eJBio

Electronic Journal of Biology, 2022, Vol. 18(11):1-2

Brief Note on Biological Organisms and Developing Mechanistic Models

Siti Hoon*

Department of Biology, University-Malaysia, Cyberjaya, Malaysia

***Corresponding author:** Email: hoon_s@gmail.com

Citation: Hoon S (2022) Brief Note on Biological Organisms and Developing Mechanistic Models. Electronic J Biol, 18(11): 1-2

Received date: October 11, 2022, Manuscript No. IPEJBIO-22-15219; **Editor assigned date:** October 13, 2022, PreQC No. IPEJBIO-22-15219 (PQ); **Reviewed date:** October 24, 2022, QC No. IPEJBIO-22-15219; **Revised date:** November 04, 2022, Manuscript No. IPEJBIO-22-15219 (R); **Published date:** November 11, 2022, DOI: 10.36648/1860-3122.18.11.054

Description

Systems biology and synthetic biology are said to represent 'two sides of the same coin,' with systems biology focussing on understanding and synthetic biology on construction. This notion is based on the implicit assumption that understanding and construction (or science and engineering) are, in themselves, 'two sides of the same coin.' Moreover, synthetic biology has been framed as an approach that encompasses understanding as well as control, construction, and creation. In the 'talking' and 'doing' of synthetic biology, one can discern a contemplative, interventionist, constructionist, and creationist stance. It is the aim of this paper to illustrate these stances in detail and to discuss more generally their techno-epistemic and socio-political implications.

Biological Organisms

Biological organisms exhibit diverse types of behaviour and levels of complexity. Models, however simplified, are attempts to impose some structure onto these complicated systems. The very process of abstraction can already provide insights into the processes shaping these systems and their behaviour. Models in biology have been remarkably successful in evolutionary biology, ecology and epidemiology. In the context of cellular and molecular biology adoption was somewhat delayed but with the rise of systems biology modelling approaches are becoming all-pervasive.

The teaching media was developed with the main feature of video lessons and other features supporting the learning of biology such as the interactive quiz and discussion to support students' learning in biology. Some video lessons described renewable energy on the field of biotechnology Industrial, which is one of the topics that commonly difficult to visualize and explain. There is a need of aiding the explanation of Biodiesel sources, Biodiesel production process and biodiesel usages by using audio visual. This study examined the design and the Learning Impact of e-AV biology website. A total of 256 high school students participated in a larger study of a quasi- experiment in year 2011 with the intervention of two different ways of teaching, one with fully media instruction using e-AV Biology teaching method and another one the traditional manner of teaching. However, for the purpose of this paper, only the perception of the students participated in experiment group were used, analyzed and report.

Developing Mechanistic Models

Developing mechanistic models has become an integral aspect of systems biology, as has the need to differentiate between alternative models. Parameterizing mathematical models has been widely perceived as a formidable challenge, which has spurred the development of statistical and optimisation routines for parameter inference. But now focus is increasingly shifting to problems that require us to choose from among a set of different models to determine which one offers the best description of a given biological system. We will here provide an overview of recent developments in the area of model selection. We will focus on approaches that are both practical as well as build on solid statistical principles and outline the conceptual foundations and the scope for application of such methods in systems biology.

That part of synthetic biology concerned with engineering promises to make good on the potential of biotechnology to address problems of food, energy, health and environment. How do the synthetic biologists realise the promise of biology as technology? In analysing realisation of promise in synthetic biology, I suggest that we should pay close attention to different rates of realisation. Synthetic biologists have consistently focused on making particular kinds of devices such as oscillators, timers and clock that both address problems of control over rates, and that themselves resemble and link to other rate-controlling mechanisms such as the many clocks found in large technical systems. They have also, again in those parts of the field concerned with engineering, expended much effort in developing infrastructures, techniques, methods and systems for rapid assembly of parts and components. The clocks and assembly methods function as both as iconic signs and as infrastructural elements or practices that will realise the promise of biotechnology. The field has not only produced what we might call infrastructural-icons for biology as technology, but almost defined itself in terms of a promise of realisation. In analysing how synthetic biology or any other technological endeavour shows how things could be (icons), and makes operational connections between things (infrastructures), the main goal is not to situate field in social or economic contexts. Rather, it is to open a way to see how synthetic biologists and others philosophers, social scientists, historians, artists, designers, scientists engineers, as students or consumers manage to address the gaps that open up as the promise of biology as technology is realised at different rates.

Synthetic biology and systems biology are often highlighted as antagonistic strategies for dealing with the overwhelming complexity of biology. However, a closer view of contemporary engineering methods (inextricably interwoven with mathematical modelling and simulation) and of the situation in biology (inextricably confronted with the intrinsic complexity of biomolecular environments) demonstrates that tinkering in the lab is increasingly supported by rational design methods. In other words: Synthetic biology and systems biology are merged by the use of computational techniques.

These computational techniques are needed because the intrinsic complexity of biomolecular environments require advanced concepts of bio bricks and devices. A philosophical investigation of the history and nature of bio parts and devices reveals that these objects are imitating generic objects of engineering , but the well-known design principles of generic objects are not sufficient for complex environments like cells. Therefore, the rational design methods have to be used to create more advanced generic objects, which are not only generic in their use, but also adaptive in their behavior. Case studies will show how simulation-based rational design methods are used to identify adequate parameters for synthesized designs, to improve lab experiments by ‘looking through noise’, and to replace laborious and time-consuming post hoc tweaking in the lab by in-silico guidance. The overall aim of these developments, as will be argued in the discussion, is to achieve adaptive-generic instrumentality for bio parts and devices and thus increasingly merging systems and synthetic biology.

ISSN 1860-3122