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Synthia - Synthetic Life and Ethical Challenges

Abstract

This article is based on scientific discoveries made by the American researcher Craig Vent, in May 2010, a synthetic chromosome using chemicals made in the laboratory, with the hope that it will be a possible cure for diseases, will lead the way to achieve new energy sources and, even, could be used to combat global warming. This unicellular organism has been called Synthia and chromosome has only 381 genes, which is useful for supporting the life of bacterium so it can feed and reproduce. Venter's scientific discovery must be assessed as one of the results of scientific work and as a new stage in the progress of research. But Venter did not create life from nothing. He recombined the biotic material so that he reordered a physical entity. It is true that the element of novelty is that he has succeeded in bringing to life a dead cell, by changing an important mechanism of life, namely genetic information. Therefore, we rather deal with a new subfield of genetic

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engineering than with a totally new domain. We should point out that human intelligence pushed the limits of death. And this is a tremendous performance.

Keywords

Synthia, Synthetic Life, Responsibility, Ethics, God, Creation

1 Introduction

On May 20, 2010 an amazing story came around the world through logs of all television news: it was created the first artificial life form, synthia that shows the extraordinary power of man. This is an amazing moment, which has a strong resonance, philosophical and theological. We have to do, in a way with the second chasing of God from His heaven, after Nietzsche seemed to have realised this the first time a century ago. But, let's see what it is.

2 What is Synthia?

After 15 years of research and over 40 million dollars spent, an American scientist named Craig Venter (considered a maverick scientist, billionaire, 63 years old and veteran of the Vietnam War), with his team of 24 researchers from the *J. Craig Venter Institute* (J.C.V.I.)[1] announced that they created the first artificial life form, which was a synthetic chromosome using chemicals made in the laboratory, with the hope that it will be possible cures for diseases, will lead the way to obtain new

1 Cf. *J. Craig Venter Institute* official website: http://www.jcvi.org/cms/research/projects/first-self-replicating-synthetic-bacterial-cell/overview/.

energy sources and, even, can be used to combat global warming.[2]

Venter has created a chromosome called *Mycoplasma Laboratorium*, then created artificial DNA strings placed in a dead bacterium, taking control of it, so the bacterium came back to life, rather it become a new form of life and began to multiply.[3]

This unicellular organism has been called Synthia and its chromosome has only 381 genes, which is useful for supporting life of the bacterium so it can feed and reproduce. The American researcher called this new form of life as synthetic, since the cell is fully formed from a synthetic chromosome, made of four bottles of chemicals, using a chemical and a computer synthesizer.

Venter and his associates have created to the dead cell the DNA from scratch in order to bring it back to life, adding amino acids one by one. Synthia is, thus, composed of 1 million amino acids plus residual DNA in the form of quotations and names of important people, which is actually a clever genetic signature.

The basic experiment was to understand the essential genes for life, so the synthesis of a genome and obtaining a living cell, fully functional with natural synthetic genome, after initially, the researcher first sequenced the two genomes, wanting to discover the minimum characteristics necessary for cellular life.

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2 F. I. Sample, *Craig Venter creates synthetic life form*, The Guardian, 20 May 2010, http://www.guardian.co.uk/science/2010/may/20/craig-venter-synthetic-life-form.

3 G. Lean, *We need a real debate about Synthia*, Daily Telegraph, 21 May 2010 http://www.telegraph.co.uk/science/7751164/We-need-a-real-debate-about-Synthia.html.

3 Scientific and Religious Controversy

The experiment of the American researcher has raised much controversy. Some have said that man has no right to consider himself as God and to handle His creation as he wishes, others said that man received from the Creator reason and then he has the right to use it to improve and protect life and His creation.[4]
Of course, there were researchers which actually argued that life is not synthetic or artificial, as Venter has not created a cell from scratch, but only of living matter, pre-existent, he only recomposed the living matter, has handled it and, did not created from nothing. Rather life was not created out of nothing, but only one of the engines of life has been replaced, or, in other words, life was copied and not created.
There were voices that said that this is the greatest scientific discovery of all times, and others that it was, for the reasons above, the greatest humbug.

