Biosafety, Biosecurity, and Preparedness Within and Without SynBERC

- What audience do these modes of safeguarding set out to protect?
- How does the act of framing the concepts with urgency legitimate emphasis given to them without questioning the assumptions of what kind of "good life" or flourishing they appeal to?
- How can we understand the three concepts individually, collectively, and contextually, using information provided both in literature produced by scientists within SynBERC and journalists, policy makers, and others outside?

Biosafety, Biosecurity, and Preparedness: Solutions Found in SynBERC's Literature and in the Media

- Drew Endy, MIT
- Human Practices, Berkeley
- Chris Anderson, Berkeley

US, Global, and Scientific Response to Questions of Biosafety, Biosecurity, and Preparedness

- Third and Fourth Geneva Conventions, 1929, 1949
- Geneva Protocol on use of chemical and biological warfare, 1925
- Biological Warfare Convention, 1972
- Asilomar Conference on Recombinant DNA, 1975
- Incident Response/Biodefense, 2001
- National Science Advisory Board, 2004

Biosafety, Biosecurity, and Preparedness in Practice Within SynBERC Labs

- Biosafety regulations as most relevant in the quotidian world of synthetic biology
  - Bio Safety Levels: daily impact of Asilomar
  - Office of Environment, Health & Safety:
    - bureaucracy associated with practice
    - lab worker training
- Biosecurity as outside of thinking space and assumed to be addressed by other forces
  - Relevant: when interacting with the Registry
- Preparedness not broached because of its apparent irrelevance to the research being done in Anderson's lab

How Do We Find Attainable Solutions to Problems of Biosafety, Biosecurity, and Preparedness

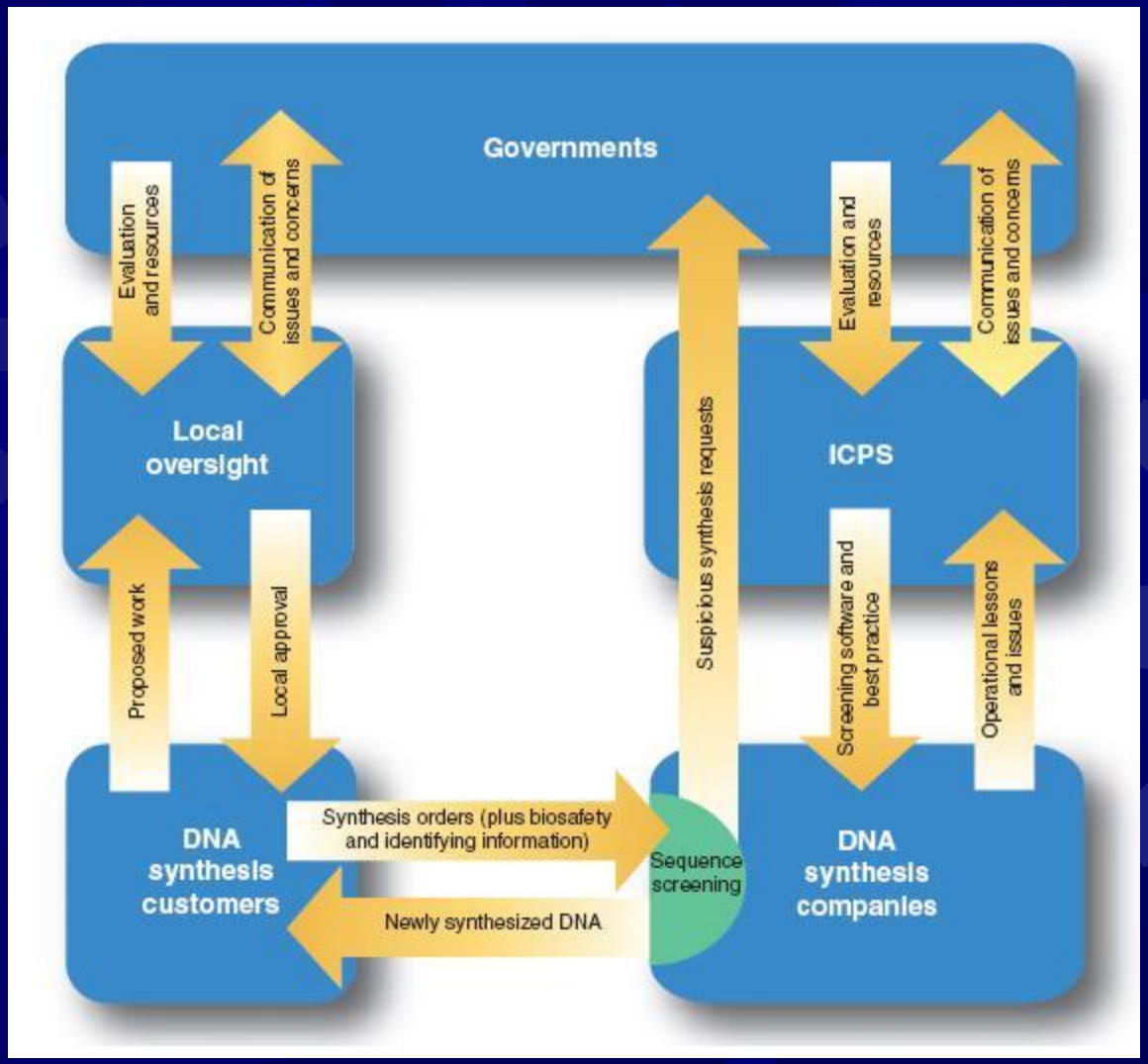
- Analyze and prioritize proposed problems
- Educate synthetic biologists on the possibilities of the impact of their research on the national and global landscape and incorporate their participation in creating national and global regulation
- Educate the public about the likelihood of such “inevitable disasters” to allow for them an active role in the creation of regulations

