Re: Mutated brain gene: part of what makes us human

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- *From*: Guy A Hoelzer <hoelzer@xxxxxxx>
- *Date*: Sat, 12 May 2007 12:42:07 −0400 (EDT)

This is a very interesting statistic, although I don't really know what to make of it yet. I want to point out, however, that this protein difference number is not at all comparable to the DNA sequence difference number, because the former represents amino acid strings while the later represents individual nucleotides. For example, I'm sure that every human chromosome (strings of nucleotides) has a different sequence than their homologous chimp chromosomes. Does this mean that their DNA is 100% different? This is the same logic that underpins the claim that 80% of the proteins are different. Some would consider it impressive that 20% of the proteins are identical along complete amino acid sequences. I would like to see the comparison of amino acid identity between humans and chimps to compare with the 99% nucleotide identity estimate between the same two species. Amino acid identities may be greater than 99%, despite having a difference of 80% at the whole protein level.

Guy

in article f229fh$2g7d$1@xxxxxxxxxxxxxxxxxxx, DK at dk@xxxxxxxxxxxxxxxxxxxxxxxxx wrote on 5/11/07 10:34 AM:

> In article <f20bkd$1860$1@xxxxxxxxxxxxxxxxxxx>, dk@xxxxxxxxxxxxxxxxxxxxxxxxx (DK) wrote:
>
> > In article <f1t1qn$2cnf$1@xxxxxxxxxxxxxxxxxxx>, Tim Tyler <seemysig@xxxxxxxxxxxxxx> wrote:
> >
> > > "Gene mutation linked to cognition is found only in humans"
> > >
> > > − http://www.physorg.com/news97825267.html
> >
> > OK, so humans have an additional splice isoform. Big deal. Unless I missed something, there are many such examples. Certainly a far cry from "part of what makes us human" (unless you wanted to say "one part out of few thousands").

> That "human and chimpanzee genomes vary by just 1.2 percent" thing is getting old and overused anyway. Truth is, when one looks at identity at protein/ORF level, humans and chimps only have 80% identity. Or, to put it the other way, one out of five proteins is different.

Actually, I was writing it from memory and my memory got it all backwards. In fact, chimps and humans share only 20% of *identical* proteins. The rest 80% are ever slighly but different. Not to imply that every one contributes to phenotypic differnces but, clearly, possibilities are endless. Here is the original paper:

http://www.pubmedcentral.nih.gov/articlerender.fcgi?tool=pubmed&pubmedid=15716009

Eighty percent of proteins are different between humans and chimpanzees
Galina Glazko, Vamsi Veeramachaneni, Masatoshi Nei, and Wojciech Makayowski

So, to edit it corectly:

> Considering that a single mutation in a single protein can drastically alter the way an entire cell or a whole organism behave, the 80% difference looks appropriately very significant and that "humans and chimps are 99% identical" − quite stupid.
>
> DK

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