

Synthetic Biochemistry and Synthesized Consciousness

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Abstract: The aim of the study is the possibility of synthesis and study of the properties of “synthetic consciousness” by modifying various chemical elements of the genome of synthetic biochemistry. We have proposed a new approach to synthesize “synthetic consciousness” using synthetic biochemistry.

Key words: Synthetic biochemistry, genome, synthesized consciousness.

1. Introduction

The relevance of the synthesis of “synthetic consciousness” using the methodology of synthetic biochemistry is difficult to overestimate. Our main scientific direction is the desire to create new living systems with useful properties.

We are currently developing methods for synthesizing “synthetic consciousness” using the example of a snail.

2. Theory

Synthetic biochemistry is a new direction in synthetic biology with the aim of using engineering principles to combine biomolecular components: genes, proteins, antibodies, cytokines, hormones, neuropeptides, vaccines and other components into new structures and networks. It is supposed to use these updated structures for the purpose of reprogramming living organisms, giving them new properties necessary for solving problems in the field of healthcare, energy security, food production and environmental development.

Our strategic goal is the synthesis of “synthetic consciousness”.

To achieve this goal, it is necessary to solve the following tasks:

- (1) Find biochemical synthesis methods;
- (2) On the basis of the snail genome, synthesize a model genome that will possess the simplest model of “synthetic consciousness”;
- (3) Develop industrial methods for producing “biobricks” of the genome.

At present, we are developing methods for synthesizing “synthetic consciousness” using the example of a snail.

Fig. 1 shows the Synthetic Biology Open Language (SBOL) visual symbol standard.

In 2010, a group of researchers revealed the first self-replicating synthetic bacterial cell, called *M. mycoides* JCVI-syn1.0. [1, 2]. Fig. 2 shows the assembly scheme of the *M. mycoides* JCVI-syn1.0 genome.

Fig. 3 shows the synthesis of monoterpenes from sucrose as an example of synthetic biochemistry.

In April 2019, scientists at ETH Zurich reported the creation of the world’s first bacterial genome, named *Caulobacter ethensis-2.0*, made entirely by a computer, although a related viable form of *C. ethensis-2.0* does not yet exist [3].

In May 2019, researchers, in a milestone effort, reported the creation of a new synthetic (possibly artificial) form of viable life, a variant of the bacteria *Escherichia coli*, by reducing the natural number of 64

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	promoter		primer binding site
	cds		restriction site
	ribosome entry site		blunt restriction site
	terminator		5' sticky restriction site
	operator		3' sticky restriction site
	insulator		5' overhang
	ribonuclease site		3' overhang
	rna stability element		assembly scar
	protease site		signature
	protein stability element		user defined
	origin of replication		

Fig. 1 Synthetic Biology Open Language (SBOL) visual character standard.

