Canadian Friends Service Committee
(QUAKERS)

First Update on Synthetic Biology for 2015

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By combining biology, computer science, and engineering, synthetic biology (SB) allows people to manufacture DNA, insert the DNA into a living cell, and have that cell create new life forms. Quakers, grounded by our testimonies of simplicity, peace, integrity, community, equality and unity with creation, can play a significant role in shaping policy regarding this rapidly expanding field. We are one of the few faith communities actively following developments in SB.

Canadian Friends Service Committee's work on synthetic biology is guided by a set of requests from Canadian Yearly Meeting 2014 (see the Appendix). One of these requests was for annual easily accessible updates on the field to be shared with Friends. Based on the amount that's happening, we're putting out this update early and will follow up with another one later in the year.

As you read each piece of news we invite you to consider these three queries:

1. How do we address the ecological dimension of synthetic biology? e.g. impacts on biodiversity, synthetic organisms being untested by evolution and ecosystems;

2. How do we address the social dimension of synthetic biology? e.g. equitable distribution of benefits, needs of the vulnerable; and

3. How do we address the spiritual dimension of synthetic biology? e.g. the sacred in living beings and in nature as regards SB; the valuing of technology as compared to human wisdom and inner truth.

In 2012 Friends from around the world gathered in Kenya and issued the *Kabarak Call for Peace and Ecojustice*[1]. It stated, "We must change, we must become careful stewards of all life. Earthcare unites traditional Quaker testimonies: peace, equality, simplicity, love, integrity, and justice." In contrast to this visionary statement, consider two provocative quotes from one of SB's most controversial characters, Austen Heinz, CEO of Cambrian Genomics (last year[2] we reported about what SynBioWatch calls Cambrian's "vagina bio-hack nonsense"[3]):

1. "It just seems obvious that eventually every human will be designed on a computer," and
2. "The individual should set the limits for this, not the government."[4]

A research report by Markets and Markets says the worldwide SB market is poised to hit $5.63 billion by 2018. "Ethical and social issues such as biosafety and biosecurity are the major factors restraining the growth of this market." Further, though still an emerging field, there is already a concentration of power as, "The global synthetic biology market is dominated by three major players, namely, Thermo Fisher Scientific, Inc. (U.S.), DuPont (U.S.), and Royal DSM N.V. (Netherlands). These players jointly accounted for approximately ~65% of the total synthetic biology market."[5]

Describing the worldview promoted by the International Genetically Engineered Machines (iGEM) competition, one journalist present wrote, "No matter the problem, a fresh-faced sophomore was willing to bet that a specially designed microbe was the solution." When asked if people were ready to accept all of this SB in their daily lives, iGEM president Randy Rettberg said, "We used to say we just needed to educate people about the science. We said that if they understood it, they would accept it." But he conceded that that didn't happen, so now iGEM is trying to "involve" the public instead.[6]

[1] http://www.saltandlight2012.org/call.pdf
[2] http://quakerservice.ca/SBUpdate2014
[3] http://www.synbiowatch.org/2015/01/bad-boy-scientism/
[4] http://www.slate.com/articles/technology/future_tense/2014/12/synthetic_biology_advocates_are_veering_too_close_to_eugenics.single.html
[5] http://www.marketsandmarkets.com/Market-Reports/synthetic-biology-market-889.html
[6] N. Twilley, "Synthetic Life After G.M.O.s," New Yorker, December 5, 2014

Students at the iGEM competition present their idea for "conquering Venus" through synthetic biology. Photo credit: iGEM Foundation, CC-BY.

A 2013 survey on public opinion conducted by the Woodrow Wilson International Center found that two thirds of the US public had not heard of SB, but that when it was explained to them in a careful and unbiased manner, they became *more* concerned that risks outweigh benefits.[7]

Many SB companies fear that negative public opinions will impact their profits. The first to transparently explain to the public that it was using SB was Belgian cleaning company Ecover.[8] The company apparently received thousands of complaints. When SB vanilla flavour came to market, "the ice-cream maker Häagen-Dazs, perhaps anticipating public mistrust"[9] quickly pledged not to use it.

