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<table>
<thead>
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<tr>
<td>Application for Diploma Opens for August Graduates</td>
<td>Monday, February 9</td>
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<td>Application for Diploma Opens for December Graduates</td>
<td>Monday, April 2</td>
</tr>
<tr>
<td>Registration for Summer 2012 Basic Sciences begins for continuing students</td>
<td>Monday, May 14</td>
</tr>
<tr>
<td>Summer Semester begins</td>
<td>Monday, June 4</td>
</tr>
<tr>
<td>Last day to drop/add</td>
<td>Friday, June 8</td>
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<tr>
<td>Application for Diploma Deadline for August graduates</td>
<td>Monday, June 18</td>
</tr>
<tr>
<td>Independence Day Holiday (July 4th falls on Sunday)</td>
<td>Wednesday, July 4</td>
</tr>
<tr>
<td>Last day to take final exams/thesis defense for August MS &amp; PhD graduates</td>
<td>Friday, July 27</td>
</tr>
<tr>
<td>Last day to submit thesis</td>
<td>Friday, August 3</td>
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<tr>
<td>Final Examination Week</td>
<td>August 13-17</td>
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<tr>
<td>Summer Semester ends</td>
<td>Friday, August 17</td>
</tr>
<tr>
<td>Final grades due (noon)</td>
<td>Wednesday, August 22</td>
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<tr>
<td>August degree award date</td>
<td>Friday, August 17</td>
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<tr>
<th>FALL SEMESTER 2012</th>
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<tbody>
<tr>
<td>Application for Diploma Opens for December Graduates</td>
<td>Monday, April 2</td>
</tr>
<tr>
<td>Registration for Fall 2012 begins for Basic Sciences continuing students</td>
<td>Monday, August 6</td>
</tr>
<tr>
<td>Fall Semester begins</td>
<td>Monday, August 27</td>
</tr>
<tr>
<td>Rotation 1</td>
<td>August 27 - November 16</td>
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<tr>
<td>Labor Day Holiday</td>
<td>Monday, September 3</td>
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<tr>
<td>Last day to drop/add</td>
<td>Friday, September 7</td>
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<tr>
<td>Application for Diploma Deadline for December Graduates</td>
<td>Monday, September 17</td>
</tr>
<tr>
<td>Last day to submit Application for Graduation for December 2012 MS grads</td>
<td>Monday, November 12</td>
</tr>
<tr>
<td>Application for Diploma Opens for May Graduates</td>
<td>Wednesday, November 14</td>
</tr>
<tr>
<td>Last day to take final exams/thesis for December MS &amp; PhD graduates</td>
<td>November 19-February 22</td>
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<tr>
<td>Rotation 2: (Holiday Break: November 22-23 &amp; December 17-January 2)</td>
<td>Wednesday, November 21</td>
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<tr>
<td>Last day to submit thesis</td>
<td>November 22-23</td>
</tr>
<tr>
<td>Thanksgiving Break</td>
<td>December 10-14</td>
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<tr>
<td>Final Exam Week</td>
<td>Friday, December 14</td>
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<td>Fall Semester ends</td>
<td>Friday, December 14</td>
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<tr>
<td>Degree award date</td>
<td>Wednesday, December 19</td>
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<td>Final grades due (noon)</td>
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<th>SPRING SEMESTER 2013</th>
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<tr>
<td>Application for Diploma Opens for May Graduates</td>
<td>Monday, November 12</td>
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<tr>
<td>Registration begins for Spring 2013</td>
<td>Monday, December 3</td>
</tr>
<tr>
<td>Spring Semester begins</td>
<td>Tuesday, January 22</td>
</tr>
<tr>
<td>Last day to drop/add</td>
<td>Friday, February 1</td>
</tr>
<tr>
<td>Application for Diploma Deadline for May graduates</td>
<td>Monday, February 11</td>
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<tr>
<td>Presidents’ Day (classes not in session)</td>
<td>Monday, February 18</td>
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<td>Rotation 3: (Spring Break: March 11-15)</td>
<td>February 25 – May 17</td>
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<tr>
<td>Last day to submit Application for Graduation for May 2013 MS grads</td>
<td>Friday, March 1</td>
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<tr>
<td>Spring Break (Basic Science PhDs and GENC)</td>
<td>March 11-15</td>
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<tr>
<td>Spring Break (BIOS, CLSC, EPID, HSVR, and NURS students only)</td>
<td>March 18-22</td>
</tr>
<tr>
<td>Last day for PhD thesis defense in order to participate in spring commencement</td>
<td>Monday, April 1</td>
</tr>
<tr>
<td>Last day to take final exams/thesis defense for May MS &amp; PhD grads</td>
<td>Friday, April 26</td>
</tr>
<tr>
<td>Last day to submit thesis</td>
<td>Friday, May 3</td>
</tr>
<tr>
<td>Final Exam Week</td>
<td>May 13-17</td>
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<tr>
<td>Spring Semester ends</td>
<td>Friday, May 17</td>
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<tr>
<td>Final grades due (noon)</td>
<td>Wednesday, May 22</td>
</tr>
<tr>
<td>Graduate School Convocation</td>
<td>Friday, May 24</td>
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<tr>
<td>Annual Commencement</td>
<td>Friday, May 24</td>
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</table>
MICROBIOLOGY PROGRAM REQUIREMENTS AND DATES

FIRST YEAR
Microbiology Program orientation August 23-24
Microbiology Graduate Student Retreat Oct. 11-14
4 First Year Advisory Committee meetings: during orientation, and toward the end of each rotation
IDJC Presentation, in December
Attend VJC or BJC/BRIP
Attend Friday Microbiology Seminar Series and present after each rotation

Fall Semester
Biomedical Sciences Core Course I, IDPT 7811 August 27-Sept. 14
Biomedical Sciences Core Course II, IDPT 7812 Sept. 17-Oct. 12
Biomedical Sciences Core Course III, IDPT 7813 Oct. 15-Nov. 6
Biomedical Sciences Core Course IV, IDPT 7814 Nov. 7-Nov. 20
Fundamentals of Microbiology and Infectious Diseases, MICB 7706 Nov. 28-Dec. 12

Spring Semester
Molecular Mechanisms of Bacterial Disease, MICB 7702 ~January 24-March 23
Molecular Virology and Pathogenesis, MICB 7701 ~March 24-May 20
Host Response to Infectious Disease, MICB 7704 ~March 24-May 20

Summer Semester
Dates for writing Preliminary Exam ~May 23-June 6
Written portion of Preliminary Exam due date ~June 6
Last day to complete oral portion of Preliminary Exam ~June 25

SECOND YEAR
Microbiology Graduate Student Retreat Oct. 11-14
Doctoral Thesis, MICB 8990 All Semesters
* 5 credit hours for Fall and Spring, 1 credit for Summer (5 credit hours if defending in summer semester)
Ethics Course, PHCL 7605 Fall Semester
IDJC Presentation
BJC/BRIP or VJC Attend and Present
Attend Friday Noon Microbiology Seminar Series and Present
2 Thesis Committee meetings
Comprehensive Exam written proposal due two weeks before oral exam and no later than May 1

THIRD YEAR UNTIL DISSERTATION YEAR
Microbiology Graduate Student Retreat Oct. 11-14
Doctoral Thesis, MICB 8990 All Semesters
* 5 credit hours for Fall and Spring, 1 credit for Summer (5 credit hours if defending in summer semester)
IDJC Presentation
BJC/BRIP or VJC Attend and Present
Attend Friday Noon Microbiology Seminar Series and Present
2 Thesis Committee meetings
DISSEPTION YEAR

Microbiology Graduate Student Retreat  Oct. 11-14
Doctoral Thesis, MICB 8990  All Semesters

* 5 credit hours for Fall and Spring, 1 credit for Summer (5 credit hours if defending in summer semester)
IDJC Presentation
BJC/BRIP or VJC Attend and Present
Attend Friday Noon Microbiology Seminar Series

Obtain approval from Thesis Committee to write dissertation ~6 months before anticipated defense date
Thesis due to Thesis Committee members at least 2 weeks before oral defense
## UCD-AMC GRADUATE SCHOOL

### Dean’s Office
Barry D. Shur, Ph.D., Dean ................................................................. 303-724-2911  
Academic Office One, Room 2615A  
Milinda Walker, Administrative Assistant ........................................... 303-724-2911

### Graduate Student Affairs Office
Fran Osterberg, M.S., Assistant Dean, Student Admissions and Support ........ 303-724-2915  
Academic Office One, Room 2609A  
Teresa Bauer-Sogi, Administrative Assistant/Main Phone Line for Information .......... 303-724-2915

