. McCudden is testing whether consolidated laboratory reports and additional laboratory testing will increase the diagnostic value of cerebrospinal fluid analysis. Routine CSF tests, such

as cells counts and electrophoresis, will be combined with quantitative IgA and IgM immunoglobulins and plasma proteins tests in an enhanced interpretative report. It is hypothesized that integrating all the test results will facilitate diagnosis of various neurological disorders more readily than traditional reports.

Dr. McCudden is currently completing two manuscripts for ongoing projects and continues work on several other projects related to the protein electrophoresis area. One of the manuscripts in preparation is on the PTH nomogram study to classify patients with disorders of calcium homeostasis, such as primary hyperparathyroidism. An abstract of this work has been accepted to the AACC annual meeting in Anaheim. Another manuscript in preparation and the subject of an abstract describes a comparison of pleural fluid and platelet collection pH between the in-house instrumentation and a reference instrument. These are basic method comparisons that do not currently exist in the literature, but will be of significant interest many users of this method.

Continuing studies include the serum protein electrophoresis study and the B2-transferrin project. With collaborators, Dr. McCudden is completing data collection for a study assessing the relative analytical sensitivities of different electrophoresis platforms, including a new capillary device that is pending FDA approval. As described previously, these studies have significant implications for the diagnosis and therapeutic monitoring of various plasma cell dyscrasias, such as multiple myeloma. The B2-transferrin project is also a collaborative project where he is evaluating a new method for detecting CSF leaks. He has recently overcome a stumbling block of getting specimens from a surgeon and anticipate completing the study in the next year.

GAYLE C. MCGHEE

Gayle McGhee works closely with the Pathologist to get material whether gross or teaching material, help schedule laboratory time to be in teaching and give support to them in preparation for lab or lecture for which they are responsible.

Autopsy – Ms. McGhee also continues to work closely with autopsy personnel to maintain and gain additional teaching material for the departments needs. She continues to share ideas on equipment and the latest technology that is being used in the field. Changes in autopsy volume continue to change so it is important that the autopsy personnel as well as Ms. McGhee work more effectively together. The autopsy room arrangement of space remains to be a challenge in respect to meeting their teaching class time schedules with the autopsy workflow and their lab time overlapping in use of the autopsy suite. There are only so many washing/work areas for the gross specimens to be prepared for the classes. This has been accomplished by autopsy personnel and teaching communicating on the daily activism. All gross specimens that are saved for teaching as well as specimens teaching personnel collect have to be cataloged, inventoried, filed appropriately, preserved and accessible by log system or computer search. Maintaining how many, what they are, when needed and when to wash for availability for class take good management. Then to replace specimens back in formalin and stored is time consuming. The scanning of virtual microscopy is now a vital part in their teaching. She continues to scan slides and collect more interesting slide cases for use in teaching. They have made their virtual images available to all by placing in a spreadsheet with diagnosis and important information as to retrieval of the virtual images. The volume has increased this year with more scanning for research projects using Ms. McGhee to scan.

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) develop a protein-level molecular classification of human GBM with distinct response to the current standard-of-care therapy (temozolomide + radiation (TMZ-XRT)); 2) define the impact of engineered genetic alterations and secondary genetic events on astrocytoma subtype-specification in GEM; and 3) determine molecular signatures of GEM GBM after TMZ-XRT.

MELISSA B. MILLER, Ph.D.

Melissa Miller's, Ph.D., 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. During the last year, Dr. Miller has researched the molecular epidemiology of community-associated methicillin-resistant *Staphylococcus aureus* (CA-MRSA) in North Carolina. This project has extended beyond the patients of UNC Health Care to child care centers in North Carolina and Virginia to further investigate the public health implications of CA-MRSA. Dr. Miller's laboratory serves as the core laboratory for the molecular characterization of MRSA isolated from cystic fibrosis patients in a collaborative multi-center study with Dr. Muhlebach in the Department of Pediatrics. In addition, she is also employing and comparing a variety of molecular technologies, including microarrays and sequencing technologies, in the clinical diagnosis and epidemiology of respiratory viral infections (including pandemic influenza) and the molecular diagnosis of sepsis. The clinical laboratory she directs was instrumental in UNC Health Care's response to the H1N1 influenza pandemic.

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

Vincent Moylan's role as clinical instructor within the department is assisting in the training of the residents in evisceration and en bloc dissection techniques when they rotate to the autopsy service. The instruction is also extended to other medical professionals (nurses, residents) outside of the department as well as medical students who are required or on occasion receive permission to attend an autopsy. He works closely with residents during the autopsy procedure and explains the gross differences between normal and abnormal anatomic findings and how they correlate with the previous patient medical history. In addition, dissection strategies are also explained in regard to both straightforward and complex cases that are essential to proper demonstration of the organ anatomy during the weekly autopsy gross conference. The importance of digital images to document all significant findings during the autopsy is stressed. The development of a searchable autopsy digital image database for appropriate departmental clinical staff is very close to being implemented this year. He is also closely allied with Dr. Nickleit and the Nephropathology laboratory and responsible for the processing of select renal cases (transplant rejection, ESRD, non-functioning kidneys) through gross examination and digital imaging. He recently collaborated with the Department of Genetics on multiple projects and was included as an author on several papers, abstracts, and poster presentations. In addition, he is also collaborating with several residents regarding a few rare and unusual autopsy cases that they hope to submit for publication. He looks forward to continuing work with Drs. Reisner and Hadler regarding other medical student related teaching projects.

VOLKER R. NICKELEIT, M.D.

The research activities of V. Nickleit, M.D., focus on different aspects of renal allograft pathology. 1) Adjunct markers (in particular tubular MHC-class II expression and capillary C4d deposition) for the diagnosis of cellular and humoral graft rejection episodes in kidney and liver grafts are under investigation. 2) A major research effort addresses polyomavirus infections in kidney allograft recipients. Quantitative PCR tests are used to study latent viral loads (BK and JC viruses) in different patient populations from the US and India and to correlate PCR readings with histology and plasma anti-polyomavirus antibody titers. The goal is to identify potential risk constellations in donor kidneys arising from high latent BK – or JC-virus loads. A new and exciting line of investigation focuses on non-invasive diagnostic strategies to establish a diagnosis of “polyomavirus nephropathy” without an (invasive) biopsy (in close cooperation with H. Singh, M.D.). Negative staining electron microscopy on voided urine samples and the search for three-dimensional polyomavirus clusters have proven in pilot analyses to be highly robust diagnostic methods with negative and positive predictive values of greater than 90%. Extended prospective studies are currently conducted in order to validate the initial findings further.

JUDITH N. NIELSEN, D.V.M.

Dr. Nielsen is continuing her collaborations with Nancy Raab-Traub from the Lineberger Cancer Center in her studies of Epstein Barr Virus LMP influence on tumor formation in mice. They are currently studying one of her genotypes in which LMP is under control of a keratin promoter, where ocular lesions have been identified, as well as metastatic squameous cell carcinoma when this genotype is fixed into different genetic backgrounds. Since metastatic squameous cell carcinoma is not easily modeled in mice, this finding could be of particular interest as an animal model of metastatic disease. These studies have resulted in a second paper being prepared for publication.

Dr. Nielsen has also continued her collaboration with a former post-doctoral student in the Joseph Heitman Laboratory, Department of Molecular Genetics and Microbiology at Duke University studying pathogenesis of *Cryptococcus neoformans* in a mouse model. A pilot study performed in August, 2009 at UNC utilizing their BSL2 cell sorting capabilities has generated the final data for a paper accepted for publication in PLoS Pathogens in January and submission of an R01 grant in which she will serve as a collaborator. This work is a continuation of her collaboration on a successful NIH NIAID K-22 grant “A link between mating pheromone sensing and virulence of *Cryptococcus neoformans*” with Dr. Kirsten Nielsen, who is now a faculty member in the Department of Microbiology, School of Medicine at the University of Minnesota.

Dr. Nielsen has developed PCR- based testing for Mouse Parvovirus (MPV) and *Leptospira bratislava* and worked with Dr. Kim in developing PCR-based tests for *Aspicularis tetraptera* and *Syphacia oblavata* in clinical specimens from their animal colonies and sentinel animal program in the DLAM. Dr. Nielsen has acquired a real-time PCR machine and, with Dr. Craig Fletcher, has hired a Research Specialist for DLAM Molecular Diagnostic Testing Development. They are currently establishing a new PCR-based testing laboratory in Genetic Medicine that will expand their testing and research capabilities.

YARA A. PARK, M.D.

Dr. Yara Park's clinical research focuses on thrombotic thrombocytopenic purpura (TTP), specifically the causes and exacerbating factors. She is currently investigating the role of infection in both the initial presentation of TTP as well as exacerbations during treatment. Additionally, she is the co-PI for the UNC site of the Transfusion Medicine and Hemostasis Clinical Trials Network grant which has three studies in progress (RING, STAR, and RECESS). Within that grant, she is the PI of the RING trial at UNC which will assess the efficacy of granulocyte transfusion in neutropenic patients with infections and the co-PI of RECESS trial which will investigate the difference between blood banked for shorter versus longer intervals in cardiothoracic patients. She is also a co-PI of the STAR trial which is studying the use of rituximab in TTP patients. Within STAR, she will be doing a sub-study with Dr. Yuri Fedoriw looking at the significance of schistocyte count and rate of relapse in TTP patients. She is also performing a device trial for BCSI, Inc. The trial is comparing their device to measure the pH of apheresis platelet units with the standard currently used, blood gas analyzer. The study is a four month study scheduled to begin in 2010. For this project, she performed a validation study of the blood gas analyzer as compared to a pH meter with Dr. Chris McCudden. They plan on publishing the results in the near future.

Additionally, Dr. Park plans to finish up manuscripts for multiple abstracts she has previously published and is co-authoring a chapter in the new edition of the book Apheresis with Dr. Mark Brecher and their current fellow, Dr. Sara Koenig.

KATHLEEN W. RAO, Ph.D.

Dr. Rao's research activities are conducted primarily through the cancer cooperative groups (CALGB and COG). In both groups she is a member of the Cytogenetics Committee which plans, reviews and analyzes cytogenetic studies that are conducted as part of the on-going treatment studies. In both groups, cytogenetic data is correlated with treatment outcomes and patient survival. In the COG (Children's Oncology Group), she is the cytogeneticist for the Infant ALL study, and will monitor the percentage of abnormal karyotypes as well as the type of cytogenetic abnormalities seen and their correlation with patient outcomes. Dr. Rao's other research interest is in laboratory quality assurance, and to that end have been involved in developing laboratory standards for cytogenetic testing. She has also been involved in projects aimed at both educating laboratory directors about QA issues and measuring the effectiveness of practice standards.

For the future, she is interested in pursuing the clinical use of whole genome microarrays for solid tumors and hematological malignancies with normal cytogenetics at diagnosis. Microarrays are just becoming commercially available for these applications, and clinical utility studies are beginning to appear in the literature. They are currently in the process of validating a high resolution oligo/SNP array for clinical application in the cytogenetics laboratory. This platform will be especially appropriate for use with cancer samples as SNP arrays can detect loss of heterozygosity, a common mechanism of genetic change in neoplasia.

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. He is likely to deserve the student comments he receives (and his continue to be quite good).

His work with the Aperio Image Analysis platform has led to collaboration in a project with Nancy Thomas and others which was part of a recent submission to the NIH. This is likely to continue for the coming of the year.

He is involved in a research project with one of Dr. Tidwell's graduate students (Rachel Goldsmith) which will lead to at least two publications-the first of which has been published and continue to undertake projects involving new educational materials in collaboration with Dr. Woosley. The most recent involves adapting an Ajax/Seadragon browser for use with pathology images.

ARLIN B. ROGERS, D.V.M., Ph.D.

Dr. Roger's lab is focused in host/environment interactions in chronic liver disease (especially cancer), with a special interest in the role of gender on disease progression. They are concentrating their current efforts on the impact of epigenetic remodeling on susceptibility to hepatocellular carcinoma (HCC), using both mouse models and cell culture systems. He is resubmitting an R01 on this topic for the July 5, 2010 deadline.

Currently they are evaluating the influence of NF- κ B on liver cancer using pharmaceutical and genetically engineered mouse approaches. Other interests of the lab include how genetic and epigenetic influences combine to promote aflatoxin B1 induced liver carcinogenesis, and the influence of gut microbiota on tumor risk.

JOHN L. SCHMITZ, Ph.D.

Dr. Schmitz has ongoing activities in several areas. Dr. Schmitz' CFAR Immunology Core supports the research activities of HIV investigators at UNC and Duke University by providing phenotypic, functional and immunogenetic testing services. The Schmitz lab has ongoing collaborations with investigators at UNC assessing the influence of HLA in autoimmune disease and aberrant responses to therapeutics (manuscripts in preparation for both). An additional area of investigation is to characterizing the performance of highly sensitive HLA antibody detection methods and their role in organ allocation, and transplant outcome. Dr. Schmitz' laboratory is actively involved in the assessment of HIV diagnostics (4th generation rapid test, contract under review) including less expensive methods for CD4 T cell enumeration (POC instrument; contract under review) and an ongoing study of a 4th generation (antigen/antibody combination tests) HIV test in collaboration with the UNC Center for Infectious Diseases. Finally, they are preparing manuscripts describing their evaluation of new platforms for autoimmune testing (CCP and ENA). Dr. Schmitz responded to an RFP from the national marrow donor program to provide laboratory testing in support of a bone marrow transplant for lymphoma in HIV patients and is in the process of writing the Immunology Core renewal application for the CFAR. Plans for next

year include increasing the use of automation in the clinical laboratories to enhance efficiency and implementation of new tests to reduce the Hospital labs sendout volume.

DENNIS A. SIMPSON, Ph.D.

Dr. Simpson's research activities are split between three main areas. The first; as a member of the cell biology core of William Kaufmann's PPG, he is responsible for developing enhanced protocols for the growth of normal human melanocytes *in vitro*. The other primary responsibility in this core is to engineer these cells to express mutant forms of proteins deemed important by the other researchers in the project. The second is to maintain and continue to develop a web based application that allows users to construct proteomic maps of human, yeast, or worm proteomes. This allows users to construct and compare the maps across these divergent organisms. This resource is available to anyone free of charge inside or outside of UNC. The URL is: <http://top2a.med.unc.edu/idea>. The final area is a study designed to better understand the DNA damage induced G2 checkpoint and the G2 to M transition in cells. This study is being done in collaboration with one of their post-docs, Kevin Kessler. They are developing a predictive mathematical model of the G2 to M transition in cells. This model takes advantage of the IDEA web site to put together protein interactions as well as mining the literature. Their first version of this model agrees very well with published data and has yielded predictions that they are currently testing. The power of this model is both its ability to suggest experiments that they would not normally do and to allow a "what if" series of tests to be done prior to every going to the bench. They are currently in the process of writing grant applications based on this model. In the future Dr. Simpson hopes to continue the development of this model with Kevin by incorporating additional aspects of the DNA damage response pathway as well as pathways involved in the regulation of DNA synthesis.

HARSHARAN K. SINGH, M. D.

Clinical responsibilities: Nephropathology and Electron Microscopy. She spends approximately 42-44 weeks on clinical service in the UNC Nephropathology Division. She supervises and teaches fellows during the daily evaluation approximately 1800 biopsy specimens/year. These include native and transplant biopsies. She serves as the director of electron microscopy services for UNC Hospitals and is responsible for the ultrastructural examination of specimens sent from Anatomic Pathology as well as specimens sent from Hematology Oncology for workup of platelet abnormalities. She supervises Nelson Goines, electron microscopy technician in UNC Hospitals. She serves as the Associate Director of the Nephropathology Division and in this role she helps the director with daily administrative activities of the Nephropathology Laboratory. She also manages their web-based communications platform "Pathagility" used to communicate biopsy results/reports with our outside referring physicians across the country (secure HIPAA compliant web-based server platform).

Research activities: Dr. Singh's research interests have been in the area of kidney transplant pathology incorporating her interests in electron microscopy and cytopathology. Ongoing work in the area of renal transplant pathology is underway using negative staining electron microscopy of urine to qualitatively identify "Hufen" as accurate non-invasive biomarkers of polyoma-BK-virus nephropathy (published in *JASN*, February 2009 and *Ultrastructural Pathology*, December 2009). A prospective study is underway at UNC (started 1/2009) to confirm their retrospective findings and this will now be in collaboration with the University of Maryland (starting

12/2009). They have also began setting up a prospective study with Queen Elizabeth Hospital, Birmingham UK and Oxford University, UK (beginning 1/2010). They have received unrestricted funding from Astellas Pharma to support this prospective study for a period of 3 years. They are continuing work to design other testing methods for the identification of Haufen and are evaluating flow cytometry as well as setting up an ELISA assay to make testing more widely available as easier to perform. They have begun experiments to use free virus containing specimens to create Haufen in-vitro by mixing with Tamm-Horsfall protein under varying laboratory conditions with very promising preliminary results. They are also conducting an international consensus study for a new classification of BK Nephropathy and funding for this endeavor is currently under review at the ERA-EDTA.

SCOTT V. SMITH, M.D.

Clinical activities are focused in surgical pathology with emphasis in pediatric, breast, pancreatic, endocrine, ENT, thoracic, genitourinary, prostate, cardiovascular, bone and soft tissue pathology. Dr. Smith is collaborating with Dr. Ian Davis in Pediatric Oncology on a new project to evaluate genome-wide identification of active regulatory elements in fresh and archival human cancers.

Dr. Smith's current clinical activities are focused in surgical pathology with broad emphasis in pediatric, breast, pancreatic, endocrine, ENT, thoracic, genitourinary, prostate, cardiovascular, bone and soft tissue pathology. His teaching activities are substantial within the medical center including the Schools of Medicine, Dentistry, and Public Health, as well as clinical teaching on the Surgical Pathology Service. In the School of Medicine, he continues as Course Co-Director for the Cardiovascular Pathophysiology course overseeing the integration of clinical cardiology and cardiovascular pathology in the second year medical student curriculum. His emphasis has been on clarity of format, content and presentation to maximize student learning and comprehension, using both traditional and non-traditional approaches. He also continues his role as a lecturer in the introductory pathology curriculum during the second year curriculum. He serves on the Second Year Course Director's Committee for the School of Medicine. In surgical pathology, he instructs residents and fellows in current diagnostic techniques in general surgical pathology with emphasis on breast, colorectal, endocrine and pediatric neoplastic and non-neoplastic conditions. He also participates in didactic instruction of residents in cardiovascular pathology and pediatric pathology. These efforts have been rewarding and he hopes to continue these activities while progressively improving the learning experience for their trainees.

Dr. Smith's research interests are clinical translational studies in solid tumors. He has undertaken collaborations with Dr. Julie Blatt and Dr. Ian Davis in the Division of Pediatric Hematology Oncology in the Department of Pediatrics. He is currently collaborating with Dr. Ian Davis in Pediatric Oncology on a new project to evaluate genome-wide identification of active regulatory elements in fresh and archival human cancers. Future goals include assuming a role as consulting pathologist with the breast carcinoma research program at UNC.

OLIVER SMITHIES, D.Phil.

Dr. Smithies' research has been working towards understanding genetic factors that influence hypertension and kidney damage in diabetics - conditions with strong genetic and environmental components. Currently they have shown that genetic changes which affect the

level of expression of the genes coding for angiotensinogen (AGT), or for renin, or the type 1a receptor for angiotensin II (Atr1a), or the endothelial form of nitric oxide synthase (eNOS), or the atrial natriuretic factor (ANF) or two of its receptors (NPRA and NPRC), all affect blood pressures in the mouse. Surprisingly, comparable changes in the gene coding for the angiotensin converting enzyme (ACE) do not alter blood pressures. This finding led them to their most recent work which uses animal models to understand the genetic basis for differences in the risk of kidney damage in diabetic individuals. Additionally, Dr. Smithies is using gold nanoparticles to test his hypothesis that the glomerular basement membrane is the place where the kidney separates differently sized macromolecules.

NOBUYUKI TAKAHASHI, M.D., Ph.D.

Diabetic nephropathy (DN): Human eNOS (*NOS3*) polymorphisms that lead to lower eNOS expression are associated with DN and renal failure. Using eNOS^{+/-} mice that produce NO equivalent to individuals with human *NOS3* polymorphisms they have demonstrated that mild decrease in eNOS causes exacerbation of DN due to increased tissue factor (TF) using anti-TF antibody. Because TF is expressed in macrophages infiltrated in glomeruli, they are now testing whether removing tissue factor from macrophages protects eNOS^{-/-} mice from DN.

Preeclampsia: Preeclampsia is a condition associated with pregnancy, and characterized by hypertension, proteinuria and edema. Because lower eNOS expression correlates with preeclampsia in humans, they overexpressed sFlt-1 using adenovirus in eNOS^{-/-} mice. Lack of eNOS exacerbated preeclampsia, which is associated with increased endothelin 1, and ET_A receptor antagonist ameliorated exacerbated preeclampsia.

Obesity: They found that mice lacking renin (*Ren1c*) are lean, insulin sensitive, and resistant to diet-induced obesity through increased metabolic rate, fatty acid oxidation and loss of fat in the feces. They have demonstrated that inhibition of angiotensin II improved leptin sensitivity and insulin sensitivity, and increased adiponectin is responsible for lean phenotype. Inhibition of angiotensin II causes anemia due to tertiary hypothyroidism by reducing TRH production in the hypothalamus.

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 the cardiovascular system. They are interested in studying cardiac and vascular development as well as mechanisms involved in heart failure and atherosclerosis. The current directions of the Taylor lab are to characterize components of the integrin signaling cascade in two very specialized cell types (cardiomyocytes and smooth muscle cells) and to target disruption of these regulatory molecules *in vivo* in an effort to determine their precise role in cardiovascular growth and development. Over the past few years they have generated lines of genetically engineered mice that have targeted loss- or gain-of-function mutations in critical proteins in the integrin signaling cascade. They have characterized the physiology of these mutant mice by immunohistochemical techniques and functional assays including echocardiography. They have found two lines of mice that are particularly interesting. In one line in which they targeted disruption of Focal Adhesion Kinase (FAK, a critical integrin-dependent tyrosine kinase) in the adult heart, they observed that FAK is not necessary for basal

cardiac function. However, challenge of these mice by aortic banding-induced pressure overload attenuates compensatory hypertrophy and leads to dilated cardiomyopathy. In contrast, overexpression of a super-activatable FAK markedly enhances hypertrophic remodeling, particularly in response to mechanical overload. They found that both hypertrophic signaling pathways and gene expression is altered in these mice and are continuing to characterize the mechanisms that lead to heart failure in this model system. In contrast another line of mice that inactivates FAK in the developing heart leads to peri-natal death associated with a massive sub-aortic ventricular septal defect and double-outlet right ventricle. The major goals for the upcoming year include characterization of the mechanistic pathways by which FAK regulates these critical processes using a combination of novel tools to follow the spatial and temporal activation of signaling molecules and discovery-based genetic approaches. Understanding the mechanisms that govern cardiac development and cardiomyocyte hypertrophy may aid in the development of pharmacologic therapies for several major cardiovascular diseases.

