

IMMUNOLOGY • biological chemistry • cancer biology • cell

regulation • genetics and development • integrative biology • molecular

biophysics • molecular microbiology • neuroscience



IMMUNOLOGY■ **CHAIR, GRADUATE PROGRAM**

Lora Hooper, Ph.D.

■ **DEGREE OFFERED**

Doctor of Philosophy

FACULTY AND RESEARCH INTERESTS**Kiyoshi Ariizumi, Associate Professor**

Ph.D., University of Tokyo, 1985

Molecular mechanisms for the pathogenesis of skin diseases.

Michael Bennett, Professor

M.D., Baylor College of Medicine, 1961

Immunogenetics and immunobiology of marrow-cell grafts; differentiation and function of NK cells; graft-versus-host reactions; natural immunity to infection; tumor immunology.

Zhijian "James" Chen, Professor

Ph.D., State University of New York at Buffalo, 1991

Ubiquitin-proteasome pathway; NF- κ B signaling; innate immunity; T-cell receptor signaling.

Peter Chen, Assistant Professor

Ph.D., University of Texas Health Science Center at Houston, 1993

Epigenetic gene regulation in an immune-privileged environment; ocular immunology; tumor immunosurveillance.

Laurie S. Davis, Associate Professor

Ph.D., UT Southwestern Medical Center, 1987

T-cell activation; autoimmunity; cytokine regulation.

Pila Estess, Assistant Professor

Ph.D., UT Southwestern Medical Center, 1980

Molecular immunology; structure/function relationships in lymphocyte cell-surface antigens, including CD44 and lymphocyte homing receptors; role of these molecules in autoimmune diseases and inflammation; molecular pathology.

J. David Farrar, Associate Professor

Ph.D., UT Southwestern Medical Center, 1996

Molecular immunology; signal transduction; regulation of T-cell differentiation and cytokine gene expression.

James Forman, Professor

D.M.D., Ph.D., Tufts University, 1965, 1971

T-cell recognition of major histocompatibility complex molecules; nonclassical class I molecules; NK cells.

William T. Garrard, Professor

Ph.D., University of California, Los Angeles, 1971

Regulation of V(D)J recombination of antibody genes; chromosome structure; control of gene expression; chromosome replication, condensation and segregation at mitosis; nuclear organization.

Michelle Joubert Gill, Assistant Professor

Ph.D., M.D., Louisiana State University, 1993, 1995

Pathogenesis and immunobiology of infectious disease; human dendritic cells in respiratory syncytial viral infections; host mucosal immune response to respiratory viral infections in children; dendritic cells in the pathogenesis of asthma.

Rebecca Gruchalla, Professor

Ph.D., M.D., UT Southwestern Medical Center, 1981, 1985

Immunopathology of antibiotic drug allergy, specifically sulfonamide drug allergy.

Eric J. Hansen, Professor

Ph.D., University of Michigan, 1977

Microbial pathogenesis and the immune response; use of recombinant DNA methods in vaccine development.

Lora Hooper, Associate Professor

Ph.D., Washington University, St. Louis, 1996

Host-microbial interactions; mucosal immunology.

Nitin J. Karandikar, Associate Professor

M.D., University of Pune, India, 1990; Ph.D., Northwestern University, 1997

Immunology of multiple sclerosis/autoimmune demyelination; immune responses to HCV infections; allo-depletion to prevent graft-versus-host disease; immune regulation by T cells.

David R. Karp, Professor

M.D., Ph.D., Washington University, St. Louis, 1984

Function of class II molecules of the major histocompatibility complex, including antigen presentation and its role in autoimmune disease; role of complement receptors in B-cell activation and presentation of soluble antigens.

Christopher Y.H. Lu, Professor

M.D., Harvard Medical School, 1974
 Transplant tolerance; regulation of macrophage function; ontogeny of macrophage function and its implications for self/nonself discrimination and autoimmunity; mechanisms of renal allograft rejection.

