

No, Newsweek, Obesity Isn't Caused by a Single Gene



By *Chuck Dinerstein* — November 19, 2017



courtesy Caroline Davis2010 [1]

In a nod to science, Newsweek [reported](#) [2] that there might be genetic underpinnings to obesity. So kudos for hopping on the science bandwagon and for a moment, not writing clickbait. But why not share the actual science instead of dumbing it down to “Regardless of how much you eat, your weight may be out of your hands?” For the scientifically literate, wishing to learn more, here is what researcher Vann Bennett [found](#) [3].

A deficiency in the ANK2 gene, which codes for chemical activity on cell membranes, has been shown to cause obesity in mice. By extension, similar deficiencies in humans are felt to be responsible for their obesity as well. Bennett’s work built upon this knowledge to look at the underlying mechanism of ANK2 variants. Mice, because of this ANK2 variation develop decreased insulin secretion when young but it is compensated for by the uptake of glucose into adipose tissue and skeletal muscle.

An unfortunate side effect of this increased absorption of glucose in adipose tissue is that it makes more robust and numerous adipose cells which serve to amplify the insulin resistance over time – which is why the obesity becomes more prominent with age. And this genetically driven obesity is independent of food consumption or metabolic activity on the part of the mouse. Another consequence of this increase in adiposity is increasing inflammatory markers.

Is there an analogous situation in humans, after all, some of us share the same ANK2 deficiency with our rodent friends?

Consider the definition of [metabolic syndrome](#) [4] (MS), which is not a disease, but a cluster of symptoms or findings. Metabolic syndrome is important to physicians because it is a risk factor associated with cardiovascular disease. Humans with metabolic syndrome have increased waist

circumference, an elevated blood sugar (due to insulin resistance), elevated triglycerides coupled with a low high-density lipid (HDL), commonly referred to as the good cholesterol, and hypertension. And many, but not all patients diagnosed with metabolic syndrome have increased inflammatory markers. Is it starting to sound familiar?

Before we jump to believing we understand it all now, know that 36 million people in the US are estimated to have metabolic syndrome, but only 6.5 million have these ANK2 variants. So only a portion of metabolic syndrome can be attributed to ANK2 deficiencies.

Weight gain is more than calories in versus calories out. Our metabolism is more complex than that – having developed over millions of years. And there are clearly more genes involved in obesity than ANK2. There is a polygenic component that real science has been studying for only a little while. Newsweek should have more respect for their readers and simplify the science and not its message.

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Links

[1] <https://www.flickr.com/photos/53416677@N08/4973532326>

[2] <http://www.newsweek.com/why-are-some-people-fat-new-gene-not-diet-might-be-problem-710979>

[3] <http://www.pnas.org/content/early/2017/11/09/1708865114.abstract?sid=7163701d-411c-4772-b650-43ad22562fdd>

[4] <https://www.nhlbi.nih.gov/health/health-topics/topics/ms>