LEIGH B. THORNE, M.D.

Translational research activities continue with Dr. Thorne's involvement in the LCCC Tissue Procurement Facility. They are working towards development of a universal/global consent in conjunction with the UNC Health Registry with the goal of consenting all potential cancer patients who visit the NC Cancer Hospital. With the addition of a data abstractor, they plan to retrospectively collect clinical data on the ~10,000 patients in their database. The data will be stored in the LCCC Datawarehouse so that researchers will have access to clinically annotated tissue for research purposes. In the last year they have begun a hematologic malignancy tissue procurement program in collaboration with Medical-Oncology and Hematopathology and are currently in the process of an NIH grant submission for a Prostate SPORE collaboration with two other institutions. Over the next few years, her goal is to raise the standards of the LCCC TPF by bringing the facility into compliance with the NCI Best Practices Guidelines as they expand to include smaller institutions in North Carolina. Her goal for the upcoming year is to develop the infrastructure for a rapid autopsy program to facilitate procurement of tissue for research purposes.

RICHARD R. TIDWELL, Ph.D.

Dr. Tidwell's research has moved in a slightly new direction during the past year. This move is exemplified by two important new collaborations. A formal collaboration was begun in February of 2010 with the Genomics Institute of Novartis Research Foundation (GNF). This collaboration allowed the Tidwell led Consortium for Parasitic Drug Development (CPDD) 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). This developmental program is being funded under the current Gates Foundation Grant and supplemented by GNF scientist and facilities. In November 2009, Dr. Tidwell received a \$1.8 million grant from the Gates Foundation to carry out a collaborative study with the Hamner Institute for Drug Safety to determine mechanism of toxicity for new drug candidates to treat HAT. This grant's ultimate goal is to uncover specific markers to predict renal and liver toxicity of new classes of molecules. The coming year will be mainly devoted to continuation of the new directions and collaborations begun during the past year.

MICHAEL D. TOPAL, Ph.D.

Dr. Topal is collaborating with Neil Hayes, Chuck Perou, Derek Chiang, Corbin Jones, and others to characterize human tumors as part of the Cancer Genome Atlas Project funded by the NCI. He is also collaborating with his postdoc, Christina Liquori, to investigate faster and less expensive methods for targeted high-throughput DNA sequencing of specific regions of the human genome. The goal is to develop inexpensive methods for sequencing multiple regions from many patients in the same reaction quickly and cheaply. The methods, if successful, will be used, in collaboration with Neil Hays, to study lung cancer mutations in patients with well-characterized clinical background. A UCRF Pilot Project Award to him is funding this work.

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

Dr. Trembath has spent 38 weeks on service since July 2009, 25 weeks on surgical pathology and 13 weeks on neuropathology as well as covering autopsy neuropathology cases with Drs. Bouldin and Miller. He intends to continue this clinical service in 2010-11. He has helped bring MGMT molecular testing online which should “go live” by the middle of May. He has collaborated with the current Molecular Fellow, Ken Muldrew, in starting to develop the assays for IDH1 and IDH2 in gliomas. The initial results from his collaboration with Dr. Deepa Rao of NIEHS on the rat model of medulloblastoma have been accepted for presentation at AANP. Depending on the number of animals and tissue available, he will see if they can dissect the molecular pathways behind the tumors in rat and see if they resemble those in human medulloblastomas. He will continue to develop collaborations with Dr. Jane Pickett of the Autism Tissue Program to investigate the neuropathology of autism. He hopes that one or more of these projects will begin to produce publications and possibly external funding in 2010-11. Additionally, Dr. Yuri Fedoriw and Dr. Trembath are beginning projects related to the molecular changes behind primary CNS lymphoma.

HEIKE VARNHOLT, M.D.

The national Hepatitis B network/consortium, for which Dr. Varnholt is the UNC liver pathologist among peers from thirteen other institutions, will begin to recruit patients in the summer. This will require more involvement on the pathologists’ part to do initial review of all cases according to a uniform set of criteria as well as organizing to send material and participate in central slide review. She has discussed with Dr. Fried the possibility to tap into the tremendous tissue resources of this consortium and to write a proposal for a study investigating the microRNA expression profile for these Hepatitis B patients and correlate them with outcome in order to optimize treatment and move toward personalized medicine.

She has worked closely with Dr. Arlin Rogers, and they have met multiple times and reviewed the histology of some of his mouse livers. In the course of this collaboration, they have identified peculiar and somewhat unexpected patterns of steatosis in some of the mouse models he has been working on and will continue to tease out the underlying fundamental genetic mechanisms behind these visible histopathologic changes.

The “liver interest group” has met twice during the last four months under the guidance of Ivan Rusyn, which has led to a fruitful discussion among a new group of individuals at UNC interested in liver diseases and composed of representatives from the major clinical areas

(surgery, hepatology, radiology, pathology) and basic scientists. Stan Lemon will join UNC soon and has approached her to collaborate on projects ranging from miR-122 in chimpanzees and hepatitis B. This promises to be a great opportunity and she looks forward to working with so many outstanding “liver people”.

CYRUS VAZIRI, Ph.D.

Several students and post-docs in Dr. Vaziri’s Boston lab were unable to move to UNC and therefore their projects were interrupted and are incomplete. Now that he has recruited and trained new personnel, his major goal is to complete the lab work necessary to publish those studies. Additionally, since the move to UNC they have initiated new independent studies that are gaining momentum and Dr. Vaziri aims to start publishing some of those studies. All these publications will be crucial for the success of future grant applications in the next funding cycles. Additionally, since arriving at UNC he has initiated collaborative projects with several faculty on the UNC campus (including Dr. Bill Janzen, Dr. Bill Kaufmann, Dr. Jean Cook). A major goal in the coming year is to use these collaborations as a vehicle for interdisciplinary grant proposals. Several grant applications have already been submitted with these colleagues as co-PI.

KAREN E. WECK, M.D.

Dr. Weck’s overall goals are to translate new technologies and scientific knowledge into clinical diagnostic testing. She has been most active in the areas of genetic testing for inherited diseases and pharmacogenetic (PGx) testing to predict drug responsiveness or determine drug resistance, as summarized below.

They have developed genetic testing for primary ciliary dyskinesia (PCD) in collaboration with Dr. Mike Knowles and Dr. Maimoona Zariwala. PCD is a rare genetic disease affecting cilia that is associated with recurrent sinusitis and bronchitis, infertility, and in severe cases may lead to end-stage bronchiectasis and require lung transplantation. Dr. Weck’s laboratory has developed a clinical genetic test panel for mutations in these genes using a combination of mutation scanning by high resolution melting curve analysis and DNA sequencing. As a result of this work, UNC has become the major international reference laboratory for clinical genetic testing for PCD. Thus far, they have tested over 100 patients from around the world for mutations associated with PCD.

Another major effort is translation of new knowledge of the genetic causes of Focal Segmental Glomerulosclerosis (FSGS) into diagnostic testing. FSGS is a segmental, fibrosing glomerular kidney disease characterized by proteinuria, nephrotic syndrome, and frequent progressive loss of renal function. Several genes have been associated with familial forms of FSGS. Through a UNC program in translational science award they have developed mutation testing in these genes. Their goal is to better characterize the spectrum, incidence and genotype-phenotype correlation of mutations associated with FSGS and to develop clinical testing in those genes with clinical utility. Their laboratory is one of the only laboratories in the country that offers clinical genetic testing for mutations in the *NPHS2* gene that are associated with resistance to steroid treatment of FSGS.

Many of Dr. Weck’s recent efforts have been focused on developing pharmacogenetic testing to predict response to drug therapy. They developed clinical testing to detect mutations the BCR-

ABL tyrosine kinase domain associated with resistance to tyrosine kinase inhibitors such as imatinib mesylate. UNC was one of the first laboratories in the country to offer this test clinically, which is now standard of care in patients with chronic myelogenous leukemia and acute lymphoblastic leukemia who develop resistance to BCR-ABL targeted tyrosine kinase inhibitors. Other clinical assays they have developed include testing for the mitochondrial DNA 1555A>G mutation associated with aminoglycoside-induced hearing loss, KIT mutation testing for drug susceptibility in melanoma, and KRAS mutation testing for colon and lung cancer drug resistance.

They are also collaborating in several clinical trials at UNC to study the clinical utility of pharmacogenetic guided therapy. As part of a clinical trial to determine the utility of pharmacogenetic guided dosing of warfarin, her laboratory is performing testing for variants in the *VKORC1* and *CYP2C9* genes associated with altered response to warfarin. In addition, they are part of an International Warfarin Consortium to study the effect of clinical and genetic factors on warfarin response. She is also collaborating with UNC investigators in the Lineberger Comprehensive Cancer Center, the UNC Institute for Pharmacogenomics and Individualized Therapy (IPIT), and the Departments of Hematology/Oncology and Genetics to determine the efficacy of CYP2D6 genotype-guided dosing for tamoxifen in breast cancer. Her laboratory is serving as the central laboratory for this multicenter collaborative clinical trial that includes UNC and several other sites across North Carolina. In addition, they are collaborating with investigators in the Departments of Cardiology, Hematology, and IPIT to conduct a clinical trial on the efficacy of CYP2C19 genotype-guided dosing for clopidogrel.

Another major effort is translation of new knowledge of the genetic causes of disease into diagnostic testing. They have developed mutation testing for genes associated with primary ciliary dyskinesia, X-linked Alport syndrome, and focal segmental glomerulosclerosis (FSGS). Their goal is to better characterize the spectrum, incidence and genotype-phenotype correlation of mutations associated with disease and to develop clinical testing in those genes with clinical utility. The UNC molecular genetics laboratory is now one of the only laboratories in the country that offers clinical genetic testing for mutations associated with these diseases.

LISA J. WEINSTEIN, M.D.

Dr. Weinstein continued to plan and participate in the Gross Didactic and Practical Conference that she initiated this year with the help of other faculty. She was involved in a project with Dr. Marion Couch investigating cachexia in a mouse model. She hoped to get IRB approval for a study examining the expression of ProExC antibody in oropharyngeal, lung, and laryngeal squamous cell carcinoma.

BERNARD E. WEISSMAN, Ph.D.

The research emphasis in Dr. Weissman's laboratory has remained focused on the role of the SWI/SNF chromatin remodeling complex in human tumor development. They also believe that the insights gained from these studies will prove applicable to understanding the basic mechanisms regulating normal development. One project centers upon dissecting the mechanisms by which inactivation of the smallest member of the complex, SNF5/INI1, leads to the development of the rare pediatric cancer malignant rhabdoid tumor (MRT). They have

validated the novel target gene, CCNG2, in 3 MRT cell lines and in primary MRTs using molecular approaches. They have also assessed how SNF5 reexpression affects chromatin structure and organization at the p21WAF1/CIP1 promoter by ChIPs analyses. They have also found that SNF5 operates through p53 dependent or independent mechanisms at this promoter in different MRT cell lines. These results have recently been published in Cancer Research. They have also identified that the NOXA gene is regulated by SNF5 in at least 3 MRT cell lines. They are currently characterizing SNF5 at several promoters by standard ChIPs analyses at 6 hours after SNF5 reexpression to confirm its recruitment. They will then proceed to the ChIP-seq study during the coming year. The second project investigates how the loss of expression of both ATPase components of the SWI/SNF complex enhances tumor progression in NSCLC. They are determining the chromatin structure at a defined set of promoters in BRG1 knockdown NSCLC cell lines using standard ChIPs technique as a prerequisite step before a global ChIP-seq analysis. They have also generated additional BRG1 knockdown NSCLC cell lines by infection with BRG1i lentivirus and confirmed the same phenotype as the original set. They have also transfected a different BRG1 target RNAi into this cell line to eliminate the caveat of off-target effects.

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

Dr. Whinna's research interest is in how the normal process of hemostasis occurs in time and space to plug an injury site without causing pathologic thrombosis in the entire vasculature. First, this involved basic protein chemistry studies on the structure-function aspects of thrombin inhibition by the serine protease inhibitors antithrombin III and heparin cofactor II (his Ph.D. thesis work). Next, he began engineering and testing of chimeric antithrombin molecules that combine favorable properties of sometimes diverse naturally occurring molecules that can act when and where it is most desirable (his postdoctoral and early faculty work). As part of the testing of these engineered antithrombins he has established and refined thrombosis models in mice and has been using these models to study the effects of not only the molecules he has engineered, but also (through collaborations) other naturally occurring and synthetic molecules. They have shown previously unreported pathophysiologic differences in two of the most widely used models of thrombosis in mice, which have important implications for studies utilizing these models and the conclusions drawn from them. Most recently they have developed improved murine hemostasis models that can be correlated with known symptomology in human disease. These models are being used to test the effects of both pro- and anti-coagulant compounds in order to delineate both normal and pathologic hemostasis.

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

Dr. Whitaker will continue to provide veterinary clinical care for the research animals on campus as her primary function. With the new animal facilities opened- or soon to open- on campus, the mouse census will more than double, which will significantly increase the case load. She will also continue 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, for which she has submitted a grant application to the American College of Laboratory Animal Medicine Foundation this year. Dr. Whitaker's 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 Laboratory Animal Topics seminar, Pathology graduate students on animal models, and investigators and laboratory

staff on the use of animals in research. She will continue to co-chair the Southeastern location of the International Mock Board Exam Coalition for the ACLAM board exam and to serve as Interim Associate Director of Veterinary Services.

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

Dr. Willis' laboratory investigates the protective role of the ubiquitin proteasome system in the pathophysiology of heart failure by regulating cardiac metabolism. During the progression to heart failure, a characteristic shift in metabolic substrate utilization occurs, whereby fatty acid oxidation is inhibited and a parallel increase in glucose oxidation occurs to maintain the high ATP demand of the heart. Decreasing levels of the transcription factors Peroxisome Proliferator Activated Receptors (PPARs) drive this process in order to avoid the lipotoxicity of fatty acid intermediates that form during oxidation. The mechanism which drives this decrease in PPAR activity and substrate utilization switch is currently unknown. They have identified a cardiac-specific ubiquitin ligase, MuRF1, which degrades specific members of the PPAR family of transcription factors, to induce these shifts in cardiac metabolism in cardiomyocytes. At the molecular level, MuRF1 interacts directly with PPAR- α , directing its ubiquitination, and targeting it for degradation by the 26S proteasome. They have also found that increasing MuRF1 levels in cardiomyocytes mediates a shift in substrate utilization in the same manner that occurs during heart failure progression. Their current studies will link these findings to demonstrate that increasing MuRF1 during the progression of heart failure progression drives PPAR- α degradation to inhibit fatty acid oxidation and increase glucose oxidation *in vivo*. Their goal for the next year is to determine ways to modulate cardiac ubiquitin ligase levels to induce cardioprotective metabolic changes using vector based gene delivery in familial and acquired cardiac disease mouse models where MuRF1 levels are down-regulated.

ALISA S. WOLBERG, Ph.D.

The major goals of Alisa Wolberg, Ph.D. are to: 1) examine cellular and biochemical features that modulate thrombin generation, and 2) determine how the pattern of thrombin generation dictates clot formation, structure, and stability. Dr. Wolberg's group has made substantial progress towards both goals during this year. They have developed the ability to examine fibrin structure as a function of its location within a clot, and have used this technique to determine how cellular procoagulant activity dictates fibrin structure and stability on cells from different regions of the vasculature. Their findings indicate that exposure of extravascular cells to the blood produces a dense, stable fibrin network. They have also shown that cytokine-stimulated endothelial cells support the formation of an abnormally dense fibrin network. They have also examined biochemical mechanisms deficient in the bleeding disorder hemophilia. They have characterized the ability of therapeutic agents to modulate the pattern of thrombin generation and clot formation and stability in hemophilic plasmas. Their techniques for measuring fibrin formation and stability may provide important information on the therapeutic dosing window of novel hemostatic agents.

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

Dr. Woosley has continued and expanded his research in GI and Liver pathology. He is the study pathologist in a large (~800 cases) population-based study of colon cancer in 33-counties of

North Carolina examining traditional dietary and lifestyle risk factors, access and utilization of health services; and polymorphisms of carcinogen metabolizing enzymes. As a companion study, they have enrolled some of these subjects in a national colorectal cancer family registry that will have the potential to identify genetic markers for colon cancer risk. A major objective of this study is to determine why African-Americans with colon cancer fare more poorly than Caucasian Americans. A follow-up proposal dealing with the same issues for rectal cancer has also been funded. Dr. Woosley is involved in the Pathology Core component of the multi-project GI SPORE grant on GI malignancy. In addition, Dr. Woosley has had scholarly activity (presentations at national meetings and publications) on the technology of pathology cation.

HONG XIAO, M.D.

In collaboration with Dr. Charles Jennette, Dr. Xiao's major research goal is, by using their innovative mouse models of antineutrophil cytoplasmic autoantibody (ANCA) induced glomerulonephritis (ANCA disease), to advance the understanding of mechanism of the ANCA mediated autoimmune disease. She currently focuses on studies: (1) testing involvement of Fcγ receptors and alternative complement pathway in pathogenesis and therapeutic interventions in ANCA disease mouse model, such as by blockage of Fcγ receptors or C5a receptors with specific antibodies or small molecule inhibitors, which may have important implications for therapies of human diseases; (2) inducing experimental ANCA disease models by neutrophil antigens in addition to MPO protein, such as Proteinase-3 (PR-3) and lysosomal membrane protein-2 (LAMP-2), or different portions of MPO for identifying specific epitopes that are targeted by pathogenic anti-MPO antibodies; (3) investigating genetic basis for variations in severity of ANCA disease among different strains of mice, which mimics disease variations in ANCA patients and trying to identify candidate genes and their protein products responsible for the differences in disease severity, which might be new markers for disease activity and potential targets for novel therapeutic strategy in humans.

XIANWEN YI, M.D., Ph.D.

- 1) Investigating the effect of LA on diabetes and atherosclerosis, using genetic mouse models.
- 2) Diabetic *Lias*^{+/-}*ApoE*^{-/-} mice induced by injection of streptozotocin (STZ) were age-matched with non-diabetic *Lias*^{+/+}*ApoE*^{-/-} mice, and all pathological parameters are being compared to identify the diabetic effect.
- 3) Lipoic acid therapeutic interventions will be carried out by feeding different doses of exogenous R-LA to *Lias* deficiency mice.
- 4) His previous results disclosed LA anti-inflammatory function and thermo-regulatory effect of LA in LPS-induced septic *Lias* mice. To further investigate the mechanisms, energy expenditure and cellular bioenergetics will be examined in the mice and mouse endothelium culture.
- 5). In order to further test the role of lipoic acid in diabetes, they have made mouse models with overexpressing or underexpressing the *Lias* gene. Dr. Yi will characterize their phenotypes.

MAIMOONA B. ZARIWALA, Ph.D.

The major goals of Dr. Zariwala's research are:

- (1) Test for new candidate genes for primary ciliary dyskinesia, (2) To test new patients for known gene mutations, (3) Continue to expand the CLIA approved clinical genetic test panel for Primary Ciliary Dyskinesia, (4) Provide consultation and ongoing support to the Molecular

Pathology Lab for clinical genetics test panel for Primary Ciliary Dyskinesia, and (5) Decipher possible genetic causes of idiopathic bronchiectasis that is not related to the CF or environmental causes.

In collaboration with Dr. Knowles, Dr. Zariwala has made significant progress towards each of these goals in the last year. The work on *DNAH11* mutation profiling is complete and manuscript is under preparation. Continued collaboration with the investigator in Germany and *DNAH5* mutation profiling replication study is near completion and work on the novel PCD-causing gene (*LRRC50*) is completed and has recently been published. Testing for novel candidate gene (*TTL1*) and known candidate genes for the newly acquired patient is continued. 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. Additionally, Dr. Zariwala is involved with Drs. Evans, Weck, and Berg to test the possible usage of the next generation sequencing technology in the clinical setting. For this work the pilot project involved using the PCD patients with known mutation and the project is near completion and the manuscript is under preparation. New collaboration has been formed with Dr. Jay Shendure from Seattle Genomic Sequencing Center to test for 24 PCD patients by whole-exome capture and massively parallel sequencing and initial data analysis yielded a novel founder mutation in Ashkanazi Jewish cohort in the previously known PCD gene. Additionally, 17 samples of non-CF bronchiectasis are also being processed by the same center. Together, these projects have the potential to identify novel PCD-causing gene(s) mutation(s) and gene(s) for the non-CF idiopathic bronchiectasis. Identification of multiple PCD candidate genes and mutations as well as the success of capture of candidate genes could open the door for expanded clinical tests. Early diagnosis will allow early intervention and will improve clinical outcome of PCD patients. This study will also represent a significant step forward in the application of new approaches to genetically heterogeneous disorders in humans.

TEACHING

HOWARD M. REISNER, Ph.D.

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 in dermatopathology 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 and Integrated Clinical Cases blocks. 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 kidney/gu) has continued and receives excellent student comments. These “mini-pathology” lab sessions are most successful when presented before the more medical sections of the laboratory

(when such exist) and are designed so as 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 to the initial block and several of our more junior faculty have used this as an opportunity to meet students. Twelve video podcasts presenting overviews of introductory laboratory material have been added to the first block and were noted as helpful by students. The availability of gross organ specimens in the 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 its implementation AIMS based quizzes have been used in the tools block and will be expanded next year.

The Tools Block (Block 1) now 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 provides a series of integrated cases in which pathology and clinical laboratory medicine play an important role.

Dr. Reisner has attempted to aid 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 a new Aperio scanner with 40X capabilities has allowed the extension of VM technology to the area of hematopathology. Images are provided on-line 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.

General Pathology Sequence (in Block 1): 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 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.

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. Two multiple choice exams were used as evaluation tools along with short “extra credit” exercises added this year to a surprising degree of enthusiasm. 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.

