Chimp genome sequence very different from man

David A. DeWitt

For many years, evolutionary scientists—and science museums and zoos—have hailed the chimpanzee (fig. 1) as 'our closest living relative' and have pointed to the similarity in DNA sequences between the two as evidence. In most previous studies, they have announced 98–99% identical DNA.[1] However, these have often focused on gene coding regions (such as the sequence of the cytochrome c protein), which constituted only a very tiny fraction of the roughly 3 billion DNA base pairs that comprise our genetic blueprint.[2] Although the full human genome sequence has been available since 2001, the whole chimpanzee genome has not. Thus, all of the previous work has been based on only a portion of the total DNA.

Recently, in a special issue of *Nature* devoted to chimpanzees, researchers report the draft sequence of the chimpanzee genome.[3] No doubt, this is a stunning achievement for science: deciphering the entire genetic make up of the chimpanzee in just a few years. This data will be very useful to scientists and will allow us to make more detailed and accurate comparisons instead of relying on estimates (such as an old estimate that chimps have 10% more DNA).

Researchers called it 'the most dramatic confirmation yet' of Darwin's theory that man shared a common ancestor with the apes. One headline read: 'Charles Darwin was right and chimp gene map proves it'.[4]

So what is this great and overwhelming 'proof' of chimp-human common ancestry? Researchers claim that there is little genetic difference between us ('only' 4%). This is a very strange kind of proof because it is actually more than double the percentage difference that has been claimed for years![5] The reality is, no matter what the percentage difference, whether 2%, 4% or 10%, they still would have claimed that Darwin was right.

Further, the use of percentages obscures the magnitude of the differences. For example, 1.23% of the differences are single base pair substitutions (1.06% are believed to be fixed differences[6]). This doesn't sound like much until you realize that it represents ~35 million mutations! But that is only the beginning, because there are an *additional* ~40–45 million bases present in humans and missing from chimps, as well as about the same number present in chimps that is absent from man. These extra DNA nucleotides are called 'insertions' or 'deletions' because in the evolutionary paradigm (indels) they are thought to have been added in or lost from the sequence (explained in fig. 2). The majority of these insertions are small (96% are less than 20 base pairs in length) but some are several thousand base pairs long. The minimum possible number of insertion events is around 5 million, counting each insertion sequence as one mutation event. Adding the 35 million substitutions yields at least 40 million separate mutation events that would separate the two species. But the total number of DNA nucleotide differences is about 125 million.

To put the numbers into perspective, a typical page of text might have 4,000 letters and spaces. It would take 10,000 pages of text to equal 40 million letters, the minimum number of mutation events. And it would take over 31,000 pages to list the 125 million base sequences that are different.

There are very significant differences in transposable elements. Humans have many more short interspersed elements (SINEs) than chimps but chimps have two novel families of retroviral elements which are absent from man. Indeed, comparing endogenous 'retroviral elements' yielded 73 human-specific insertions and 45 chimpanzee specific insertions. Humans have two SINE (Alu) families that the chimpanzees lack and humans have significantly more copies (~7,000 human-specific copies vs ~2,300 chimpanzee specific ones). There are also ~2,000 lineage specific L1 elements. All of these lineage specific changes would be required to take place sometime between the last chimp/human common ancestor, and the most recent common ancestor for all people on the planet. Importantly, these are modifications for which there is no known selective advantage.

Small scale insertions are not the only differences. A major distinction between chimpanzees and man is the fact that chimpanzees have 48 (24 pairs) chromosomes while man has 46 (23 pairs). Evolutionists claim that two chromosomes in the putative human-chimp common ancestor were fused to become the human chromosome 2.

Figure 1. *Despite the genetic similarity between man and chimpanzee, to the surprise of evolutionary scientists there are still many anatomical, physical and behavioural differences. Although similarity is taken as evidence of common ancestry, similarity can also be the result of a common Designer.*

With no known selective advantage it is difficult to see how this fusion would become exclusively characteristic of man. Chromosome fusions can occur but are particularly messy and typically thought to reduce reproductive success due to the resulting monosomy and trisomy in the zygotes produced by the mating of a normal genotype and an individual with the fused chromosomes. Many of these types of chromosomal defects are associated with mental retardation. The chance of the same chromosome fusion occurring in two individuals at the same time in the same place such that they just happened to mate with one another to produce viable male and female offspring stretches credulity to breaking point. Moreover, there are 9 pericentric inversions (a stretch of nucleotides in a chromosome that appears to have been spliced out and reinserted in the reverse order).