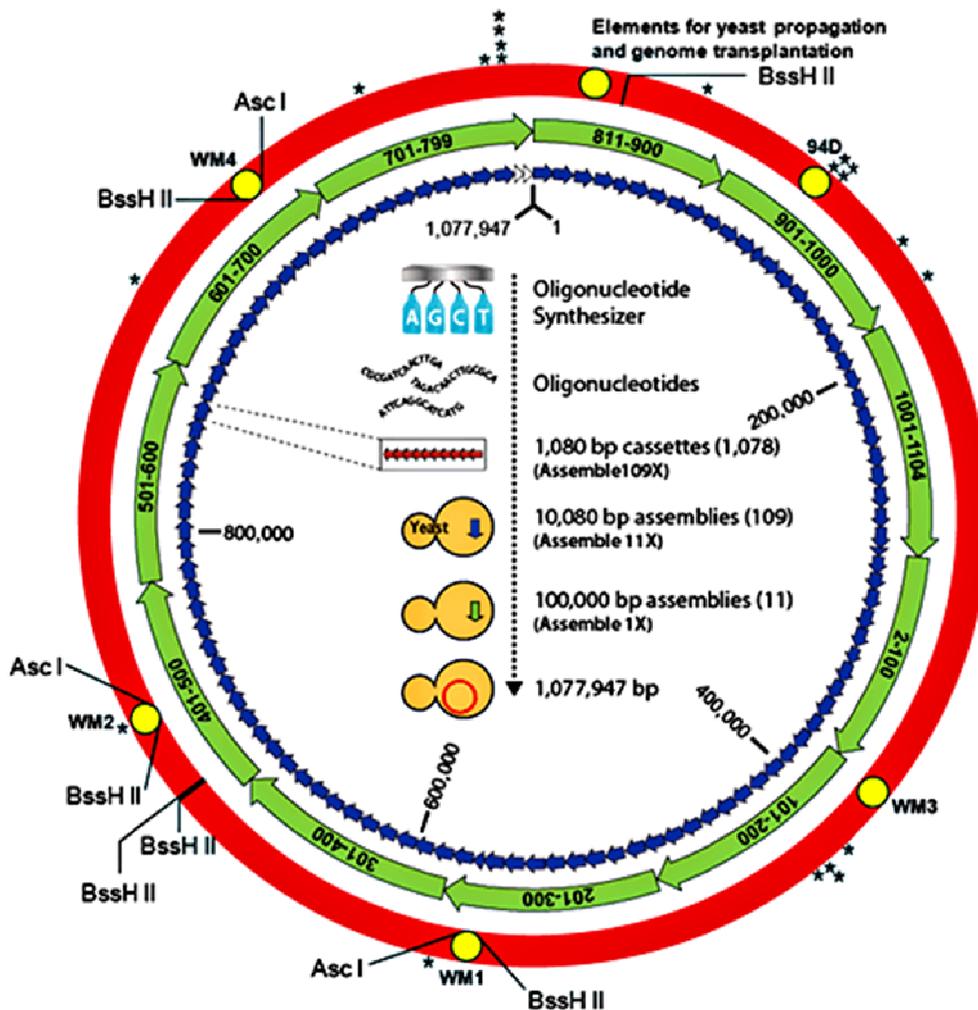


Fig. 2 Genome assembly scheme of *M. mycoides* JCVI-syn1.0.