MOLECULAR AND CELLULAR PATHOLOGY GRADUATE PROGRAM

William B. Coleman, Ph.D., Director of Graduate Studies

Jonathan W. Homeister, M.D., Ph.D., Associate Director of Graduate Studies

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. Four students successfully completed the Ph.D. program (Diane Bender, Mehmet Karaca, Elizabeth Merricks, and Chris Scull). With these graduates, the Molecular and Cellular Pathology Graduate Program has produced 157 total graduates and 111 Ph.D. graduates since 1954. For the most part, the recent Ph.D. graduates have immediate plans to continue their professional development through postdoctoral research and/or additional training. 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 2009, Fall 2009, and Spring 2010, faculty members associated with the Molecular and Cellular Pathology Ph.D. Program hosted 17 laboratory rotation experiences for 12 individual students (among 12 faculty laboratories). This was comparable to the success of the 2008-2009 rotations (with 18 laboratory rotation experiences for 15 individual students). In June 2010, five rising second year students officially joined the Molecular and Cellular Pathology Ph.D. Program, including Meghan Free, Lantz Mackey, Adam Pfefferle, Kristine Wadosky, and Laura Weise Cross. Hence, the Molecular and Cellular Pathology graduate program has recruited 5 students in each of the two years of the BBSP.

In the period spanning 2009-2010, graduate students contributed to numerous publications in peer-reviewed journals and published abstracts, many with a graduate student as first author. In addition, several graduate students were recognized for their research excellence with awards. Rupan Sandhu received the Experimental Pathologist-in-Graduate-Training Merit Award from the American Society for Investigative Pathology. At the Molecular and Cellular Pathology Annual Research Symposium, Troy McEachron received the award for best poster presentation by a graduate student and Jessica Rodriguez received the award for best oral presentation by a graduate student. Lantz Mackey, Jessica Rodriguez, and Rupan Sandu received Student Travel Awards from the American Society for Investigative Pathology (to attend Experimental Biology

2010). Research support for students in Molecular and Cellular Pathology was provided by several sources. Maria Aleman, Mehmet Karaca, Matthew Medlin, Amanda Rinkenbaugh, and Aleeza Roth were supported by the Environmental Pathology Training Program. New appointments to the Environmental Pathology Training Program in June 2010 include Adam Pfefferle. Dinuka De Silva is supported by the Cancer Biology Training Program. Kaitlin Lenhart was supported by the Developmental Biology Training Program. Jessica Cardenas, Jason Doherty, and Jessica Rodriguez were supported by the Integrative Vascular Biology Training Program. In addition, several students applied for extramural predoctoral fellowships from the American Heart Association, the Department of Defense, or the NIH. Lance Johnson and Kellie Machlus received a predoctoral fellowship from the American Heart Association. Mark Gramling was partially supported by the *Thomas S. and Caroline H. Royster Jr. Fellowship* and Jessica Rodriguez was partially supported by the *William R. Kenan Jr. Fellowship*. During 2009-2010, two students were recognized as Robert H. Wagner Scholars in Molecular and Cellular Pathology: Amanda Rinkenbaugh and Mark Gramling. Four Molecular and Cellular Pathology Ph.D. students (Amanda Rinkenbaugh, Jessica Rodriguez, Aleeza Roth, Rupan Sandhu) are HHMI Fellows participating in the Program in Translational Medicine.

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 Fall 2009 Seminar Series featured presentations by eight Molecular and Cellular Pathology Ph.D. students. The Spring 2010 Seminar Series featured presentations by three Molecular and Cellular Pathology Ph.D. students and two postdoctoral fellows 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 2010. Rupan Sandu (from Dr. William B. Coleman's laboratory) gave a presentation entitled "*Targeting the Epigenome to Sensitize Breast Cancer Cells to Chemotherapeutic Drugs*," Avani Pendse (from Dr. Nobuyo Maeda's laboratory) gave a presentation entitled "*A Diabetogenic Ins2-Akita Mutation Uncovers the Insulin Resistance in Adipose Tissues of PPAR γ P465L/+ Female Mice*," and Matt Medlin (from Dr. Chris Mack's laboratory) gave a presentation entitled "*SIP Receptor 2 Signals Through the RGS-RhoGEF, LARG to Promote Smooth Muscle Cell Differentiation*." This series provides a valuable opportunity for students, faculty, and staff to learn more about graduate student research that is ongoing in the department. In October of 2009, the sixth Marc J. Mass, Ph.D., Memorial Distinguished Lecture was held, featuring Dr. Robert Schreiber (Alumni Endowed Professor of Pathology and Immunology, Washington University School of Medicine, St. Louis, MO). Dr. Schreiber's lecture was entitled "*Cancer Immunoediting: Mechanisms and Therapeutic Applications*." In the summer of 2009, the graduate students selected Dr. William B. Coleman as the 2009 recipient of the ***Joe W. Grisham Award for Excellence in Graduate Student Teaching***. The award was presented in September 2009 at the home of Dr. J. Charles Jennette. In other activities, the graduate students have continued to have regular (bi-monthly) outings to a local restaurant for informal discussions related to the graduate program and their research.

RESIDENCY TRAINING PROGRAM

The Department of Pathology and Laboratory Medicine currently sponsors a residency training program in anatomic and clinical pathology. The Program is fully accredited by the American Council on Graduate Medical Education (ACGME). A full description of the Program is on the departmental web site (<http://www.med.unc.edu/residency-program-in-pathology/>).

The educational goals and philosophy of the residency program are to (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; and (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 system-based practice).

The program offers a four-year, combined anatomic and clinical pathology residency, with ample opportunities for research and post-residency fellowship training in a wide range of subspecialty areas in pathology. The Program was reviewed by the Residency Review Committee of the American Council for Graduate Medical Education and was awarded “Continued Full Accreditation” in October, 2004.

The Program required that all residents take combined training in anatomic pathology and clinical pathology. The first three years of the Program are focused on core training in anatomic pathology (AP) and clinical pathology (CP). The curriculum is organized to intermingle AP and CP core rotations within each of the first three years of training. The fourth year of the training program includes six months of elective rotations in AP, CP or pathology research, so that the resident can concentrate on his or her particular interests. Overall, there are nine months of elective rotations interspersed within the four-year training program.

The Department of Pathology and Laboratory Medicine has a strong commitment to provide funding and faculty support for resident research. Funding for resident research projects comes from a variety of sources, including NIH research or training grants, NIH Individual Research Service Awards, and other fellowships. To encourage basic research, the Department offers a one-year research fellowship, available on a competitive basis, to post-residency trainees in the Department of Pathology and Laboratory Medicine. The fellowship pays a stipend to the resident commensurate with the fellow’s level of training; and will also provide a \$5,000 bench fee to the laboratory of the trainee’s research advisor. The research must be focused on discovering or elucidating basic mechanisms of disease. More applies/correlative/clinical research experiences can be obtained in the various clinical fellowships available to pathology residents. Dr. William Funhouse is the director of this research fellowship.

The Department provides all residents in the training program with an individual study carrel, a light microscope, and a computer. The computer is fully loaded with appropriate software, connected to the internet and fully supported by the UNC Hospitals’ computer-support staff.

The residency program currently accepts four new residents per year into the four-year general residency program. There are currently 14 residents in the general residency program. Additionally, there are two trainees in our post-residency surgical pathology fellowship program,

six trainees in ACGME-accredited clinical subspecialty fellowships, and four postdoctoral trainees in clinical laboratory medicine fellowships (accredited by other agencies). UNC Hospitals current funds 13 of the training positions in the general residency program, with the remaining residency funding coming from the Department.

In 2008-09, 359 applicants applied through the Electronic Residency Application Service (ERAS®) for the four PGY1 training positions offered. The Department invited 53 of these 359 applicants for an interview, and 41 came to Chapel Hill for an interview. Thirty-nine of these interviewees were listed in the 2009 National Resident Match, which is conducted by the National Resident Matching Program. The Department filled all four PGY1 positions in the 2009 Match from within the group of top-listed applicants on the Match list.

SUBSPECIALTY FELLOWSHIP TRAINING PROGRAM

CLINICAL CHEMISTRY FELLOWSHIP

CATHERINE A. HAMMETT-STABLER, Ph.D., DIRECTOR

Begun in 1972, this COMACC-accredited postdoctoral training program has a rich history of producing leaders within the field of Clinical Chemistry. Fellows receive two-years of intensive training in both the analytical and clinical aspects of clinical chemistry and are prepared to enter laboratory medicine in clinical service, educational, or research roles. Although the program did not have a fellow for the academic year 2009-2010, two fellows will begin their training July 2010. Steven Cotton, Ph.D. (Pharmaceutical Sciences, Eshelman School of Pharmacy, UNC, 2010) was recruited to the UNCH funded position. In addition, Laura Bender, Ph.D. (Department of Cancer Biology, Wake Forest University, 2005) will join the program as the recipient of the Past-President's Scholarship (Van Slyke Foundation of the American Association of Clinical Chemistry). The Clinical Chemistry Fellowship is directed by Catherine Hammett-Stabler, Ph.D., DABCC.

CLINICAL MICROBIOLOGY FELLOWSHIP

PETER H. GILLIGAN, Ph.D., DIRECTOR

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 American College of Microbiology. 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. The Clinical Microbiology Fellowship is directed by Peter H. Gilligan, Ph.D.

ABMG CLINICAL MOLECULAR GENETICS FELLOWSHIP

(http://www.pathology.unc.edu/fellowsp/molecular_path.htm).

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 dyskinesia, 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 clinical aspects of the training program are complemented by a strong research foundation. The Clinical Molecular Genetics Fellowship is directed by Jessica Booker, Ph.D. There was one fellow in the training program in 2009-2010.

CYTOGENETICS FELLOWSHIP

KATHLEEN W. RAO, Ph.D.

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 UNC Cytogenetics laboratory is a full service laboratory, processing over 3600 specimens annually, for both constitutional and oncology cytogenetic analysis, including CVS, amniocentesis, peripheral blood, bone marrow, tumors, tissue biopsies, and paraffin sections. Fellows are trained in a variety of techniques, including tissue culture, chromosome banding and analysis, FISH, and high resolution chromosomal microarray. The Clinical Cytogenetics Fellowship is directed by Kathleen W. Rao, Ph.D.

CYTOPATHOLOGY FELLOWSHIP

SUSAN J. MAYGARDEN, M.D., DIRECTOR

Cytopathology was fortunate to have two excellent fellows, Dr. Cherry Starling and Dr. Lori Scanga, during this academic year. Dr. Starling joined us from Baylor (Dallas), and Dr. Lori Scanga continued her training at UNC after completing her surgical pathology fellowship with us. Both Drs. Starling and Scanga did an excellent job this year. The fellowship this year was expanded to include immediate interpretations by fellows for adequacy for most FNAs after November. This provided an opportunity for graduated responsibility, and freed up the faculty to assist on simultaneous FNAs and other duties in the laboratory. Dr. Starling will be taking a private practice job in Midland, Texas, and Dr. Scanga will stay on at UNC as an Assistant Professor in the Department of Pathology and Laboratory Medicine.

FORENSIC PATHOLOGY FELLOWSHIP
DEBORAH L. RADISCH, M.D., 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 fully accredited by the Accreditation Council for Graduate Medical Education (ACGME) and is under the direction of the Chief Medical Examiner for the State of North Carolina. The trainee in forensic pathology performs approximately 250 forensic autopsies during the course of the on-year fellowship. Consultations in subspecialty areas, including neuropathology, pediatric pathology, forensic odontology, and forensic radiology, are readily available within the Department of Pathology and Laboratory Medicine and the School of Medicine and Dentistry. Ancillary laboratory studies, including clinical chemistry, microbiology, and special histology, are provided by the Department of Laboratory Medicine. The Forensic Pathology Fellowship is directed by Deborah L. Radisch, M.D. There was one fellow in the training program in 2009-2010.

HEMATOPATHOLOGY
CHERIE H. DUNPHY, M.D., DIRECTOR

The volume and complexity of cases has continued to increase in this Division since the recent move into the recently completed, state-of-the-art North Carolina Cancer Hospital. The annual in-house bone marrow volume is > 2,000 and the lymphoma-evaluation case volume is approximately 750. Outside review of Hematopathology diagnostic cases has also continued to increase as these reviews are necessary for patients being referred to UNC for therapy. Additional immunohistochemical and flow cytometric markers are continuously being added to the diagnostic repertoire for this Division, which remains on the cutting-edge of diagnostic Hematopathology. The Division looks forward to incorporating 6-color flow cytometry into clinical practice, which will allow for better definitions of hematolymphoid neoplasms on conceivably smaller numbers of neoplastic cells. The Division has benefitted from the new faculty additions, including Drs. George (Yuri) Fedoriw and John Hunt. Dr. Stephanie Mathews will be joining the Hematopathology (part-time) attending faculty in the Fall of 2010.

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

The Department of Pathology and Laboratory Medicine and University of North Carolina Hospitals sponsors a one-year fellowship in Molecular Genetic Pathology. The training program is accredited by the ACGME to educate one fellow per year. Trainees gain a working knowledge of molecular procedures including Southern blot, in situ hybridization/FISH, sequencing, protein truncation test, DNA amplification, tissue microdissection and other cell enrichment procedures, 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, inherited disease, infectious disease, HLA-typing, identification, and pharmacogenetics. The fellow analyzes and interprets molecular data from clinical cases and composes reports that are placed in the patient's medical record. The fellow learns to design and carry out research aimed at understanding the molecular basis of disease and translating fundamental discoveries into improved 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. The Program is directed by Margaret L. Gulley, M.D., with support from many other faculty and staff. More information is found at, (http://www.pathology.unc.edu/fellowsp/molecular_genetic_path.htm).

NEPHROLOGY FELLOWSHIP

VOLKER R. NICKELEIT, M.D., DIRECTOR

The Department of Pathology and Laboratory Medicine sponsors a one-year fellowship in renal pathology. One or two fellows are accepted into the program. The fellows are directly involved in the diagnostic evaluation of over 1700 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 from the division of nephropathology. 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 UNC division of nephropathology and the fellowship training program is directed by V. Nickeleit, M.D. There are three fellows in the training program 2009-2010.

NEUROPATHOLOGY FELLOWSHIP

THOMAS W. BOULDIN, M.D., DIRECTOR

(<http://www.pathology.unc.edu/fellowsp/neuropath.htm>)

The Department of Pathology and Laboratory Medicine and UNC Hospitals sponsors a broadly based, two-year fellowship in diagnostic and experimental neuropathology. The training program is fully accredited by the Accreditation Council for Graduate Medical Education (ACGME). All aspects of diagnostic neuropathology are covered, including autopsy and surgical neuropathology, interpretation of muscle and nerve biopsies, and ophthalmic pathology. Trainees participate in teaching neuropathology to pathology residents and medical students and in a wide range of regularly scheduled conferences that stress clinico-pathologic correlation. Numerous research opportunities are available for the trainee, including investigation of the molecular genetic mechanisms responsible for the heterogeneity of patient responses to cancer chemotherapy. Departmental faculty members involved in the fellowship program include Nadia Malouf, M.D. (muscle diseases); C. Ryan Miller, M.D., Ph.D. (surgical and autopsy neuropathology and molecular genetic mechanisms in cancer); Leigh Thorne, M.D. (molecular pathology and muscle pathology); Dimitri Trembath, M.D., Ph.D. (surgical and autopsy neuropathology and molecular pathology); and Thomas Bouldin, M.D. (surgical and autopsy neuropathology, ophthalmic pathology, and peripheral neuropathies). The fellowship is directed

by Dr. Bouldin. There were no fellows in the training program in 2009–10.

SURGICAL PATHOLOGY FELLOWSHIP

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

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 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 signout responsibilities. Therefore, 2 months of elective time are available during the year for completion of a relevant research project. Finally, there is an option for integration of the Surgical Pathology and Molecular Genetic Pathology Fellowship in serial order, for the benefit of fellows interested in an academic career in molecular surgical pathology.

TRANSFUSION MEDICINE FELLOWSHIP

ARABA N. AFENYI-ANNAN, M.D., M.P.H., DIRECTOR

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. Ongoing projects include prevention and rapid detection of bacterial contamination of blood products, epidemiology and pathogenesis of thrombotic thrombocytopenic purpura (TTP), and multiple studies within the NIH funded Transfusion Medicine/Hemostasis Clinical Trials Network, of which we are one of 17 participating sites. The Transfusion Medicine fellowship is directed by Araba Afenyi-Annan, M.D., M.P.H. The fellow during 2009-2010 was Sara Koenig, M.D. During her fellowship, she conducted two research projects involving 1) the use of fresh frozen plasma for burn patients and the 2) optimizing the apheresis collection of peripheral hematopoietic progenitor cells. Abstracts from both projects were submitted to national meetings. The abstract entitled, "Evaluation of Stem Cell Calculator used to Determine Optimal Volume to Process in Collection of Peripheral Hematopoietic Progenitor Cells," was accepted for an oral abstract presentation at the American Society for Apheresis 2010 Annual Meeting. Dr. Koenig has a strong interest in medical education and has a project that involves the design and implementation of computer based educational modules to improve resident and medical student teaching of Transfusion Medicine. She will join the faculty in July 2010 as a fixed term, clinical Assistant Professor and serve as Associate Medical Director of the HPC Laboratory.

GRAND ROUNDS SEMINARS 2009-10

GRAND ROUNDS ORGANIZING COMMITTEE: BERNARD E. WEISSMAN, Ph.D. (Chair), MEMBERS: MARGARET L. GULLEY, M.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 2009-10. 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, we use Grand Rounds 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 2008-09 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.

FALL 2009

<i>DATE</i>	<i>SPEAKER/AFFILIATION</i>	<i>TITLE</i>
08/20/2009	Karen E. Weck, M.D. <i>Associate Professor, Depts. of Pathology and Laboratory Medicine and Genetics, UNC-CH</i>	<i>Genetic Testing for Individualized Medicine – Are We There Yet?</i>
09/03/2009	Roger L. Lundblad, Ph.D. <i>Independent Consultant and Adjunct Professor, Dept. of Pathology and Laboratory Medicine, UNC-CH</i>	Therapeutics for Hemophila A – Where We Are, How We Got There, and Where I Think We May be Going
09/17/2009	Alisa S. Wolberg, Ph.D. Assistant Professor, Dept. of Pathology and Laboratory Medicine, UNC-CH	<i>Cellular and Soluble Contributions to Fibrin Formation, Structure and Stability</i>
10/01/2009	Melissa B. Miller, Ph.D.	Pandemic Influenza and MRSA – the

10/15/09	Assistant Professor, Dept. of Pathology and Laboratory Medicine, UNC-CH C. Ryan Miller, M.D., Ph.D.	Perfect Storm?
10/29/2009	Assistant Professor, Dept. of Pathology and Laboratory Medicine, UNC-CH M. Benjamin Major, Ph.D. Assistant Professor, Dept. of Cell and Developmental Biology; Member, Lineberger Comprehensive Cancer Center, UNC-CH	Genomics-driven drug-biomarker co-development in genetically-engineered mouse models of glioblastomas Using Integrative Functional Screening to Understand Signaling in Cancer
11/05/2009	John L. Schmitz, Ph.D. (ABMLI, ABHI) Associate Professor, Dept. of Pathology and Laboratory Medicine, UNC-CH	Challenges in the Application of HLA Antibody Testing in Solid Organ Transplantation
11/12/2009	Axel Regeniter, M.D., Ph.D. Faculty, University of Basel, Deputy Chief of Clinical Chemistry, Basel University Hospital, Switzerland	<i>Capillary electrophoresis, immunotyping and specific proteins: A visual approach for the detection and follow-up of monoclonal gammopathies</i>
11/19/2009	H. Shelton Earp, M.D. Director, Lineberger Comprehensive Cancer Center, Lineberger Professor of Cancer Research, Professor of Medicine and of Pharmacology, UNC-CH	<i>“Tyrosine Kinase Signaling and Cancer”</i>
12/10/2009	Richard S. Paules, Ph.D. Senior Scientist and Head, Environmental Stress and Cancer Group, Laboratory of Molecular Toxicology, Division of Intramural Research, National Institute of Environmental Health Sciences, RTP	<i>The use of genomics in the quest for clinically useful biomarkers of adverse events</i>
12/17/2009	John D. Wright, Jr., M.D. Associate Professor, Depts. of Ophthalmology and of Pediatrics, UNC-CH	Overview of Ophthalmic Pathology, Part II

SPRING 2010

DATE	SPEAKER/AFFILIATION	TITLE
01/07/2010	Ilona Jaspers, Ph.D. Associate Director, Center for Environmental Medicine, Asthma, and Lung Biology, Associate Professor, Department of Pediatrics, UNC-CH	How smoking may affect the ability to fight influenza
01/14/2010	Cam Patterson, M.D., M.B.A., FACC, FAHA Ernest and Hazel Craige Distinguished Professor of Cardiovascular Medicine, Physician-in-Chief, UNC Center for Heart	Signaling events in endothelial cells and angiogenesis

	and Vascular Care, Director, UNC McAllister Heart Institute, Chief, Division of Cardiology, Associate Chair for Research, Department of Medicine, UNC-CH	
01/21/2010	Julie Blatt, M.D. Professor of Pediatrics, School of Medicine, UNC Division of Pediatric Hematology Oncology, UNC-CH	Vascular anomalies: A smorgasbord for the clinician, pathologist and biologist
02/04/2010	Cyrus Vaziri, Ph.D. Associate Professor of Pathology and Laboratory Medicine, Member, Lineberger Comprehensive Cancer Center, UNC-CH	Genome Maintenance via Integration of DNA Replication and DNA Repair
02/18/2010	Peter M. Banks, M.D. Director of Hematopathology, Carolinas Medican Center, Charlotte; Adjunct Professor of Pathology and Laboratory Medicine, UNC-CH; Past President, North Carolina Society of Pathologists	Changes Over Time in Diagnostic Pathology: Concept versus Practice
02/25/2010	Core Support for Translational and Clinical Research at UNC using Human Specimens C. Ryan Miller, M.D., Ph.D. Assistant Professor of Pathology and Laboratory Medicine, Director, Translational Pathology Laboratory (LCCC/DPLM), UNC-CH Karen E. Weck, M.D. Associate Professor of Pathology and Laboratory medicine, Director, Laboratory Assay Development Service (TraCS Institute), UNC-CH Margaret L. Gulley, M.D. Professor of Pathology and Laboratory Medicine, Director, Rapid Adoption Molecular (RAM) Laboratory (LCCC/UCRF/DPLM), UNC-Ch	The Translational Pathology Laboratory (TPL) – A LCCC/DPLM Core Facility for Translational Research at UNC Laboratory Assay Development Service (TraCS Institute) Rapid Adoption Molecular Lab and resources of the TraCS Institute
03/04/2010	Leigh B. Thorne, M.D. Assistant Professor of Pathology and Laboratory Medicine, Member, Lineberger Comprehensive Cancer Center, UNC-CH	Garbage In, Garbage Out – Impact of Biobanking in Translational Research
03/11/2010	Virginia L. Miller, Ph.D. Professor and Assistant Dean of Graduate Education, Department of Genetics, UNC-CH	Yersinia pestis Yaps: What are they talking about?
03/18/2010	R. Jude Samulski, Ph.D.	Gene Transfer and Orphan Diseases: Is

