DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE (GRAD)

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 across multiple buildings on the UNC campus and offers well-equipped, internationally recognized laboratories for research and advanced work in investigating the mechanisms of diseases.

Please visit the graduate program’s website (https://www.med.unc.edu/pathology/) for more graduate program information.

Clinical Professors
Frederic Askin, Surgical Pathology, Pulmonary Pathology
Michelle Aurelius, Forensic Pathology
Peter Banks
Russell R. Broadus, Molecular Pathogenesis of Endometrial Cancer
Leslie G. Dodd, Surgical Pathology, Cytopathology
Ronald J. Falk, Glomerular Disease, Lupus, Vasculitis, Dialysis
George Fedorov, Hematopathology, Applications of Flow Cytometry
Paul Googe, Dermatopathology
J. Charles Jennette, Renal Pathology, Immunopathology
Susan J. Maygarden, General Surgical Pathology, Cytopathology, Prostate Carcinogenesis
Melissa B. Miller, Molecular Diagnostics, Antimicrobial Resistance, Molecular Epidemiology of MRSA
Volker Nickeleit, Renal Pathology, Fibronectins
Yara Park, Transfusion Medicine
Charles M. Perou, Breast Cancer, Genomics, Microarrays, Tumor Classification, Drug Resistance
John L. Schmitz, Flow Cytometry, HIV, Diagnostic Immunology, Sexually Transmitted Diseases
Jan Silverman, Cytopathology, Gastrointestinal Pathology, Genitourinary Pathology
Harsharan K. Singh, Cytopathology, Fine Needle Aspiration Biopsy, Renal Pathology
James A. Swenberg, Chemical Carcinogenesis, Toxicology, Mass Spectrometry, DNA Damage and Repair, Endogenous DNA Damage
Leigh B. Thorne, Molecular Pathology, Autopsy Pathology
Karen E. Weck, Molecular Genetic Pathology
Wendell Yarbrough, Otolaryngology/Head and Neck Surgery

Clinical Associate Professors
Kevin Alby, Clinical Microbiology
Jessica K. Booker, Genetics, Breast Cancer

Clinical Professors
Wendell Yarbrough, Karen Leigh Spectroscopy, DNA Damage and Repair, Endogenous DNA Damage
Harsharan K. Singh, Jan Silverman, Transmitted Diseases
John L. Schmitz, Classification, Drug Resistance
Charles M. Perou, Yara Park, Volker Nickeleit, Molecular Epidemiology of MRSA
Melissa B. Miller, Carcinogenesis
Susan J. Paul George Fedoriw, Ronald Leslie
Peter Banks
Frederic Askin, Clinical Professors

Clinical Professors
Christine Bookhout, Surgical Pathology
Benjamin Calhoun, Breast Pathology
Steven Cotten, Clinical Chemistry
GeorgetteA. Dent, Hematopathology, Medical Education
Nabila Haikal, Forensic Pathology
Laleh Hakima
Jonathon W. Homeister, Leukocyte Trafficking, Inflammatory Vascular Disease, Thrombosis and Hemostasis, Cardiovascular Pathology, Autopsy Pathology
Alina Iuga, Histopathology, Inflammation and Neoplastic Disorders of the Digestive System
Matthew Karafin, Transfusion Medicine
Nicole L. Korpi-Steiner, Clinical Chemistry
Danielle Maracaja
Stephanie P. Mathews, Hematopathology
Jason Merker, Molecular Pathology
Jayson Miedema, Dermatopathology
Siobhan M. O’Connor, Breast Pathology, GYN Pathology, Cytopathology
LoriR. Scanga, #Surgical Pathology, Cytopathology
Eric T. Weimer, Histocompatibility, Flow Cytometry and Clinical Microbiology/Immunology
Herbert C. Whinna, Mechanisms of Hemostasis and Thrombosis, Biochemistry and Vascular Biology of Blood Coagulation, Protein Structure-Function
Sara E. Wobker, Genitourinary Pathology
Lee-Ching Zhu

Clinical Assistant Professors
Thomas Alexander
Janet Baranello
Sue Ann Berend, Cytogenetics
Sandra Bishop-Freeman, Forensic Toxicology
Amy Brownlee
Benjamin Cho
Mariama Evans
Jonathan Galeotti, Hematopathology
Johann D. Hertel, Cytopathology
Kimberly Janssen, Forensic Pathology
Steve Johnson
Dona Kanavy
Staci Keene
Vanessa Moreno
Craig Nelson, Forensic Pathology, Water-Related Deaths, Including Drowning of All Kinds and Particularly Scuba, Rebreather, and Freediving Deaths
Lori Ramkisson, Clinical Cytogenetics, Molecular Genetics
T. Danielle Samulski, Gynecologic Pathology, ENT Pathology, and Cytopathology
Lauren Scott, Forensic Pathology, Preventive Health, Especially Suicide and Accident Prevention, the Value of Autopsy in Medical Education
Bart Singer, Surgical Pathology
Tam Sneddon
Susan Venuti, Forensic Pathology
Alisha Ware
Sam Wu, Dermatopathology