### OTHER IMPORTANT NUMBERS

<table>
<thead>
<tr>
<th>Service</th>
<th>Phone</th>
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<tbody>
<tr>
<td>AMC Registrar's Office</td>
<td>303-724-8056</td>
</tr>
<tr>
<td>(Diana Warren)</td>
<td></td>
</tr>
<tr>
<td>Bookstore</td>
<td>303-724-2665</td>
</tr>
<tr>
<td>Bursar’s Office</td>
<td>303-724-8032</td>
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<tr>
<td>Classroom Scheduling</td>
<td>303-724-8114</td>
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<tr>
<td>Audio-Visual Assistance</td>
<td>303-724-8129</td>
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<tr>
<td>Diversity Office</td>
<td>303-724-8003</td>
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<tr>
<td>E-mail Coordinator</td>
<td>303-724-HELP</td>
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<tr>
<td>IT Services</td>
<td>(4357)</td>
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<td>Police Escort to Car</td>
<td>303-724-4444</td>
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<tr>
<td>Financial Aid</td>
<td>303-556-2886</td>
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<tr>
<td>Health Services/Insurance</td>
<td>303-724-7674</td>
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<tr>
<td>(LaVerne Loechel)</td>
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<td>ID Cards</td>
<td>303-724-0399</td>
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<tr>
<td>Health Sciences Library</td>
<td>303-724-2152</td>
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<tr>
<td>Ombuds Office</td>
<td>303-724-2950</td>
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<tr>
<td>Parking Office</td>
<td>303-724-0049</td>
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<tr>
<td>Student Assistance Office</td>
<td>303-724-7684</td>
</tr>
<tr>
<td>Student Psychiatric Health</td>
<td>303-724-4953</td>
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<tr>
<td>Services/Counseling</td>
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<tr>
<td>Emergency Dept.</td>
<td>303-848-9111</td>
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<tr>
<td>Information Systems</td>
<td>303-724-4357</td>
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<td>Env. Health &amp; Safety</td>
<td>303-724-0345</td>
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### EMERGENCY NUMBERS

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<td>Emergency</td>
<td>911</td>
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<tr>
<td>Non-emergency</td>
<td>303-724-4444</td>
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</table>
DEPARTMENT OF MICROBIOLOGY PERSONNEL

FACULTY THEIR AFFILIATIONS AND RESEARCH

David J. Barton, Associate Professor
MICB, MOLB, MSTP, BSP
Ph.D., 1989, University of Toledo, Toledo Ohio
Picornavirus RNA translation and replication; hepatitis C virus and innate antiviral immunity.
303-724-4215, david.barton@ucdenver.edu

Ronald E. Gill, Associate Professor
MICB
Ph.D., University of Washington, Seattle
Regulation of gene expression by intercellular interactions during the development of Myxococcus xanthus.
303-724-4230, ron.gill@ucdenver.edu

Kathryn V. Holmes, Professor Emerita
MICB, MOLB, MSTP, BSP
Ph.D., 1968, Rockefeller University, New York
Molecular biology and pathogenesis of coronavirus infections, including SARS; virus-receptor interactions; design and testing of novel synthetic peptide viral vaccines.
303-724-4231, kathryn.holmes@ucdenver.edu

Randall K. Holmes, Professor and Chair
MICB, MOLB, MSTP, BSP
M.D. 1968, New York University
Ph.D. 1968, New York University
Structure-function relationships of bacterial toxins.
303-724-4224, randall.holmes@ucdenver.edu

Caroline A. Kulesza, Assistant Professor
MICB
Ph.D., 2001, University of Virginia, Charlottesville, VA
Molecular mechanisms of viral persistence and pathogenesis associated with cytomegalovirus infection; functional analysis of viral non-coding RNAs.
303-724-4206, caroline.kulesza@ucdenver.edu

Thomas E. Morrison, Assistant Professor
MICB
Ph.D., 2004, University of North Carolina-Chapel Hill
Molecular pathogenesis of arbovirus infection and regulation of virus-induced inflammatory responses.
303-724-4283, thomas.morrison@ucdenver.edu

Dohun Pyeon, Assistant Professor
MICB, MOLB, BSP
Ph.D., 1999, University of Wisconsin-Madison
Virus-host interactions in human papillomavirus infection and oncogenesis.
Jerome B. Schaack, Associate Professor  
MICB, MOLB, MSTP, BSP  
Ph.D., 1983, Yale University  
303-724-4220, jerry.schaack@ucdenver.edu

*Gene therapy vectors; adenovirus preterminal protein function in the regulation of the infectious cycle.*

Michael J. Schurr, Associate Professor  
MICB  
Ph.D., 1992, University of North Texas, Denton, Texas  
*Transcriptional regulation and molecular biology of bacterial virulence factors.*  
303-724-4221, michael.schurr@ucdenver.edu

Linda van Dyk, Associate Professor  
MICB, IMMUN, MOLB, MSTP, BSP  
Ph.D., 1994, University of Texas Southwestern, Dallas, Texas  
*Genetic and molecular approaches to pathogenesis and latent infection by lymphotropic herpesviruses.*  
303-724-4207, linda.vandyk@ucdenver.edu

Michael L. Vasil, Professor  
MICB, MOLB, MSTP, BSP  
Ph.D., 1975, University of Texas Southwestern Medical School  
*Mechanisms of bacterial pathogenesis with emphasis on genetic regulation and biochemistry of virulence factors.*  
303-724-4228, mike.vasil@ucdenver.edu

Andrés Vázquez-Torres, Associate Professor  
MICB, MSTP, BSP  
DVM., 1988, University of Cordoba, Spain  
Ph.D., 1996, University of Wisconsin, Madison  
*Molecular and redox determinants in the pathogenesis of intracellular bacteria.*  
303-724-4218, andres.vazquez-torres@ucdenver.edu

Martin I. Voskuil, Associate Professor  
MICB, MOLB, MSTP, BSP  
Ph.D., 1998, University of Wisconsin, Madison  
*Mycobacterium tuberculosis and Burkholderia pseudomallei mechanisms of latency and drug tolerance.*  
303-724-4219, martin.voskuil@ucdenver.edu
ADJUNCT FACULTY THEIR AFFILIATIONS AND RESEARCH

Thomas B. Campbell, Professor
Division of Infectious Diseases, MICB
M.D., 1985, Southwestern Medical School, Dallas, Texas
*Human herpesvirus 8 and Kaposi’s sarcoma; HIV-1 replication fitness; clinical trials of antiretroviral therapy.*
303-724-4929, thomas.campbell@ucdenver.edu

Richard E. Davis, Associate Professor
Biochemistry and Molecular Genetics, MICB
Ph.D., 1982, The University of Massachusetts, Amherst
*Novel forms of RNA, cap-interacting proteins and RNA trans-splicing, and chromatin diminution*
303-724-3226, richard.davis@ucdenver.edu

Sonia C. Flores, Professor
Division of Pulmonary Sciences & Critical Care Medicine, MICB
Ph.D., 1988, University of South Alabama, Mobile
*Mechanisms of HIV-1 Tat and Nef-dependent vascular endothelial cell phenotypic changes.*
303-724-6084, sonia.flores@ucdenver.edu

Dirk Homann, Associate Professor
ANES, IMMUN, MICB, MSTP, BSP
M.D., Free University Berlin, Germany
Specific T-cell responses under conditions of pathogen control, persistent viral disease, and autoimmunity.
303-724-6843, dirk.homann@ucdenver.edu

Edward N. Janoff, Tim Gill Professor of Medicine and Microbiology
Division of Infectious Diseases, MICB
M.D., 1981, University of Arizona
*Mucosal immunity; HIV transmission and vaccine; pneumococcal infections and vaccine; B cell regulation.*
303-724-4936, edward.janoff@ucdenver.edu

Jeffrey S. Kieft, Associate Professor
Howard Hughes Medical Institute and Biochemistry & Molecular Genetics, MICB, MOLB, STBB, Pharm
Ph.D., 1997, University of California, Berkeley
Discovery, structure, and function of RNA, RNA-protein, and RNA-ribosome complexes important for infection by viruses.
303-724-3257, jeffrey.kieft@ucdenver.edu

Laurel L. Lenz, Associate Professor
Integrated Dept. of Immunology, National Jewish Health and U of CO, MICB, BSP, Reproductive Sciences
Ph.D., 1998, University of Washington, Seattle
*Molecular mechanisms of Listeria pathogenesis; bacterial subversion of innate immunity.*
303-398-1767, lenzl@njhealth.org
Mario L. Santiago, Assistant Professor  
Division of Infectious Diseases, MICB, IMMUN, MSTP, BSP  
Ph.D., 2003, University of Alabama at Birmingham  
*Innate host restriction and adaptive immunity against pathogenic retroviruses (Friend retrovirus, SIV and HIV).*  
303-724-4946, mario.santiago@ucdenver.edu

Kenneth L. Tyler, Professor and Chair  
Neurology, MICB, IMMUN  
M.D., 1978, Johns Hopkins School of Medicine  
*Molecular and genetic basis of virus-induced cell death (apoptosis) using reovirus infection in cell culture and animal models (encephalitis, myocardiitis, hepatitis).*  
303-724-4327, ken.tyler@ucdenver.edu
GRADUATE STUDENTS

Chris Abraham (MICB) .......................................................... Kulesza Lab, 4-4204
Chad Austin (MICB) ............................................................ Voskuil Lab, 4-4277
Iona Bartek (MICB) ............................................................... Voskuil Lab, 4-4277
Elisabeth Bowers (MICB) ...................................................... Janoff Lab, 4-3019
Daphne Cooper (MICB) ......................................................... Barton Lab, 4-4212
Katie Delaney (MICB) .......................................................... Tyler/Beckham Lab, 4-4327
Laura Griffin (MICB) ............................................................ Pyeon Lab, 4-5748
Kalani Halemano (MICB) ...................................................... Santiago Lab, 4-7617
David Hawman (MICB) ....................................................... Morrison Lab, 4-8375
Zane Jaafar (MICB) ............................................................... Kieft Lab, 4-3256
Henri Jupille (MICB) ............................................................ Morrison Lab, 4-8375
Sam Li (MICB) ...................................................................... Santiago Lab, 4-7617
Alex Little (MICB) ................................................................. Schurr Lab, 4-4281
Yuta Okkotsu (MICB) ........................................................... Schurr Lab, 4-4281
Toni Schwarz (MIBC) ........................................................... Kulesza Lab, 4-4204
Kristina Stoermer (IMMUN) ................................................. Morrison Lab, 4-8375
Jacinta Wiens (MOLB) .......................................................... Vasil Lab, 4-4241

