

University of Wisconsin-Madison

NTP/Zoo655 - Modeling Neurodevelopmental Disease  
3 credits

<https://canvas.wisc.edu/courses/91623>

Spring 2018

**Course Designations & Attributes:**

Graduate 50%

Seminars: Monday/Wednesday 2:30–3:45 pm in **371 Noland Hall**

**Instructional Mode:**

All face to face.

Lectures, delivered by faculty instructors, will alternate with journal club-style primary literature discussions led by the students. Lectures will provide students with a broad understanding of the problem and the current literature. Discussions, based on selected readings, will give students an opportunity to deepen their understanding of the topics and to develop critical reading skills.

**Credit Hours:**

The credit standard for this 3 credit course is met by an expectation of a total of 135 hours of student engagement with the courses learning activities (at least 45 hours per credit), which include regularly scheduled instructor:student meeting times (twice weekly for 75 minutes each), reading, writing, and other student work as described in the syllabus.

**Course Director:** Yevgenya Grinblat, Associate Professor in the Departments of Integrative Biology and Neuroscience. 125 Zoology Research Building; [ygrinblat@wisc.edu](mailto:ygrinblat@wisc.edu)

**Office hours:** To schedule a meeting outside of class time please contact Prof. Grinblat at [ygrinblat@wisc.edu](mailto:ygrinblat@wisc.edu). Regular weekly office hours may be scheduled if needed.

**Course Description:**

This 3-credit course will systematically explore current research strategies for modeling human diseases that affect the central nervous system. Topics will include birth defects that disrupt normal brain architecture (holoprosencephaly and neural tube closure defects), disorders of the visual system, and postnatal disease, e.g. neurodegeneration and stroke. This course is designed for advanced undergraduate students, but is appropriate for graduate students and undergraduates who meet the prerequisites.

**Prerequisites:** Graduate standing or Botany/Genetics/Zoology 466, Zoology 470, NTP/Psych/Zoology 523, Or Zoology 570

**Course Objectives:**

- to provide students with a broad understanding of how basic biomedical research is used to model human disease
- to provide students with the opportunity to sharpen their critical reading and thinking skills, and to learn through teaching
- to prepare students for a lifetime of learning through independent primary literature analysis
- to equip students with the tools necessary to be knowledgeable and committed advocates for basic research and its essential role in healthcare

# University of Wisconsin-Madison

## Course Learning Outcomes:

Students will be able to:

- apply and enhance their understanding of genetics and cell biology
- understand the concepts and methods used to model human disease
- read and critically evaluate current scientific literature
- develop and present short lectures on selected topics
- prepare review-style articles based on primary literature research

**Class materials:** There is no textbook for this class as the field is changing rapidly. Assigned reading will be drawn from current literature. All reading materials will be distributed via Learn@UW prior to class.

**Grading:** The final grade for the course will be calculated as follows:

Literature discussion summaries (weekly, 5 points each)	40%
Class presentation of independent research topic (end of semester)	25%
Written report on independent research project (end of semester)	25%
Class participation	10%

Literature discussion summaries: a short (~1 page) critical evaluation of the assigned readings, which includes a question you would like answered during discussion (see detailed instructions below). Summaries for each discussion meeting will be due by 2 pm on the day before the meeting. Please upload your summaries in a designated Dropbox folder on Learn@UW.

Independent research projects: In consultation with the instructor, each student will select a topic not covered in class and will develop a short lecture to present to class at the end of semester. Students will also prepare a review-style article on their selected topics (see below for guidelines). Students may choose to work individually or in pairs to explore their topics in more depth.

Extra credit: you may earn extra credit by attending relevant research seminars and submitting brief summaries of the covered material. Please check with Prof. Grinblat *before attending* to make sure the seminar topic is appropriate.

The final letter grade assignment will be based on a conventional scale (A 90-100, AB 86-89, B 75-85, BC 71-74, C 60-70, D 50-59, F < 50).

**Additional criteria for graduate student assessment:** graduate students enrolled in the class will be required to read and analyze at least two additional original papers per topic, chosen in consultation with the instructor, and to include this analysis in their written summaries. During independent projects, graduate students will be expected to include a short proposal for future studies in their oral and written presentations.

**Final exam:** There will be no final exam.

University of Wisconsin-Madison

Week	Day	Date	Topic	Format*
1	Wed	Jan 24	Course overview	L (YG)
2	Mon	Jan 29	Birth defects affecting brain architecture	L (YG)
	Wed	Jan 31	Birth defects affecting the visual system	L (YG)
3	Mon	Feb 5	Birth defects affecting the brain&visual system	D1
	Wed	Feb 7	iPS cells and retinal disease modeling	L (DS)
4	Mon	Feb 12	iPS cells and retinal disease modeling	D2
	Wed	Feb 14	Neurodegenerative disorders	L (ED)
5	Mon	Feb 19	Neurodegenerative disorders	D3
	Wed	Feb 21	Neurodegenerative disorders: clinical perspective	L (CG)
6	Mon	Feb 26	Neurodegenerative disorders: clinical perspective	D4
	Wed	Feb 28	ADHD	L (LP)
7	Mon	Mar 5	ADHD	D5
	Wed	Mar 7	Psychiatric illness	L (YG)
8	Mon	Mar 12	Psychiatric illness	D6
	Wed	Mar 14	Postnatal neurodevelopmental disorders	L (XZ)
9	Mon	Mar 19	Postnatal neurodevelopmental disorders	D7
	Wed	Mar 21	Individual meetings/IP topic selection	
10	Mon	Mar 26	SPRING BREAK	
	Wed	Mar 28	SPRING BREAK	
11	Mon	Apr 2	Individual meetings/IP topic selection	
	Wed	Apr 4	Burning issues and future perspectives	L (YG)
12	Mon	Apr 9	Burning issues and future perspectives	D8
	Wed	Apr 11	Student lectures	
13	Mon	Apr 16	Student lectures	
	Wed	Apr 18	Student lectures	
14	Mon	Apr 23	Student lectures	
	Wed	Apr 25	Student lectures	
15	Mon	Apr 30	Student lectures	
	Wed	May 2	Student lectures	
16	Wed	May 9	<b>FINAL PAPERS DUE</b>	

**\*Format:**

L – lecture

D – discussion (D1 - D8)

**Lecturers:**

YG: Yevgenya Grinblat, Ph. D., Course Director

DS: Divya Sinha, Ph. D., Postdoctoral Fellow, Ophthalmology

ED: Erik Dent, Ph. D., Professor of Neuroscience

XZ: Xinyu Zhao, Ph. D., Professor of Neuroscience

CG: Cathy Gallagher, M. D., Professor of Neurology

LP: Luis Populin Ph. D., Professor of Neuroscience