

## THE BUZZ ABOUT THE EVOLUTION CONSPIRACY

*Lisa Shiel is consistently convincing in her new book, The Evolution Conspiracy, that Evolutionary Scientists have defined "facts" and "theory" to suit themselves and in a way that any other scientific field (such as physics, mathematics, biochemistry, etc.) would find completely inappropriate. That is, the Evolutionary Scientists have circumvented the true scientific method. The other thing that she points out is that it is not always appreciated that nearly all Evolutionary Scientists refuse to share their data for years and years, thus preventing effective evaluation of their results by other scientists.*

**Dr. Quinton R. Rogers, Distinguished Professor Emeritus  
Dept of Molecular Biosciences, School of Veterinary Medicine  
University of California Davis**

*This gem of a book sheds light on the current status of evolution as a scientific theory. Lisa A. Shiel examines the question from a strictly scientific point of view, carefully evaluating various categories of evidence, ranging from microbiology to paleontology. For the most part, the evidence fails to support the theory of evolution to the extent its supporters claim. The book is concise, lucid, and to the point. Although authoritative and well referenced, it is written in such a way as to be accessible to all levels of readers, from intelligent high school students to doctoral candidates at universities.*

**Michael A. Cremo, Author  
Forbidden Archeology, Human Devolution, etc.**

*I agree with the author's points of view on the theory of evolution as discussed in Volume 1. Her discussion of the issues concerning evolution in relation to biology is solid even though her educational background is not in science. Her authorship of this book supports her contention that it doesn't take a degree in a certain field to understand and question the so-called concepts of evolution...I hope she will also investigate additional problems with the theory of evolution...when she writes volumes 2 and 3. Her book is easy to read and understand.*

**Jacquelyn W. McClelland, PhD  
Professor, North Carolina Cooperative Extension  
North Carolina State University**

*In an era of learned helplessness and deference to authority, Lisa shows interested non-specialists can comprehend evolution and discover for themselves where scientific theory is strong and where it needs some additional work.*

**Tyler A. Kokjohn, PhD  
Professor of Microbiology, Midwestern University**

## MORE BUZZ ABOUT THE EVOLUTION CONSPIRACY

*I enjoyed this book a great deal. . . Lisa Shiel makes the most difficult issues easy to comprehend. She explains the myriad of complex words, even providing the average Joe a glossary with useful definitions. . . This book is a delight because it encourages questioning and urges readers to think for themselves. . . Shiel reminds us that we can question, and we should.*

**Emily Decobert**  
**[BookPleasures.com](http://BookPleasures.com)**

*We are at our best when we reason without prejudice. But the mind loves shortcuts and to generalize or to follow an existing paradigm. It is tragic that modern academia has become closed to questioning the propped-up evolutionary evidences for our origins. But this book takes a fresh look at evolution, time, and human origins. What are we? Why are we? Though I differ with Shiel on some conclusions I do completely agree that the evolutionary presuppositions of our age stand in dire need of a thorough scientific reevaluation.*

**Paul Abramson, Editor**  
**[www.Creationism.org](http://www.Creationism.org)**

*A powerful argument against the shibboleths of Evolutionists and the cult of Darwin. Scientifically rigorous and extensively researched, this book offers a clear, concise look at the science and problems of evolutionary theory. Lisa Shiel systematically dismantles the arguments that have long been the cornerstone of Darwinian hegemony in the biological sciences in workmanlike fashion, illustrating exactly what is wrong with the theory in a compelling and easy-to-understand text. . . A triumph of logic over dogma! I really enjoyed the book; in fact, I couldn't put it down. I flew through it in a few hours.*

**Timothy Birdnow**  
***American Daily Review***

*[Shiel] points out that it is not just those trying to promote creationism that have serious doubts about evolution as legitimate science. . . [This book] cuts through the confusion in the science community. . . Readers, however, will be left with one big question: Why would anyone think evolution is a fact?.*

**Sam Stickle**  
**[www.AccountabilityInTheMedia.com](http://www.AccountabilityInTheMedia.com)**

THE  
EVOLUTION  
CONSPIRACY



# THE EVOLUTION CONSPIRACY

## **Vol. 1**

*Exposing Life's Inexplicable  
Origins & the Cult of Darwin*

LISA A. SHIEL

FOREWORD BY TYLER A. KOKJOHN, PHD



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*For everyone who dares  
to think and question...  
and embrace the mystery.*



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## Foreword

One hundred and fifty years ago, Charles Darwin published *On the Origin of Species*, observations and speculations supporting his ideas of descent with modification—evolution. Evolving itself as new information emerged, Darwin's idea comprises a core component of modern biological science. Along the way, few scientific ideas have inspired as much heated debate and engendered such raw emotion.

