Creighton
UNIVERSITY
Medical Center

Department of Medical Immunology and Microbiology

Doctor of Philosophy Program

Handbook 2018-2019

Curriculum
Faculty Information
Degree Checklist

Revised and approved 05/03/2017

This publication contains the most current information available on the subjects covered as of the date of publication. This publication should **not** be considered a contractual or binding agreement. The department reserves the right to modify or eliminate the policies described herein, and apply any such modifications to any student without regard to date of admission, application, or enrollment.

Revised and approved 05/03/2017

Doctor of Philosophy Curriculum

I. INTRODUCTION

The Ph.D. program is designed to provide students with the educational background, oral and written presentation skills, and research experience to prepare them for successful independent careers in the health sciences or science-related fields in the broad topic areas of microbiology and immunology. Study for the Ph.D. degree emphasizes independence in scientific pursuit, with a particular emphasis on research. Course work and dissertation research are designed to bring the student to a high-level of competence in microbiology and immunology with particular expertise in the area chosen for dissertation research. You will be expected to demonstrate a high capacity for original and independent thought, and apply this creativity, educational background, and knowledge of the scientific method to dissertation research. While you will rely to a certain extent on the Major Advisor at the outset, you will soon assume primary responsibility for your research project. In this context, the Major Advisor will act as a resource person intimately acquainted with the research, but not directing the project on an experiment-to-experiment basis.

II. PROGRAM OBJECTIVES

Within the context of Creighton as a Jesuit, Catholic University, the Graduate School provides value-centered education for students to develop mastery of their chosen field of study. The Medical Microbiology and Immunology programs offer an environment ideal for fostering critical judgment, scholarly initiative, and disciplined inquiry. At the completion of this graduate program in Medical Microbiology and Immunology, students will:

1. Demonstrate advanced knowledge in the fields of Medical Microbiology and Immunology.
2. Demonstrate independent critical and analytical thinking, both within their field of study, and beyond for the use of their knowledge for service to others.
3. Identify and suggest possible solutions to ethical dilemmas that occur in their work and field of study, and understand the importance of professional ethics in all aspects of scientific communication and laboratory work.
4. Demonstrate competence in the laboratory, including application of the scientific method and appropriate use of basic and state of the art laboratory tools and techniques.
5. Demonstrate written and oral skills necessary for communication of research, knowledge, and ideas to scientists and non-scientists alike.

III. FINANCIAL AID

A. Stipends

On entering the Ph.D. program, you may receive a stipend for living expenses. Continued departmental support will be reviewed on an annual basis, and normally will not exceed five years. Therefore, if you are receiving a departmental stipend, it is essential that you devote full time and energy to your class work and research project, and you will be required to enroll as a full-time student (8 credit hours

minimum) each semester and summer session (6 credit hours). Exceptions can be made with the consent of your Major Advisor, the Graduate Program Director, and the Department Chair. **In addition, you are expected to continue your research endeavors over the summer break and other breaks which are standard for undergraduate students.** It is during these times, when classes are not in session, that you can make significant progress on your research project. Any vacations or personal days should be coordinated through your Major Advisor to ensure that you do not miss mandatory graduate student meetings, exam proctoring duties, seminars, etc.

B. Graduate Assistantships

Graduate Assistantships are financed by funds gained from the University and other related sources. The appointee will assist in clerical and other duties performed in the student's major department. The appointments require no less than 10 and no more than 20 hours of the student's time per week.

IV. TERMINAL OBJECTIVES AND CURRICULUM

Upon the completion of the doctoral program, the student should be able to:

A. Demonstrate advanced knowledge in fields of medical microbiology and immunology.

B. Demonstrate ability in independent critical and analytical thinking, both within and beyond the scope of his/her research, as evidenced by:

a) Independent execution of thesis research project
   i) Literature review
   ii) Experimental design
   iii) Proper inclusion of controls
   iv) Critical analysis of data and troubleshooting

b) Critical analysis of published scientific literature
   i) Experimental design
   ii) Proper use of controls
   iii) Interpretation of data

C. Develop competence in the laboratory, including application of the scientific method and appropriate use of basic and state of the art laboratory tools and techniques.

D. Develop the oral communication skills necessary for active participation in scientific gatherings, both as a presenter and a discriminating member of the audience.

a) Presentation of published scientific data
b) Presentation of own scientific data
c) Presentation of concise 10-minute research presentations for regional and national meetings
d) Active participation as an audience member in seminars and journal club

E. Demonstrate skill in written scientific communication.

a) Manuscript preparation
b) Grant preparation
c) Abstract/poster preparation for scientific meetings

F. Comprehend the importance of professional ethics in all aspects of scientific communication and laboratory work.

G. Acquire the scientific independence required to assume the next professional position.

H. Develop the necessary skills required to effectively educate and train others in the classroom and laboratory.

CORE CURRICULUM	**CREDIT HOURS**
Foundations of Microbiology (MIC 721) Fundamentals of Molecular and Cell Biology (BMS 604) Research Methods (IDC 627) Advanced Microbial Pathogenesis (MIC 733) Host Defense (MIC 740)[a] Research Writing Course (IDC 701) Topics in Medical Microbiology/Immunology (MIC 790) Scientific Ethics (IDC 601) Introduction to Biostatistics for the Biomedical Sciences (IDC 625) **Total Core Credit Hours**	4 credit hours 6 credit hours 3 credit hours 3 credit hours 3 credit hours 3 credit hours 2 credit hours 1 credit hour 3 credit hours **28 credit hours**
ELECTIVE COURSES Diagnostic Microbiology (MIC 735) Bacterial Physiology (MIC 739) Advanced Immunology (MIC 746) Molecular Virology (MIC 749) Cellular and Molecular Immunology (MIC 745) Antimicrobial Agents and Chemotherapy (MIC 753) Topics in Medical Microbiology/Immunology (MIC 790) Directed Independent Readings (MIC 893) Advanced Cell and Molecular Biology (BMS 706) Courses from other departments may be considered if the graduate committee feels the coursework would benefit the student's development	**2 courses minimum (no elective credit hour minimum)**
Departmental Seminar (MIC 791)	**Each Semester (1 credit hour)**
Directed Independent Research (MIC 897)	**12 credit hours minimum**
Doctoral Dissertation (MIC 899)	**12 credit hours minimum**
TOTAL CREDIT HOURS	**90 credit hours**

[a] Taught in conjunction with medical students. Graduate students have separate syllabus and course requirements.

