



Foundation for Applied Molecular Evolution

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PRESS RELEASE

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The Foundation for Applied Molecular Evolution to manage a \$5.4 million Templeton to understand the origin of life

The Foundation for Applied Molecular Evolution (FfAME) announced today that the John Templeton Foundation has awarded the FfAME \$5.4 million to support research to explore the origins of life on Earth. In addition to supporting work in Alachua County, the FfAME will direct an open competition from scientists worldwide to propose innovative solutions to this long standing question, one of the oldest to be asked by humankind. Pre-applications are invited by submission to the Foundation web page by May 30, 2015 (www.ffame.org).

“A number of private individuals and philanthropies have recently recognized the possibility that this very old question might now finally be ripe for an answer,” said Steven Benner, Distinguished Fellow at the FfAME who is directing the program. The late Harry Lonsdale, an entrepreneur from Oregon, recently funded a small amount of work in this area with his personal fortune. The Simons Foundation more recently has dedicated still larger amounts of funds to support laboratories worldwide who seek to address this problem. This complements a long standing activity in astrobiology from NASA.

“The Simons Foundation portfolio is largely classical, devoted mostly to research strategies that were defined a half century ago”, remarked Dr. Benner. “We are hoping in our Templeton program to support more innovative ideas, ideas that have a chance of solving paradoxes related to origins that will remain even if all of the classical questions are answered.”



The FfAME webpage makes references to several of these paradoxes, or “difficult problems” (<http://templetonorigins.ffame.org>). For example, life is believed to require water; the life that we know on Earth certainly depends on it. However, water naturally corrodes molecules like DNA and RNA. Thus, even though DNA and RNA need water to function, the reactivity of water makes them difficult to make in water. Further, even if they are made, they easily fall apart in water.

Nor is this all. “One of the most repeated experiments in chemistry, one done in the kitchens of anyone who left on the oven for too long, shows what happens to organic molecules if you leave them without supervision,” said Benner. “They form tar, asphalt, complex mixtures more likely to pave roads that spontaneously generate life”.

Much classical work seeking to identify reactions that might create biological molecules out of non-living molecules presently on early Earth or from meteorites ignore this problem. The late Robert Shapiro was especially critical of chemists who wrote out complex schemes interconnecting reactive molecules that worked only under careful supervision from a chemist, and who claimed that they produced something useful to understand the origin of life. Shapiro noted that this was like a golfer “who having played a golf ball through an 18-hole course, then assumed that the ball could also play itself around the course in his absence.”

“Bob Shapiro was something of a ‘bad boy’ in this field, and did not win many friends among chemists – many still active - who approach origins in this way,” commented Benner. “But he was basically correct. A half century ago, research of this type was important. Today, we are hoping to find chemists able to move beyond this classical approach, take Shapiro’s objections seriously, and find ways to overcome them.”

A willingness to tackle difficult questions is essential for a laboratory to compete successfully for these funds, noted Benner. “But we are not limited to the ‘known unknowns’,” he added. “We



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are looking for those who identify the ‘unknown unknowns’ in origins of life. And then offer experimental approaches to sort things out.”

The Templeton-FfAME partnership is not the first between these two organizations. It is, however, the largest. “We hope to bring to North Central Florida more activity that combines philanthropy with science,” said Benner. “And it is difficult to find a bigger, or older, or more interesting question to have as a focus”.

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[About the Foundation for Applied Molecular Evolution and The Westheimer Institute for Science and Technology \(TWIST\) at the FfAME.](#)

The FfAME was founded in 2001 as a non-profit research organization to address “big questions”, from the nature and extent of life in the cosmos to the molecular biology of human disease. FfAME scientists also use insights made by addressing big questions to solve practical problems, including the diagnosis and treatment of disease, the extension of healthy life spans in humans, and application of the molecular sciences, bioinformatics, and engineering to commerce.

Supported by philanthropic donations, proceeds of technology transfer, and grants and contracts from public and private organizations, the FfAME represents one of the few non-profit private organizations in North Central Florida. Its accomplishments in technology include materials to measure the load of viruses in infected patients, surveillance of public spaces for Ebola, norovirus, and other infectious agents in the news, and new catalysts for human therapy.

More exotically, FfAME scientists perform “Jurassic Park” experiments that resurrect genes and proteins from now-extinct organisms, using these to understand the evolution of life on Earth in a



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changing ecosystem and environment. FfAME is a long-standing member of the NASA Astrobiology Institute, where it has contributed to the search for biology on Mars, Titan, and elsewhere in the Solar System.

FfAME is also committed to public outreach and education. The book: *Life, the Universe, and the Scientific Method*) teaches scientific methods by seeking answers to “big” questions such as: Does alien life exist? FfAME staff give lectures on space exploration at Cape Canaveral and elsewhere, and is public lectures across the country and around the world, most recently in Seattle, China, and Moscow.

About the John Templeton Foundation

The John Templeton Foundation is a non-profit organization based in Pennsylvania, founded by its namesake to explore “big questions” under the motto: “How little we know, how eager to learn.” In the life sciences, the John Templeton Foundation supports projects investigating the evolution and fundamental nature of life, human life, and mind, especially as they relate to issues of meaning and purpose. Projects come from a variety of disciplinary perspectives, including the biological sciences, neuroscience, archeology, and paleontology.