When they think of evolution, most readers will likely recall the current debates over how this subject and competing explanations are taught in the public schools. But evolution encompasses far more than some seemingly arcane facts taught in biology classes and touches us all directly.

In early 2009, the world passed through an influenza pandemic scare. Noting a potentially lethal H5N1 bird influenza was burgeoning unchecked in Asia, authorities had long worried this virus would evolve to infect humans and produce a deadly pandemic. However, the viruses never got those memos, and a new H1N1 (swine) flu, with an apparently high fatality rate, emerged in Mexico. Scientists ascertained quickly the novel and complex genealogy of this new virus, but no one could say whether it would be an ordinary (although still nasty) influenza or something destined to evolve into a fearsome killer like the virus of 1918. Then again, it might simply disappear. Such is the state of our knowledge of influenza virus evolution and epidemiology.

Soon, all of us may be forced to answer questions regarding this new flu virus—perhaps some readers already have. No one can predict what evolution will cook up, and there is no guarantee that being immune to the original H1N1 virus will offer any protection against a new killer virus that has yet to appear. The ugly fact is that evolution can move at blinding speed in influenza viruses and, under the right conditions, could quickly render all drugs useless. The US government has been commendably proactive on this issue, but oversight by an informed citizenry is essential to ensure leaders make wise decisions and establish productive priorities.

Influenza is not the sole existential threat to humanity. Pathogens entirely new to medicine such as the coronavirus that caused SARS (severe acute respiratory syndrome) and human immunodeficiency viruses (HIV) have evolved and spread to menace the entire world. Anyone who eats, breathes or goes to a hospital is under some danger from constantly changing disease agents. The sad part is that we are often unwittingly helping these pathogens evolve into uncontrollable adversaries. Even if humans represent the apex of evolution, as Nobel laureate Joshua Lederberg noted, nothing guarantees our continued survival.

Lisa Shiel explores and dissects the explosive and complex subject of evolution, but readers are forewarned that she does so in a unique fashion. Neither enamored acolyte nor iconoclast bent on destruction, Lisa subjects the evidence to brutal assessments and translates often mysterious scientific jargon for her readers. In so doing she reveals that the basic ideas of evolutionary theory and the evidence on which they rest are not the sole purview of the scientific elite, but are accessible to those who will make an effort to understand. Her slant is provocative and undoubtedly will stimulate a good deal of debate.

Since Darwin, the debate over if and how evolution should be taught has itself evolved. Unfortunately, from a public relations standpoint, it is obvious that scientists have not always helped their cause. Although often presented as a perfected and complete theory, many aspects of evolution are not understood completely and are the subject of intense scientific investigation. These gaps provide attack points for proponents of competing ideas who have shifted the debate focus to battles over specific shortcomings that are then extrapolated in attempts to discredit evolution theory in its entirety. The contestants marshal impressive multitudes of supportive facts and argue stridently, leaving school board members and the public befuddled. Confronted with unfamiliar terms, conflicting data, perhaps even outright double-talk, it is natural to defer to trusted authority.

But which experts should we believe? Follow Lisa's advice and work like a scientist would in a perfect world—assume nothing, gather up the facts and give them a cold, hard evaluation.

Kick down the doors and think for yourself.

Tyler A. Kokjohn  
Phoenix, Arizona  
May 31, 2009

*Tyler A Kokjohn is a professor of microbiology at Mdwestern University.*



# Preface

Evolution.

One word, deceptive in its simplicity, has transformed the way we look at ourselves and everything around us. Once thought of as unique, man has become one of the animals with no special claim on the planet. As children, few of us question what we learn in biology class about the origins of life and the position man holds in the hierarchy. Science textbooks present evolution as fact—indisputable, inevitable, and incomprehensible to everyone outside the exalted few with PhDs in the appropriate fields.

Scientists bank on the fact that most people, overwhelmed by evolutionary theories, will decide they lack the mental capacity or rigorous training to understand how evolution works. In a book about evolution written for a lay audience, the scientist-author will employ cartloads of big, impressive words interspersed with phrases like adaptive radiation, exaptation, descent with modification, and phenotypic plasticity. Those terms respectively allude to the process of several new species branching out from a single ancestor species, traits not attributable to natural selection, the inheritance of new traits, and changes in an organism's appearance set off by environmental conditions.