If you enter the Ph.D. program having already earned your M.S. degree, you may receive up to 30 credit hours applied to your Ph.D. program requirements.

V. ACADEMIC REQUIREMENTS

A. A minimum grade of "B" is required to earn graduate credits in "500-series" (advanced undergraduate) courses. In courses numbered 600 and above (open exclusively to graduate students) the minimum acceptable grade is "C". Accumulation of any grade below "C" terminates the student's graduate status.

B. If you accumulate more than 6 credit hours of "C's" or any grade less than a "C", regardless of the credit hours involved, you will be automatically dismissed from the program.

C. All appeals for removal of probation, academic suspension, transfer of credits or change in program are heard by the Executive Board of the Graduate School. Petitions are filed in writing to the Dean as described in the Graduate Catalog.

VI. SELECTION OF MAJOR ADVISOR

A. Prior to the selection of a permanent Major Advisor, the Graduate Program Director will serve as your *ad hoc* advisor.

B. Upon entering the program you will begin laboratory rotations within the first two weeks of your first semester. Students should identify up to four laboratories with research programs of interest and spend a 4-6 week rotation within each laboratory. If you enter the program having already identified a laboratory and major advisor, laboratory rotations during the first semester are still encouraged. At the end of the first semester, you should select your Major Advisor and area of research interest. Major Advisors who hold Secondary or Contributed Services positions within the Department must be approved by the Department Chair.

C. Your Major Advisor will serve as the Chair of your Graduate Committee and will direct your research program. Your Major Advisor will carry the responsibility of providing the necessary funding for your research project(s). However, you will be encouraged to seek extramural funding through the help of your Major Advisor to provide valuable training in all aspects of grant writing.

D. A change in your Major Advisor is strongly discouraged. However, under unusual circumstances you may petition to the Graduate Program Director, and must receive the approval of the Department Chair.

VII. THE ADVISORY COMMITTEE AND COMMITTEE MEETINGS

A. You are responsible for selecting your Advisory Committee through consultation with your Major Advisor.

B. The Advisory Committee will consist of the Major Advisor and a minimum of four other faculty members (at least 5 members total). At least 1 of the committee members must hold primary appointment in a department other than Medical Microbiology and Immunology.

C. The first meeting of the Advisory Committee will be scheduled during the second semester of the first year of your doctoral program. During this meeting you will outline your remaining coursework and will present to your Advisory Committee your proposed research project. **Please submit the completed and signed Graduate Student Initial Plan of Study to the Department Office for placement in the student's file.**

D. You are expected to have developed and discussed your Individual Development Plan (IDP; see Section XIII) with your Major Advisor and will present the goals of your IDP at your first Advisory Committee Meeting. You should review the IDP annually and present an update on your IDP to your Advisory Committee at least once more after the second year.

E. Committee meetings are required to be held every six months. If a committee meeting is not held the student will not be able to register for class (spring, summer and fall semesters).

F. Your committee meetings will be evaluated by the Advisory Committee, with emphasis on oral skills, presentation of data, progress in research project, ability to answer questions, ability to critically evaluate your data and suggest future studies, etc.

G. You are required to submit copies of all Graduate Student Committee Evaluation Forms after each Advisory Committee Meeting to the Department Office for placement in the student's file.

H. You are required to submit a copy of the Annual Graduate Student Activity Profile after each spring meeting to the Department Office for placement in the student's file.

VIII. DEFENSE OF PREDOCTORAL FELLOWSHIP GRANT

A. The student will prepare a 6 page grant on the doctoral research project (following NIH guidelines for R21 or F31 applications for length and content) in conjunction with the CTS713 course (or equivalent) offered the second semester of the second year of the program.

B. With the grant prepared in **VIII.A.** as a starting point, **a specific aims page for the NIH grant defense must be presented to the Advisory Committee for approval at least two months prior to its defense.**

C. Following approval of the Specific Aims page, **the "final draft" of the NIH grant must be completed and submitted to the Advisory Committee at least one month prior to the defense date. The grant defense must be held on or before August 1 of the second year in the program**, unless the Student's committee agrees upon another time. After the defense, if the document requires more revision, the student must make those changes. The advisor must verify that the revisions have been completed. The student must

submit both the “final draft” and the revised final version of the grant (if necessary) to the Department Office for placement in the student’s file. These final revisions should take no longer than 2 months.

D. In the event that an exception to these deadlines is deemed necessary (e.g. for student health or family issues), the Major Advisor of the student wishing to extend the August 1 deadline would need to petition the Curriculum Committee in writing stating the reason why an extension should be granted and an alternate date for the deadline set.

IX. WRITTEN COMPREHENSIVE EXAM

A. Testing will normally occur during the month of **June** after the second semester in the program has been completed, but may occur as late as the second year, depending on when individual core courses are offered. Students matriculating in the program in the same semester are expected to take the exam on the same day.

B. Students will be given at least two exam questions for each of the following core curriculum courses: MIC721, IDC627, MIC733, MIC740 and BMS604. The exam will be given over two consecutive days, with one day covering questions for MIC740 and MIC733, and the other day covering questions for MIC721, IDC627, and BMS604. The students will have no longer than 8 hours to complete the exam questions offered on a given day.

C. Questions will be submitted from faculty who teach in the core curriculum courses. Questions will be submitted to the curriculum committee, who will read the questions and edit them for clarity with guidance from the faculty member who wrote the question, and then formally approve the questions for the exam.

