

INFECTIOUS DISEASE AND HOST DEFENSE (IDHD) TRACK GRADUATE STUDENT HANDBOOK

Track Director: Dr. Meghan Hermance

Overview

Infectious diseases continue to profoundly impact global health, with new pathogens regularly emerging and previously controlled infections resurging. The Infectious Disease and Host Defense (IDHD) Track offers an exciting, multidisciplinary Ph.D. training experience at the forefront of this critical field.

Our program addresses urgent challenges including the rise of antibiotic-resistant bacteria, emerging zoonotic threats, increased pathogen transmission through arthropod vectors, immune and inflammatory disorders, and significant gaps in effective diagnostics, therapeutics, and vaccines. By joining the IDHD Track, students will collaborate with leading researchers across microbiology, immunology, cell biology, and vector biology, gaining comprehensive skills needed to tackle complex infectious disease and immune-related problems. Upon graduation, IDHD Track students will be prepared to take on leadership roles in academic, government, and industrial research settings.

Students in the IDHD Track benefit from:

- Cutting-edge research exploring pathogen biology, host immune responses, and novel therapeutic strategies.
- Hands-on training using state-of-the-art facilities and innovative technologies.
- Personalized mentorship from internationally recognized experts.
- Opportunities for interdisciplinary collaborations and professional development.

Prepare yourself to become a leader in infectious disease research, contributing essential discoveries to improve human health worldwide. Explore how the IDHD Track can empower you to make a lasting impact.

This handbook serves as a supplemental resource to the BMS Student Handbook (see <https://www.southalabama.edu/colleges/com/doctoral-program/resources/2025bmshandbook.pdf>). Students should refer all questions to their Major Professor and/or the Track Director.

Mission Statement

The mission of the IDHD Track is to develop outstanding new scientists for a wide range of career opportunities involving microbiology and immunology in academic, clinical, industrial, and government settings. To meet this goal, students are trained to rigorously investigate cellular and molecular mechanisms underlying microorganism life styles, immune defenses, host-pathogen interactions, and transmission, and to effectively evaluate and communicate scientific information.

IDHD Track – Affiliated Faculty (as of 08/16/2026)

Faculty Member	Primary Department
Kevin Macaluso, Professor and Chair	Microbiology and Immunology
Jonathon Audia, Professor	Microbiology and Immunology
Robert Barrington, Professor, ORET Director	Microbiology and Immunology
Meghan Hermance, Associate Professor, Track Director	Microbiology and Immunology
Michael Elliott, Associate Professor	Microbiology and Immunology
Allyson Shea, Assistant Professor	Microbiology and Immunology
Timothy Casselli, Assistant Professor	Microbiology and Immunology
Michele Schuler, Professor, BRL Director	Microbiology and Immunology
Eliane Esteves, Research Assistant Professor	Microbiology and Immunology
Christopher Davies, Professor, ADR	Biochemistry and Molecular Biology
Haidee Custodio, Associate Professor	Pediatrics
Linda Hassouneh, Pediatric Hospitalist	Pediatrics
John VandeWaa, Professor	Internal Medicine
David Wood, Professor Emeritus	Microbiology and Immunology
John Foster, Professor Emeritus	Microbiology and Immunology
Robert Lausch, Professor Emeritus	Microbiology and Immunology

IDHD TRACK REQUIREMENTS

Dissertation Committee

During the first year, through discussions and laboratory rotations (IDL 594), students begin the process of selecting their Major Professor. Selection of a mentor must be completed by the end of Summer Semester Year 1 (see **Table** below). This is followed by the selection of a Dissertation Committee consisting of at least four additional members, two of which must have an appointment in the IDHD Track (as per BMS guidelines). Students are expected to enlist at least one faculty member with a primary appointment outside the Department of Microbiology and Immunology. In addition, students are encouraged to enlist faculty members from outside of the department and/or outside of the institution to provide expertise necessary to their project. The expectation of the IDHD Track Faculty is that students will hold their first committee meeting before the end of Fall Semester Year 2.