	Professor of Pharmacology, Director, Gene Therapy Center, UNC-CH	There Hope on the Horizon?
03/25/2010	Nancy E. Thomas, M.D., Ph.D. Associate Professor of Dermatology, Member, Lineberger Comprehensive Cancer Center, UNC-CH	The Molecular Aspects of Melanoma Heterogeneity
04/08/2010	Pathology and Laboratory Medicine Graduate Student Research Day Matt D. Medlin, Ph.D., Candidate, Christopher P.Mack, Ph.D., Advisor	S1P Receptor 2 Signals Through the GRS-RhoGEF, LARG to Promote Smooth Muscle Cell Differentiation Targeting the Epigenome to Sensitize Breast Cancer Cells to Chemotherapeutic Drugs
	Rupninder Sandhu, Ph.D., Candidate, William B. Coleman, Ph.D., Advisor	A Diabetogenic Ins2-Akita Mutation Uncovers the Insulation Resistance in Adipose Tissues of PpargP465L/+ Female Mice
	Avani Pendse, Ph.D., Candidate, Nobuyo Maeda, Ph.D., Advisor	
05/15/2010	Pathology and Laboratory Medicine Residents and Fellows Research Day Alexander (Sasha) J. Finn, M.D., Ph.D. AP/CP Resident, PGY4 Natalie Banet, M.D. AP/CP Resident, PGY2	Pseudonests 2: Electric Boogaloo
	Jessica L. Poisson, M.D. AP/CP Resident, PGY2	Evaluation of the Combined Utility of p16 and ProExC Immunohistochemistry in Distinguishing Endocervical Glandular Neoplasia from its Benign Glandular Mimics
	Michael J. Papez, M.D. Surgical Pathology Fellow	Seasonal Occurrence of Thrombotic Thrombocytopenic Purpura
05/13/2010	David Eberhard, M.D., Ph.D. Pathologist and Director of Clinical Trials Services, LabCorp Center for Molecular Biology and Pathology, RTP, NC	Association of Toll-like receptor-4 with Endometrial Cancer
05/27/2010	Marila Cordeiro-Stone, Ph.D. Professor, Department of Pathology and Laboratory Medicine, UNC-CH	Individualized Treatment and Targeted Therapies in Oncology: Focus on Pathology
06/17/2010	Maimoona B. A. H. Zariwala, Ph.D. Assistant Professor, Department of Pathology and Laboratory Medicine, UNC-CH	DNA Damage Tolerance in Human Cells
		Genetics of Primary Ciliary Dyskinesia (PCD)

PATHOLOGY FACULTY RETREAT

The Pathology Faculty Retreat with a central focus on research and clinical scholarship was held on May 20, 2010 at the Kenan Center. Interdisciplinary groupings of faculty in the Department with synergistic interests, knowledge and skills, with a particular focus on bringing together faculty who are not already collaborating were identified. The groups included:

Cancer

Group Leader: Bill Kaufmann

Participants: Bill Coleman, Bill Kaufmann, R. Miller, A. Rogers, M. Cordeiro-Stone, C. Vaziri, B. Weissman, Mike Topal, Bill Funkhouser, A. Bridges, S. Maygarden, V. Godfrey, H. Varnholt, J. Woosley

Vascular Pathobiology

Group Leader: Nadia Malouf

Participants: D. Bellinger, C. Fletcher, J. Homeister, N. Takahashi, M. Kakoki, H-S. Kim, M. Willis, N. Malouf, H. Xiao, P. Hu, X. Yi

Blood Pathobiology

Group Leader: Alisa Wolberg

Participants: F. Church, T. Fischer, S. Lord, H. Whinna, A. Wolberg, O. Gorkun, K. Inoue, A. Annan, Y. Park, C. Dunphy, G. Fedoriw, C. Bagnell, J. Chapman

Infection/Immunology

Group Leader: John Schmitz

Participants: M. Miller, M. Gulley, J. Nielsen, J. Schmitz, J. Whitaker, H. Reisner

Genetics/Pharmacogenomics

Participants: J. Booker, R. Farber, K. Kaiser-Rogers, J. Kornegay, Dimitri Trembath, K. Weck, M. Zariwala

Each group met separately and summarized the strengths, weaknesses and threats for its area of research in the Department and at UNC in general. Each group proposed one or more of the following: new collaborative research project, new translational research project involving human subjects and relevant to health care or new training grant proposal for pre-doctoral or postdoctoral or both.

Progress reports on the proposals are due after six months.

ENVIRONMENTAL PATHOLOGY TRAINING PROGRAM

The Environmental Pathology Training Program seeks to develop scientists who discover mechanisms by which environmental substances affect cellular processes to cause disease. The program trains scientists to combine an understanding of the pathogenesis of human diseases and expertise in appropriate research methods to study these diseases. The research focus of the program is on the etiology and pathogenesis of cancer and DNA damage and repair, reflecting the expertise of the faculty mentors. This program is currently in year 34 of support from the

National Institute of Environmental Health Sciences. The grant has 6 slots for postdoctoral fellows and 6 slots for predoctoral trainees. We also have a T35 Institutional Grant with 6 slots for short-term research training for minority undergraduates. Two of these slots are allocated to this program and 4 of the slots are allocated to two other NIEHS-sponsored training programs in toxicology and in biostatistics, epidemiology and environmental sciences on this campus. All six of the positions are administered by this grant. During this past year all of the training slots on the Environmental Pathology Training Program and the Minority Training Program were filled.

Some postdoctoral candidates learn about our training program by viewing our website or reading our advertisements in national journals or through the job placement services of national societies. Some candidates are interviewed and recruited at the job placement activities at national meetings. Others candidates are referred to the program by prominent investigators in environmental pathology. The program has gained a national recognition as one of the premier postdoctoral training programs in this field. Trainees accepted by the program typically come from fine graduate programs in related fields from around the country. A number of our trainees have had M.D. or D.V.M. degrees. Several trainees supported by this institutional grant have subsequently obtained individual postdoctoral research training grants. In recent years two postdoctoral trainees have received individual training grants from the NIH and the DOD, and another has received a K08 Award from the NIH. Trainees typically have found appropriate transitional positions and permanent jobs. One of the trainees recently completing support from the program went directly to a faculty position in environmental sciences. Predoctoral trainees are chosen from among the applicants accepted into the IBMS/BBSP graduate program who after their one in Molecular and Cellular Pathology. Trainees selected are among those expressing an interest in environmental issues and the research of training program mentors. Typically, one or two predoctoral students are chosen per year, usually the best among the candidates interested in the work of training grant preceptors. This year there will be slots for two new predoctoral trainee who will be selected from among first year BBSP trainees. Students that graduate from this program have usually found postdoctoral positions in very strong laboratories. Candidates for short-term research training for minority undergraduates are chosen among the highly selected candidates referred by the UNC graduate school and the BBSP Program. These candidates are put in contact with preceptors whose research fits the candidates stated interests. We attempt to make placements where there is a good match between the research of the preceptors and the interests of the candidates. Trainees spend 10 weeks in the summer working with the selected faculty member. The goal of this program is to attract students to enter graduate school in these research areas. It has been notably successful in achieving this objective; several have attended graduate school at UNC.

The final class of six trainees supported by the NIEHS Minority Undergraduate Training Grant was in attendance during the past summer. Significantly, one of these trainees was selected for the best presentation award at the annual MARC program national meeting. The NIEHS determined that the Minority Undergraduate Training Grant could no longer be supported by the T35 grant mechanism. Since the alternative mechanism for funding undergraduate training was not up for competition this year, we have not yet submitted an application for a grant to replace it. It is likely that we will do so when the alternative grants are announced by NIEHS.

In May 2009, a competitive renewal application was submitted for the Environmental Pathology Training Grant. The application will not be funded and a revised application is being prepared for submission and review during the coming year. We will be able to appoint trainees to fill

slots that open this grant year and further support will be provided by carry over funding. In this grant year one trainee withdrew and one will finish his Ph.D. degree; two new predoctoral trainees will be appointed to their slots. There are two postdoctoral trainee positions that will become available at the end of this grant year as previous occupants completed the term of their training. We are in the process of recruiting new trainees for these two slots to be appointed when the current trainees terminate at the end of June.

CLINICAL SERVICES

BACKGROUND McLENDON CLINICAL 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 09-10, the laboratory is projected to contribute 54 million dollars to UNC Hospital's operating margin.

The Core laboratory has just completed a four year project using LEAN and Six Sigma tools to redesign the laboratory space, increase efficiency and reduce cost. The highlight of this project is the robotic automation that takes tedious manual tasks related to specimen processing and automates them. This project has decreased test turnaround time, decreased labor requirements and provided excess capacity that will allow the laboratory to expand the Outreach service. Personnel redeployed from the Core Laboratory will help to staff our new Outreach growth initiative to include marketing of McLendon Laboratory services in the surrounding counties.

McLendon Laboratories is also investing in automation and bar code labeling technology in the Surgical Pathology Laboratory. The laboratory will have the capability of bar coding specimens and using the bar code from processing through the analysis and interpretation. This will improve patient safety and decrease turn around.

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 consultations specimens. In 2009, 28,500 cases were diagnosed, including 2900 outside and around 800 dermatopathology cases, representing a 2% year-over-year increase in faculty caseload. Increasing case volumes and case complexities made it challenging to sign out all cases with residents each day, so we expanded from 4 to 6 SP benches in July 2009, with splitting of the surgical specialties bench into an ENT/thoracic bench and a GU/pancreatobiliary bench, and with creation of a dedicated Dermatopathology bench. Dr. Woosley's partial effort in Dermatopathology through the Department of Dermatology ended in July 2009, dovetailing with

the creation of the new Dermatopathology bench in Surgical Pathology in July 2009. A new faculty member, Dr. Yuri Trembath, joined the practice in Fall 2009, with primary responsibilities in Surgical Pathology and Neuropathology. We said farewell to Drs. Rubinas and Livasy in December 2009 as they entered private practice. We continue our system for credentialing of Surgical Pathology Fellows in the fall, with transition to final signout responsibility as Instructors in the spring. This gives us flexibility in the spring to cover faculty departure or to create a short-term frozen section rotation. One challenge for 2000 is to expand to 7 surgical pathology signout benches in August 2010, to be accomplished by splitting the breast/benign Gyn and Gyn Onc benches into 3 separate benches. A second challenge for 2010 includes transition to synoptic reporting. A budget goal for 2010 -- 2011 is to negotiate for seamless barcoding of cases from accessioning to case signout.

The histology laboratory is commensurately busy. We are fortunate that the Laboratory is well-
led by Ms. Maglione, and that it is well-managed by Ms. Deloney. This laboratory and its
upstream accessioning personnel are critical to an efficient, error-free service. Block volumes
have risen 60% over a 5 year period during which case volumes rose 20%. These block volume
increases have been met with increased productivity, Lean analysis, and improved
instrumentation. Lean analysis of immunohistochemistry workflow has reduced turnaround time
for receipt of immunohistochemical stains. Challenges for 2010 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 Labs, and of Dr. Jennette, Chair 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 had a modest increase in workload in 2009. The workload for the
last 3 years is summarized below.

January 1, 2007- December 31, 2007

GYN Pap smear cases:	17644
NonGYN cases (fluids):	4340
NonGYN consults:	360
FN cases:	1477

January 1, 2008-December 31, 2008

GYN Pap smear cases:	17422
NonGYN cases (fluids):	4973
NonGYN consults:	424
FN cases:	1651

January 1, 2009-December 31, 2009

GYN Pap smear cases:	17493
NonGYN cases (fluids):	5760
NonGYN consults:	442
FN cases:	1762

The cumulative increase in workload, however, has justified the hiring of an additional cytotechnologist, primarily to assist with immediate adequacy assessment of FNAs. This cytotechnologist has recently been hired and is expected to begin work in mid-May, 2010.

Drs. Cherry Starling and Lori Scanga are expected to complete the cytopathology fellowship in June, 2010. The two fellows from 2008-2009 successfully passed the ABP cytopathology board exam in late 2009.

AUTOPSY PATHOLOGY

LEIGH B. THORNE, M.D., DIRECTOR

We recognize the autopsy as a valuable medical procedure for assessing quality of patient care, evaluating clinical diagnostic accuracy, determining therapeutic effectiveness, increasing understanding of pathobiology, augmenting clinical and basic research, and for medical education. The autopsy is used as a critical investigative tool to discern the cause and natural history of disease, to educate medical students and residents, and as an integral component of patient care. The large variety of cases encountered provides a rich learning environment. UNCH Autopsy Service continues to provide valuable information to clinicians and families of patients. In this fiscal year, a total of 129 autopsies were performed including 38 pediatric cases. A multidisciplinary committee was also formed to address issues with decedent care in general. 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. Ultimately, the goal is to create a decedent care coordinator to facilitate the entire process. In addition to our clinical mission, the service continues to serve as an important resource for researchers at UNC.

MOLECULAR PATHOLOGY

MARGARET L. GULLEY, M.D., DIRECTOR

The Molecular Genetics Laboratory performs assays on DNA or RNA to aid physicians in diagnosis, monitoring, and treatment of infectious disease, cancer, and heritable conditions. A description of our clinical services is found on our website:

http://labs.unhealthcare.org/directory/molecular_pathology/index.html

Research and development is an important component of our clinical and academic mission to serve our patients using modern molecular technologies. Our training programs educate physicians, medical students, post-doctoral fellows, genetic counseling students, and clinical laboratory science students such as those enrolled in the Masters in Molecular Diagnostic Sciences program. Our training program in Molecular Genetic Pathology was the first in the nation to educate a board-certified physician in this subspecialty. Every other year we provide a month-long course in Molecular Diagnostics and Cytogenetics that is targeted at pathology residents and also accepts a wide range of interested medical professionals. Further information on our clinical, educational and research efforts in molecular pathology is found at:

http://www.pathology.unc.edu/faculty_labs/gulley_lab/welcome.html.

Molecular pathology is growing rapidly as clinicians increasingly use molecular tools for diagnosis and management. Clinical assays added to our test menu in the past year include:

1. EGFR mutations for predicting response to therapy in lung cancer.
 2. BRAF mutations to predict response to therapy in colon cancer, melanoma, and some thyroid cancers.
 3. Virus (EBV and CMV) DNA detection in cell and tissue specimens to complement the plasma or CSF tests previously offered.
 4. Cytochrome P450 2C19 (CYP2C19) sequence variants associated with resistance to clopidogrel (Plavix) anti-platelet therapy and increased cardiovascular morbidity and mortality.
 5. Mitochondrial DNA 1555A>G mutation associated with aminoglycoside-induced and non-syndromic hearing loss
 6. Microsatellite instability testing on endometrial carcinoma to complement the colon cancer indication previously offered.
 7. Gene expression profiling of breast cancer using 244k Agilent arrays for use in clinical trials.
- 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 validate these novel and useful assays.

Major Equipment: Roche LightCycler 2.0 and 480 real-time PCR instruments, 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, RoboSep, and UVP gel documentation system.

Faculty are Margaret L. Gulley M.D., Karen E. Weck M.D., Bill K. Funkhouser, Jr., M.D., Ph.D., Leigh B. Thorne M.D., Jessica K. Booker Ph.D., Maimoona Zariwala Ph.D. and Rosann Farber Ph.D. Fellows are Kenneth Muldrew M.D., M.P.H. and Hongxin Fan Ph.D. The fellows as of July 1, 2010 are Chuck Sailey M.D. and Ferrin Wheeler Ph.D. 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)

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

The Transfusion Medicine Service underwent physical changes over the past year. The Platelet Program changed their name to Blood Donation Program and moved into the NCCH in August. They are collecting between 55 – 60% to date for the year of the platelet needs of UNCH. In addition, the NRC is requiring TMS to construct a separate room for the blood product irradiator with several hi-tech entry requirements (hand geometry) for staff allowed to enter. Apheresis continues to be fully staffed at this time, allowing them to collect HPC products, handle patients and grow in research procedure assistance. All areas (Blood Bank, Apheresis, Blood Donation program, HPC) underwent self-inspection for the newly released AABB Standards for Blood Banks and Transfusion Services which were effective November 1st, 2009. This was in

preparation for the upcoming bi-annual assessment next quarter as well as CAP inspection sometime in July-October. Apheresis is also preparing for another FACT inspection for late fall.

CLINICAL MICROBIOLOGY, IMMUNOLOGY LABORATORIES
PETER H. GILLIGAN, Ph.D., DIRECTOR

The CMIL continued to expand and enhance our clinical services in FY 2009-10 while maintaining our training mission. The major accomplishment this year was the development of improved diagnostic capabilities for the detection of pandemic influenza virus, H1N1 2009. This required improving our molecular detection capabilities for influenza to include an H1N1 2009 specific PCR, development of pyrosequencing for detection of oseltamivir resistant strains of H1N12009, and cross training of several technologists from the Molecular Genetics Laboratory so that we could offer around the clock testing for H1N12009. We processed approximately 4 times as many specimens for influenza than would be done in a typical influenza year. In addition to the influenza pandemic, using improved molecular diagnostics for other respiratory viruses, the importance of human metapneumovirus was recognized in our patient population. We improved our testing algorithm for *Clostridium difficile* by introducing a new antigen screening test and a PCR confirmatory test for the detection of toxigenic *C. difficile* strains. The new testing algorithm is more sensitive than our previous testing algorithm and allows us to report a final result for all specimens submitted for the detection of *C. difficile* in less than 24 hours, a 24 to 36 hour improvement in turn-around-time.

We enhanced our antimicrobial susceptibility testing service by offering automated susceptibility testing for both gram positive organisms and yeast.

The immunology section working in conjunction with allergy and ENT services expanded allergy testing resulting in a significant increase in test volume (42%) and improved patient services. Our hepatitis serology testing was greatly enhanced by the installation of a random access analyzer that improved turn-around-times and facilitated STAT hepatitis serologies in patients with fulminant hepatitis and for low birthweight infants. In addition, Ehrlichia serologies were instituted which enhanced our ability to detect tick-borne diseases.

An important pre-analytic stage initiative in conjunction with the nursing service has been the "Send the blob not the swab" campaign. The goal of this initiative is reduce the number of swabs submitted for culture while increasing the number of aspirates and biopsies sent.

In addition to hosting laboratory scientists from both Malawi and China, we offered a new teaching activity for Infectious Disease fellows called "Introduction to the Clinical Microbiology-Immunology Laboratories" to supplement our popular "Friday with the Fellows" lecture series. Our CPEP approved training programs in Medical and Public Health Microbiology and Clinical Immunology are both currently at capacity and we are actively engaged in training Molecular Genetic Fellows in aspects of Molecular Microbiology. We have continued the important work of training Pathology Residents, medical students (PATY 410, 415, 417) (we had the highest medical student enrollment ever in these courses), and clinical laboratory science students while adding intensive training for Masters in Molecular Diagnostic Science students.

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

In June and July 2009 we met and held discussions with the house staff from both the surgery and medicine departments to address their concerns about the elimination of the 1AM draw. We

determined that the house staff was utilizing the 1AM draw in order to have results available prior to 6AM on all of their patients for rounding. We determined that the house staff did have a way to access patient results on the units via a ward report and there was no need to re-establish the 1AM draw which we had difficulty staffing and was a huge dissatisfaction for the patients who were awakened at that time.

At this same time, we modified our quality monitors to include data on the percent of results that are available in WebCIS by 6AM as well as 8AM which we were already monitoring. Initially, only 35-37% of test results were available by 6AM. We modified the start time of our 4AM draw to begin at 3AM and we have been able to maintain 55-59% of test results being available by 6AM. The target for this is 60% or greater. We average over 93% of all tests ordered at 4AM being resultated by 8AM. We are currently working on a program to narrow down the exact percent of tests that can not be resultated by 8AM because they are batched, sent out, or take longer time to complete such as blood cultures.

In August we moved the outpatient blood collection service being performed in the Gravelly building to the new North Carolina Cancer Hospital. The new space is larger and a great improvement for the staff and patients being seen there.

We continue to train NA's working in the ED on improving their general phlebotomy skills and particularly their skills related to blood culture collections. Since beginning this training we have succeeded in reducing the number of contaminated blood cultures collected by the ED staff to a contamination rate of less than 2% from historic levels of 3 to 5%.

We anticipate blood culture contamination rate for Phlebotomy Services from July 2009 through June 2010 to be 1%. Each contaminated blood culture is estimated to cost \$8400 because of increased utilization of medical diagnostic and therapeutic services. Since we do approximately 25,000 blood culture annually, reducing blood culture contamination rates by 1%, saves the institution approximately 2 million dollars.

Currently, less than 1% of blood cultures are not collected within one hour of the time the order is placed as a result of delays within the control of Phlebotomy Services due to staffing. This is a great improvement from when we began monitoring this in July 2008 when it was 45%.

In April 2009, the state of North Carolina began screening all newborns for cystic fibrosis. As a result, the volume of Sweat Chloride Collections is anticipated to grow by 57% (157 collections over last year) to end the year on June 30, 2010 with approximately 493 total sweat chloride collections from July 1, 2009 through June 30, 2010. In May 2010, we meet with the cystic fibrosis staff to re-structure appointment times for collection of sweat chloride testing to insure optimal utilization of these time slots.

Phlebotomy Services calculates a 5% increase in the total volume of patients collected this fiscal year over last. Outpatient collections are currently down 9% from the previous year. We can attribute the overall increase to the hourly inpatient collections and the greater use of our service by the house staff and nurses.

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

The Core Laboratory services include clinical chemistry, hematology, coagulation, urinalysis, special coagulation, and referral testing. Clinical chemistry is further divided into automated chemistry, blood gas/critical care, special chemistry, and toxicology. The Laboratory receives 3000-4000 samples daily and performs >5 million tests annually. The 2009-2010 fiscal year saw the completion of three major projects: eleven instruments were replaced by consolidation of much of the testing onto four high-complexity systems combining chemistry and immunoassay. With the introduction of these systems, minor renovations were undertaken to create the work cell designed several years ago. Lastly, much of the sample processing and handling was automated using the enGen™ Laboratory Automation System (Ortho Clinical Diagnostics, Inc.). This last project extended over six intensive months of planning and system development, and ties together pre-analytical, analytical, and post-analytical processes. Not to be outdone, other sections of the laboratory were actively engaged in enhancing patient care: special chemistry developed and introduced methods for the analysis of acylcarnitines and carnitines using LC/MSMS, new quality control software was introduced, and intraoperative parathyroid hormone (PTH) testing was moved to the operating room suites to provide better turn-around-times during these cases.