STAFF

Thomas Shallow, 4-4227 .................................................. Administrator
Gwen Frederick, 4-4224 ...................................................... Administrative Assistant
Sally Wiseman/Mary Moua, 4-4431 ........................................ Grant Administrators
Deanne Sylvester, 4-3244 .................................................... Program Administrator
DEPARTMENT OF MICROBIOLOGY COMMITTEES AND DUTIES

Faculty Committee: all faculty + graduate student representative

Admissions and Recruitment Committee
- Linda van Dyk*
- Jerry Schaack
- Mario Santiago
- Caroline Kulesza
- Sonia Flores
- Yuta Okkotsu, Graduate Student

First Year Advisory Committee
- Martin I. Voskuil*
- Jerry Schaack
- Caroline Kulesza
- Thomas Morrison

Department of Microbiology Chair
- Randall K. Holmes

Microbiology Graduate Student Director
- Jerry Schaack

Faculty Senate Representatives
- Michael Schurr and Ron Gill

Seminar Series Coordinator
- Michael Schurr

Contacts for Major Equipment and Facilities

- BSL-3 Director: Martin Voskuil
- BSL-3 Manager: Jerome Schaack
- Centrifuges: Kathryn Holmes
- Fluorescent Microscope: Michael Vasil
- French Press: Michael Schurr
- Gel Documentation Systems: Henri Jupille, 4-8375 (Morrison lab)
- Phosphorimager: Henri Jupille, 4-8375 (Morrison lab)
- Film Developer: Tem Morrison
- qRT-PCR

Graduate Student Representatives

- Graduate Student Faculty Liaison: Daphne Cooper, 4-4212
- Graduate Student Secretary: Laura Griffin, 4-5748
- Admissions and Recruiting Committee Member: Toni Schwarz, 4-4204
- IDJC Series Coordinator: Zane Jaafar, 4-4204
- Bacteriology Journal Club/Research in Progress Coordinator: Chad Austin, 4-4277
- Graduate Student Retreat Organizational Committee: Chad Austin, 4-4277
INTRODUCTION

The student handbook for the University of Colorado Denver Graduate School is on the website www.ucdenver.edu/academics/colleges/Graduate-School/Pages/default.aspx. This provides the general guidelines and requirements for all graduate programs at UCD.

The Microbiology Graduate Program Handbook is a supplement that explains requirements and guidelines specific for the Microbiology Graduate Program. These are the requirements that will apply to incoming graduate students throughout their time at UCD, unless changes in policy are made by the Microbiology Faculty. Additional information can be found at the departmental website: http://www.ucdenver.edu/academics/colleges/medicalschool/departments/Microbiology

GENERAL INFORMATION

In-state Residency Status
New students from out of state must immediately upon arrival in Colorado obtain documentation to support the petition for State Residency. This is a very important priority for first year students. After the first full year, funding will be available (assuming satisfactory academic progress) only if the student qualifies as an in-state resident or is a foreign national. The documents that must be obtained include local checking account, driver’s license or State ID, and voter’s registration, as well as proof of Colorado domicile. Further information will be provided during the Graduate School Orientation and is also available at the Graduate School website.

Checking Account
It is important to establish a checking account as soon as possible. The University issues all pay checks, including student stipends, as automatic direct deposits. Students should be sure they have a voided check or savings account deposit slip available when filling out payroll forms. Students are also required to produce a Social Security card for payroll purposes.

UCD Identification Card and After Hours Access
Everyone on campus must carry a UCD picture ID at all times. This ID serves many purposes including enabling students to access the library, obtain parking, gain access to the laboratory sections of the Department, after-hours entry into RC-1, after-hours access to the elevators, and to attend special University functions. Please notify the Department Administrator immediately if your UCD ID is lost so it can be canceled and replaced.

E-mail Access and IT Services
Graduate students will have an account in the electronic mail/internet access system by contacting the University of Colorado IT Services- 4-HELP (4357). You will need to know both your nine-digit Student Identification Number and your four-digit Personal Identification Number (PIN) to obtain an account in the system. If you do not know your PIN, you may obtain it at the UCD-AMC Registrar’s Office in Admissions & Records by going there in person with a picture ID. Note that these are university accounts and cannot be used for political lobbying, downloading music files, etc. University IT Services is also available to assist you with your IT/Helpdesk needs. Please refer to the following website for more information regarding their services and protocol- http://www.ucdenver.edu/about/departments/ITS/CustomerCare/Pages/Anschutz-Medical-Campus-Students.aspx
**Keys**
The Department Administrator will issue keys for office doors. Entrance to animal and BSL-3 facilities requires modification of your ID card. There is a substantial charge for lost keys.

**Use of Laboratory Equipment**
The Department of Microbiology has made a sizeable investment in state-of-the-art equipment to support its research programs. Expert users for each piece of equipment are designated to teach new users how to get the most benefit from the equipment and how to properly use it. All users must observe equipment guidelines and sign up in the logbooks. This keeps the equipment available for everyone. Access to equipment will be restricted for anyone who abuses the equipment.

**Computers**
The Department of Microbiology has invested in computers for the students and other research personnel. Individual laboratories all have computers that are accessible to students. In general, most laboratories use Macintosh computers, some use PCs and some Mac computers have virtual PC. The computer graphics room has common use computers for special purposes. There is a scanner, a color printer and phosphorimers available. There are appropriate image analysis programs on these computers. Separate computer facilities are located in the fluorescence microscopy suite. Because these are common use computers, everyone is asked to keep their own data on flash drives and not on the hard drives. It is especially important to prevent virus problems and to maintain free space on the hard drive that no extra programs may be installed on these common use computers.

**Computer Programs**
The Department Administrator can help students set up remote access accounts for their home computers. In addition, UCD has site licenses for several programs such as Microsoft Office, and virus protection programs that can be downloaded onto student computers without charge. This will allow compatibility between computers at work and at home. All computers connected to the UCD network are required to run approved, up-to-date virus protection software.

**Photocopying**
Most classes will hand out photocopied materials or materials that can be printed from the course web site. However, journal clubs, lab rotations, etc. may require that students have access to photocopy facilities. The Department Administrator will provide students with a photocopy account number. Reasonable amounts of photocopying for professional purposes are funded at present. After admission to a laboratory for thesis research, the student will use the copy code for that lab.

**Microbiology Library**
The Microbiology Department Library contains books and journals that are provided by various faculty members. Journals and books may be removed from the library for photocopying only, and should be promptly replaced. Requests for new books should be directed to the Graduate Program Director.

In addition, many faculty members have other books as well as current issues of journals in their labs or offices. The Health Sciences Library purchases many online journal subscriptions that can be easily accessed on campus via [http://hlslibrary.ucdenver.edu](http://hlslibrary.ucdenver.edu).
FIRST-YEAR STUDENT INFORMATION

First Year Advisory Committee
The First Year Advisory Committee will advise and oversee the academic progress of students until they form a Thesis Committee at the beginning of their second year. Each first year student will meet with the First Year Advisory Committee during the first week of the fall semester. At this meeting, the student and committee will review his/her academic background and goals. The committee will help the student make decisions regarding courses and rotations, and help resolve any problems that may arise until their Thesis committee is formed. The First Year Advisory Committee will also meet individually with each student 1 to 2 weeks before the end of each rotation to discuss academic progress, rotation plans, and to plan future courses. Students may call a meeting of the committee at any time by contacting the committee chair.

Microbiology Graduate Program Director
The Director will act as an administrator for graduate student activities from matriculation through the thesis defense and is a member of the First Advisory Year committee. The Director and Program Administrator will interface with the Graduate School to ensure students are registered for appropriate courses and credits and ensure students fulfill required committee meetings as well as seminar and journal club presentations. A file will be maintained by the Program Administrator Deanne Sylvester for each student that records their activities and accomplishments while in the graduate program and post-graduation.

Planning Academic Program

The Graduate School requires at least 30 semester hours in course work pre-comps (rotations and research courses taken prior to or concurrent with the completion of the comprehensive examination) and an additional 30 semester hours of thesis credits for the Ph.D. All work undertaken as a graduate student must be in compliance with the academic Code of Honor (see UCD Graduate Student Handbook, provided by the Graduate School upon matriculation).

