How would scientists create the life force needed to animate a cell constructed in the laboratory to undergo mitosis?

To answer the question, it is important to first decide what is life?

A web search will give a few definitions.

One of te best definitions, is “The condition that distinguishes animals and plants from inorganic matter, including the capacity for growth, reproduction, functional activity, and continual change preceding death.”

My own view is to describe life as a continuous series of multiple, mostly complicated chemical reactions , occurring at blistering fast rates in a living organism .

The organism can be anything from a simple single cell procaryotic organism to a large multicellular eucaryotic organism. The blistering fast reaction rates are measured in milliseconds.

To obtain these short reaction times, catalysts (enzymes and ribozymes) are needed otherwise these reactions will occur at a snail’s pace that will not be able to support life.

My views of life are therefore:

1.

Life refers to all life forms, from one cellular prokaryotic organisms to complicated multicellular eukaryotic organisms. Life is distinguished from non life by the continuous simultaneous genetic code guided chemical reactions that occur at blistering speeds. This is applicable to all live forms. A live form continuously accumulates and discards atoms and molecules.

If the reactions are interrupted or cease to occur, illness and death are the result. Complete cessation of life’s continuous chemical reactions equals death. Living chemistry changed into non living chemistry when death occurs.

An very important group of these continuous reactions are the chemistry responsible for the deciphering and execution of the genetic code.

Another group of very important reactions are the once responsible for duplication of the the code carrier (making exact copies of the code carrier) while also protecting the integrity of the code against copying errors that frequently occurs during the copying process. (mitosis during ordinary cell division and meiosis in gamete production..). Protection is also necessary agains environmental hazzards like radiation. (refer to the press release announcing the 2015 Nobel Chemistry Laureates).

2

It is relative easy to interrupt the chemical reactions and to cause death. All of us had during our life killed life forms that we regarded as irritable or dangerous.

3.

Life needed “kick starting”.

The term “ kick starting of life” leads us back to the original question asked on this post

“ How would scientists create the life force needed to animate a cell constructed in the laboratory to undergo mitosis? ” In other words how will they kick start life in a cell that was assembled in a laboratory?

I will refer to this “life force” as” the spark of live”. The spark that started life, the spark that ignited the life giving chemical reactions (the flame of life). The flame that is consuming but also producing while consuming , a major portion of the fuel it is consuming, allby itself.(Life in all its variety)

We have sophisticated laboratories that can modify cells. It is possible to assemble all the “parts” in the correct order but the spark that change non living chemistry into living chemistry is still evading us. Nobody had ever been able to provide this spark that will ignite the process or “industry” called life. It is a industry that expanded into a multitude of different factories once it was ignited. It is the largest manufacturing industry on this planet.

This unknown spark is preventing scientists from bringing assembled non living cells into living chemically active cells.

The J Criaig Venter Institute’s research didn’t solve the problem of artificial life , their work just further underline the importance of the genetic code in sustaining life and the probability that without the code it would be impossible to ignite life giving and life sustaining chemistry.

The J Criaig Venter Institute’s so called synthetic cells are not really synthetic cells. The Institute’s scientists digitized the genetic code of *Mycoplasma mycoides* and used the digitized code to produce synthetic constructed DNA . The synthetic DNA the Institute produced contained the same genetic code as the original *Mycoplasma mycoides* .

The complete synthetic *M. mycoides* genome was transplanted into *Mycoplasma capricolum* recipient cells that have had their code (genes) for their restriction enzymes removed.

The restriction enzymes of the synthetic *M mycoides* then suppressed the DNA of *M capricolum*, causing it to loose or to let its DNA disappear completely due to the lack of retrictive enzyme to protect it against he synthetic DNA..

M capricolum’s DNA disappeared because it was regarded as foreign DNA and deactivated by the restriction enzymes coded for by the synthetic DNA.

The scientists also added a “watermark” . Encoded in the watermark is new DNA code able to write words, sentences and numbers. (the names of the researchers, an e-mail address and three well known quotes were entered in the synthetic DNA as evidence of their achievement).

The JCVI manipulated the synthetic *M mycoides* further until they produced a cell with smallest possible genome (the minimal amount of genetic code) able to sustain this minimal cell. The minimum cell‘s genetic code is the same as the minimal code that the natural (wild) *M mycoides* would need to flourish under the same circumstances.

Compare this also with the reasons given for the rewarding of the 2015 Noble Chemistry Prize. The need for gene protection through proof reading and error correction are also a requirement for the JCVI’s minimal cell.

It seems that an important requirement for the successful ignition of the flame of life is an executable genetic code and mechanisms to decipher and execute the code. Clear evidence discarding such a hypothesis are currently non existent.

All indications are that the successful ignition of the flame of life requires the presence of an executable genetic code.

It seems that a bottom up construction, without a viable preexisting genetic code, would be a fruitless futile exercise.

To answer the original question, we are still unable and perhaps never will be able, to provide the spark that is necessary to ignite the flame of life.

In my view this difficulty to ignite life is another indication that the genetic code had to precede the origin of life. We are not looking for a life force but for a spark that will ignite life, The spark that ignited LUCA (last universal common ancestor) , which is is probably the only ancestor of life. (AOL)

Present knowledge indicates that LUCA was probable a procaryotic cell with the following abilities to allow the spread of the flame of life:

All and probably a larger genome of minimal executable code than the code in the JCVl’s minimal cell to start with and with the added :

Code to manufacture chlorophyl

Code to manufacture respiratory enzymes.

Code to install Nitrogen fixing abilities

A possible candidate is a type of cyanobacterium.

It is for the reader to decide after honestly perusing all available arguments and research that are used to either support or contradict the next statement and to determine its trustworthiness and vitality:

“For the invisible things of him since the creation of the world are clearly seen , being perceived through the things that are made, even his everlasting power and divinity; that they may be without excuse to doubt his existence”