D. Students must pass all the questions related to each core course to pass the written comprehensive exam. In the case of a failed question, the answer will be reviewed by another faculty member with expertise in the content area. A final decision regarding the failed grade will be made by the curriculum committee.

E. If the student fails to pass questions covering up to two topic areas or courses, the student’s knowledge of the failed topic areas will be reassessed in an oral exam (“partial oral exam”). If the student fails more than two course exam questions, the student must pass an oral exam over all the course topics covered in the written exam (“full oral exam”). Every effort will be made to schedule the oral exam within 60 days from notification of failure.

The participating faculty present at the oral exam will include those responsible for teaching the core curriculum courses that the student failed to pass in the written comprehensive exam (the number will depend on how many questions the student failed to pass in the written exam). Additional observers to the oral exam will include at least three members of the curriculum committee (who may also serve as participating faculty), the Dean or a delegate of the Dean (with faculty standing) of the Graduate School, and the Department Chair. The

Major Advisor will not be present at the oral exam. Following deliberation by the participating faculty, the student will be notified of the committee's decision.

F. If the student does not pass the oral exam, the curriculum committee will make a decision within 10 business days on whether the student may pursue a Master's degree or will be dismissed from the program. The opportunity to pursue a Master's degree must then be approved by the student's thesis committee.

G. If the student is dismissed from the program as a result of failing the oral exam, and the student chooses to dispute this decision, the student must notify the Graduate Program Director and the Graduate School in writing within 10 business days of the formal receipt of the decision. The appeals process would follow the Graduate School Dismissal Appeals Policy.

X. DISSERTATION RESEARCH AND DEFENSE:

A. Once you have completed your dissertation, a final copy should be provided to each member of the Advisory Committee and the Dean of the Graduate School.

B. To ensure that Committee Members are given adequate time to read and critique the dissertation, the oral defense cannot be scheduled any sooner than 30 days after committee members have been provided with the dissertation, unless otherwise approved by the committee.

C. You will give an oral presentation of your dissertation research.

D. The defense of your dissertation will follow the presentation and will include questions to evaluate:

(1) The dissertation itself (i.e., quality and completeness of the research, validity of the methods used, validity of conclusions, etc.).
(2) Your capacity for independent thought,
(3) Your in-depth knowledge in the specific areas of microbiology and immunology related to the dissertation topic
(4) Your knowledge of all areas fundamental to medical microbiology and immunology.

E. Successful defense must satisfy the majority of the Advisory Committee. However, you may not be granted the degree without the full support of your Major Advisor. The decision of the Advisory Committee is final.

XI. POLICY ON ACADEMIC HONESTY

All Creighton University graduate students are subject to the standards of academic integrity required by the University, and to the established penalties for academic misconduct in course work. In addition, students must also observe additional standards announced in writing by faculty members for particular courses.

Student academic misconduct includes, but is not limited to:

a. Cheating: The deliberate use or attempted use of unauthorized material in an academic exercise, including unauthorized collaboration with classmates.

b. Plagiarism: The deliberate representation of the words, ideas or work of others as one's own in an academic exercise; the appropriation of the language, ideas or thoughts of another and representation of them as one's own original work.
c. Falsification: Falsifying documents, correspondence, reports, or records of any kind, or knowingly providing false information or evidence to University or School personnel, or to others external to the University.
d. Fabrication: The deliberate generation or augmentation of data, information, citation or result in an academic exercise.
e. Improprieties of Authorship: Improper assignment of credit or misrepresentation of material as original without properly referencing the original authors.
f. Facilitating Academic Dishonesty: The deliberate assistance or attempted assistance of another student to commit an act of academic misconduct.
g. Theft or destruction of library materials or other academic resources.
h. Violation of codes of conduct described in the University's *Student Handbook*, program or department policies, and/or articulated by instructors either verbally or in writing. Further information regarding academic or academic-related misconduct, and disciplinary procedures and sanctions regarding such misconduct, may be obtained by consulting the current edition of the Creighton University Graduate Bulletin.

XII. ACCOMMODATIONS FOR QUALIFYING DISABILITIES

Creighton University will provide reasonable accommodations for persons with documented qualifying disabilities. However, it is the student's responsibility to request accommodations. Students requiring special accommodations need to get a letter documenting the specific disability from the Office of Disability Accommodations (402-280-2166). This letter should be presented to instructor at the beginning of the course, so the accommodation can be discussed with your instructor.

XIII. INDIVIDUAL DEVELOPMENT PLANS FOR GRADUATE STUDENTS

Individual Development Plans (IDPs) are recognized for fostering professional development. The purpose of an IDP is to assist with

- Identifying professional goals and objectives;
- Assessing one's skill set relative to their career goals;
- Developing a plan to acquire the skills and competencies needed to achieve short- and long-term career objectives.

We have adopted the approach recommended by the Federation of American Societies for Experimental Biology (FASEB) and the American Association for the Advancement of Science (AAAS) that utilizes a website tool designed to help graduate students and postdoctoral fellows to create an IDP. This free website tool is called myIDP (http://myidp.sciencecareers.org). It provides:

- Exercises to help you examine your skills, interests, and values.
- A list of 20 scientific career paths with a prediction of which best fit your skills and interests.
- A tool for setting strategic goals for the coming year, with optional reminders to keep you on track.

- Articles and resources to guide you through the process. It also contains links to career resources and tools to help you develop concrete plans, attend workshops, networking etc.

For more information about the tool, see the editorial published in Science written by Bruce Alberts, Editor-in-Chief of Science, and Jim Austin, Editor of ScienceCareers.org. http://www.sciencemag.org/content/337/6099/1149.full

Outline of the IDP Process

The development, implementation, and revision of IDPs require a series of steps to be conducted by graduate students or post-doctoral fellows and their mentors. These steps are an interactive effort, and so both the student and the mentor must fully participate in the process.

