Disclosure

of things evolutionists don't want you to know

Volume 23 Issue 6 www.ScienceAgainstEvolution.info March 2019

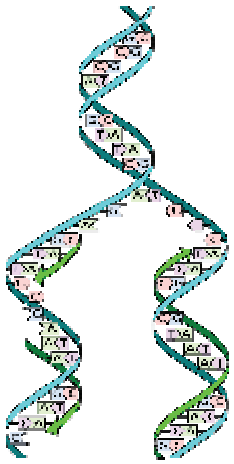
DNA Replication

Evolutionists claim this incredibly complex process evolved twice.

One of our readers alerted us to an article by Yang Gao (and his associates) published in the professional journal, *Science*, about how DNA replicates.

DNA Replication

Before we tell you about Gao's article, we need to establish some background about how the DNA molecule replicates.



DNA replication: The double helix is un'zipped' and unwound, then each separated strand (turquoise) acts as a template for replicating a new partner strand (green). Nucleotides (bases) are matched to synthesize the new partner strands into two new double helices. [1]

As you will soon see, it isn't quite that simple—but don't worry about that yet.

You also need to know the difference between eukaryotes and prokaryotes.

Eukaryotes are organisms whose cells have a nucleus enclosed within membranes, unlike prokaryotes (Bacteria and Archaea), which have no membrane-bound organelles. [2]

That's a bigger difference than you might think. The editors of *Science* refered to eukaryotes and prokaryotes as being from "different worlds" in the title of their commentary on Gao's article. Of course, that is hyperbole. Both kinds of cells exist on Earth. The editors exaggerated just to emphasize that eukaryotes and prokaryotes are so different that they could have come from different planets.

Seen for the First Time

The introduction of the *Science* article about DNA replication begins and ends with these words:

> **INTRODUCTION**
>
> DNA replication has been studied since the 1950s. It is well established that double-helical DNA needs to be separated for replication by a helicase. … Six decades after the discovery of the DNA double helix, visualization in atomic detail of how a functional replisome is formed and performs concerted leading- and lagging-strand synthesis at a replication fork has not been reported. [3]

In other words, nobody had ever actually seen a DNA molecule being unzipped to produce two identical DNA molecules—until now.

> We determined cryo–electron microscopy

[1] Illustration credit: Madeleine Price Ball. https://en.wikipedia.org/wiki/DNA_replication

[2] https://en.wikipedia.org/wiki/Eukaryote

[3] Yang Gao, *et al.*, *Science*, 22 Feb 2019, "Structures and operating principles of the replisome", http://science.sciencemag.org/content/363/6429/eaav7003

(cryo-EM) structures of the T7 replisome and show how its essential enzymatic functions are coordinated in three dimensions. [4]

They used an electron microscope to watch the process happen, and described in incredibly precise detail exactly what happened, and used some computer animation to demonstrate the process. Then they reached this rather unexciting conclusion:

> **CONCLUSION**
>
> We note the similarity between hexameric DNA helicases and AAA+ protein chaperones and unfoldases, which form spiral-shaped hexamers around protein substrates and move along proteins by a hand-over-hand subunit translocation mechanism. The operating principles of the bacteriophage replisome observed here rationalize many well-known features of bacterial and eukaryotic replication. In each replisome, a helicase is the central organizer and tangentially unspools the downstream DNA, while leading- and lagging-strand polymerases synthesize DNA separately on the front and back sides of the helicase. [5]

No Big Deal

It didn't seem like a big deal to us—but the editors of *Science* realized the importance of the research and explained how important this is to the theory of evolution.

> On page 835 of this issue, Gao *et al.,* report the cryo–electron microscopy (cryo-EM) structure of the T7 bacteriophage replisome at a high atomic detail. The study not only advances our understanding of the helicase mechanism but also reveals an unexpected arrangement of the two DNA Pols in the replisome. Specifically, the two Pols sandwich the DNA helicase in an asymmetric manner; one DNA Pol is on top of the helicase, and one DNA Pol is below (see the figure). This architecture is unlike textbook illustrations of both DNA Pols trailing behind the helicase. [6]

What biology students have been told since 1950 is wrong. Admittedly, that probably isn't too important. Hopefully, every student knows there is some artistic license in every textbook illustration, so it isn't a very big deal that textbook drawings aren't perfectly accurate. The big deal is coming later in the article.

