DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE (GRAD)

Contact Information
Department of Pathology and Laboratory Medicine
http://www.med.unc.edu/pathology

J. Charles Jennette, Chair
Herbert C. Whinna, Vice Chair for Clinical Services and Director of McLendon Clinical Laboratories
Monte S. Willis, Vice Chair for Academic Affairs
Joan M. Taylor, Vice Chair for Research

Graduate work in the Department of Pathology and Laboratory Medicine is offered through the pathobiology and translational science graduate program to those interested in acquiring more extensive knowledge of disease pathogenesis. Major emphasis is given to the laboratory investigation of molecular and cellular mechanisms responsible for disease initiation, progression, and treatment. Students are given the opportunity to undertake candidacy for the doctor of philosophy degree. Participation in research activities leading to an original dissertation is required of all advanced degree candidates.

Prospective candidates must hold a bachelor’s degree from an accredited college or university. Admission to the program is through the Biologic and Biomedical Sciences Program (http://bbsp.unc.edu).

The department is located in the Brinkhous-Bullitt Building, and offers well-equipped, internationally recognized laboratories for research and advanced work in pathology.

Please visit the graduate program’s Web site (http://www.med.unc.edu/pathology/mcp/pbts/intro-mission) for more graduate program information.

Professors
Frank C. Church, Thrombosis and Hemostasis, Macromolecular Protein Structure-Function, Molecular Pathology
William B. Coleman, Breast Cancer Epigenetics, Biology of Liver Stem Cells, Hepatocarcinogenesis, Cancer Molecular Diagnostics
Leslie G. Dodd, Surgical Pathology, Cytopathology
Ronald J. Falk, Glomerular Disease, Lupus, Vasculitis, Dialysis
Rosann A. Farber, Genetic Instability in Cancer, Human Molecular Genetics, Microsatellite Instability
William K. Funkhouser Jr., Surgical Pathology, Molecular Pathology, Immunology
Peter H. Gilligan, Diagnostic Bacteriology, Pulmonary Disease in Cystic Fibrosis, Toxin Mediated Diarrheal Disease
Margaret L. Gulley, Molecular Diagnostics, Oncology, Epstein-Barr Virus
J. Charles Jennette, Renal Pathology, Immunopathology
David G. Kaufman, Human Origins of DNA Replication, Interactions between Human Endometrial Epithelial and Stromal Cells
Nigel Key, Thrombosis and Hemostasis
Christopher P. Mack, Transcriptional Regulation in the Cardiovascular System, Smooth Muscle Cell Biology
Nigel Mackman, Thrombosis and Hemostasis

Nobuyo Maeda, Molecular Genetics of Atherosclerosis, Transgenic Laboratory Animals as Model Systems, Molecular Evolution
Susan J. Maygard, General Surgical Pathology, Cytopathology, Prostate Carcinogenesis
Melissa B. Miller, Molecular Diagnostics, Antimicrobial Resistance, Molecular Epidemiology of MRSA
Valerie Murr, Oral, Head, and Neck Pathology
Timothy C. Nichols, General Cardiology, Cardiac Catheterization, Per-Cutaneous Transluminal Coronary Angioplasty
Volker Nickeleit, Renal Pathology, Fibronectins
Charles M. Perou, Breast Cancer, Genomics, Microarrays, Tumor Classification, Drug Resistance
Howard M. Reisman, Immunogenetics of Blood Coagulation, Immunochemistry
John L. Schmitt, Flow Cytometry, HIV, Diagnostic Immunology, Sexually Transmitted Diseases
Harsharan K. Singh, Cytopathology, Fine Needle Aspiration Biopsy, Renal Pathology
James A. Swenberg, Chemical Carcinogenesis, Toxicology, Mass Spectroscopy, DNA Damage and Repair, Endogenous DNA Damage
Joan M. Taylor, Adhesion Signaling, Cardiovascular Disease
Cyrus Vaziri, Regulation of DNA Replication, S-Phase Checkpoints, and Post-Replication DNA Repair on Mammalian Cells
Bernard E. Weissman, Tumor Suppressor Genes
Monte S. Willis, Molecular Mechanisms of Cardiac Disease and Ubiquitin-Proteasome Biology
Alisa S. Wolberg, Cellular and Molecular Mechanisms in Hemostasis and Thrombosis
John T. Woosley, Dermatopathology, Hepatobiliary and Gastrointestinal Pathology, Histopathologic Assessment of Prognosis

