**Title of project:** Physiological regulation of hypothalamic myelin plasticity

<table>
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<tr>
<th>PI and Supervisor:</th>
<th>Dr Clemence Blouet</th>
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<tbody>
<tr>
<td>Name &amp; email address of best initial contact for project:</td>
<td>Dr Clemence Blouet <a href="mailto:Csb69@medschl.cam.ac.uk">Csb69@medschl.cam.ac.uk</a></td>
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<td>Where is the project located?</td>
<td>IMS-MRL</td>
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<td>PhD or MPhil project?</td>
<td>Suitable for both a MPhil or a PhD</td>
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<td>Animal licence needed?</td>
<td>Preferred but can be acquired during first year.</td>
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<td>Clinically trained student needed?</td>
<td>Non-clinical</td>
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<td>Working with... Any senior postdocs or internal collaborators involved</td>
<td>Prof Thora Karadottir</td>
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<td>Short description of the project (max 150 words)</td>
<td>The brain (particularly the hypothalamus) is a key player in the control of appetite, metabolism and endocrine functions. Our lab studies pathways through which the brain senses and integrates metabolic signals in the regulation of energy and glucose homeostasis. Recent findings from the lab indicate that myelin in the hypothalamus is highly plastic and this plasticity is regulated by nutrients and metabolic hormones. This level of myelin plasticity seems to be very unique to the hypothalamus. Understanding the underpinning mechanisms may transform our understanding of myelin biology its role in adult brain plasticity. In the hypothalamus, myelin plasticity might represent a mechanism through which hypothalamic circuits become more efficient in specific physiological contexts. Intriguingly, our data suggest that myelin plasticity is important for long-term homeostatic regulations. In this project, we propose to survey the physiological relevance of hypothalamic myelin plasticity, test the effect of a variety of physiological stimuli relevant to homeostatic controls, and characterise the role of myelin plasticity in the long-term regulation of homeostats. Please contact Dr Blouet for more info if interested!</td>
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<td>Techniques which will be learned</td>
<td>This project will provide the opportunity to learn a wide variety of techniques, from genetic fate-mapping tools, brain cell-specific inducible knock-out models, chemogenetic, fiber photometry and various histology techniques including immuno fluorescence, electron microscopy and light-sheet imaging of cleared whole brains. The student will work in partnership with a postdoc on this project, with Dr Blouet, as well with key technical staffs for more specialised expertise. The student will also benefit from our bespoke training programme and will develop skills in critical appraisal, research design, data management, transparency, presentation skills and scientific publishing.</td>
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<td>Future directions...</td>
<td>This would be an ideal project for someone interested in the fundamental biology of adult brain plasticity in physiological situations, how this might be impaired in disease, and the development of tools targeting these mechanisms to improve health.</td>
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