Exploring the link between monoaminergic systems and behaviour

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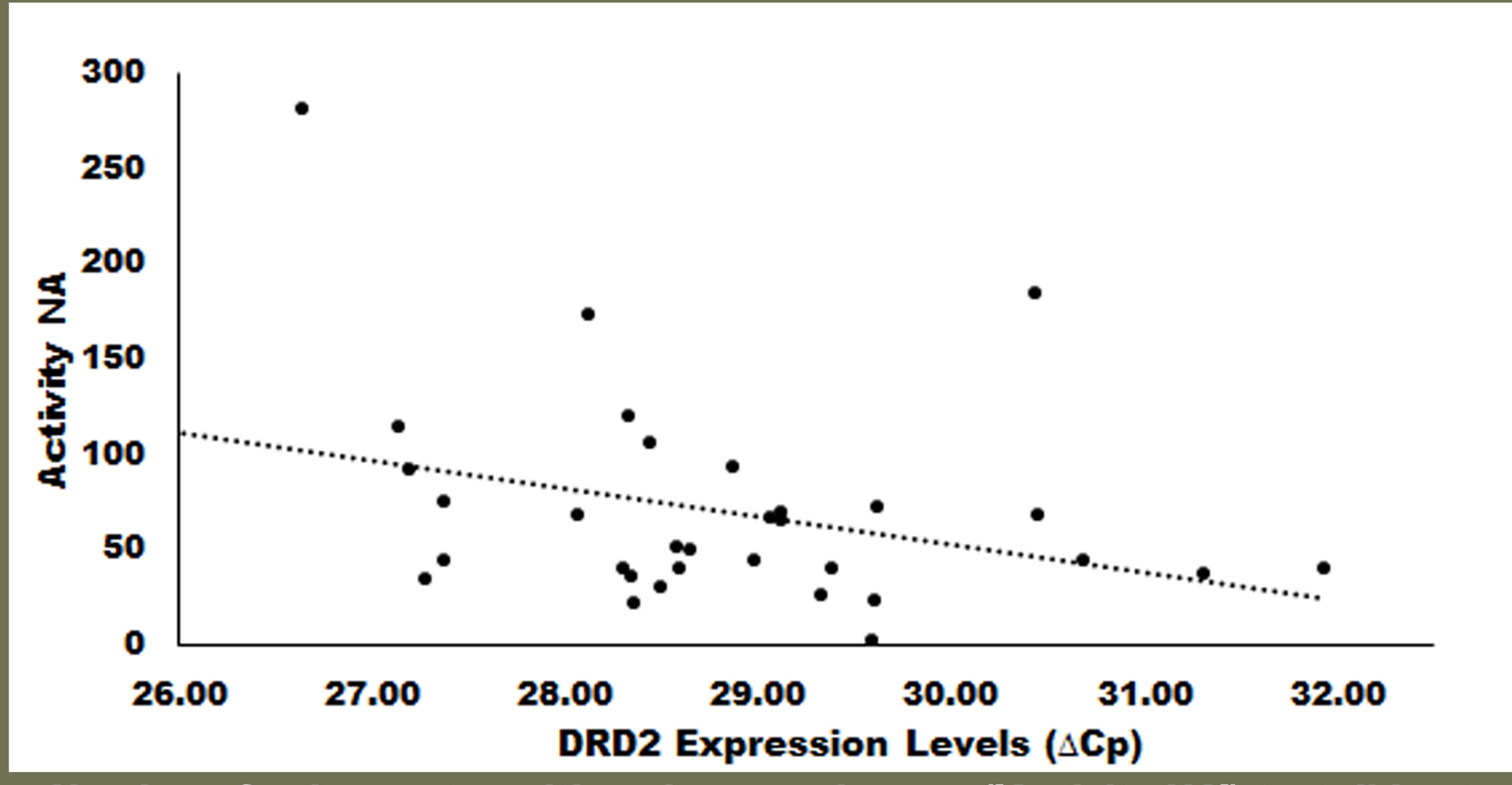
## Background

Why individuals differ in behavioural responses has received intense research attention 1-4, and has typically focused on describing variation in:

- Boldness,
- Activity, and
- Exploration 1-4.

Nevertheless, the mechanisms underlying such behavioural variation remain largely unknown. Variation is likely influenced by genetic differences between individuals, with genes in the monoaminergic systems commonly implicated<sup>1</sup>. I show here that:

Variation in monoaminergic gene expression were not linked with variation in the behaviour here measured



Number of sub-area transitions in a novel arena ('Activity NA') test did not correlate with DRD2 expression (n = 32,  $r_s = -.30$ ).

## Conclusions

No significant relationships were detected, whereas other studies have 1-3. This might be due to differences among studies (e.g., methodological differences), or that the nature of the relationship between these behaviours and monoaminergic systems is more species-specific, and/or more complex than so far assumed.

Methods: Thirty-three red junglefowl chicks (*Gallus gallus*) were at 28-30 days of age, exposed to behavioural assays measuring boldness, activity and exploration. Chicks were then culled and prefrontal cortex gene expression of several dopaminergic (DRD1, DRD2) and serotonergic genes (TPH, 5HT2A, 5HT2B, 5HT2C, 5HT1B) were analysed.

Spearman correlation was applied to investigate relationship between behaviour and gene expression values.

References:

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- 2. Abbey-Lee et al. (2018). Experimental manipulation of monoamines levels alters personality in crickets.
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- 3. Abbey-Lee et al. (2019). Effects of monoamine manipulations on the personality and gene expression of three-spined sticklebacks. Journal of Experimental Biology, 222(2), jeb211888

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