



National Science Foundation
4201 Wilson Boulevard
Arlington, Virginia 22230

NSF 14-048

Dear Colleague Letter: Submission of I/UCRC Proposals in Response to [NSF 13-594](#) in Areas Related to Engineering Biology and Cellular Biomanufacturing

Date: March 13, 2014

Dear Colleagues:

The National Science Foundation (NSF) Industry/University Cooperative Research Centers (I/UCRC) Program has over a 30-year history of fostering long-term partnerships among industry, academe and government in various technology sectors. These partnerships develop through the cooperative execution of precompetitive research that strengthens the ecosystem for open innovation and U.S. competitiveness. Sector precompetitive research addresses application-inspired fundamental topics that are longer term, recognized challenges to the industry sector as a whole such that industry members benefit from collaboration in the research definition and execution. NSF provides catalyzing investment to these centers, which are primarily supported by industrial members and other stakeholders. The research carried out at each center is of interest to both the industry members and the center faculty. I/UCRCs contribute to the nation's research infrastructure base and enhance the intellectual capacity of the engineering and science workforce through the integration of research and education. As appropriate, I/UCRCs use international collaborations to advance these goals within the global context.

In emerging areas of technology at the interface between fields such as the engineering of biology and cellular biomanufacturing, including the field of synthetic biology, there is an even greater need for collaborative precompetitive research that will ensure the success of these nascent technology areas. In particular, research that contributes to the establishment of standards for production; provides tools for the assessment of quality, robustness and stability of the process and product; and develops metrics that will facilitate risk assessment associated with a regulatory framework, will be essential for the eventual commercialization of products from the engineering of biology. The I/UCRC model in which industry members pool and apply their funds to center projects that address shared research challenges can be enabling to such nascent fields by leveraging the investment and reducing the risk for each participating member organization.

To foster collaborations between industry and academe in the fields of engineering biology and cellular biomanufacturing, including synthetic biology, NSF welcomes and encourages proposals in response to [NSF 13-594](#) in these areas. Potential areas of precompetitive research that are of interest include but are not limited to:

1. Basic research that will enhance the commercialization of engineering biology and cellular biomanufacturing:
 - a. Probe mechanisms of host organism genome instability and develop strategies to enhance stability in industrial platforms.
 - b. Develop processes that will speed the translation of lab-based engineered organisms and laboratory media to industrial strains and media.
 - c. Examine the reusability and transferability of genetic material from one strain and/or context

to another and measures to assess the reliability of such processes.

2. The development of standards that will facilitate the commercialization of technologies:
 - a. Establish reference cell lines and/or reference synthetic circuits or parts for the purposes of benchmarking and/or making marketing claims.
 - b. Establish reference process data such as the time to construct a circuit of a given number of parts, the cost of construction and the time and cost from design inception to a functioning engineered organism.
 - c. Develop tools to enable the measurement and/or prediction of metabolic burden and cost in terms of fitness, robustness and/or stability of an organism upon the addition of specified genetic circuitry.

3. The development of tools that will facilitate progress through the regulatory landscape:
 - a. Develop computational and experimental tools that will enable the prediction and characterization of cell phenotype after the genetic alteration and/or insertion of synthetic genetic material.
 - b. Establish reference organisms for comparative purposes in establishing risk associated with release.
 - c. Develop tools that facilitate the measurement of risk and consequences of horizontal gene transfer between an engineering (synthetic) organism and native organisms.

The above list is provided for illustrative purposes only. **Any precompetitive research areas that enhance the translation of basic research to commercialized processes and products in these fields would be considered.**

CONTACT PERSONNEL

Please contact one of the following program officials if you have questions about this I/UCRC funding opportunity:

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Sincerely,

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