

**University of Trieste**  
**MSc in Neuroscience (A.Y. 2024-25)**  
**Molecular Neurophysiology – Signal transduction in Neurobiology**

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**In collaboration with Prof. Andrew Constanti, University College London**

Here is a list of recommended introductory material for reference before the main topic lectures. Examinable material is what is contained in the main topic lecture (PPT slide show, available on Moodle platform). Some supplementary information also mentioned in the videos is for general interest only.

### **Signal transduction:**

<https://www.youtube.com/watch?v=m9jOXiYdMeY>

Good basic introduction to the mechanism of steroid hormone action.

<https://www.youtube.com/watch?v=Bn16Nuazbz8>

Good basic video explaining the receptor mechanism of action of insulin.

<https://www.youtube.com/watch?v=-osiUGKsu7o>

Basic explanation of receptor tyrosine kinase function.

[https://www.youtube.com/watch?v=ZBSo\\_GFN3ql](https://www.youtube.com/watch?v=ZBSo_GFN3ql)

Good basic video explaining how G-protein-coupled receptors work in the cell membrane.

### **Calcium signaling:**

<https://www.youtube.com/watch?v=eq5RN2SO7tg> (Part 1)

<https://www.youtube.com/watch?v=xwKa6DKPAk> (Part 2)

Basic (hand drawn) video, but quite good in explaining the Calcium-Calmodulin Dependent Kinase II (CaM kinase) enzyme. ONLY Part 1 and 2.

[https://www.youtube.com/watch?v=erHdQ6cCu\\_s](https://www.youtube.com/watch?v=erHdQ6cCu_s)

Inositol triphosphate (IP<sub>3</sub>) and calcium signaling pathway-second messenger system.

<https://www.youtube.com/watch?v=7LyZkNeyw9s>

Short video showing Ca<sup>2+</sup> sparks and waves in a freshly dispersed rat cardiomyocyte loaded with Fluo-4-AM.

<https://youtu.be/80Cnyp6HUII?si=7bttMXQFQ48WVtG9>

Ca<sup>2+</sup>-videomicroscopy technique

<https://www.youtube.com/watch?v=UZNPv86y7Fg>

Good basic video describing muscle excitation contraction coupling.

<https://www.youtube.com/watch?v=3Wc7I-H5stQ>

Dihydropyridine and ryanodine channels - excitation/contraction coupling.

### **cAMP signaling:**

<https://www.youtube.com/watch?v=ent0LSDpvD4>

Seminar on cAMP nanodomains in the heart (lecturer: Prof. Manuela Zaccolo Oxford University).

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