Courses and Curriculum

The table below outlines the planned progression through the BMS core curriculum and the IDHD Track.

Updated 8/7/2026

	Fall	Spring	Summer
Year 1	• IDL 580 • IDL 577 (Methods) • IDL 576 (Lit Reports) • GIS 501 (RCR) • IDL 594 (Rotation 1)	• IDL 581 • IDL 576 (Lit Reports) • IDL 594 (Rotations 2, 3)	• IDL 640 (BioStats) • IDL 594 (Rotation 4, if needed) or MIC 537 (Directed Studies for students who matriculate into Track) • MIC 590 (Special Topics – Introduction to Literature Reports) • Selection of Primary Mentor
Year 2	• MIC 530 (Microbes and Host Defense) • MIC 590 (Special Topics – Introduction to Scientific Writing: Literature Reviews) • MIC 536 (Literature Reports) • MIC 636 (Research in Progress seminars) • MIC 537 (Directed Studies) • First Committee Meeting	• Advanced Coursework (<i>one of</i> MIC 630 Pathogenesis, MIC 632 Immunology, MIC 633 Virology) • MIC 590 (Special Topics – Introduction to Proposal Synthesis) • MIC 536 (Literature Reports) • MIC 636 (Research in Progress seminars) • MIC 537 (Directed Studies)	• MIC 537 (Directed Studies)
		• Qualification Exam	
Year 3 - 5	• MIC 536 (Literature Reports) • MIC 636 (Research in Progress seminars) • MIC 799 (Research and Dissertation)	• MIC 536 (Literature Reports) • MIC 636 (Research in Progress seminars) • MIC 799 (Research and Dissertation)	• MIC 799 (Research and Dissertation)

Academic standing guidelines are described in the BMS Handbook.

BMS Core Curriculum

Year 1	IDL 580	Fundamentals of Biomedical Science I
	IDL 581	Fundamentals of Biomedical Science II
	IDL 576	Literature Reports
	IDL 577	Introduction to Research Methods
	IDL 594	Directed Studies Rotation
	GIS 501	Responsible Conduct of Research
	MIC 590	Special Topics (Summer Semester)
	IDL 640	Biostatistics

IDHD Core Curriculum

Year 2 All of the following courses:

MIC 530	Microbes and Host Defense
MIC 536	Literature Reports (IDHD Journal Club)
MIC 636	Research in Progress seminars
MIC 537	Directed Studies
IDL 640	Statistics and Experimental Design in Biomedical Research
MIC 590	Special Topics (Fall and Spring Semesters)

Plus one of the following advanced courses*:

MIC 630	Advanced Microbial Pathogenesis
MIC 632	Advanced Immunology
MIC 633	Advanced Virology

*Pre-requisites for advanced courses are IDL 580, IDL 581 and MIC 530

Additional Track Requirements

- Regular Dissertation Committee meetings and progress reports as described in the BMS Handbook.
 - In addition to the required BMS forms, the IDHD Dissertation Committee Meeting Evaluation form (see below) is required for each student committee meeting. The completed form will be shared between the Major Professor, all committee members, and the student. The Track Director shall also receive a copy of the completed form.
- Attendance and participation at the MIC 536 Literature Reports and MIC 636 Research in Progress seminars (any absences must be excused by the Course Director).
- Organizing, attending, and presenting at the annual IDHD Research Symposium (any absences must be excused by the Major Professor and the Track Director).
- Presentation at a national meeting.
- Professionalism expectations include attendance at the College of Medicine Distinguished Scientist Seminars and the Department of Microbiology and Immunology seminars (any absences must be excused by the Track Director).
- Elective courses as suggested by the student's Dissertation Committee.
- Written prospectus and oral defense of the prospectus (Qualification Examination, see below).
 - In addition to the required BMS forms, the IDHD Qualification Examination Evaluation form (see below) is required. The completed form will be shared between the Examination Committee Chair,

the Major Professor, all committee members, and the student. The Track Director shall also receive a copy of the completed form.

