

Cellular Neurobiology 2018-19

SVB0069/SVB0055



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https://cmb.campusnet.unito.it/do/docenti.pl/Show?_id=pbovolin#profilo



Yoav Gothilf - Tel Aviv University – Visiting professor

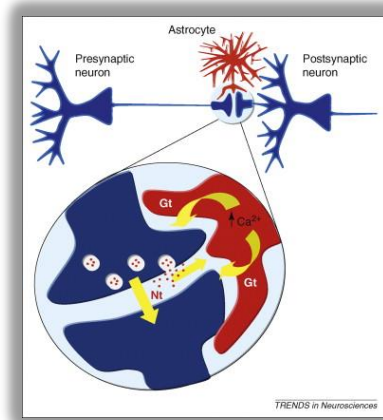
yoavgothilf@gmail.com

<http://gothilflab.wixsite.com/gothilflab>

Student survey

<p>Your previous degree (title, University)</p>	
<p>Year (first or second) and type of Master Degree (if different from CMB)</p>	
<p>Level of English knowledge, type of English courses taken before</p>	
<p>Neurobiology courses attended before</p>	
<p>Specify from which courses you obtained some Neurobiology background in the past</p>	
<p>In which of the following fields of neuroscience do you have significant background? Put a cross near the fields that you choose</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Neuroanatomy <input type="checkbox"/> Neurochemistry <input type="checkbox"/> Neurophysiology <input type="checkbox"/> Cellular Neurobiology <input type="checkbox"/> Molecular Neurobiology <input type="checkbox"/> Developmental Neurobiology <input type="checkbox"/> Neuropathology <input type="checkbox"/> Behavioural studies <input type="checkbox"/> Neuropsychology <input type="checkbox"/> Other.....
<p>Which of the above Neurobiology fields do you like most?</p>	
<p>Do you like best classical lectures (only the teacher speaks) or interactive</p>	

Course delivery



- This course includes **40 hours of in-class lectures** and seminars, exercises discussions times and short movies.

First part: Bovolin (28 hrs)

Second part: Gothilf (12 hrs)

