

GUIDELINES FOR THE TERM PAPER IN MEDS 5384, BRAIN MICROCIRCUITRY

1. Your paper should be limited to a single region of the CNS that is recognized by most neuroscience experts. Papers about entire systems contain multiple brain regions are not acceptable.
2. Papers must focus on the cellular organization and the brain microcircuitry.
3. Only a function or functions relevant to that microcircuit are acceptable.
4. Papers may not duplicate one of the chapters in the Shepherd text.
5. If you cannot find the information you need, it may not be known or it may be in an older reference. Some old data will be quite useful.
6. All writing must be original work. All quotes must be identified with quotation marks, and the source cited.
7. The topic must be approved by me by the mid-term.
8. All papers will be presented during the last class and should be turned into me the week before final exams.

Each paper should include a section on each of the following:

1. Cell types. You must define cell types. There are many ways to do this, some old and some very modern. You must identify:
 - a. Projection neurons
 - b. Local circuit neurons, e.g., interneurons, Golgi II cells
2. Inputs – You may link the function of your CNS region to a system through its inputs and outputs.
3. Neurotransmitters – both for the input synapses and local synapses
4. Function of neurons – here you try to explain how the inputs and local circuit neurons activate the projection neurons. You have a lot of leeway here, in terms of how much physiology you include. Data from MRI or other methods that cannot resolve single cells will be less useful, but you might include it in #6.
 - a. Data from extracellular recordings in vivo
 - b. Data from intracellular recordings in vivo or in vitro
 - c. Other types of functional data
5. Outputs – Where do the projection neurons send their axons? What is their purpose?
6. Basic microcircuit – Here you try to explain how this part of the CNS operates based on all the data presented in #1-5. This is a discussion of the cellular mechanisms that operate in the brain region. You should avoid a discussion of the overall system and system wiring diagrams.
 - a. A drawing of the basic circuit is required.
 - b. A discussion of how the basic circuit operates is required.

Check with me about specific details of your paper. These guidelines can be modified only with our permission.

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