- Defense of Dissertation (see below).

Conflict Resolution and Communication

The IDHD Track Director serves as the primary point of contact for all matters related to the IDHD Track. As part of professional responsibility, all program-related questions or concerns should be directed to the Track Director first. In cases where the Track Director is unavailable or additional input is required, Dr. Audia or Dr. Macaluso may serve as the main point of contact. Maintaining clear and respectful communication through appropriate channels supports a productive and collaborative training environment.

Qualification Examination

The IDHD Track Qualification Examination will consist of a written prospectus accompanied by an oral defense of the prospectus. Students are expected to hold the oral defense of their prospectus by the end of May in Year 2. The Examination Committee will consist of the student's selected Dissertation Committee members plus a faculty member outside of the Dissertation Committee who will serve as Chair. The student and their faculty mentor will work to identify an Examination Committee Chair. Final approval of Examination Committee Chair is at the discretion of the Chair of the Department of Microbiology and Immunology and/or the IDHD Track Director. As per BMS Guidelines, the Examination Committee Chair shall have a vote, whereas the Major Professor shall not. This examination will follow a format similar to that outlined in the BMS Student Handbook (see <https://www.southalabama.edu/colleges/com/doctoral-program/resources/2025bmshandbook.pdf>) with the following specifications. Note, failure to pass the Qualification Examination will result in dismissal from the IDHD Track, thus ending all associated financial commitments at the discretion of the Chair of Microbiology and Immunology.

Written Prospectus

The written prospectus will follow the format of a NIH F31/R21 grant proposal and a substantive draft of this document will be prepared as part of MIC 590 Special Topics Introduction to Proposal Synthesis (described below). Students are **not** expected to generate and include substantial preliminary data to support the technical and conceptual feasibility of the hypothesis proposed for testing. Although preliminary data are permitted, the purpose of this written examination is to determine whether the student is able to use the primary literature to identify a knowledge gap in their selected field of study and then develop a clear and testable hypothesis based on the identified problem. The student is expected to develop a rigorous experimental design with clear descriptions of expected outcomes, alternative outcomes, and alternative approaches. The Prospectus will be distributed to the Examining Committee at least 2-weeks prior to the scheduled date of oral defense (which should be by the end of May).

Oral Defense of Prospectus

The written Prospectus will serve as the basis for the oral defense. Students will prepare a 25-30-minute seminar to provide background on the topic followed by an outline of the overall research strategy and anticipated results, alternative outcomes, and alternative approaches. The students should also include an overall interpretation and impact of the proposed studies. The format for this seminar is left to the discretion of the Examination Committee as to whether questions will occur throughout the seminar or left to the defense phase. Upon completion of the seminar portion, the oral defense of prospectus will be led by the Examination Committee Chair. Students should expect that the Examination Committee will ask questions pertaining to the body of the prospectus, but will also ask questions to determine the student's knowledge of basic sciences and aspects

specific to their selected field of study. Upon conclusion of the defense, the student will be excused from the room and the Examination Committee will deliberate the student's performance on both the written and oral components. A passing grade requires a majority of the Examination Committee agree to pass the student on **both** the written and oral phases of the examination. Any component of the examination the student does not pass will be subject to one retake at the discretion of the Examination Committee.

Advancement to Candidacy and Post-Qualification Exam Research Expectations

Following successful completion of the Qualification Examination and advancement to candidacy, students are expected to make sustained and meaningful progress toward completion of their dissertation research. Advancement to candidacy signifies that the student is prepared to assume increasing responsibility for the development and execution of their dissertation research and for meeting the expectations of the IDHD Track. Students are expected to maintain regular engagement with their Major Professor and Dissertation Committee and to meet research milestones, timelines, and other expectations established by these parties. Students must hold regular Dissertation Committee meetings and respond appropriately to recommendations, concerns, and/or corrective actions identified by the Committee. Continued enrollment in MIC 799 (Research and Dissertation) requires satisfactory research effort and progress.

