BIOM 535.01: Advanced Virology

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BIOM 535: Advanced Virology

COURSE INFORMATION:
CRN: 35062
Credits: 3
Term: Spring 2015

INSTRUCTOR CONTACT INFORMATION:
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COURSE SUMMARY:
A. Course Description: This course is offered concurrent with Virology BIOM 435. What follows here is an addendum for students enrolled in BIOM 535 Advanced Virology. As graduate scholar, you are expected to begin making increasing contributions to your field of study. In general, this means mastering the principles of the field (i.e., the currently accepted “facts”), and then developing your own ideas to advance the field. This means giving critical thought to the material presented, and thinking about it in new ways, asking deeper questions, reorganizing the facts to find novel meanings etc., etc. To facilitate your growth as a scholarly contributor to your field of study, and sharpen your skills of critical thought and creativity the activities outlined below are added to the course material of BIOM 435 (also see the BIOM 435 syllabus).

ASSIGNMENTS AND ASSESSMENT, AND GRADING:
A. Specific Aims Assignment: IN LIEU OF THE TERM PAPER ASSIGNMENT OF BIOM 435, select a virology topic of your choice and write one specific aim. Most likely you will base your aim on a recent paper that you find interesting. At the end of the semester, you will present your aim to the class followed by an open discussion.

   a) Written aim due last week of semester.
   b) Submit via email. (Word file or PDF)
   c) 2000 words max
   d) Recommended organization:
      A. Rationale (including necessary summary of background and significance)
      B. Experimental design (note: not experimental “details”)
      C. Expected outcomes and interpretations.
      D. Caveats and alternative approaches.

The driving force behind biomedical research is the creativity of independent scientists. Most virology research in the United States is funded by agencies such as National Institutes of Health (NIH) or National Science Foundation (NSF). “Peer-review” committees (comprised of scientists from around the country), assess the strengths and weaknesses of grant applications, and this largely determines which projects are funded. Successful grant applications clearly state the research questions, and what will be done to address them. The “Specific Aims” section is where the scientist describes what they will actually DO with the research funds requested, and what they expected to learn from the data. This includes:
   - the experimental approaches that will be used, and any necessary controls
   - the nature of data to be produced
   - the range of likely results or data
- how the results/data will be interpreted
- the potential drawbacks or limitations of the approach
- possible alternative approaches.

The goal of the Specific Aims section of a grant is to clearly convey what you plan to do, and what will be learned, and convince the review committee that you clearly understand the methodologies, and have the creativity and knowledge to deal with unanticipated complications such that useful information will be obtained in any event.

In general, aims can be described as either "hypothesis-driven" or "descriptive." Descriptive aims are those that involve a search for something (aka “fishing expeditions”), or collection of data without any clear sense of meaning or significance. Such aims are usually not very compelling because it is difficult to know if any useful information will be gained. In contrast, hypothesis-driven aims generate more enthusiasm because they are based on a set of clear questions. A well-designed, hypothesis-driven aim will yield useful information no matter what the results. Of course, descriptive research can be important to lay the foundations of hypothesis-driven research. In general though, granting agencies expect that the descriptive work has already been done and included in the application as “preliminary data.”

B. Topics in Virology BIOM 596: In lieu of the primary lit review assignment of BIOM 435, you will participate in a weekly virology journal club with graduate students and postdoctoral fellows who are engaged in active virology research on campus (meeting times and locations for virology journal club are decided first week of the semester). Each week one person selects a current virology research article and presents it to the group for critical discussion.

C. Grading (approximate; subject to change):
Disability Services
The University of Montana assures equal access to instruction by supporting collaboration between students with disabilities, instructors, and Disability Services for Students. If you have a disability that requires an accommodation, contact either of us at the beginning of the semester so that proper accommodations can be provided. Please contact Disability Services for Students if you have questions, or call Disability Services for Students (DSS) for voice/text at 406.243.2243. You may also fax the Lommasson Center 154 for more information at 406.243.5330.
# Topics covered as time permits

<table>
<thead>
<tr>
<th>Topic</th>
<th>Flint chapters</th>
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<tbody>
<tr>
<td>1. General perspectives on viruses</td>
<td>V.1, Ch. 1-3</td>
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<tr>
<td>2. Methods of studying viruses</td>
<td>V.1, Ch. 1-3</td>
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<tr>
<td>3. Virus structure</td>
<td>V.1, Ch. 4</td>
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<td>4. Initiation of infection</td>
<td>V.1, Ch. 5</td>
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<td>5. Gene expression/genome replication</td>
<td>V.1 Ch. 6-11</td>
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<td>6. Assembly, egress and spread</td>
<td>V.1, Ch. 13</td>
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<td>7. Pathogenesis</td>
<td>V.2, Ch 1, 2</td>
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<td>8. Host defenses/viral immune evasion</td>
<td>V.2, Ch 3,4,5</td>
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<td>9. Viruses and cancer</td>
<td>V.2, Ch. 7</td>
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