Every discipline spawns jargon as a verbal shorthand. In evolutionary science, the jargon both helps scientists keep control and dissuades laymen from asking

questions scientists would rather not answer. That's why this book promotes one key premise.

*Anyone can understand evolution.*

Once we comprehend the theory, we can spot the chinks in its facade. In spite of scientists' efforts to confuse the rest of us, people do question evolution. In a May 2008 Gallup poll, respondents who agreed humans evolved gradually outnumbered those who disagreed by a narrow margin of 50% to 44%. Of those who agreed, about 36% gave God credit for helping the process along. In a June 2007 Gallup poll a mere 18% of respondents believed wholeheartedly in evolution, with a full 35% calling evolution at best "probably true" (Gallup 2008). When pollsters asked respondents in the May 2008 poll whether God played any role in man's development, fully 84% said yes—with 53% believing God created humans no more than 10,000 years ago. Another 31% thought God aided human evolution over the course of millions of years. The choices for answering did not include an option for those who believe humans have existed for longer than 10,000 years without evolving.

In the 2008 poll, the pollsters substituted the word "developed" for evolved when asking participants what they believed. This leaves wiggle room for evolutionists to include people who believe man "developed" gradually in their count of evolution believers. But does "develop" automatically liken with "evolve" in everyone's mind? We may never know. Still, to have 44% of those polled disbelieve evolution and another 36% call it at best "probably" accurate suggests that in spite of scientists' efforts to convince us that we should believe everything they say because they have PhDs, average people can see the cracks in evolution's house.

Evolutionists focus their defensive efforts on creationist claims, giving the impression that nobody except religious zealots disputes evolution. Either God created man 10,000 years ago or every organism alive today evolved from a single cell produced by molecular magic. Evolutionists ridicule nonbelievers as fools, misled by blind faith in what the Bible says. They ignore the facts—that scores of intelligent people believe in Christianity, that people of other faiths eschew evolution too, and that plenty of others find answers somewhere in the gray area between religion and science. Even creationists span a spectrum of beliefs, from strict 10,000-year Creationism to the evolution-like variety.

I approach the subject from a different perspective. Instead of criticizing evolution in an effort to promote my personal beliefs, I've chosen to examine evolutionary theories and the evidence attached to them through a secular lens. I will also wipe the fog of scientific jargon from our vision. Anytime I invoke a scientific term, that word or phrase will appear in bold and an explanation will follow. Terms in bold also appear in the glossary at the end of the book.

Neither scientist nor cleric, creationist nor evolutionist, I write as a layman who has scoured the scientific journals, websites, and popular publications to expose the evidence and politics of evolution. In this book, the culmination of years of research, I aim to empower laymen everywhere.

Read. Think. Decide for yourself.



## Reference

- Gallup, Inc. "Evolution, Creationism, Intelligent Design." 2008. <<http://www.gallup.com/poll/21814/Evolution-Creationism-Intelligent-Design.aspx>>
- "Exaptations." Evolution 101 (Understanding Evolution). University Of California Museum of Paleontology, 2008. <<http://evolution.berkeley.edu/evosite/evol101/IIIIE5cExaptations.shtml>>
- O'Neil, Dennis. "Adaptive Radiation." Glossary of Terms (Early Primate Evolution). 1999-2008. <<http://anthro.palomar.edu/earlyprimates/glossary.htm>>
- "Phenotypic Plasticity." Glossary (Understanding Evolution). University Of California Museum of Paleontology, 2008. <<http://evolution.berkeley.edu/evolibrary/glossary/glossary.php?start=n&end=r>>



# 1

## Imagining Life's Origins

Life happened.

To know this we need only look around us at the staggering diversity and complexity of living things that inhabit our planet. Life exists. Exactly when did life emerge? Exactly how did an inorganic world become organic?

One day about 3.5 billion years ago, a bowl of primordial goop coalesced into living cells. A lifeless world became alive, teeming with single-celled bacteria. Those primitive life-forms would reign supreme for 3 billion years, until another magic moment occurred—the first single-celled rebel decided to split. Voila! Multicellular life was born.

