**Students’ FIRST and LAST NAMES:**

Report of Practical Course “**Calcium imaging in *Drosophila* larva**”

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1. **Introduction**

Explain the objectives of the study and provide some scientific context

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1. **Methodology**
2. ***Model organism***

Why is the GAL4/UAS system useful in *Drosophila* neurobiological studies?

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Which combination of GAL4 and UAS do we use in this course? Explain why.

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1. ***Experimental settings***

Explain one of the protocols which we use for our observations and draw a schematic of the experimental settings.

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Draw the light paths of the fluorescence

microscope for imaging using GCaMP or GFP; provide short explanations:



1. **Results & discussion**
2. **Peristalsis movements**

Describe your observations under the binocular. What is the mean frequency of body peristalsis in the larvae when crawling forward? When crawling backward? Explain how you computed these values.

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**Muscle imaging**

Describe and compare your observations under the microscope with GFP and with GCaMP larvae. Explain where the differences come from.

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1. **Motoneurons imaging**

Compare your observations in the different conditions tested (under the binocular *vs* under the microscope).

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Using ImageJ or FIJI, select 100-200 frames from the data that are provided and do the following:

1. Select the Regions of Interest corresponding to segments T1/2 to A8/9 left and right
2. Fig.1a: Show a frame with the selected ROIs annotated
3. Pull the values of fluorescence for A1 and A7 left and right (4 ROIs total).
4. Fig.1b: Plot the normalized values ∆F/F0 over time

Show the figures and discuss your results: what fictive behavior are you observing? How symmetric is it? What is the duration of the sequence of activity; if is it periodic, what is the period? Where is activity localized, where in the VNC does it seem to be initiated?

Compare the propagation of activity in muscle cells and in motor neurons and discuss the neuronal bases of this observation.

*[Send this part by email or printed]*

**Discussion**

How does larval locomotion compare with fruitfly locomotion? Can you speculate how shared the neuronal circuits are?

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What modification in the microscope and/ or protocol could you add to improve data quality? **……………………..……………………..……………………..……………………..……………..………..……………………..……………………..……………………..……………………..……………………..……………………..……………………..……………………..……………………..……………………..……………………..……………………..……………………..……………………..……………..………..……………………..……………………..……………………..………………**