Post-qualification exam, students are also expected to maintain required attendance and participation in IDHD Track courses and activities, including Journal Club, Research in Progress (RIP) seminars, Distinguished Scientist Seminars, and the annual IDHD Research Symposium, as applicable. Students are also expected to successfully complete any additional coursework or training recommended by their Dissertation Committee to address deficiencies or strengthen their preparation for completion of the dissertation research. These expectations are consistent with the Track's existing requirements for committee meetings, course participation, seminars, and committee-recommended coursework.

Failure to demonstrate satisfactory research progress or to meet academic and professional expectations may result in remediation, probation, or referral to the Graduate Student Promotions and Evaluation Committee (SPEC), consistent with BMS policies. Any combination of two unsatisfactory course grades, unsatisfactory Dissertation Committee evaluations, and/or Professional Notes will trigger referral to Graduate SPEC for review. Continued unsatisfactory performance, including inadequate progress in MIC 799, may ultimately result in recommendation for dismissal from the IDHD Track.

Defense of Dissertation

The format of the Dissertation is at the discretion of the Dissertation Committee and must be distributed to the committee at least 2 weeks prior to the scheduled defense. The defense will be conducted by the student's Dissertation Committee members. The Defense of Dissertation will consist of a public presentation (50 minutes and time for questions) immediately followed by a closed defense meeting. Upon conclusion of the closed defense, the student will be excused from the room and the Dissertation Committee will deliberate the student's performance on both the written and oral components. A passing grade requires a majority of the Dissertation Committee to agree to pass the student on **both** the written and oral phases of the examination. Any component of the examination the student does not pass will be subject to a retake at the discretion of the Dissertation Committee.

Brief Course Descriptions (see respective course syllabi for further details)**MIC 536 Literature Reports (IDHD Journal Club)**

The IDHD journal club is designed to provide scholarly reviews of recently published, high-impact articles focused on infectious diseases and host-pathogen interactions. The format is an interactive discussion led by a primary presenter with active engagement from attendees. The course supports critical literature analysis, effective scientific communication, and evaluation of experimental design. Each student will lead a Journal Club discussion once during each academic year.

MIC 636 Research in Progress (RIP) seminars

The IDHD Research in Progress seminars provide students with a structured forum to present and discuss their ongoing dissertation research with faculty and peers. Presentations emphasize the scientific rationale, experimental design, current findings, interpretation, limitations, and future directions of the student's research, with discussion intended to provide constructive feedback and strengthen the student's ability to communicate and defend their work. RIP Seminars complement Journal Club by emphasizing critical evaluation and discussion of the student's own research rather than published literature. Each student will present a RIP once during each academic year.

MIC 530 Microbes and Host Defense (3 credit hours)

This course will build upon the foundation of basic immunology and microbe structure, metabolism, and genetics that was established in the Year 1 IDL courses to expand the student's knowledge of microbial pathogens (bacteria, fungi, parasites, and viruses), the clinical diseases involved, and the host response to specific pathogens. Special emphasis will be placed on recognizing targets for new antimicrobials and the development of effective vaccines and diagnostic tools.

MIC 630 Advanced Microbial Pathogenesis (3 credit hours)

This course will provide state-of-the-art knowledge on selected topics in microbial pathogenesis, including molecular mechanisms and emerging technologies. The course offers an integrated view of the genetics and biochemistry of microbial structures in bacteria and fungi of medical importance. Assignments will cover advanced information on topics such as microbial structures, protein secretion, uptake of nutrients and other molecules, global regulatory signals and signal transduction pathways, lifestyles of intracellular and extracellular bacteria, aspects of innate immunity, mobile genetic elements, toxins, and microbial interactions with host cells.

