1. Course Title: Molecules to Man: Past, Present and Future Therapeutic Strategies for Disease

Course number: GMS 6560

Classroom: MWF 1:55-2:45pm– Academic Research Building (ARB) Room R5-265 (Department of Pharmacology & Therapeutics Conference Room) 3 credit course

Course Director: Jeffrey K. Harrison, Ph.D.

Administrative Assistant for the Course: Ellen L. Esparolini Phone: 294-5350 Office: R5-234 E-mail: eesparol@ufl.edu

2. Office hours: By appointment

3. Course Objectives
The overall goal of this course is to educate students in the pharmacologic and therapeutic basis to manage disease in humans. The course will cover the therapeutic application of small molecule drugs and biologics (peptides, gene therapy and cell-based therapies) to the treatment of disease in numerous systems. Students will develop an understanding of the underlying cellular mechanisms by which small molecule drugs and biologics affect both normal and pathophysiologic processes, but also gain an appreciation of how they act in the intact organism in the presence of diseases. Specifically, the course will a) provide students with a basic knowledge of mechanism(s) of action of prototype therapeutics (including major side effects), b) educate students on the history of drug/therapy development of various drug classes, c) consider current opportunities and approaches for development of new therapeutic agents (novel targets), that complement or supplant existing drugs.

Course Format: A mixture of educational modalities will be utilized. Class sessions will involve didactic delivery and application exercises that include learning the history, basic science, clinical relevance and future directions of therapeutic development in the specific subject matter. Students will be expected to pre-learn some of the material in assigned readings. Competencies in the basic knowledge of drug mechanisms will be determined by readiness assessment tests (RATs). Presentations by students (individual and teams), with facilitation by faculty, will be used to explore aspects of the history, basic and clinical science, and future directions of drug development. The format of a typical week (3 sessions) in the course involves:

Day 1 (1hr): Lecture/overview of topic by faculty member or faculty team

Day 2 (1hr): RAT based on lecture material from Monday and pre-assigned readings. Faculty will address student deficiencies revealed in the RAT. TBL (team based learning)/Application exercises will follow the RAT that will consist of a few open ended discussion questions based on a review article or research paper.

Day 3 (1hr): Student led discussions of basic science approaches to disease modeling and future directions in drug development. Clinical case studies can be included. Faculty facilitate discussion of the topics.
**Topics:**
A broad range of topics will be covered. The course will begin with a discussion of autonomnic pharmacology. Specific therapeutic modalities used to treat major diseases will follow and include:
- Cardiovascular diseases (pharmacologic management of heart failure, anti-hypertensive drug therapy, agents to control cardiac arrhythmias, diuretic agents, and lipid lowering drugs)
- Neuropharmacology (pharmacotherapies for Alzheimer’s disease (AD) and related dementias, mood and behavior disorders, neural circuit-based disorders, Parkinson’s disease (PD) and other movement disorders, drug addiction and treatment, and management of pain)
- Chronic inflammatory and autoimmune diseases
- Antimicrobial agents
- Cancer therapeutics including traditional chemotherapies and target-based approaches
- Pharmacotherapeutic approaches for diabetes and other endocrinology disorders

**4. Course Schedule:** specifics TBD

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<thead>
<tr>
<th>Week</th>
<th>Topics covered</th>
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<tbody>
<tr>
<td>1</td>
<td>Course expectations, autonomnic pharmacology</td>
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<td>2</td>
<td>Anti-hypertensive drugs</td>
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<td>3</td>
<td>Anti-arrhythmic agents</td>
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<td>4</td>
<td>Treatment of heart failure</td>
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<td>5</td>
<td>Pharmacotherapies for mood and behavior disorders (depression, anxiety, psychosis)</td>
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<td>6</td>
<td>Drug addiction</td>
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<td>7</td>
<td>Pharmacotherapies for neural circuit-based disorders (epilepsy)</td>
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<td>8</td>
<td>Pharmacotherapies for Alzheimer’s disease (AD) and Parkinson’s disease (PD)</td>
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<td>9</td>
<td>Pharmacologic approaches to pain</td>
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<td>10</td>
<td>Lipid disorders</td>
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<td>11</td>
<td>Chronic inflammation and autoimmune disease therapies</td>
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<td>12</td>
<td>Cancer therapeutics; traditional and target based</td>
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<td>13</td>
<td>Diabetes, endocrine, metabolic</td>
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<td>14</td>
<td>Anti-microbial and anti-viral agents</td>
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<td>15</td>
<td>Final exam week</td>
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5. Methods of Evaluation and Grading:
Students will be evaluated based on their performance on individual readiness assessment tests, in-class presentations and participation, and a final comprehensive exam. The final overall grade will be determined as follows:

- Readiness assessment tests (RATs) 40%
- Application exercises/presentations/participation/attendance 40%
- Comprehensive final exam 20%

The individual readiness assessment test (IRAT) will consist of multiple choice type questions based on content learned in pre-assigned readings and lectures.

Application exercises: Team activities/presentations, participation/attendance: Student participation in the team activities and presentations will be assessed by the course faculty. A rubric will be used for each presentation that will consist of 10 expectations for the students (to be defined by the various topics). Each expectation will be scored on a scale of 0-2 points (0:inadequate; 1: acceptable; 2: outstanding). Points will be summed and the average of all evaluations by faculty in attendance at the team activity will constitute the grade for that presentation.

Comprehensive final exam: multiple choice and short answer questions.

The following grading scale will be used for this course:
- A 93-100%
- A- 90-92.5%
- B+ 87-89.5%
- B 84-86.5%
- B- 80-83.5%
- C+ 77-79.5%
- C 74-76.5%
- C- 70-73.5%
- D+ 67-69.5%
- D 64-66.5%
- D- 60-63.5%
- E < 60%

At the end of the semester the final letter grade cut-offs may be adjusted lower, but will not be adjusted higher.

6. Attendance: Requirements for class attendance and make-up exams, assignments and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

7. Accommodations for students with disabilities: Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

8. Required and recommended textbooks: Lecture materials will be provided in pdf format. There is no required textbook.
9. **Information on current UF grading policies**: please consult the following website: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

10. **Evaluation process**: Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at: https://evaluations.ufl.edu

11. **Materials, Supplies, Fees**: not applicable