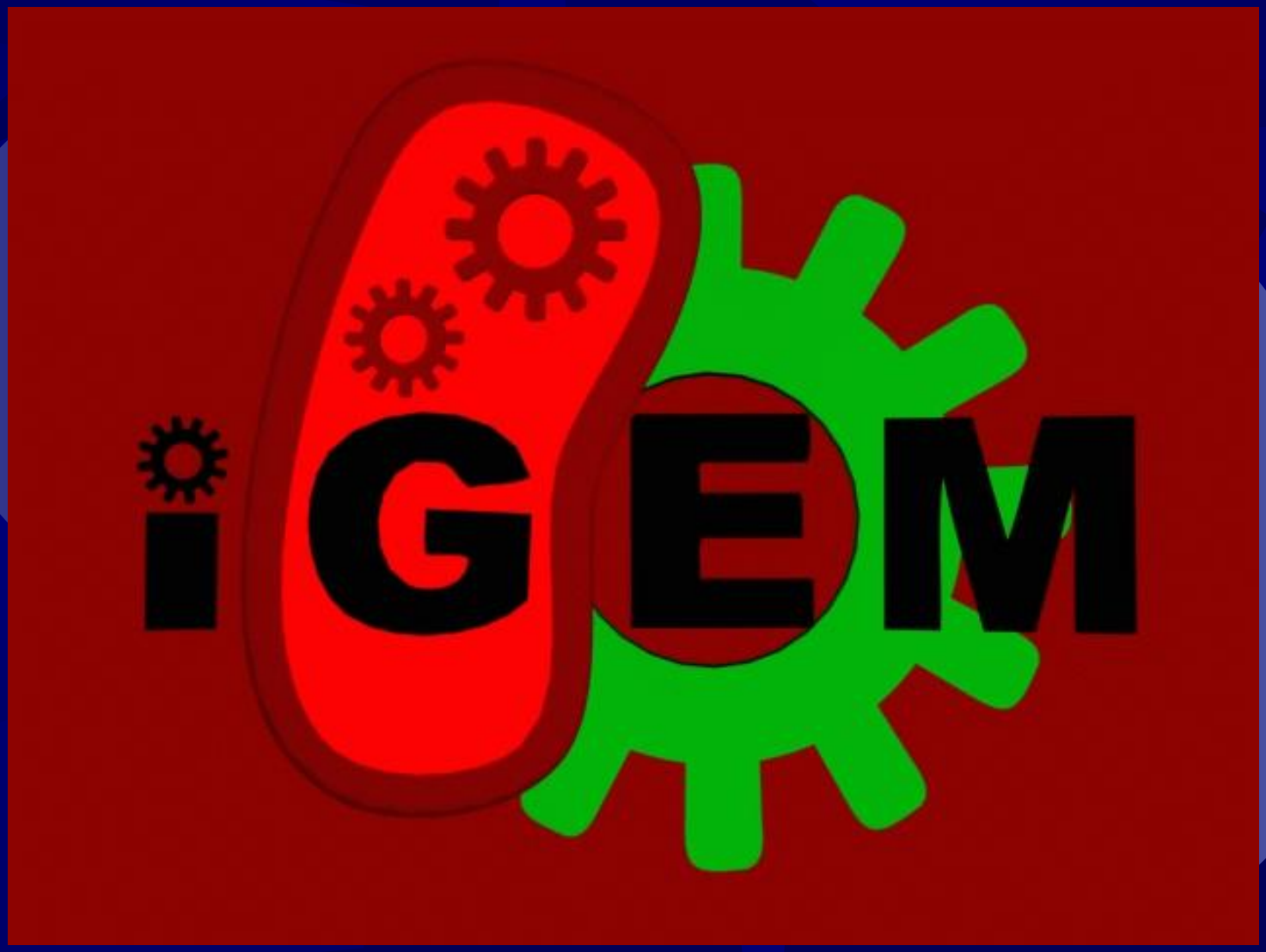
Human Practices

SynBERC
Synthetic Biology Engineering Research Center

"Thrust 4 examines synthetic biology within a frame of human practices, with reciprocal emphasis on ways that economic, political, and cultural forces may condition the development of synthetic biology and on ways that synthetic biology may significantly inform human security, health, and welfare through the new objects that brings into the world."

- www.synberc.org


Governments
Evaluation and resources
Communication of issues and concerns
Local oversight
Proposed work
Local approval
Suspicious synthesis requests
Evaluation and resources
Communication of issues and concerns
ICPS
Screening software and best practice
Operational lessons and issues
DNA synthesis customers
Synthesis orders (plus biosafety and identifying information)
Newly synthesized DNA
Sequence screening
DNA synthesis companies


iGEM

Things that motivate activity

- The Good
  - The good of corporations/industry
  - The good of academia/science
  - The good that motivates the solution to "real world problems"
- Bayh-Dole Act
  - Guides research in the direction of industry

Berkeley
University of California

- Grant and a three-way partnership between UC Berkeley's QB3 Inst., Amyris Biotechnology, and One World Health.
- The relationship is mutually beneficial. Everyone wins, no losers, no problems.

What if…

- The relationship is not mutually beneficial?
- What if the good of academia/science, and that which motivates the solution to “real world problems” is subordinated to the good of corporations?

Banal Dangers

- The problems that may arise from the solution to “real world problems.”
- With mass production: how do you control the technology in the hands of industry?
  - Regulations? Oversight Frameworks? Cost-Benefit Analyses?