The *Science* editors said that replication of the DNA molecule is a complex task, and that Gao's team used an electron microscope to watch it happen, and the textbooks were wrong. They took the following paragraph to say what we just said in one sentence:

> Replication of the DNA genome is performed by a replisome complex composed of numerous proteins. Cells have duplex DNA genomes, and their replisomes duplicate both strands simultaneously. A functional replisome requires, at a minimum, a helicase to unwind the DNA duplex, two DNA polymerases (Pols) to replicate the two DNA strands, and a primase to form RNA primers that DNA Pols extend. The replisome functions at a Y junction, or replication fork, and is a complex task because DNA Pols can only extend DNA in a 3′-to-5′ direction. Thus, as the helicase unwinds the antiparallel DNA strands, the DNA Pol on one strand (the leading strand) can go in the same direction as the helicase and replicate DNA continuously, but the DNA Pol on the antiparallel strand (the lagging strand) is generated in the opposite direction. This requires repeated priming and extension of the lagging strand discontinuously as a series of Okazaki fragments. This "semidiscontinuous replication" is shared by all cells. On page 835 of this issue, Gao *et al.* (*1*) report the cryo–electron microscopy (cryo-EM) structure of the T7 bacteriophage replisome at a high atomic detail. The study not only advances our understanding of the helicase mechanism but also reveals an unexpected arrangement of the two DNA Pols in the replisome. Specifically, the two Pols sandwich the DNA helicase in an asymmetric manner; one DNA Pol is on top of the helicase, and one DNA Pol is below (see the figure). This architecture is unlike textbook illustrations of both DNA Pols trailing behind the helicase.

The Big Deal

Now, here is the big deal:

> Multiprotein complexes carry out each step of the "central dogma" of genetic information flow: replication, transcription, and translation. Interestingly, proteins of transcription and translation are homologous among Bacteria, Archaea, and Eukarya and thus evolved from a common ancestor. By contrast, the DNA Pol, helicase, and primase of bacterial replisomes share no homology to their eukaryotic counterparts, implying that these replisome enzymes evolved independently, after the evolutionary split of bacteria and eukaryotes. The primordial cell possibly used a simpler

---

[4] *ibid.*
[5] *ibid.*
[6] Huilin Li and Michael E. O'Donnell, *Science*, 22 Feb 2019, "DNA replication from two different worlds", pp. 814-815, http://science.sciencemag.org/content/363/6429/814

process of DNA replication, or used an RNA genome.

Surprisingly, the asymmetric arrangement of two DNA Pols that sandwich the helicase was also demonstrated by EM for the eukaryotic replisome of the yeast *Saccharomyces cerevisiae*, albeit at lower resolution than the T7 study by Gao *et al.* Thus, although "worlds apart" in terms of their independent evolution, the core elements of bacterial and eukaryotic replisomes both contain a helicase between two DNA Pols, although the eukaryotic replisome requires a trimeric scaffolding factor (Ctf4) to help tether the top DNA Pol to the helicase.

Another unexpected feature of the bacterial (T7) and eukaryotic replisomes is that the top DNA Pol functions on the opposite strand: The DNA Pol at the top of T7 helicase replicates the leading strand, whereas the DNA Pol at the top of eukaryotic CMG helicase replicates the lagging strand (see the figure). This is because bacterial helicases encircle the lagging strand, whereas eukaryotic CMG helicase encircles the leading strand. It remains a mystery why this "mirror" arrangement evolved, but both arrangements share a pragmatic logic for replisome function. All replicative helicases split the duplex at their leading edge, with one strand going through the middle of the helicase ring and the other strand deflected off the top of the ring. Hence, a DNA Pol at the top of the helicase can immediately duplicate the separated strand. [7]

A "central dogma" of the theory of evolution is that Bacteria, Archaea, and Eukarya evolved from a common ancestor—but the evidence suggests their replisome enzymes mysteriously evolved independently.