The sequence of courses required for the first year of the Microbiology Graduate Program is shown on the following page. Students must take 8.5 credit hours of the BMS Core Course series (IDPT 7811, IDPT 7812, IDPT 7813, and IDPT 7814), three laboratory rotations (MICB 7650, ~11 weeks each). Core V is not required for Microbiology Program students and is replaced with Fundamentals of Microbiology and Infectious Diseases (MICB 7706). Microbiology students are required to take MICB 7706, MICB 7701, MICB 7702, and MICB 7704. Depending on the student's past courses, the First Year Advisory Committee may allow alternative courses and/or provide transfer credit for some courses. A request in writing must be submitted to, and approved by, the First Year Advisory Committee and the Microbiology Graduate Program Director. Students who matriculate in BSP or other graduate programs and wish to pursue a degree in Microbiology may submit requests to the First Year Advisory Committee to modify the requirements for courses to be taken in the first year and the committee may, in some cases, require that specific courses in Microbiology be taken during the second year. Students should be aware that they will be responsible for general knowledge in Microbiology during the Preliminary Examination. Students must take at least 19 credits in the first year of study in order to be eligible to take the comprehensive exam during the second semester of the second year.

Registration for classes is completed on line. It is advisable to discuss with the Graduate Program Director and the First Year Advisory Committee the courses that you plan to take each semester of the first year. If you fail to register before the deadline, you will be responsible for late fees. You need to register for one credit each summer or you will have retirement benefits withheld from your stipend. For the fall semester of the second year, you need to sign up for five credits of 7650 (pre-Comprehensive Exam research) as well as for the one credit ethics course. For the spring semester, you need to sign up for five credits of
7650. After you have passed your comprehensive exam, you need to sign up for five credits of 9850 (post-comprehensive exam credits) for each semester until you graduate. After the first year, with agreement of the Thesis mentor and committee, additional course work may be taken in the second and later years.

“Ethics in Research” (PHCL7605) is also required, and is generally taken in the fall semester of the student’s second year.
# TYPICAL FIRST YEAR CURRICULUM

## FALL SEMESTER

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomedical Sciences Core Course I. <em>IDPT 7811</em></td>
<td>(2.0 CR)</td>
</tr>
<tr>
<td>Biomedical Sciences Core Course II. <em>IDPT 7812</em></td>
<td>(2.5 CR)</td>
</tr>
<tr>
<td>Biomedical Sciences Core Course III. <em>IDPT 7813</em></td>
<td>(2.5 CR)</td>
</tr>
<tr>
<td>Biomedical Sciences Core Course IV. <em>IDPT 7814</em></td>
<td>(1.5 CR)</td>
</tr>
</tbody>
</table>

A unified presentation of fundamental principles of biochemistry, cell biology, genetics and molecular biology. Designed for all first year basic science graduate students.

**Fundamentals of Microbiology and Infectious Diseases. *MICB 7706* (2 credits)**

A lecture course designed to introduce graduate students to the discipline and study of microbiology and infectious diseases. The basics of microbiology will be presented with an emphasis on methodology and techniques.

<table>
<thead>
<tr>
<th>Rotation</th>
<th>MICB 7650</th>
</tr>
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<tbody>
<tr>
<td>I</td>
<td>(1 credit)</td>
</tr>
<tr>
<td>II</td>
<td>(1 credit)</td>
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</tbody>
</table>

Each rotation will last approximately 11 weeks. The second rotation will begin 12 weeks into the fall Semester and extend into the Spring Semester.

## SPRING SEMESTER

**Molecular Virology and Pathogenesis. *MICB 7701* (3 credits)**

This 8-week course addresses the molecular biology of viruses and the host-virus interactions that influence pathogenic outcomes of virus infections. Topics include virus structure, virus receptors and entry into cells, genome organization and replication, viral gene expression, virus assembly, host responses to viral infection, emerging viral diseases, epidemiology, virus eradication, and virus evolution. Select medically important viruses will be covered including poliovirus, hepatitis viruses, influenza, HIV, herpesviruses, papillomaviruses and others. Course grades will be based on a mid-term and final exam, student presentations and participation in discussions.

**Molecular Mechanisms of Bacterial Disease. *MICB 7702* (3 credits)**

MICB7702 is an 8-week lecture and primary literature discussion course. The course covers pathogenic bacteria and an in-depth discussion of several paradigms of bacterial diseases that illustrate important concepts and molecular mechanisms of bacterial pathogens and evasion of host defenses.

**Host Response to Infectious Disease. *MICB 7704* (2 credits)**

An interactive graduate course, which provides an overview and specific examples of the host response to infectious disease. Current research and future directions in the field are discussed. Students are assessed via presentations, participation and an exam.

**Electives. Students take additional approved elective courses, see appendix 2. (variable)**

**Laboratory Rotation III. *MICB 7650* (1 credit)**

## SUMMER SEMESTER

**Preliminary Examination.** The preliminary examination is taken in mid-June. The prelim is a two-part exam. The first part is a written critical review of the literature on a specified topic. The second part is an oral exam based on the written document and will include general knowledge from the first-year coursework.

**Research in Microbiology.** Start thesis work in dissertation laboratory, July 1.
Electives

There are many other excellent graduate courses available in the UCD-AMC Basic Science Ph.D. Graduate Programs. A list of elective courses currently approved by the Microbiology Program faculty can be found in Appendix 2. Students in the Microbiology Graduate Program may take electives during their first year with approval of the First Year Advisory Committee, or during subsequent years with the permission of their mentor. An annual listing of all graduate courses is published on-line at: http://www.ucdenver.edu/student-services/resources/registrar/students/Courses/Pages/CourseDescriptions.aspx and semester updates are sent to students via email from the Graduate School office.

Lab Rotations

Each student is expected to do three lab rotations in laboratories of Microbiology Graduate Program faculty members during the first two academic semesters. Information about the research being done in each faculty laboratory is available on the Microbiology web page: http://www.ucdenver.edu/academics/colleges/medicalschool/departments/Microbiology. During orientation, first-year students will meet with the Microbiology graduate faculty and learn about their research programs.

When a student has agreed upon a rotation with a faculty member, the student should notify the Graduate Program Director and Program Administrator. Rotations are letter graded one-credit courses. Each rotation extends for ~11 weeks. Students will present a 15 minute seminar at the conclusion of each rotation. At the end of each rotation students will meet with their current faculty advisor for an exit interview. At this time, both parties will discuss an evaluation form that will be submitted electronically for the student's permanent record.

Selecting a Mentor

Each student participates in three lab rotations with mentors who are doing work relevant to the student's interests. By the end of the spring semester, students are expected to have selected a laboratory for his/her dissertation research. In making this decision, it is the individual student’s responsibility to discuss possible dissertation research projects and availability of research funding, stipend support and lab space with each faculty mentor that he/she is considering. The student is encouraged to read the papers from the lab and grant applications supporting the research program, and to be familiar with the unique style of management in the lab. Then the student should approach the faculty member that is his/her first choice about making a commitment to accept the student into the lab.

Virtually all students join a lab. However, entry into a lab is not guaranteed. If the student is unable to make an agreement with a mentor to join a lab, the student should initiate discussions with the First Year Advisory Committee and the Program Director to discuss a possible fourth rotation, the inability to find a laboratory for your thesis research may lead to dismissal from the program.

Grades

Reporting of grades. Grades are reported to the Registrar by the Course Director and the Graduate Program Director (for rotations).

Passing grades. All required courses (including the Core Course, laboratory rotations, and Microbiology course work) are to be met with grades of B (3.0) or better. If a student earns less than a B (3.0) in any of
these courses, the First Year Advisory Committee and the Microbiology Graduate Program Faculty will
decide, on a case-by-case basis, the appropriate measures to be taken.

**Academic probation.** The overall grade point average must be a B (3.0) in order for the student to be in
good standing in the Graduate School. The Registrar will notify the student and the Graduate Program if
and when a student is on academic probation. The First Year Advisory Committee will then meet with the
student to plan a strategy to remove the student from probation. This may require achieving higher grades
in the later courses to balance grades of B- or lower, or taking additional courses. During probation a
grade of B or better must be maintained in all courses. The student will have a maximum of two semesters
at the discretion of the Microbiology Graduate Program Faculty (if enrolled as a full time student) to raise
their GPA to at least 3.00. If a student remains on academic probation after two semesters, s/he will be
subject to immediate dismissal upon the recommendation of the full Microbiology faculty and concurrence of the Dean of the Graduate School. If there are extenuating circumstances, however, the
program director may petition the Dean for an extension of the probationary time period. Students on
academic probation are not eligible to take the Preliminary Examination.

**Participation in Journal Clubs, Research Progress Seminars and Microbiology Seminars**
One of the most important aspects of the graduate program and an essential tool for continuing education
for all faculty and post docs is a lively program of seminars, journal clubs, and data clubs. For graduate
students, these serve both as a source of state-of-the-art, new microbiology information and an
opportunity to develop strong skills in speaking, which correlate well with future success. We encourage
questions from all members of the audience of each of these programs during and after the talks. Vigorous
participation by everyone makes these sessions very worthwhile.

Each graduate student is **expected** to attend the weekly Microbiology Seminars, which are held on
Fridays at noon in the Microbiology Conference Room, unless otherwise posted. Notices of the seminar
topics are on the departmental bulletin board and on a poster in the entryway to RC-1 North.

In addition, each student is **expected** to attend the Infectious Diseases Journal Club, and either the
Virology Journal Club or the Bacteriology Journal Club/Research in Progress (BRIP). The student should
notify the Graduate Program Director of which one is selected for each quarter, then attend and participate
regularly. Of course, students may participate in all journal clubs if they choose.

