



**National Science Foundation**

**Directorate for Biological Sciences, Molecular and Cellular Biosciences**

**Directorate for Engineering,**

**Emerging Frontiers in Research and Innovation**

**Chemical, Bioengineering, Environmental and Transport Systems**

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# NSF Investments in Synthetic Biology

National Academies of Science | October 21, 2013

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**NSF Mission:** To promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense

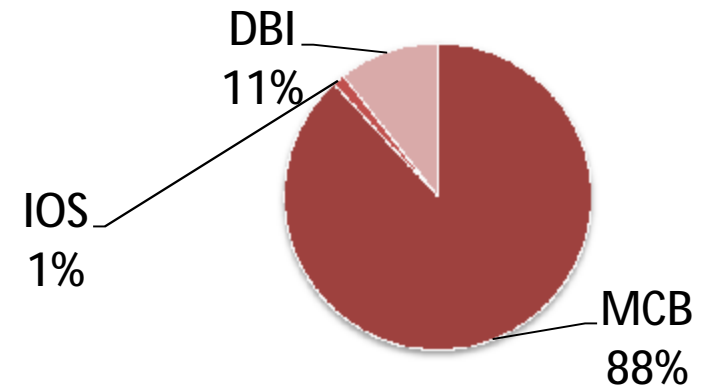
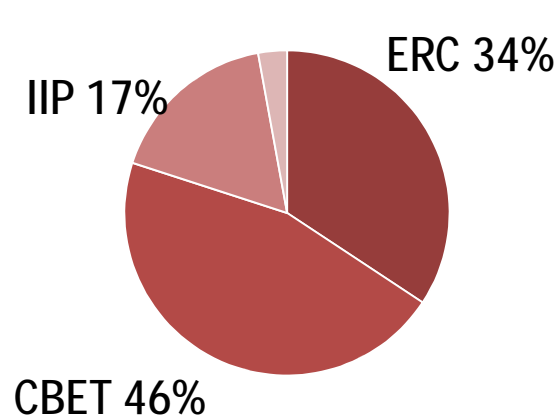
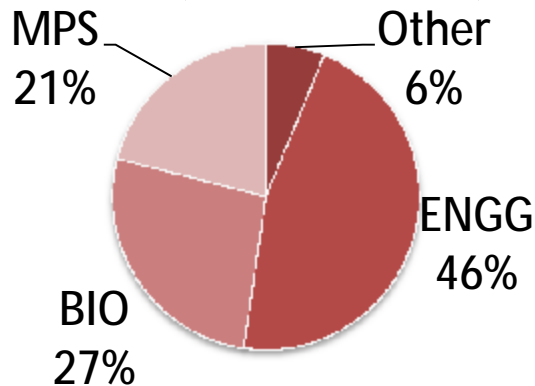


# Synthetic Biology Funding at NSF

(~\$55M /year)

- **ENG**
  - ERC
    - SynBERC, CBiRC
  - CBET
    - Core program
  - IIP-
    - SBIR, STTR
- **CISE, SBE, EHR, MPS (CHE, PHY)**

- **BIO**
  - MCB
    - Core
    - SAVI
  - DBI
    - Informatics
    - Education
  - IOS





## Synthetic Biology – NSF Funding

NSF investments in Synthetic Biology have been predominantly driven through unsolicited proposals by the research community

|                                         |                                                                                                                                   |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| SynBERC                                 | Largest investment by NSF established in 2006                                                                                     |
| EFRI – IDEAS lab                        | Joint NSF/EPSRC ‘Sandpit’ on Synthetic Biology                                                                                    |
| CBET/BBBE                               | Unsolicited proposals                                                                                                             |
| MCB/Systems and Synthetic Biol. Cluster | Unsolicited proposals                                                                                                             |
| SBIR/STTR                               | Unsolicited proposals                                                                                                             |
| INSPIRE – SAVI                          | Science Across Virtual Institutes<br>Yeast Chromosome Synthesis and Analysis;<br>partnership between US, China, Europe, and India |



## Challenges Agency Sees for the Focus Areas It Supports

NSF mission is to advance science and ensure education and training of workforce  
translate advances in science to ensure national prosperity (i.e .job creation)

### Advance of science:

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Development of fundamental technologies

Research infrastructure (repositories, data storage, who funds it, what are the standards)

International collaboration/competition

Concentration of resources vs democratization of science

Development in organisms other than E. coli

How do you proceed safely, ethically, with public trust (perceived versus actual risk)

### Education

Discipline specific versus interdisciplinary training

Curriculum resources

### Translation to Industry, Job creation

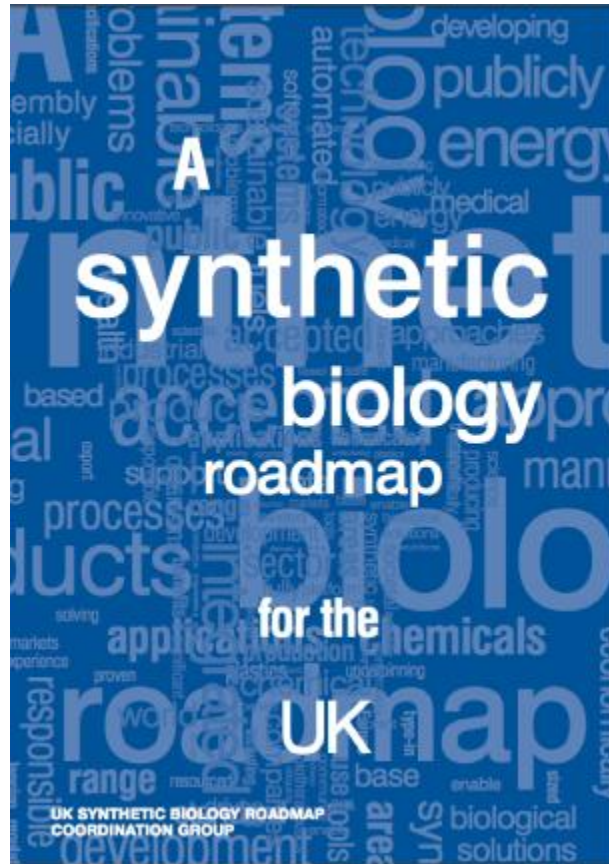
Robustness of systems

Economics. uncertain IP. regulatory landscape



## Issues for the forum to explore

- Coordination of funding/collaboration to better leverage resources between agencies
- Address perceived versus actual risk of technology
- Is there a need for standard development for the purpose of developing repositories for data
- How will we fund national/international research infrastructure that benefits all



**PRIORITY CONSIDERATION: DEVELOP A NATIONAL STRATEGY / ROADMAP FOR SYNBIO RESEARCH/EDUCATION/INDUSTRIAL DEVELOPMENT, SOCIETAL, EETHICAL, AND POLICY ISSUES**