Let's ponder that for a moment. All living cells contain DNA. You no doubt have heard about how much information is stored in the DNA molecule compared to how many books it would take to hold all that information. DNA is an incredibly efficient information storage medium. Evolutionists believe that all living cells inherited DNA from the first living cell. The first two things that first living cell had to learn were (1) to harness energy and (2) reproduce itself. If it hadn't done that, it would have died alone.

So, according to evolutionists, the first living cell ~~miraculously~~ *fortunately*, at a minimum, evolved "a process involving a helicase to unwind the DNA duplex, two DNA polymerases (Pols) to replicate the two DNA strands, and a primase to form RNA primers that DNA Pols extend." But in eukaryotes the process is so different from prokaryotes, it is as if they came from "different worlds." It is as if they were independently created. Perish the thought! ☺

We wish we had noticed the difficulties this discovery poses for the theory of evolution first—but we didn't. We don't know if Gao's team didn't notice it either, or noticed it and chose not to mention it.

The body of Gao's article does not contain the word, "evolution." His article describes in precise detail exactly what they observed and how they observed it. We applaud him for just reporting what they found without speculating about why the process is different in eukaryotes and prokaryotes. That's good science.

We also applaud the editors of *Science* for recognizing the implications of Gao's observation and not sweeping the implication of the difference under the rug.

DNA replication is a complex process that evolutionists believe originated ~~miraculously~~ *unexplainably* in the first living cell. It takes a lot of faith to believe that happened by chance. It takes even more faith to believe it happened twice by chance.

Evolution in the News

The Secret of Life

Paul Davies claims to have found "life's secret ingredient."

Six weeks ago Paul Davies wrote an article for *New Scientist* in which he claims to have found "life's secret ingredient" and presented "a radical theory of what makes things alive." [8] He made some excellent points. He began that article by saying,

> THERE is something special – almost magical – about life. Biophysicist Max Delbrück expressed it eloquently: "The closer one looks at these performances of matter in living organisms, the more impressive the show becomes. The meanest living cell becomes a magic puzzle box full of elaborate and changing molecules."
>
> What is the essence of this magic? It is easy to list life's hallmarks: reproduction, harnessing

[7] *ibid.*

[8] Paul Davies, *New Scientist*, 30 January 2019, "Life's secret ingredient: A radical theory of what makes things alive", https://www.newscientist.com/article/mg24132150-100-lifes-secret-ingredient-a-radical-theory-of-what-makes-things-alive/

> energy, responding to stimuli and so on. But that tells us what life does, not what it is. It doesn't explain how living matter can do things far beyond the reach of non-living matter, even though both are made of the same atoms.
>
> The fact is, on our current understanding, life is an enigma. Most strikingly, its organised, self-sustaining complexity seems to fly in the face of the most sacred law of physics, the second law of thermodynamics, which describes a universal tendency towards decay and disorder. [9]

It is difficult to define life, as we noted years ago in a previous newsletter. [10] Davies has noted a key identifier. Dead (inanimate) things always tend toward decay and disorder in a natural attempt to find the lowest energy state. Walls naturally fall down—they don't naturally build themselves. Dead bodies obey the second law of thermodynamics and decay—but living bodies grow and reproduce, becoming more complex, apparently violating the second law.

Living things don't actually violate the second law because the second law applies to a closed system, in which no heat (that is, energy) flows in or out. If you examine the complete system consisting of the living thing and the environment in which the thing lives, energy flows from the environment into the living thing, and the overall distribution of the energy in the living thing and the environment is less segregated, in accordance with the second law.

Imagine an ice cube in a glass of hot water. The ice will melt and the water will cool until all the water in the glass will be the same temperature. A glass of warm water will never naturally change into a glass of hot water with an ice cube in it—unless a conscious entity (like Maxwell's demon) makes it happen by using directed energy.

