

The End of Irreducible Complexity?

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The titles of two recent science news articles caught my attention, “More ‘evidence’ of intelligent design shot down by science” and “Intelligent design ‘evidence’ unproven by real science.”^{1, 2} The evidence in question is a molecular machine. Members of the Intelligent Design Movement and creation scientists have often stated that molecular machines are irreducibly complex and could not be formed by evolution. However, evolutionists now claim the mechanism of “pre-adaptation” is a way that these molecular machines could have evolved.

What Is a Molecular Machine and Why Is It Irreducibly Complex?

Molecular machines are complex structures located inside of cells or on the surface of cells. One popular example is the bacterial flagella. This whip-like structure is composed of many proteins, and its rotation propels bacteria through their environment. The molecular machine of interest in a recent PNAS article is a protein transport machine located in the mitochondria.³ This machine transports proteins across the membrane of mitochondria so they can perform the very important function of making energy.

Molecular machines are considered to be irreducibly complex. An irreducibly complex machine is made of a number of essential parts, and all these parts must be present for it to function properly. If even one of these parts is missing the machine is non-functional. Evolution, which supposedly works in a stepwise fashion over long periods of time, can’t form these complex machines. Evolution is not goal-oriented; it cannot work towards a specific outcome. If a part of the machine would happen to form by random chance mutation (which itself is not plausible⁴), but the other parts of the machine were not formed at the same time, then the organism containing that individual part (by itself non-functional) would not have a particular survival advantage and would not be selected for. Since the part offers no advantage to the organism, it would likely be lost from the population, and evolution would be back to square one in forming the parts for the machine. There is essentially no way to collect the parts over time because the individual parts do not have a function (without the other parts) and do not give the organism a survival advantage. Remember, all the necessary parts must be present for the machine to be functional and convey a survival advantage that could be selected for.

So How Can Evolution Account for Irreducibly Complex Molecular Machines?

The inability to find mechanisms that add information to the genome necessary to form parts for the molecular machines and the inability of Darwinian evolution to collect parts for the machines (no direction or goal) have led evolutionists to develop the idea of “pre-adaptation.” Simply stated, “pre-adaptation” is the formation of new parts for a new molecular machine (from currently existing parts that perform another function) before the machine is needed by the organism. Some quotes will help clarify.

Study authors Abigail Clements et al. state, “We proposed that simple ‘core’ machines were established in the first eukaryotes by drawing on pre-existing bacterial proteins that had previously provided distinct functions.”⁵

Sebastian Poggio, co-author of the study, stated, “[The pieces] were involved in some other, different function. They were recruited and acquired a new function.”⁶

Wired Science writer, Brandon Keim, puts it this way: “[T]he necessary pieces for one particular cellular machine ... were lying around long ago. It was simply a matter of time before they came together into a more complex entity.” He also states,

The process by which parts accumulate until they’re ready to snap together is called preadaptation. It’s a form of “neutral evolution,” in which the buildup of parts provides no immediate advantage or disadvantage. Neutral evolution falls outside the descriptions of Charles Darwin. But once the pieces gather, mutation and natural selection can take care of the rest ...⁷

These quotes conjure up images of Lego building blocks from my childhood days. The same blocks could be put together in many different ways to form different structures. The study authors suggest proteins that perform one function can be altered (via mutation⁸) and used for a different function. This eliminates the need to add new genetic information and requires only a modification of current information. Clements et al. state, “This model agrees with Jacob’s proposition of evolution as a “tinkerer,” building new machines from salvaged parts.”⁹

The problem with this concept is why would evolution “keep” parts that are intermediate between their old function and a new function? The parts or proteins are more or less stuck between a rock and a hard place. They likely don’t perform their old function because they have been altered by mutation, and they don’t perform their new function in a molecular machine because not all the parts are present yet.¹⁰ Studies have shown that bacteria tend to lose genetic information that is not needed in their current environment.