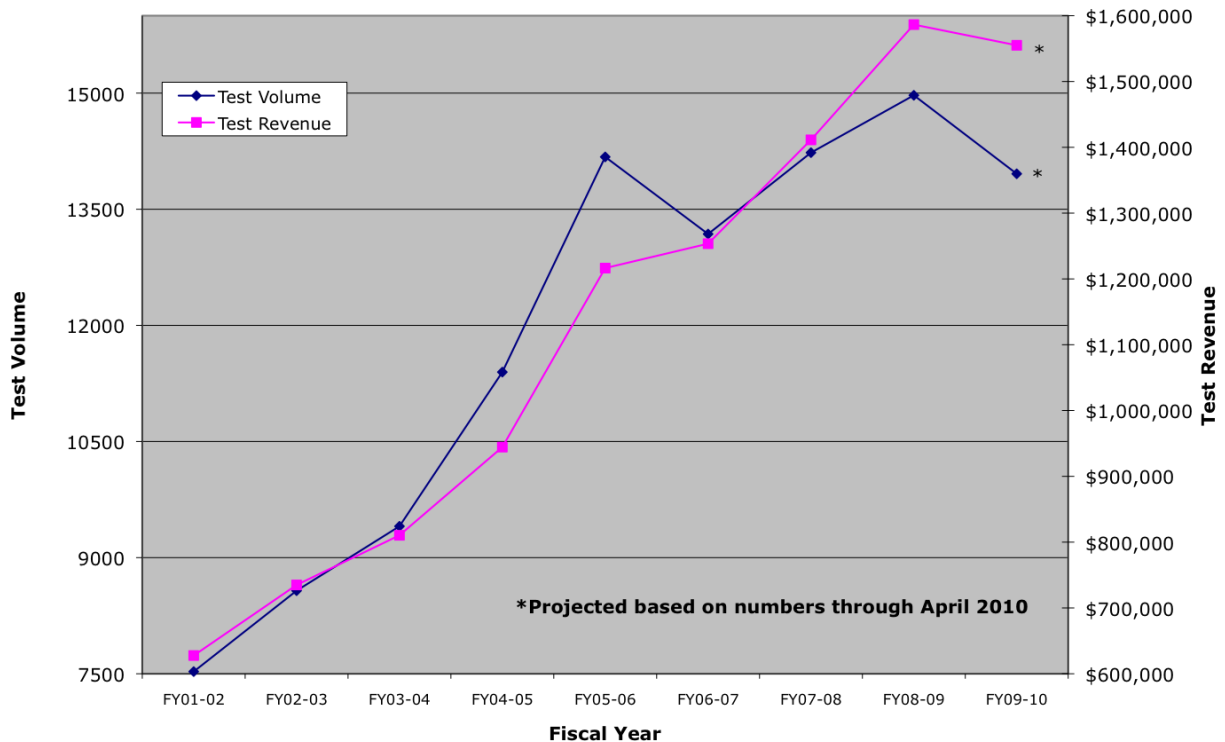
HEMATOPATHOLOGY
CHERIE H. DUNPHY, M.D., DIRECTOR

The volume and complexity of cases has continued to increase in this Division since the recent move into the recently completed, state-of-the-art North Carolina Cancer Hospital. The annual in-house bone marrow volume is > 2,000 and the lymphoma-evaluation case volume is approximately 750. Outside review of Hematopathology diagnostic cases has also continued to increase as these reviews are necessary for patients being referred to UNC for therapy. Additional immunohistochemical and flow cytometric markers are continuously being added to the diagnostic repertoire for this Division, which remains on the cutting-edge of diagnostic Hematopathology. The Division looks forward to incorporating 6-color flow cytometry into clinical practice, which will allow for better definitions of hematolymphoid neoplasms on conceivably smaller numbers of neoplastic cells. The Division has benefitted from the new faculty additions, including Drs. George (Yuri) Fedoriw and John Hunt. Dr. Stephanie Mathews will be joining the Hematopathology attending faculty in the Fall of 2010.

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

As did much of the rest of McLendon Clinical Laboratories, the Special Coagulation Laboratory saw a downtrend in volumes over the past fiscal year with a lesser drop off in revenue.

Special Coagulation Fiscal Years 2001-2010



The laboratory also performed special studies testing for equipment companies generating additional revenue for UNCH to that shown in the above graph. Faculty and staff 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. We continue to optimize patient care and safety as well as plan for the development and implementation of necessary new testing in the future.

CYTOGENETICS

KATHLEEN W. RAO, Ph.D., DIRECTOR

KATHLEEN A. KAISER-ROGERS, Ph.D., CO-DIRECTOR

During the past fiscal year, the most significant change in the Cytogenetics Lab has been the in-house validation and addition to the test menu of high resolution whole genomic SNP microarrays. Through December 2009, the laboratory offered a 105,000 feature oligonucleotide combination whole genome/targeted CGH array for evaluation of copy number changes in patients with developmental disabilities, dysmorphic features and other birth defects. Over 500 of these assays were ordered through the laboratory last year, and demand for this technology has increased to approximately 600-700 this year. Issues with the continued availability of the 105K array prompted our change of vendors and, consequently, of array design. As of June 1, 2010, we have validated and are offering a 1.8 million feature oligo/SNP array that combines the ability to detect copy number changes with the ability to identify loss of heterozygosity which

can be seen in patients who are the products of consanguinity and patients with some forms of UPD.

The caseload increased significantly in 2009-2010 in the Cancer Cytogenetics section of the laboratory with the opening of the Cancer Hospital, with increases seen in requests for both conventional karyotyping and FISH assays. At the current time, the laboratory offers 30 different interphase FISH assays, most of which are designed to diagnose or monitor specific genetic abnormalities associated with various cancers.

We continue to characterize the chromosome rearrangements of some of our more interesting patients using both traditional and molecular cytogenetic techniques including both fluorescence in situ hybridization (FISH) and array CGH. The rearrangements and corresponding phenotypes observed in two of our patients were reported in poster form at the March 2010 American College of Medical Genetics Meeting and the May 2010 American Cytogenetics Conference by our fellow, Dr. Ferrin Wheeler.

The Cytogenetics Laboratory continues to participate in the cancer cooperative groups (CALGB and COG). Dr. Rao did a 60 minute interactive workshop on cases from the CALGB Karyotype Review at the cytogenetics workshop at the CALGB Fall meeting (2009) in Phoenix.

LABORATORY INFORMATION SERVICES

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

Major projects from the past fiscal year for Lab Information Services included upgrading the CoPath Anatomic Pathology system to the latest version, interfacing the Ortho 5600 instruments and interfacing the new Ortho Lab Automation System. The two Ortho projects involved revamping a majority of the interfaced tests in Core Lab. Several additions were also made to the menu of interfaced Point of Care tests. Upcoming projects include a database upgrade to the Soft LIS, a courier tracking package for Outreach, an interface with Rex Hospital, synoptic reporting for CoPath as well as an advanced barcoding module for CoPath.

NEPHROPATHOLOGY LABORATORY

VOLKER R. NICKELEIT, M.D., DIRECTOR

The Division of Nephropathology at UNC 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 1,700 renal specimens (native & transplant biopsies and nephrectomies) from over 200 nephrologists throughout the state, region and the world are analyzed annually. During the 2009 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 by immunohistochemistry. Thus, the actual number of procedures that are performed on renal specimens by far exceeds 5000 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 30,000 renal specimens, 15,000 serum samples, and 1000 urine samples. Currently one visiting scholar from Saudi Arabia and one pathology post doctoral research associate from Sudan 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 USCA meetings, the Columbia Presbyterian post graduate course on nephropathology in New York, or the 'Nephropathologiekurs Volhard-Fahr' in Mannheim, Germany. The Division of Nephropathology is closely allied with the UNC Kidney Center and the Glomerular Disease Collaborative Network (GDCN). The GDCN has been in operation for 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

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

The Quality Management Group has been very active this year in participating in projects using LEAN and Six Sigma techniques. We now have two trained LEAN facilitators, one employee completing her black belt training and one employee in green belt training. The LEAN facilitators worked with Surg Path to streamline the process flow in histology and to create single piece flow through the laboratory. A separate LEAN project incorporated interfaced equipment into the laboratory eliminating several hours of staining time for samples. One of the Green Belt projects evaluated turnaround time in the Core Lab and using Six Sigma was able to reduce routine turnaround time for chemistry testing by several minutes. The Green Belt project that is currently underway is looking at ways to improve test ordering accuracy and coding for outpatients so that payment denials by insurance companies will be decreased. The Quality Management Group was recently honored by the hospital for their outstanding contributions in the area of safety. The group has also been reviewing CAP standards and conducting interim inspections in anticipation of the full CAP inspection this summer.

NEUROPATHOLOGY

THOMAS W. BOULDIN, M.D., DIRECTOR

Diagnostic services in Neuropathology are provided at UNC Hospitals by C. Ryan Miller, M.D., Ph.D., Dimitri G. Trembath, M.D., Ph.D., and Thomas W. Bouldin, M.D. Dr. Bouldin is the director of the Division of Neuropathology. Neuropathology services include diagnostic surgical neuropathology, autopsy neuropathology, forensic neuropathology, nerve biopsy interpretation, and ophthalmic pathology. The surgical neuropathology service and autopsy service provide sufficient neuropathology specimens to allow the Department of Pathology and Laboratory Medicine to sponsor an ACGME-accredited subspecialty fellowship training program in neuropathology. The service also provides training of the Department's residents in anatomical and clinical pathology.

The volume of surgical neuropathology cases has continued to increase and become more complex over the last five years, due in part to the growth of the clinical neurosurgical service, the expansion of the Neuro-Oncology programs at UNC Hospitals, and the opening of the North Carolina Cancer Hospital.

The Neuropathology faculty members attend and are active participants in the weekly Neuro-Oncology Multidisciplinary Conference at UNC Hospitals. A complete listing of the clinical conferences conducted by the neuropathology faculty is as follows:

Brain Cutting Conference (Autopsy Service) Weekly
Muscle and Nerve Biopsy Conference Weekly

Clinical Neurosciences Conference Monthly
Ophthalmic Pathology Signout Conference Weekly
Multidisciplinary Neuro-oncology Conference Weekly

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 the community. The service has grown to serve 70 clients in the research triangle area including hospital and community based clinics, skilled nursing facilities, private physician practices and home health agencies. Support is provided primarily in the areas of diagnostics, assistance with regulatory compliance and maintenance of point of care testing/competency. Twenty-four 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 101,000 patients ordering and processed over one-half million tests.

Outreach formally enlisted the assistance of Mayo Medical Laboratories' Outreach Support Program in performing an operational and market analysis. A return on investment analysis was developed and the resulting strategic and business plan was presented to senior administration in August. Additional meetings and communications were held with the CFO and budgets for investment in capital (automobiles), software (customer service/courier tracking) and staff (supervisor, sales and couriers) were submitted for next fiscal year. Planning for a computer interface with Rex Laboratory has continued to progress and other venues of cooperation are being discussed.

Outreach as initiated two Six Sigma/Lean projects. A green belt project was started on reducing the amount of write-offs due to improper/incomplete diagnostic coding and a lean project examining the Outreach processing area. The process area was remodeled and Outreach continues to work with the Core laboratory staff as it implements automation. A customer service/call center is being established to combine outreach, core laboratory and micro customer service areas. The ambulatory care center's operating room expansion, projected to be completed in early 2011 will also result in a moderately complex laboratory being located in that facility and will be supported by Outreach staff.

TRANPLANT LABORATORIES

JOHN L. SCHMITZ, Ph.D., DIRECTOR

HLA, Flow Cytometry and HPC Laboratory

Several changes have taken place in the flow cytometry laboratory aimed at improving patient care and enhancing laboratory efficiency. First, the laboratory has validated an in house assay for the diagnosis of chronic granulomatous disease. This test was previously referred to Mayo Laboratories. However, inconclusive results were often obtained due to the adverse effect of shipment on the patients neutrophils. Performing this testing in house eliminates the adverse effects of shipping as well as contributes to the reduction in the referral testing budget. The flow cytometry laboratory has improved the test used for diagnosis of paroxysmal nocturnal hemoglobinuria (PNH). The previous test had a lower sensitivity for rare PNH cells found in some patients and occasionally demonstrated suboptimal staining of neutrophils. The new assay

utilizes a reagent that more consistently stains cells and is better at detecting rare PNH clones. These advantages improve the ability of the laboratory to diagnose this disease. Finally, the laboratory is taking steps to improve efficiency. The first step we have taken is to eliminate the use of hardcopy records of our flow cytometric histograms. The laboratory now stores all histograms as list mode data files and pdf's of the cytometer printouts. This serves to reduce paper use, the amount of laboratory space needed for file storage as well as the labor associated with filing test results and periodic shipping to offsite storage.

The Histocompatibility (HLA) Laboratory has likewise taken steps to improve patient care and enhance laboratory efficiency. The HLA laboratory has eliminated cytotoxicity based crossmatching due to reduced demand. As flow cytometry has become the gold standard method for crossmatching for solid organ transplantation, cytotoxicity crossmatch demand has waned. Reduced demand has led to concerns over staff competency and the cost of maintaining a technology that has limited use. As such the laboratory has stopped offering this testing. This will result cost savings for the laboratory by reduced QC/QA activities required to support the testing. The HLA has recently validated its flow cytometric crossmatch assays on the new BD FACSCanto cytometers in the Flow Cytometry Laboratory. This provides a back up in case of malfunction with the HLA Laboratories instrument. The HLA has recently conducted an evaluation of a real-time PCR assay for low resolution HLA-A, B and DRB1 typing. This platform provides a more rapid method for HLA typing of individual patient samples which could reduce the time for completing on call HLA typing of deceased donors resulting in decrease labor costs.

MUSCLE PATHOLOGY LABORATORY
LEIGH B. THORNE, M.D., DIRECTOR

This core provides processing and histochemical staining for frozen muscle biopsies received in the UNCH Dept of Surgical Pathology. Approximately 80 muscle biopsies are performed each year at UNCH. From 7/1/09- 6/30/10, we collected, processed and stained 72 samples. Approximately half of the biopsies required additional referral lab testing (mitochondrial analysis, additional biochemical testing). The lab was also established as a recharge center and was able to offer our services to researchers at UNC and outside institutions including the National Center for Canine Models of DMD.

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

The HPC Laboratory has instituted a product stability program to ensure the quality of the products. The laboratory has also switched to transporting products within the hospital in dry ice instead of liquid nitrogen to improve safety. Additionally, the viability of the HPC products will be performed using flow cytometry, which is more accurate, instead of trypan blue staining. The laboratory is planning renovations that will increase the safety and ventilation of the area as well as adding to the workspace.

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 **327** principal investigators from **53** departments and centers at UNC-CH, and other area institutions. The total number of active laboratory clients now stands at **886**.

In the past 12 months the light microscope facilities logged **8,774** hours of use, electron microscope facilities logged **2009** hours of use and the laboratory has performed **1,026** electron microscopy specimen preparations.

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.

The laboratory participated in an NIH Shared Instrumentation Grant for a new transmission electron microscope. This grant requested an amount of \$442,000.00. Results will be available in February 2011.

The laboratory received \$25,000 in funding from the School of Medicine for the following projects:

- 1) Purchase service contract for Zeiss LSM 710 confocal laser scanning microscope.
- 2) Upgrade image processing system.

The laboratory received \$100,000 form the Department of Pathology and Laboratory Medicine for the following projects:

- 1) Add energy dispersive x-ray microanalysis to SEM
- 2) Add backscatter electron detection system to SEM
- 3) Upgrade preparative electron microscopy microwave system
- 4) Purchase glow discharge system

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 these systems were used by 10 principal investigators for a total of 335 hours.

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

Major changes continued in the Anatomic Pathology Translational Core Laboratory (APTCL) this year. First, we shortened our name to the Translational Pathology Laboratory (TPL). Our core management team was completed with the promotions of Dr. Nana Nikolaishvili-Feinberg to Facility Director and Mervi Eeva to Laboratory Manager. The two are charged with the day-to-day management of the core. Our staff of Research Specialists grew from 5 FTE to 7 FTE with the addition of new staff members Bentley Midkiff and Mark Olorvida. External funding has continued from the LCCC University Cancer Research Fund (Drs. Shelley Earp and Bill Marzluff), the GI SPORE (Drs. Joel Tepper and Bill Funkhouser), the Center for Environmental Health and Susceptibility (CEHS, Drs. Jim Swenberg and Bill Kaufmann,) and the Preclinical and Translational Research Center (PaTRC, Drs. Miller and Terry Van Dyke). We have also acquired several new instruments, including a second Leica Bond automated immunostainer, an Aperio ScanScope XT, and an Aperio ScanScope FL (pending). Overall, we provided services for 51 UNC investigators and 36 clinical trials. Diagnostic slides and FFPE tissue blocks were pulled from the Surgical Pathology archives on over 2,680 patient cases. Almost 7,500 unstained, 1,618 H&E stained, and 282 special stained sections were prepared. Seventy-four (74) new antibodies were brought online and 3,638 IHC stained sections were prepared. 2,671 slides were scanned with the Aperio ScanScope, Applied Imaging Ariol, and HistoRx AQUA instruments. Thirty-six new tissue microarrays (TMA) were constructed and from these almost 676 sections were cut. In collaboration with TPF, almost 867 scrolls and 1,688 cores were taken from FFPE blocks for nucleic acids extraction.

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

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 periods 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 researches.

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 7700, 7500 and 7300 Sequence Detection Systems and high throughput preparation of total RNA and genomic DNA by ABI Prism 6700 Automated Nucleic Acid Workstation and 6100. Currently more than 1,000 disease-related genes have been developed to detect their expression levels mostly in mice, and 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 researches. 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

As Director of the ADME Mass Spectrometry Center, Dr. Bridges' role is to provide study design assistance, bioanalytical support, and data interpretation to preclinical and clinical studies conducted by investigators at UNC and beyond. Center capabilities include quantitation by triple quadrupole mass spectrometry, molecular weight determination by ion trap mass spectrometry, and identification of novel metabolites by both types of equipment.

With regards to equipment, the Center maintains:

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

This past year, the Center supported the work of UNC principal investigators in the Schools of Medicine, Pharmacy, and Public Health. Primary research activities involved analysis of antiparasitic agents (in collaboration with Dr. Richard R. Tidwell), anti-HIV agents (in collaboration with Dr. Ron Swanstrom), and anticancer nanoparticles (in collaboration with Dr. William Zamboni). In addition, the Center has collaborated long-distance with researchers

from Duke University, East Carolina University and the University of Puerto Rico. Upgrades and renovations include configuring 521 Brinkhous-Bullitt to provide continuous nitrogen for the mass spectrometers, installation of a cooled autosampler for the API3000, and completion of the three-year lease-purchase of the Thermo Quantum Ultra. Work conducted by the Center varied from simultaneously quantifying seventeen different antiretrovirals in human plasma/breast milk/semen/cervicovaginal fluid, to determining the kinetics of enzymatic reactions, to identifying novel metabolites in complex biological matrices. Overall, users logged over 200,000 hours of instrument time over the past year. The Center was written into eight different grant proposals (three from the TraCs Institute, one from the LCCC University Cancer Research Fund, and four from extramural sources), two graduate students completed semester-long rotations through the Center, two research fellows and one professional student completed year-long rotations through the Center, and the Center was cited in fourteen peer-reviewed journal publications.

FACULTY AND SENIOR STAFF CHANGES

KIRSTEN M. BOLAND, B.S., M.H.S., resigned her position as Pathologists' Assistant effective July 30, 2010.

JOHN H. BRADFIELD, D.V.M., Ph.D., resigned his position of Director, DLAM, effective January 31, 2010, to accept the position of Senior Director, Association for the Assessment and Accreditation of Laboratory Animal Care International (AAALAC).

JOHN D. BUTTS, M.D., Chief Medical Examiner, retired from State service effective June 30, 2010.

THOMAS B. CLARK III, M.D., Associate Chief Medical Examiner, retired from State service effective June 30, 2010.

MEGAN J. DiFURIO, M.D., was appointed Clinical Assistant Professor effective August 18, 2010. She will serve as attending pathologist and focus on diagnostic pathology, cytopathology and surgical pathology.

CRAIG A. FLETCHER, D.V.M., Ph.D., was appointed Research Associate Professor effective August 1, 2009. His responsibilities will be in the Division of Laboratory Animal Medicine.

KEVIN E. GREENE, M.D., was appointed Clinical Assistant Professor effective July 1, 2010. He will serve as attending pathologist in surgical pathology and focus on gastrointestinal and liver pathology.

PAMELA GROBEN, M.D., was appointed Clinical Professor, 25% FTE, effective July 1, 2010. She will serve as attending pathologist in surgical pathology and provide pathologic interpretation of skin samples as a board certified dermatopathologist.

PEIQI HU, M.D., was appointed Research Assistant Professor effective December 30, 2009. Dr. Hu is involved in research on antibody-mediated kidney disease, specifically, disease mediated by anti-neutrophil cytoplasmic autoantibodies.

STEVE HOLMES, B.S., M.H.S., was appointed Clinical Instructor effective July 1, 2010. He will serve as Pathologists' Assistant.

J. CHARLES JENNETTE, M.D., was reappointed as Chair after completion of a five-year review.

APRIL KEMPER, M.S., M.H.S., was appointed Clinical Instructor effective August 1, 2010. She will serve as Pathologists' Assistant.

HYUNG-SUK KIM, Ph.D., was promoted to Research Professor effective October 14, 2009.

SARA KOENIG, M.D., was appointed Clinical Assistant Professor effective July 1, 2010. She will serve as an attending pathologist with clinical responsibilities on the Transfusion Medicine Service.

CHAD A. LIVASY, M.D., resigned his position effective January 31, 2010, to accept a position at Carolinas Pathology Group, Charlotte, North Carolina. Dr. Livasy was appointed Adjunct Associate Professor of UNC Pathology effective February 1, 2010.

STEPHANIE MATHEWS, M.D., was appointed Clinical Assistant Professor, 20% FTE, effective November 1, 2010, for service in Hematopathology.

MELISSA B. MILLER, Ph.D., was promoted to Associate Professor with tenure effective June 27, 2010.