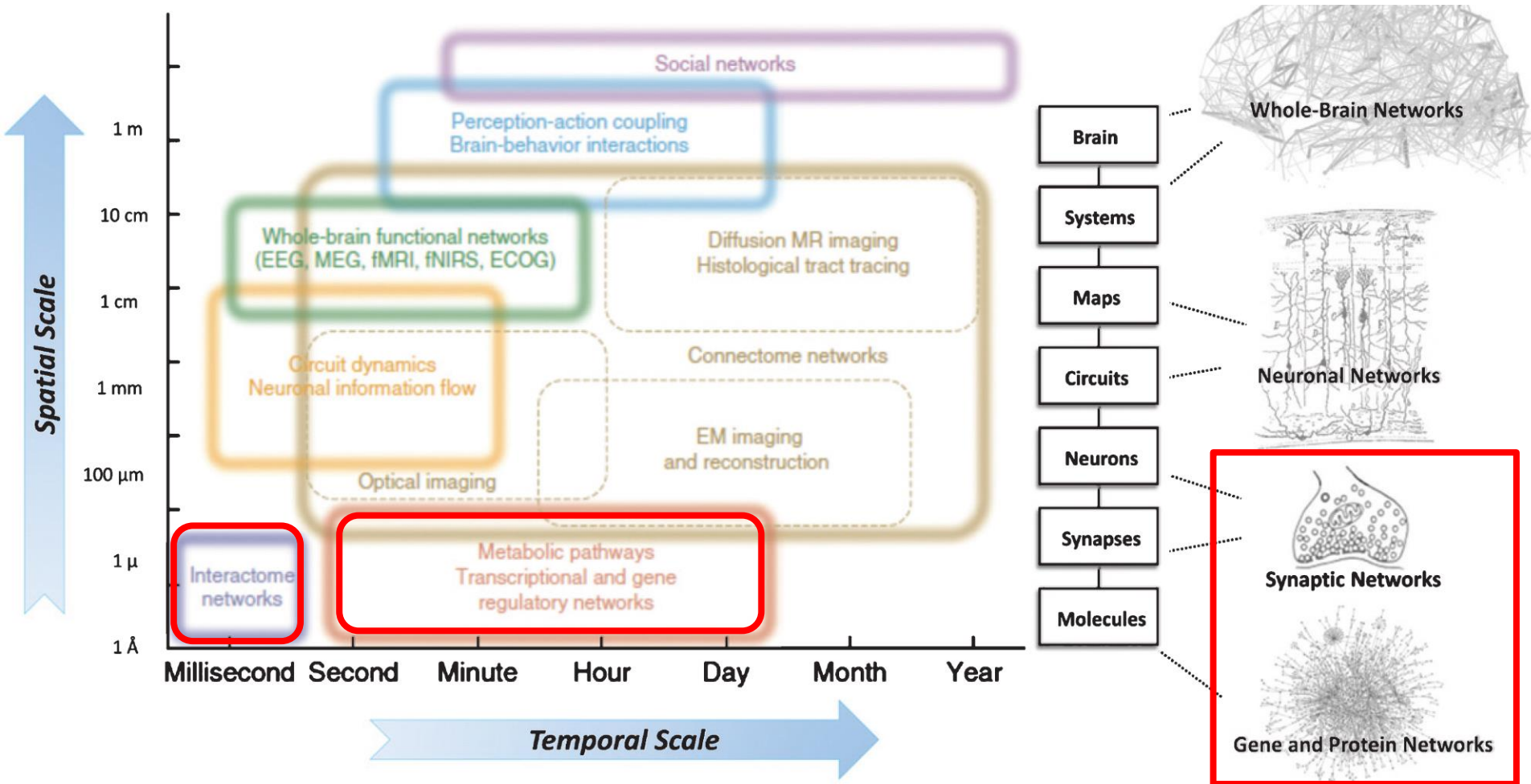
- At the end of the first part the students will be engaged in **short ppt presentations of an experimental article** related to the topics presented in class by the teacher (about 4 hrs)

What is Neuroscience about?