After completing the myIDP exercises and developing a plan, you should establish a mentoring team (as described in myIDP) to help you reach your career goals. This team will likely include your major advisor and advisory committee members, or for postdoctoral fellows, their sponsor and/or supervisor. Likewise, it could include individuals outside your department or school. And as a student, your mentoring team serves a different purpose than your degree program's advisory committee. As you use myIDP to create your own plan, you should share selected portions of the plan with your mentoring team to discuss your accomplishments and goals in light of the MMI program objectives and your career aspirations.

Soliciting Guidance†

As you use myIDP to create your own plan, you need to be prepared to share selected portions of the plan with your mentor/supervisor. The following are tips to facilitate the discussion:

- Make an appointment separate from other lab meetings. This should not be a ten-minute add-on to a discussion about your data. It needs to be a discussion focused on your career.
- An environment away from the lab will eliminate distractions.
- Start out on a positive note – "I've really enjoyed my last year in the lab. I feel I've made great progress on my research project and now I'm beginning to think ahead to the next step in my career".
- Do not attempt to share your entire IDP. Prepare a concise outline of what you want to discuss. myIDP facilitates this by allowing you to print out a selected portions of your IDP.
- Be prepared to negotiate! If your plan A is to teach science in a liberal arts college, you will need to get comprehensive teaching experience (developing syllabus, delivering lectures, engaging students in active learning, writing exams, giving grades, etc.). As this will inevitably take time away from the laboratory, you need to agree on how the research will get done.
- It is not reasonable to expect a single person to be an expert in everything you need to learn. You should expect to develop a "mentoring team" consisting of experts in different dimensions of science. As you identify skill areas that need work, you would be best served by seeking out different mentors for different skills.
- Extend your mentoring network beyond the bounds of your current department or institution.

For Mentors/Advisors

- Step 1. Become Familiar with Available Opportunities

  By virtue of experience you should have knowledge of some career opportunities, but you may want to familiarize yourself with other career opportunities and trends in job opportunities (refer to sources such as National Research Council reports and *Science* career reviews).

- Step 2. Discuss Opportunities with the Graduate Student or Postdoctoral Fellow

  This needs to be a private, scheduled meeting distinct from regular research-specific meetings.

- Step 3. Review IDP and Help Revise

  Provide honest feedback, both positive and negative, to help graduate students and postdoctoral fellows set realistic goals. Agree on a development plan that will allow them to be productive in the laboratory and adequately prepare them for their chosen career.

†From a pre-print article from *ScienceCareers.org* 2012 by P. Clifford, C. Fuhrmann, B. Lindstaedt, J. Hobin.

THE GRADUATE FACULTY
DEPARTMENT OF MEDICAL MICROBIOLOGY and IMMUNOLOGY

Richard Goering, Ph.D., Chairman
Patrick C. Swanson, Ph.D., Graduate Program Director

Primary Appointees:
Bartz, Jason C., Ph.D.,
Belshan, Michael, Ph.D.
Bourret, Travis, Ph.D.
Chaperon, Edward A., Ph.D.
Chen, Xian-Ming, M.D.
Drescher, Kristen M., Ph.D.
Goering, Richard, Ph.D.
Hanson, Nancy D., Ph.D.
Knoop, Floyd C., Ph.D.
Selmecki, Anna, Ph.D
Swanson, Patrick C., Ph.D.

Secondary Appointees:
(Primary Appointment shown in parenthesis):
Agrawal, Devendra K., Ph.D., (Department of Biomedical Sciences)
Bittner, Marvin J., M.D. (Department of Medicine)
Cavalieri, Stephen J., Ph.D., (Department of Pathology)
Giger, Donald K., Ph.D. (V.A. Medical Center, Pathology)
Govindarajan, Venkatesh, Ph.D. (Surgery Cancer Center)
Gorby, Gary L., M.D. (Department of Medicine)
Kincaid, Anthony, Ph.D., PT (Department of Physical Therapy)
Preheim, Laurel C., M.D. (Department of Medicine)
Shibata, Annemarie, Ph.D. (Department of Biology)
Varman, Meera, M.D. (Department of Pediatrics)

Contributed Services Faculty:
Davis, Catherine, Ph.D.
Fey, Paul, D., Ph.D. (UNMC)
Penn, Robert., M.D. (UNMC)
Rupp, Mark E., M.D. (UNMC)
Smith, Philip W., M.D. (UNMC)

THE FACULTY AND THEIR RESEARCH

Devendra K. Agrawal, Professor; Ph.D., (Biochemistry), Lucknow University, India, 1978; Ph.D., (Medical Sciences), McMaster University, Canada, 1984. Transcription/translation of cell adhesion molecules; mechanisms of restenosis/intimal hyperplasia; apoptosis of vascular smooth muscle cells; and allergy/asthma.

Jason C. Bartz, Professor, Ph.D., (Veterinary Science), University of Wisconsin, Madison, 1998. Prion diseases, pathogenesis of neurodegenerative disorders, neurovirology.

Michael Belshan, Associate Professor, Ph.D., (Molecular, Cellular, and Developmental Biology), Iowa State University, 1999. Virus-host cell interactions, virus replication and pathogenesis in human immunodeficiency virus (HIV) replication.

Marvin J. Bittner, Associate Professor, M.D. (Infectious Diseases), Harvard Medical School, 1976; Clinical infectious diseases; travel medicine; hospital epidemiology.

Travis J. Bourret, Assistant Professor, Ph.D. (Microbiology and Immunology), University of Colorado Health Sciences Center, 2008. Current research focuses on the interface between the causative agent of Lyme disease, *Borrelia burgdorferi,* and its arthropod vector *Ixodes scapularis*; particularly investigations of (i) the impact of tick-borne reactive oxygen species (ROS) and reactive nitrogen species (RNS) on gene expression, physiology and overall virulence of *B. burgdorferi*; and (ii) the role of the *B. burgdorferi* DnaK suppressor protein (DksA) in sensing and coordinating responses to the diverse environmental signals that *B. burgdorferi* encounters throughout its infectious cycle.