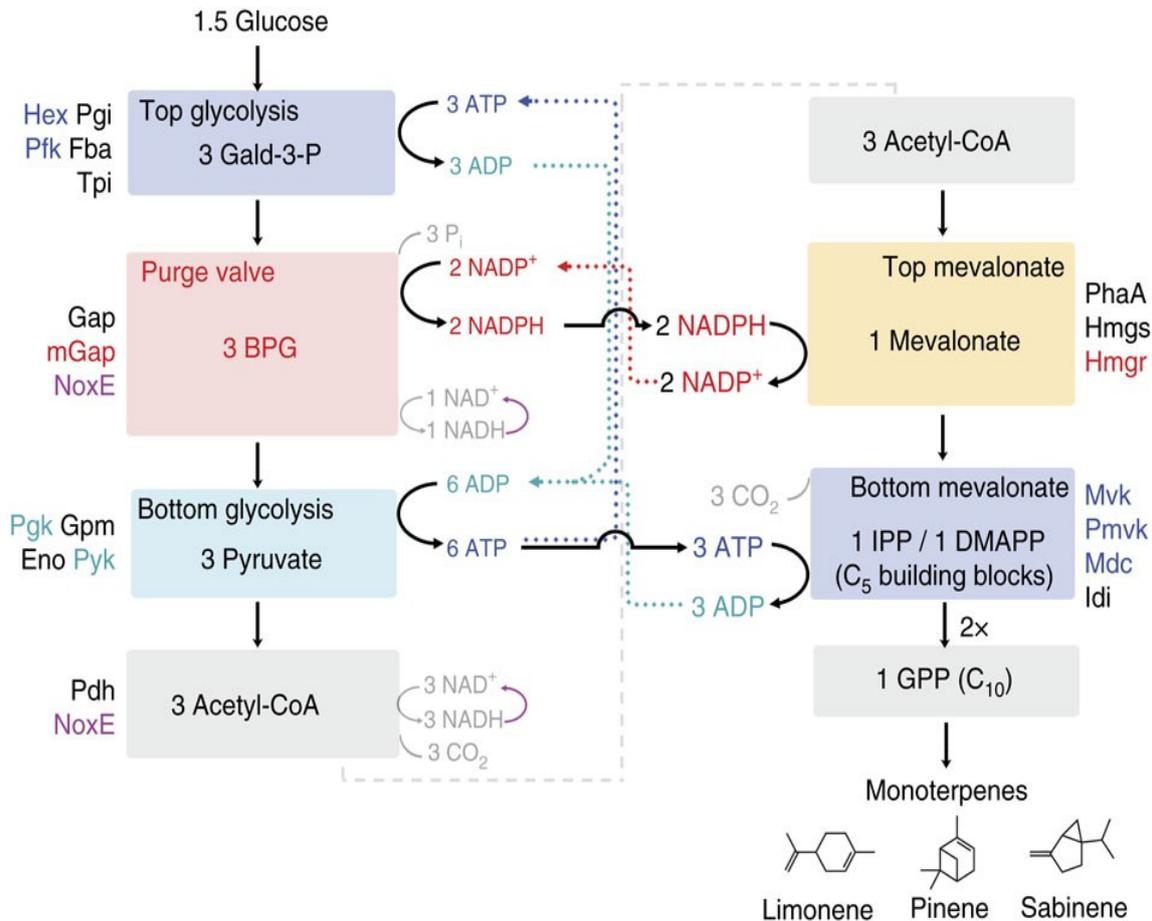


Fig. 3 Schema of the synthetic biochemistry system for conversion of glucose to monoterpenes.

codons in the bacterial genome to 59 codons instead, in order to encode 20 amino acids [4, 5].

3. Results and Discussion

We believe that in order to solve the “difficult problem of consciousness” we need to solve the problem of “synthetic consciousness”. What is “synthetic consciousness” in terms of chemistry? In childhood, every chemist dreamed of synthesizing a “thinking molecule” that would have a “synthetic consciousness”. Will the “synthetic consciousness” think, feel, perceive the world around him, experience emotions? Will the behavior of a creature with a “synthetic consciousness” resemble human behavior? We believe it is possible.

We believe that if DNA is a material carrier of biological information, then synthesized c-DNA will also be a carrier of modified information.

Having decrypted the DNA, scientists got a key tool for the artificial creation of genomes. Nediľjko Budiša constructed two amino acids that did not exist in synthetic nature, and then he managed to force the bacteria to produce proteins, which included these same artificial substances.

4. Conclusions

Thus, the use of the new approach opens up broad prospects for the development of new genetic technologies that allow creating a “synthetic consciousness” with a predefined cognitive of practically significant properties.

We have proposed a new science—chemical psychoneuroendocrinoimmetry (CPNEI), which studies the neurochemical mechanisms of interaction of the mental, nervous, endocrine and immune systems.

References

- [1] Gibson, D. G., Glass, J. I., Lartigue, C., Noskov, V. N., Chuang, R. Y., Algire, M. A., Benders, G. A., Montague, M. G., Ma, L., Moodie, M. M., Merryman, C., Vashee, S., Krishnakumar, R., Assad-Garcia, N., Andrews-Pfannkoch, C., Denisova, E. A., Young, L., Qi, Z. Q., Segall-Shapiro, T. H., Calvey, C. H., Parmar, P. P., Hutchison, C. A., Smith, H. O., and Venter, J. C. 2010. "Creation of a Bacterial Cell Controlled by a Chemically Synthesized Genome." *Science* 329 (5987): 52-6.
- [2] Venetz, J. E., Del Medico, L., Wölfle, A., Schächle, P., Bucher, Y., Appert, D., Tschan, F., Flores-Tinoco, C. E., van Kooten, M., Guennoun, R., Deutsch, S., Christen, M., and Christena, B. 2019. "Chemical Synthesis Rewriting of a Bacterial Genome to Achieve Design Flexibility and Biological Functionality." *Proceedings of the National Academy of Sciences of the United States of America* 116 (16): 8070-9.
- [3] Zimmer, C. 2019. "Scientists Created Bacteria with a Synthetic Genome. Is This Artificial Life?—In a Milestone for Synthetic Biology, Colonies of *E. coli* Thrive with DNA Constructed from Scratch by Humans, Not Nature." *The New York Times*.
- [4] Fredens, J., Wang, K., de la Torre, D., Funke, L. F. H., Robertson, W. E., Christova, Y., et al. 2019. "Total Synthesis of *Escherichia coli* with a Recoded Genome." *Nature* 569 (7757): 514-8.
- [5] Aibassov, Y. 2020. "Chemical Psychoneuroendocrinology." *J. Chem. Chem. Eng.* 14 (1): 26-9.