Associate Professors
Georgette A. Dent, Hematopathology, Medical Education
George Fedoriw, Hematopathology, Applications of Flow Cytometry
Mehmet Kesimer, Mucin Glycobiology and Airway Epithelial Pathobiology
C. Ryan Miller, Neuropathology, Genetics of Gliomagenesis and Experimental Therapeutics
Yara Park, Transfusion Medicine
Young E. Whang, Androgen Receptor, Prostate Cancer
David C. Williams Jr., Hematopathology, NMR Spectrophotometry and Structural Biology

Assistant Professors
Johann D. Hertel, Cytopathology
Nicole L. Korpi-Steiner, Clinical Chemistry
Jiandong Liu, Cardiovascular Biology
Li Qian, Cardiovascular and Stem Cell Biology
Jay S. Raval, Transfusion Medicine
Eric T. Weimer, Histocompatibility, Flow Cytometry and Clinical Microbiology/Immunology
Scott Williams, Stem Cell and Developmental Biology
Sara E. Wobker, Genitourinary Pathology
Qing Zhang, Cancer Cell Biology

Clinical Professors
Michelle Aurelius, Forensic Pathology
Thomas W. Bouldin, Neuropathology, Ocular Pathology, Neurotoxicology
Paul Gooze, Dermatopathology
Pamela M. Groben, Dermatopathology
Kathleen A. Kaiser-Rogers, Clinical Cytogenetics
Deborah L. Radisch, Forensic Pathology
Scott V. Smith, Surgical Pathology, Cardiovascular Pathology, Pediatric Pathology
Leigh B. Thorne, Molecular Pathology, Autopsy Pathology
Karen E. Weck, Molecular Genetic Pathology

**Clinical Associate Professors**

Jessica K. Booker, Genetics, Breast Cancer
Kevin Greene, Surgical Pathology of the Liver and Gastrointestinal Tract
Susan C. Hadler, Oral Diagnosis
Nabila Haikal, Forensic Pathology
Jonathon W. Homeister, Leukocyte Trafficking and Homing, Inflammatory Vascular Disease, Thrombosis and Hemostasis, Cardiovascular Pathology, Autopsy Pathology
Eizaburo Sasatomi, Gastrointestinal and Liver Pathology
Dimitri G. Trembath, Surgical Pathology and Neuropathology
Herbert C. Whinna, Mechanisms of Hemostasis and Thrombosis, Biochemistry and Vascular Biology of Blood Coagulation, Protein Structure-Function

**Clinical Assistant Professors**

Greg Bianchi, Urologic Surgery and Pathology
Claudia M. Brady, Surgical Pathology
Sue Ann Berend, Cytogenetics
Justin Brower, Forensic Toxicology
Sandra Bishop-Freeman, Forensic Toxicology
Stephanie P. Mathews, Hematopathology
Vincent J. Moylan Jr., Cardiac Pathology and Autopsy Pathology
Craig Nelson, Forensic Pathology, Water-Related Deaths, Including Drowning of All Kinds and Particularly Scuba, Rebreather, and Freediving Deaths
Siobhan M. O’Connor, Breast Pathology, GYN Pathology, Cytopathology
Nirali M. Patel, Molecular Pathology Anatomic and Clinical Pathology
Marian Rollins-Raval, Hematopathology, Flow Cytometry and Coagulation
Lori R. Scanga, Surgical Pathology, Cytopathology
Lauren Scott, Forensic Pathology, Preventive Health, Especially Suicide and Accident Prevention; the Value of Autopsy in Medical Education
Susan Venuti, Forensic Pathology
Ruth E. Winecker, Forensic Pathology