Clinical Instructors
Michelle Bartlett, Pathologists’ Assistant
Kimberly Calabrese, Pathologists’ Assistant
Shelby Currier, Pathologists’ Assistant
Nicola Gerken, Pathologists’ Assistant
Research Professors

Claire Doeschuk, Diseases Affecting the Airways of the Lung
Craig A. Fletcher, Vascular Biology
Matthew Flick, Elucidating Mechanisms Linking Coagulation and Fibrinolytic Factors to Inflammatory, Infectious, and Malignant Disease
Virginia L. Godfrey, Veterinary Pathology, Animal Models of Genetic Disease, Autoimmunity
Ajay Gulati, Pediatric Gastroenterology
Tracy M. Heenan, Laboratory-, Exotic- and Companion-Animal Medicine
Melhem Kesimer, Mucin Glycobiology and Airway Epithelial Pathobiology
Nigel Key, Thrombosis and Hemostasis
Christopher P. Mack, Transcriptional Regulation in the Cardiovascular System, Smooth Muscle Cell Biology
Nobuyo Maeda, Molecular Genetics of Atherosclerosis, Transgenic Laboratory Animals as Model Systems, Molecular Evolution
Valerie Murrah, Oral, Head, and Neck Pathology
Timothy C. Nichols, General Cardiology, Cardiac Catheterization, Percutaneous Transluminal Coronary Angioplasty
Volkert Nickeleit, Renal Pathology, Fibronectins
Li Qian, Cardiovascular and Stem Cell Biology
Rani Sellers
Jonathan Serody
Harsharan K. Singh, Cytopathology, Fine Needle Aspiration Biopsy, Renal Pathology Adhesion Signaling, Cardiovascular Disease
Melissa Troester, Molecular Studies with Human Populations
Cyrus Vaziri, Regulation of DNA Replication, S-Phase Checkpoints, and Post-Replication DNA Repair on Mammalian Cells
Gregory Wilkerson
Alisa S. Wolberg, Cellular and Molecular Mechanisms in Hemostasis and Thrombosis
Maimoona A. Zariwala, Genetic Analysis of Patients With Primary Ciliary Dyskinesia (PCD)

Research Associate Professors

Silvio Antoniai, Protease-Activated Receptors in Cardiovascular Diseases, Myocarditis, and Heart Failure Animal Models
Pablo Ariel, Director of the Microscopy Services Laboratory
Andrew Gladden, Epithelial Cell Biology; Reproductive Tract Development and Neoplasia
Peiqi Hu, Immune-Mediated Kidney Disease
Feng Li, Cardiovascular Biology
Jiandong Liu, Cardiovascular Biology
Steven Shipley, Comparative Medicine, Infectious Disease
Young E. Whang, Androgen Receptor, Prostate Cancer
Scott Williams, Stem Cell and Developmental Biology
Melinda Yates

Research Assistant Professor

Hannah Atkins, Comparative Medicine
Jessica Bowser, Dynamics of Epithelial Integrity and Regeneration at the Interface of Inflammation and Cancer, Molecular and Biochemical Mechanisms of Endometrial Cancer Progression
Ilana Gafex
Nneka George

Meghan Free, Nephrology and Hypertension
Natalia Isaeva, Otolaryngology
Yukako Kayashima, Atherosclerosis
Boa Kim
Sushant Patil, Bioinformatics
Reinhardt-Boris Reidel, Airway Protein Function in Health and Disease
Allison Rogala, Comparative Medicine, Host-Microbial Interactions
Blake Rushing
Jonathan Schisler, Translational Research in Patients with Myocardial Infarcts
Travis Schrank
Erica Sparkenbaugh
W.H. Davin Townley-Tilson
Hao Fei Wang
Morika Williams, Comparative Medicine

Research Instructor

Diane Armao, Neuropathology

Adjunct Professors

Albert Baldwin, Biology
Bryan Dangott
Peter H. Gilligan, Diagnostic Bacteriology, Pulmonary Disease in Cystic Fibrosis, Toxin Mediated Diarrheal Disease
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
William Kaufmann
Myla Lai-Goldman, Personalized Molecular Diagnostics
Chad A. Livasy, Surgical Pathology
Roger Lundblad, Consultant
C. Ryan Miller
Judith N. Nielsen, Animal Health Maintenance, Diagnosis and Eradication
Howard M. Reisner, Immunogenetics of Blood Coagulation, Immunochemistry
Gary J. Smith, Prostate Cancer, Cancer Cell-Tissue Microenvironmental Interaction, Angiogenesis
Richard Tidwell

Adjunct Associate Professors

Delores Grant, Cancer Research
David G. Kaufman
Thomas Lightfoot, American Red Cross Blood Services
Christopher McKinney, General Pathology
Stephanie Montgomery
Jay S. Raval, Transfusion Medicine
Nobuyuki Takahashi, Animal Models of Hypertension, Preeclampsia, Diabetic Nephropathy and Obesity

Adjunct Assistant Professors

Edward Bahnson, Vascular Biology, Diabetes and Metabolic Syndrome
Victoria Baxter
Nikia Laurie
Brian Le
Nathan Montgomery
Avani Pendse, Surgical Pathology
Ricky Thompson
Tamiwe Tomoka, General Pathology
Patrick Wilson
PATH Graduate-level Courses

PATH 713. Molecular and Cellular Pathophysiologically 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.