Stephen J. Cavalieri, Professor, Ph.D., (Medical Microbiology), West Virginia University, 1981. Clinical microbiology; antimicrobial susceptibility testing; mycobacteriology; rapid diagnostic testing for infectious diseases; clinical virology.

Xian-Ming Chen, Professor, M.D., (Medical Microbiology), Hubei Medical University Xianning Medical School, 1985. Current research focuses include: (I) characterizing the alterations of microRNA expression profile in epithelial cells following microbial infection; (II) clarifying the role for Toll-like receptors (TLRs) and TLR-associated intracellular signals in microbial-stimulated microRNA expression in epithelial cells; (III) identifying the specific target(s) of each microRNA of interests and determining its relevance to epithelial anti-microbial responses; and (IV) exploring the therapeutic potential of microRNA-mediated post-transcriptional gene silencing manipulation.

Kristen M. Drescher, Professor, Ph.D., (Molecular Microbiology and Immunology), Johns Hopkins, 1996. Pathogenesis of demyelinating diseases; Multiple sclerosis.

Paul Fey, Professor, Ph.D., (Medical Microbiology), Creighton University, 1995. Molecular epidemiology and characterization of Staphylococcus species.

Richard V. Goering, Professor, Ph.D., (Microbiology), Iowa State, 1972. Molecular techniques for the epidemiological analysis of nosocomial pathogens; genetics of antibiotic resistance.

Gary L. Gorby, Associate Professor, M.D., (Infectious Disease), Northeastern Ohio Universities College of Medicine, 1983. Pathogenesis of *Neisseria gonorrhoeae* infections.

Venkatesh Govindarajan, Associate Professor, Ph.D., (Developmental/Molecular Biology), University of Houston, 1997. Fibroblast growth factor (fgf) signaling during ocular and skeletal development.

Nancy D. Hanson, Professor, Ph.D., (Medical Microbiology), University of Nebraska Medical Center, 1991. Current Research focuses on 1) identification of selective pressures required for the emergence of resistance using analysis tools such as whole genome sequencing, plasmid analysis, regulation of gene expression and protein production and transport, and 2 development of rapid diagnostics for the identification of resistance of mechanisms associated with treatment failure in Gram-negative pathogens using Real Time PCR assays, HRM assays, RNA analysis evaluating expression of chromosomal resistance, and protein analysis.

Floyd C. Knoop, Professor, Ph.D., (Medical Microbiology/Biochemistry), University of Tennessee Medical Center, 1974. Mechanisms of NAD-dependent ADP-ribosylation and receptor-mediated transmembrane signalling by microbial toxins; basis of adenyl and guanyl cyclase/protein kinase activation.

Mark E. Rupp, Professor, M.D., (Infectious Disease), Baylor College of Medicine, 1984. Pathogenesis of prosthetic device Infections; adherence of coagulase-negative staphylococci; Infection control/Hospital epidemiology.

Anna Selmecki, Assistant Professor, PhD (Molecular, Cellular, Developmental Biology and Genetics), University of Minnesota, 2007. Mechanisms underlying adaptation of microorganisms and precancerous cells to their microenvironments, particularly how genome instability impacts the rate and dynamics of adaptation of these cells.

Patrick C. Swanson, Professor, Ph.D., (Chemistry), University of Michigan, 1995. V(D)J recombination and other processes underlying antigen receptor diversity, and diseases associated with defects in these processes.

For More Information, See the Department Web Site at www.mmi.creighton.edu/index.html
And FaceBook page at: https://www.facebook.com/CreightonMMI

GRADUATE STUDENT INITIAL PLAN OF STUDY
DEPARTMENT OF MEDICAL MICROBIOLOGY & IMMUNOLOGY

Student name (degrees) _____
Degree program:_____
Year admitted:_____

Major Advisor:_____
Date of selection_____

Names of Advisory Committee Members:

_____

_____

_____

_____

Date of selection:_____

Plan of Study:
Date approved by Advisory Committee:_____
Date submitted to Dean of the Graduate School:_____

Proposed course work: Course Number	**Semester**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Signatures with date of meeting:

Student:_____ Date: _____

Advisor:_____ Date:_____

GRADUATE STUDENT BI-ANNUAL PROGRESS REPORT
DEPARTMENT OF MEDICAL MICROBIOLOGY & IMMUNOLOGY

Report for Spring Semester _____

Student Name (degrees): _____

Degree Program: ____ Year Admitted: _____

Major Advisor: _____

Names of Advisory Committee Members:

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

Plan of Study:
Date approved by Advisory Committee: _____
Date submitted to Dean of the Graduate School: _____

Titles of courses taken during Reporting semester:	**Course Number**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Signatures with date of meeting:

Student: _____ Advisor: _____

Date: _____ Date: _____

Comments: (Attach a separate sheet if necessary)

Submit copies to Graduate Dean, Department of Medical Microbiology and Immunology Graduate Program Director

Creighton UNIVERSITY Medical Center

Department of Medical Microbiology and Immunology
STUDENT COMMITTEE EVALUATION FORM

PLEASE PRINT

Spring/Fall, 20__

STUDENT: _____ DATE OF REPORT: _____

Please rate the above student according to the following scale:
(Mark an "X" in the appropriate box)

1 = Unsatisfactory **2** = Needs Improvement **3** = Competent/Solid **4** = Excellent **5** = Superior/Exceptional

(A mark of **1**, **2**, or **5** REQUIRES COMMENTS)
(Leave blank if not applicable)

Knowledge/Interpretation	**1**	**2**	**3**	**4**	**5**	**Critical Thinking & Problem Solving Skills**	**1**	**2**	**3**	**4**	**5**	**Affective Skills**	**1**	**2**	**3**	**4**	**5**
General Knowledge						Quality of Presentation						Oral Speaking Skills					
Knowledge of Basic Science						Accuracy of Data Collections						Interpersonal Skills with Faculty and Staff					
Interpretation of Data and Development of Experiments						Quality of Written Records and Reports						Enthusiasm, Amount of Effort, Participation & Responsibility					
Preparation for Meeting – Handouts, Figures, etc.						Critical Reasoning and Judgment						Takes Initiative					
Responses to Questions						Research Progress						Reliability and Dependability					
						Ability to Identify Problem(s)						Progress in Coursework					

Overall progress in research project:

☐ **PASS:** Adequate level of knowledge. Able to correctly demonstrate and apply knowledge in relevant situations.

