

## Genome-wide coexpression of steroid receptors in the mouse brain: identifying signaling pathways and functionally coordinated regions

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# Genome-wide co-expression of steroid receptors in the mouse brain: identifying signaling pathways and

## Introduction

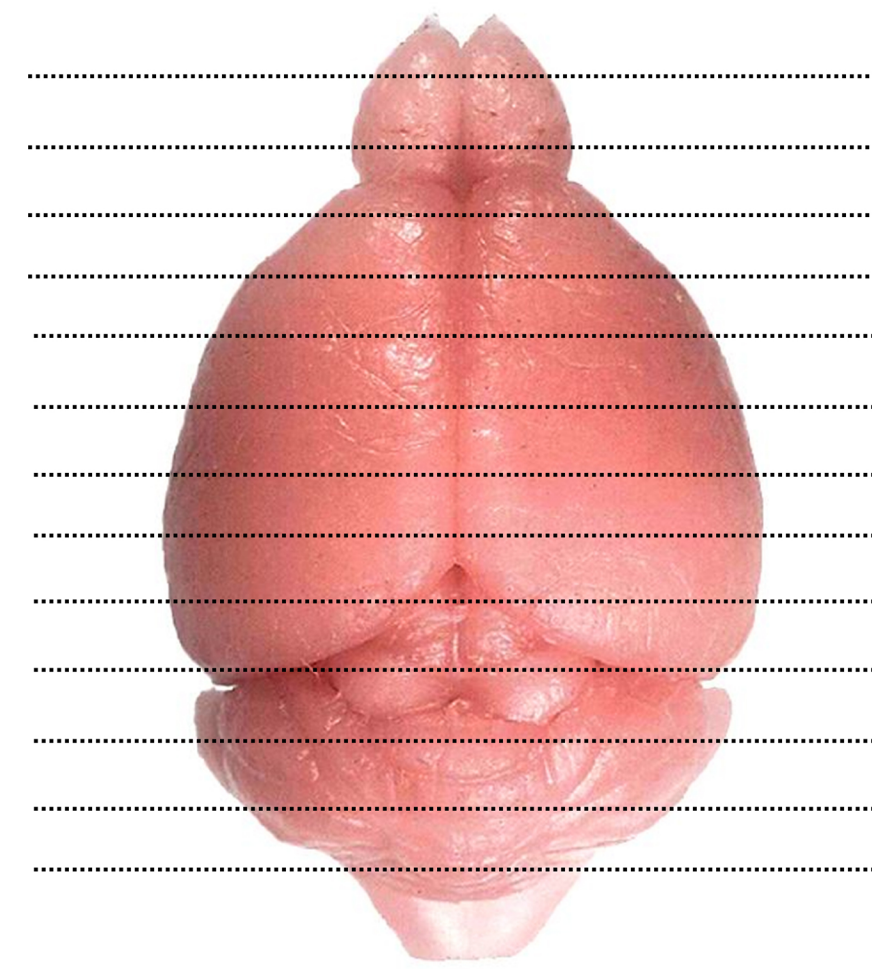
Steroid hormones coordinate the activity of many brain regions by binding to nuclear receptors that act as transcription factors. This study uses genome wide correlation of gene expression in the mouse brain to:

- 1) find brain regions that respond in a similar manner to particular steroids,
- 2) identify signaling pathways that are used in a steroid receptor and brain region-specific manner, and
- 3) discover potential target genes and relationships between groups of target genes.

The data constitute a rich repository for the research community to support further new insights in neuroendocrine relationships, and to develop novel ways to manipulate brain activity in research or clinical settings.