MIC 632 Advanced Immunology (3 credit hours)

This course provides an in-depth analysis of selected topics in immunology. The course is centered around formal presentations followed by student presentations. Design and interpretation of immunological experiments are emphasized throughout the course.

MIC 633 Advanced Virology (3 credit hours)

This course reviews the reproductive cycle of important human viruses and subviral agents and the diseases they cause. The focus is on the molecular biology of animal viruses and their mechanisms of regulation, assembly, and pathogenesis. Human immunodeficiency virus and other viruses of current interest will be considered in detail. The course is constructed as an interactive lecture series with student reports and literature surveys.

MIC 590 Special Topics (1-3 credit hours)

This course will be taken by students over three consecutive semesters and will cover the following special topics:

Introduction to Literature Reports – The goal of this section is to introduce students to literature relevant to their field of study and to develop critical scientific reading and writing skills using the primary literature. Students will work with their mentor to select papers to read. Then students will complete a written assignment for each paper that will be evaluated by the mentor.

Introduction to Scientific Writing: Literature Reviews – The goal of this section is to instruct students on how to prepare review-style scientific articles summarizing the work in their chosen field of study. Students will build on the Introduction to Literature Reports and begin developing their written summaries into a review that will be supplemented with summaries of additional papers. Students will work with their mentors to identify the relevant literature and begin to integrate what has been done with what needs to be done to move the field forward. This exercise will prepare students for preparation of their Written Prospectus.

Introduction to Proposal Synthesis – The goal of this section is to instruct students on how to prepare grant proposals using the NIH F31/R21 format. Students will work with their mentor to identify possible topics to be developed. In-class sessions will provide guidance, tips, and feedback on progress. At the end of the section student proposals will be evaluated in a 'mock Study Section'. This exercise will prepare students for preparation of their Written Prospectus.

IDL 640 Statistics and Experimental Design in Biomedical Research

The course focuses on common statistical methods used to evaluate data in biomedical research as well as logic and hypothesis-driven experimental design. The course will utilize a combination of lectures, writing assignments, discussion of statistics in published work, analysis of practical data sets, and assigned reading.

MIC 537 Directed Studies (1-6 credit hours per semester)

Students participate in research under the direction of a graduate faculty member. The student may pursue independent research or participate in a literature project.

MIC 799 Research/Dissertation (1-6 credit hours per semester)

Independent research by the student under the sponsorship of the graduate faculty in the individual departments in the Basic Medical Sciences.

IDHD Dissertation Committee Meeting Evaluation Form

Student Name: _____

Mentor: _____

Meeting Date: _____

Year in Program: _____

Committee Members Present:

Overall Scores Based on Combined Feedback from the Committee (Strengths and Weaknesses):

Category	Score (1–4 or N/A)	Comments/Concerns
Research Progress (e.g., New Data, Manuscripts)		
Conceptual Understanding & Use of Literature		
Experimental Design & Rigor		
Meeting Presentation, Communication, & Engagement		
Professional Development (e.g., Fellowship applications, posters, conference attendance, student organization leadership roles, etc.)		
Overall Rating (not an average – overall impact score analogy)		

Evaluation Scale Guide

1 – Unacceptable: The student shows a lack of understanding or performance is significantly below expectations. Requires immediate and substantial remediation. Students receiving an unacceptable rating in any category will require them to prepare and submit a written corrective action plan to the committee.

2 – Below Expectations: Student demonstrates partial understanding or underdeveloped skills. Improvement is necessary to meet program expectations.

3 – Meets Expectations: Acceptable performance. Student demonstrates a sufficient level of knowledge, skills, and progress for their current stage.

4 – Above Expectations: Above-average performance. Student demonstrates a clear understanding and effective skill application. Progress is on track or ahead.

N/A: Not Applicable to this evaluation or not observed.