<https://www.youtube.com/watch?v=PfQkDHopJs8>

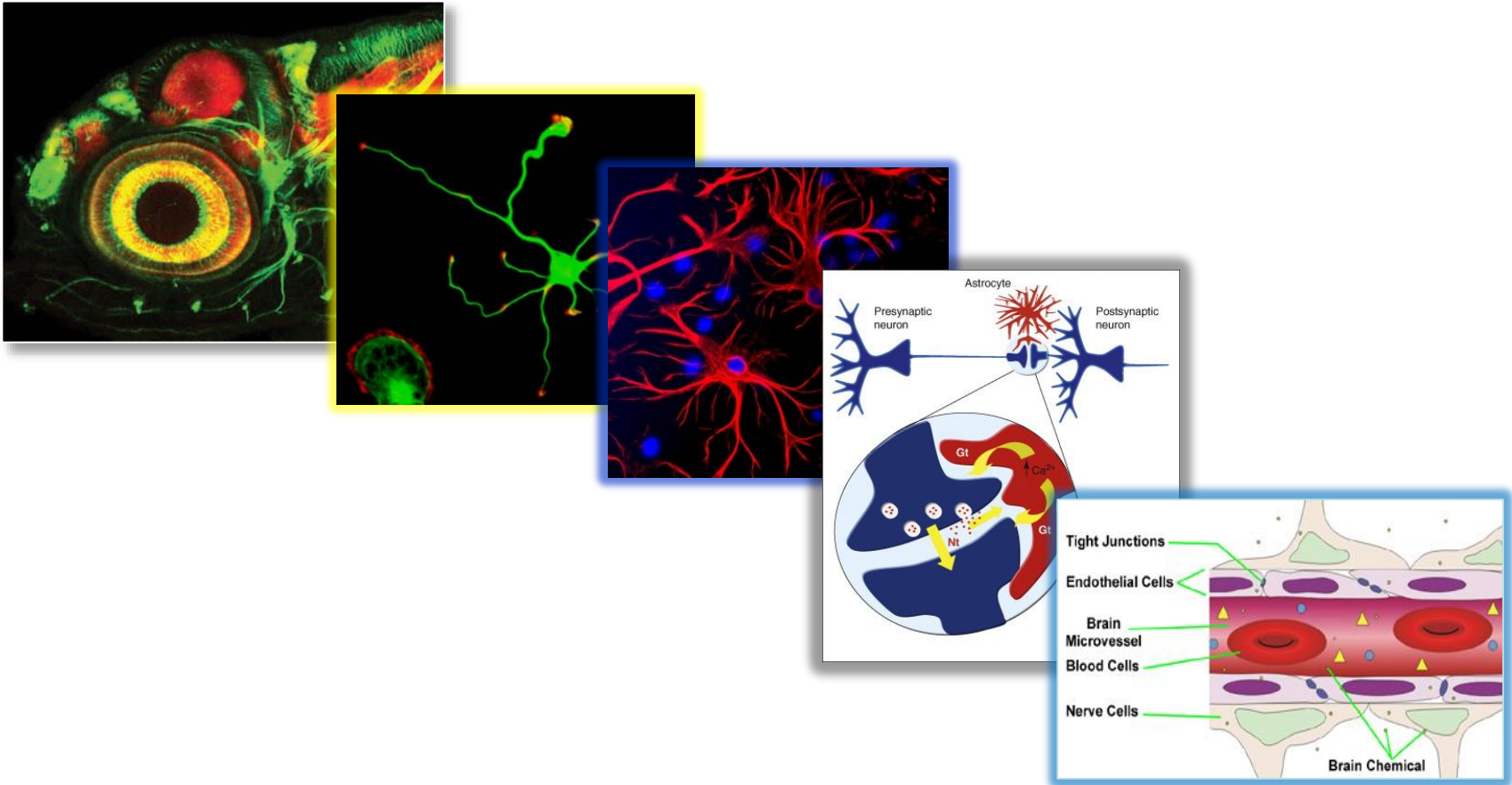
Schematic representation of how structural levels within the nervous system integrate over multiple spatial and temporal scales



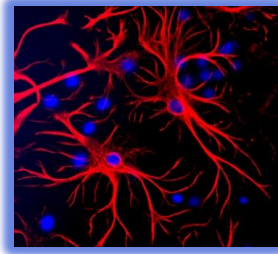
Hampel et al., 2018

Main focus of our course:

Cells of the Nervous System

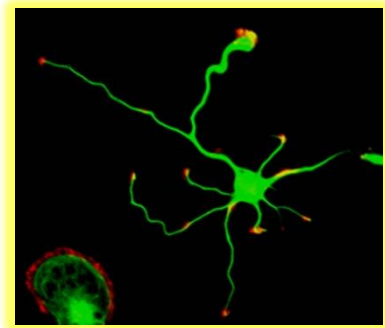


Course Syllabus



- **Glial cells:** - classification, morphology and classical roles – reactive gliosis - gliotransmission - microglia
- **Ependymal, choroidal and endothelial cells:** BBB, B-CSF-B, the problem of delivery of exogenous molecules to the brain
- **The neuron:** - origin and function of neuronal multiplicity - subcellular organization of the neuron - origin, maintenance and functional aspects of neuronal polarity - dendritic spines, transport and targeting of dendritic mRNA, local synthesis of proteins - trafficking of axonal and dendritic proteins
- **Cellular communication in the nervous system:** - organization of the presynaptic and postsynaptic density – neurotransmitter release - general classification of neurotransmitters and their receptors - structure and function of GABA and glutamate receptors - the endocannabinoid system - synaptic maintenance and plasticity - non-synaptic communication
- **The zebrafish model in Neurobiology**
- **Molecular neuroendocrinology:** Anatomical organization and molecular mechanisms of the circadian clock system in vertebrates - Neuroendocrine regulation of food consumption and associated pathological aspects from fish to mammals

