

Early-life stage exposure to the antidepressant paroxetine compromises later-life behavioural phenotypes and animal fitness

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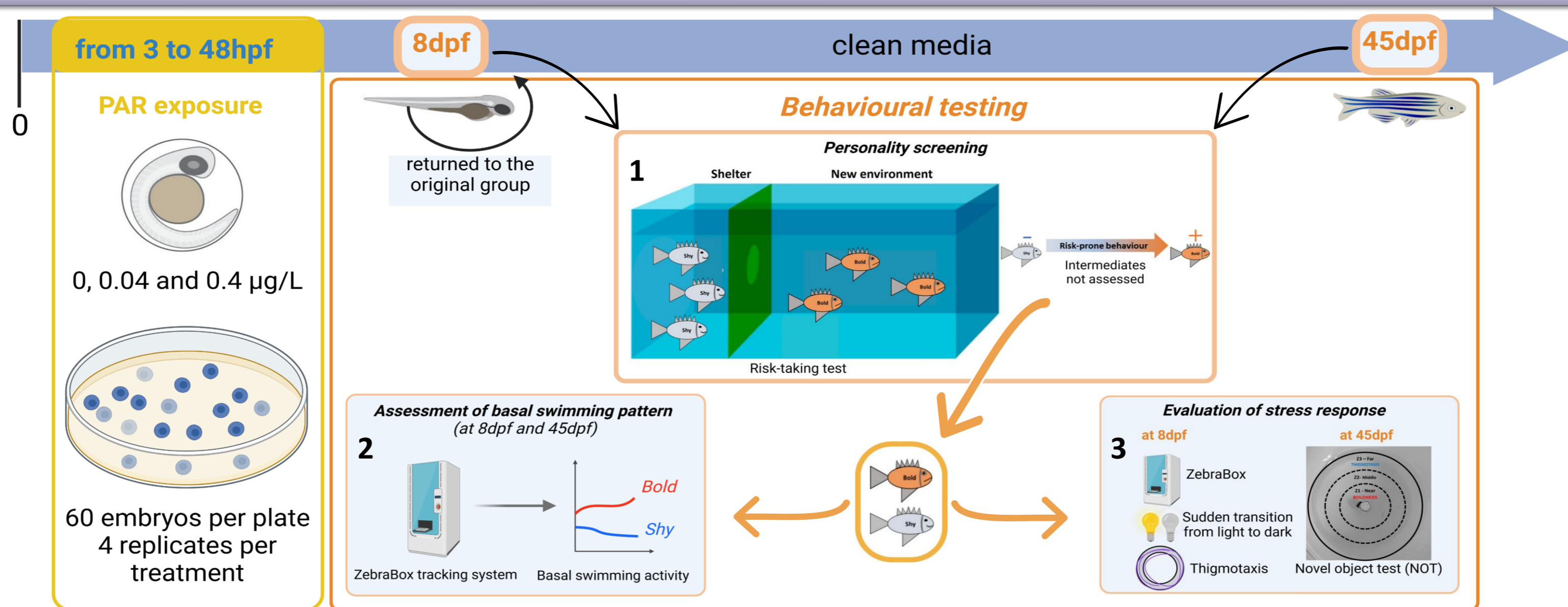
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INTRODUCTION & AIM

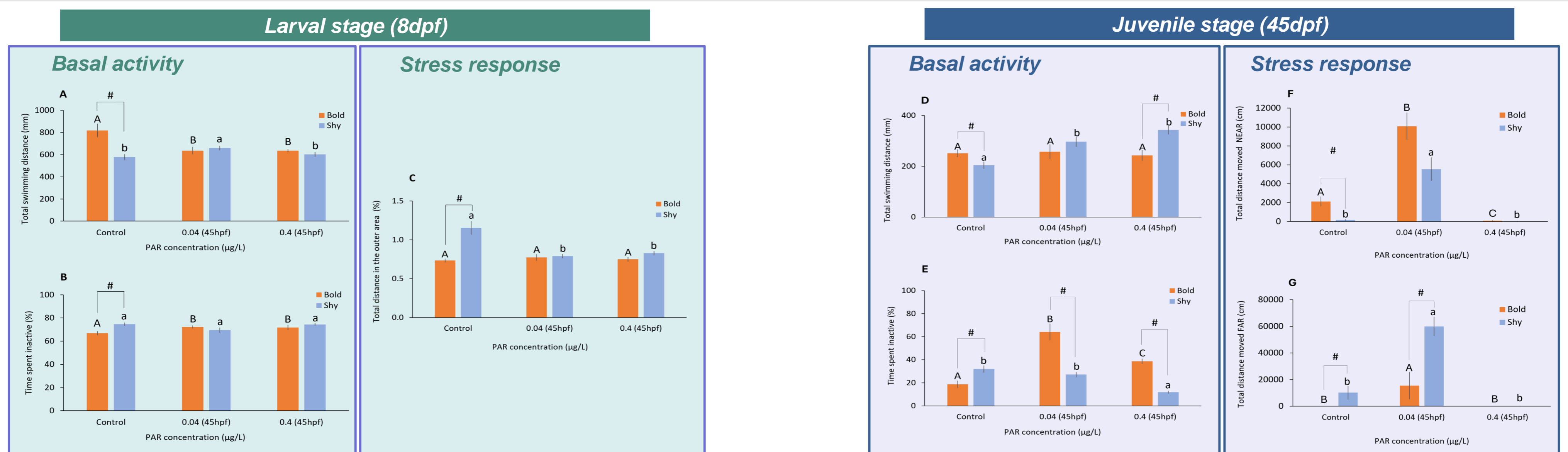
- Intraspecific behavioural variability (e.g., coping styles) ensures an optimal adaptive response to environmental stressors.
- Medications affecting the serotonergic system (e.g., selective serotonin reuptake inhibitor (SSRI) antidepressants) may lead to behavioural phenotype modulation.
- Paroxetine (PAR) is an SSRI antidepressant widely detected in surface waters (up to 270 ng/L) and fish tissues.
- Knowledge regarding SSRI's influence on fish coping styles is limited, particularly for PAR.

Aim: To examine how early developmental exposure to environmental levels of paroxetine (0.04 and 0.4 µg/L) may affect stress-coping behaviours in zebrafish later in life.

METHOD



RESULTS & DISCUSSION



Basal swimming behaviour and behavioural stress response of bold and shy individuals at 8 dpf and 45 dpf. A and D - Basal swimming distance; B and E – Total time spent inactive; C and G - Thigmotaxis; F - Boldness. Different lower-case letters represent significant differences across treatments for shy phenotype and different capital letters for bold phenotype; “#” indicates significant differences between bold and shy fish. Statistical analysis was performed using a two-way ANOVA followed by the Holm-Šidák method ($p < 0.05$).

CONCLUSION

- PAR exposure during early development interferes with personality-associated behavioural responses at later life stages (larval and juvenile).
- In fish previously exposed to PAR differences between shy and bold found in controls are lost at 8 dpf (with decreased swimming distance and increased inactivity time in exposed bold fish and decreased thigmotactic response in shy fish). At 45 dpf, differences between phenotypes are found but with an opposite pattern to the control.
- These results require further studies for increased comprehension of the ecological implications of these behavioural phenotype modifications.