Another interesting observation was the frequency of substitutions that change the amino acid sequence of proteins. While ~29% of proteins are identical between chimps and humans, this leaves a large number that are different. In some of the cases, the amino acid change is the result of in-frame indels. These changes result in the addition or deletion of three nucleotides (a complete amino acid codon) at one spot. This adds or deletes an amino acid to / from the resulting protein. About 5% of proteins have this type of change.

Importantly, the human protein class with the most differences from the chimp are transcription factors. These are proteins that bind to DNA and control transcription and protein expression.

Surprisingly for the evolutionists, the amino acid substitution rate between chimps and man is greater than that between mice and rats (evolutionists like to think of humans and chimps as being more closely related than mice and rats). However, these and many of the other differences may simply reflect intrinsic distinctions between chimpanzees and man from the beginning of creation.

Creationists believe that God made

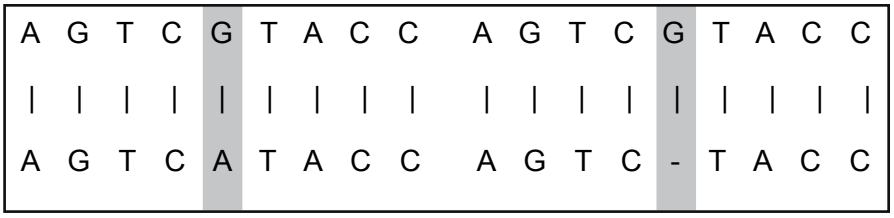

Figure 2. *Comparison between a base substitution and an insertion/deletion. Two DNA sequences can be compared. If there is a difference in the nucleotides (an A instead of a G) this is a substitution. In contrast, if there is a nucleotide base which is missing it is considered an insertion/deletion. It is assumed that a nucleotide has been inserted into one of the sequences or one has been deleted from the other. Insertions or deletions are generically called 'indels'. Indels can be of virtually any number of nucleotides.*

Adam directly from the dust of the earth just as the Bible says. Therefore, man and the apes have never had an ancestor in common. However, assuming they did for the sake of analyzing the argument, then 40 million separate mutation events, thousands of modifications to transposable elements, modifications in length of the Y chromosome, several pericentric inversions and a chromosome fusion would have had to take place and become fixed in the population in the six million years Darwinists claim they have since the common ancestor of humans and chimps. This is only ~300,000 generations and it is not enough generations to achieve these staggering changes, as even generous assumption applied in population genetics models show—a problem referred to as 'Haldane's dilemma'.[7]

The problem of fixing these changes in the population is exacerbated because the authors acknowledge that most evolutionary change is thought to be due to neutral or random genetic drift. That refers to change in which natural selection is not operating. Without a selective advantage, it is even more difficult to see how this huge number of mutations could become fixed in the human and chimp populations.

Some scientists are surprised at the anatomical, physical and behavioural differences between man and chimpanzee when they see so much apparent genetic similarity. With a philosophy that excludes a Creator God, they are forced to accept similarity as evidence of common ancestry. However, similarity can also be the result of a common Designer.

It is the differences that make the difference. The most important difference is that man is created in the image of God.

References

1. DeWitt, D.A., >98.5% Chimp human DNA similarity? Not anymore, *TJ* **17**(1):8–10, 2003.
2. Wildman, D.E., Uddin, M., Liu, G., Grossman, L.I. and Goodman, M., Implications of natural selection in shaping 99.4% nonsynonymous DNA identity between humans and chimpanzees: Enlarging genus *Homo*, *Proc. Nat. Acad. Sci. USA* **100**(12):7181–7188, 2003.
3. The Chimpanzee Sequencing and Analysis Consortium 2005., Initial sequence of the chimpanzee genome and comparison with the human genome, *Nature* **437**:69–87, 2005.
4. <www.news-medical.net/?id=12840>, 31 August 2005.
5. Studies of chimp-human similarity have typically ignored insertions and deletions although this accounts for most of the differences. A study by Roy Britten included these insertions and deletions and obtained a figure that is close to the 4% reported here. Britten, R.J., Divergence between samples of chimpanzee and human DNA sequences is 5% counting indels. *Proc. Nat. Acad. Sci. USA* **99**:13633–13635, 2002.
6. Individuals within a population are variable and some chimps will have more or less nucleotide differences to man. This variation accounts for a portion of the differences. Fixed differences represent those that are universal. In other words, all chimpanzees have one nucleotide and all humans have a different one at the same position
7. Batten, D., Haldane's dilemma has not been solved, *TJ* **19**(1):20–21, 2005; ReMine, W.J., Cost theory and the cost of substitution—a clarification, *TJ* **19**(1):113–125, 2005.