☐ **FAIL:** Inadequate knowledge in the discipline. Unable to relate learning to research situations. Distant and/or showed little interest.

COMMENTS: STRENGTHS/WEAKNESSES (A mark of **1**, **2**, or **5** REQUIRES COMMENTS)

☐ Continue on Back

EVALUATOR: _____ Signature of EVALUATOR: _____

Annual Graduate Student Activity Profile (SAP)

Instructions: For your spring thesis/dissertation committee meeting, please fill out this form electronically and send the completed form to Joy Hart-Nielsen in the Department Office and Dr. Patrick Swanson, Graduate Program Director. Print copies for each of your committee members.

Name_____ Major Advisor _____

Date of Report_____

Annual Progress Report

List the manuscripts published during the previous year (January-December) where you were an author or coauthor. Include the full author list, title, journal/book chapter, and reference (volume/pages or hyperlink). Use the following as a template. If none, indicate none.

Palmer VL, Nganga VK, Rothermund ME, Perry GA, Swanson PC. Cd1d regulates B cell development but not B cell accumulation and IL10 production in mice with pathologic CD5(+) B cell expansion. BMC Immunol. 2015 Nov 4;16(1):66

List any presentations you gave outside the Department of Medical Microbiology and Immunology during the past year (January-December). Identify the authors, the type of presentation (oral or poster), the name of the conference and location or institution and department in which you gave the presentation, and the date. Use the following as a template. If none, indicate none.

Schabla NM, Fletcher JT, Perry GA, and Swanson PC. Poster Presentation. VprBP's serine/threonine kinase activity supports V(D)J recombination by promoting expression of RAG1/2. European Congress of Immunology. Vienna, Austria. 6th September, 2015.

List any recognition awards or funding awards you received during the past year. If none, indicate none.

List any research conferences you attended where you did not give a presentation. If none, indicate none.

CREIGHTON UNIVERSITY
GRADUATE SCHOOL
MEDICAL MICROBIOLOGY & IMMUNOLOGY

ASSESSMENT REPORT FOR NIH GRANTS AND THEIR ORAL DEFENSE

Name of Candidate: _____ _____
(Last) (First) (Middle) (Degree)

Date: ____ / ____ / _____

To the Dean of the Graduate School and the members of the Board of Graduate Studies:

The Department of Medical Microbiology & Immunology, in which this candidate for this degree has done his (her) major (core) work, reports on the following:

The Committee in charge of assessing the
☐ **NIH grant and its oral defense by this candidate reports as follows:**

Committee Member	Rating based on Expectations				
	Exceeds		Meets	Does not meet	
	Outstanding	Excellent	Satisfactory	Fair	Poor

Committee Chair –

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The Committee, therefore, recommends that the candidate (be, be not) _____ allowed to advance to candidacy

_____ _____
Richard Goering, Ph.D. **Patrick C. Swanson, Ph.D.**
Department Chair **Graduate Program Director**

Committee Chair:

If the overall assessment of the NIH grant proposal and defense did not meet expectations, please describe the specific recommendations and timeline for resubmitting a revised NIH grant proposal and defending the revised proposal as agreed upon by the committee.

NIH Grant Proposal and Defense Assessment

Student Name_____ **Evaluator Name**_____ **Date**_____

Written Proposal	Section	Expectation	Rating based on Expectations					Criteria for poor performance
			Exceeds		Meets	Does not meet		
			Outstanding	Excellent	Satisfactory	Fair	Poor	
	Overall	Proposal represents the unique effort of the student and is well-written following appropriate convention and grammar for academic written English						Contained sections teetering on plagiarism or would be considered plagiarism. Contained numerous typographical errors, or showed consistently poor sentence structure or transitions which made reading difficult.
	Specific Aims	Provided succinct introduction and justification and significance of proposed research						Fails to clearly articulate scope of problem and merit of the proposed project.
		Presented testable hypothesis based on research justification						Did not state or provide sufficient background for a hypothesis to be deduced. Hypothesis is absent, not testable, or not well-articulated.
		Listed specific aims that addressed hypothesis and provide succinct rationale and objectives for each aim						Lacked appropriate or relevant specific aims that test the underlying hypothesis
	Research Strategy	Clearly explained the background and significance of the problem or critical barrier to progress in the field that the proposed project addresses.						Background is poorly developed, organized, or documented by primary literature. Misread or misused the literature and displayed a narrow understanding of the field. Significance is poorly developed or well-reasoned based on the background. Even if successful, project lacks significance.
		Clearly described the innovative features of the proposed project.						Discussion of innovation is absent, poorly developed, or lacks insight. Project itself lacks innovation, even if successful.
		Preliminary data, if provided, is well-presented, described and discussed.						Preliminary data is poorly presented, misinterpreted, or fails to support the specific aims of the project.
		Clearly described						Showed a poor understanding of

		appropriate and feasible experimental approaches and analyses to accomplish the project's specific aims Expected results are clearly articulated.						laboratory methods as evident from the proposed experimental design. Used inappropriate or incorrect methods. Failed to articulate methods for data collection and analysis (including statistical considerations). Discussion of expected results is absent or poorly developed.
		Recognized pitfalls and shortcomings/ limitation of the proposed experimental design and methods, and provided alternative hypotheses and approaches should the results not turn out as expected.						Potential pitfalls and shortcomings/limitation of the proposed experiments and methods are absent, poorly developed, or narrow in scope (e.g. focused solely on experimental artifacts rather than interpretation of results). Did not provide alternative hypotheses and approaches to address potential pitfalls and shortcomings.
	Other Research Plan Sections (e.g. Human Subjects or Vertebrate Animals)	Sections are organized according to instructions and succinctly address discussion points.						Appropriate sections are absent, poorly organized, diffuse, or fail to address discussion points.
	References	References are fully cited and properly organized						References are absent, lack full citations, are inappropriate, or are poorly organized
Comments Regarding Written Portion:								