SIOBHAN O'CONNOR, M.D., was appointed Clinical Assistant Professor effective July 1, 2010. She will serve as an attending pathologist in surgical pathology and cytopathology with a focus on breast pathology.

JUDITH N. NIELSEN, D.V.M., was promoted to Research Professor effective October 14, 2009.

DEBORAH L. RADISCH, M.D., was appointed Chief Medical Examiner effective July 1, 2010.

TARA C. RUBINAS, M.D., resigned her position of Assistant Professor effective December 31, 2009, to accept a position at LabCorp.

LORI R. SCANGA, M.D., Ph.D., was appointed Clinical Assistant Professor effective July 1, 2010. She will serve as an attending pathologist in surgical Pathology and cytopathology with focus on gynecologic diseases.

JOHN L. SCHMITZ, Ph.D., was promoted to Professor effective August 1, 2010.

NOBUYUKI TAKAHASHI, M.D., Ph.D., was promoted to Associate Professor with tenure effective April 1, 2010. Dr. Takahashi resigned his position effective April 30, 2010, to accept a

faculty position at Tohoku University, in Sendai, Japan. He was appointed Adjunct Associate Professor, non-salaried, at UNC effective May 1, 2010.

KAREN E. WECK, M.D., was promoted to Clinical Professor effective July 1, 2010.

LISA J. WEINSTEIN, M.D., resigned her position of Assistant Professor effective July 9, 2010, to accept a position at LabCorp.

SPECIAL HONORS AND AWARDS

GREGORY BIANCHI, M.D.

Recipient of 2010 Robert C. Cefalo House Officer Award that recognizes member of Housestaff for exemplary service.

FRANK C. CHURCH, Ph.D.

2009, "Coater" for White Coat Ceremony for 1st Year Medical Students, UNC-CH

WILLIAM B. COLEMAN, Ph.D.

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

GEORGE FEDORIW, M.D.

Philip M. Blatt Award for Excellence in Teaching Laboratory Medicine.

ALEXANDER FINN, M.D.

Recipient of the Inaugural Walter Lamer Residency Excellence Award

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

Invited to become a Section Editor for Molecular Pathology for the journal, Archives Path Lab Med.

Invited to take over Dr. Lynch's "Milestones" segment for the quarterly ASIP "Pathways" newsletter.

Invited to serve on the Nominating committee for the ASIP.

DAVID GOODMAN, M.D.

Frederic A. Askin Award for Excellence on Teaching Academic Pathology.

J. CHARLES JENNETTE, M.D.

Alexander Breslow Memorial Lectureship, George Washington University School of Medicine President, Association of Pathology Chairs

HARVEY MICHAEL JONES, M.D.

Elected to Board of Governors, American Osler Society, April, 2010

Received BA in History, University of Texas, May 2010

NOBUYO MAEDA, Ph.D.

Journal of Lipid Research 50th Anniversary Lectureship Award, April 19, 2009

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

Recipient of 2010 UNC School of Medicine Academy of Educators Innovations in Undergraduate Medical Teaching Award.
Frederic G. Dalldorf Award for Teaching Health Affairs Students

ELECTED MEMBERSHIPS, 2009-2010

WILLIAM B. COLEMAN, Ph.D.

Secretary-Treasurer, The American Society for Investigative Pathology

CHERIE H. DUNPHY, M.D.

President, North Carolina Pathology Society

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

Association of Directors of Anatomic and Surgical Pathology
Council member, 2009-present

PETER H. GILLIGAN, Ph.D.

Dean, American College of Microbiology
Board of Directors, American Academy of Microbiology

CATHERINE A. HAMMETT-STABLER, Ph.D.

President-elect, American Association for Clinical Chemistry
President, National Registry of Certified Chemists

J. CHARLES JENNETTE, M.D.

President, Association of Pathology Chairs

SUSAN T. LORD, Ph.D.

Chair, International Fibrinogen Research Society, 2003-present

CHRISTOPHER P. McCUDDEN, Ph.D.

Executive Committee: North Carolina Section of the American Association for Clinical Chemistry

MELISSA B. MILLER, Ph.D.

Board of Governors, American College of Microbiology

VOLKER R. NICKELEIT, M.D.

Councilor/Member: board of directors (Renal Pathology Society, USA)

KATHLEEN W. RAO, Ph.D.

International Standing Committee on Human Cytogenetic Nomenclature, (elected) Member 1/1/2007-12/31/2011. (One of 2 people elected in a national election in which all clinical cytogeneticists could vote, to represent the US on this governing committee)

Elected member of the Board of Directors of the American College of Medical Genetics (ACMG)

JOHN L. SCHMITZ, Ph.D.

President, Association of Medical Laboratory Immunologists

HARSHARAN K. SINGH, M.D.

Elected Vice-Secretary, Renal Pathology Society (companion society of the United States and Canadian Academy of Pathology).

KAREN E. WECK, M.D.

Chair, Training and Education Committee, Association for Molecular Pathology

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

Member at Large, Association of Pathology Chairs

LEADERSHIP POSITIONS

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

Clinical Veterinarian for the University

JOHN F. CHAPMAN, Dr.P.H.

Chair, CCT Examination Committee, NRCC

Member (Advisor) CLSI Subcommittee on Serum Indices

WILLIAM B. COLEMAN, Ph.D.

Council, The American Society for Investigative Pathology

Finance Committee Chair, The American Society for Investigative Pathology

Finance Committee, Federation of American Societies for Experimental Biology

Publications Committee, The American Society for Investigative Pathology

Divisional Oversight Committee, The American Society for Investigative Pathology

Membership Committee, The American Society for Investigative Pathology

Education Committee, The American Society for Investigative Pathology

MARILA CORDEIRO-STONE, Ph.D.

Continue to serve as a member of the Society of Toxicology, Career Resource and Development (CRAD) Committee (May1, 2009 to April 30, 2012)

GEORGETTE A. DENT, M.D.

National Group on Student Affairs Committee on Student Records

National Group on Student Affairs Committee on Diversity Affairs

Electronic Residency Service Application Service Advisory Committee

Chair, Planning Committee for Group on Student Affairs Quadrennial meeting

American Medical Association (AMA) Initiative to Transform Medical Education Conference on Medical School Admissions

AAMC Group on Student Affairs Steering Committee

CHERIE H. DUNPHY, M.D.

Chair, Case of the Quarter, Society for Hematopathology
College of American Pathologists Instrumentation Committee
College of American Pathologists Diagnostic Immunology Resource Committee

ROSANN A. FARBER, Ph.D.

Associate Chair, Department of Genetics

PETER H. GILLIGAN, Ph.D.

Member, Presidential Task Force on Clinical Microbiology, American Society for Microbiology

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

Member, Mouse Pathology Consortium within the American College of Veterinary Pathologist.

MARGARET L. GULLEY, M.D.

Chair, Topics Committee, Evaluation of Genomic Applications in Practice and Prevention (EGAPP) Stakeholder's Group

CATHERINE A. HAMMETT-STABLER, Ph.D.

AACC Delegate to the Personalized Medicine Coalition
Chair, Toxicology Certification and Examination Sub-Committee National Registry of Certified Chemists

KATHLEEN A. KAISER-ROGERS, Ph.D.

Chair of the American College of Medical Genetics Salary Survey Committee

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

Co-Chair, Society of Toxicology, Scientific Liaison Task Force

CHAD A. LIVASY, M.D.

Training and Education Committee, International society of Breast Pathology

SUSAN T. LORD, Ph.D.

Chair, International Society of Thrombosis and Haemostasis, Scientific Program Organizing Committee for XXII Congress, 2008-2009

MELISSA B. MILLER, Ph.D.

ASCP, Workshops for Laboratory Professionals Committee
ASM, Laboratory Practices Committee
ASM, Professional Development Committee

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

Member, National Cancer Institute, The Cancer Genome Atlas (TCGA), Glioblastoma Disease Working Group (DWG)
Member, Scientific Advisory Committee, National Functional Genomics Center

KATHLEEN W. RAO, Ph.D.

Chair, ACMG Laboratory Quality Assurance Committee

ARLIN B. ROGERS, D.V.M., Ph.D.

Chair, American College of Veterinary Pathology, Annual Meeting Plenary Session (Chair)
Chair, American Society for Investigative Pathology, The ACVP Society Symposium (TASS)

JOHN L. SCHMITZ, Ph.D.

Chair, Credentials Committee; American Board of Medical Laboratory Immunology

RICHARD R. TIDWELL, Ph.D.

Chair, The Bill and Melinda Gates Foundation, Initiative on Public-Private Partnerships for Health (IPPPH)
Chair, World Health Organization, Drug Development, Preclinical and Clinical Studies; Treatment and Drug Resistance section for the World Health Organizations Scientific Working Group on African Trypanosomiasis Product Development Partnerships for Neglected Global Health
Chair, Medicines for Malaria Ventures, Expert Scientific Advisory Committee
Chair, Advisory Board, Absorption Distribution Metabolism and Elimination Mass Spectrometry Center (ADME)
Director, Consortium for Parasitic Drug Development (CPDD)
Director, Center for Translational Research on Tropical Diseases (CTRTD)

KAREN E. WECK, M.D.

Member, Biochemical and Molecular Genetics Resource Committee, College of American Pathologists/American College of Medical Genetics

BERNARD E. WEISSMAN, Ph.D.

Director, of Postdoctoral Studies – Curriculum in Toxicology
Faculty Advisor, LCCC Tissue Culture Facility
Faculty Advisor, LCCC Animal Studies Core Facility

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

Chairman of the Scientific Subcommittee on Plasma Coagulation Inhibitors of the International Society for Thrombosis and Hemostasis

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

Advisory Board , North Carolina Academy of Laboratory Animal Medicine.
Co-chair, International Mock Board Exam Coalition for the American College of Laboratory for Southeast region
Animal Medicine Board exam review
Interim Associate Director of Veterinary Services, Division of Laboratory Animal Medicine

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

Italian Society of Pathology (Societa Italiana di Patologia), Scientific Programming Committee, April 2009-Present (XXX National Congress, 2010)
American Society of Investigative Pathologists: Program Committee (Experimental Biology 2009-12): Meeting Dec. 10-11, 2009
American Association of Clinical Chemistry (AACC), North Carolina Section, Treasurer Jan. 2008-Jan. 2010

Nominations Committee, National Sigma Xi Research Society. November 2009-November 2010.

Chair, American Association of Clinical Chemistry (AACC), North Carolina Section. January 2010-present. Italian Society of Pathology (Societa Italiana di Patologia), Scientific Programming Committee, April 2009-Present (XXX National Congress, 2010)

American Society of Investigative Pathologists: Program Committee (Experimental Biology 2009-12): Meeting Dec. 10-11, 2009

MAIMOONA B. ZARIWALA, Ph.D.

Chair, PCD Foundation, Member of Research Committee

MEMBER OF BOD OF NATIONAL/INTERNATIONAL ACCREDITATION AGENCY

JOHN F. CHAPMAN, Dr.P.H.

Member, BOD, National Registry of Certified Chemists

GEORGETTE A. DENT, M.D.

Member, Liaison Committee on Medical Education (LCME)

Accreditation site visit of the educational program at the Weil Cornell College of Medicine, March 16-19, 2010

CATHERINE A. HAMMETT-STABLER, Ph.D.

Member, National Registry of Certified Chemists

JOHN L. SCHMITZ, Ph.D.

Member, American Board of Medical Laboratory Immunology

American Society for Histocompatibility and Immunogenetics Accreditation Review Board

MEMBER OF FDA, CDC OR COMPARABLE COMMITTEE

FRANK C. CHURCH, Ph.D.

Member, Internl. Scientific Advisory Board 22nd International Congress on Thrombosis and Haemostasis, Boston, MA (July, 2009)

Member and Co-Organizer, 6th International Meeting on Serpins, planned for 2012

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

Member, Immunology Devices Panel, Medical Devices Advisory Committee, Center for Devices and Radiologic Health, 2007-present.

CATHERINE A. HAMMETT-STABLER, Ph.D.

Member, CLSI, Working Group on Gas Chromatography/Mass Spectrometry Confirmation of Drugs

CHAD A. LIVASY, M.D.

Member, Breast Cancer Research Consortium (SPORE institution committee to pick clinical trials to be funded by the Breast Cancer Research Foundation, quarterly (all day))

CHRISTOPHER R. McCUDDEN, Ph.D.

Member, Clinical Laboratory Standards Institute (CLSI). Member: Sub-committee on Serum Indices in the Clinical Laboratory

MELISSA B. MILLER, Ph.D.

Member, FDA, Microbiology Devices Panel

VOLKER R. NICKELEIT, M.D.

Member, US Food and Drug Administration/CDER division of special pathogen and transplant products: *cardiovascular and renal drugs advisory committee; December 2009*

KATHLEEN W. RAO, Ph.D.

Committee Member, Children's Oncology Group Cytogenetics Central Review
Children's Oncology Group, Infant Leukemia Committee (Did not assign value to this committee membership)
Committee Member, Cancer and Leukemia Group B (CALGB) Cytogenetics

JOHN L. SCHMITZ, Ph.D.

Elected member of the United Network for Organ Sharing (UNOS) Histocompatibility Committee. UNOS is the federal government contractor that oversees organ transplantation in the United States

LEIGH B. THORNE, M.D.

Member, NIH caHUB (Cancer Human Biobank) Acquisition of Normal Tissue Working Group

KAREN E. WECK, M.D.

Member, Molecular and Clinical Genetics Devices Panel Consultant, FDA

MEMBER OF NIH OR COMPARABLE STUDY SECTION

ARABA N. AFENYI-ANNAN, M.D., M.P.H.

NHLBI Sickle Cell Disease Guidelines Expert Panel

FRANK C. CHURCH, Ph.D.

2006-2010: Member of American Heart Association, Council on Arteriosclerosis, Thrombosis and Vascular Biology Council Leadership Committee, Mid-Atlantic Region (Vice-Chair, 2006; Chair 2007-2010)

2009 and 2010: Clinical and Experimental Therapy Study Section 3, Department of Defense, Federal Breast Cancer Idea Grants.

WILLIAM B. COLEMAN, Ph.D.

Member, Cancer Biomarkers Study Section, National Institutes of Health, July 2008-Present

ad hoc External Grant Reviewer for the National Institutes of Health, Cancer Diagnostics and Treatment SBIR/STTR Study Section, February and June 2010

MARILA CORDEIRO-STONE, Ph.D.

Member, NIH, Challenge Grant Proposals, Ad hoc reviewer
Member, The Wellcome Trust (New research proposal), Ad hoc reviewer

CHERIE H. DUNPHY, M.D.

Active pathologist reviewer for Children's Oncology Group
Active pathologist reviewer for Cancer and leukemia Group B (CALGB)

THOMAS H. FISCHER, Ph.D.

Member, NHLBI, RED Study III

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

Member, NIH, NCCR, Core Facility Renovation, Repair and Improvement, Special Emphasis Panel
Member, NIH, NCMHD, Health Disparities Research on Minority and Underserved Population, Special Emphasis Panel Ad Hoc

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

Member, NIH/NCCR, Comparative Medicine, 6/5/07 – 6/3/10

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

External Grant Reviewer, NIH; for the Italian Ministry of Health Call for Young Researchers (September)

WILLIAM K. KAUFMANN, Ph.D.

Member, CSR NIH, EUREKA Grants Review

JOE N. KORNEGAY, D.V.M., Ph.D.

Ad hoc reviewer, NIH-NHLBI, K99/R00 NIH Pathway to Independence Applications
Ad hoc reviewer (May 21, 2010), Muscular Dystrophy Association, Medical Advisory Committee

SUSAN T. LORD, Ph.D.

Member, NIH, College of CSR Reviewers, March 2010 – March 2012
Member, NIH, Special Emphasis Panel/Scientific Review Group ZRG1 F10A-S 20L,
Fellowships: Physiology and Pathobiology of Cardiovascular and Respiratory Systems, June 21-22, 2010
Member, NIH/NHLBI, Special Emphasis Panel/Scientific Review Group, ZRG1 VH D(58) R, Challenge Grant Applications, June 5, 2009

VOLKER R. NICKELEIT, M.D.

NIH/National Institute of Allergy and Infectious Diseases (NIAID), 'Kidney Transplantation Rejection Mechanism' review committee, special emphasis grant review panel, November 2009

JOHN L. SCHMITZ, Ph.D.

Member, NIH Special Emphasis Panel/Scientific Review Group

JOAN M. TAYLOR, Ph.D.

Member, NIH Cardiac Development and Disease

Member, NIH Heart Development and Differentiation

RICHARD R. TIDWELL, Ph.D.

Member, NIH, NIAID, ICTDR. Human African Trypanosomiasis: Strategic Research Direction

LEIGH B. THORNE, M.D.

Member, Committee caHUB for biobanking

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

Stage 1 Study Section Reviewer. NIH ARRA RC1 challenge grant applications on cancer biomarkers assigned to the Biology of Development and Aging (BDA) Initial Review Group (IRG) panel ZRG1 BDA-A (58). June, 2009.

Study Section Reviewer. NIH American Recovery and Reinvestment Act (ARRA) National Heart, Lung and Blood Institute (NHLBI) grant opportunities—unsolicited topics ZHL1 CSR-A (O2) 2. Baltimore, MD. August 4-5, 2009.

Study Section Reviewer. American Heart Association. Cardiac Biology BCT5. April 20, 2010.

ALISA S. WOLBERG, Ph.D.

Member, American Heart Association, Thrombosis/Throm BSCT2

Member, NIH, P30 (Biomedical Research Core Centers

Member, Department of Defense, FY 10 Wound Infection and Healing

SERVICE AS EDITOR OR ON EDITORIAL BOARDS

FRANK C. CHURCH, Ph.D.

Editorial Board, J. Biol. Chem.

Editorial Board, J. Thromb. Haemost.

Editorial Board, Thrombosis

WILLIAM B. COLEMAN, Ph.D.

Editor, BMC Cancer

Editorial Board, Clinica Chimica Acta

Editorial Board, The American Journal of Pathology

Editorial Board, Experimental and Molecular Pathology

Editorial Board, Archives of Pathology and Laboratory Medicine

Editorial Board, Laboratory Investigation

GEORGETTE A. DENT, M.D.

Member, Editorial Advisory Committee, UNC Medical Bulletin

CHERIE H. DUNPHY, M.D.

Chief Editor, E-Medicine, Hematopathology Section, Pathology

Archives of Pathology and Laboratory Medicine
Haematologica
Case Reports in Medicine
International Journal of Medical and Biological Frontiers

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

Section Editor, Molecular Pathology
Section Editor, Arch Path Lab Med

PETER H. GILLIGAN, Ph.D.

Editor, Journal of Clinical Microbiology
Associate Editor, MBio
Editorial Board, Diagnostic Microbiology and Infectious Diseases
Editorial Board, European Journal of Clinical Microbiology and Infectious Diseases
Editorial Board, Clinical Microbiology Reviews
Editorial Board, Journal of Pediatric Infectious Diseases

MARGARET L. GULLEY, M.D.

Editorial board member, J Molec Diagn
Editorial board member, Editorial board member
Editorial board member, Diagn Mol Pathol
Editorial Board Member, American Journal of Surgical Pathology
Editorial Board Member, Evidence for Genomic Applications

CATHERINE A. HAMMETT-STABLER, Ph.D.

Associate Editor, Clinical Biochemistry

J. CHARLES JENNETTE, M.D.

Section Editor-Immunopathology, American Journal of Clinical Pathology
Section Editor-Pathology, Journal of Nephrology
Editorial Board, Clinical and Diagnostic Laboratory Immunology
Editorial Board, Clinical Journal of the American Society of Nephrology
Editorial Board, Journal of Rheumatology
Editorial Board, Kidney International
Editorial Board, Laboratory Investigation
Editorial Board, Pathology Case Reviews

KATHLEEN A. KAISER-ROGERS, Ph.D.

Editorial Board, Clinical and Vaccine Immunology
Editorial Board, Journal of Immunologic Methods

DAVID G. KAUFMAN, M.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

WILLIAM K. KAUFMANN, Ph.D.

Editorial Board, Carcinogenesis

CHRISTOPHER P. MACK, Ph.D.

Reviewer, Journal of Biological Chemistry

Reviewer, Circulation Research

Reviewer, Circulation

Reviewer, American Journal of Physiology

Reviewer, Developmental Dynamics

Reviewer, Arteriosclerosis Thrombosis and Vascular Biology

Reviewer, Journal of Thrombosis and Hemostasis

Reviewer, Cancer Research

Reviewer, Journal of Molecular and Cellular Cardiology

Reviewer, Journal of Clinical Investigation

NOBUYO MAEDA, Ph.D.

Editorial Board, Experimental Biology and Medicine 2005-2012

CHRISTOPHER R. MCCUDDEN, Ph.D.

Editorial Board, Laboratory Medicine

MELISSA B. MILLER, Ph.D.

Editorial Board, Journal of Clinical Microbiology

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

Editorial Board, Brain Pathology

VOLKER R. NICKELEIT, M.D.

Editorial Board, Kidney and Blood Pressure Research

Editorial Board, Clinical Nephrology

Editorial Board, Nephrology Dialysis Transplantation Educational eTOC

JOHN L. SCHMITZ, Ph.D.

Editorial Board, Clinical and Vaccine Immunology

Editorial Board, Journal of Immunologic Methods

JOAN M. TAYLOR, Ph.D.

Reviewer, Journal of Biological Chemistry

Reviewer, Circulation Research

Reviewer, Circulation

Reviewer, American Journal of Physiology

Reviewer, European Molecular Biology Organization (EMBO)

Reviewer, Arteriosclerosis Thrombosis and Vascular Biology

Reviewer, Journal of Molecular and Cellular Cardiology

Reviewer, Journal of Clinical Investigation

Reviewer, Molecular and Cellular Biology

Reviewer, Journal of Cell Biology

Reviewer, Cardiovascular Pharmacology

Reviewer, Cell Biology International

DITMITRI G. TREMBATH, M.D., Ph.D.

Journal of Neuropathology and Experimental Neurology

HEIKE VARNHOLT, M.D.

Editorial Board, Annals of Hepatology

Editorial Board, Digestive Diseases and Sciences

KAREN E. WECK, M.D.

Associate Editor, *Genetics in Medicine*

Associate Editor, *Pharmacogenomics and Personalized Medicine*

Editorial Board, *Journal of Molecular Diagnostics*

BERNARD E. WEISSMAN, Ph.D.

