

s.19(1)

From:
To:
CC:
Date: 2016/05/05 2:45 PM
Subject: Re: Synthetic Biology – visions of the future SYNENERGENE Forum 24-25th June 2016
Amsterdam

I would like to understand this more fully myself, and the recent responses have prompted me to weigh in to try to gain that understanding from the group on this email thread. As I have mentioned previously in past conference calls, I struggle to see that what we are doing under the activities we now call Synthetic Biology is qualitatively any different from what we were doing when we were genetically engineering things. We now have more sophisticated and powerful tools, but to use an analogy, whether we are using a hand saw and hammer or a power saw and nail gun, we would be still doing carpentry. And if we say we are using engineering principles, what do we mean exactly, and are we saying we were not doing so when we were doing genetic *engineering? What type of thinking were we not doing then that we are doing now? So with respect to gene drive, those constructs that drive through a population seem to me to be just newer implementations of the knowledge and capabilities that have been developed in the fields of molecular biology and genetics, which have underpinned genetic engineering from the beginning. Whether transgene insertions that drive through a population (a characteristic of the gene combinations inserted into a genome through genetic engineering techniques) are or are not a part of Synthetic Biology depends on what we agree Synthetic Biology is or even if it is an area of scientific endeavor that deserves a new name at all. Right now, I am reminded of the fable about the blind men and the elephant.

On Thu, May 5, 2016 at 1:37 PM,
wrote:

- > I loathe to get into the defining Synthetic Biology argument and I very
- > much fear that I might regret the contribution, but the lack of clear
- > definition is clearly problematic in this conversation. The question of
- > whether gene drives are synthetic biology does not have a simple answer - a
- > synthetic gene drive is a tool that is a product of synthetic biology. It's
- > like many tools that are the product of an engineering process: it can be
- > used to engineer a new system or it can simply be used.
- >
- > The logic behind this answer is that synthetic biology is defined as the
- > application of engineering principles (e.g. standardisation,
- > modularisation, modelling, predictive design and abstraction hierarchies
- > etc.) to biology and biotechnology. Synthetic biology is not limited to
- > making changes to genomes since you can apply engineering principles to
- > building with biological materials *in vitro* as well as in a cell. The
- > insertion into, or modification of DNA in living cells is, however, where
- > most of the community is working at present. Since we are not yet advanced
- > to a stage where we can consider ourselves as true engineers, synthetic
- > biology practitioners are mainly aiming to advance the science and
- > technologies to enable the engineering of biology to be as predictable (and