Oral Defense	Section	Expectation	Rating based on Expectations					Criteria for poor performance
			Exceeds		Meets	Does not meet		
			Outstanding	Excellent	Satisfactory	Fair	Poor	
	Overall	The presentation is succinct, well-organized, and figures are appropriate and well-described.						Presentation is excessively long or poorly organized. Figures are lacking, inappropriate, or poorly described.
		Student responds well questioning. Answers are thoughtful and direct.						Student fails to respond to questions or shows inadequate preparation to answer questions thoughtfully and directly.
	Specific Aims and Research Plan	Provided succinct introduction and described the justification and significance of proposed research						Fails to clearly articulate scope of problem and merit of the proposed project.
		Presented testable hypothesis based on research justification						Did not state or provide sufficient background for a hypothesis to be deduced. Hypothesis is absent, not testable, or not well-articulated.
		Specific aims are explicitly stated and well-discussed						Did not state specific aims or discussion of specific aims was poorly developed or articulated
		Clearly explained the background and significance of the problem or critical barrier to progress in the field that the proposed project addresses.						Background is poorly developed, organized, or articulated. Published results, if included, lack references, are poorly presented, or misstated or misinterpreted. Significance is poorly developed or well-reasoned based on the background.
		Clearly described the innovative features of the proposed project.						Discussion of innovation is absent, poorly developed, or lacks insight.
		Clearly described appropriate and feasible strategies, methodologies, and analyses to accomplish the project's specific aims.						Showed a poor understanding of laboratory methods proposed for use in the project.
		Clearly identified how the data will be collected, analyzed, and interpreted.						Failed to articulate methods for data collection and analysis (including statistical considerations). Discussion of expected results is absent or poorly developed.
		Recognized pitfalls and						Discussion of potential pitfalls and

		shortcomings/ limitation of the proposed experimental design and methods, and provided alternative hypotheses and approaches should the results not turn out as expected.						shortcomings/limitation of the proposed experiments and methods was absent, poorly developed, or poorly described. Discussion of alternative hypotheses and approaches to address potential pitfalls and shortcomings was absent or poorly described.
	Other Research Plan Sections (e.g. Human Subjects or Vertebrate Animals)	Sections are organized according to instructions and succinctly address discussion points.						Relevant sections, if included in the grant proposal, are not discussed, or are poorly developed or articulated.
Comments Regarding Oral Portion:								

After considering the criteria above, please indicate your overall assessment of the NIH grant proposal and defense.

☐ Overall, the written NIH grant and oral defense does not meet expectations. *Specific recommendations and timeline to achieve at least a satisfactory rating should be provided in the space below.* If the student fails to achieve a satisfactory rating after attempting to meet the recommendations, or cannot resubmit a revision according to the timeline, then the student should not be recommended to continue in the program.

☐ Overall, the written NIH grant and oral defense meets or exceeds expectations.

Overall rating (circle one): Satisfactory Excellent Outstanding

Evaluator Name_____ **Signature**_____

If the overall assessment of the NIH grant proposal and defense did not meet expectations, please provide specific recommendations and timeline for resubmitting a revised NIH grant proposal and defending the revised proposal.

CREIGHTON UNIVERSITY
GRADUATE SCHOOL
MEDICAL MICROBIOLOGY & IMMUNOLOGY

DISSERTATION DEFENSE REPORT
FOR DOCTOR OF PHILOSOPHY DEGREE

Name of Candidate: _____ _____
(Last) (First) (Middle) (Degree)

Date: _____/_____/_____

To the Dean of the Graduate School and the members of the Board of Graduate Studies:

The Department of Medical Microbiology & Immunology, in which this candidate for this degree has done his (her) major (core) work, reports upon the dissertation defense as follows:

Passed _____ **Failed** _____
_____ _____
_____ _____
_____ _____

_____ _____

Committee Chair -

It is recommended that the degree (be, be not) _____ conferred on the above named candidate.

Date_____

_____ _____
Richard Goering, Ph.D. **Patrick C. Swanson, Ph.D.**
Department Chair **Graduate Program Director**

To the President and the Board of Directors:

The Board of Graduate Studies recommends that the degree of _____
Be conferred on the above named candidate.

Date _____ _____
(Dean of the Graduate School and
Chairman of the Board of Graduate Studies)

Syllabus and Assessment Criteria for MIC 899 Doctoral Dissertation and Defense

Student Name _____ **Major Advisor** _____ **Evaluator** _____ **Final Grade** _____

Course Description and Objectives

This course consists of original investigation under supervision and guidance of the major advisor and advisory committee. Upon successful completion of this course, students will:

- Demonstrate a depth of knowledge in all areas fundamental to the general research area.
- Be able to resolve scientific problems independently, critically assess the scientific literature, and formulate clear research questions.
- Be able to test and examine the research question experimentally, process the results using adequate empirical methods, and draw proper conclusions from the study.
- Be able to communicate their work with precision, accuracy, clarity, and completeness both orally and in writing.
- Be able to demonstrate critical and independent thought.

Academic Honesty: Students are required to follow the Creighton University policy on proper academic conduct, as detailed in the current Creighton University Graduate Student Bulletin.