This theory, known as the “primordial soup” or “organic soup” theory, appears in every biology textbook. On the surface, the theory sounds valid and plausible. Never mind the blank space gaping in the theory’s center, where a picture of the first life should be. No one can see the moment when life began; in fact, no one can tell when that moment occurred. Still, no scientist lets the unknowable nature of life’s origins keep him from talking as if we know what happened. If questioned, most scientists will say that we cannot know exactly how life began, therefore the question is meaningless.

Yet what is life?

## The Definition of Life

We know what life is. We see it everywhere around us. Ask us to define life, however, and we stumble. Even scientists cannot agree on how to describe the characteristics of life. Some definitions given by scientists would fit a star! Since few people would want to include celestial objects in their definition of life, this situation leaves us with a problem. What differentiates life from nonliving matter?

A simple and popular definition describes living matter as anything that has the ability to **regenerate** (sustain itself), **replicate** (propagate its kind), and **evolve** (produce inherited changes). A more detailed description of living cells includes four key traits:

- ▷ A container, or **cell**;
- ▷ Active genetic material, or **DNA**
- ▷ Reproductive capacity
- ▷ A metabolism, to create energy from food

Right now scientists are working to create artificial cells, containers for the genetic and other materials found in natural cells. To qualify as a real cell, the artificial containers must have semi-permeable membranes to confine the required materials, keep out unwanted stuff, and allow needed materials to enter the cell. As yet, scientists have failed to achieve this milestone.

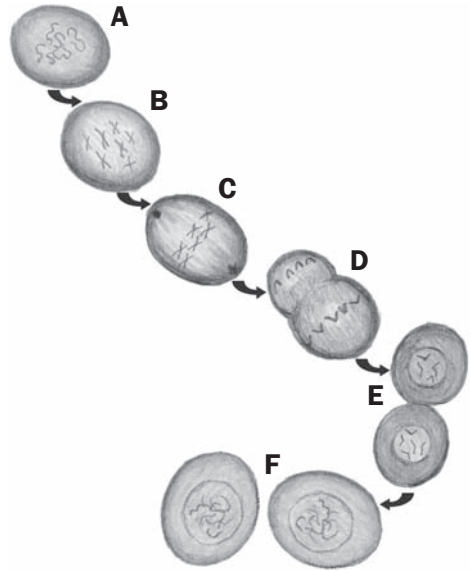
A cell needs genetic material to regulate its functions. Once a membrane-enclosed entity has been endowed with DNA and the ability to pass that DNA onto its offspring, it becomes a **protocell**. Before scientists can reach the second milestone of inserting DNA into the container, thus creating a protocell, they must achieve the first goal of manufacturing a membrane. Once they have inserted DNA, the scientists must find a way to both keep the cell alive and activate the genetic material. Inert DNA will do no good for a fledgling cell.

After conquering the first two obstacles, scientists must then hope the protocell will reproduce itself via **mitosis** (see fig. 1.1), the splitting of one cell into two. Finally the protocell must have a **metabolism**, a series of chemical reactions that yield energy without which the cell could never sustain itself. In a 2007 article in *USA Today*, Mark Bedau of ProtoLife—a company seeking to manufacture artificial cells—noted that once scientists make a cell, they will consider themselves lucky to keep it alive for an hour in a laboratory.

Life must have containers, DNA, reproduction, and metabolism. Yet this definition has failed to attain majority, much less unanimous, support within

### Figure 1.1 Mitosis

Eukaryotic cells live in interphase (F), except when they undergo mitosis. The process of mitosis begins with prophase, in which the nucleus goes away and the chromosomes gather in coils (A) then break up into what look like double strands (B). Next up, the chromosomes migrate to the cell's midsection during metaphase (C). Anaphase (D) begins the separation, as the chromosomes split between the halves of the cell. Telophase (E) concludes the division, leaving two separate yet identical cells (F) each with a newly re-formed nucleus.



the scientific community. Inventor and futurist Ray Kurzweil leads the pack of proponents of **artificial intelligence**, the notion that machines will soon display humanlike intellect. When they do, Kurzweil believes machines will qualify as living beings, deserving of the same rights humans demand for each other.

Will machines become alive? They already have containers; think of the box that holds the guts of a computer. Machines can “metabolize” electricity into energy for themselves; metabolism refers to the processes by which new material gets absorbed into a body or converted into usable energy. Machines can reproduce themselves, in a way; robots on an assembly line can make other machines, meaning if robots become sentient they could decide to reproduce themselves. Machines don’t have genetic material—yet. If humans meld with machines in the manner some scientists want, then machines may receive the DNA they need to become alive.