**Clinical Instructors**

Steve Holmes, Examination of Simple and Complex Specimens, Surgical Pathology
April E. Kemper, Autopsy Pathology, Surgical Pathology
Tracie W. Massey, Tissue Procurement; Surgical Pathology
Andre Phelan, Pathologists’ Assistant: Surgical Pathology Training for Residents and Students

**Research Instructor**

Diane Armao, Neuropathology

**Research Professors**

Craig A. Fletcher, Vascular Biology
Virginia L. Godfrey, Veterinary Pathology, Animal Models of Genetic Disease, Autoimmunity
Tracy M. Heenan, Laboratory-, Exotic- and Companion-Animal Medicine
Judith N. Nielsen, Animal Health Maintenance, Diagnosis and Eradication
Michael D. Topal, Genomic Instability and Disease
Maimoona A. Zariwala, Genetic Analysis of Patients with Primary Ciliary Dyskinesia (PCD)

**Research Associate Professors**

Brian Cooley, Thrombosis, Vascular Injury, Microsurgery
Ajay Gulati, Pediatric Gastroenterology
Peigi Hu, Immune-Mediated Kidney Disease
Masao Kakoki, Prevention of Cardiovascular Diseases
Steven Shipley, Laboratory Animal Medicine; Infectious Disease
Melissa Troester, Molecular Studies with Human Populations
Julia W. Whitaker, Laboratory Animal Medicine
Hong Xiao, Immune-Mediated Glomerular Disease and Vasculitis

**Research Assistant Professors**

Silvio Antoniak, Protease-Activated Receptors in Cardiovascular Diseases, Myocarditis, and Heart Failure Animal Models
Pablo Ariel, Director of the Microscopy Services Laboratory
J. Todd Auman, Pharmacogenomics, Cancer Pharmacology
Victoria Baxter, Pathogenesis of and Host Immune Response to Infectious Disease, Particularly Encephalomyelitic Arboviruses; Animal Model Development
Feng Li, Cardiovascular Biology
Stephanie A. Montgomery, Comparative Pathology and Animal Histopathology
Allison Rogala, Laboratory Animal Medicine Services, Comparative Medicine, and Host-Microbial Interactions
Jonathan Schisler, Translational Research in Patients with Myocardial Infarcts
Yang Yang, DNA Damage and Repair

**Adjunct Professors**

Mark E. Brecher, Blood Component Processing and Storage, Transfusion Strategies, Transfusion Transmitted Diseases
Jared Block, Hematology and Hematopathology
M. David Goodman, Medical Education and Autopsy Pathology
H. Michael Jones, Medical Education at Medical Student and Resident Level, Medical History, Autopsy Pathology, Research Support
Melina Kibile, Surgery and Surgical Research
Joe N. Komeyag, Duchenne Muscular Dystrophy, Canine Model, Translational Studies, Muscle Hypertrophy
Myla Lai-Goldman, Personalized Molecular Diagnostics
Chad A. Livasy, Surgical Pathology
Roger Lundblad, Consultant
Anil Mandal, Nephrology
Richard S. Paules, Oncogenes Tumor Suppressor Genes and Cell Cycle Control in Neoplastic Transformation of Mammalian Cells
Gary J. Smith, Prostate Cancer, Cancer Cell-Tissue Microenvironmental Interaction, Angiogenesis
Carol Weida, Cytopathology and Anatomic Pathology
Mark Weiss, General Pathology

