1. Q Re: Tradeoffs in centralized vs. decentralized infrastructure for Bio-manufacturing (competitiveness & security)
2. Tradeoffs RE: Bio-Based Economy, common feedstocks for chem/energy/medicine/materials

What are the conditions that make/would make responsible development in SB (SR?) possible?

–processes –inst…

1. Distinguish sci- hype- sci fiction
 time lag
 great uncertainty
 yet we proceed into
 governance and risk 🡪 how to make decisions in face of >> uncertainty (and lack of total transparency)
2. Lack of good governance is not a reason to “lie” to consumers. Look for more lawsuits under Lana them(?) Act.
3. Research on and development of methods for working across boundaries.
4. Innovations ecosystems affecting productivity and societal impacts from a 21st century perspectives. (Note drivers, values, etc.)
5. Conduct social science research (“integrated” and not “integrated”) about what professional researchers (in public and private sectors) that are funded by programs labelled as “synbio”, or in research centers uniquely devoted to ‘engineering biology’ are actually doing, and how this may contribute, or not, to broader aspirations eg. sustainability. And this work incorporates (hidden) definitions of what ‘good health;, ‘sustainability’ or ‘food security’ look like.
6. Comparative and international research will be critical for making US policy in an era of globalization of bioeconomies and global biological systems.
7. Find whys to support, encourage international work
8. Fast-paced world of sci advancements

How to include public in meaningful ways?
Engagement/involvement
“education” of non-experts 🡪 distinguish hype from sci fiction 🡪 about synbio and other areas

1. Governance

Government Regulatory | Context
Soft | National Bioengineering Initiative

Include outreach engagement with public
Legal Issues
Political ramifications

1. Leverage existing research operationalizing sustainability framework to assess synbio applications of the tradeoffs therein as one (or many) option(s) in a suite of other options for achieving societal objectives

Need to map the cultural diversity of the synbio community writ large to understand competing world views and relation to empirical claims, social theorem, theories of change – etc. i.e. cultural thermo of applied to synbio culture.

1. Research to identify and assess success in education on norms across traditional and non-traditional practitioners in synbio
2. Central significance of an interdisciplinary research and training initiative focused on bioeconomies, the reconfigurations (of relations among social, bio, tech, economy) that they bring about, and the distributions of outcomes that flow from them.
3. Assistance from NSF to provide formal pathways for research to reach policymaking bodies
4. What are the desired goals and outcomes? What’s the framework on which to hang a research agenda I a directed, not ad hoc way?
5. Notions of sustainability need to be “unpacked” and operationalized in context of bio-economy: how to do that, who should be involved in what ways?

Role of synbio?

1. What is the interface between the non-traditional developers and the traditional “hard” governance institutions? (An alternative governance intersect with hard governance?)
2. Market/Business
–Society interfaces
\*tech transfer
\*resp. innovation
3. Build societal research into specific problem areas.

Test beds: Scale up from focused problem to wider application within that problem area

1. Coordinated & Systematic

Mappings of international/transnational policies & governance structures as they emerge

= comparative policy, etc.

1. Systematic consideration of alternative pathways for achieving synbio goals.

(for a given “promise”, what are other social/technical means of delivering on said “promise”)

1. Sustainability focus is crucial, BUT do not shy away from health care
2. (Location and pace of innov.)

Economy

ENV SEC (????) (????)

Focus on connections across topics

Focus on research to mitigate uncertainty on connections…

1. Do we need a research agenda specifically focused on synthetic biology?

Finding the right balance of integrative and independent SS research

1. How to measure the impact of investments in informal science education

-museums
-community labs
- academic efforts

1. Support for non-traditional ‘broker’ roles (including support for policy interactions and communications between centers)

Eg. policy implementation, research and practice

1. Due to the many disciplines that have interests in the future of synthetic bio, we need a well-defined definition of what constitutes synbio!
2. Relevant data & metrics needed to account for and support decisions on investments 🡪 personnel, information, materials 🡪 supply chains and bioeconomy and security
3. Build on nano societal initiative at NSF

Uncertainty

Risk

Innovation

History of sci

1. How program is structured – most important?

-innovative models
- integrated

Team-based on big Q’s

And also independent!

And not just synthetic biologists, but also social movements, communities that are the “focus” of SB solutions, etc.

1. NSF should be a local agency intellectually relative to synthetic bio., especially relative to interdisciplinary work.