

Genome-wide association studies (GWAS) to provide insights into the complex interplay of nuclear receptor transcriptional networks and their contribution to the maintenance of homeostasis

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Competing interests: TM none; DV none; GPC none; EE none

Genome-wide association studies (GWAS) have become an essential tool in exploring the relationship between common sequence variation sites and specific traits (Tam *et al.*, 2019). A protein family that provides ample research material for GWAS are nuclear receptors. These receptors comprise one of the largest groups of transcriptional factors and regulate the activity of a wide range of biological processes (Weikum *et al.*, 2018). A biological system that seems to be heavily reliant on nuclear receptors' activity is homeostasis. Homeostasis can be described as the inner equilibrium, both physical and chemical, required for proper organism function. Homeostasis can be threatened by internal or external unforeseen stimuli called stressors, and as such, organisms have developed a complex mechanism that copes with such threats and acts to maintain homeostasis called the stress response system (Chrousos, 2009). This research uses the glucocorticoid receptor (GR), a vital mediator of the stress response system (Nicolaidis *et al.*, 2015), and a heavily researched nuclear receptor as the basis of a GWAS research on the interplay between nuclear receptors and homeostasis. Specifically, a comprehensive list of epigenetic factors, receptor cofactors, and enzymes that interact with GR was

constructed in an effort to create a concise network of the various biological functions this receptor partakes. This network, plus the remaining nuclear receptors found in humans was studied with a large genomic dataset. The results are expected to provide insight into the interplay of nuclear receptor transcriptional networks and their contribution to homeostasis maintenance.

References

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