SYNBIO
IDEATHON

BIOME Ideathon 2021 Guidelines

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Introduction

Welcome to the BIOME 2021 Ideathon Competition! Your task is to select a relevant problem in today's world and come up with a feasible project that addresses this problem using the tools of biotechnology. You may use everything from plasmids to *E. coli*, from protein design to gene delivery. The entire world of bioengineering is at your fingertips, and we can't wait to see what you come up with!

Getting Started

Ready to get started? To begin, start by joining the official BIOME Slack. An email invitation should have been sent to your **Stanford email** by the time of the Ideathon, but if not, you should reach out to the Exec Team (see the Contacts section), and we can troubleshoot any problems.

Once you're in the BIOME Slack, please confirm you're in the #synbioideathon2021 Slack Channel. If you do not see the channel name under your list of channels, please search for the channel via the Channel Browser and add yourself. Once again, if you run into any technical difficulties, the Exec Team is available to assist you.

We also ask that you download the Slack Desktop and Slack Mobile Apps and remain logged in for the duration of the Ideathon. Slack is how **all** communication will be handled

for the Ideathon, and it will also be key for making sure you can access our gift cards, Zoom links, and logistical competition details.

Finally, please make sure to register for all the Zoom events! Even if you're unsure if you're able to attend, registering guarantees you will receive a Zoom link for each event, enabling you to attend if you do find you are able to make it. There is a series of gift card giveaways that happen throughout our events, so it's in your best interest to attend as many events as possible!

Timeline

We have prepared a wonderful line-up of synthetic biology speakers events designed to guide you along during the week. We will distribute DoorDash, Starbucks, Coupa and more gift cards to attendees throughout events and we encourage all participants to join as many events as they can. If you are unable to make some events, please let the BIOME Exec Team know, and we can help accommodate your group based on any conflicts.

Date and Time (PST)	Event	Link
April 14th, 5:00-5:30 PM	Ideathon Launch and Introduction	Recording
April 14th, 7:00-7:30 PM	Social Mixer and Team Formation	See Slack Thread for Project Groups
April 15th, 10:30-11:30 AM	A Conversation with Dr. Drew Endy	Recording
April 15th, 4:00-5:00 PM	Company Presentation: Amino Bio	Recording
April 15th, 5:00-6:00 PM	Company Presentation: Octave Biosciences	Recording
April 15th, 7:00-8:00 PM	Team Registration Check-in	DM BIOME Exec for Make Up
April 15th, 11:59 PM	**Team Registrations Deadline**	**Form**
April 16th, 1:00-2:00 PM	Bioengineering with Dr. Zelda Love	Registration
April 17th, 12:00-1:00 PM	BIOME Lab Managers Check-in	Registration
April 18th, 12:00 PM	**Abstract and Video Submission Deadline**	**Form**

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April 18th, 5:00-5:30 PM	Awards Ceremony	Zoom

Competition Logistics

You can register alone or as a team with up to three people. If you want to compete on a team but do not have other members when you register, there will be an opportunity to meet the other competitors and form teams at the event mixer on Wednesday, April 14th. Finalized team registration lists should be submitted to **this form** and are due after the second day of the competition. **The registration due date is Thursday, April 15th at 11:59 PM PST.**

When your team registers, you must select which *Project Category* you will be competing in. Your final presentation will be judged among the other presentations in your chosen category for the various prizes (see below), alongside a general prize across categories. If your project does not fall under a given category, you may register under the "Miscellaneous" option. The *Project Categories* are:

Data Modalities for Multiple Sclerosis (sponsored by Octave Bioscience)
Despite the significant biological and pharmaceutical advancements of the last several decades, neurodegenerative diseases continue to present strong diagnostic and therapeutic challenges. One example is multiple sclerosis (MS), a progressive and incurable neurodegenerative disease that impacts many around the world.

At Octave Bioscience, we are developing a comprehensive platform to address the full range of measurement, diagnostic, and analytical tools available for understanding and combating multiple sclerosis. We have developed an assay for multiple protein biomarkers associated with disease activity and progression. Octave's platform has focused on three data modalities:

1. proteomic data on metabolites and biomarkers
2. imaging data to quantify central nervous system features
3. digital health and clinical data on patient symptoms.

Your challenge area is to come up with other data modalities (e.g. genomics, transcriptomics, microbiomics, metabolomics, etc. or RNAseq, ATACseq, etc.) that may provide insights about MS disease state and treatment response, along with creating a strategy to integrate the multi-omics data.

Education & Science Communication (sponsored by Amino Bio)

Every day, astounding advances in biotechnology and genetic engineering radically reshape the future society and economy in which the next generation will live and work.

Even today, the biotechnology industry impacts billions of lives every year and is a cornerstone of our society.

Yet, only a small fraction of the population understands and can use it to help solve the world's biggest problems; from fuel to food to medicine to sustainable materials. At Amino Labs, we are passionate about democratizing access to learning and innovation in the world of life science. We believe that inventing, building and deploying tools that make "programming biology" accessible to non-scientists is key in driving wide-spread meaningful growth of ideas and solutions to our greatest problems. Only when millions more can problem solve using biology will our human and ecological problems be solved.

Join us in our mission to demystify biotechnology and bring biotechnology outside of the traditional lab spaces and into the hands of our next generation of innovators and citizens. In this Project Category, you will work to design simple hands-on experiments, science demonstrations, biological systems, visualizations, games, or any other form of tool to better communicate a concept in bioengineering to the public.

Environmental Impact & Planetary Health (sponsored by BIOME)

The synthetic biology revolution is rapidly changing the way that humans interact with the world around us. From disease to agriculture to chemicals production and pollution, the biosciences are redefining the modern industrial age. Yet in the past, such periods of growth, innovation, and expansion in human history have also had a critical cost: the destruction of natural ecosystems, habitats, and wildlife in the pursuit of human advancement.

