

Searching for messages from ET in life's Genetic Code

When we hear popular media talking about something contained in our “genetic code”, usually it’s from someone who misused the term. They really are talking about one or more genes within our *genome*, rather than the actual Genetic Code. The code of life as it’s sometimes called is the language that the cellular machinery in all life forms on Earth uses to translate the genes—sequences of DNA and RNA building blocks—into an entirely different class of biological molecules: proteins.

The Genetic Code is contained in our DNA, but, unlike the variations that occur between individuals and between species, the Code is practically the same for every single organism on this planet. But there’s one [story](#) involving something contained in our Genetic Code that actually does use the term appropriately. It’s actually been worked out mathematically that the Code could be a message—for us.

Searching for extraterrestrial messages

Run by NASA, the SETI Institute and various other agencies and organizations around the planet search for extraterrestrial intelligence ([SETI](#)) based on one major assumption. Namely, we believe it’s possible that some fraction of intelligent species who developed technology on other worlds long before we did on Earth would be trying to “reach out” using some kind of radio or microwave transmission. This doesn’t mean that better ways to communicate over space do not lie ahead as we move forward technologically. In a hundred years, or even tomorrow, we could invent something that makes radio technology as obsolete as the telegraph. But because we learned to send and receive radio signals almost immediately after we harnessed electricity, SETI researchers assume that any civilization that really wants its presence known to emerging civilizations like ours would use the low tech method, the first one that a new civilization would likely master.

Although fictional, Carl Sagan’s brilliant novel, [Contact](#), showed us how an interstellar radio signal would be recognized as being intelligent in origin, and how humans might react to it on Earth. Since Sagan’s novel and the movie that came of it, the real life SETI program has scanned thousands of stars that could have Earth-like planets. This has revealed some candidate signals, though nothing has passed enough tests or persisted long enough for researchers to say that they have something.

“Wow! signal”

The search that uses huge equipment like radio telescopes can go on for decades with investigators identifying possible candidate signals once in a while, and painstakingly trying to rule out natural origins. But while that’s been happening, a smaller research team has been looking for extraterrestrial messages right in our DNA, and believes they have found one—right in the sequences of the Genetic Code itself. [Published](#) early last year in the prestigious planetary science journal, *Icarus*, the report by a Kazakhstani team is extremely mathematical. Basically, the team has identified patterns in the relationships, or coding, between the DNA/RNA building blocks and the building blocks, called amino acids, that cells assemble into proteins.

So profound are the patterns, say the researchers, that “the code mapping itself is uniquely deduced from their algebraic representation.” They titled the paper “The ‘Wow! Signal’ of the terrestrial genetic code”, because “the signal displays readily recognizable hallmarks of artificiality.”

Furthermore, “extraction of the signal involves logically straightforward but abstract operations, making the patterns essentially irreducible to any natural origin.” In the ensuing discussion, the *Icarus* paper makes the case that the apparent design of the Genetic Code implies that life on Earth was seeded from locations across space.

The idea that Earth’s earliest life forms arrived on this planet more than 3.5 billion years ago through [natural seeding events](#), such as transfer within meteoroids, is gaining popularity among astrobiologists, but the *Icarus* paper suggests that seeding might be artificial. Even more profound, the researchers explain that the Genetic Code can be used to carry non-biological information, even if the carrying capacity is far less than that of radio transmissions.

Science fiction, religious fiction or reality?

Artificial seeding of Earth life billions of years ago, with a message from the seeders in our DNA to boot, is right out of science fiction. In particular, there was a Star Trek episode in which it was discovered that life on Earth—and on all of the planets with intelligent beings that look suspiciously similar to humans, but for a few facial ridges, pointed ears or other details—had evolved from DNA seedlings, spread throughout the galaxy billions of years ago by ancient beings. The ancient beings had the familiar human bipedal form and seeded the planets knowing that similar beings would evolve.

The human form being ancient takes things a little further into the imagination than the Kazakhstan team does; nothing in their research contradicts current ideas about the emergence of humans, and human form, over the last few million years, from four-legged mammals, and before that from fish and other forms. Still the prospect of intentional seeding by an intelligent civilization, with a DNA message that we might be able to decipher, is tantamount to Star Trek coming to life.

It also has opened the door for people whose thinking and methods are never right for a peer-reviewed journal such as *Icarus*. I’m referring to the creationists, the pseudoscientist groups that reject evolution, build museums showing dinosaurs on Noah’s Ark, and these days call themselves researchers in “intelligent design”. While the proposal in the *Icarus* paper is perfectly consistent with life evolving on this planet for at least the last 3.5 billion years, beginning with only microorganisms, this has not kept intelligent design pseudoscientists from [spinning it](#) to promote their beliefs.

Even if the Kazakhstan team turns out to be correct that life was seeded on this planet by intention, as with the natural seeding idea, all it does is set back to the origin of life to an earlier time and distant location. The hypothetical beings that we can imagine doing the seeding, whether biological or robotic, had to come from something that evolved from lower life at some point in time. Such beings would have logical reasons for putting any message in the Genetic Code part of the genome of the microorganisms they deposited. That reason is that it’s the protected part of the genome, the part that cannot evolve,

because it's the part of the genome that makes life possible in the first place. Change the language that's used to make genes express themselves, and nothing works.

On the other hand, because the Genetic Code does not evolve in any major way, it allows for the rest of the genome to evolve, and to do so in very dramatic, unpredictable ways. We don't know where this research will go, but even at this early point, we can be sure that once understood it will not support biblical creation.

David Warmflash is an astrobiologist, physician, and science writer. Follow [@CosmicEvolution](#) to read what he is saying on Twitter.