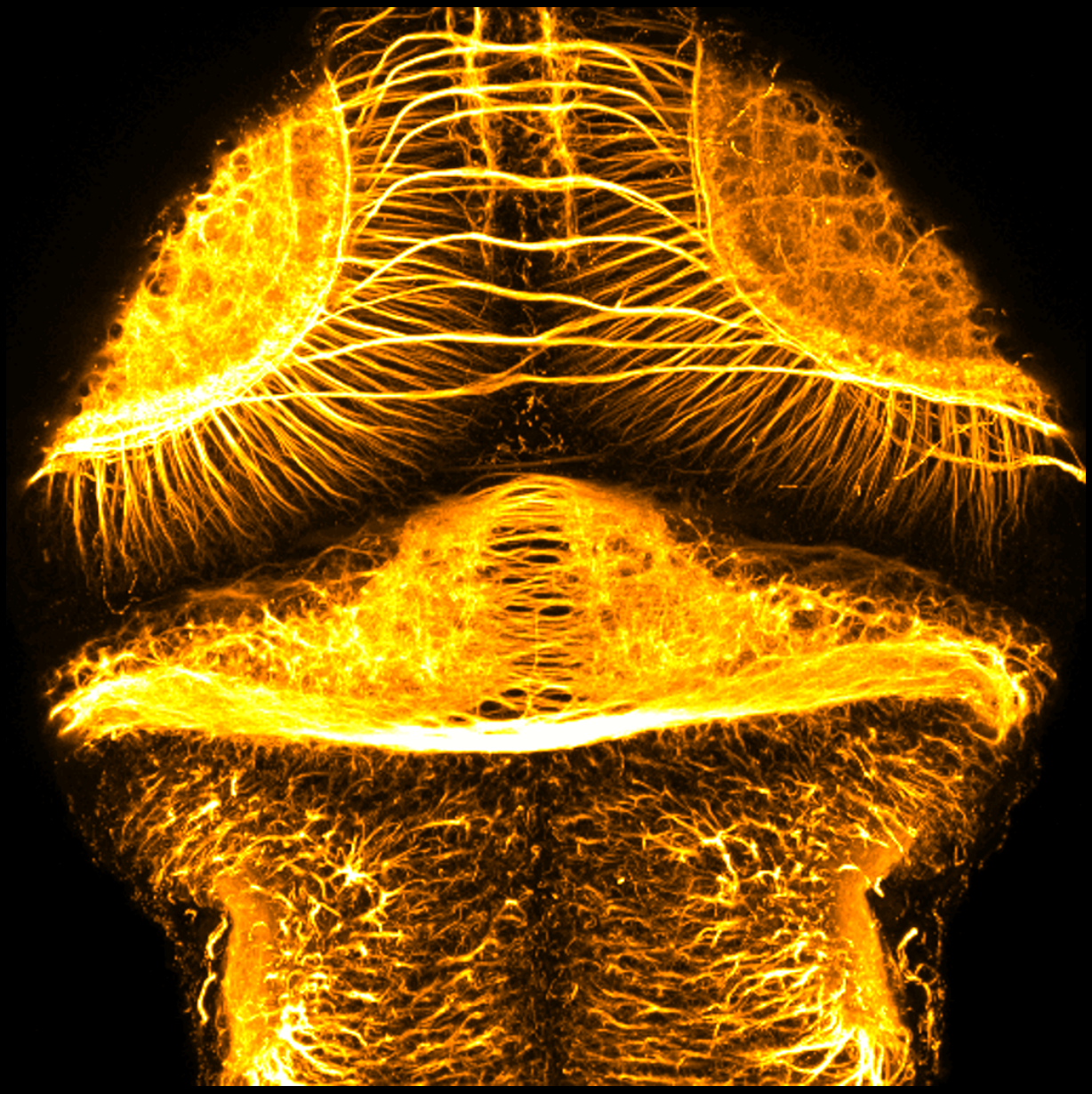
Abstracts of papers presented at the:

1ST UK ZEBRAFISH MEETING

10th – 12th September 2025



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1ST UK ZEBRAFISH MEETING

WEDNESDAY, 10TH SEPTEMBER 2025 (OCEAN, EXMOUTH)

14:00 - 15:30 **Registration and poster drop-off**

- Delegate arrival at Ocean, Exmouth
- Welcome coffee/ tea/ biscuits/ cake

15:30 - 15:40 **Welcome from the organising committee**

15:40 - 17:20 **Session 1 – research talks**
Chair: Nikolas Nikolaou

- **Katy Marshall-Phelps**: New insights into the mechanisms of axonal neurotransmitter release and its impact on myelination
- **Xinwei Wang**: A non-mGlur6 origin of the vertebrate On-pathway?
- **Emma Dumble:** Oligodendrocyte precursor cells use an activity-dependent feedback mechanism to stabilise developing retinal ganglion cells
- **Min-Kyeung Choi**: Developmental glucocorticoid over-exposure alters transcriptional response to stress in the zebrafish hypothalamus
- **Becky Yarwood**: Using zebrafish models to understand hereditary spastic paraplegia caused by variants in PCYT2
- **Golsana Haghdousti**: Investigating manganese homeostasis and neurotoxicity in a larval zebrafish model of manganese-overload Parkinsonism
- **Marcus Keatinge**: Cell type specific humanisation of zebrafish genes allows for the deconstruction of cellular phenotypes in neurodegenerative disease in vivo
- **Aya Takesono**: The effects of oestrogen and endocrine-disrupting chemicals on vertebrate brain development and health
- **Ada Jimenez-Gonzalez**: Zebrafish as a model to investigate zinc exposure as a risk factor for amyotrophic lateral sclerosis

17:30 - 18:15 **Keynote 1: David Lyons**
How zebrafish helped uncover a conserved mechanism of myelin repair

Evening **Evening at your own disposal**

OLIGODENDROCYTE PRECURSOR CELLS USE AN ACTIVITY-DEPENDENT FEEDBACK MECHANISM TO STABILISE DEVELOPING RETINAL GANGLION CELLS

Emma Dumble, Tim Czopka

University of Edinburgh

Neuronal circuits are tuned by activity-dependent feedback mechanisms. However, it remains unclear whether this process is purely neuron-autonomous or if glial cells, crucial regulators of neuronal connectivity, also play a role in activity-dependent tuning. Here we show a population of glial cells, oligodendrocyte precursor cells (OPCs), directly regulate neuronal arbours through activity-dependent mechanisms. Using the zebrafish visual system, we find that the silencing of retinal ganglion cells (RGCs) as well as the elimination of OPCs results in enlarged RGC arbours. However, when combining both manipulations RGC arbour size is rescued. This suggests OPCs may act downstream of neuronal signals to mediate activity-dependent sculpting. To test how OPCs may feedback to neurons, we generated new transgenic reagents using pH-sensitive GFP (pHluorins) to study OPC exocytosis as a putative mechanism to release signals in response to activity. Using live cell imaging, we demonstrate that OPC exocytosis rates are responsive to visual input and that blocking OPC exocytosis alters RGC presynapses. In our ongoing experiments, we aim to dissect further whether OPC feedback to neurons is mediated by glutamatergic neurotransmission and if it requires calcium-dependent activity integration in OPCs. Together, our results reveal a novel, non-canonical role for a previously unappreciated type of glial cells in sculpting neuronal circuits. By participating in activity-dependent feedback mechanisms, OPCs are fine-tuning the developing nervous system in a way that extends beyond their classical roles of forming myelin.