

## NSC 1001.2 'How To Develop A Drug For My Grandmother's Dementia'

Carrie K. Jones, Ph.D., Director, *In Vivo* and Translational Pharmacology, Vanderbilt Center for Neuroscience Drug Discovery with invited lecturer Dr. Paul Newhouse, M.D., Director, Vanderbilt Center for Cognitive Medicine

W 2:10-3:40 pm (one 50-min. session: 1/11; eight weekly 90-min. sessions: 1/18-3/15)

### Description

There are over 36 million people living with dementia worldwide, 75% of which have a primary diagnosis of Alzheimer's disease (AD). Currently, there is no available prevention or cure for AD. This seminar is designed to provide a basic understanding of how new drugs are identified and developed for chronic illnesses like AD at Vanderbilt. Students will be challenged to think and discuss the critical ramifications of how we make new drugs: including patient safety and access, as well as the cost of drug development and who pays for it. There will be a required weekly online interactive blog on Backboard after each class.

**01/11/2017 Introductory Lecture to Course:** Emerging Worldwide Epidemic of Dementia; Lecture and Interactive Discussion; Weekly Class Assignment: Read Book entitled *Still Alice* by Lisa Genova and/or Watch Movie Version 'Still Alice'

**01/18/2017 Session 1: Lab Camp**-Visit to the Vanderbilt Center for Cognitive Medicine with our host Dr. Paul Newhouse; Clinical Presentation and Diagnostic Testing Batteries Used to Assess Clinical Dementia

**01/25/2017 Session 2:** Identify and Validate a New Drug Target for Alzheimer's disease (M1 Muscarinic Acetylcholine Receptor); Read Ma et al. entitled 'Selective activation of the M1 muscarinic acetylcholine receptor achieved by allosteric potentiation.'

**02/01/2017 Session 3:** Interactive Discussion on Preclinical Development of M1 Positive Allosteric Modulator (PAM) for AD; Basic Biology of M1 PAMs, Automated High-throughput Screening (HTS), Medicinal Chemistry

**02/08/2017 Session 4: Lab Camp**- Visit to the Vanderbilt HTS Center, Medicinal Chemistry and DMPK labs for hands-on demonstrations of the technologies used to identify and develop M1 PAMs

**02/15/2017 Session 5: Lab Camp**-Interactive Discussion Animal Models of Dementia- Can you really test dementia in a mouse? Evaluation of Novel M1 PAMs in animal models of dementia; Tours and Hands-on Demos in Animal facilities

**02/22/2017 Session 6: Lab Camp**-Interactive Discussion-How are we going to evaluate our M1 PAM in AD patients? Visit to the Vanderbilt Clinical Research Center with Dr. Newhouse; Hands-on tour of the clinical units that will be used to evaluate the first M1 PAM in humans! Ethical Issues Debated.

**03/01/2017 Session 7:** Interactive Discussion-How are we going to pay for the development of our M1 PAM? The Economics of Drug Discovery: How much will our drug cost and who will pay for it?

**03/08/2017 Session 8:** Final Wrap-up for the stages of drug discovery and development of an M1 PAM of AD. Discussion regarding future of developing medicines for AD and ways that students can become involved on campus in these research and community outreach efforts during their 4 year training period.

**Evaluation:**

50% Weekly Class Participation; 50% Weekly Online Interactive Blog Assignments

**Required Reading**

Lisa Genova, *Still Alice* and/or movie *Still Alice*

Franz F. Hefti, *Drug Discovery for Nervous System Diseases* (Tentative)