Rules & Requirements
Requisites: Co-requisite, PATH 714L.
Grading Status: Letter grade.

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

Rules & Requirements
Requisites: Pre- or corequisite, PATH 713.
Grading Status: Letter grade.

PATH 715. Molecular and Cellular Pathophysiologically 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.

Rules & Requirements
Requisites: Co-requisite, PATH 716L.
Grading Status: Letter grade.

PATH 716L. Molecular and Cellular Pathophysiologically Basis of Disease: Laboratory II. 2 Credits.
A graduate-level laboratory course on mechanisms of systemic disease pathogenesis, emphasizing cell and tissue-based examples of diseases of the major organ systems.

Rules & Requirements
Requisites: Pre- or corequisite, PATH 715.
Grading Status: Letter grade.

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.

Rules & Requirements
Grading Status: Letter grade.

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.

Rules & Requirements
Grading Status: Letter grade.

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, bioactive substances in foods, pesticides, metals, dusts, particles, and allergens. Lectures will emphasize epidemiology, mechanisms of toxicity, and human disease pathogenesis.

Rules & Requirements
Grading Status: Letter grade.

PATH 730. Cancer Immunology. 2 Credits.
The goal of this graduate-level course is to learn about recent advances in the field, acquire specialized knowledge and to develop a foundation of critical thinking skills in cancer immunology. The course format will combine lectures and in-class discussion of assigned readings, with particular emphasis on state-of-the-art research methods. Students should be familiar with modern concepts of immunology and should consult with the course director before enrolling. The course meets for half a semester.

Rules & Requirements
Grading Status: Letter grade.

PATH 730. Cancer Immunology. 2 Credits.

Rules & Requirements
Grading Status: Letter grade.

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.

Rules & Requirements
Grading Status: Letter grade.
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 PATH 766 or on its own.

Rules & Requirements
Grading Status: Letter grade.

PATH 770. Mouse Efficacy and Disease Models. 3 Credits.
The Mouse Efficacy and Disease Models class is designed for second to third year students who intend on performing in vivo animal research. This course is intended to familiarize graduate students in the issues associated with the development and interpretation of mouse models and also an introduction to alternative models.

Rules & Requirements
Requisites: Prerequisites, Students must be earning a degree in a Biological & Biomedical Sciences Program (BBSP) with preference given to students in the Pathobiology and Translational Science Graduate Program; students should also have selected a thesis lab prior to enrolling in this class.
Grading Status: Letter grade.

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.

Rules & Requirements
Grading Status: Letter grade.
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.

Rules & Requirements
Grading Status: Letter grade.
Same as: GNET 801.

PATH 850. Scientific Writing in Pathobiology and Translational Science. 1 Credits.
The students will develop a research plan based on their thesis project and write a 6-page grant in the style of a NRSA F31 application. Students will learn to edit and critique their fellow student’s proposals which will help prepare the students for writing and editing their preliminary exam and future grant applications. Restricted to students currently earning a degree in a Biological & Biomedical Sciences Program (BBSP) with preference given to students in the Pathobiology and Translational Science Graduate Program.

Rules & Requirements
Grading Status: Letter grade.

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.

Rules & Requirements
Repeat Rules: May be repeated for credit. 6 total credits. 3 total completions.
Grading Status: Letter grade.

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.

Rules & Requirements
Repeat Rules: May be repeated for credit.
Grading Status: Letter grade.

PATH 920. Seminar in Interdisciplinary Vascular Biology. 1 Credits.
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.

Rules & Requirements
Repeat Rules: May be repeated for credit. 6 total credits. 6 total completions.
Grading Status: Letter grade.

PATH 940. Pathobiology and Translational Science Seminar. 1 Credits.
A series of scientific seminars by graduate students, Post-doctoral Fellows, research faculty, and others in the Department of Pathology and Laboratory Medicine. Students will develop the skills necessary to deliver an effective and engaging oral scientific presentation of their research. They will become proficient in understanding the pathogenesis of the wide range of diseases being studied in the department, and the methodologies employed to determine the pathogenesis of those diseases.

Rules & Requirements
Repeat Rules: May be repeated for credit. 7 total credits. 7 total completions.
Grading Status: Letter grade.

PATH 993. Master's Research and Thesis. 3 Credits.
May be repeated.

Rules & Requirements
Repeat Rules: May be repeated for credit.

PATH 994. Doctoral Research and Dissertation. 3 Credits.
Rules & Requirements
Repeat Rules: May be repeated for credit.

Contact Information
Department of Pathology and Laboratory Medicine
Visit Program Website (http://www.med.unc.edu/pathology/)

Director of Graduate Studies
Andrew B. Gladden
agladden@email.unc.edu

Student Services Manager
Angel Truesdale
angel_truesdale@med.unc.edu

Chair
Russell Broaddus
rbroaddus@med.unc.edu