When talking about the origins of life, most scientists restrict their definitions of living things to organic life. **Organic** refers to substances that contain carbon. Machines could still qualify under this definition, however, since the metals they consist of could be carbon based like our bodies.

Scientists currently working on creating “life” in the lab believe they are at most 10 years away from success in fabricating a cell container. Two decades ago scientists believed they’d have accomplished that goal in less than 20 years. The container goal, the first step in creating a living cell, eludes scientists. Most

laymen will underestimate the difficulty of the task because scientists downplay it. If scientists do someday fabricate a viable container, they must still figure out how to insert the stuff of life into the container and give the “cell” active genetic material that will imbue it with life.

And that’s just step two.

If scientists do create a living cell, the experiment will not have exposed how life began. They will have discovered but one possibility out of many. No one can prove how life began because of the second problem facing origins research.

We can’t see back to the beginning.

## Genesis Theories

Astronomers have the Big Bang, the moment when nothingness exploded into everything-ness. Evolutionists have a big, invisible, silent bang.

When and why did inorganic molecules form organic life? When we say inorganic compounds transmuted into organic ones, we mean that somehow non-carbon substances bonded with carbon to form new compounds. Life on earth is carbon based; hence, for life to have emerged, the inorganic materials that abounded on primordial earth must have turned into organic substances. Sometime after that, organic molecules cozied up to one another and produced the very first cell. Scientists call the process of life emerging from nonliving materials **abiogenesis**.

That life does exist raises a myriad of questions. Ancient people told creation myths that explained life’s origins via the actions of a god or supernatural force. Today scientists scoff at the notion of divine intervention. Religious evolutionists concede God exists, but claim He only watches as evolution works its magic on the world. At the same time, evolutionists gloss over the moment when life began, assuming that it did begin via an unknown mechanism. The details, they say, are irrelevant.

Throughout history, though, people have struggled to part the curtain that hides from us the greatest mystery of all—life’s genesis.

### Spontaneous Generation

Life from lifelessness.

That idea formed the core of the first popular theory about the origins of life. Known as **spontaneous generation**, the theory explained that life arises from lifeless matter via a mysterious and somewhat magical process. The theory may have originated in the 6<sup>th</sup> Century BC with the Greek philosopher Anaximander.

Philosophers who followed Anaximander expounded on and adapted the idea of spontaneous generation until, eventually, Aristotle took up the theory during the 4<sup>th</sup> Century BC.

In his *The History of Animals*, written around 350 BC, Aristotle explained that while some living things reproduce to create offspring from themselves, other creatures spring from inanimate matter spontaneously. Pile up hay and mice will appear. Leave a mound of garbage and maggots will appear. Seeing these coincidences, Aristotle came to the natural assumption that clutter gives rise to vermin due to spontaneous generation—the transmutation of nonlife into life by supernatural means, i.e. by a method that seems to defy natural laws.

In Aristotle's day most people thought everything in the universe consisted of the four basal elements of fire, water, air, and earth. A fifth element, called **quintessence**, existed above the earthly plane and permeated everything like a supernatural force. Quintessence was also believed to compose all the celestial bodies. Belief in the basal elements, quintessence, and spontaneous generation continued through the Middle Ages and into the 19<sup>th</sup> Century. Even Erasmus Darwin, grandfather of Charles Darwin, extolled spontaneous generation in his 1803 poem *The Temple of Nature*. Laboratory experiments conducted by various scientists, including Louis Pasteur, finally disproved spontaneous generation.

### **Panspermia**

Did the building blocks of life arrive from another planet? According to the theory of **panspermia**, life was seeded here on Earth from a celestial source. Panspermia hypotheses range from comets colliding with the earth, depositing life-essential elements or possibly living cells themselves, to alien beings kick-starting life in their own laboratories. Mainstream scientists who subscribe to panspermia stick with the cometary origins. They say comet impacts delivered to Earth the necessary **prebiotic** molecules, the precursors to life.

Panspermia, sometimes called **exogenesis**, originated in the 19<sup>th</sup> Century as a counter-theory to spontaneous generation. At their core, panspermia theories share the assumption that the seeds of life are common throughout the universe. Whether delivered by a comet or ET hands, those seeds arrived on Earth in the distant past and took root here, where they evolved into the life we see around us today. Proponents of the theory, including astronomer Fred Hoyle, point out that bacteria can survive the harsh conditions of space. Surely that fact hints bacteria originated beyond our world.

