

Brain Health 411

Professor Tracey J. Shors, Ph.D.

The course is an upper level course in Psychology, with an emphasis on topics related to the neuroscientific and psychological study of brain health. In addition to scientific papers, students will read several books related to the covered topics. Students will also be required to construct essays, give a short presentation, participate in class discussions and complete standard exams. Lectures will cover the following topics:

INTRODUCTION TO TOPIC OF BRAIN HEALTH (read Stroke of Insight)

- How learning and neurogenesis interact to support brain health
- Mental and Physical (MAP) Training
- How can we make the most of “translation?”
- Can we translate from the real world back to the laboratory?
- Exercise for cognitive enhancement and stress reduction
- Mental training for cognitive enhancement
- spinal and cranial nerves (class presentations)
- (First exam on October 6)
- Zika and its effects on brain health What do sex differences in the brain really mean? Are they meaningful? If so, which ones and why?

ENHANCING BRAIN HEALTH

- Anatomy of an Epidemic (book discussion; second essay)
- Meditation or medication?
- Psychotropic medications – do they help or hinder brain health?
- The heart -- how does it talk to the brain?
- Far from the Tree (book discussion; third essay)
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Required Reading and Books (Kindle version is fine.)

- The Human Brain, Rita Carter, DK Publisher, 2009, ISBN: 978-0-7566-5441-2
- My Stroke of Insight, A Brain Scientist's Personal Journey, Plume, 2009
- Far from the Tree, Andrew Solomon, 2012
- Anatomy of an Epidemic, Robert Whitaker, Crown Publishers, 2010

Examination and Grading: Each student will be expected to participate in class discussions – after I provide a more or less formal lecture on the topic. Students will be required to construct two short essays (~2000-3000 words) and contribute to class presentations. The testing will consist of one objective/short answer test on Brain Health in general and a second quiz on the heart. I will assign some journal readings as we go along, which will be posted on Sakai.

GRADES:

TWO ESSAYS 25X2 = 50

CLASS PRESENTATIONS = 15

CLASS PARTICIPATION = 10

Midterm = 15

quiz = 10

Week 1: Overview of brain health and translational neuroscience September 6

Week 2: Assignments for September 8 and 13

The first two lectures will focus on the neuronal and behavioral consequences of mental and physical skill (MAP) training as they relate to neurogenesis and cell survival, as well as the basis and treatment implications regarding sex differences in the incidence and expression of mental illness. I will post articles to read after the first introductory lecture.

<http://cdp.sagepub.com/content/23/5/311.short>

- Shors T.J. (2014) The adult brain makes new neurons and effortful learning keeps them alive. *Current Directions in Psychological Science*, 23, 311-318.

<http://www.sciencedirect.com/science/article/pii/S1074742714001580#>

- Shors, T.J., Olson, R.L., Bates, M.E., Selby, E.A., & Alderman, B.L. (2014). Mental and Physical (MAP) Training: A Neurogenesis-Inspired Intervention that Enhances Health in Humans. *Neurobiology of Learning and Memory*, 115, 309, <http://dx.doi.org/10.1016/j.nlm.2014.08.012>.

<http://www.nature.com/tp/journal/v6/n2/full/tp2015225a.html>

- Alderman, B.L., Olson, R.L., Brush, C.J., Shors, T.J., (2016). Mental and Physical (MAP) Training: Combining meditation and aerobic exercise reduces depression and rumination while enhancing synchronized brain activity. *Transl. Psychiatry* 6, e726; doi:10.1038/tp.2015.225

Week 4 and 5: In class presentations

Each student will present short summary regarding function and integration of spinal and cranial nerves. I will hand out those assignments in class.

Week 6: Zika virus and neurogenesis in the adult and fetal brain

Week 7-9: Anatomy of an Epidemic, Robert Whitaker, Crown Publishers, 2010

Each student will pair up with another student to present short summary regarding the pros and cons of psychotropic medications. I will hand out the specific assignments in class.

Weeks 10: The Heart and its Integration with the Brain

Weeks 11-14: Far from Tree (select chapters will be discussed with student presentations)