

McGill University, Department of Neurology and Neurosurgery  
**History of Neuroscience (NEUR 560)**  
Winter Term 2021

**Zoom link:**

<https://mcgill.zoom.us/j/81426138945?pwd=YU1OK0I5VVMwMUtIMWJSR2ZPbnRSUT09>

- Please read the Guidelines on Remote Teaching and Learning [<https://www.mcgill.ca/tls/instructors/class-disruption/strategies/guidelines-remote>].
- All lectures will be recorded. Students will be notified through a ‘pop-up’ box in Zoom that a lecture or portion of a class is being recorded. By remaining in sessions that are recorded, you agree to the recording, and you understand that your image, voice, and name may be disclosed to classmates. You also understand that recordings will be made available in myCourses to students registered in the course. Should you choose not to participate in a lecture while it is being recorded, you will have access to the recording and can peruse it later (at your convenience).

**Time:** Fridays, 13:00 to 16:00

**Instructors:**

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**Coordinators:** Mechawar and Rochford

**Office hours:** By appointment.

**Description:** This 500-level course offers a historical survey of neuroscience, from antiquity to the major discoveries of the XX<sup>th</sup> century. Conceptual and technical advances having led to our current understanding of brain function will be reviewed and discussed. Particular attention will be devoted to the evolution of knowledge concerning the nature of nervous tissues, the functional organization of sensory and motor systems, and the processes underlying emotions and cognition. The course will conclude with a brief history of the study of psychopathologies.

**NOTE:** In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

**Lectures:**

January 8 :	<b>Course introduction/overview (NM, JR, ST) &amp; Philosophy of brain function, part I (JR)</b>
January 15 :	<b>Philosophy of brain function, part II (JR) Theories of brain function I (5,000 B.C. – 1,200 A.D.) (ST) [1]*</b>
January 22 :	<b>Theories of brain function II (1,200 A.D. – pres. day) (ST) [2-4]</b>
January 29 :	<b>The neuron doctrine (NM) [3]</b>
February 5 :	<b>The electrical brain (NM) [pp. 431-435] <i>Essay topics distributed</i></b>
February 12 :	<b>The chemical brain (NM)</b>
February 19 :	<b>Sensory systems (ST) [5-7]</b>
February 26 :	<b>Motor functions (ST) [14-16] <i>Essay 1 due</i></b>
March 5 :	<i>No class – Spring break</i>
March 12 :	<b>Intellect and the brain (JR) [21-22] <i>Essay topics distributed</i></b>
March 19 :	<b>Emotions (JR) [19-20]</b>
March 26 :	<b>Memory (JR) [23-24] <i>Essay 2 due</i></b>
April 2 :	<i>No class – Good Friday</i>
April 9 :	<b>Psychopathology (special lecture: Dr. Ridha Joobar)</b>
April 16 :	<b>FINAL EXAM</b>

**\* [Suggested chapters from the S. Finger textbook]**

**Evaluation:**

Students will be evaluated on two take-home essays (5 pages each; 2 x 30%), and a final written exam (40%).

*In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded. Conformément à la Charte des droits des étudiants de l'Université McGill, les étudiants de ce cours ont le droit de soumettre en anglais ou en français tout travail écrit qui doit être classé.*

*The instructors will not adopt the use of text-matching software to verify the originality of students' written course work. However, students must be aware of and respect the principles of academic integrity (see below).*

**Textbook:**

Finger, S. *The Origins of Neuroscience: A History of Explorations into Brain Function*. New York: Oxford University Press, 1994.

**Additional suggested readings**

### Textbooks (general)

Finger, S. *Minds behind the brain – A history of the pioneers and their discoveries*. New York: Oxford University Press, 2000.

Marshall LH & Magoun HW. *Discoveries in the Human Brain – Neuroscience prehistory, brain structure, and function*. Totawa (NJ): Humana Press, 1994.

### Theories of Brain Function I & II

**Gross CG. (1995) Aristotle on the Brain. *The Neuroscientist* 1: 245-250. (Sept. 10)**

Rose FC (2009) Cerebral Localization in Antiquity *J Hist Neurosci* 18: 239-247.

Todman D. (2008) Epilepsy in the Graeco-Roman World: Hippocratic Medicine and Asklepiian Temple Medicine Compared. *J Hist Neurosci* 17: 435-441.

