**University of Leicester**

**MIBTP studentship project 2026**

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| **Additional Supervisor** | Dr Roberto Feuda (<https://www.unibo.it/sitoweb/roberto.feuda/en> )  Dr Nils Reinhart (https://www.biozentrum.uniwuerzburg.  de/en/neurogenetics/research/professorship-foerster/nils-reinhard/) |

**Section 2 – *Project Information***

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| **Project Title** | Identifying the neurogenetic network underlying visually-driven sleep |
| **Project Summary** | |
| Sleep is a behavioural quiescence widely observed in the animal kingdom.  Evidence indicates that daily light and visual stimuli contribute to sleep  pressure; our lab is interested in identifying the elusive molecular and neural  basis of such vision-driven sleep. We have identified various genetic components  in the light/vision-driven sleep in the fruit fly Drosophila melanogaster. Circuit-based  manipulation also indicates parallel neurogenetic pathways linking the  visual system and the known sleep homeostatic centre in the fly brain. This PhD  project, therefore, aims to combine the latest techniques in connectomics and  Drosophila sleep to map out these neural pathways in the fly brain. The student  will conduct this exciting project through the following three objectives.  1)Identifying sleep-controlling genetic network: By apply bulk-RNAseq, we will  identify common differentially expressed genes (DEGs) in sleep altering visual  mutants. In collaboration with Feuda lab, we will then map these DEGs onto  scRNA-Seq data (2) to identify the commonly affected neural clusters.  2)Identification of neural connection of vision-sleep pathway: Working with Dr  Nils Reinhart, we will use the fly brain connectome (3) to digitally construct  neural connection of vision-sleep pathway and examine its overlaps with the  DEGs enriched neural clusters. The finding will be confirmed experimentally by  confocal brain imaging using customised DEGs-based reporter (2).  3)Verification of the sleep modifying effect of DEGs and associated cell clusters:  upon generation of the gene/neural cluster list, automatic high throughput sleep  monitor system will be used to test if reduction of these genes modifies the sleep  phenotype. The reduction will be implemented in all neurons as well as in the  neural clusters identified.  Techniques that will be undertaken during the project  Drosophila Genetics, behaviour assay, in silico brain imaging, Bioinformatics on  scRNA-Seq and Connectome, immuno-confocal brain imaging. | |
| **References** | |
| 1. PMID: 30865587 2. PMID: 37523539 3.PMID: 39638801 | |