Editorial Board, Lung Cancer: Targets and Therapy

Editorial Board, Gene Research International

Editorial Board, Cancer Research

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

Editorial Advisory Board, Assistant Editor, *Laboratory Medicine*, Fall 2008-Present

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

Editorial Board, *Human Pathology*

INVITED LECTURES AT STATE/NATIONAL AND INTERNATIONAL MEETINGS

ARABA N. AFENYI-ANNAN, M.D., Ph.D.

Duffy Antigen Receptor Chemokine (DARC): A Mediator of Renal Disease? American Association of Blood Banks Annual Meeting, New Orleans, LA, October 2009

Introduction to Transfusion Medicine and Blood Banking, Internal Medicine Department, Resident Lecture Series 7/16/09

Introduction to Transfusion Medicine and Blood Banking, Emergency Medicine Department, Resident Lecture Series 8/19/09

Introduction to Transfusion Medicine and Blood Banking, Obstetrics & Gynecology Department, Resident Lecture Series, 8/26/09

Ask the Experts Panel, North Carolina Association of Blood Banks, Spring Meeting, Durham, NC, April 14, 2010.

Introduction to Transfusion Medicine and Blood Banking, Pediatric Critical Care Fellows, January 28, 2010

FRANK C. CHURCH, Ph.D.

“Enhanced Cell-Associated Fibrinolytic Pathway but Not Coagulation Pathway Activity Contributes to Motility in Metastatic Breast Cancer Cells”. J.C. Carter, R.A. Campbell, J.A. Gibbons, A.S. Wolberg, and F.C. Church. Oral presentation at American Society of Hematology meeting, 2009, New Orleans, LA. Presented by F.C. Church.

WILLIAM B. COLEMAN, Ph.D.

“Targeting the breast cancer epigenome.” R. Sandhu, J.D. Roll, A.G. Rivenbark, and W.B. Coleman, American Society for Investigative Pathology, Annual Meeting, April 2010, Anaheim, CA

“Molecular and personalized medicine: Training the next generation of translational biomedical researchers.” W.B. Coleman, 2010 Medical Library Association Annual Conference, May 2010, Washington, DC

GEORGETTE A. DENT, M.D.

Osborne M, Davis D, Dent GA, Kavan M, and Garrity M. “Group on Student Affairs Brown Bag Session: Tips to avoid the scramble and help your students MATCH successfully.” Association of American Medical Colleges Annual Meeting, Boston, MA, November 8, 2009.

Dent GA. “Hematopathology Update: Flow Cytometry.” National Medical Association Scientific Assembly, Las Vegas, NV, July 28, 2009.

Nivet MA.,(speaker) Dent GA,(moderator), “Responsibility to Our Patients: Healthcare Reform” GSA/GDI/OSR, National Spring Meeting, Austin, Texas, April 18.

Garrison G, Thomas L., Wood IK, Dent, GA (moderator), “Have We Abrogated Our Responsibility: What Should the Attrition Rate Be?” GSA/GDI/OSR, National Spring Meeting, Austin, Texas, April 20.

CHERIE H. DUNPHY, M.D.

Ancillary Methods: Flow Cytometry and Immunohistochemistry in the Diagnosis and Classification of Myeloid Neoplasms, NCSP meeting, Chapel Hill, NC, April 16, 2010.

The New WHO Classification of Lymphoid Neoplasms, UNC CME Program, Chapel Hill, NC, April 17, 2010.

Ancillary Methods: Flow Cytometry, UNC CME Program, Chapel Hill, NC, April 17, 2010.

GEORGE FEDORIW, M.D.

Diagnosis of Chronic Lymphocytic Leukemia. Department of Internal Medicine, Division of Hematology/Oncology. 8/25/2009

Diagnostics and Classifications of Plasma Cells and Neoplasms, UNC Pathology CME: 4/17/10

Understanding the Diagnostic Process in Pediatric Hematology/Oncology, Association of Hematology/Oncology Nurses annual meeting: 4/15/10

UT Southwestern Pathology Webinar Series, June 14, 2010

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

The C.L. Davis, DVM Foundation and the North Carolina Association of Laboratory Animal Medicine Workshop in Laboratory Animal Medicine, Thursday, May 13, 2010, North Carolina State University, College of Veterinary Medicine, Raleigh, NC

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

"Usefulness of identity testing in Pathology", University of Illinois, Chicago, IL, 10/05/09.

“Metrics for QA – Defining Value”, ADASP, March 2010

PETER H. GILLIGAN, Ph.D.

Infectious Disease Quiz of the Year Co-Quizmaster Sept 2009. 49th ICAAC San Francisco, CA

Clinical Microbiology Update Sept/Oct 2009. MAHEC Asheville, Wake AHEC, Greenville AHEC

What's New in CF Microbiology? Oct 2009 Teleconference Network of Texas (304)

Diagnostic Microbiology in Cystic Fibrosis during the past 10 years: What have we learned? Feb 2010 10th Irish Cystic Fibrosis Conference Killarney, Ireland (305)

What's new in CF Microbiology? April 2010, Carolina Clinical Connection, Asheville, NC

The role of practice guidelines in the Clinical Microbiology Laboratories. May 2010. American Society for Microbiology San Diego CA

Understanding the increasing complexity of CF microbiology. June 2010. Audioconference for the American Society for Microbiology

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

"The Collaborative Cross," NIH-DCM Resource Directors Mtg., 5/10/10

"The Laboratory Mouse," C.L. Davis Foundation, Raleigh, NC, 5/14/10

MARGARET L. GULLEY, M.D.

"Reporting Molecular Test Results," AMP Annual Meeting, Orlando, Nov 21, 2009.

"EBV Associated Disease", Association for Molecular Pathology Board Review Course, Bethesda, May 1, 2009.

"Natural viral infection facilitates diagnosis, monitoring and treatment of Epstein-Barr virus-related cancers", University of Wisconsin at Madison visiting professor seminar, Sept 23, 2009.

"Molecular Surgical Pathology for the Practicing Pathologist", Educational Course, American Society for Clinical Pathology, Ft Lauderdale, April 19-21, 2010 (9 lectures)

"What every pathologist should know about molecular genetic testing in lymphoid neoplasms", UNC Department of Pathology and Lab Medicine Alumni Conference, Chapel Hill, April 17, 2010.

"What every pathologist should know about molecular genetic testing in myeloid neoplasms", NC Society of Pathologists Annual Meeting, Chapel Hill, April 16, 2010.

"New Molecular Oncology Lab Tests", Medical Oncology conference, UNC Hospitals, May 24, 2010.

"Innovations & Challenges in Molecular Pathology", Quality Improvement Meeting, UNC Hospitals, Dec 15, 2009 (30 min)

CATHERINE A. HAMMETT-STABLER, Ph.D.

Urine Drug Screening and Other Questions. Psychiatry Consult-Liaison Series; November 20, 2009

Understanding Immunoassays – Issues the Practicing Endocrinologist Needs to Know.

Department of Medicine Adult and Pediatric Endocrine Fellows Conference. August 20, 2009

Natural is Not Safe. Mid-West Clinical Laboratory Coalition. St Paul, MN. May 24, 2010

Beyond Herbals: Poisonous Plants. AACC New England Local Section. Boston, MA. May 20, 2010

The Role of the Laboratory in Supporting the Pain Clinic. AACC Philadelphia Local Section. Philadelphia, PA. May 5, 2010

Dealing with Misconceptions, Lies, and Myths: using Urine Toxicology in the Pain Management Setting. Pain, Addiction, and the Law 2010. Chapel Hill, NC. April 25, 2010

Osteoporosis and the Role of the Laboratory. AACC Florida Local Section. Ft. Lauderdale, FL. March 18, 2010

Toxicology Opportunities in Pain Management. AACC Rocky Mountain Local Section. Denver,

CO. March 1, 2010

Laboratory Support of the Pain Management Clinic. AACC Northern California Local Section. San Francisco, CA. January 19, 2010

The Dark Side of Complementary and Alternative Medicines. AACC Southern California Local Section. Brea, CA. January 18,

Early Diagnosis of Myocardial Infarction with Sensitive Troponin Assays. Department of Medicine. With Joseph Rossi, MD. Chapel Hill, NC. April 22, 2010

Laboratory monitoring of analgesic compliance in pain patients. Anesthesiology Pain Conference; January 7, 2010

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

“A review of experimental thrombosis” TraCS Workshop on Translational Research Opportunities in Cardiovascular Disease, University of North Carolina at Chapel Hill, July 30, 2009.

“Fucosylated glycan-dependent mechanisms of atherothrombosis.” ASIP symposium “Glycans in atherosclerosis” at Experimental Biology 2010, Anaheim, CA, April 28, 2010.

JOHN HUNT, M.D.

UNC CME Course Lecture, What to expect when you are (un)expecting: Hematolymphoid neoplasms in non-lymphoid surgical pathology specimens. April 17, 2010

J. CHARLES JENNETTE, M.D.

International Symposium of the Hamburg Clinical Research Unit, “Pathogenesis of ANCA Vasculitis”, Hamburg, Germany, November 28, 2009

(X4) American Society of Nephrology Renal Week Postgraduate Education Course: Basic Renal Pathology - from Bedside to Bench, Four CME Lectures: “IgA Nephropathy”, “Diabetic Glomerulosclerosis”, “Crescentic Glomerulonephritis”, and “Vasculitis”, San Diego, November 27 & 28, 2009.

American Society of Nephrology Renal Week Postgraduate Education Course: Glomerulonephritis Update: Pathology of Rapidly Progressive Glomerulonephritis, San Diego, October 28, 2009.

American Society of Nephrology Annual Meeting, “Pathology and Classification of Lupus Nephritis and IgA Nephropathy”, San Diego, October 28, 2009.

American Society of Nephrology Annual Meeting, “What is “Secondary” Focal and Segmental Glomerulosclerosis?”, San Diego, October 30, 2009.

American Society of Nephrology Annual Meeting, “Molecular Insights of ANCA Glomerulonephritis”, San Diego, November 1, 2009.

22nd European Congress of Pathology, “Immune Complex Mediated Small Vessel Vasculitis”, Florence, Italy, September 7, 2009.

25th Glomerular Disease Collaborative Network Meeting, “Pathology and Pathogenesis of Focal Segmental Glomerulosclerosis, Membranous Glomerulopathy, IgA Nephropathy, ANCA Vasculitis, and Lupus Nephritis”, Chapel Hill, NC, May 15-16, 2010

First International Renal Pathology Conference, “An Algorithmic Approach to Renal Biopsy Interpretation of Glomerular Diseases”, La Coruna, Spain, June 9, 2010.

First International Renal Pathology Conference, “Classification of Lupus Glomerulonephritis: 5 Years Later”, La Coruna, Spain, June 9, 2010.

Alexander Breslow Memorial Lectureship, "Clinical and Pathologic Diagnosis of Systemic Vasculitis: A Prerequisite for Optimum Treatment", George Washington University School of Medicine, Washington, DC, May, 27, 2010

"Pathogenesis of Vasculitis and Glomerulonephritis Caused by Anti-Neutrophil Cytoplasmic Autoantibodies (ANCA)", George Washington University School of Medicine, Washington, DC, May, 27, 2010

JOE N. KORNEGAY, D.V.M., Ph.D.

"Overview of the GRMD Model", Parent Project Muscular Dystrophy Board Meeting, Chicago, IL, November 16-19, 2009

"National Canine Muscular Dystrophy Core (NCMDC)", Wellstone MDCRC Face to Face Meeting, Iowa City, IA, June 29-30

Case Studies in Neurology - Monoparesis (Peripheral Nerve Disease); Paraparesis (Spinal Cord Disease); Tetraparesis (LMN Disease); Tetraparesis (Intracranial Disease). North Carolina Veterinary Conference, Raleigh, NC, November 7, 2009

"Misconceptions in Neurology (Plenary Session), Internship-Residency Program: Structure and Setup in the North American System, Spinal Cord Diseases", Neuromuscular Diseases, April 26-28, 2010

"Practical Management of Animals with Neurologic Disease", Malaysian Small Animal Veterinary Association, Kuala Lumpur, MALAYSIA, May 1-2, 2010

CHAD A. LIVASY, M.D.

"Basal-like breast cancer: Epidemiology and Precursor Lesions", Pathobiology of Triple-Negative/Basal-like Breast Cancers, Marseille Cancer Research Center Marseille, France October 16, 2009

"Evaluating the Heterogeneity of Breast Cancer", Department of Pathology Grand Rounds Memorial Sloan Kettering Cancer Center, New York City, NY, October 27, 2009

NOBUYO MAEDA, Ph.D.

University of Illinois Chicago, Nov 25, 2009

Keio University Japan, Feb 12, 2009

Angiotensin Conference, Osaka Japan, Feb 13, 2009

Tohoku University, Sendai Japan, Feb 15, 2009

Duke University, Cardiovascular Seminar Series, Durham, NC, April 7 2010

CHRISTOPHER R. McCUDDEN, Ph.D.

Macroprolactin: It's not the size of the prolactin it's how you analyze it. Ohio Valley Section AACC Fall Meeting: George Grannis Award Lectureship. Hebron, Kentucky. Nov. 18, 2009
Cerebrospinal Fluid Analysis in Neurological Disorders. UNC-CH, Dept. Neurology, 10/6/09

MELISSA B. MILLER, Ph.D.

15th Annual Symposium on Child Abuse and Neglect (Children's Advocacy Centers of North Carolina), "Culture and Non-culture Methods for Detection of *Neisseria gonorrhoeae* and *Chlamydia trachomatis*," Lake Junaluska, NC, September 30, 2009.

Southwestern Association of Clinical Microbiology 28th Annual Meeting, "Friday Afternoon in Clinical Microbiology: Challenging Cases," Fort Worth, TX, September 3, 2009.

Infectious Disease Grand Rounds, October 23, 2009, Laboratory Diagnosis of Influenza

Struggles and Case Studies American Society for Microbiology 110th General Meeting, Workshop: “Molecular Microbiology Methods - Statistics, in the Verification and Validation of Molecular Assays,” San Diego, CA, May 22, 2010.

Southeastern Association of Clinical Microbiology, NC Branch Annual Meeting, “Accurately Detecting Emerging Antimicrobial Resistance,” Charlotte, NC, April 19, 2010.

5th Decennial International Conference on Healthcare-Associated Infections (Society for Healthcare Epidemiology of America, the Centers for Disease Control and Prevention, the Association for Professionals in Infection Control and Epidemiology, and the Infectious Diseases Society of America), “Advances in Laboratory Technologies can Improve Infection Prevention Efforts,” Atlanta, GA, March 19, 2010.

Infectious Disease Grand Rounds, “The evolving epidemiology of MRSA,” June 11, 2010.

UNC School of Nursing Continuing Education Program: The Team Approach to Child Abuse and Neglect, “Culture and non-culture methods for detection of *Neisseria gonorrhoeae* and *Chlamydia trachomatis*,” May 14, 2010.

Infectious Disease Grand Rounds (co-presented with John Schmitz and Peter Gilligan), “What’s new in the Clinical Microbiology-Immunology Laboratories,” April 30, 2010.

34th Annual Internal Medicine Conference, “New Lab Tests for Infectious Diseases: Advances and Pitfalls,” April 7, 2010.

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

Genomics-driven drug-biomarker co-development using genetically-engineered mouse models of glioblastoma. 7th Annual National Functional Genomics Center (NFGC) Meeting. Clearwater, FL. September 30, 2009.

Genomics-driven drug-biomarker co-development for glioblastoma. Molecular Mechanisms of Human Disease: Solid Tumors: Transcripts, Tyrosine Kinases, and Therapeutics. American Society for Investigative Pathology. Arlington, VA. June 8, 2009.

Genomics-driven drug-biomarker co-development for glioblastoma. Neurosurgery Grand Rounds. University of California, San Francisco, Brain Tumor Research Center. San Francisco, CA. August 18, 2009.

Genomics-driven drug-biomarker co-development for glioblastoma. Pathology Grand Rounds. University of Alabama at Birmingham, Department of Pathology, Division of Neuropathology. Birmingham, AL. July 28, 2009.

VOLKER R. NICKELEIT, M.D.

European Congress of Pathology, XXII meeting, session on allograft pathology/quality and safety of the donor in organ transplantation: “Renal allograft biopsy at time of implantation”. September 2009, Florence, Italy

Tenth Banff Conference on Allograft Pathology: “Proposal for a BK-nephropathy Banff consensus classification.” August 2009, Banff, Canada

BK Nephropathy: A Clinicopathologic Meeting: "Pathology of BK nephropathy". November 2009, post graduate center, Queen Elizabeth Hospital, Birmingham, UK

International Renal Pathology Conference, 1st meeting (joint meeting of the Renal Pathology Society, the Nephropathology Working Group of the European Society of Pathology and the Spanish Society of Pathology): “Clinicopathologic conference”. June 2010, La Coruna Spain –

International Renal Pathology Conference, 1st meeting (joint meeting of the Renal Pathology Society, the Nephropathology Working Group of the European Society of Pathology and the Spanish Society of Pathology): “Transplant glomerulopathy – etiology and pathogenesis.” June 2010, La Coruna Spain

11th Congress of the Arab Society of Nephrology and Renal Transplantation, "Workshop on Nephropathology - Approach to Renal Biopsy". May 2010, Damascus, Syria
11th Congress of the Arab Society of Nephrology and Renal Transplantation, "Workshop on Nephropathology - Antibody mediated rejection and C4d". May 2010, Damascus, Syria
11th Congress of the Arab Society of Nephrology and Renal Transplantation, "Workshop on Nephropathology - Chronic Allograft Rejection". May 2010, Damascus, Syria
11th Congress of the Arab Society of Nephrology and Renal Transplantation, "Workshop on Nephropathology - Pathologic Forum Approach". May 2010, Damascus, Syria
11th Congress of the Arab Society of Nephrology and Renal Transplantation: "Polyomavirus nephropathy: updates and controversies". May 2010, Damascus, Syria
Glomerular-Disease Collaborative Network meeting (GDCN 25th annual conference): "Renal biopsy case discussion: an interactive forum". May 2010, Chapel Hill, NC, USA
Course on *The Practice of Nephropathology* (Nephropathologiekurs Volhard-Fahr), lecturer on: "Transplant-Pathology". Mannheim, Germany, March 2010.

JUDITH N. NIELSEN, D.V.M.

ILAR Journal Review, CL Davis laboratory Medicine Workshop, Raleigh, NC., May 14, 2010

YARA A. PARK, M.D.

Transfusion Medicine Overview, Part 2, Department of Medicine, July 23, 2009
Transfusion Medicine Overview, Part 1, Department of Pediatrics, July 27, 2009
Transfusion Medicine Overview, Part 2, Department of Pediatrics, July 29, 2009
UNC CME Lymphoid Neoplasms: Integrated Diagnosis and Differential Diagnosis, "Transfusion Support for Hematologic Malignancies" April 17, 2010
Department of Pediatrics, Division of Neonatology, "Neonatal Transfusion" February 24, 2010

KATHLEEN W. RAO, Ph.D.

Rao, K. W.: Interactive Review of Interesting Cases. Cytogenetics Workshop, CALGB Fall Meeting, November 14, 2009, Phoenix Arizona

SAMUEL D. SIMMONS, M.D.

Death Investigation: A Collaborative Effort, 2nd NCSU Forensic Sciences Symposium; North Carolina State University, December 2009, Raleigh, NC

HARSHARAN K. SINGH, M.D.

Haufen as urinary biomarkers of polyomavirus nephropathy. BK Nephropathy: A Clinicopathological Meeting. Postgraduate Centre, Queen Elizabeth Hospital, Birmingham, UK. November 9, 2009.

BK Nephropathy: Controversies and Updates. 11th Congress of the Arab Society of Nephrology and Renal Transplantation, Damascus, Syria, May 5-9, 2010.

"Vascular Pathology" – Nephrology Fellows Lecture Series, UNC Kidney Center, Chapel Hill, North Carolina.

Renal Biopsy Case Presentations – Annual Meeting of the Glomerular Disease Collaborative Network (GDCN). Chapel Hill, NC, May 15-16, 2010.

OLIVER SMITHIES, Ph.D.

Wright State University, 2009 Earl H. Morris Lectureship, Dayton, Ohio, "60 Years as a Bench Scientist", 7/10/09

Kenan Fellows Program and Kenan Institute interview, 8/5/09
British Medical Journal phone interview, 8/14/09, Career Focus on Nobel Prize Winner.
Heart Failure Society of America, 13th Annual Scientific Meeting, Boston, MA, “Mouse Models of Cardiovascular Disease”, 9/13/09.
University of Massachusetts, Amherst, “On Being a Scientist for 60 Years”, 9/14/09
Interview (skype) with Marc-François Pelletier, Ph.D., Co-Producer and Host, Futures in Biotech, TWiT Netcast Network, 9/25/09
Xi’an Jiaotong University (XJTU), Xi’an, China, Honorary Professorship Ceremony, “On Being a Scientist for 60 Years”, 10/8/09
Beijing, China, Honorary Professorship Ceremony, “On Being a Scientist for 60 Years”, 10/9/09
Beijing, China, Peking University Health Science Center, “On Being a Scientist for 60 Years”, 10/9/09
AMDCC Meeting lecture, Baltimore, MD, 10/22/09
Gairdner Foundation 2009, Stem Cells, Disease Mechanisms and Future therapies Symposium, “On Being a Scientist for 60 Years”, Toronto, Canada, 10/28/09
University of Virginia, Charlottesville, VA, “On Being a Scientist for 60 Years”, 11/5/09.
Smithies College of Medical Students at UNC lecture, 11/13/09.
Carolina Genetics Student Organization, UNC-CH, “On Being a Scientist for 60 Years”, 12/2/09
Indian Institute of Technology, Kanpur, India, teleconference, Techkriti, 2/13/10
Video interview to demonstrate the importance of the biosciences to NC, Jim Shamp, Senior Editor, Biotechnology Center, 2/16/10.
Developmental Biology training program, UNC-CH, “On Being a Scientist for 60 Years”, 3/11/10
Celebrating 50 Years of Carolina Computing Event Panelist, FedEx Global Education Center Building, 3/18/10
15th Gertrude and Florian Nelson Cardiovascular Research lecture, University of Mississippi Medical Center, “Turning Pages: From Gels to Genes”, 4/1/10
2010 Louis A. Bloomfield Memorial Lecture, Case Western Reserve University, Cleveland, Ohio, “On Being a Scientist for 60 Years”, 4/21/10
Case Western Reserve University, Cleveland, Ohio, “Thoughts on the Kidney Glomerulus”, 4/22/10
Cell and Molecular Biology Training Program, UNC-CH, “On Being a Scientist for 60 Years”, 4/29/10
20th World Congress of the International Society for Heart Research, Kyoto, Japan, 5/13-16/10, “Turning Pages: From Gels to Genes”
2010 KSBMB Annual Meeting, “Meeting with Young Scientists”, Seoul, Korea, 5/18/10
60th Meeting of Nobel Laureates in Lindau, Germany, 6/27/10 – 7/2/10, plenary lecturer, “Chance, Opportunity and Planning in Science”.
Panel discussion “On being a scientist”, 7/1/10, Lindau, Germany.

