



GFI Research Program White Space Collaborations

Mapping the secretome of animal myoblasts, adipocytes, and other cells used in cultivated meat

REQUEST FOR PROPOSALS (RFP)

Applications Due: Oct 20, 2020

Find an editable proposal template [HERE](#).
Submit your completed proposal [HERE](#).
Review our FAQs [HERE](#).



Introduction

The Good Food Institute (GFI) is a global nonprofit building a sustainable, healthy, and just food system. Our scientists, entrepreneurs, lawyers, and policy experts are focused on using food innovation to answer the question: How can we feed the world's growing population with safe and healthy foods produced through systems that benefit people, animals, and the planet? We focus on accelerating research, development, and the path to competitive commercialization for a promising solution to this question – namely, the production of meat through animal-free methods.

GFI and its Science & Technology Team specifically work to catalyze research and development to improve the [organoleptic](#) properties, price point, and production capacity of plant-based and cultivated meat products. To that end, GFI established a Research Program in 2018, made possible by the generous donations of philanthropic supporters. This program supports essential research designed to solve many of the challenges facing these industries and seeks to create open-access tools and methods for the development of appetizing, affordable, and widely available alternative protein products.

White Space Collaborations provide funding for targeted research that tackles the ideas outlined in the white space concept notes identified by the [Advancing Solutions for Alternative Proteins \(ASAP\) Initiative](#).

For additional information on GFI and the alternative protein industries we support, please visit: <https://www.gfi.org/essentials>

For additional information on the GFI's research funding and grant recipients, please visit: <https://www.gfi.org/researchgrants>

To provide feedback on this RFP or to clarify any of the information presented within, please contact GFI's grant management team at: research_grants@gfi.org.

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Background

In the study, “Shifting Diets for a Sustainable Food Future,” the World Resources Institute estimates we will need 70% more food to meet global demand in 2050 than in 2006. It is unlikely that improvements in agricultural productivity alone will be able to close this gap, given that yields would have to increase 33% faster than they did during the Green Revolution. The authors suggest that closing this 70% food gap will require both productivity increases and dietary shifts away from consumption of animal-derived proteins, due to the fact that the production of animal-based foods involves substantially more resources and generates more environmental stress than the production of plant-based foods.

Decades of work by scientists, public health authorities, environmentalists, and others to persuade people to consume more plants and less meat have not reduced meat consumption. Despite rising awareness of the global impacts of our dietary choices, consumers continue to base their purchasing decisions primarily on price, taste, and convenience. Quite simply, reducing animal protein consumption is intractable for most people due to a lack of appetizing and affordable products that could serve as alternatives to conventional animal protein products. The challenge, then, is to innovate and bring to market diverse protein alternatives that are as delicious, price-competitive, and convenient as animal-derived food products are currently. By making healthy and sustainable alternative proteins comparable to conventional proteins in the areas of flavor, price, and ubiquity, alternative proteins become the default choice.

Funding Opportunity Priority Area

GFI's [Advancing Solutions for Alternative Proteins \(ASAP\) Initiative](#) has identified pressing scientific and technological challenges facing the alternative protein industry. This RFP seeks research proposals that address the white space opportunity outlined in the following concept note.

Mapping the secretome of animal myoblasts, adipocytes, and other cells used in cultivated meat

Description

Stem cells secrete a variety of signaling factors that can influence the behavior of surrounding cells, known as paracrine signals. In high-density bioprocesses, these secreted factors can accumulate to concentrations that can dramatically influence productivity and behavior of neighboring cells. By mapping the secretome of animal myoblasts, adipocytes, and other stem cells used for cultivated meat, a better understanding of which factors influence proliferation, differentiation, and other cellular traits can be obtained. Mapping efforts will inform how to best leverage this knowledge to improve cultivated meat production.

Current Challenge

The addition of a select set of exogenously added growth factors to cell culture media stimulates growth and proliferation. However, these effects can be inhibited or assisted by other secreted factors from stem cells, including soluble secreted factors (e.g. cytokines and growth factors) and extracellular vesicles such as exosomes and microvesicles. To add to the complexity, secreted extracellular vesicles can harbor peptides, proteins, and small RNA species that can all influence cell behavior. Optimization of large-scale animal bioprocesses can be greatly enhanced if inhibitory factors are identified and selectively removed or reduced, while proliferative factors are retained or recycled. Furthermore, a deeper understanding of paracrine signals can potentially facilitate cost reduction of the cell culture media. Mapping the secretomes of different animal stem cell types used in cultivated meat is the first step in informing future bioprocessing and media optimization efforts.

Proposed Solution

The cultivated meat field would benefit from comprehensive, standardized characterization of secreted cellular components for cells of a number of cultivated meat-relevant species and cell types grown under environmental conditions similar to those used in industrial production. The secretomes from a variety of human stem cell populations have been analyzed previously, providing protocols for collecting secreted factors and characterization via mass spectrometry, gene chips, and sequencing analyses. Cultivated meat researchers can leverage these methods for collecting data on the secretomes of myoblasts, adipocytes, and other stem cell types relevant to cultivated meat. These data could inform bioprocessing strategies, medium recycling approaches, selection of growth factors to manufacture recombinantly, and co-culture studies. These data should be provided in open-access publication and, ideally, additionally housed within an online database. This tool can serve as a centralized resource to collate subsequent data from other researchers expanding the numbers of species, cell types, and growth conditions for which the secretome has been analyzed. This will facilitate cross-comparisons to elucidate mechanistic insights for a deeper understanding of generalized principles governing cell signaling.

