

**MED 6197**  
**Cellular and Molecular Neuroscience, 2011**  
**OUTLINE AND SCHEDULE**

**TIME: Tuesday and Thursday 2:00 – 4:00 pm, 4<sup>th</sup> floor conference room**  
**Midterm break: Feb 22**

**Coordinator:**

**Dr. Michiru Hirasawa, H4338/4313, phone 777-6727, email: michiru@mun.ca**

### **Course Objective**

To build the understanding of:

- Cellular and molecular mechanisms of the nervous system
- Experimental approaches for cell and molecular biology in neuroscience

Skill development:

- Critical assessment of information
- Concise writing

### **Contents**

➤ **Lectures**

Various topics relevant to cellular and molecular neuroscience will be presented by faculty members.

➤ **Article discussions**

50% of the final mark; critique (60%), presentation during class (30%) and participation during class (10%)

1. **1-page** written critique to be submitted before the session (each critique will be assessed by the faculty member in charge of the session).
2. In the class, each student takes a turn to present a part of the assigned paper i.e. everyone participates in presenting a single article (intro, Fig1, Fig2...). Methods, results and discussion should be blended into the discussion of each figure. The order of presentation will be determined at the session (students will not know in advance which part they will get).

### **Tips for written critique and discussions**

❖ **Synopsis (approx. 50% of the page)**

1. **Background:**

- What issue is being addressed?
- What has previously been done?

- What new hypothesis/approach are the authors using to address the problem/issue?
  - 2. Clearly state the objectives of the paper.
  - 3. Results:
    - For each figure:
      - What is the question it is addressing?
      - How was the experiment performed – understand and be able to explain the experimental technique and method of analysis.
      - What is the main conclusion from the result of the experiment?
- ❖ Critique (approx. 50% of the page)
1. Do the experiments address the hypothesis?
  2. What is novel about the study?
  3. How does it fit with the current data on the topic?
  4. What are the limitations of the experiment used?
  5. Other possible interpretations of the result

➤ Writing assignment

Journal of Neuroscience Journal club article format (below is the guideline from the journal website)

**Content and Format**

We encourage critical reviews, but comments must be accurate, well-reasoned, and diplomatic. Inappropriately harsh or glowing reviews will not be considered.

In general, Journal Club articles should have three components: a short overview of the background of the reviewed paper, a critical data-based review of the key findings, and a brief summary of the significance of the paper.

The Journal Club must offer more than a summary of what was stated in the original article. For example, it might provide a more in-depth explanation of a new technique used in the paper, important caveats or interpretations that the author did not mention, or a distinct interpretation of the results in the context of work that the author did not discuss (e.g., important findings published in the last couple of months).

The Journal Club should focus on the most important results — there is rarely reason to discuss every figure.

The length is limited to about 1500 words. References are limited to approximately 7.

Avoid using jargon and unnecessary abbreviations.

Titles should be informative.

A single, original schematic or explanatory figure is acceptable.

1. Choose an article

Deadline: Jan. 25

- Choose a paper that mainly deals with cellular/molecular neuroscience
- Choose from one of the following journals: Nature, Science, Nature Neuroscience, Neuron, Journal of Neuroscience
- Submit first and second choice along with a brief statement of why you chose these papers

2. Present an outline (15% of final mark)

- 30 min presentation
- Summarize the paper (background, hypothesis, approach, key results and conclusion)
- Summarize what the authors discussed
- Outline the focus of your discussion. Clearly explain how it is different from what is written in the paper
- Q & A

3. Write an article (35% of final mark)

Deadline: April 12

There will be two reviewers (instructors) assigned to a paper.

| Date |     |   | Topic   | Instructor   |
|------|-----|---|---|--------------|
| Wk1  | Jan | 11  | Course overview   | M Hirasawa   |
|      |     | 13  | Gene expression   | J Vanderluit |
| Wk2  |     | 18  | Protein analyses  | J Vanderluit |
|      |     | 20  | Transgenic/computer lab ( <b>HS computer lab B</b> )                                    | A Dorward    |
| Wk3  |     | 25  | Transgenic Literature overview  | AD           |
|      |     | 27  | Neurotransmitters: synthesis, storage and release                                       | M Hirasawa   |
| Wk4  | Feb | 1   | <b>Article #1</b>   | MH           |
|      |     | 3   | Overview of various types of receptors, details of GPCR; Receptor pharmacology          | J Weber      |
| Wk5  |     | 8   | <b>Article #2</b>   | JW           |
|      |     | 10  | Receptors/signalling pathways (excluding GPCRs)   | K Mearow     |
| Wk6  |     | 15  | Ion channels inclu. Ionotropic receptors (NMDAR, AMPAR etc) and postsynaptic potentials | X Chen       |
|      |     | 17  | <b>Article #3</b>   | XC           |
| Wk7  | 22  | <i>Midterm break</i>  |   |              |
|      | 24  | Electrophysiology/ lab visit  | M Hirasawa  |              |
| Wk8  | Mar | 1   | <b>Presentations on written assignments</b>   |              |
|      |     | 3   | <b>Presentations on written assignments</b>   |              |
| Wk9  |     | 8   | <b>Article #4</b>   | MH           |
|      |     | 10  | Synaptic integration/ plasticity  | Q Yuan       |
| Wk10 |     | 15  | <b>Article #5</b>   | QY           |
|      |     | 17  | Molecular imaging in metabolic disease (MRS, PET and SPECT)                             | E Kendall    |
| Wk11 | 22  | Imaging 1: General introduction to imaging, confocal microscopy, fluorescence imaging | K Mearow  |              |
|      | 24  | <b>Article #6</b>   | KM  |              |
| Wk12 | 29  | Imaging 2: EM, image analysis, stereology, golgi staining, cell tracing etc.          | J McLean  |              |
|      | 31  | <b>Article #7</b>   | JM  |              |
| Wk13 | Apr | 5   | Stem cells/ lab visit   | J Vanderluit |
|      |     | 7   | <b>Article #8</b>   | JV           |