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Accelerating Innovations in Biomanufacturing Approaches through Collaboration Between NSF and the DOE BETO funded Agile BioFoundry (NSF-DOE/ABF Collaboration)

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Program Background

We recognize that broader access to biofoundry infrastructure:

- Advances basic research (and biomanufacturing)
- Transforms biology, biotechnology, and bioengineering workforce to one skilled in:
 - Hypothesis-driven experimental design AND
 - Modular workflows

To this end, **NSF**, **DOE BETO (Department of Energy's Bioenergy Technologies Office)**, and the **ABF (Agile BioFoundry)** are collaborating to support proposals from the science community that:

- would utilize the integrated design-build-test-learn capabilities of the ABF
- translate basic research in synthetic and engineering biology into products and processes that will impact the U.S. bioeconomy.



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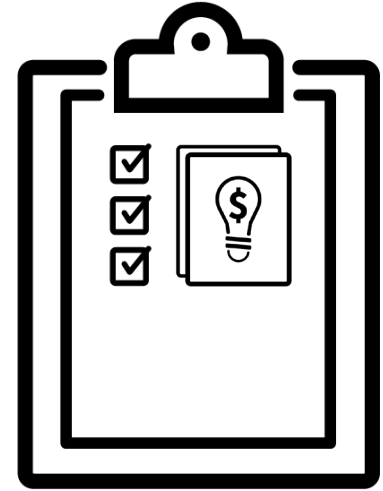
Current Solicitation (NSF 22-549)

- Proposals must leverage the unique Design-Build-Test-Learn (DBTL) capabilities available at the **ABF**
- **NSF** funds:
 - Activity at IHE or non-profit that occurs in parallel to/prior to work at **ABF** that readies the project for translation to practice
 - Post-doctoral fellows, graduate students or undergraduate student interns hosted by national laboratories or **ABF**
- **DOE BETO** will cover the costs for implementation of approved projects at ABF. Partnering with industry is encouraged for technologies both to facilitate eventual scale up and regulatory approval.

Review Process

Proposals are reviewed at **NSF** according to the **NSF** Review Criteria

- All proposals must address **Intellectual Merit** and **Broader Impact**
- There are additional solicitation specific review criteria (*see solicitation for complete description*)
- **NSF** will coordinate and manage the review of proposals with input from **DOE BETO**





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Agile BioFoundry

Work with the Agile BioFoundry via NSF 22-549

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Agile BioFoundry

A consortium of seven national laboratories dedicated to accelerating biomanufacturing



Agile BioFoundry Capabilities

Design

- DIVA bioCAD

Build

- DIVA DNA Construction & Validation
- Genetic Transformation
- Fungal Synbio & Bioprocess Dev.

Test

- Biocatalyst Optimization
- Biolector / Robolector
- Experimental Data Depot
- Biosensors: *in vitro* and *in vivo*
- Microfluidic Screening
- Riboregulator Development
- Metabolomics and Proteomics

Learn

- Deep Learning
- Machine Learning
- Metabolic Flux Modeling & Analysis
- Pan Genome Analysis
- Regulatory Modeling

Process Integration & Scale-up

- Fermentation Scale-up Recovery
- Multiscale Bioreactor Cultivation

Integrated Analysis

- Life-Cycle Analysis – GREET
- Techno-Economic Analysis

Host Onboarding



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[Agilebiofoundry.org/capabilities](https://agilebiofoundry.org/capabilities)

Agile BioFoundry's Collaborating Partners



Feasibility Document

Scope – 2 pages maximum

- Overview
- Aims & Outcomes
- Alignment with NSF & BETO

ABF Resources – 2 pages maximum

- ABF Capabilities
- Timetable



Applicant name, Organization

Feasibility document writing instructions and form for applicants to NSF solicitation # 22-549, the NSF-DOE / Agile BioFoundry funding opportunity

Refer to the solicitation # 22-549 for comprehensive application instructions. This form provides guidelines for the applicant, in order to describe the proposed research, which is to be carried out with ABF resources. ABF staff will use this document to evaluate the feasibility of the proposed research.

There is a 4-page limit. Avoid inclusion of proprietary information. Use the margins and typeface provided here. Adjust document structure, such as indentations, as needed. Download this template as a word document. Delete instructions in blue text before submitting your document to info@agilebiofoundry.org.

Title

Applicant name, Organization

I. Scope (2 pages maximum)

The ABF focuses on synthetic biology of industrially relevant bacteria and yeast species, not plant or mammalian cell genetics or cell culture or biomedical applications. The ABF and DOE BETO address research challenges for the production of sustainable aviation fuel (SAF) and decarbonization of industry. Review [recent ABF projects](#) for further information.]

A. Overview

B. Aims of the project

1. Aim 1
2. Aim 2...

C. Expected outcomes

D. Alignment of the project with NSF and DOE BETO priorities

II. ABF resources ([website here](#)) to be used for this project (2 pages maximum)

A. Description of capabilities to be used

Provide breakdown for each ABF national laboratory.

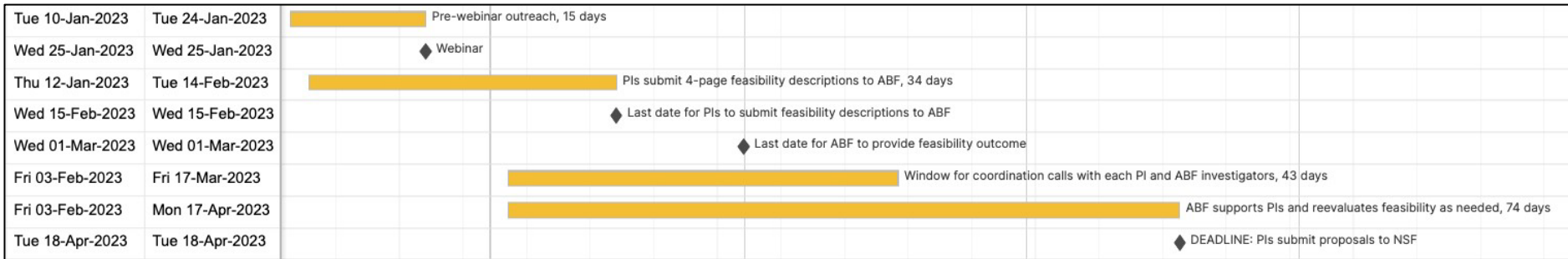
B. Approximate timetable of ABF-focused research

Use the table below for an approximate schedule of tasks and capabilities. The first row provides an example.

Aims	Quarter Due	List of ABF Capabilities
Aim 1...	Q1	DNA design

Feasibility Review

1. PI Submits a feasibility document – no later than Feb 15.
2. ABF reviews feasibility documents as they arrive and provides feasibility outcomes via email as quickly as possible – no later than March 1.
3. If ABF encourages application, the PI will receive a link to book a ‘speed dating’ call with investigators from all ABF labs – on or before April 17
4. The PI will follow up with specific ABF investigators for budget and aims.



Successful Applications

- **NSF** oversees the application review and selection process.
 - in consultation with **DOE BETO** and **ABF**
- For **ABF-based** project scope, relevant National Labs enter into the necessary agreements with the outside organization(s).
 - *may* include a Cooperative R&D Agreement (CRADA)

Questions?