Proponents of the life-from-Mars theory of panspermia have fought to prove that microbes could survive a trip from Mars to Earth. The theory requires that a massive impact, say from a meteorite, hurled living matter from

the Martian surface into space, where it began a long journey to Earth. Critics claimed nothing living could survive such a catastrophe. In 2008, however, a team of German scientists at Fraunhofer Institute for High-Speed Dynamics crushed bacteria and lichen under pressures equivalent to nearly half a million times that of our atmosphere. The little guys survived.

Maybe panspermia theories will garner more evidence. For the moment, though, another theory reigns over the kingdom of abiogenesis research.

### The Primordial Soup Theory

The predominant theory about how life began sounds like a recipe, albeit for a kind of soup no one would want to eat. Consuming the primordial soup would kill a human being.

Why? The primordial soup theory explains how the catalyst for nonliving matter becoming living cells probably came from arsenic and formaldehyde, poisonous compounds purported to have existed in abundance on the early earth. Those compounds came together somehow, the theory says, initiating a process that led to living cells.

The process begins with elements such as oxygen and hydrogen bonding together to form molecules called **nucleotides**. The nucleotides in turn produce **nucleic acids** such as DNA and RNA. Nobody knows how or where these molecules developed. Everyone assumes they did develop somehow because, according to this model, nucleotides must have formed or life would never have emerged. Once the nucleotides formed—perhaps in the atmosphere, cascading down as prebiotic rain—they somehow acquired the ability to reproduce, passing on genetic material to their descendants.

Then **natural selection** took over the hard work. Somehow genetic changes occurred. Advantageous changes were passed down, while crummy ones got discarded. The process of natural selection encouraged the gradual evolution of those simple nucleotides. Somehow an evolving nucleotide joined with more nucleotides and other types of molecules. The molecule community somehow acquired an outer membrane, which became useful as protection so the little community decided to hang onto that outer skin, becoming a single entity. Evolution kicked in again and our little nucleotide-based friend somehow developed a metabolism. Thus the living cell was born.

Or maybe the container came first. Or maybe it all formed at once. Or maybe the first cell developed out of an utterly alien process no one has theorized yet. We will never know.

The predominant theories about life's origins, whether panspermia or the primordial soup, hinge on a single concept manifested in the word "somehow."

By an unknown, unseeable, unprovable method organic compounds evolved into living cells. Single-celled life somehow evolved into multicellular life, organisms consisting of more than one cell, and somehow branched out into the array of living things we see around us. To understand the magical method of somehow, we must first understand the theory of evolution.

### References

- WordNet. s.v. "Abiogenesis." <<http://wordnet.princeton.edu/perl/webwn?s=abiogenesis>>
- Borenstein, Seth. "Scientists Struggle to Define Life." *USA Today*, 19 August 2007. <[http://www.usatoday.com/tech/science/2007-08-19-life\\_N.htm](http://www.usatoday.com/tech/science/2007-08-19-life_N.htm)>
- "The Cell Cycle & Mitosis Tutorial: Mitosis." The Biology Project. University of Arizona, 2004. <[http://www.biology.arizona.edu/Cell\\_bio/tutorials/cell\\_cycle/cells3.html](http://www.biology.arizona.edu/Cell_bio/tutorials/cell_cycle/cells3.html)>
- "Evolution 101." Understanding Evolution. University of California Museum of Paleontology, 2008. <[http://evolution.berkeley.edu/evolibrary/article/0\\_0\\_0/evo\\_01](http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_01)>
- New Scientist*. "Life Came from Mars' Theory Survives Pressure Test." 27 January 2007.
- . "Panspermia." 4 March 2006.
- Merriam-Webster's Collegiate Dictionary*, 11<sup>th</sup> ed., s.v. "Quintessence."
- Rasmussen, Steen, Liaohai Chen, David Deamer, David C. Krakauer, Norman H. Packard, Peter F. Stadler, and Mark A. Bedau. "Transitions from Nonliving to Living Matter." *Science*, 303 (5660): 963-64.
- Wilkins, John S. "Spontaneous Generation and the Origin of Life." TalkOrigins Archive, 2004. <<http://www.talkorigins.org/faqs/abioprob/spontaneous-generation.html>>