Diseases and behaviors likely the product of thousands of genes with complex interactions

If you told a modern geneticist that a complex trait…was the work of just 15 genes, they'd probably laugh. It's now thought that such traits are the work of thousands of genetic variants, working in concert.

But Evan Boyle, Yang Li, and Jonathan Pritchard from Stanford University think that this framework doesn't go far enough.

They note that researchers often assume that those thousands of weakly-acting genetic variants will all cluster together in *relevant genes*. For example, you might expect that height-associated variants will affect genes that control the growth of bones.

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But genes don't work in isolation. They influence each other in large networks, so that "if a variant changes any one gene, it could change an entire gene network," says Boyle. He believes that…changes in basically *any gene* will ripple inwards to affect the core genes for a particular trait. The Stanford trio call this the "omnigenic model."

This might explain why the search for genetic variants behind complex traits has been so arduous.

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Geneticists are running ever-bigger and more expensive searches to identify the variants behind all kinds of traits and diseases, in the specific hope that their results will tell them something biologically interesting…But if [the omnigenic model] is right, then most variants will not provide such leads because they exert their influence in incidental ways.

[Read the full study here]

The GLP aggregated and excerpted this blog/article to reflect the diversity of news, opinion, and analysis. Read full, original post: What If (Almost) Every Gene Affects (Almost) Everything?