

Faustian bargain: Has Huntington's disease killer mutation contributed to human IQ?

Huntington's disease is awful. It slowly robs its victims of mobility, wits and emotions. And there is no cure. The idea that it might be the obverse of something good sounds, to say the least, counter-intuitive. Yet that is the contention of a small band of neuroscientists who have been studying it. They suggest the underlying cause of Huntington's, a strange form of genetic mutation called a triplet-repeat expansion, might also be one of the driving forces behind the expansion of the human brain. Huntington's, these people suspect, may be a price humanity pays for being clever.

In contrast to most genetic diseases, Huntington's is caused by a dominant gene. This means that a faulty gene from either parent, not necessarily both, is enough to cause it.

The fault's nature is also strange. Usually when a gene goes wrong, part of it is either missing or has the wrong genetic letters in it. In Huntington's, the disease-causing version of the gene has too much DNA, not too little, and the protein produced, known as huntingtin, is thus too big. One part of every huntingtin gene contains a stretch in which the genetic letters C, A and G are repeated several times, in that order. In most people, the number of repeats ranges from nine to 35. These people are healthy. Those with 36 or more repeats are, however, at risk of developing Huntington's—and those with more than 40 will definitely develop it, unless they die beforehand of something else.

Unlike recessives, harmful dominant mutations have nowhere to hide from natural selection. It is that which has led some people to wonder if there is more to Huntington's disease than meets the eye. That even the healthy have a variable number of repeats suggests variety alone may confer some advantage. Moreover, there is a tendency for children to have more repeats than their parents, a phenomenon known as anticipation. This suggests a genetic game of "chicken" is going on: up to a point, more repeats are better, but push the process too far and woe betide you.

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