**Training Classes**
There are several university requirements to assure safety of all personnel who work in laboratories. The
Environmental Health and Safety Division of UCD offers classes and certification in **radioisotopes, handling hazardous waste, and blood borne pathogens.** For working in microbiology laboratories, all
of these classes are recommended. Each topic has an initial class with extensive handouts to read before
and an annual refresher class in which you will hear about new regulations, recent problems, etc. The
information on the scheduling of the classes is on the website:
[http://ucdenver.edu/academics/research/AboutUs/health-safety](http://ucdenver.edu/academics/research/AboutUs/health-safety).

Graduate students should take these classes at the beginning of their first rotation. Radioisotopes may be
taken at a later date or a non-users version may be taken depending on the laboratories in which rotations
will take place. Please notify the Graduate Program Director as soon as the necessary examinations have
been passed so the information can be put into your folder. It is the student’s responsibility to stay current
with required annual refresher classes.

The Animal Care and Use Program at: [http://www.ucdenver.edu/academics/research/AboutUs/animal](http://www.ucdenver.edu/academics/research/AboutUs/animal),
provides information about requirements for using animals in research programs. Special training in
surgery, anesthesia, etc. is offered from time to time.
Stipend Support, Health Insurance, and Tuition
Microbiology Program students receive an annual stipend ($26,000 for 2012-2013 academic year), individual health and dental insurance, and tuition. The Microbiology Department Administrator will arrange for payment of these funds, and handle any financial problems that may arise. Late registration fees are the responsibility of the student.

First-year non-resident students are expected to take all necessary steps to attain Colorado Residency by the end of their first year in the Program. This makes them eligible for in-state tuition rates, a very considerable savings. The Program is only responsible for the cost of the equivalent of the in-state tuition rate after the student’s first year.

After the thesis mentor has been selected, the student's stipend, insurance, tuition, research expenses and professional travel will be paid from grants to the mentor. While receiving support from an NIH grant, you cannot receive additional funds from outside employers per NIH guidelines.

Fellowship Applications
All graduate students are urged to apply for individual graduate student fellowships. A comprehensive source of fellowships is on the web at http://www.grantsnet.org. Students can apply for NSF and Howard Hughes Medical Institute fellowships during the first months after arriving, as these fellowships are only available to first-year students. Other fellowships available based on research interest, sex, race, prior military experience, etc., are indicated on the website. The faculty and the Microbiology Department Grants Specialist will be glad to help with applications.

Copies of the fellowship applications should be submitted to the Microbiology Department Administrator. The Director of the Microbiology Graduate Program should be notified when an application is submitted and when the outcome of the application is known.
PRELIMINARY EXAMINATION

Overview
At the end of the second semester of the first year, each student who is not on academic probation is required to take a Preliminary Examination by the end of June. The Preliminary Exam changed for students matriculating in Fall of 2010 for all programs. The Microbiology Program now uses a two-part exam. The exam will include a critical review of a defined microbiology subject chosen by the faculty and written by the student. Following the written document, an oral exam will be administered to test knowledge of the review subject and knowledge of the student’s first-year coursework including fundamental questions in virology and bacteriology. This exam is designed to provide an opportunity for students to read a body of literature, distill the findings into a coherent summary, and write in the style of a scientific review. This exercise will help prepare the student to write the introduction section of their Comprehensive Exam in the following year.

Guidelines for exam
A subject that addresses issues that are topical in microbiology will be selected by the Prelim Exam Committee, consisting of three members of the faculty. The subject matter of the review will be a topic of special interest to the committee, and may include virology, bacteriology or both. The committee will select three to five papers which will form the basis of the review. Other papers relevant to the subject may be utilized by the student. The student will have two weeks to write 10 pages (not including figures) of a double spaced, one inch margin, review of the literature. It is recommended that students include a summary figure that encapsulates the review material. A future directions section should be included in which the student proposes possible avenues of future research based on the body of work described in the review. The student should also keep in mind that the exam is a critical review and thus, the student should attempt to make assessments of the relevant importance of findings to the big picture and not just restate findings and interpretations from the primary literature. A meeting of the student taking the exam and the faculty comprising the preliminary examination committee will be held prior to the exam to discuss the requirements for the written and oral portions of the exam and to answer questions.

After the written portion is turned in to the Prelim Exam Committee the student will have at least one week to prepare for the oral portion of the exam. Students should be prepared to answer questions based on the specific exam subject including but not limited to the papers used to write the review. The student should also be keenly aware of techniques used to establish the facts described in their review. Faculty will also ask questions that assess the student’s knowledge of basic concepts of microbiology. Thus, students are advised to review first year coursework especially from microbiology courses. Students are also advised to form a study group to review course material.

Grading exam
The written and the oral portions of the Preliminary Exam will be graded as pass, pass with conditions or fail. Both written and the oral portions must receive a pass or pass with conditions grade. If a student does not pass both sections of the exam the Microbiology Graduate Program faculty will decide whether to administer a second exam or disenroll the student. After the student passes the Preliminary Examination, the student begins research in their thesis laboratory.
COMPREHENSIVE EXAMINATION

Eligibility and dates
Eligible students (2nd year students who have passed preliminary examinations and are in good academic standing) will write and orally defend an NIH R01-style research proposal. The Thesis Committee members will serve as the committee for the written and oral portions of the comprehensive exam. The Graduate Program Director will serve as the fifth member on all comprehensive exam committees as the thesis mentor cannot serve on this committee. If the Director is already a member of the Thesis Committee, the Director will appoint a fifth member. Students should plan to spend no more than four weeks out of the laboratory researching, discussing, and writing the proposal. Five copies of the written portion of the exam must be turned in to the Thesis Committee two weeks prior to the oral exam date and the oral exam must be completed between January 1st and May 15. The date of the oral examination should be scheduled by the student before April 1st.

Paperwork to Schedule the Exam
The forms to schedule this exam are in a packet on the Graduate School website at http://www.ucdenver.edu/academics/colleges/Graduate-School/Pages/default.aspx and then click on Student Services/Academic Resources/PhD resources. These materials should be downloaded the term prior to your anticipated examination date. Your Application for Admission to Candidacy (see above) is due at least two weeks prior to your expected examination date.

1. Download and complete the "Application for Admission to Candidacy".
2. Complete the "Request for Scheduling Exam" form.
3. Sign the application and obtain the signature of your program mentor on the "Application for Admission to Candidacy" and of your Program Director on both the "Application for Admission to Candidacy" and the "Request for Scheduling Exam" form.
4. Submit both forms to the Graduate School at least two weeks prior to the exam.
5. The Graduate School will prepare and distribute the "Notice of Examination" to you, the academic program, and your committee members.
6. Your program will receive not only the "Notice" but all necessary forms to complete the examination. Contact your program advisor regarding the makeup of the Examination Committee as well as the format the exam will take.

YOU MUST BE REGISTERED FOR THE TERM IN WHICH THE COMPREHENSIVE EXAMINATION IS TAKEN. If your examination occurs between terms, you will be required to register for the subsequent term.

Written Proposal
The research proposal should be about your intended thesis research that has been developed through interactions with your mentor in the months preceding the comprehensive exam. You should propose 2-3 years of work. It is important that you craft a solid hypothesis and 2-3 specific aims that test your hypothesis. You will also need to demonstrate a significant depth and breadth of knowledge of the relevant background to the problem you propose to study. The hypothesis, rationale, strategy, and experimental design in the written proposal should be the work of the student. You may consult with: your PI, the members of your thesis committee, fellow graduate students, post-docs, other faculty,
and the published literature. When you discuss your proposed research with others, you must inform them that you are discussing your comprehensive exam and indicate to them that your interactions are for the purpose of developing your ideas or discussing how certain experiments might work or be interpreted. However, faculty and other advisors should not edit the student’s written proposal for style or content.

**Format guidelines:** Your research proposal should contain no more than 12 pages single-spaced (excluding references), plus a separate page for Abstract/Specific Aims. Margins are to be no less than 0.5 inches and the font should be no smaller than Arial 11pt. Proposals that fail to abide by format guidelines will be returned.

**Organizational of the written proposal.**

**Abstract/Specific Aims.** One separate page. Write an abstract that succinctly describes your project. It should briefly introduce the problem and summarize the overall objectives and methods to be used. It should serve as a concise and accurate description of the work when separated from the proposal.

**Research Plan.** 12 pages. The research plan is divided into the following sections.

*Background and Significance.* Briefly describe the background leading to the present proposal, critically evaluate existing knowledge, and specifically identify the gaps the project is intended to fill. State concisely the importance and health relevance of the research described in the proposal by relating the specific aims to the broad, long-term objectives.

In other words:

- Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.
- Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.

Clearly state a hypothesis and summarize how the proposal will test that hypothesis. Most top-notch NIH grant applications are driven by well-focused and testable hypotheses. Generally, applications should ask questions that prove or disprove a hypothesis rather than search for a problem or simply collect information. Think of your hypothesis as the foundation of your application -- the conceptual underpinning on which the entire structure rests. Your experimental results will prove or disprove your hypothesis. Don't confuse your hypothesis with methods. Methods describe how you will perform your experiments. **Keep Your Hypothesis Focused.** Choose an important, testable, focused hypothesis that increases understanding of biologic processes, diseases, treatments, or prevention and is based on previous research. Hypotheses should naturally provoke questions. Answering these questions then becomes the goal of each of your specific aims.

