

## Classic Papers in Neuroscience: A selection of salient discoveries and their impact

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The course will present and discuss a selection of pioneering, notable experimental papers that became classics in neuroscience. These papers sample a spectrum of topics, methods and levels of analysis. In each case, we will discuss the roots and rationale of the work, the results, the extent to which these results withstood the test of time, and the long-term impact on the field of neuroscience. Additional papers or reviews reflecting subsequent developments in the field will also be discussed in each case.

The course is intended to promote understanding of the conceptual and methodological framework in which major chapters in current neuroscience are embedded, and the development of a selection of research questions and experimental approaches.

The papers to be discussed are (listed in alphabetical order):

1. Bliss TVP, Lomo T (1973). Long-lasting potentiation of synaptic transmission in the dentate area of the anaesthetized rabbit following stimulation of the perforant path. *J Physiol (London)* 232, 331-356.
2. Castellucci V, Pinsker H, Kupfermann I, Kandel ER (1970). Neuronal mechanisms of habituation and dishabituation of the gill-withdrawal reflex in *Aplysia*. *Science* 167, 1745-1748.
3. Georgopoulos AP, Schwartz AB, Kettner RE (1986). Neuronal population coding of movement direction. *Science* 233, 1416-1419.
4. Hodgkin AL, Huxley AF (1952). A quantitative description of membrane current and its application to conductance and excitation in nerve. *J Physiol (London)* 117, 500-544.
5. Konopka RJ, Benzer S (1971). Clock mutants of *Drosophila melanogaster*. *Proc Natl Acad Sci USA* 68, 2112-2116.
6. Lettvin JY, Maturana HR, McCulloch WS, Pitts WH (1959). What the frog's eye tells the frog's brain. *Proc. Inst. Radio Engr* 47, 1940-1951.
7. Newsome WT, Britten KH, Movshon JA (1989). Neuronal correlates of a perceptual decision. *Nature* 341, 52-54.
8. Ogawa S, Tank DW, Menon R, Ellermann JM, Kim S-G, Merkle H, Ugrubil K (1992). Intrinsic signal changes accompanying sensory stimulation: Functional brain mapping with magnetic resonance imaging. *Proc Natl Acad Sci USA* 89, 5951-5955.
9. O'Keefe J, Dostrovsky J (1971). The hippocampus as a spatial map. Preliminary evidence from unit activity in the freely-moving rat. *Brain Res* 34, 171-175.
10. Phillips RG, LeDoux JE (1992). Contribution of amygdala and hippocampus to cued and contextual fear conditioning. *Behav Neurosci* 106, 274-285.

11. Scoville WB, Milner B (1957). Loss of recent memory after bilateral hippocampal lesions. *J Neurol Neurosurg Psychiat* 20, 11-21.
12. Sperling G (1960). The information available in brief visual presentations. *Psychol Monog: General and Applied*, 74 (11) 1-29.

Assessment: This will be conducted in two steps. An interim project will require writing a short summary of two of the target papers discussed in the course up to that point in time. The final project will require the student to select a paper not in the course's list, do a literature search and describe whether that paper stood the test of time and why/why not.

Time and Location: Tuesday, 12:00-14:00, Meyer 815. The course will start on February 16, 2016. One of the 12 classes will be held on a different day of the week, TBA.

Prerequisites: Cellular and Molecular Neuroscience and Behavioral and Integrative Neuroscience

Course enrollment cap: 20