**Adjunct Associate Professors**

David A. Eberhard, Pathology, Scientific and Business Support for Clinical Trials
Thomas H. Fischer, Gene Therapy, Blood Coagulation, Atherosclerosis
Delores Grant, Cancer Research
Susan Hester, National Health and Environmental Effects Research Laboratory
W. Carl Jacobs, General Pathology
Daniel J. Kenan, Nephropathology
Thomas Lightfoot, American Red Cross Blood Services
Ruth A. Lininger, Surgical Pathology, Breast Pathology
Christopher McKinney, General Pathology
Keith Nance, General Pathology
Ann Oaks, General Pathology
Thomas O’Connell, Molecular Physiology and Endocrinology
Sharon Presnell, Tissue Engineering
Tara C. Rubinas, Gastrointestinal Pathology and Hepatopathology
William Sanders, Medical Information Technology
Nobuyuki Takahashi, Animal Models of Hypertension, Pre-eclampsia, Diabetic Nephropathy and Obesity

Adjunct Assistant Professors
Araba N. Afenyi-Annan, Transfusion Medicine
Edward Bahnson, Vascular Biology, Diabetes and Metabolic Syndrome
Paul Chastain, Patient Care, Experience, and Clinical Outcomes
Bal Dhungel, Lymphoproliferative Disorders
Wendell Jones, Genomic Bioinformatics
Michal Kamionek, General Pathology
Grace Lee, Hematology
Emily Maambo, General Pathology
William Oliver, Forensic Pathology
Ashley Rivenbark, Cancer Biology
Ruth Walters, Dermatopathology

Professors Emeriti
Nadia Malouf Anderson
C. Robert Bagnell Jr.
Stuart Bentley
Debra A. Budwit
John D. Butts
John F. Chapman Jr.
Myra L. Collins
Marila Cordeiro-Stone
Robert E. Cross
Frederic G. Dalldorf
Cora-Jean S. Edgell
James D. Folds
Donald T. Forman
Joe W. Grisham
Catherine A. Hammett-Stabler
John E. Hammond
Susan T. Lord
William W. McLendon
James R. Pick
Marjorie S. Read
Harold Roberts
Kinuko I. Suzuki

PATH

Advanced Undergraduate and Graduate-level Courses

PATH 426. Biology of Blood Diseases. 3 Credits.
An introduction to the biology and pathophysiology of blood and the molecular mechanisms of some human diseases: anemias; leukemias; hemorrhagic, thrombotic, and vascular disorders; and HIV disease/AIDS.
Requisites: Prerequisite, BIOL 205; Permission of the instructor for students lacking the prerequisite.
Grading status: Letter grade
Same as: BIOL 426.

PATH 426H. Biology of Blood Diseases. 3 Credits.
An introduction to the biology and pathophysiology of blood and the molecular mechanisms of some human diseases: anemias; leukemias; hemorrhagic, thrombotic, and vascular disorders; and HIV disease/AIDS.
Requisites: Prerequisite, BIOL 205; permission of the instructor for students lacking the prerequisite.
Grading status: Letter grade
Same as: BIOL 426H.

PATH 462. Experimental Pathology. 1-9 Credits.
Hands-on research experience in a predetermined instructor's laboratory. Students learn and apply specific techniques and participate in investigations of molecular mechanisms responsible for disease processes (pathobiology). Contact the director of graduate studies in pathology for information. May be repeated.

PATH 464. Light Microscopy. 3 Credits.
Permission of the instructor. Course focuses on practical fundamentals of light microscopy including optics, contrast mechanisms, fluorescence, laser scanning confocal microscopy, photography, and digital imaging.

Graduate-level Courses

PATH 713. Molecular and Cellular Pathophysiological Basis of Disease: Mechanisms of Disease. 3 Credits.
A graduate course on cell injury and pathogenesis of disease with emphasis on basic mechanisms at the molecular, cellular, and organismal levels. Three lecture hours with a complementary two-and-a-half-hour laboratory each week.
Requisites: Co-requisite, PATH 714L.

PATH 714L. Molecular and Cellular Pathophysiological Basis of Disease: Laboratory I. 2 Credits.
Pre- or A graduate-level laboratory course on basic mechanisms of disease pathogenesis, emphasizing cell and tissue-based examples of major disease mechanisms.
Requisites: co-requisite, PATH 713.