Grading Criteria: Using these guidelines, indicate your assessment for this student's thesis and presentation. Not all criteria may apply and not all have to be met within a category to assign a grade. Criteria listed are modified from "How to Grade a Dissertation: The Characteristics of Dissertations, 2005" by the American Association of University Professors.

Outstanding (A)	Very Good (B)	Conditional (C)	Unacceptable (F)
Written Thesis			
Introduction			
☐ Asked a new question or addressed an important problem leading to new avenues of research.	☐ The question or problem addressed was logical and traditional.	☐ Question or problem was highly derived from the advisor's work.	☐ Looked at a question or problem that was trivial, weak, unoriginal, or already solved.
☐ Exhibited mature, independent thinking.	☐ Had some original ideas, insights, and observations.	☐ Displayed a narrow understanding of the field.	☐ Did not show an understanding of basic concepts or conventions of the discipline.
☐ Displayed a deep understanding of complicated literature.	☐ Showed understanding and mastery of the subject matter.	☐ Demonstrated understanding at a simple level.	☐ Missed relevant literature; sources were misread or misused.
☐ Argument was focused, logical, thoroughly researched, and sustained.	☐ Made a strong, comprehensive, and coherent argument.	☐ Could sustain an argument, but the argument was not imaginative or convincing.	☐ Had a weak, inconsistent, unconvincing, or invalid argument.
☐ Using well-developed rational, an intriguing hypothesis with clever specific aims was proposed.	☐ A hypothesis was clearly stated accompanied by appropriate specific aims.	☐ A hypothesis could be inferred but was not stated; some of the aims did not test the hypothesis.	☐ Did not state or provide sufficient background for a hypothesis to be deduced.
Methods and Techniques			
☐ Had a research design with the potential to change the experimental approaches others use to resolve their questions.	☐ Included well-executed research using a solid approach.	☐ Showed the ability to do research and demonstrated technical competence.	☐ Poor execution of laboratory methods was evident from the document and results.
☐ Used or developed new tools, methods, or types of analyses.	☐ Used appropriate theory, methods, and techniques.	☐ Missing some appropriate controls.	☐ Used inappropriate or incorrect methods..
Results			
☐ Results were highly important, interesting, and relevant to the hypothesis.	☐ Obtained solid, expected results that addressed the hypothesis.	☐ Results were not noteworthy or relevant to the hypothesis.	☐ Had data that was flawed, false, or misinterpreted. Included results already known.
☐ Analysis was comprehensive, complete, sophisticated, and convincing.	☐ Analysis was adequate and valid.	☐ Had an unsophisticated analysis—did not explore all possibilities and missed connections.	☐ Had wrong, inappropriate, incoherent, or confused analysis.
☐ Pushed the discipline's boundaries and opens new areas for research.	☐ Made a modest contribution to the field but did not open it up.	☐ Made a small contribution that was narrow in scope.	☐ Did not make a contribution.

☐ Effort and productivity exceeded expectations resulting in peer reviewed publications and presentations.	☐ Effort and productivity met expectations resulting in published abstracts and presentations.	☐ Effort and productivity was only adequate. Independent of technical hurdles, research progress was protracted.	☐ Effort and productivity was poor and completion of the thesis required contributions by others.

Discussion and Conclusions

☐ Exhibited command and authority over the material. Had a point of view presented with a confident, independent, and authoritative voice.	☐ Applied known literature to the problem studied.	☐ Presented the literature but was not critical of it.	☐ Showed a poor understanding of the literature; showed a lack of basic knowledge or careful thought; did not explain or interpret results.
☐ Conclusion tied the whole thesis together and was extremely well written.	☐ Identified what observations were important and was well organized.	☐ Had a weak structure and organization and did not discuss what was important.	☐ Had unsupported or exaggerated interpretation. Contained errors or mistakes.
☐ Showed a deep understanding of theory.	☐ Explored interesting connections but missed some opportunities.	☐ Displayed little creativity, imagination, or insight.	☐ Did not handle theory well, or the theory was missing or wrong.

Writing, Figures, Tables, Legends, and Citations

☐ Document was very well organized and the quality of writing outstanding. Figures, graphs, tables, and illustration effectively communicated the results and effectively conveyed complicated ideas to the reader.	☐ Writing, figures, graphs and tables appropriately conveyed information and results.	☐ Format and writing needed significant revision. Figures, graphs and tables were rarely used when they could have effectively communicated results and ideas.	☐ Figures, graphs, and tables were inappropriate, misrepresented the results, and/or contained errors. It was poorly written and had numerous spelling and grammatical errors.
☐ Citations covered the topic very well, were unbiased, and included a historical and up-to-date documentation of pertinent literature.	☐ Appropriate citations were used to document the thesis.	☐ Citations tended to be superficial in their coverage of the topic.	☐ Inappropriate and unrelated citations were used or were inappropriately applied.

Oral Presentation and Defense

☐ Effectively illustrated key points and captivated the audience.	☐ Conveyed the major findings of the work and was suitable for the audience.	☐ Was adequate in conveying what was done.	☐ Was sloppy, confusing, and did not communicate what was done or why.
☐ Structure and flow was fluid, easily followed, and effectively conveyed the work and it's significance.	☐ Presented in a logical manner and provided a "take-home message" for the audience.	☐ "Jumped around some" but still communicated what was needed.	☐ Extremely hard to followed, lacked organization, and appeared to have been hurriedly assembled.
☐ Media used was extremely effective and creative.	☐ Quality of the media conveyed what was done and why.	☐ The media used was just adequate.	☐ Media used was inappropriate and failed to communicate the work.
☐ Questions were answered directly, succinctly, and in an authoritative voice and manner that could change the way people think.	☐ Most questions were answered satisfactorily and handled appropriately.	☐ Questions were answered if provided guidance by the audience or advisory committee.	☐ Questions were not answered even when prodded by the audience or advisory committee.

Comments: