

**From:** [REDACTED] <[REDACTED]>

**To:** Jeffrey Epstein <jeevacation@gmail.com>

**Subject:** Huffington Post: Origin Of Life Ideas May Need Makeover

**Date:** Thu, 13 Dec 2012 11:55:49 +0000

---



## Origin Of Life Ideas May Need Makeover

By: Tia Ghose, LiveScience Staff Writer

Published: 12/11/2012 07:08 PM EST on LiveScience

Scientists trying to unravel the mystery of life's origins have been looking at it the wrong way, a new study argues.

Instead of trying to recreate the chemical building blocks that gave rise to life 3.7 billion years ago, scientists should use key differences in the way that living creatures store and process information, suggests new research detailed today (Dec. 11) in the *Journal of the Royal Society Interface*.

"In trying to explain how life came to exist, people have been fixated on a problem of chemistry, that bringing life into being is like baking a cake, that we have a set of ingredients and instructions to follow," said study co-author Paul Davies, a theoretical physicist and astrobiologist at Arizona State University. "That approach is failing to capture the essence of what life is about."

Living systems are uniquely characterized by two-way flows of information, both from the bottom up and the top down in terms of complexity, the scientists write in the article. For instance, bottom up would move from molecules to cells to whole creatures, while top down would flow the opposite way. The new perspective on life may reframe the way that scientists try to uncover the [origin of life](#) and hunt for strange new life forms on other planets. [[7 Theories on the Origin of Life](#)]

"Right now, we're focusing on searching for life that's identical to us, with the same molecules," said Chris McKay, an astrobiologist at the NASA Ames Research Center who was not involved in the study. "Their approach potentially lays down a framework that allows us to consider other classes of organic molecules that could be the basis of life."

### Chemical approach

For decades, scientists have tried to recreate the [primordial events that gave rise to life](#) on the planet. In the famous Miller-Urey experiments reported in 1953, scientists electrically charged a [primordial soup](#) of chemicals that mimicked the chemical makeup of the planet's early oceans and found that several simple amino acids, the most primitive building blocks of life, formed as a result.

But since then, scientists aren't much further along in understanding how simple amino acids could have eventually morphed into simple, and then complex, living beings.

Part of the problem is that there isn't really a good definition of what life is, said Sara Walker, study co-author and an astrobiologist at Arizona State University.

"Usually the way we identify life on Earth is always by having DNA present in the organism," Walker told LiveScience. "We don't have a rigorous mathematical way of identifying it."

Using a chemical definition of life — for instance, requiring DNA — may limit the hunt for extraterrestrial life, and it also may wrongly include nonliving systems, for instance, a petri dish full of self-replicating DNA, she said. [[5 Bold Claims of Alien Life](#)]

### **Information processing**

Walker's team created a simple mathematical model to capture the transition from a nonliving to a living-breathing being. According to the researchers, all living things have one property that inanimate objects don't: Information flows in two directions.

For instance, when a person touches a hot stove, the molecules in his hand sense heat, transmit that information to the brain, and the brain then tells the molecules of the hand to move. Such two-way information flow governs the behavior of simple and complex life forms alike, from the tiniest bacteria to the giant humpback whale. By contrast, if you put a cookie on the stove, the heat may burn the cookie, but the treat won't do anything to respond.

Another hallmark of living beings is that they have different physical locations for storing and reading information. For instance, the alphabet of letters in DNA carries the instructions for life, but another

part of the cell, called the ribosome, must translate those instructions into actions inside the cell, Davies told LiveScience.

(By this definition, computers, which store data on a hard drive and read it off using a central processing unit, would have the hallmarks of life, although that doesn't mean they are alive per se, Walker said.)

The new model is still in its infancy and doesn't yet point to new molecules that could have spawned life on other planets. But it lays out the behavior needed for a system needs to be considered living, Walker said.

"This is a manifesto," said Davies. "It's a call to arms and a way to say we've got to reorient and redefine the subject and look at it in a different way."

*Follow LiveScience on Twitter  We're also on Facebook & Google+.*

- [Extreme Life on Earth: 8 Bizarre Creatures](#)
- [6 Most Likely Places to Find Alien Life](#)
- [Top Ten Unexplained Phenomena](#)

Copyright 2012 LiveScience, a TechMediaNetwork company. All rights reserved. This material may not be published, broadcast, rewritten or redistributed.

Typos, misspellings courtesy of iPhone word & thought substitution.