**University of Leicester**

**MIBTP studentship project 2026**

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| **Additional Supervisor** |  |

**Section 2 – *Project Information***

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| **Project Title** | Clock, Ageing and Disease |
| **Project Summary** | |
| In modern society we are all living longer. However, it comes with a challenge:  our quality of life in later years. The world is facing a rise in age-related  illnesses, especially neurodegenerative diseases like Alzheimer’s and  Parkinson’s. Interestingly, recent research has revealed a crucial connection  between these conditions and our body internal timekeeper, the circadian clock.  How does the circadian clock influence ageing and neurodegenerative disease?  We know that disruptions to the clock are a hallmark of both, and that its  deregulation seems to accelerate the ageing process. This suggests that age  related changes in clock function are both a cause and an effect.  In this project, you will investigate this relationship using the fruit fly,  Drosophila melanogaster. This seemingly humble organism is a powerful genetic  model, with a well-understood circadian clock and an array of sophisticated  tools at our disposal.  You will use state-of-the-art techniques to manipulate the clock's molecular  gears. For instance, you will apply CRISPR/Cas9 gene editing to precisely alter  clock genes. Additionally, you will use post-translational interventions, such as  antibodies or small molecules, to regulate clock proteins without genetic  modifications. Using advanced imaging and transcriptomics, you will monitor  the effects of these changes at both the single-cell and whole-organism levels.  Our long-term goal is to translate this knowledge into therapies that could help  people live not just longer, but also healthier, lives.  If you're an aspiring doctoral candidate with a passion for genetics,  neuroscience, or molecular biology, this project offers an exciting opportunity to  contribute to a field with immense potential. You’ll gain hands-on experience  with advanced techniques and contribute to research that could one day  improve the lives of millions.  Techniques that will be undertaken during the project  Molecular biology, cloning, PCR, gene expression, protein expression and  purification, bioinformatics, databases, genetics, confocal microscopy | |
| **References** | |
| Importance of circadian timing for aging and longevity.  https://doi.org/10.1038/s41467-021-22922-6. | |