4 The Assessment of Christian Ethics

In terms of ethics, in general and Christian ethics, in particular, this research project raises several issues, such as: is Synthia a form of genetic manipulation or is it placed in another new area? What objective significance may have for the scientific community or religious space? How far can scientific research go without harming human dignity and integrity and otherness of creation? Should scientific research be subject to economic utility, or should it be independent? Human life, that is, for the

4 Cf. J. Breck, *Darul sacru al vieții. Tratat de bioetică* (trad.rom.), (Cluj-Napoca: Editura Patmos), 2003, p. 15.

religious man, sacred and inviolable, may even be subject to any type of manipulation?[5]

Venter's scientific discovery must be assessed as a result of scientific work and as a new stage in the progress of research. Obviously years of work, personal enthusiasm or dedication in trying to be useful to humanity are in fact, a praiseworthy and appreciated effort. You may believe that this area opened by this new discovery is a different one from genetic engineering, because, as they say, Venter created an artificial life form. Nothing more wrong.

We must speak loudly: Venter did not create life from nothing. There was no way. But, he recombined the biotic material so that he reordered a material entity. It is true that the element of novelty is that he has succeeded in bringing to life a dead cell by changing an important mechanism of life, namely genetic information. Therefore, we rather deal with a new subfield of genetic engineering than with a totally new domain.

We are, therefore, in the place of manipulation space which genetic engineering offers. They may want to make a maximum advertising, using words and phrases with maximum media impact and effect. We cannot be at the beginning of a new field of science, that of artificial or synthetic life, because, in this case life would be obtained from only a total simple matter, either, even from scratch. Yet, here they are replacing, as we said before, the basic mechanisms of life, so there is a skilled genetic engineering.

We should point out that human intelligence pushed the limits of death. And this is a tremendous performance. Human intelligence is, according to religious outlook, a gift of God to

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5 C. Dumea, *Omul între a fi sau a nu fi – Probleme fundamentale de bioetică*, (Bucureşti: Ed. EARCB, 1998), p. 20; C. Maximilian et al., *Fascinaţia imposibilului - Bioetica*, (Bucureşti: Ed. Editis, 1994), p. 69.

work together with Him in creative transformation[6], so that He, the Creator, is no stranger to human performance, but they work together. This does not minimize the importance of this discovery, truly epoch-making, but it is not the only great discovery of our time. What is crucial would compliance with minimum ethical standards, which save the human dignity and guarantee that this discovery will serve man and his future and this will not be a new instrument of domination and human enslavement[7].

5 The Assessment of Scientific Ethics

For the researchers this discovery, indeed, marks the transition to a new level of human capability to use science in the service of their own destiny, but also overcoming that early period of genetic engineering. This event will give scientists enthusiasm and energy to go further on this path of research, pushing beyond the limits of human knowledge.

Of ethical and scientific point of view, the questions arise: will this discovery be used for the benefit of human; will it serve his dignity and integrity? Or will it be used for military purposes, for his destruction? Or will it be used for radical transformation of human nature, in its physical aspect, searching for who knows what physical performance, which may affect the biological[8] integrity of man and human genetic treasure?[9]

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6 Cf. C. Yannaras, *Abecedar al credinței*, (București: Ed. Bizantină, 1996), p. 55.

7 M. C. Vicol, *Bioetica Seculară versus Bioetica Creștină,* în: *Revista Română de Bioetică* nr. 1, vol. 4 (2006), p. 16.

8 Cf. N. L. Geisler, *Christian Ethics – Options and Issues*, (Michigan: Baker Book House, Grand Rapids, 1989), p.177.

9 H. Jonas, *The Imperative of Responsibility. In Search of an Ethics for the Technological Age*, (Chicago and London 1984), p. 1.