## Allen Brain Atlas<sup>1</sup>

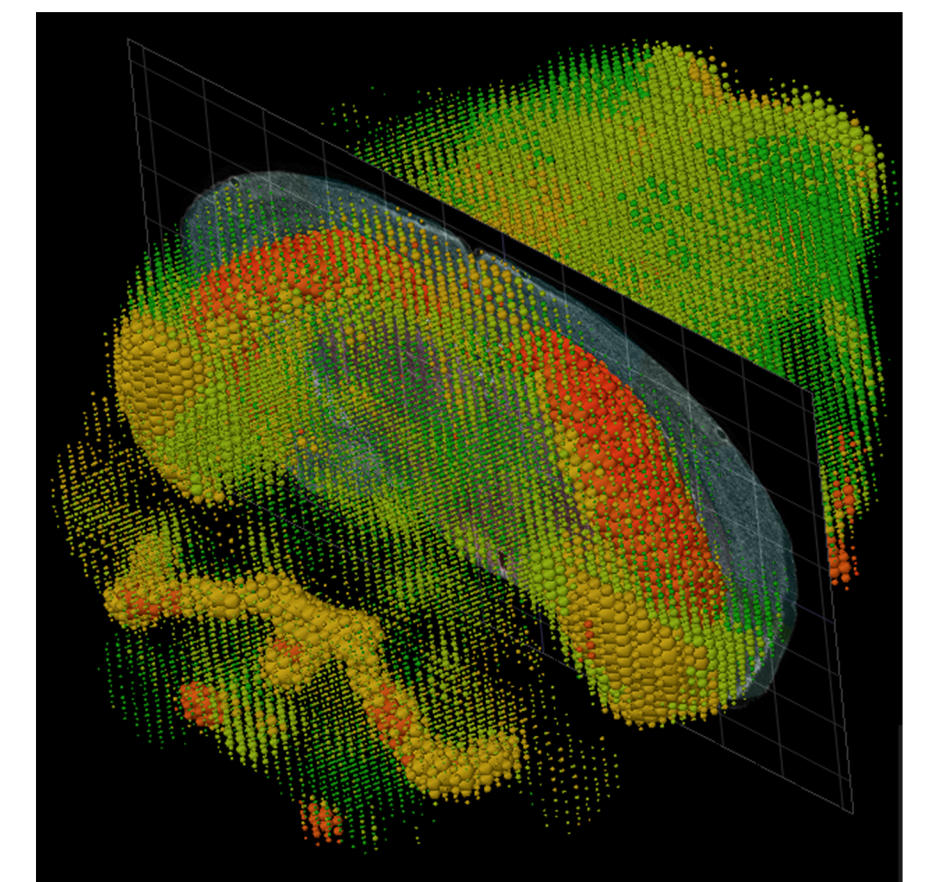
Mouse Brain



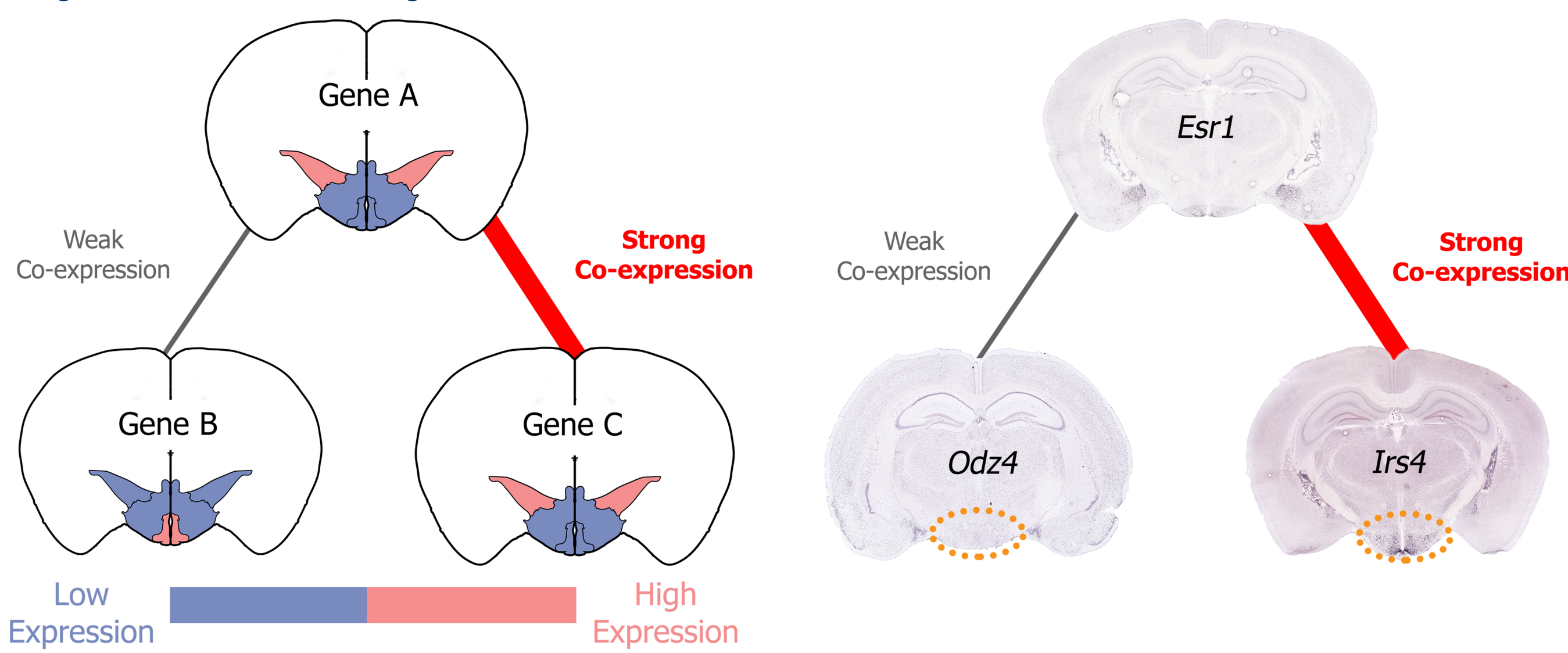
~22,000 Genes



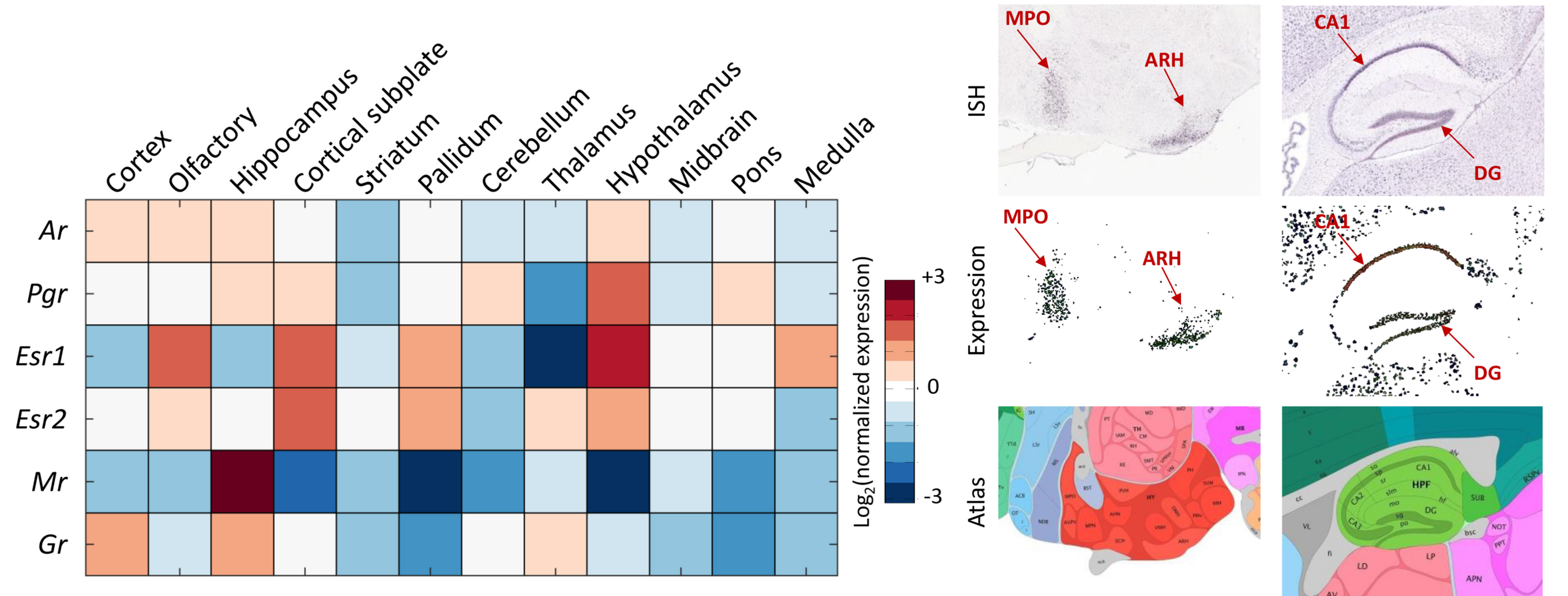
3D Expression Map



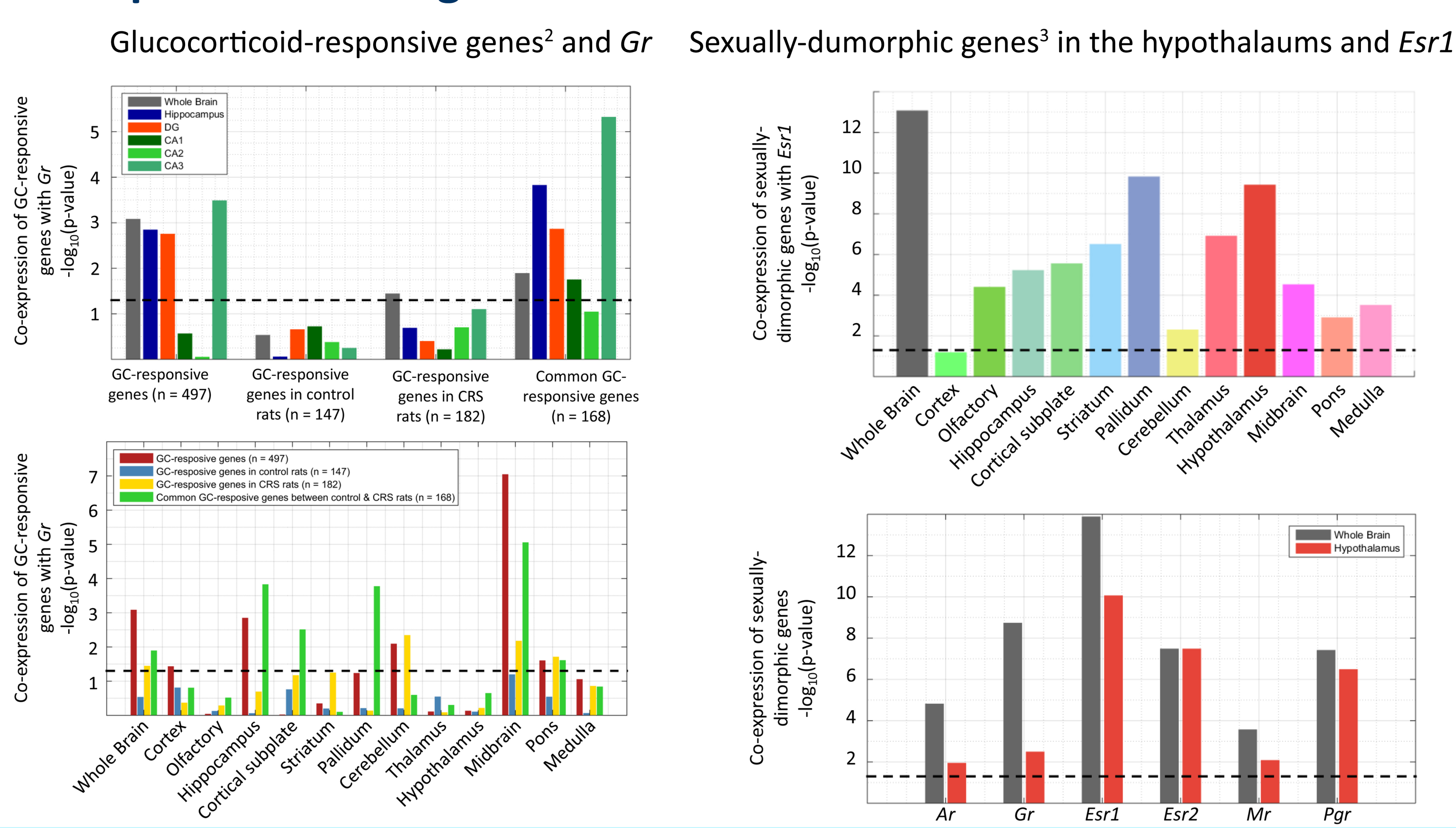
