

THE CEREBELLUM: IS IT JUST FOR MOTOR CONTROL? AS.080.370(01)

FALL 2019

The cerebellum is traditionally thought to be involved in movement and motor control, and observations of patients with cerebellar damage do in fact show motor deficits. However, since the proliferation of functional MRI, cerebellar activations have been observed in a surprising number of brain activation studies that were designed to investigate the neural correlates of cognitive function, and cognitive deficits have been observed in cerebellar patients. Over the past 2 decades, an increasing number of investigators have tried to characterize the role of the cerebellum in cognitive function. Through lectures and reading discussions this course will survey cerebellar circuitry, neuroimaging and neuromodulatory methods for investigating the cerebellum, and traditional and non-traditional functions of the cerebellum, including cerebellar involvement in cognitive functions such as language, working memory, and executive control.

- Time: Tuesdays and Thursdays 10:30-11:45 am
- Location: Ames 320
- Instructor: Dr. John Desmond (jdesmon2@jhmi.edu)
- Office hours: By Appointment, Reed Hall Room 106 (1620 McElderry St, East Baltimore campus, right next to outpatient center). Telephone: 410-502-3583
- Grading: Participation – 20%
Midterm – 40%
Final – 40%
- Participation: On most Tuesdays we will discuss a research paper related to the previous Thursday's lecture topic. All students are expected to participate in the discussions (voluntarily or as called upon by the instructor). Participation in the paper discussion classes will count 10% toward your grade. Students will also give a conference style slide presentation of a paper (approx. 5-10 minutes with questions, 10%). Attendance at lectures is also expected.
- Exams: There will be one mid-term and one (non-cumulative) final exam. These may consist of multiple choice, short answer, and long answer questions, and will cover both lecture material and the Tuesday discussion papers. If a test cannot be taken on the regular day due to illness, family emergency, or extra-curricular activities, arrangements should be made to take the test in advance whenever possible. Students should inform instructors about such extra-curricular activities as early in the semester as possible.
- Goals: At the completion of this course students will have a better understanding of (1) cerebellar anatomy and connectivity; (2) symptoms of cerebellar damage; (3) cognitive neuroscience methods for studying the human cerebellum; and (4) the involvement of the cerebellum in non-motor functions. Students will also gain experience presenting scientific data in a Society for Neuroscience style oral presentation format.

Schedule:

<u>Day</u>	<u>Date</u>	<u>Lecture Title</u>
Tue	3-Sep	Introduction, overview, cerebellar anatomy
Thur	5-Sep	Anatomy cont., motor symptoms, theories of motor function
Tue	10-Sep	Paper discussion
Thur	12-Sep	Methods of studying the human cerebellum: TMS
Tue	17-Sep	Paper discussion
Thur	19-Sep	Guest Lecture: Dr. Gabriela Cantarero
Tue	24-Sep	Guest Lecture: Dr. Adrian Haith
Thur	26-Sep	Methods for studying the human cerebellum: fMRI
Tue	1-Oct	Paper discussion
Thur	3-Oct	Sensory Acquisition
Tue	8-Oct	Paper discussion
Thur	10-Oct	Review
Tue	15-Oct	MIDTERM EXAM
Thur	17-Oct	Classical conditioning
Tue	22-Oct	Student presentations
Thur	24-Oct	Timing
Tue	29-Oct	Paper discussion
Thur	31-Oct	Student presentations
Tue	5-Nov	Student presentations
Thur	7-Nov	Verbal working memory
Tue	12-Nov	Paper discussion
Thur	14-Nov	Language
Tue	19-Nov	Paper discussion
Thur	21-Nov	Executive function
Tue	26-Nov	Thanksgiving
Thur	28-Nov	Thanksgiving
Tue	3-Dec	Guest lecture: Dr. Cherie Marvel
Thur	5-Dec	Review
	7-10 Dec	Reading period
Thur	12 Dec	Final Exam 6-9 PM