**Executive Summary:**

**Pseudogenes: a result of common ancestry or common designer?**

Genetic technology has recently become more and more advanced and has given us a very detailed look at the genome’s structure and function of a wide range of organisms. In 2003 the Human Genome Project reached a milestone in being able to sequence and map the entire human genome. This allowed researchers to identify all of the 20 000- 25000 genes in human DNA and determine the sequences of 3 billion base pairs.[[1]](#footnote-2) Researchers in this field of genomics are currently working with this data to compare the structures, functions and maybe even evolutionary relationships of the organisms of the world. They are able to see the similarities and differences of organisms by looking at the basic building blocks of their DNA. Research has shown that organisms have remarkable similarities in their genetic makeup especially humans and chimpanzees- shown to be 98% identical in their genetic makeup.[[2]](#footnote-3) This homology between species genetics have caused many to believe that there must be a common ancestor. New research is being done on so called “junk DNA” that has been found within the genomes of organisms. These genes seem to have no function and are believed to persist in the genomes of higher organisms as “evolutionary remnants.” Also this “junk DNA” has been found to be located in identical places between different species. So what do these similarities between the genomes of species mean? Evolutions say that these similarities reflect the fact that these genes were inherited from a common ancestor. Creationists on the other hand say that each species was created independently but designed with similar features causing them to have comparable functions.

Recent genome sequencing results have shown that >90% of the DNA of vertebrates does not code for a product.[[3]](#footnote-4) The human chromosome 22 was recently sequenced by Dunham et al which identified 134 pseudogenes within 545 genes in the region which is about 1.1% of the human genome. Using this data it was extrapolated that there are about 15000 pseudogenes in the human genome.2 There are four major kinds of this “junk DNA.” The main one is pseudogenes which are genes that have been inactivated by an insertion or deletion so that they no longer perform any function. They are located near functional genes and closely resemble the functional gene. Some have a mobile element inserted into the open reading frame and others are known as “processed pseudogenes” which work through reverse transcription to reinsert themselves back in the DNA. Another one is introns which are normally spliced out of the mRNA by the splisosome. There are also satellite sequences which are tandem arrays of short repeats and interspersed repeats which are long repetitive sequences.

There are many examples of pseudogenes between humans and other primates that are located in the exact position on the DNA of each species. One of which is the GLO gene which is required for synthesizing ascorbic acid to make vitamin C. In most animals the GLO gene is present but in humans and guinea pig the gene has been inactivated. It’s hypothesized that it has been inactivated because humans and guinea pigs get enough vitamin C in their diet so they do not need to synthesize their own. 2 Pseudogenes provide evidence for a common ancestor heritage in humans and animals because it seems unlikely that identical mutations would be found in two species. Mutations alone are random processes so how would two different organisms acquire the same mutation in the same location? There is no known mechanism that would allow for sequences to be copied from modern apes into the same position of human DNA which leads one to conclude that they were copied from ancestral sequences.2 Another argument that common ancestor evolutionists argue is why would God design functionless genes into our genomes? They are vestigial structures and when compared to their functional counterpart they appear functionless.

At first glance this evolutionary claim seems to have a very strong argument. However we are still learning and we have much more to learn about the functions of genes. More and more studies are showing that pseudogenes do actually have functions such as gene expression, gene regulation, and generation of genetic (antibody, antigenic, and other) diversity.[[4]](#footnote-5) We can look at this along the same lines as vestigial organs that recently are being found to have function, we just might not know enough about DNA to confidently say that they don’t have a function. In the example above of the GLO gene that synthesizes vitamin C which has been inactivated in humans and guinea pigs has not been found to be inactivated in apes as of yet. Humans and apes are quite similar so it does seem like a reasonable prediction that they might have common pseudogenes but yet this doesn’t necessarily point to evolution. Neutral mutations tend to be eliminated from populations and so it doesn’t make sense according to the evolution theory that these neutral mutations are still persisting.[[5]](#footnote-6) It also doesn’t correlate with the evolutionary theory that these genes are inactivated in the exact same way because this indicates a severe population bottleneck at some point in time. Another thing to look at is mutational hotspots which give rise to more mutations in a certain area. Hot spots represent highly mutable nucleotide areas which reflect different endogenous and exogenous factors that influence the mutation process in specific tissues. It is now known that the sequences of 10 bases away can influence the degree of hotspot behaviour.[[6]](#footnote-7) If two different species have mutations in identical locations it is because it is more likely that mutations would occur in these “hotspot” areas.

How should a Christian look at this evidence of pseudogenes in human DNA that is homologous with different organisms? It’s important to realize that because of the fall in Genesis chapter 3, sin has entered the world. Plants bear thorns and thistles, the soil is difficult to work and animals and humans bear the effects of sin. The effects of evil are evident in our world. The Lord put a curse on all life after the fall which could have resulted in the introduction of errors into DNA. Although we cannot understand it, we know that God has a purpose for all things and his purpose is to bring us closer to him. We can see the commonality between species in our DNA as a significant indicator of a common designer. God designed animals and humans with similar features so that we would function similarly. In saying this, God gave humans a special role and distinguishes us from the rest of creation. We are set apart from animals in that we can have a relationship with God. Humans are similar to animals genetically in many ways but I think we should be careful to hastily use this as a proof of evolution. Much more must be learned about the thousands of pseudogenes in the numerous genomes before such strong claims of evolution can be made.

1. “Human Genome Project,” http://www.ornl.gov/sci/techresources/Human\_Genome/home.shtml [↑](#footnote-ref-2)
2. Edward E. Max. “Plagerized Errors and Molecular Genetics Another Argument in the evolution- creation controversy” May 5, 2003. Creation/ Evolution, http://www.talkorigins.org/faqs/molgen/ [↑](#footnote-ref-3)
3. [Linda K. Walkup](http://creation.com/article/5571). “Junk DNA: Evolutionary Discards or God’s Tools” August 2000. Technical Journal **14**(2):18–30,
http://creation.com/junk-dna-evolutionary-discards-or-gods-tools-journal-of-creation-tj#r\_hybridisation [↑](#footnote-ref-4)
4. Evgeniy S. Balakirev and Francisco J. Ayala, “Pseudogenes: Are they Junk or Functional DNA” *Annual Review of* Genetics 37: 123-151 December 2003 [↑](#footnote-ref-5)
5. ## David A. Plaisted “Shared Errors in the DNA of Humans and Apes,” http://www.cs.unc.edu/~plaisted/ce/junk.html

 [↑](#footnote-ref-6)
6. John Woodmorappe “Potentially decisive evidence against pseudogene shared mistakes” *Countering Critics* TJ 18(3) 2004 http://creation.com/images/pdfs/tj/j18\_3/j18\_3\_63-69.pdf [↑](#footnote-ref-7)