Future Goals and Other Committee Feedback:

Minority Opinions/Concerns Raised by Committee Members:

☐ No Minority Opinions/Concerns ☐ Moderate Concerns ☐ Significant Concerns

Next Meeting Timeline:

☐ 3 months ☐ 6 months Specify date: _____

Committee Chair Signature: _____ Date: _____

IDHD Qualification Examination Evaluation Form

Student Name: _____

Mentor: _____

Examination Committee Chair: _____

Oral Exam Date: _____

Committee Members Present:

Committee Evaluation Procedures

This evaluation form is an IDHD Track supplement to the BMS “Recommendation for Admission to Candidacy” form (see form #7 in BMS handbook). When the student is excused from the room at the end of the oral examination, the Examination Chair will lead the Committee’s discussion of student performance on both the written and oral portions of the exam. With input from the Committee, the Chair will fill out the evaluation tables during the discussion.

Scale for Evaluation Tables

1 – Unacceptable: The student shows a lack of understanding or performance is significantly below expectations. Requires immediate and substantial remediation.

2 – Below Expectations: Student demonstrates partial understanding or underdeveloped skills. Improvement is necessary to meet program expectations.

3 – Meets Expectations: Acceptable performance. Student demonstrates a sufficient level of knowledge, skills, and progress for their current stage.

4 – Above Expectations: Above-average performance. Student demonstrates a clear understanding and effective skill application. Progress is on track or ahead.

An “unacceptable” (i.e., score of 1) Overall Rating results in a failed written or oral portion of the exam. “Unacceptable” or “below expectations” scores in two or more categories automatically trigger the “unacceptable” Overall Rating.

Written Prospectus Evaluation:

Scores Based on Combined Feedback from the Examination Committee

Category	Score (1–4)	Comments (Strengths and Weaknesses)
Hypothesis & Specific Aims: Student develops a focused hypothesis based on an identified gap in knowledge and appropriate specific aims that test the hypothesis.		
Background & Significance: Student uses rigorous existing literature to support the overall scientific premise along with establishing conceptual and technical feasibility of the proposed studies.		
Experimental Design & Rigor: Student provides adequate detail, well-organized research design, and substantial evidence of ability to conduct independent research and interpret results. Expected outcomes and alternative approaches are thoroughly addressed.		
Writing & Grantsmanship: Student presents ideas in a logical and coherent progression. Vocabulary is appropriate and precise. The reader can effortlessly discern the meaning. No distracting grammatical errors. Proper citations.		
OVERALL RATING (not an average – overall impact score analogy)		

Oral Defense of Prospectus Evaluation:

Scores Based on Combined Feedback from the Examination Committee

Category	Score (1–4)	Comments (Strengths and Weaknesses)
General Scientific Knowledge: Student demonstrates competence in the scientific fields under investigation and the graduate program curriculum at this stage of training.		
Research Strategy: Student provides adequate rationale and justifies technical aspects of conducting the proposed research; demonstrates an understanding of pitfalls and is knowledgeable on alternative strategies.		
Organization & Effectiveness of Communication: Student presents ideas in a logical and coherent progression. Graphics and visual aids explain and reinforce text and presentation. Student uses a clear voice and correct terminology.		
Critical Thinking & Response to Examiners' Questions: Student independently responds with accurate and relevant information.		
OVERALL RATING (not an average – overall impact score analogy)		

Overall Committee Recommendation for Qualification Exam:

☐ Written Pass, Oral Pass

☐ Written Pass, Oral Fail

☐ Written Fail, Oral Pass

☐ Written Fail, Oral Fail

List specific things the student should focus on for the retake of an examination portion:

Post-QE Research Expectations: Following advancement to candidacy, students are expected to make sustained progress toward completion of their dissertation research. Please document any specific expectations, milestones, recommendations, or concerns identified by the Examination Committee:

Examination Chair Signature: _____ Date: _____