**Industrial CASE Studentship Advertisement – 2023 Entry**

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| **Supervisor(s) names:** | **Mark Walton, David Bannerman, Thomas Akam** (Oxford)<br>**Gary Gilmour, Thomas Blackmore** (COMPASS Pathways) |
| **Department(s)/ Organisations:** | *Experimental Psychology, University of Oxford*<br>*COMPASS Pathways* |
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| **Tel:** | - |
| **Project Title:** | **Investigating long-term, post-acute effects of psychedelics on cognitive function: neurobiological and psychological mechanisms** |

**Brief description of project:**

Serotonergic psychedelics induce profound changes in brain functioning and plasticity, often lasting many weeks after a single dose. Several lines of evidence suggest that psychedelics facilitate *cognitive flexibility* – the ability to adapt behavioural strategies in the face of changing internal or external circumstances. However, the precise neural and psychological mechanisms of action and the timescale of these effects remain unclear. This gap in our knowledge is potentially of high importance as there is much interest in these drugs – including from COMPASS Pathways, the industrial sponsor – to provide novel, rapidly acting therapies for the treatment of a range of psychiatric disorders. There is consensus within the academic community and at COMPASS that a key step will be to generate *foundational understanding of the mechanisms by which different serotonergic psychedelic and non-psychedelic drugs influence behavioural and neural plasticity*.

Threrefore, the overarching aim of this DPhil project is to use combinations of behavioural testing, pharmacology and neural recordings in mice to examine the following questions:

1. *What are the serotonergic mechanisms underpinning the effects on cognitive flexibility?*
2. *What defines the "window of opportunity" to observe effects?*
3. *How do psychedelics modulate neural representations underpinning flexible updating?*

Together, the project will lay the foundations for a better understanding of the mechanisms underlying the relationship between serotonergic pharmacology – particularly serotonin psychedelics – and flexible behaviour and cognition in the rodent.

The student will be based in Oxford, but will also work closely with researchers at COMPASS Pathways who have expertise in psychedelics and translational research relevant to neuropsychiatric disease states (including at least a 3 month placement at the company). This will enable the student to be exposed to cutting-edge research into how neurochemistry influences flexible behaviour as well as a broad cross-functional team engaged in mental health research

innovation.  In Oxford, the student will receive training in *in vivo* techniques including training and testing mice using sophisticated behavioural tasks, performing pharmacological manipulations and recording neural activity as well as advanced analytical approaches including computational modelling; at COMPASS, they will experience the drug development process within a mental healthcare company.

**Attributes of suitable applicants:**

We are looking for a highly motivated and intellectually curious student to take on this project.  A background in a relevant biological discipline (e.g., Neuroscience, Experimental Psychology, Pharmacology etc.) is anticipated, though someone with strong quantitative skills (e.g., computer science, physics) and demonstrable interest in this area would be considered.  As the experiments will all use animal models, it is essential that the student is willing and able to work with rodents. Therefore, candidates with hands-on experience of *in vivo* research using rodents, particularly with a behavioural slant, will be strongly favoured.  While training will be given both by the Oxford Interdisciplinary Bioscience Doctoral Training Partnership and by the lab in quantitative skills such as programming and data analysis in Matlab and Python, experience with either or both of these (or related programmes), as well as strong statistical knowledge, will also be viewed very positively.

**Funding notes:**

This project is funded for four years by the Biotechnology and Biological Sciences Research Council UKRI-BBSRC. UKRI-BBSRC eligibility criteria apply (https://www.ukri.org/files/funding/ukri-training-grant-terms-and-conditions-guidance-pdf/). Successful students will receive a stipend of no less than the standard UKRI stipend rate, currently set at £17,668 per year.

*This project is supported through the Oxford Interdisciplinary Bioscience Doctoral Training Partnership (DTP) studentship programme. The student recruited to this project will join a cohort of students enrolled in the DTP's interdisciplinary training programme, and will participate in the training and networking opportunities available through the DTP. For further details, please visit www.biodtp.ox.ac.uk. The DTP and its associated partner organisations aim to create a community that is innovative, inclusive and collaborative, in which everyone feels valued, respected, and supported, and we encourage applications from a diverse range of qualified applicants.*