For example, the well known microbial ecologist Richard Lenski has shown that bacteria cultured in a lab setting for several years will lose information for making flagella from their genome.¹¹ Bacteria are being supplied with nutrients and do not need flagella to move to find a food source. Bacteria are model organisms when it comes to economy and efficiency, and those bacteria that lose the information to make flagella are at an advantage over bacteria that are taking energy and nutrients to build structures that are not useful in the current environment. Thus, even if new parts for a new molecular machine could be made via mutation from parts or proteins used for another function, the process of natural selection would eliminate them. The parts or proteins no longer serve their old function, and they cannot serve their new function until all the parts for the machine are present.

In particular, notice the use of verbs in the quotes above, such as drawing on, recruited, came together, and snap together. These are all action verbs that invoke the image of someone or something putting the parts together. Going back to the Lego analogy, an intelligent designer (me!) is required to put the Lego blocks together to form different structures. Just leaving the blocks lying on the floor or shaking them up in their storage container doesn’t result in anything but a big mess of blocks! Although the powers to “tinker” and “snap together” are conferred on mutation and natural selection, they are incapable of designing and building molecular machines.

Conclusion

Pre-adaptation is another “just so” evolutionary story that attempts to avoid the problems of necessary information gain and the goal-less nature of evolution. It fails to answer how parts that are intermediate between their old and new functions would be selected for and accumulated to build a molecular machine.

Michael Gray, cell biologist at Dalhousie University, states, “You look at cellular machines and say, why on earth would biology do anything like this? It’s too bizarre. But when you think about it in a neutral evolutionary fashion, in which these machineries emerge before there’s a need for them, then it makes sense.”¹² It only makes sense if you start with the presupposition that evolution is true and confer powers to mutation and natural selection that the evidence shows they do not have.

Clements et al. write, “There is no question that molecular machines are remarkable devices, with independent modules capable of protein substrate recognition, unfolding, threading, and translocation through membranes.”¹³ The evidence is clear, as Romans 1:20 states, that the Creator God can be known through His creation. Many people will stand in awe of the complexities of molecular machines and still deny they are the result of God’s handiwork. But that doesn’t change the truth of His Word that He is the Creator of all things.

Footnotes

1. Keim, B., 2009. More ‘evidence’ of intelligent design shot down by science. *Wired Science*. Retrieved from, <http://www.wired.com/wiredscience/2009/08/reduciblecomplexity/>
2. Vieru, T., 2009. Intelligent design ‘evidence’ unproven by real science. *Softpedia*. Retrieved from, <http://news.softpedia.com/news/Intelligent-Design-039-Evidence-039-Unproven-by-Real-Science-120351.shtml>
3. Clements, A., et al., 2009. The reducible complexity of a mitochondrial molecular machine. *Proceedings of the National Academy of Sciences* **106**(37):15791–15795.
4. Hodge, B., 2005. Are mutations part of the “engine” of evolution. *War of the worldviews*. Kentucky, USA: Answers in Genesis. Retrieved from, <http://www.answersingenesis.org/articles/wow/are-mutations-the-engine>
5. Clements, Ref. 3.
6. Keim, Ref. 1.
7. Keim, Ref. 1.
8. Clements et al. state that “relatively little mutation” would be required to alter currently existing proteins to modify them for use in a molecular machine. However, her own work showed that the protein of interest required the “engineering” (in her words) of a point mutation at a specific location in the protein and the addition of several sequences (not original to the protein) to convert the function of the protein. This is more than just a little “tinkering” with pre-existing proteins. This is the addition of information to the protein for which there is no known natural mechanism.
9. Clements, Ref. 3.
10. The odds of random chance mutation forming all the parts of a molecular machine at one time is not plausible.
11. See Purdom, G., 2008. A poke in the eye? *Answers in Depth* **3**:45–47.
12. Veiru, Ref. 2.
13. Clements, Ref. 3.