Immunology Theme

Prospective students should use this checklist (http://www.uab.edu/graduate/images/acrobat/checklist/Immunologychecklist.pdf) to obtain specific admissions requirements on how to apply to Graduate School.

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Theme Information

Objectives

The Immunology Graduate Theme is a part of the UAB Graduate Biomedical Sciences Program (http://www.uab.edu/gbs/home). We are an interdisciplinary program emphasizing the study of multiple aspects of the immune system, from basic molecular mechanisms to whole animal studies and human translational research. The remarkable breadth of our program can be seen in the primary departments of the almost fifty theme faculty members. Faculty from the Departments of Microbiology (http://www.uab.edu/medicine/microbiology), Cell Biology (http://www.uab.edu/medicine/cdbi), Biochemistry and Molecular (http://www.uab.edu/medicine/biochem) Genetics (http://www.uab.edu/medicine/genetics), Biology (http://www.uab.edu/biology), Pathology (http://www.uab.edu/medicine/pathology), Medicine (http://www.uab.edu/medicine/dom), Pediatrics (https://www.uab.edu/medicine/peds), Environmental Health Sciences (http://www.soph.uab.edu/ehs), Epidemiology (https://www.soph.uab.edu/index.php?q=epi), Surgery (http://www.uab.edu/medicine/surgery), Ophthalmology (http://www.uab.edu/medicine/eyedoc), Dermatology (http://www.uab.edu/medicine/dermatology), and Dentistry (http://dental.uab.edu) are involved in internationally recognized research and in the training of PhD-level graduate students and postdoctoral fellows. Currently, forty-five students are in training in the laboratories of our immunology faculty. Primary areas of research include: Allergy, Autoimmunity, Cancer Immunology, Clinical/Translational, Developmental Immunology, Host Defense, Immunodeficiency, Immunogenetics, Inflammation, Mucosal Immunology, Neuroimmunology, Structural Immunology, and Transplantation Immunology. Students obtaining a PhD in the Immunology Graduate Theme will be well-versed in modern immunology and have the option to pursue diverse career pathways.

Admission Requirements

Acceptance is based on undergraduate record (curriculum and grade point average [GPA]), Graduate Record Exam (GRE) scores, letters of recommendation, a personal statement of research and career interests, and past research activities. Domestic candidates who pass the first round of selection will be invited to visit UAB and meet the Immunology faculty and students.

The general requirements for acceptance into the Theme are:

- Minimum GPA of 3.0 on a 4.0 scale
- Combined verbal/quantitative GRE score #1100. New GRE scores should be at least 50% or better on each verbal/quantitative.
- A strong background in biology, chemistry, and/or mathematics. Undergraduate level courses in immunology, cell biology, biochemistry, physics, genetics, organic and analytical chemistry are strongly encouraged. Undergraduate mathematics through calculus is also recommended. International students must submit scores from the Test of English as a Foreign Language (TOEFL) earned within the last two years. Applicants with scores of 600 (paper-based), 250 (computer-based), or 100 (internet-based) or higher will be considered.

All students in the program receive a stipend (currently $29,000), tuition and fees. Support is provided by the Theme, by the student's mentor, or through one of many fellowship programs.

Overview of the Theme

The Theme emphasizes interdisciplinary training in all areas of modern immunology. The first year of the program involves fundamental coursework and three research-based rotations in laboratories of the student's choosing. A qualifying examination and admission to candidacy take place in the second to third year. Advanced coursework, journals clubs, and dissertation research occur in the second and subsequent years. It is expected that completion of the PhD will require five to six years. To broaden their training experience, students are introduced to research at the national and international levels through seminars presented by outside speakers and by attendance at national and international scientific meetings. Students take an active role in inviting and hosting speakers at UAB, and they are strongly encouraged to present their own results at outside meetings.

Immunology Theme Faculty

The faculty listing for the Immunology theme is located at http://services.medicine.uab.edu/facultydirectory/FacultyListingType.asp?FacultyTypeID=IM

Additional Information

Deadline for Entry Term(s): Consult Theme Director for information
Deadline for All Application Materials to be in the Graduate School Office: Please refer to theme website to verify deadline dates: http://www.uab.edu/gbs/immunology
Number of Evaluation Forms Required: Three
Entrance Tests Required: GRE

For detailed information, contact Dr. Louis B. Justement, Theme Director, UAB Immunology Graduate
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Course Descriptions

Core Curriculum

BLOCK 1 - BIOCHEMISTRY/METABOLISM

- Amino acids and primary protein structure
- Protein secondary and tertiary structure
- Postranslational modifications and allosteric changes
understanding of selected aspects of lymphocyte biology. Possible year immunology students with the opportunity to gain a more in-depth Lymphocyte Biology.