Bonnie Miller, Assistant Professor

Ph.D., UT Southwestern Medical Center, 1987
 Mechanisms of opioid immunomodulatory effects.

Chandra Mohan, Professor

M.D., National University of Singapore, 1984;
 Ph.D., Tufts University, 1995
 The immunopathology and immunogenetics of lupus; immunological tolerance; autoimmunity.

Nancy L. Monson, Associate Professor

Ph.D., University of Wisconsin, Madison, 1996
 The role of B cells in the pathogenesis of multiple sclerosis.

Jerry Y. Niederkorn, Professor

Ph.D., University of Arkansas, 1977
 Immune privilege of the anterior chamber of the eye; immune surveillance of intraocular tumors; immune modulation of cancer metastases; immunobiology of corneal transplants; immunology of parasitic diseases.

Chandrashekhar Pasare, Assistant Professor

Ph.D., National Institute of Immunology, India, 1999
 Toll-like receptors and control of adaptive immunity; dendritic cell biology.

Anne Satterthwaite, Associate Professor

Ph.D., Harvard University, 1993
 Genetic analysis of signal-transduction pathways regulating B lymphocyte development and function.

Richard H. Scheuermann, Professor

Ph.D., University of California, Berkeley, 1986
 Regulation of immunoglobulin gene expression; regulation of lymphocyte growth, development and apoptosis; lymphocyte receptor signal transduction; technology development; novel approaches to cancer therapy.

Mark Siegelman, Associate Professor

Ph.D., M.D., UT Southwestern Medical Center, 1981, 1983
 The molecular biology of cell-surface molecules governing adhesion to and transmigration through vascular endothelium.

Nancy E. Street, Assistant Professor

Ph.D., UT Southwestern Medical Center, 1987
 Activation and differentiation of murine T-helper cells; the role of T-helper cells in tumor dormancy and infectious disease.

Iwona Stroynowski, Professor

Ph.D., Stanford University, 1979
 Structure and function of immunologically relevant molecules; antigen presentation in the immune system.

Olaf Stüve, Associate Professor

M.D., Free University of Berlin, 1993; Ph.D., Maastricht University, Netherlands, 2006
 Prion protein as a disease modifier in autoimmune diseases of the central nervous system.

Joel D. Taurog, Professor

M.D., UT Southwestern Medical Center, 1974
 Biology of HLA and disease.

Dwain L. Thiele, Professor

M.D., Baylor College of Medicine, 1977
 Mechanisms of cytotoxic lymphocyte function and activation; transplantation immunology.

James A. Thomas, Associate Professor

M.D., Stanford University, 1989
 Signal transduction in innate immunity.

Jonathan W. Uhr, Professor

M.D., New York University School of Medicine, 1952
 Cancer immunology and genetics.

Ellen S. Vitetta, Professor

Ph.D., New York University School of Medicine, 1968
 The targeting of cytotoxic reagents to lymphoid cancers and HIV-infected cells.

Edward K. Wakeland, Professor

Ph.D., University of Hawaii, 1976
 The molecular biology of genes regulating immune responses and autoimmunity.

E. Sally Ward, Professor

Ph.D., University of Cambridge, England, 1985
 Genetic manipulation and structure/function studies of antibodies and T-cell receptors; T-cell mediated autoimmunity.

Jonathan C. Weissler, Professor

M.D., New York University, 1979
Regulation of cytotoxic lymphocytes in human lung; accessory cell function in human lung.

Christoph Wuelfing, Associate Professor

Ph.D., Max-Planck Institute for Biochemistry, Germany, 1994
T-cell activation using video microscopy; costimulation and cell biology of T-cell activation.

Felix Yarovinsky, Assistant Professor

M.D., Russian State Medical University, 2000
Toll-like receptor signaling; dendritic cells and host-pathogen interactions.

Dorothy C. Yuan, Professor

Ph.D., UT Southwestern Medical Center, 1977
Molecular regulation of immunoglobulin synthesis; interactions between B and T lymphocytes and NK cells.