> The existence of a link between information and physics dates back 150 years, to a thought experiment by physicist James Clerk Maxwell. Maxwell imagined a tiny being, later dubbed a demon, who could perceive the individual molecules of a gas in a box and assess their speeds as they rushed about randomly. By the nimble manipulation of a shutter mechanism, the demon could accumulate the speedy ones in one place and the tardy ones in another. Because molecular speed is a measure of temperature, the demon would have used information about molecular speeds to establish a temperature gradient in an initially uniform gas. This disequilibrium could then be exploited to do work. [11]

It is an undeniable fact, established by years of experimental verification, that energy must flow from a high energy state to a low energy state to get work done. A cuckoo clock stops running when the iron pine cone gets as low as it can get. You have to pull the chain to raise the pine cone into a higher potential energy state to create a disequilibrium for energy to flow to make a cuckoo clock work.

Davies said,

> Like life, Maxwell's imaginary demon seems to violate the second law of thermodynamics. But on careful examination it doesn't, so long as information is treated as a physical resource – an additional fuel, if you like. … For that reason, many scientists recognise the equation "life = matter + information". [12]

That's so close. I would say, "life = matter + motivation" because information, by itself, doesn't do anything. There is information in a book—but that doesn't matter if nobody reads the book. There is information in the DNA molecule—but that doesn't matter if there is no cellular process that decodes the DNA molecule and acts upon that information for some purpose.

Everything done by every living thing has a purpose. There is a reason why living things reproduce, harness energy, and respond to stimuli, and so on. It is all part of a plan. A seed germinates, sending roots down and a stalk up, for a reason. That reason is to produce more seeds. Even Richard Dawkins recognized the existence of "selfish genes" forty years ago. [13]

The Problem is Purpose

The problem with the theory of evolution is the fundamental assumption that things evolved for no reason. Evolution is based upon the false belief in purposeless increase in complexity.

---

[9] *ibid.*

[10] *Disclosure*, September 2005, "One Million Dollars!", http://scienceagainstevolution.info/v9i12f.htm

[11] Paul Davies, *New Scientist*, 30 January 2019, "Life's secret ingredient: A radical theory of what makes things alive", https://www.newscientist.com/article/mg24132150-100-lifes-secret-ingredient-a-radical-theory-of-what-makes-things-alive/

[12] *ibid.*

[13] Dawkins, *The Selfish Gene: 40th Anniversary Edition*, https://www.amazon.com/Selfish-Gene-Anniversary-Landmark-Science/dp/0198788606/ref=sr_1_1?crid=3SM33N4WABC9&keywords=dawkins+selfish+gene&qid=1552058748&s=gateway&sprefix=dawkins+selfish+%2Caps%2C327&sr=8-1

by Lothar Janetzko

Center for Scientific Creation

https://www.creationscience.com/

IN THE BEGINNING: Compelling Evidence for Creation and the Flood

This month's website review looks at the website of the Center for Scientific Creation. This site serves as the place on the Internet where you can order a hard copy of the 8th edition of *In the Beginning: Compelling Evidence for Creation and the Flood* by Dr. Walt Brown. This book can also be read or printed out at this website.

At the top of the home page of the site you will find two short videos which provide a general introduction of the Hydroplate Theory developed by Dr. Brown to explain in detail what happened at the time of Noah's flood as described in the Bible.

Also, on the home page you will find a short About the Author paragraph which provides a biographical sketch of the life of Dr. Brown. If you are interested and wish to know more about Walt Brown, a link is provided to a chapter of a book that provides more details of his life.

Links to three additional videos can also be found on the site presenting the Hydroplate Theory Overview Part I, Part II and Part III.

Near the bottom of the home page you will find a description of the contents of the book Dr. Brown has written which presents the results of his more than 35 years of study regarding creation and the flood. The current book is the 8th edition published in December 2008. The online version is updated from time to time.

Following the ONLINE BOOK link on the main page of the site, you arrive at the Table of Contents of the book. After a Preface, the book is divided into three parts: Part I: Scientific Case for Creation; Part II: Fountains of the Great Deep; and Part III: Frequently Asked Questions, followed by Technical Notes and an Index.

The Table of Contents is presented as links so the reader can easily jump to information that may be of interest. Part II presents the details about the Hydroplate Theory and Part III seeks to answer the most frequently asked questions the author has received in his seminars and public presentations.

In the Preface of the book, Dr. Brown asks the question "Where is the creation-evolution controversy headed? I believe the battle will be won – not in courts, legislatures, boards of education, or church councils – but by grassroots science education." This is what he seeks to provide in his book.