

## How do genes evolve?

**The GLP aggregated and excerpted this blog/article to reflect the diversity of news, opinion and analysis.**

Just as whole organisms have an evolutionary history that can be traced backwards in time, revealing varying degrees of relatedness to other organisms through common ancestors, so too does each gene have an evolutionary history that can be traced back through time. Many modern genes are part of gene families, each gene in the family having similar, yet distinct functions, and originally derived from a common gene ancestor. A new study presented in the January 12, 2016 issue of the Proceedings of the National Academy of Science (PNAS), uncovers one method evolution takes to go from a single primitive gene to multiple genes, each with unique abilities and discrete functions.

The study looked at the evolution of the Steroid Hormone Receptor family of genes. Steroids are essential molecules in animals, that are chemically derived from cholesterol, to produce a large variety of hormones, from cortisol and aldosterone (products of the adrenal glands), to sex hormones like estrogen and testosterone. When one of the steroid hormones enters the cell it exerts its influence on DNA through a Steroid Hormone Receptor. It is the Steroid Hormone Receptor that binds to the appropriate place in the DNA, to either activate or repress other genes. For example, cortisol can have an anti-inflammatory effect by binding to the Glucocorticoid Receptor, suppressing genes in cells of the immune system, essentially turning these cells off.

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