Chengcheng "Alec" Zhang, Assistant Professor

Ph.D., University of Illinois at Urbana-Champaign, 1999
Mechanisms by which the cell fates of adult stem cells are regulated; interaction of adult stem cells and their in vivo microenvironment; ex vivo expansion of HSCs for cell therapy and gene therapy; interplay between stem cells and cancer.

■ ADJUNCT FACULTY

Alex W. Tong, Adjunct Associate Professor

Ph.D., Oregon Health Sciences University, 1980
Multiple myeloma as a model for malignant B-cell pathophysiology; TH2-mediated anti-tumor immunity; anti-oncogene ribozyme vectors; multidrug resistance.

DESCRIPTION OF THE DISCIPLINE

Since 1975, UT Southwestern Medical Center has offered a program through UT Southwestern Graduate School of Biomedical Sciences leading to a Ph.D. in immunology. This course of study is interdisciplinary, with a faculty composed of members from the Cancer Immunobiology Center and the medical school departments of Biochemistry, Dermatology, Immunology, Internal Medicine, Microbiology, Neurology, Ophthalmology, Pathology and Surgery.

A distinguishing characteristic of this graduate program is its multidisciplinary approach.

General areas of research include a variety of topics: transplantation immunology, graft-versus-host reactions, autoimmunity, histocompatibility antigens and disease, immunoglobulin structure and function, immune response to cancer, immunotoxins, autoimmune diseases, molecular genetics of T- and B-cell receptors, cell-mediated cytotoxic mechanisms, lymphocyte activation and signaling, cytokines, T- and B-cell interactions, and regulation of immunoglobulin synthesis.

OBJECTIVES

The broadly stated objective of the program is to train each student to function as a professional in the scientific community. Specifically, the program endeavors to offer each trainee the opportunity to acquire a firm and substantial understanding of the broad field of immunology as well as the opportunity to develop certain research skills and tools that will allow him or her to advance knowledge in the field of immunology and to develop the teaching capabilities that are essential for a viable academic career.

CURRICULUM

The field of immunology encompasses many broad areas related to basic science and medicine. A major strength of the Immunology Graduate Program resides in its large faculty of individuals whose research interests include molecular immunology, cellular immunology, transplantation, immunogenetics, immunology of infectious diseases, tumor immunology and clinical immunology. This offers students a broad-based education in all current immunologic concepts and techniques so they can become competitive for future opportunities.

During the first semester, students participate in the Core Course of the Division of Basic Science and have the opportunity to gain a broad-based scientific background in areas of modern biology. Students have an opportunity to attend journal clubs, works-in-progress seminars and the

Excellence in Immunology seminars during their first semester.

After completing the Core Course and joining the Immunology Graduate Program, a variety of courses are offered.

■ REQUIRED COURSES

Fundamentals of Immunology
Cellular and Molecular Immunology
Immunology of Infectious Diseases.

It is recommended that students also take Molecular Mechanisms of Infectious Disease. Other courses that may be useful for the Immunology student are Genetic Manipulation of the Immune System, and Bioinformatics and DNA Microarray Analysis.

Each of these courses focuses on integrating material from basic molecular biology, cell physiology and clinical pathophysiology. The format for these courses involves didactic information and reading of the original literature followed by critical discussion in an informal setting. Descriptions of the courses are found in the Division of Basic Science chapter of this catalog.

The Immunology program has a weekly seminar series in which all advanced graduate students present their research on an annual basis to the entire Immunology program. This experience affords students an opportunity to perfect their skills in oral presentation and communication to a sophisticated audience. Teaching opportunities also are available.

During the spring of the second year, students are required to pass a qualifying examination for



admission to candidacy for the Ph.D. The qualifying examination consists of a written proposal and its oral defense. Successful completion of the qualifying examination is required to advance to candidacy for the Ph.D.

A supervisory research committee is appointed for those candidates. This committee reviews and evaluates the student's progress and, upon completion of the dissertation based on original research and the student's public presentation of the work, participates in the final oral examination of the student.