Course objectives



- This course aims to provide students with an advanced knowledge of **cell and molecular biology of neurons, glia and other neural cell types**.
- The students will familiarize with **techniques and research strategies** employed in cellular neurobiology
- They will improve their **comprehension** of scientific articles and develop their **skills in choosing, reporting and discussing data** from the neurobiology scientific literature

Textbooks

This course is not based on a specific textbook. However for basic or additional information you can refer to the following books (DBIOS library):

- **Neuroscience** – Purves et al. (Sinauer)
- **From molecules to networks : an introduction to cellular and molecular neuroscience** – J.H. Byrne, J.L. Roberts. (Academic Press)
- **Principles of Neural Sciences**– Kandel (McGraw-Hill)
- **Fundamental Neuroscience** – L. Squire et al. (Elsevier)
- **Basic neurochemistry: principles of molecular, cellular and medical neurobiology** - Brady et al. (Academic Press)
- **Cellular and Molecular Neurophysiology** – Hammond (Academic Press)
- **Principles of Neurobiology** – Luo (Garland)

Teaching materials and activities

Campusnet web page:

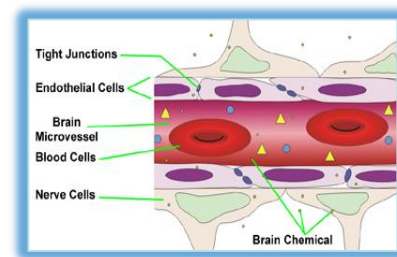
http://cmb.campusnet.unito.it/do/corsi.pl/Show?_id=c9db

Moodle web page:

<http://cmb.i-learn.unito.it/course/view.php?id=144>

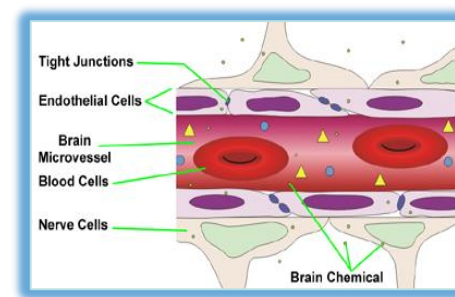
- **Please register yourself to the Cell Neurobiology websites on Campusnet and Moodle**
- **Please check often these pages for last moment news**

Learning assessment (1)



- **Bibliographic search activity (obligatory)** - For each main topic (4 in total) presented in lecture form by the teacher, all the students will make a bibliographic search on PubMed/Google Scholar to find one research article, which should be interesting and pertinent to the topic. The teacher will select four-five articles per topic, among all the ones proposed by the students, for student ppt presentations
- **Short article presentation (optional):** groups of 2 students will give a ppt presentation before the end of the course on one of the articles previously selected through the Bibliographic Search activity. This presentation provides **additional points to the grade of the final exam** of Cellular Neurobiology, provided this will be passed in the first exam session (January-February 2017).

Learning assessment (2)



- **Final exam** – This exam will be a **written test** of 20-25 questions with different formats: word definitions; open questions; short reading-comprehension exercises based on literature material. In **alternative** to the final exam, students can request an **oral exam** by writing an email to the teacher at least 3 days in advance. The oral exam will consist of a discussion on the topics covered in the lectures
- **Scores** - **15%** of the final grade will be based on the **Bibliographic Search activity**. The remaining **85%** will be covered by the **final exam**. The maximum grade will be 32/30. “ 30 cum laude” will be assigned to grades 31 and 32. **Additional points obtained by the PPT presentation** will be added to the final exam of the first exam session (January-February 2018).