

# convergence of biology & chemistry & opportunities for outreach & education

The views expressed are the presenter's own and do not necessarily represent those of the United Nations, the biological weapons convention, or its implementations support unit



**If it's green or wriggles, it's biology.  
If it stinks, it's chemistry.  
If it doesn't work, it's physics!**

## INVENTORY OF SYNTHETIC BIOLOGY PRODUCTS – EXISTING AND POSSIBLE



(Draft – July 27, 2012)

### Why This Inventory?

For good or ill, new technologies are often defined by a few iconic examples that capture the public imagination. Early on, nanotechnology was defined by its application to stain-resistant clothing and sunscreens, convenient improvements but hardly transformational. Of course, the real revolution was occurring in the background, which involved a newfound ability to see, simulate, and manipulate matter at an atomic scale. Slowly, it became apparent that nanoscale science and engineering were having pervasive impacts across multiple economic sectors and products, as well as up and down value chains, and creating significant potential for improvements in costs and efficiency.

So far, synthetic biology has been associated with a few limited applications, but this initial inventory provides a glimpse of its impact on multiple sectors ranging from energy to pharmaceuticals, chemicals, and food. The real power of synthetic biology may be creating a field of knowledge critical to the design of new technologies and manufacturing processes in general.

This exploratory inventory is an attempt to look over the horizon of this emerging science. As such, it is a "work in progress" and we hope others will help us as we update and expand the inventory. Research on specific applications or near-commercial activities does not guarantee eventual market entry and economic impact, but the breadth of commercial and upstream activity is important to track as the science advances.

### Methodology

This inventory of the applications of synthetic biology was compiled from a) a Lexis-Nexis search of US newspapers and newswires on the terms "synthetic biology" and applications<sup>1</sup> for the years 2008-2011; b) a Web of Science search on the term "synthetic biology" for 2008-2011; c) a visual search of project descriptions and websites entered into the 2010 and 2011 iGEM competition, as provided on the iGEM website<sup>2</sup>; and d) a web search for specific companies and synthetic biology via Google.

The material from a) and b) was further analyzed by using the data mining and visualization tool QDA Miner<sup>3</sup> with WordStat to select paragraphs that contain one of several keywords and categories which are shown in List A below. The default settings were used. Of the 1,236 newspaper and newswire documents, 1,070 were found to match at least one of the words in the keyword analysis. Of the 397 Web of Science abstracts, 319 were found to match the keyword search.

<sup>1</sup> <http://dx.doi.org/10.1039/b200000a>

<sup>2</sup> See: <http://www.provance.com/qdaminer/qdaminerDesc.html>

- 68 SB products in commercial development
  - Biofuels
  - Chemicals
  - Food
  - Materials
  - Medicine
  - Others
- Chemicals (25)
- Market status:
  - 6 near term
  - 6 medium term
  - 10 long term
  - 3 horizon

BIOBRICKS FOUNDATION

SB6.0

The Sixth International  
Meeting on  
Synthetic  
Biology

sb6.biobricks.org

July 9-11  
2013 Imperial  
College  
London UK



09-11 JULY  
2013



ORGANISATION FOR THE  
PROHIBITION OF  
CHEMICAL WEAPONS



## SYN-BIO-SIS:

How engagement by the synthetic biology  
community influences international policy

**10.00 – 12.30 Friday 12 July 2013**

Room 120, Sir Alexander Fleming Building  
Imperial College London South Kensington Campus SW7 2AZ

Science and international policy making processes are not always natural bedfellows. Do the views of scientists actually make a difference? Is it worth scientists contributing to discussions over the social implications of their work? Is anyone listening? This event will see three international bodies highlight the importance of active engagement by the synthetic biology community in global health security and efforts to deal with biological and chemical weapons.

Prepared remarks by:

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Discussants:

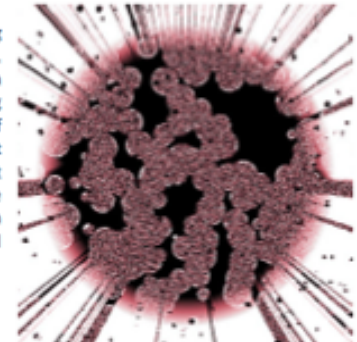
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Followed by an open discussion



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