RICHARD R. TIDWELL, Ph.D.

“Overview of the consortium of parasitic drug development”, CPDD Scientific Meeting. St. Andrews, Scotland, Aug. 18, 2009.

CYRUS VAZIRI, Ph.D.

Keynote Address, 12th Annual Midwest DNA Repair Symposium, Louisville KY, 2010
'International Conference on Radiation and Cancer Biology at Nagasaki 2010', Nagasaki, Japan, 2010

Genome Dynamics Group, Tokyo Metropolitan Institute of Medical Sciences, 2009
32nd Annual Meeting of Molecular Biology Society of Japan, Yokohama, Japan, 2009

KAREN E. WECK, M.D.

“Genetic Testing Principles Applied to Case Studies: Cystic Fibrosis, BRCA1/2, and DNA Sequencing Analysis”, College of American Pathologists Annual Meeting, Oct 13, 2009, Washington, DC.

“Pharmacogenetic testing”, Duke School of Medicine Department of Pathology

“Genetic Testing for Personalized Medicine – *Are we there yet?*” North Carolina Medical Genetics Association Annual Meeting, Asheville, NC, April 16, 2010.

“Pharmacogenetic testing for individualized therapy” American Association of Clinical Chemistry, Capital Section Annual Spring Meeting, Richmond, VA, May 13, 2010.

BERNARD E. WEISSMAN, Ph.D.

Chairperson and Invited Speaker- Forty Years of Somatic Cell Genetics and Tumor Suppressor Genes: From Cells to Genes to Whole Genome Sequencing, AACR Annual Meeting Symposium, Washington, DC. April, 2010

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

Ubiquitin Drug Discovery and Diagnostics 2009. Philadelphia, PA “The Ubiquitin Ligase Muscle Ring Finger-1 (MuRF1) Protects Against Cardiac Ischemia Reperfusion Injury In Vivo”. Oct. 14, 2009.

American Heart Association Scientific Sessions. Orlando, FL “The cardiac ubiquitin ligase muscle ring finger-1 (MuRF1) ubiquitinates and degrades PPAR-alpha to regulate fatty acid and glucose metabolism” Nov. 17, 2009.

American Society of Investigative Pathology sponsored Workshop entitled “Ubiquitination, SUMOylation, and the Unfolded Protein Response in Disease” at Experimental Biology 2010 (Anaheim, CA). Talk entitled: “Regulation of cardiac hypertrophy and metabolism by the ubiquitin ligase muscle ring finger-1.” April 25, 2010..

American Physiology Society Cardiovascular Section sponsored symposium entitled “The Role of the Ubiquitin Proteasome System in Cardiac Disease, Diabetes, and Aging” at Experimental Biology 2010 (Anaheim, CA). Talk entitled: “Transcriptional regulation of cardiac ischemia reperfusion injury and metabolism by muscle-specific ubiquitin ligases.” April 28, 2010.

Second International Conference on Cardiomyopathy in Children, Session entitled “Molecular Mechanisms in Cardiomyopathy (Washington, D.C.). Talk entitled “Cardiac Dystrophin Treatment in Duchenne Muscular Dystrophy.” May 13, 2010.

King’s British Heart Foundation Centre of Research Excellence Symposium: “Stress signaling in the cardiovascular system” at King’s College London. Talk entitled: “Ubiquitylation-dependent signaling in heart disease”. June 14, 2010.

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

Overview of murine thrombosis models. 4th Symposium on Hemostasis and Thrombosis with Special Focus on Factor VIIa and Tissue Factor: Understanding the Molecular Mechanism. April 5, 2008. Chapel Hill, NC.

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

“The Laboratory Dog”, C L Davis Foundation and North Carolina Academy of Laboratory Animal Medicine Workshop in Laboratory Animal Medicine. May 13, 2010.

ALISA S. WOLBERG, Ph.D.

“Understanding Fibrin Clot Strength and Stability”, 10 Novo Nordisk Symposium on Haemostasis Management, October 1, 2009

“Modulation of Fibrin Structure by Cell Surface Tissue Factor”, 5th Symposium on Hemostasis with Special Focus on Factor Vila and Tissue Factor – from Cell Biology to Animal Models, April 30, 2010

DIRECTOR OF CONTINUING EDUCATION COURSES

ARABA N. AFENYI-ANNAN, M.D., Ph.D.

Blood Groups as Host Disease Factors, American Association of Blood Banks Annual Meeting, New Orleans, LA, October 2009

CHERIE H. DUNPHY, M.D.

Course Director and Presiding Officer, North Carolina Society of Pathologists 2010 Annual Meeting, Chapel Hill, NC, April 16, 2010

Course Director, UNC Department of Pathology and Laboratory Medicine Annual CME Program Lymphoid Neoplasms: Integrated Diagnosis and Differential Diagnosis, April 17, 2010.

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

ASCP Educational Course, Molecular Surgical Pathology, Ft. Lauderdale, FL, April 2010

PETER H. GILLIGAN, Ph.D.

Understanding CF Microbiology May 2010 Workshop given at the American Society for Microbiology General Meeting, San Diego, CA

J. CHARLES JENNETTE, M.D.

Presiding Officer and Program Committee Chair, Association of Pathology Chairs Annual Meeting, “Pathology Practice and Management: Sharing Successes, Avoiding Failures and Preparing for the Future”, Seattle, Washington, July 15-17, 2009

25th Glomerular Disease Collaborative Network Meeting, Chapel Hill, NC, May 15-16, 2010

JOE N. KORNEGAY, D.V.M., Ph.D.

Animal Model Assessment (Co-chair with Markus Ruegg). Bringing Down the Barriers, TREAT-NMD (Co-Sponsored by NIH). Brussels, BELGIUM, October 19, 2009

MELISSA B. MILLER, Ph.D.

Southeastern Association for Clinical Microbiology 31st Annual Meeting, “Molecular Microbiology 101,” Greenville, SC, November 4, 2009 (4h)

Southwestern Association of Clinical Microbiology 28th Annual Meeting, “Molecular Microbiology 101,” Fort Worth, TX, September 2, 2009 (4h)

VOLKER R. NICKELEIT, M.D.

European Congress of Pathology, XXIIInd meeting, Florence, Italy, September 2009; pre-congress meeting of the nephropathology working group on “Transplantation” Short Course (#45), United States and Canadian Academy of Pathology (USCAP), continuous education series: “*Diagnosing Tubulointerstitial and Vascular Diseases of the Kidney: a Case based Algorithmic Approach using Virtual Microscopy*” Washington D.C. March 2010

HARSHARAN K. SINGH, M.D.

United States and Canadian Academy of Pathology (USCAP) Short Course entitled “Diagnosing tubulointerstitial and vascular diseases of the kidney: An algorithmic approach utilizing virtual microscopy” USCAP Annual Meeting, Washington, D.C. March 20-26, 2010.

SERVICE ON UNC AND UNCH COMMITTEES

ROBERT C. BAGNELL, Ph.D.

Member, Microscopy Core Labs Sub-Committee
Member, Faculty Council

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

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

THOMAS W. BOULDIN, M.D.

Graduate Medical Education Committee (11 meetings per year)
North Carolina Cancer Hospital Executive Committee (11 meetings per year)
Full Professors Appointment, Promotion and Tenure Committee (8 meetings per year)
Health Sciences Advisory Committee (12 meetings per year)
Full Professors Appointment, Promotion and Tenure Committee (8 meetings per year)

ARLENE S. BRIDGES, Ph.D.

Member, UNC Health Sciences Library Advisory Committee

JOHN F. CHAPMAN, Dr. P.H.

UNCH Point of Care Testing Committee (monthly)
Chair, UNCH Point of Care Testing Committee (monthly)

FRANK C. CHURCH, Ph.D.

Member, Morehead-Cain Foundation, Central Selection Committee, interviewed the finalists for the incoming fall, 2010 (met 3 straight days in spring)
Member, University Research Council Grants Review Panel, meets twice per year (spring work load was to review 46 proposals).
Member, 2nd year Course Directors Committee (CC2), meets once per month.
Member, Medical School Student Promotions Committee (SPC), meets once per month and more frequently depending upon the situation.
Member, Medical School Admissions Committee, interviewed 2-3 student applicants each week during the fall and most of the spring semesters, committee/sub-committees meets between 3-4 times per month depending on the month and the situation with regards to admissions deadlines.

Member, Academy of Distinguished Teaching Scholars, UNC-CH
Member, Executive Committee of the Carolina Cardiovascular Biology Center
Fellow, Academy of Educators, UNC-CH School of Medicine

WILLIAM B. COLEMAN, Ph.D.

Member, Faculty Council
Member, Biological and Biomedical Sciences Program Executive Committee
Member, Department of Pathology and Laboratory Medicine Basic Science Faculty Compensation Plan Committee
Member, Department of Pathology and Laboratory Medicine Research Advisory Committee
Member, Molecular and Cellular Pathology Graduate Program Executive Committee
Member, Molecular and Cellular Pathology Graduate Program Education Committee
Member, Wagner Scholar Selection Committee, Molecular and Cellular Pathology Graduate Program
Member, Environmental Pathology Training Program Executive Committee
Member, Curriculum in Toxicology Education Committee
Member, UNC Program in Translational Medicine Executive Committee

MARILA CORDIERO-STONE, Ph.D.

Chair, Graduate Education Committee, Curriculum in Toxicology
Member, Executive Committee of the Biological and Biomedical Science Program
Member, Executive Committee of the Curriculum in Toxicology

GEORGETTE A. DENT, M.D.

Student Promotions Committee
Curriculum Committee
1st year Course Directors Committee
2nd year Course Directors Committee
3rd & 4th year Course Directors Committee
Change Management Advisory Board for Connect Carolina
Chair, Hospital Infection Control Committee
Assistant Dean for Admission Search Committee

CHERIE H. DUNPHY, M.D.

Member, UNC Fixed Term Promotions Committee

ROSANN A. FARBER, Ph.D.

Member, Admissions Committee (Pathogenesis)
Member, Faculty Hearings Committee
Member, Faculty Advisory Committee on Postdoctoral Scholars

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

Member, Institutional Animal Care and Use Committee

PETER H. GILLIGAN, Ph.D.

Member, Admissions Committee
Member, MD/PhD Selection Committee
Member, Appointment, Promotion and Tenure Committee

MARGARET L. GULLEY, M.D.

Member, UNC Clinical Translational Science Award, Section Leader
Member, UNCH RAM Lab Advisory Group to UCRF
Member, Executive Director's Advisory Group

CATHERINE A. HAMMETT-STABLER, Ph.D.

Member, School of Medicine 2nd year Course Directors
Member, Clinical Documentation Committee
Member, CDC Documentation Sub-committee
Chair, Biomedical IRB Committee

J. CHARLES JENNETTE, M.D.

Member, Hillsborough Physician Leadership Team
Member, SOM Strategic Space Committee
Member, UNC Health Care System Executive Council
Member, Dean's Advisory Committee of the UNC School of Medicine
Member, UNC Physicians & Associates Board
Member, Medical Staff Executive Committee
Co-Chair, SOM Strategic Space Committee
Member, UNC Health Care System Executive Council
Member, Hillsborough Hospital Planning Committee

WILLIAM K. KAUFMANN, Ph.D.

Member, Post-Tenure Review
Member, CEHS Executive Committee

JOE N. KORNEGAY, D.V.M., Ph.D.

Member, Institutional Animal Care and Use Committee (IACUC)
Member, Department of Pathology and Laboratory Animal
Medicine Preliminary Exam Committee
Chair, Division of Laboratory Animal Medicine (DLAM)
director search committee (Co-Chair)

SUSAN T. LORD, Ph.D.

Member, Research Advisory Committee, Department of Pathology and Laboratory Medicine
Member, Advisory Board, Program in Cellular and Molecular Biophysics
Member, Association of Professional Women in the Medical School Executive Committee
Education Advancement Board

CHRISTOPHER P. MACK, Ph.D.

Member, BBSP Admissions Committee
Member, Department of Pathology Preliminary Exam Committee

NOBUYO MAEDA, Ph.D.

Member, DLAM Space Committee
Chair, DLAM Advisory Committee

SUSAN J. MAYGARDEN, M.D.

Member, GME committee

MELISSA B. MILLER, Ph.D.

Anti-infectives Subcommittee of the Pharmacy & Therapeutics Committee and the Department of Hospital Epidemiology, UNC Health Care
Hospital Infection Control Committee
H1N1 Steering Committee

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

Member, Lineberger Comprehensive Cancer Center Clinical Genomics
Member, Lineberger Comprehensive Cancer Center Clinical Informatics

JUDITH N. NIELSEN, D.V.M.

Member, Network of Laboratory Animal Coordinators Steering Committee
Member, Institutional Animal Care and Use Committee
Member, IACUC subcommittee on Pharmaceuticals for Use in Laboratory Animal Research – did not meet this year, but fielded questions from faculty regularly.
Member, Ad Hoc SOM/DLAM Space committee, 8 meetings.

YARA A. PARK, M.D.

Member, Pharmacy and Therapeutics Committee

KATHLEEN W. RAO, Ph.D.

Member, Curriculum Committee
Member, Block 9 Course Committee
Co-Chair, Second Year Curriculum committee
Co-Chair, Academy of Educators

HOWARD M. REISNER, Ph.D.

Member, Student Promotions Committee
Member, Campus IT Governance Communications Technology Coordinating Committee

HARSHARAN K. SINGH, M.D.

Member, UNC Hospitals Credentials Committee

SCOTT V. SMITH, M.D.

Member, Pediatric Tumor Board
Member, Multidisciplinary Thoracic Oncology Tumor Board
Member, Genitourinary Oncology Tumor Board

JOAN M. TAYLOR, Ph.D.

Chair, School of Medicine Appointments for Tenure and Promotions Committee
Member, Health Science APT
Member, BBSP FYG Leader Committee
Member, School of Medicine Conflict of Interest Committee
Member, Carolina Cardiovascular Biology Center, Executive Committee
Member, Integrative Vascular Biology Training Program Admissions Committee

Member, Medical Student Research Grant Evaluation Committee

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Member, LCCC Governance Committee

RICHARD R. TIDWELL, Ph.D.

Member, Biomedical IRB Board

Member, UNC-CH 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.

Member, UNC UCRF Pilot Project Review Committee

Member, Pathology Mentoring Committee

Member, Pathology Promotions Committee

Member, UNC RAC (Dean's Research Advisory Committee)

Member, UNC Proteomics Review Committee

Chair, UNC Core Facilities Oversight Committee

Chair, UNC TraCS Office of Translational Technologies Core Facilities

BERNARD E. WEISSMAN, Ph.D.

Member, Graduate Education Committee-DPLM

Member, Executive Committee-Curriculum in Toxicology

Member, Postdoctoral Advisory Committee- LCCC

Chair, Grand Rounds-DPLM

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

UNCH POC Committee

UNCH Transfusion Committee

UNCH Quality Council

UNCH MSEC

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

Member, Institutional Animal Care and Use Committee (IACUC)

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

Executive Committee Member, McAllister Heart Institute, University of North Carolina. June 2009-present.

ALISA S. WOLBERG, Ph.D.

Member, UNC Thrombosis and Hemostasis Program Seminar Series

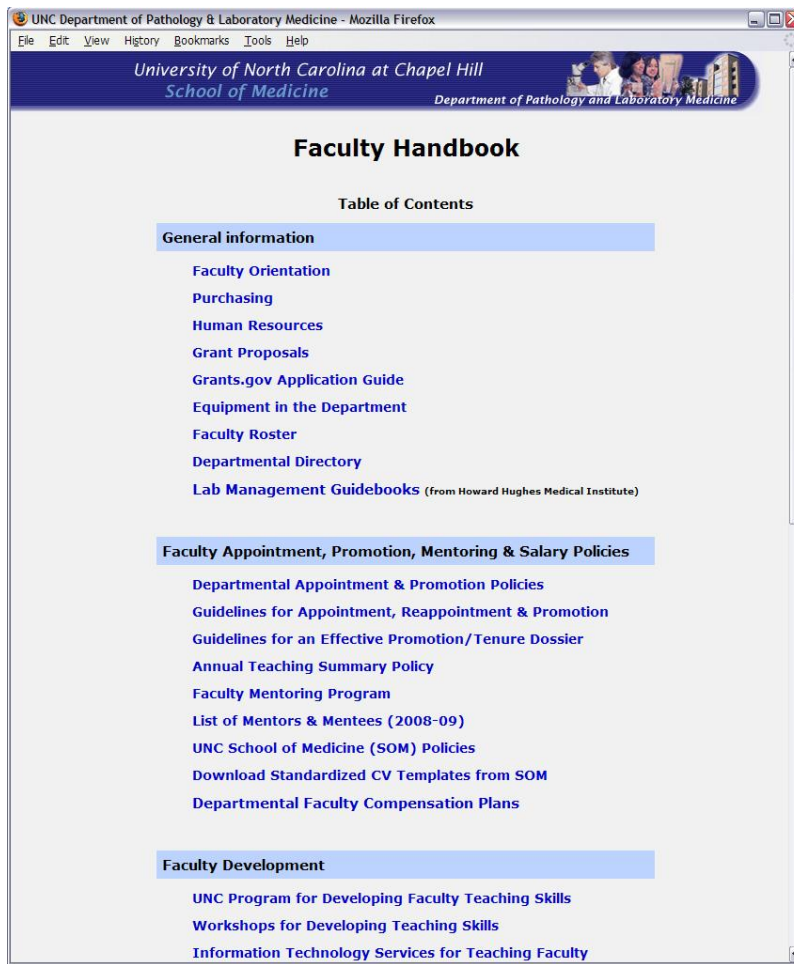
Member, Molecular and Cellular Pathology Graduate Program Executive Committee

Member, Molecular and Cellular Pathology Graduate Program Education Committee

Chair, Molecular and Cellular Pathology Graduate Program Qualifying Exam Committee

DEPARTMENTAL 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, promotion policies, School of Medicine policies, purchasing, grant proposals, human resources, equipment available within the Department, and core research services available within the Department, School of Medicine, and University. The handbook also provides an introduction and overview of the faculty orientation process. The Department of Pathology and Laboratory Medicine's Faculty Handbook is accessible online at http://www.pathology.unc.edu/bulletin_board/handbook/index.html.



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University of North Carolina at Chapel Hill
School of Medicine
Department of Pathology and Laboratory Medicine

Faculty Handbook

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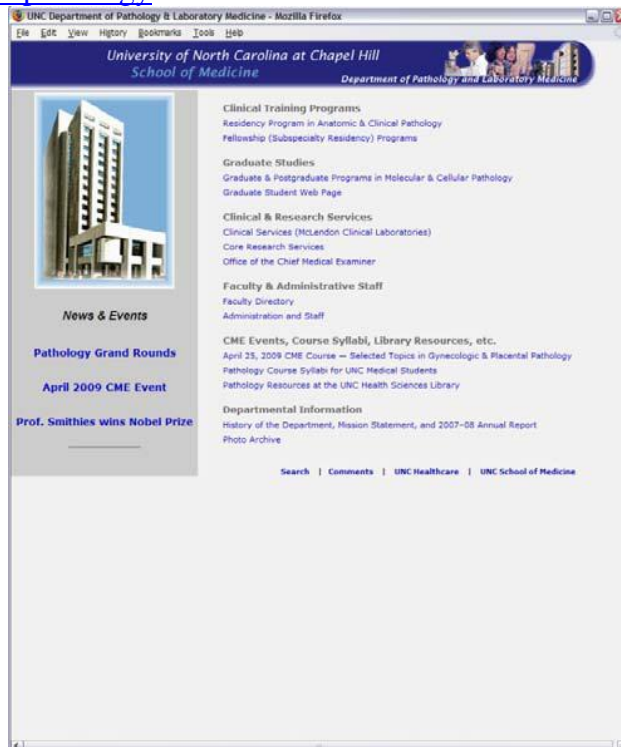
DEPARTMENTAL WEBSITE

The Departmental website (<http://www.pathology.unc.edu>) was inaugurated in 1995 as a means of making potential applicants more aware of our graduate, postdoctoral, and residency training programs. Today, the website is a comprehensive, detail-rich resource for those seeking information about the educational, research, and clinical training programs of the Department. The website includes information on the residency training program, the fourteen fellowship programs, the graduate program in molecular and cellular pathology, the pre- and post-doctoral training program in environmental pathology, departmental core research services, a faculty directory with linked biographical sketches, and a listing of upcoming seminars, CME courses and research symposia.

The website is maintained by Dr. Thomas W. Bouldin. The server for the website has been administered by Dr. Thomas B. Clark. Web pages for the graduate program are authored by Dr. William B. Coleman and Dr. Jonathon W. Homeister. Web pages for the residency and fellowship training programs and for the faculty are maintained by Dr. Bouldin. The website currently has 180 megabytes of information in over 3800 text and image files.

In May, 2010, the Departmental website is moving to the UNC School of Medicine web server. The content of the website will be similar but the design of the website will be changed to mirror the design of the School of Medicine's website. Dr. Bouldin will continue as webmaster of the new Departmental website and will continue to author the web pages for the residency and fellowship programs. Dr. Homeister and Dr. Coleman will continue to author the web pages for the graduate program in Molecular and Cellular Pathology on the new website. The URL of the new website is

<http://www.med.unc.edu/pathology>.



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School of Medicine
University of North Carolina at Chapel Hill
July 1, 2009 – June 30, 2010

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Chapter 4. Phenotypic Markers Used in Diagnostic Hematopathology

Chapter 5. Normal versus Abnormal FCI findings: Peripheral blood, body fluids, bone marrow, and lymph node

Chapter 6. Classification of Hematolymphoid Neoplasms

Chapter 7. Chronic Myeloproliferative Diseases

Chapter 8. Myelodysplastic Syndromes

Chapter 9. Myelodysplastic/Myeloproliferative Diseases

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Chapter 16. Immunodeficiency-Associated Lymphoproliferative Disorders

Chapter 17. Histiocytic and Dendritic Cell Neoplasms

Chapter 18: Mastocytosis

Chapter 19. Unique Applications of FCI to FNA Specimens

Chapter 20 Unique Applications of FCI to Body Fluids

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