**Preliminary Studies.** Describe the preliminary studies or data relevant to the proposal. This information can encompass published literature from your laboratory, as well as data you have generated since you have been in the laboratory. Figures and Tables should be annotated with citations that indicate who is credited with generating the data, especially when it is someone other than yourself. Figures and Tables are to be embedded within the document, not submitted as a separate section, and are included as part of the 12 page limit. Figures should be legible and should include a figure legend.

**Experimental Design.**

- Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Describe the rationale for the proposed experiments and include sufficient detail for how the
experimentation is to be completed. Include how the data will be collected, analyzed, and interpreted. Schematics, tables, and timelines can be very effective ways to present complex experiments and working models.

- Discuss potential outcomes, problems and alternative strategies. Make sure that your proposed experiments generate interpretable results allowing you to answer the question you propose. When you have that answer, discuss what you will do next.

References
The written proposal should be well referenced. Proposals may use any standard citation style, but you must include the names of all authors (in the same sequence as the publication), article and journal title, book title, volume number, page numbers, and year of publication. References are not included in the page limitations.

Oral Examination
It is the responsibility of the student to schedule the oral defense. Examinations will take the form of an oral defense of the research proposal. Examination committees will consist of the thesis committee, not including your mentor. Your mentor will not participate in the examination, although he or she may attend. Plan to present a 15-20 minute overview of your proposal as a Powerpoint presentation. Summarize relevant background and preliminary data. Present your hypothesis and specific aims. Broadly review your experimental plan. You will be questioned about anything and everything related to the proposal. It is wise for the student to review broadly before the examination. Students are advised to take one or more practice oral exams from other students and/or post-docs. Exams typically take 2-3 hours.

Outcomes
Pass. You must receive the affirmative votes of a majority of the members of the committee in order to pass. Student continues to doctoral candidacy.

Pass with revisions/conditions. Revisions to the written proposal may be required by the examination committee. A pass with revisions will require the student to address the comments of the review committee and resubmit a revised written proposal within two weeks of the oral examination. The revised proposal will be reviewed by the committee and a Pass/Fail determination will be made. Other requirements, such as additional coursework or directed reading, may also be made by the committee. The terms for completion of these requirements will be determined by the committee at the end of the oral examination. In such cases, the committee, via the chair, will provide written instructions regarding the conditions that must be met by the student to receive a passing grade. You will be considered to have "passed" when these conditions are met to the satisfaction of the committee. Failure to meet the conditions in the time specified will result in failure of the examination.

Fail. In the event that you fail the examination, you are subject to immediate dismissal from the Graduate School. At your program’s discretion, you may be allowed to retake the examination once. The retake will be in a form designated by the committee and must be completed within six months. Failure of the second exam will result in automatic dismissal.
THESIS COMMITTEE AND DISSERTATION

Thesis Committee
This is a committee of four faculty members plus the mentor that will be formed as soon as the dissertation mentor has been agreed upon. At least one member must be from outside the core Microbiology Faculty. The mentor and student recommend to the Graduate Program Director, appropriate members of the committee and the faculty member who will chair the committee. The Graduate Program Director will consult with the Department Chairman to gain approval for the recommended committee. The committee must include at least one, but not more than two, faculty members outside the Core Microbiology Graduate Program Faculty. Outside members should have expertise in the area of the student’s research.

The Thesis Committee must be constituted and an initial meeting must be conducted by November 1st of the second year. The student is responsible for scheduling a meeting of the committee every six months, or more often if necessary, to review the student's plans and progress and make suggestions to facilitate the research. The committee will also mediate conflicts that may arise between the student and mentor. Individual committee members are available for consultation at any time.

Before each meeting, the student should submit to each member of the committee a written summary of the progress since the last meeting and plans for the next six months or more. If the student is scheduled to give a research-in-progress seminar, it may be convenient to schedule the committee meeting immediately after the presentation to avoid repetition.

After each committee meeting, the student and committee chair should promptly write minutes of the meeting. The student and the committee chair should reach agreement on the document, after which each committee member, the student, the Graduate Program Director, and the Graduate school (submitted online) are provided a copy of the final report. In addition, a copy must be given to the Department Administrator for inclusion in the student's folder.

The Thesis Committee will help the student and mentor decide when enough original research and submission of high-quality manuscripts describing the research have been done to allow the student to write the dissertation. The Thesis Committee will not agree to a thesis defense date until at least one first-author primary research article has been submitted to a peer-reviewed journal. One submitted paper is a minimum requirement and not considered the norm for fulfilling sufficient research to earn a PhD.

In the last six months of the student's time at UCD, the student must comply with all the regulations of the Graduate School regarding writing and submission of the thesis and the graduation procedures and ceremonies. The Thesis Committee will read the dissertation and be responsible for the final examination in defense of the dissertation. Students must allow at least 14 days after submitting the dissertation to the thesis committee before the date of the thesis defense.

Dissertation
The dissertation is written by the student according to UCD guidelines and based on the student's original research. The mentor will provide primary guidance on the scientific writing, and the student may also consult with other faculty, in particular the Chairman of the Student's Advisory Committee. The Assistant Dean of the Graduate School offers lectures throughout the year describing the required format of the dissertation. It is advised that you attend this lecture. Examples of previous successful dissertations are available in the Microbiology Department. The student and mentor are responsible for providing high quality illustrations for the dissertation and making copies of the final dissertation for the Thesis Committee.
The student must provide the completed dissertation to the thesis committee at least two weeks prior to the public oral presentation of the student’s dissertation research. The written dissertation is expected to be in final form. The student is primarily responsible for the form of the dissertation. Detailed instructions can be found under Student Services/Academic Resources/PhD resources at http://www.ucdenver.edu/academics/colleges/Graduate-School/Pages/default.aspx. The student’s mentor should carefully read and edit the dissertation prior to submission to the thesis committee. If the written document is found to be poor by the thesis committee, the oral presentation and defense of the thesis may be delayed.

The student is responsible for scheduling the date and location of the public oral presentation of the dissertation research to the UCD community. On the scheduled date, the student will present a public seminar on the dissertation research, followed by questions from the audience. The student will then immediately take an oral Final Examination in Defense of the Dissertation administered by the Student’s Thesis Committee. The Committee may suggest changes needed for the dissertation to be acceptable as well as examining the student on the content of the research. Each member of the Examination Committee must sign approval or disapprove of the dissertation and the Oral Defense for submission to the Graduate School. A simple majority vote of the committee determines the outcome of the deliberations.

Once the dissertation defense is passed and all the requirements for completion of the dissertation have been accomplished and approved, the student should provide a bound copy of the final version of the dissertation with figures to the UCD library, the Microbiology Department, and the mentor. The specific requirements for the written document are available from the Graduate School. A copy of the dissertation abstract must be submitted for microfilming.

The student is now eligible to receive the PhD degree. This degree can be awarded at the Spring UCD graduation, or in August or December without a ceremony as described in the UCD Student Handbook. Consult the Graduate School office for current rules regarding when requirements must be met and complete in order to participate in graduation ceremonies.

**CHANGING ADVISORS OR DISMISSAL FROM THESIS LAB**

While it is always the goal that a student who chooses a thesis advisor is able to complete the PhD thesis with this advisor, this relationship does not always work out. While the Microbiology Program does not have the authority to dictate whether or not a student continues in a particular thesis lab, the Program does suggest certain guidelines in the interest of fairness to both student and mentor. Still, in the end, it is at the discretion of both the student and advisor as to whether a student continues in the chosen thesis lab.

**Guidelines:**

1) If a student is having trouble in the lab, such as in the form of conflicts with the mentor or lack of mentoring, then the student should consult with the Microbiology Graduate Program Director and/or the Chair of their Thesis Committee. This action should be taken as soon as problems arise. A written summary of the meeting and issue should be documented.

2) If a mentor is unhappy with the performance, lab citizenship, work ethic or intellectual engagement of a student (or any other problem), then the mentor should meet with the student expressing these concerns. Consultation with the Graduate Program Director and/or the Chair of the student’s thesis committee is also recommended. A written summary of the meeting and issue should be documented.

3) In either of the cases above, the advisor and the student should then work out a plan of remediation. This plan should be in writing, and it is advised that the plan be forwarded to the
Microbiology Graduate Program Director and the Chair of the student’s Thesis Committee. Regular meetings between the student and advisor should be held, and satisfactory or unsatisfactory improvements documented (copied to the Director and committee Chair).

4) Should a conflict reach the point where either the student or mentor decides that mentor-student relationship should end, then the student has several choices. The student can find another mentor within the Program, transfer to another lab in a different graduate program, choose to leave the Program with a Masters degree (subject to the rules of the Graduate School and approval by the Thesis Committee), or choose to leave the Program.