But could this time be different? Unlike previous revolutions in science and technology, the biosciences are intrinsically tied to the natural world. As much as any technology may pose risks, synthetic biology also holds the unique promise of potentially being able to address some of the most critical challenges facing humanity today with solutions that could be much cleaner and greener — both in industry and consumer applications — than ever possible before.

Your task for this Project Category is to identify a solution from synthetic biology that could help address one aspect of the environmental and climate crises that face humanity.

You are free to focus on any area within this you'd like, but we encourage you to identify a problem and solution that could feasibly begin implementation with the synthetic biology tools of today.

Miscellaneous
If your project doesn't fit into any of the categories described above, no worries! All teams are also eligible to enter in the Miscellaneous Category, where you can propose your own problems and ideas for tackling them. Please note that projects in the Miscellaneous Category will only be eligible for non-track specific prizes.

Abstracts and Final Presentations

Once you select your problem and devise a project to address your problem, the final step is to present your proposal in a comprehensive, clear, and scientifically rigorous way. There are two deliverables: an **abstract** and a **final presentation** (see judging guidelines below). The abstract should be about **half a page** in length and clearly state the problem and your biology-inspired solution and proposal. Examples will be released during the competition. The final presentation should be a recorded slide deck presentation (maximum **10 minutes**) that communicates the problem and your proposal effectively. These deliverables must be submitted to **this form** by **12 PM PST on Sunday, April 18th**.

Competitors should watch and vote for their favorite presentation after 12 PM PST on April 18th. You may not vote for your own team. The members of the team that wins this "People's Choice" award will each receive a **$25** DoorDash gift card. Judging deliberation to determine category-specific and overall winning teams will occur after the deliverable deadline and the results will be released during the awards ceremony at **5 PM PST on Sunday, April 18th**.

Example Abstract

Example Slides

Awards and Prizes

BIOME Overall Prize
The overall winning team will receive up to $3000 in project funding and mentorship from graduate students and professors, organized by the BIOME Executive Team. Once campus

lab access is available for undergraduates, you will be allowed to order any lab supplies you need and begin executing your project idea. This prize winner will be selected from across the categories at large.

Environment & Planet Health Prize
The winning team will receive up to $1000 in project funding and mentorship from graduate students and professors to begin executing their idea, organized by the BIOME executive team. This will also include lab access once available. This prize winner will be selected from the Environment & Planet Health project category.

People's Choice Award
The winning team for this award will receive $25 DoorDash gift cards per each member of the team. This prize is determined through popular vote by the participants of the Ideathon, and is open to any team that completes a final submission.

Education Prize
The winning team for this award will receive the opportunity to work to develop an educational kit based on a plasmid/circuit design from the Ideathon in partnership with Amino. This prize is selected by Amino, and will be specific to the *Education and Science Communication* Project Category.

Newcomer Prize
The winning team will receive an Amino Labs Zero to Genetic Engineering Hero beginners kit, which can be used to help students learn more and develop stronger wet lab skills. This prize is selected by Amino, and will be awarded to the best project developed by a team of students who are new or still emerging bioengineers and wet lab scientists.

Multi-Omics Prize
The winning team will have a chance to meet with Octave's leadership (CEO, COO, VP, etc.) over a complimentary catered lunch to learn more about the company, carry out a

whiteboarding/brainstorming to see how these ideas could transfer to Octave's roadmap, and discuss creative ideas more broadly that could inspire opportunities in industry. Free Octave swag will be delivered to each of the winners as well. This prize is selected by Octave, and will be awarded to the team from the *Data Modalities* track with the best multi-omics approach to provide insights about MS disease state and treatment response.

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Judging Guidelines

The judging panel will evaluate the deliverables according to the criteria listed below. The sum of all criteria scores will determine the team's final score. This final score will be used to determine the winning teams.

Abstract

The problem selected is well-defined and relevant.	5	4	3	2	1
A coherent and scientifically rigorous project is presented that persuasively addresses the problem selected.	5	4	3	2	1
The project proposed is scientifically feasible.	5	4	3	2	1
The abstract proposes a project that creatively uses biology or bioengineering tools to advance the solution.	5	4	3	2	1
The abstract is roughly half of a page in length.	5	4	3	2	1

Final Presentation

The problem selected is well-defined and relevant.	5	4	3	2	1
A coherent and scientifically rigorous project is presented that persuasively addresses the problem selected.	5	4	3	2	1
The project proposed is feasible as an undergraduate student.	5	4	3	2	1
The presenters demonstrate how the proposed project uses biology or bioengineering tools to advance the solution.	5	4	3	2	1
All presentation slides are concise and clear.	5	4	3	2	1
The presentation is well-organized from beginning to end.	5	4	3	2	1
The speakers communicate the proposal clearly and cogently.	5	4	3	2	1
The presenters wisely use the 10-minute time limit.	5	4	3	2	1

Questions and Contacts

The BIOME Team will be available throughout the entire Ideathon, in addition to the events and official Office Hours, to assist in any problems, questions, comments, or concerns that may come up during the Ideathon. Any questions or concerns should be

emailed to biome_exec@lists.stanford.edu or addressed in the #SynBioIdeathon2021 Slack Channel.

With urgent questions, also feel free to reach out to individual members of the executive board via Slack DM or email. We will respond as soon as possible, though Slack communication is preferred and will likely be faster.

Board Members:
Ayush Pandit — Co-President (@apandit and apandit@stanford.edu)
Lauren Isabella Elfriede Ramlan — Co-President (@lauren and lramlan@stanford.edu)
Aditi Limaye — Community Coordinator (@Aditi and alimaye@stanford.edu)

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