ORAL COMMUNICATIONS

EFFECTS OF ENVIRONMENTAL TEMPERATURE VARIATION AND BDNF MODULATION ON THE SPATIO-TEMPORAL SHOALING BEHAVIOUR OF ADULT ZEBRAFISH (DANIO RERIO) REVEALED BY TWO- AND THREE-DIMENSIONAL ANALYSIS

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Zebrafish (Danio rerio) are highly social animals that exhibit shoaling behaviour, a fundamental component of their ecological adaptation and survival strategy. Shoaling confers multiple advantages including enhanced predator avoidance, improved foraging efficiency, and coordinated collective responses to environmental threats. In our previous work, we demonstrated that both environmental temperature variation [1,4] and genetic modulation of brain-derived neurotrophic factor (BDNF) [5] significantly influence zebrafish brain neurochemistry and behaviour.

In the present study, we extend this line of investigation to the social domain by examining how the same thermal and genetic manipulations affect the spatio-temporal dynamics of shoaling behaviour in adult zebrafish. To achieve this, we employed integrated two- and three-dimensional tracking approaches [6], enabling a detailed and quantitative assessment of group-level organisation and movement patterns. Our findings demonstrate that alterations in protein expression driven by temperature or genotype are reflected in measurable changes in shoaling structure and dynamics. Importantly, these effects are not always predictable from individual-level behavioural phenotypes alone, highlighting the emergent properties of social behaviour and underscoring the importance of multi-scale approaches in behavioural neuroscience.

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