The UC Denver Ombud’s office is also available to students and mentors to help resolve conflicts and misunderstandings. They are experts in problem resolution and are completely confidential. Please refer to their website to find out more about their offerings [http://www.ucdenver.edu/about/departments/OmbudsOffice/Pages/OmbudsOffice.aspx](http://www.ucdenver.edu/about/departments/OmbudsOffice/Pages/OmbudsOffice.aspx)

**TIME LIMIT**

Doctoral students are expected to pass the comprehensive examination and advance to candidacy within two years and are required to complete all degree requirements within seven years of matriculation. Students are strongly encouraged to finish their degree requirements in less than seven years. During this time, students are required to maintain satisfactory academic performance and to demonstrate appropriate progress toward accomplishing the goals of their thesis projects, as evaluated by their mentor and Thesis Committee as requirements for remaining in the Microbiology Graduate Program. Students who fail to complete the degree in the seven-year period are subject to termination from the Department of Microbiology graduate program upon recommendation of the Thesis Committee and Department Chair. For a student to continue beyond the seven year limit, the Graduate Program Director must petition the Microbiology Department Faculty and include 1) reasons why the student should be allowed to continue in the program and 2) the amount of additional time that will be needed for completion of the degree, which cannot exceed one additional year.

**CAREER INFORMATION**

The graduates of this program have gone into academic positions with teaching and research, biotechnology companies, and government agencies. It is important for us to keep in contact with our graduates both to provide help if needed and to help us in preparing applications for training grants which require information on careers of program graduates.

Up-to-date information on job opportunities at the postdoctoral level and career positions is posted on a bulletin board in the Microbiology Department as well as on our career center website at [www.ucdenvercareercenter.org/index.html](http://www.ucdenvercareercenter.org/index.html). In addition, job placement services are available from professional societies such as ASM, ASV, ASCB, etc. Program faculty are of great help in finding postdoctoral positions. The Graduate School sponsors Career Days for graduate students and postdoctoral fellows to learn about possible career options.

The Microbiology Graduate Program makes every effort to allow the graduate students and postdoctoral fellows to interact with faculty guests who present Microbiology Seminars. Often they are invited to lunch with the guest speaker after the seminar. In such meetings, the students and postdocs are the hosts for the event, providing any requested information about the graduate programs here. In addition, they should ask questions of the speaker about his/her own field of research, career path, and present institution. To learn more about career opportunities outside of academics, you may attend seminars offered by the Alternatives in Science Club as well as many networking events offered through the
Colorado BioScience Association (CBSA). Membership to CBSA is paid through the University, so most events are covered.

**TRAVEL TO PROFESSIONAL MEETINGS**

Professional scientific meetings are excellent places to learn what is new in a particular field, interact with scientists from other institutions and countries, see new equipment, and present research data. A student’s attendance at local, national, or international meetings is by mutual agreement between the student and mentor based on scientific or financial criteria. Reimbursement for meeting travel costs and expenses are provided from the mentor’s research funding (at the mentor’s discretion and only with prior approval of the mentor) or the student’s individual graduate fellowship. Many national meetings also offer partial funding for selected graduate students to attend. It is the student's responsibility to investigate and apply for such external funding. Funding for attending a meeting is often coupled to having research data to present at the meeting as a poster or oral presentation with slides. Abstracts for meetings are due months in advance of the meeting. Information on various meetings and their abstract deadlines is available at the websites of the various scientific societies.

Graduate Students must obtain a University Travel credit card. All travel supported by University funds must be charged to the University Travel Card. All travel funded by University funds must be pre-authorized by obtaining departmental approval. Gwen Frederick will assist you in making all your travel plans (airfare, hotel, etc.). It is your responsibility to contact Gwen as soon as you begin making plans for your travel and well before the meeting begins. Advance planning will avoid paying late registration fees and higher airfares.

**TEACHING OPPORTUNITIES**

Students who have an interest in teaching experience should make this interest known to the Director of the Graduate Program and to their advisory committee (First Year or Thesis). It is sometimes possible to gain limited teaching experience by participating in the teaching labs for medical students or facilitate paper discussions for first year core students. Faculty will provide advice in preparation and feedback on teaching performance in order to improve teaching skills. Other teaching opportunities may be available if desired.

**GRADUATE STUDENT ACTIVITIES**

**Student Senate and Council**
The Microbiology Graduate Program is allowed to elect representatives for Student Senate. Senate oversees and votes on University-wide student issues. Also, all graduate students are welcome to attend monthly Graduate Student Council (GSC) meetings. GSC acts on issues of importance to graduate students. Any student may submit issues to Senate or GSC for consideration.

**Microbiology Student Governance**
The Microbiology Department also has its own Student Council which elects a faculty liaison to represent the Microbiology student body to the faculty and an Admissions and Recruitment Committee member to assist in selecting new student candidates. The Council also elects a Graduate Student Retreat Committee Chair to organize the upcoming year’s retreat and a Secretary to record and distribute meeting minutes. The Council also selects journal club coordinators for Infectious Disease Journal Club (IDJC), Bacteriology Journal Club/Research in Progress (BJC/BRIP), and Virology Journal Club (VJC).
University Research Forum
Each year a Student Research Forum is held to highlight the research contributions of graduate students and medical students. Students from all programs present posters on their research. Faculty judge the posters and presentations and financial awards are made. Food is provided and there is a large and enthusiastic audience of faculty and students. Cash prizes are provided to students with the posters considered the most outstanding by faculty reviewers.

Graduate Student Retreat
Every autumn, all of the students and post-docs are invited to take part in the Microbiology student and post-doc retreat. The two-night retreat is held at one of the YMCA retreat cabins near Estes Park, Colorado. Attendees are able to present either a poster or a small seminar if they wish, and awards are presented to best presentation in each category. The retreat is a time not only to share scientific ideas and practice presentation skills, but also to enjoy the company of fellow department members while hiking through colorful trails or enjoying a few hours in the local town.

Recruitment of New Students for the Microbiology Graduate Program
Applications for admission in August of 2013 will begin to arrive in late summer and fall of 2012. The deadline for applications is December 1st. The Admissions Committee, composed of faculty and a student representative, will review written applications and recommend approximately 10 students to be interviewed. Candidates will be invited to interview with faculty and graduate students.

Students in the Microbiology Program are expected to help host the applicants at meals or social events, interview them as requested, present posters on their own research, and provide tours of the campus. Students with insight into applicant's qualifications are welcome to submit the information to the Admissions Committee. Students in the Microbiology Graduate Program will play an important role in welcoming new graduate students, orienting them to UCD, and mentoring them during the first year of the graduate program.

Other Activities
Social activities are available both campus wide, including welcome weekend and Fun In The Sun (FITS) on Fridays during the summer, and other departmental functions.
APPENDIX 1

REQUIREMENTS FOR BSP STUDENTS JOINING MICROBIOLOGY

**Mentor Discussion**

A Biomedical Sciences Program (BSP) student who completes a rotation in the lab of a Microbiology Graduate Program faculty member and wishes to work in that lab will discuss options with the faculty member. If the faculty member would like to have the student join the lab, then the student and faculty member will discuss which graduate program that the faculty member is associated with (e.g., Microbiology, Molecular Biology, etc.) would be most suitable for the student. One important factor is the formal course requirements.

**Departmental Approval**

If the faculty member and student decide that the student would ideally get his/her degree from the Microbiology Graduate Program, they must request approval by the Microbiology Graduate Program faculty. A majority vote of the core Microbiology Faculty will decide whether or not to accept the student into the Program.

**Time of Transfer**

Students normally transfer from the BSP program into other programs on July 1.

**Coursework**

In order to take the Comprehensive Examination, all students in the Microbiology Graduate Program are required to have taken and passed with a grade of B or better at least 30 academic credits. This must include the core courses (8.5 credits), Ethics (1 credits), 3 laboratory rotations (1 credit each) and at least 7.5 additional credit hours of approved elective courses. Microbiology students are required to take either MICB 7701 or MICB 7702 and either MICB 7706 or MICB 7704 and are encouraged to take as many of these courses as possible. The remaining credits may consist of research credits. Acceptable courses to fulfill the Microbiology elective requirements are listed in Appendix 2.

The BSP program allows BSP students to select from a wide range of electives offered by the Graduate School to satisfy their course requirements and preparation for the preliminary examination. BSP students who select the Microbiology Graduate Program would typically do so at the end of the second semester of their first year, but they must decide which electives to take before the second semester or classes would need to be taken in their second year.

