University of Florida  
Department of Microbiology and Cell Science

Microbial Defense  
MCB 6355 (1 credit)  

SPRING SEMESTER 2010

COURSE DESCRIPTION:

MCB6355. Microbial Defense Credits: 1. Principles of host defense to microbial invasion will be examined in a context of cellular biology involving both plants and animals. Current scientific research that incorporates these principles will also be discussed.

COURSE INSTRUCTORS  
Dr. Joseph Larkin III  
Dr. Nian Wang  

& OFFICE HOURS:  
Rm.1253  
Rm.1249  
Lake Alfred  
Wednesdays 3-4 PM  
XXX  
Phone: 392-6884  
Phone:  
E-mail: jlarkin3@ufl.edu  
E-mail:  

LECTURES:  
Dates February 9, 2010 to March 4, 2010  
Tuesday, 2nd and 3rd Periods (8:30 – 10:25 AM (10 min break after 1st period)  
Thursday, 2nd and 3rd Periods (15 total contact hours per semester)

COURSE OBJECTIVES:
  • To develop the concepts and skills required to understand and critically evaluate research that addresses cellular biology events involved in host defense to microbial pathogens  
  • To apply the theories in cell biology to current problems in host defense to microbial pathogens  
  • To critically evaluate orally delivered research  
  • To become more effective oral communicators of scientific research

STUDENT RESPONSIBILITIES:

ATTENDANCE:

Class attendance is required to achieve the objectives of this course.

Section 1 (Dr Nian Wang) will focus on bacterium-host interactions, while Section 2 (Dr. Joe Larkin) will focus on mammalian defense strategies against various pathogens. Bacterial pathogens utilize different virulence factors (e.g. effectors, toxins) to help them survive in different niches. Meanwhile, the hosts including plants, animals and humans may fend off the infection by mounting a battery of defense responses. We will learn the amazing interactions that happen over the long co-
evolution of host and pathogens.

Totally, eight original research papers have been selected and assigned to each student for presenting except one occasion with two students together as a group (Table 1).

In addition eight **Henry Stewart Talks** have been selected and assigned for presentation.

**Henry Stewart Talks (HST):** The University of Florida has purchased the rights to utilize a seminar series featuring talks from the leading researchers in his/her respective fields. We will be utilizing selected talks from this series to facilitate learning. The general website, [http://www.hstalks.com](http://www.hstalks.com) can be accessed anywhere on campus by clicking the above site marker. The assigned talks can be accessed through the above link or directly through the links provided within the syllabus.

1. All students are required to read the papers and watch the HST and be prepared to contribute to discussions (NOT just the presenters).

2. The presentations will resemble those of a Journal Colloquium course, but the class size will be small enough to permit everyone to contribute to the discussions.

3. PowerPoint slides are recommended for the presentations. Presentations may also contain excerpts of the HS Talks for emphasis. Presenting student(s) will be responsible for distributing their slide presentations to the entire class at least one day before their presentation. Presentations may be distributed by email or provided to the instructors of posting on the e-learning website. All students are expected to have read/watched, and understood, each paper (presentation) and to contribute to each of the discussions. The presentation should be around 30-35 min with 10-15 min for discussion.

4. Discussion. Each student should prepare at least one question (fill the question form) for the speaker. The speaker(s) will be allowed two times to pick up students from the audience to answer the question for himself/herself.

5. No exams will be given in this course. Grades will be assigned based on presentations and participation in the discussions.

6. In case of the presentation by the two students, they should work as a group and will take turns presenting different sections of the paper, to assure that everyone contributes equally.

**DEADLINES:**

Students are expected to meet the deadlines for their oral presentation
STUDENT EVALUATION:
Students will be evaluated on the basis an oral presentation (50 points) and class participation (50 points).