None of them work so long as the good of academia/science and that which motivates solutions to “real world problems” are subordinated to good of corporations and industry.

Case Study: Registry

- Registry/Open Source/ Security issues

  -spread of knowledge= advancement of science

  - can learn how to makes things

  - obtain DNA sequences

  - DNA synthesis is cheap

*This info is also available to people with malicious intent

Possible Solution 1

- Solution 1
  - Regulations on who uses the registry
  - *Limitations→Global SB communication is cut.
    - Loss of SB global community & collaboration
    - Slow down in SB innovation=slow down in preparation
    - Could cause a SB black market.
- DNA synthesis industry regulation
  - database of synthesis user
  - screen orders

Possible Solution 2

- Encourage open environment of knowledge exchange

  - Everyone knows what is taking place at all levels
  - Self Regulation
  - Keeps track of innovation
    - Preparation: knowledge of good means keeping track of the possible bad

Present day Registry

- Few well characterized parts and well trained SB
  - skills more concentrated
    - Registry→less useful to “terrorists”

The Future…

The well trained SB will be the “iGEM-ers” of today

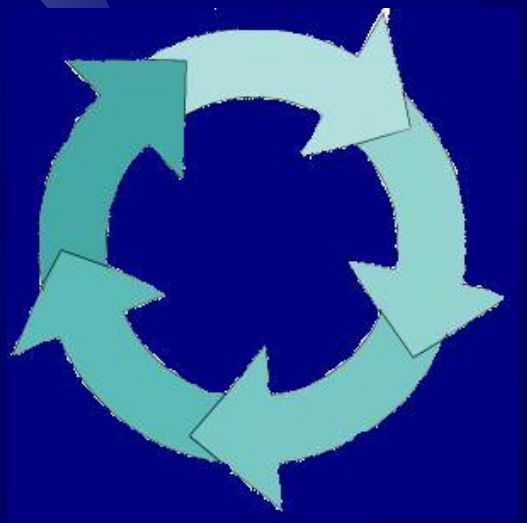
SynBERC:
CONSTITUTION OF SECURITY WITHIN SYNBERC

- Discussion of the production of security practice, with a focus on discourse as practice;
- Analysis of security as product, brand, equipment;
- Does 2nd-order observation prepare us to examine the potentialities of security practice within SynBERC?

Security

Problem space, truth claims, effects, "ethical orientation" and

the *functionality of identifying framing*



Ethos

Habit Formation in Emergent Spaces:

How can we identify and frame the possibilities and limitations of the work that SynBERC's constitution of security does, examining security practice as equipment in relation to creating flourishing?