Karenberg A (2009) Cerebral Localization in the Eighteenth Century - An Overview. *J Hist Neurosci* 18: 248-253.

Steinberg DA. (2009) Cerebral Localization in the Nineteenth Century - The Birth of a Science and its Modern Consequences. *J Hist Neurosci* 18: 254-261.

### The Neuron Doctrine

**Sotelo C. (2003) Viewing the brain through the master hand of Ramon y Cajal. *Nat Rev Neurosci* 4 :71-77.**

Golgi C. (2003) The impossible interview with the man of the hidden biological structures. Interview with Paolo Mazzarello. *J Hist Neurosci* 15 :318-325.

Garcia-Lopez P, Garcia-Marin V, Freire M. (2010) The histological slides and drawings of Cajal. *Front Neuroanat* 10;4:9.

### The Electrical Brain

**Beaudreau SA, Finger S. (2006) Medical electricity and madness in the 18th century: the legacies of Benjamin Franklin and Jan Ingenhousz. *Perspect Biol Med* 49:330-345.**

Parent A. (2004) Giovanni Aldini : from animal electricity to human brain stimulation. *Can J Neurol Sci* 31 :576-584.

Verkhatsky O, Krishtal OA, Petersen OH (2006) From Galvani to patch clamp : the development of electrophysiology. *Pflugers Arch* 453 :233-247.

### The Chemical Brain

**Snyder S (2009) Neurotransmitters, receptors, and second messengers galore in 40 years. *J Neurosci* 29:12717-12721.**

Finger, S. Otto Loewi and Henry Dale: The Discovery of Neurotransmitters, in *Minds behind the brain – A history of the pioneers and their discoveries*. New York: Oxford University Press, 2000.

## Sensory systems

**Hubel DH, Wiesel TN (1998) Early exploration of the visual cortex. *Neuron* 20 :401-412.**

## Motor functions

**Stiles A (2006) Cerebral automatism, the brain, and the soul in Bram Stoker's *Dracula*. *J Hist Neurosci* 15:131-152.**

Tyler KL, Malessa R (2000) The Goltz-Ferrier debates and the triumph of cerebral localizationalist theory. *Neurology* 55:1015-1024.

Eadie MJ (2009) The role of focal epilepsy in the development of Jacksonian localization. *J Hist Neurosci* 18:262-282.

## Intellect and the Brain

Jacobsen, C.F. (1935) Functions of frontal association areas in primates *Archives of Neurology and Psychiatry* 33, 358-369. (PDF available at:

<http://www.sfn.org/skins/main/pdf/HistoryofNeuroscience/CFjacobsen.pdf>

## Emotions

McLean, P. (1998). Paul McLean. In *The History of Neuroscience in Autobiography VOLUME 2*. L.R. Squire (ed). San Diego: Academic press. (PDF available at [http://www.sfn.org/skins/main/pdf/history\\_of\\_neuroscience/hon\\_vol\\_2/c9.pdf](http://www.sfn.org/skins/main/pdf/history_of_neuroscience/hon_vol_2/c9.pdf))

Papez, J. W. (1937). A proposed Mechanism of Emotion. *Archives of Neurology and Psychiatry*. 38: 725-734. (PDF available at

<http://www.sfn.org/skins/main/pdf/HistoryofNeuroscience/papez.pdf>)

## Memory

Milner, B. (1998). Brenda Milner. In *The History of Neuroscience in Autobiography VOLUME 2*. L.R. Squire (ed). San Diego: Academic press.. (PDF available at [http://www.sfn.org/skins/main/pdf/history\\_of\\_neuroscience/hon\\_vol\\_2/c10.pdf](http://www.sfn.org/skins/main/pdf/history_of_neuroscience/hon_vol_2/c10.pdf))

### **Use of course materials:**

© Instructor-generated course materials (e.g., handouts, lecture notes, exam questions) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Note that infringements of copyright can be subject to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.

### **Academic Integrity:**

*McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under*

*the Code of Student Conduct and Disciplinary Procedures (see <http://www.mcgill.ca/students/srr/honest/> for more information).*

*L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site <http://www.mcgill.ca/students/srr/honest/>).*