Who can control this scientific process and how to provide security of best practices to ensure that, for example, this discovery will not be used in biological warfare, and to manufacture new and efficient weapons of biological destruction, thus in the man's disfavour, for his physical destruction? Or, who knows in what corner of the world and where in the future, another sick man, as Mengele will try by experiments on humans to massacre every trace of humanity, in the name of science and not for humans, as it is natural? Maybe someone will come to the idea of exterminating selectively, ethnically, or racially, some human beings? And the speculation thread goes darker.

Similarly, religious community, which sees human as *the living image of God himself, image found and called to find the fully deeper understanding in Christ, the perfect image of God, God' revealer to man and human itself*[10] may be dominated by the same kind of turmoil, which could add terms like: this discovery can destroy the beauty of God's creation, can affect the integrity of transmission of genetic inheritance, or of human freedom as an individual? Who guarantees that the sequence of such manipulations will not lead to a selective use, as a foundation for future religious, political persecution, etc.? Can human dignity be saved in case of irrational or full of pride use, of science against human?

We think it is clear that new ethical rules should be, as the science forwards and opens the horizon of abuse as much as the usefulness and potential optimization of human life.

Is this warning not an exercise of rhetoric? If we look in the not too distant past we see that experiments on people in Nazi concentration camps, in communist hospitals or in African colonial wars, led to serious damage to humanity, the inalienable dignity of human beings, who we believe in no matter that we have religious or scientific certainty.

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10 ****Doctrina Socială a Bisericii. Compendiu*. vol. II, (București: EARCB, 2006), p. 70.

Centring authentic dignity of each individual, gives us the key to any safe use of scientific technologies, giving us the certainty that human intelligence, only thus can fully serve human life and dignity.

If we try to look objectively this event of our civilization, we could certainly think about the benefits that it can bring, as curing chromosomal diseases, suppressing the process of environmental degradation, or stopping the extinction of species etc. This method could be used to create that bacterium which can help to produce bio-fuel or, even, to clean up even some of the ecological damages. Or, maybe they could create synthetic microbes that could be used in vaccine production. And our imaginations can fly further.

With great responsibility we must take into account that, although, the interventions on genome may provide healing of certain human suffering, they affect a very fragile land, where the environment and handling plays a role that cannot be underestimated, and the feeling of any man of science playing God can lead to serious abuses. We should not fall on a religious position, as to appreciate that man cannot create something from nothing, because he, himself is a presence, an existence that can only make assumptions on this origin.

The religious perspective sustains that only God can create life, or, if someone claims that may even imitate God and His power of creation, this creates a great risk that can throw humanity in a new and modern barbarism. Dr. Craig Venter more precisely recreated life than produced it from scratch, therefore, we do not stand in this perspective. Scientists should not forget, however, that there is one Creator, God and any activity, even scientific, must have in its centre human being, good and its protection.

6 Final evaluation

An evaluation of this scientific moment claiming that this discovery may show that organisms can be designed differently than nature intended, can really be the source of many abuses, because long-term consequences can only be imagined without knowing their true purpose. Who can guarantee that you cannot degrade or destroy the integrity of our genetic? Or if this happens, irretrievably, then who will bear responsibility for this and will they be able to fix something?

To properly assess Venter discovery, we must take into account the fact that man was created by God in His own image and hence there is not only a special dignity of man, but, especially a greater responsibility to protect and promote human life in any situation, anywhere, anytime. Life is the most precious gift God gave us, so we have a duty to defend it as the incarnate Son of God Himself did, relentless not to sacrifice on others than on him alone for our salvation.

Therefore, using the *deacony of truth*[11] we should say that Ventor Craig's discovery is another big step for mankind, but this has to respect fundamental ethical norms of science to avoid derailment or abuse of any kind.

11 Pope John Paul II, *Redemptor hominis*, in: *AAS* 71 nr. 19 (1979), p. 306.