These two genomes are exactly what we’d predict if they both evolved from the same ancestral genome. Charles Darwin knew nothing of DNA. If you had told him that there was a heritable genetic code in each organism, with patterns of evidence to support what he was already saying based on other evidence, he would’ve done backflips!

**PSEUDOGENES**

Like pages torn out of a book, some mutations destroy a gene’s message but leave large portions of structure intact. We know we’re looking at the remnants of a gene (called a pseudogene) – the same way we still recognize a book with missing pages. When we compare the human genome with those of chimps, gorillas, and orangutans, we notice something interesting: not only a surprising amount of the same genes in the same order, but also exactly identical mutations in many genes and pseudogenes – right down to the DNA letter. A non-evolutionary hypothesis could be that the exact same mutation happened, independently, in each separate lineage. In contrast, evolutionary theory would predict that this mutation happened in a common ancestral species, which was then inherited as populations went their separate ways.

One study looked at shared genetic errors in olfactory pseudogenes (Y. Gilad, et al.). Here we see some mutations unique to a specific lineage: in the figure, we have 15 mutations unique to humans; 3 identical errors shared between humans and chimps only; another 3 between humans, chimps, and gorillas; and 6 between all four species. What we don’t find (at least in this small sample) is just as telling: e.g., we’re not seeing any mutation present in both orangutans and humans, but absent from chimps and gorillas. Rather, if a mutation is present in orangutans and humans, we find the same mutation in chimps and gorillas. This is just the kind of pattern we’d expect if all four species do, in fact, share one prior ancestral population. This new genetic evidence provides independent support for the “family tree” predicted earlier (based on fossils, etc.).

Another example uses chickens (D. Brawand et al.). Evolution strongly predicts that placental mammals, like humans, share a common ancestral population with egg-laying animals, like birds, about 310 million years ago. The prediction is that we today are highly modified egg-laying organisms. To test this, one research group looked for the remains of egg yolk production genes (called vitellogenins) in humans. Comparing the two genomes, they located three vitellogenins in chickens (VIT1, VIT2, & VIT3), recorded which other genes were nearby in chickens (ELTD1, SSX2IP, & CTBS), and then located those other genes in the human genome. When they looked for remnants of egg-yolk producing genes nearby, they found them! (The black bars between the chicken and human genomes represent matches between the two.) Humans actually have small, fragmentary remains of egg-yolk producing genes still functioning in chickens.

**SUMMARY**

Is evolution “only a theory”? If we’re asking whether it’s a well-tested explanatory framework, supported by a large body of experimental evidence, that makes highly accurate predictions, and that has not (yet) been falsified through experimentation, then yes! We’ve had evolution as a productive scientific theory for over 150 years, and we have not yet rejected it. These genomic patterns strongly agree with independent lines of evidence for evolutionary theory — from the fossil record to embryology. If evolution had not already been a theory prior to genome sequencing, this alone would have brought the idea to the fore.
As Christians, we accept that God works through what we perceive as “natural,” as well as through supernatural means – both are forms of divine action, requiring the ordaining and sustaining action of God. The idea that God uses evolution as a creative mechanism is increasingly being recognized as one of the faithful options for evangelical Christians, and resources for this view are becoming more widely available (e.g. BioLogos.org).

FIND OUT MORE


Dennis Venema, BioLogos Blog Series. biologos.org/author/dennis-venema

Dennis R. Venema and Scot McKnight, Adam and the Genome: Reading Scripture after Genetic Science (Brazos Press, 2017). See also: “Adam & the Genome,” CSCA YouTube Channel (csca.ca/youtube).


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