Preliminary and Comprehensive Exams follow Microbiology Department guidelines.
## APPENDIX 2

### COURSES AND ELECTIVES FOR MICROBIOLOGY GRADUATE PROGRAM STUDENTS

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Sem.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICB 7706 Fundamentals of Microbiology and Infectious Disease</td>
<td>2.0</td>
<td>Fall</td>
</tr>
<tr>
<td>MICB 7702 Molecular Mechanisms of Bacterial Disease</td>
<td>3.0</td>
<td>Spring</td>
</tr>
<tr>
<td>MICB 7701 Molecular Virology and Pathogenesis</td>
<td>3.0</td>
<td>Spring</td>
</tr>
<tr>
<td>MICB 7704 Host Response to Infectious Disease</td>
<td>2.0</td>
<td>Spring</td>
</tr>
<tr>
<td>MICB 7705 Medical Microbiology (with medical students)</td>
<td>4.0</td>
<td>Spring</td>
</tr>
<tr>
<td>BMGN 7620 Genomics</td>
<td>2.0</td>
<td>Spring</td>
</tr>
<tr>
<td>BMST 7350 Proteins</td>
<td>3.0</td>
<td>Spring</td>
</tr>
<tr>
<td>BMST 7354 Structural Analysis of Biomolecules 1</td>
<td>2.0</td>
<td>Spring</td>
</tr>
<tr>
<td>CANB 7600 Cancer Biology</td>
<td>3.0</td>
<td>Spring</td>
</tr>
<tr>
<td>CANB 7620 Histophysiology</td>
<td>3.0</td>
<td>Spring</td>
</tr>
<tr>
<td>CPBS 7606 Statistics for the Basic Sciences</td>
<td>3.0</td>
<td>Fall/Spring</td>
</tr>
<tr>
<td>CPBS 7711 Bioinformatics I</td>
<td>4.0</td>
<td>Fall</td>
</tr>
<tr>
<td>CSDV 7605 Stem Cells and Development</td>
<td>4.0</td>
<td>Spring</td>
</tr>
<tr>
<td>HMGP 7600 Survey of Human Genetics</td>
<td>3.0</td>
<td>Spring</td>
</tr>
<tr>
<td>HMGP 7620 Genomics</td>
<td>2.0</td>
<td>Spring</td>
</tr>
<tr>
<td>IDPT 7646 Tissue Biology and Disease Mechanisms</td>
<td>3.0</td>
<td>Fall</td>
</tr>
<tr>
<td>IMMU 7602 Special Topics in Tumor Immunology</td>
<td>1.0</td>
<td>Spring</td>
</tr>
<tr>
<td>IMMU 7630 Overview of Immunology</td>
<td>2.0</td>
<td>Fall</td>
</tr>
<tr>
<td>IMMU 7662 Immunology</td>
<td>6.0</td>
<td>Spring</td>
</tr>
<tr>
<td>MOLB 7616 Topics in Molecular and Cellular Biology</td>
<td>1.0</td>
<td>Spring</td>
</tr>
<tr>
<td>MOLB 7800 Advanced Topics in Molecular Biology</td>
<td>1.0-4.0</td>
<td>Spring</td>
</tr>
<tr>
<td>NRSC 7600 Cellular and Molecular Neurobiology</td>
<td>3.0</td>
<td>Fall</td>
</tr>
<tr>
<td>PHCL 7605 Ethics in Research</td>
<td>1.0</td>
<td>Fall</td>
</tr>
<tr>
<td>PHCL 7606 Receptors and Cell Signaling</td>
<td>3.0</td>
<td>Spring</td>
</tr>
</tbody>
</table>
APPENDIX 3

GRADUATE SCHOOL POLICY FOR VACATION AND LEAVE FOR PHD CANDIDATES

Graduate School is a privilege; working in the biomedical research/academic field, whether as a graduate student, a postdoctoral fellow, or an independent investigator, is a time-honored and challenging profession that requires a high level of commitment and responsibility. Students who receive full-support stipends from UCD Ph.D. programs are required to pursue their training on a full-time basis, devoting each day of the normal work week, plus any additional time required by their research projects and academic courses. Additionally, for a student to maintain full-time student status, the Graduate School has established the following guidelines for vacation and leave time. These represent the leave to which a graduate student is entitled; however, research demands and commitment to graduate studies often result in students using less than the allotted leave. Individual graduate programs might not have a formalized system for accounting for vacation and sick leave; if so, vacation and leave monitoring falls under the honor system and is the responsibility of the student.

Vacation and Holidays. Graduate students shall receive all University holidays and no more than 14 calendar days (counting all days Monday through Sunday) of vacation per annum, with no year-to-year accrual. Students shall continue to receive stipends during vacations and holidays. In the graduate school at UCD, the times between academic terms and the summers are considered active parts of the training period and are not necessarily free times. However, students taking courses are expected to attend all classes and take all exams as scheduled. They should not take vacations when classes or exams are scheduled. For advanced students, vacation time should be arranged with the dissertation advisor.

Sick Leave and Other Leave. Graduate students may continue to receive stipends for up to 15 calendar days (counting all days Monday through Sunday) of sick leave per annum, with no year-to-year accrual. Under exceptional circumstances, additional sick days may be granted following a written request and approval by the student’s program director. Sick leave may be used for the medical conditions related to pregnancy and childbirth.

Parental Leave – Graduate students may also receive stipends for up to 30 calendar days (counting all days Monday through Sunday) of parental leave per annum for the adoption or the birth of a child. Either parent is eligible for parental leave. Parental leave must be approved by the student’s program director. Sick leave may not be used to supplement parental leave, except as noted above.

Unpaid Leave – Individuals requiring more than 15 calendar days of sick leave or more than 30 calendar days of parental leave, must seek approval from their program for an unpaid leave of absence. Approval for a leave of absence must be requested in advance by the student and approved by the program. The leave period and conditions must be documented, both at the time of leave and at the time of re-entry into the program. A copy of this agreement must be submitted to the Graduate School.

Leave of Absence – Leaves of absence are arranged with and approved by Program Directors. The Graduate School should be informed by the student. A leave of absence may be approved for a maximum of one year. Students who fail to register or submit a Statement of Academic Intent after an absence of one academic year will be withdrawn and required to reapply for admission to the Graduate School through their program and be considered with all other applicants. A leave of absence does not automatically extend the time limit set forth for graduation.
Doctoral students who have passed their Comprehensive Examination are required to be registered continually for the Fall and Spring semesters. Failure to do so will result in the student being required to retake the Comprehensive Examination or reapply to the Graduate School. An official leave of absence may modify this registration requirement during the leave period.

Termination – Upon graduation or termination a graduate student forfeits all unused annual and sick leave; payment may not be made from grant funds (training grants or research grants) for leave not taken.
APPENDIX 4

USEFUL WEBSITES FOR NEW GRAD STUDENTS

HOUSING AND AMENITIES WEBSITES

http://ucdenver.edu/life/services/Pages/index.aspx
A comprehensive list of all services available to students

http://ucdenver.edu/life/services/student-assistance/Pages/default.aspx
Student Assistance Office (numerous sometimes helpful links)

http://www.ucdenver.edu/life/services/housing/Pages/default.aspx
SAO help with housing

CITY/COUNTY/STATE

http://www.denver.org/

http://www.colorado.gov/cs/Satellite/Revenue-MV/RMV/1185957917898
Air Care Colorado (emissions testing required for registering vehicle in Denver or Arapahoe Counties)

http://www.sos.state.co.us/
Colorado Sec. State

http://www.elections.colorado.gov/DDefault.aspx
Elections home (voter registration forms, links, etc.)

http://www.co.arapahoe.co.us/
Arapahoe County Website (numerous useful links)

http://www.co.arapahoe.co.us/Departments/CR/index.asp
County Clerk and Recorder Webpage (about registering your car)

http://www.denvergov.org/
Denver County & City website (numerous useful links)

http://www.cotrip.org/home.htm
CO Dept. of Transportation (road conditions, travel warnings, etc.)

Elections info page (voter registration forms and maps, etc)
LOCAL ENTERTAINMENT/EVENTS

http://www.westword.com/
Westword, good source for live music and other events happening in the city

ON CAMPUS WEBSITES

http://my cu.edu
Employment information (pay, W2's, W-4's, employee ID #, various payroll forms (direct deposit), etc. also able to update personal contact info). login is email username & password

https://portal prod cu.edu/UCDAccessFedAuthLogin.html
Student information (grades, student #, financial information) login is email username & password

http://www.ucdenver.edu/student-services/resources/registrar/registration/Pages/default.aspx
Student authorization (for enrolling in classes, etc.) login is email username & password

http://blackboard.cuonline.edu/webapps/portal/frameset.jsp
Class login - email username and password

http://hslibrary.ucdenver.edu/
Library main website
IMPULSE login (for accessing journals, Interlibrary loan, etc) login is: firstname.lastname password is student #
UCD library search

http://dy3uq8jh2v.search.serialssolutions.com/
UCD library journal search (option to search by PubMedID (very useful))

TRAINING/FACILITIES WEBSITES

http://ucdenver.edu/academics/research/AboutUs/healthsafety/Pages/EnvironmentalHealthSafety.aspx
Environmental Health & Safety (numerous useful links, well worth a thorough look around, also host of training modules accessed via blackboard)

http://ucdenver.edu/academics/research/AboutUs/health-safety/training/respiratory-protection-training/Pages/RespiratoryProtectionTraining.aspx
N-95 Respirator Training/Fit-Testing (for those needing to go into the BSL-3)

http://ucdenver.edu/academics/research/AboutUs/health-safety/training/Pages/radiation-safety-training.aspx
Radiation Safety Training

http://ucdenver.edu/academics/research/AboutUs/animal/Pages/index.aspx
Animal Program
Animal Facility/Safety Training

Mass Spectrometry Core (note: their website form does not work, you have to go down to the core facility and talk to them to get your samples submitted)

DNA sequencing core

Sample submission page (requires login with unique account set-up. requires PI name and Speed Type to set up account)

NMR Core

Microscopy Core
August 23, 2012

TO:  Microbiology Program New Students – 2012-13

RE:  Receipt of Student Handbook and Colorado Residency Requirements

This is to confirm that I have received the Cancer Biology Program Student Handbook and have reviewed it with the program Student Advisor.

The Colorado Residency Requirements have been explained to me and I have instigated the appropriate actions to comply. I understand that non-compliance on my part by July 1, 2013 obligates me to pay the difference between non-resident tuition and resident tuition.

I acknowledge that I have reviewed and understand the graduate student vacation/sick leave policy.

_______________________________________     __________________
Signature/Date