Expressing the SB industry's concern, the Chair of a group on SB, writing for the global network of academies (ICN), said,

> We have been here before: exaggerated fears and uncritical acceptance of claims of the risks of genetic modification led to excessively cautious regulation and a block on innovation [...] given the precedent of how the issue of genetically modified crops were handled, many scientists are worried that some policy-makers will take unsubstantiated concerns of environmental groups at face value and impose cumbersome and unnecessary rules.[10]

[7] E. Pauwels, "Public Understanding of Synthetic Biology," BioScience 63, no. 2 (2013): 79-89

[8] S. Strom, "Companies Quietly Add Biofuel Tools to Household Products," New York Times, May 30, 2014

[9] N. Twilley, "Synthetic Life After G.M.O.s," New Yorker, December 5, 2014

[10] http://www.bbsrc.ac.uk/web/FILES/Reviews/1006-synthetic-biology-dialogue-methodology.pdf

Claire Marris of King's College, London, has questioned the assumption that the public would seek to block those SB innovations which would be in the public interest. Marris notes that industry's position tends to be, "Public concerns are to be surveyed (or more accurately sur*veilled*) and their concerns are to be overcome rather than respected and responded to."She raises many questions seemingly ignored by industry, including, "How do solutions provided by synthetic biology compare to alternatives, including alternatives that involve no cutting-edge science?" You can find her detailed analysis of communications about SB at http://www.tandfonline.com/doi/pdf/10.1080/09505431.2014.986320

"Solutionism" is a philosophical approach that seems to inform much of the thought and discussion about SB. According to Evgeny Morozov, "solutionism" tends to exhibit, "An unhealthy preoccupation with sexy, monumental and narrow-minded solutions… to problems that are extremely complex, fluid and contentious. …Solutionism presumes rather than investigates the problem it is trying to solve, reaching for the answer before the questions have been fully asked."[11]

Jim Thomas of the ETC Group highlights, in responding to an academic essay on SB, another major issue - that discussions about SB are too often framed as related to science, and not enough attention is given to the overwhelming *profit* motives driving research.

> Shell, BP, Exxon, and Chevron have channelled [billions] into shaping the field [of SB], sometimes lobbying for and then buying into public labs as a means to outsource and subsidize their own research and development costs... Asking, *which is worse, fossil fuels or syn biofuels?* unhelpfully hides the false dichotomy of that choice. In fact, the same companies are benefiting from either answer.[12]

Finally, at international meetings concerning the Convention on Biological Diversity (CBD), the 193 nations involved have hotly debated SB. Norway, The Philippines, Malaysia, Bolivia, and others have sought either a complete moratorium on SB or a robust new international regulatory system. Canada and the UK have led the charge in the opposite direction, seeking minimal regulation. Civil society groups say this approach gives SB companies' powers to commit biopiracy[13] (i.e. "the exploitative appropriation of Indigenous forms of knowledge by commercial actors"[14]). The future of the regulation of the synthetic biology industry remains uncertain as the CBD continues to debate the issues.

[11]Evgeny Morozov, "To Solve Everything, Click: The Folly of Technological Solutionism"2013.

[12]J. Thomas, "Beware Bubbles and Echo Chambers," Synthetic Future: Can We Create What We Want Out of Synthetic Biology?, special report, Hastings Center Report 44, no. 6 (2014): S43-S45

[13]http://www.synbiowatch.org/2014/10/northern-syn-bio-club-blasted-for-impeding-un-talks-progress/

[14]https://en.wikipedia.org/wiki/Bioprospecting

Annex:

The 2014 CYM minute on SB recommends work in the following ways:

1. That CYM affirm the seven principles identified in Principles for the Oversight of Synthetic Biology, a document that makes many important recommendations, and continue to work with the Biotechnology Reference Group of the Canadian Council of Churches (BRG) on discerning ways to implement the seven principles:
    i. Employ the Precautionary Principle;
    ii. Require mandatory synthetic biology-specific regulations;
    iii. Protect public health and worker safety;
    iv. Protect the environment;
    v. Guarantee the right-to-know and democratic participation;
    vi. Require corporate accountability and manufacturer liability; and
    vii. Protect economic and environmental justice.
2. That CYM request that Canadian Friends Service Committee (CFSC), with the help of concerned groups such as the ETC Group and the BRG, provide Canadian Quakers with an annual, easily understandable update on synthetic biology;
3. That CYM request CFSC, and encourage Monthly Meetings, to find opportunities to link with other faith and community groups, and with Indigenous peoples, to share insights and discernment about synthetic biology; and
4. That CYM encourage CFSC and Quaker Meetings in Canada to engage with other faith groups and interested parties, including organizations involved in research and/or manufacture in synthetic biology, to hold and/or participate in conferences that address ethical, spiritual, social, and economic aspects of synthetic biology.

Find out more about synthetic biology, including background of how this concern of Friends has developed and what Meetings from across Canada have said:
http://www.quakerservice.ca/syntheticbiology

Questions? Comments? Contact CFSC Program Coordinator Matthew Legge
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