PATH 715. Molecular and Cellular Pathophysiological Basis of Disease: Systemic Pathology. 3 Credits.
A graduate-level laboratory course on systemic pathology, emphasizing diseases of major organ systems. A follow-up to PATH 713/714L. Three lecture hours (three credits) with a complementary two-and-a-half-hour laboratory (two credits) each week.
Requisites: Co-requisite, PATH 716L.

PATH 716L. Molecular and Cellular Pathophysiological Basis of Disease: Laboratory II. 2 Credits.
Pre- or A graduate-level laboratory course on mechanisms of systemic disease pathogenesis, emphasizing cell and tissue-based examples of diseases of the major organ systems.
Requisites: co-requisite, PATH 715.
PATH 723. Practical Considerations for Translational Research. 2 Credits.
Permission of the instructor. A multi-disciplinary course providing students principles involved in translating basic science into clinically applicable diagnostics and therapies to improve human disease outcomes. The course is focused on bioinformatics, bioethics, trial design, FDA approval, and commercialization of laboratory diagnostics.

PATH 725. Cancer Pathobiology. 3 Credits.
Permission of the instructor. This course examines pathobiological features of cancer. An interdisciplinary approach draws from epidemiology, genetics, molecular biology, and clinical medicine to investigate cancer etiology, pathogenesis, prevention, and treatment.

PATH 726. Human Environmental Disease. 1-3 Credits.
This course will study human disease processes that are induced or exacerbated by our environment. Environmental disease stressors include solar radiation, air and water pollution, bioreactive substances in foods, pesticides, metals, dusts, particles, and allergens. Lectures will emphasize epidemiology, mechanisms of toxicity, and human disease pathogenesis.

PATH 766. Current Topics in Cardiovascular Biology. 3 Credits.
Permission of the instructor. Second-year graduate students only. This manuscript-based course will emphasize recent advances in heart and blood vessel development, the molecular mechanisms that regulate cardiovascular cell function, and current methodologies in the cardiovascular field. It will be team taught by members of UNC's McAllister Heart Institute.

PATH 767. Molecular and Cellular Biology of Cardiovascular Diseases. 3 Credits.
Second year graduate students or permission of the instructor. Course reviews the molecular, cellular, and organismal pathogenesis of cardiovascular disease. It is team-taught by faculty with topic expertise and stresses primary literature and current methodologies. May be taken as a companion to PATH766 or on its own.

PATH 792. Seminar in Carcinogenesis. 2 Credits.
Permission of the instructor. Survey of classical and current literature on selected critical issues in carcinogenesis. Students discuss experimental methods and observations as well as theories and generalizations. Two seminar hours a week.
Same as: TOXC 792.

PATH 801. Cell Cycle Regulation and Cancer. 3 Credits.
This journal club-style discussion course will focus on molecular events that regulate normal cell cycle progression, and on how deregulation of the cell cycle leads to cancer. Classes will follow the development of the cell cycle field chronologically, learning how current concepts and paradigms have evolved through scientific inquiry.
Same as: GNET 801.

PATH 890. Special Topics in Pathology. 1-3 Credits.
A study in special fields under the direction of the faculty. Offered as needed for presenting material not normally available.
Repeat rules: May be repeated for credit. 6 total credits. 3 total completions.

PATH 900. Research in Pathology. 2-12 Credits.
Permission of the department. This is a research course in which advanced students in pathology carry on investigations on mechanisms of disease. Six or more laboratory hours a week, to be arranged. May be repeated.
Repeat rules: May be repeated for credit.

PATH 920. Seminar in Interdisciplinary Vascular Biology. 1 Credit.
Permission of the instructor. Participants in the Interdisciplinary Vascular Biology Training Program only. Students will be required to present their thesis work as a formal seminar, give an introductory lecture to introduce their project (in cooperation with their thesis advisor), and to attend and discuss the seminars of other students.
Repeat rules: May be repeated for credit. 6 total credits. 6 total completions.

PATH 993. Master's Research and Thesis. 3 Credits.
May be repeated.
Repeat rules: May be repeated for credit.

PATH 994. Doctoral Research and Dissertation. 3 Credits.