Final grades will be based on the following performance standard (100 points total):

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>92 - 100%</td>
<td>A</td>
</tr>
<tr>
<td>85 - 91.9%</td>
<td>B+</td>
</tr>
<tr>
<td>80 - 84.9%</td>
<td>B</td>
</tr>
<tr>
<td>75 - 79.9%</td>
<td>C+</td>
</tr>
<tr>
<td>70 - 74.9%</td>
<td>C</td>
</tr>
<tr>
<td>60 - 69.9%</td>
<td>D</td>
</tr>
<tr>
<td>Less than 60%</td>
<td>E</td>
</tr>
</tbody>
</table>

COURSE SCHEDULE:

Table 1 Schedule of topics and presentations (Section 1)

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Topic</th>
<th>Presenters</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb 9</td>
<td>Tue</td>
<td>Kay Sabine; Hahn Simone; Marois Eric; Hause Gerd; Bonas Ulla &lt;br&gt;A bacterial effector acts as a plant transcription factor and induces a cell size regulator. &lt;br&gt;Science 2007;318:648-51.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb 11</td>
<td>Thu</td>
<td>Melotto M, Underwood W, Koczan J, Nomura K, He SY. &lt;br&gt;Plant stomata function in innate immunity against bacterial invasion. &lt;br&gt;Cell. 2006 8;126:969-80.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb 16</td>
<td>Tue</td>
<td>Hiroki Iwai, Minsoo Kim, Yuko Yoshikawa, Hiroshi Ashida, Michinaga Ogawa, Yukihiro Fujita, Daniel Muller, Teruo Kirikae, Peter K. Jackson, Shuji Kotani and Chihiro Sasakawa &lt;br&gt;A Bacterial Effector Targets Mad2L2, an APC Inhibitor, to Modulate Host Cell Cycling &lt;br&gt;Cell, 130: 611-623, 2007</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Feb 16 Tue Alto NM, Shao F, Lazar CS, Brost RL, Chua G, Mattoo S, McMahon SA, Ghosh P, Hughes TR, Boone C, Dixon JE.
Identification of a bacterial type III effector family with G protein mimicry functions.

Feb 18 Thu Patel JC, Hueffer K, Lam TT, Galán JE.
Diversification of a Salmonella virulence protein function by ubiquitin-independent differential localization.
Cell. 2009137:283-94.

Feb 18 Thu Gurcel L, Abrami L, Girardin S, Tschopp J, van der Goot FG.
Caspase-1 activation of lipid metabolic pathways in response to bacterial pore-forming toxins promotes cell survival.
Cell. 2006 ;126:1135-45.

Week 3
T 04/06 Presentation by (1st class period)
http://hstalks.com/lib.php?t=HST61.2037_1_2&c=252

Presentation by (2nd Class Period)
http://hstalks.com/lib.php?t=HST61.2215_1_3&c=252

R 04/08 Presentation by (1st Class Period)
http://hstalks.com/lib.php?t=HST61.2130_1_3&c=252

Presentation by (2nd Class period)
http://hstalks.com/lib.php?t=HST61.2192_1_3&c=252

Week 4
T 04/13 Presentation by (1st Class Period)
Presentation by (2nd Class Period)
http://hstalks.com/lib.php?t=HST61.2177_1_2&c=252

Presentation by (1st Class Period)
http://hstalks.com/lib.php?t=HST61.2246_1_3&c=252

Presentation by (2nd Class Period)
http://hstalks.com/lib.php?t=HST61.2081_1_3&c=252

REFERENCE TEXTBOOKS:
REQUIRED READINGS:

ACADEMIC HONESTY:
As a result of completing the registration form at the University of Florida, every student has signed the following statements: “I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University.”

UF COUNSELING SERVICES:
Resources are available on-campus for students having personal problems or lacking clear career and academic goals that interfere with their academic performance. These resources include:
1. University Counseling Center, 301 Peabody Hall, 392-1575. Personal and career counseling.
2. Student Mental Health, Student Health Care Center, 392-1171. Personal counseling.
3. Sexual Assault Recovery Services, Student Health Care Center, 392-1161. Sexual assault counseling.

SOFTWARE USE:
All faculty, staff and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

We, the member of the University of Florida, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

ACOMMODATIONS FOR STUDENTS WITH DISABILITES:
The Dean of Students Office provides individualized assistance for students with documented disabilities. Services are based upon student need and impact of their specific disability. There is no requirement for any student to self-identify as having a disability. However, students requesting academic accommodations must register with the Dean of Students Office and provide the appropriate documentation verifying their disability. The Dean of Students Office determines what is and is not appropriate documentation. Examples of accommodations that are available to students include, but are not limited to, registration assistance, approval of reduced course load, course substitutions, classroom and examination accommodations, auxiliary learning aids, additional course drops when disability related, and assistance in other university activities. The designated coordinator for compliance with Section 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) is the Assistant Dean of Students responsible for Students with Disabilities Programs, P202 Peabody Hall, 392-1261 (Voice), or 392-3008 (TDD).