## Spatial Co-expression



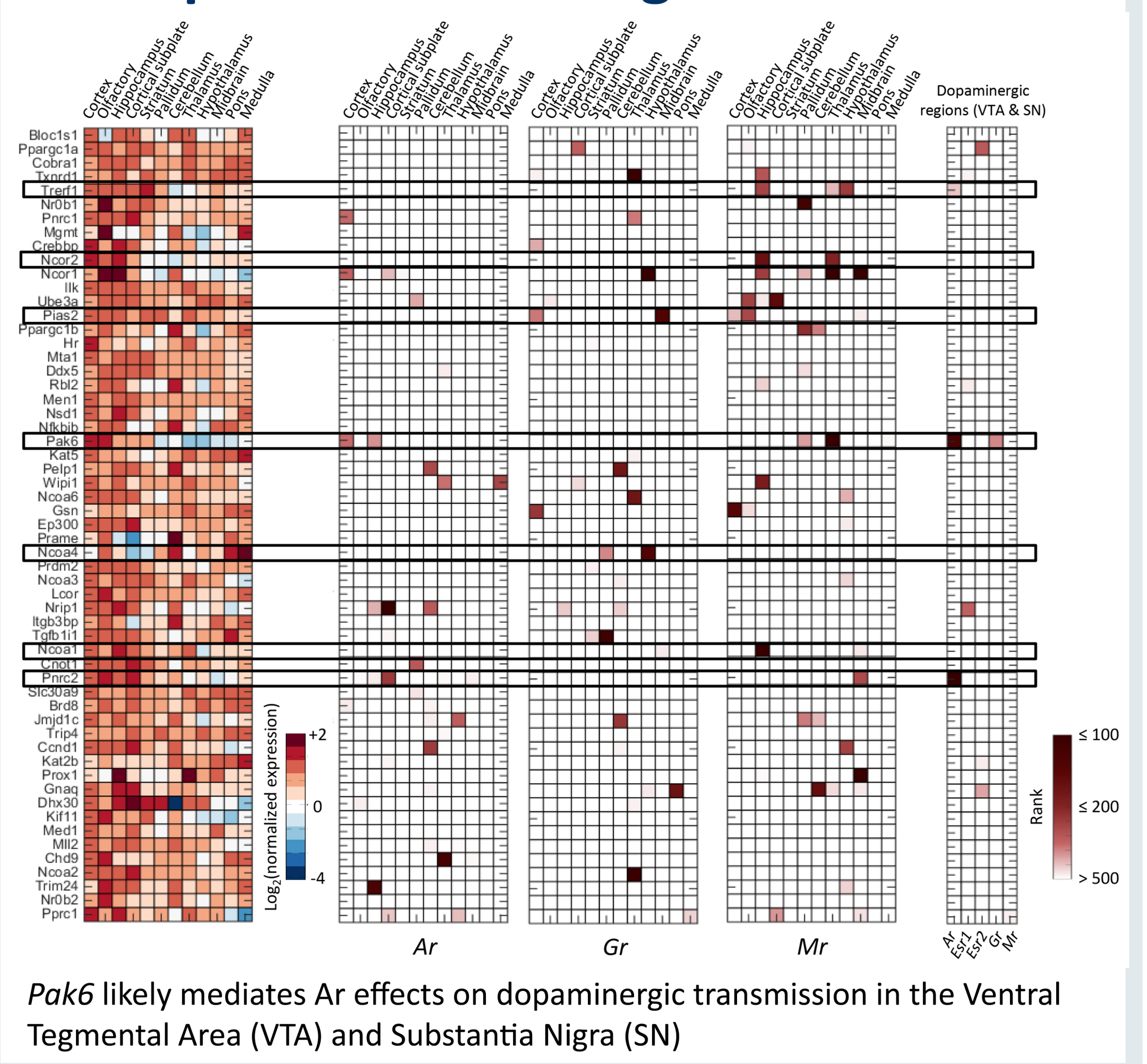
## Receptors Expression in the Brain



## Co-expression of Target Genes

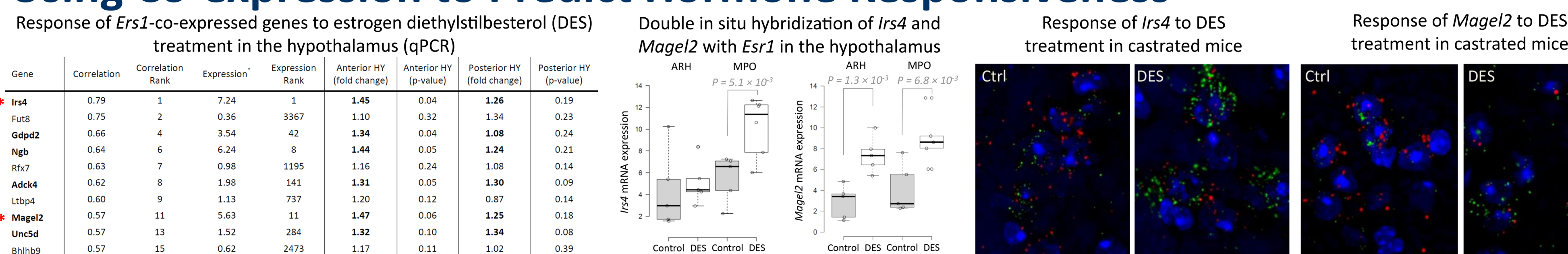


## Co-expression of Co-regulators<sup>4</sup>



*Pak6* likely mediates Ar effects on dopaminergic transmission in the Ventral Tegmental Area (VTA) and Substantia Nigra (SN)

## Using Co-expression to Predict Hormone Responsiveness



## References

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- <sup>4</sup> Zalachoras I, et al. (2013) Differential targeting of brain stress circuits with a selective glucocorticoid receptor modulator. *Proc Natl Acad Sci U S A* 110(19):7910–5.