Ph.D. programs in Pharmacology and Interdisciplinary Toxicology

Philip R. Mayeux, Ph.D.
Director of Education

2011 National Directors of Graduate Studies in Physiology & Pharmacology Meeting
Ph.D. Program in Pharmacology
Paul Gottschall – Director
Admit 3-4 students each year on state stipend ($24,000 + tuition) for 18 months support

Ph.D. Program in Interdisciplinary Toxicology
Lee Ann McMillan-Crow – Director
Admit 2-3 students each year on state stipend ($24,000 + tuition) for 18 months support

20 core training faculty and 8 joint/adjunct faculty
GRE 1290 for current domestic students
Graduates have an average of 2.3 first-author pubs from a total 3.4 pubs
Time to graduation is 5.0 years
Curriculum Issues Related to Training In Pharmacology

- How to fit Principles of Pharmacology, Physiology, Biochemistry, Cell Biology and Biostatistics in the first year?
- How to adapt to a year-long course in Medical Pharmacology?
- How to provide training in Systems Pharmacology?
- How to balance RCR, Grant Writing and Presentation Skills in years 1 and 2?
- How to develop independent learning?
- How to administer a qualifying exam that effectively evaluates the student?
How to fit Principles of Pharmacology, Physiology, Biochemistry, Cell Biology and Biostatistics in the first year?

“Common Curriculum” for all graduate students was dissolved three years ago.

Ideal to teach Principles in the fall semester – but we are at the mercy of the other courses

Principles of Pharmacology and Toxicology has no prerequisites so it can be taught any time
How to adapt to a year-long course in Medical Pharmacology?

All students take Medical Pharmacology (Toxicology students take 1/2 of the lectures)

3 years ago changed from 1 semester course to year-long course with erratic lecture schedule – 10am to 2pm

Adapted by making year 2 less structured and to place required courses (or electives) early in the morning or later in the afternoon.

We believe that the experience of taking Medical Pharmacology with medical students is more valuable than learning from recorded lectures.
How to provide training in Systems Pharmacology?

2-semester course in Experimental Pharmacology and Toxicology beginning the spring of year 1
Combination of lecture and demonstration by each faculty member stressing whole animal systems pharmacology and toxicology
IOSP Short Course at Michigan State University – summer between years 1 and 2
How to balance RCR, Grant Writing and Presentation Skills in year 1 and 2?

Feel strongly that RCR, grant writing and presentation skills need to be taught throughout years 1 and 2.

Each semester students take a 1-hour course “Scientific Communications and Ethics”

Semesters 1 and 2 – RCR is the primary focus but students also give 1-, 5-, and 15-min presentations.

Semesters 3 and 4 – grant writing is the focus and students prepare an NIH NRSA or AHA proposal.
How to develop independent learning?

Journal Club – required every semester until graduation

Presenter is asked to design the next set of experiments and this is discussed with the class

Experimental Pharmacology and Toxicology I & II

Last two sessions are devoted to presentations by each student directed at how the techniques learned could be used to address a research hypothesis given to them
How to administer a qualifying exam that effectively evaluates the student?

Qualifying Exam is taken in June of year 2

Issue: Historically Pharm and Tox had the same 2-day written exam (15 questions) but different oral exam (general knowledge for Pharm and grant proposal for Tox)

2010 – went to common written and oral exam

1-day written exam (6 questions) followed by 3-day take-home exam (choose 1 of 2 questions on a topic peripherally related to their research – must develop hypothesis, experimental design, present hypothetical data, interpretation. This graded by their oral examination committee

Oral exam – general knowledge
## Curriculum in Pharmacology for Years 1 and 2

<table>
<thead>
<tr>
<th>Fall Year 1</th>
<th>Spring Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemistry</td>
<td>Prin Pharm Tox</td>
</tr>
<tr>
<td>Cell Biology</td>
<td>Physiology</td>
</tr>
<tr>
<td>Biostatistics</td>
<td>Exp Pharm Tox</td>
</tr>
<tr>
<td>Journal Club</td>
<td>Journal Club</td>
</tr>
<tr>
<td>Sci Comm Ethics</td>
<td>Sci Comm Ethics</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall Year 2</td>
<td>Spring Year 2</td>
</tr>
<tr>
<td>Med Pharm</td>
<td>Med Pharm</td>
</tr>
<tr>
<td>Exp Pharm Tox</td>
<td>Clinical Toxicology</td>
</tr>
<tr>
<td>Journal Club</td>
<td>Journal Club</td>
</tr>
<tr>
<td>Sci Comm Ethics</td>
<td>Sci Comm Ethics</td>
</tr>
<tr>
<td>Elective</td>
<td>Elective (optional)</td>
</tr>
</tbody>
</table>