The objective of this class is to provide first of selected immunology topics based on the current literature. Students actively participate in the course through weekly presentations and serve as an important refresher for the developing immunologist. inimmunology, especially for those with minimal immunology background, immunity. These integrated series of lectures provide a firm foundation survey course that covers basic concepts of innate and adaptive Introductory Immunology.

Introductory Immunology is a team-taught Theme Specific Courses

Introductory Immunology. Introductory Immunology is a team-taught survey course that covers basic concepts of innate and adaptive immunity. These integrated series of lectures provide a firm foundation inmunology, especially for those with minimal immunology background, and serve as an important refresher for the developing immunologist. Students actively participate in the course through weekly presentations of selected immunology topics based on the current literature.

Lymphocyte Biology. The objective of this class is to provide first year immunology students with the opportunity to gain a more in-depth understanding of selected aspects of lymphocyte biology. Possible topics include T cell subsets, B cell biology, lymphocyte activation, and transplantation immunology. The course is literature intense and students are required to read and present numerous scientific papers.

Dendritic Cell Biology. Understanding the biology and function of the immune system's professional antigen presenting cells, the dendritic cells, is a fast moving challenge. The course will cover the seminal papers in the field that have laid the groundwork for our current understanding of this group of complex cells. The major component of the class will emphasize student presentations of assigned reviews and journal articles. Presentations will include an overview (provided by the review article) and 2-3 papers per class.

History of Immunology. This course will examine the concepts that have shaped what we now consider pillars in our knowledge of the immune system. The course will cover the major events and discoveries that led to these established concepts and, where possible, the advent of technologies that facilitated these advances. The course will involve student participation in the form of presentations in selected areas as well as lectures by some individuals who were part of this history.

Neuroimmunology. The purpose of this course is threefold;

1. To provide students with a basic overview of immunology and neuroscience in conjunction with a specific focus on how neuro inflammatory processes affect the brain
2. To teach students basic neuroanatomy of the brain
3. To have students understand the clinical implications of neuroinflammatory diseases by attending rounds with clinicians.

How the immune system influences the brain is an emerging field in neuroscience research and is currently not being addressed in a graduate or medical course.

Innate Immunity. The study of innate immunity has made a resurgence in recent years and its critical role, not only in host defense against invading pathogens, but in the development of adaptive immune responses is now appreciated. This course will provide an in-depth look at selected aspects of the innate immune response including the cellular and molecular components critical to its development. The course will involve student presentations on selected topics.

Mucosal Immunology. The mucosal immune system is essentially the primary site of interaction between invading pathogens and the immune system. Mucosal immunity has always been a strength of the immunology community at UAB and is rarely covered at most other institutions. This class will provide in-depth analysis of the structural features that distinguish the mucosal immune system from the peripheral immune system. Features of innate and adaptive immunity as they relate to mucosal immune responses will also be covered. The course will involve student presentations on selected topics.

Journal Clubs

MIC 797-00: Cellular and Molecular Immunology Journal Club (http://www.microbio.uab.edu/CMJournalClub/JC0809.html)
MIC 796-00: Neuroimmunology Journal Club (http://www.microbio.uab.edu/courses/NeuroIm.htm)
MIC 737-VT: Mucosal Immunology Journal Club (http://www.microbio.uab.edu/courses/MIC737.htm)
MIC 772-VT: Bacterial Pathogenesis Journal Club (http://www.microbio.uab.edu/courses/MIC772.htm)
MIC 724-VT: Virology Journal Club (http://www.microbio.uab.edu/courses/MIC724.htm)
MIC 785-00: Post-Transcriptional Regulatory Mechanisms (http://www.microbio.uab.edu/courses/MIC785.htm)
MIC 786-00: Retrovirology Journal Club (http://www.microbio.uab.edu/courses/MIC786.htm)
MIC 789-00: Journal Club in Biological Crystallography (http://www.microbio.uab.edu/courses/MIC789.htm)
MIC 760: Autoimmunity Journal Club (http://www.microbio.uab.edu/courses/MIC760.htm)
MIC 701-00: Inflammation Journal Club (http://www.microbio.uab.edu/courses/MIC701-00.htm)