Anticipated Impact

Little work has been published to date on the secreted factors from stem cells derived from the species used in cultivated meat. Empirical mapping of the secretome is important as unique factors likely exist for each species and cell type. Now that a growing number of publicly-accessible cultivated meat-relevant cell lines are becoming available to researchers, such secretome mapping efforts are finally feasible. These data can identify unique growth factors, cytokines, and nucleic acid species that assist the growth, proliferation, differentiation, and maturation of cells. The data can also inform medium recycling and feeding strategies that reduce the build up of inhibitory factors in the cell culture media (see [Csaszar et al. 2012](#)). A comprehensive secretome map can play a part in addressing the largest challenges in commercializing cultivated meat: lowering costs and scaling up. This effort will be most effective if results are publicly available rather than siloed in for-profit companies.

Related Efforts

A rich set of literature exists on mapping the secretome of human mesenchymal stem cell populations that can serve as a guide for future research efforts (one example, [Mitchell et al. 2019](#)). Computational predictions for reducing accumulation of inhibitory paracrine factors can greatly improve stem cell expansion ([Csaszar et al. 2012](#)).

We expect that proposals submitted for consideration as White Space Collaborations directly address the pressing challenge identified in this concept note. Proposals that do not address this concept note will not be considered for funding.

Please review our [Frequently Asked Questions](#) for more information about what types of research GFI seeks to fund, as well as what research GFI will not fund.

Eligibility Information

Applications submitted from any sector (academia, government, industry, nonprofits, etc.) and from around the world will be considered. Based on GFI's foundational mission to support the entire plant-based and cultivated meat industries, the purpose of this program is to support research that will be made available and accessible to benefit the industries and global society as a whole. Grantees shall make any data and results arising out of the work performed in connection with the project available to the public via a public webpage, presentation, or publication in an open-access peer-reviewed journal. Exceptions to this standard approach will be limited and accepted only in special cases where alternative terms are negotiated and agreed upon by GFI and the applicant in writing prior to the release of any grant funds. Specific terms related to confidential information and intellectual property will be negotiated during the execution of the research agreement prior to the disbursement of any grant funds.

See our [Frequently Asked Questions](#) for more details on Intellectual Property Rights and other contract terms. While the creation of intellectual property is not prohibited, GFI reserves the right to withdraw acceptance of a proposal if the potential grantee insists on intellectual property rights in the research that are not acceptable to GFI.

Graduate students or postdoctoral researchers may serve as the lead investigator on a project proposal. In this case, GFI may ask for a brief letter of support signed by a faculty member at the student or postdoc's higher education institution. The letter of support should state the faculty member's commitment to serve as a project collaborator and advisor and to allow the proposed research to be carried out in his or her laboratory.

Lead researchers from projects that have previously been awarded a grant from GFI are eligible to apply to this RFP. Proposals from labs that are currently receiving GFI grant funding are allowed if the lead researcher of the new submission is different from the lead researcher of the previously funded project.

Award Information

Proposals should include research goals that can be achieved in twelve months or less from the funding start date. Total budgets (including indirect costs) should be less than or equal to \$100,000. Indirect costs can be no more than 10% of the requested direct costs for projects submitted by researchers at academic institutions, government labs, and nonprofit organizations. No indirect costs may be included in project budgets from researchers at for-profit companies.

Applicants who want to propose a project requiring an extended timeframe and/or increased budget must contact GFI's grant management team at research_grants@gfi.org before submitting their proposal to discuss the need for additional time and/or funding. GFI will then decide whether or not to allow an exception and will inform the applicant in writing of the decision.

How to Apply for a White Space Collaboration

To apply for funding for a White Space Collaboration, please follow these steps:

1. Complete your research proposal using the editable proposal template found [HERE](#).

*Please save your proposal as a PDF and use the following naming convention:
PIFamilyName-Date(mm/yyyy).pdf*

2. Submit your completed proposal [HERE](#).

*Alongside your research proposal, you may choose to submit optional Letters of Support. These Letters of Support can be from either industry or academia, but should focus on your unique ability to deliver on the specific objectives outlined in your research proposal. If you choose to submit Letters of Support, please include no more than two, and save them as one single PDF using the following naming convention:
PIFamilyName-Date(mm/yyyy)-LoS.pdf*

Applications are accepted until the October 20, 2020 deadline listed on the front page of this RFP and are reviewed following that deadline.

Review Process and Evaluation Criteria

All submitted proposals will undergo a scientific review to determine their feasibility and suitability for GFI funding. The review committee consists of GFI scientists and external experts from academia and industry. Applicants will be notified of the outcome of their submission no later than six weeks after the submission deadline.

Proposals are evaluated using the following criteria:

- **Scientific alignment**
Anticipated likelihood of addressing the research challenges or opportunities specified in this RFP and identified through GFI's [Advancing Solutions for Alternative Proteins \(ASAP\) Initiative](#).
- **Expected impact**
Anticipated likelihood of positive impact on the sensory characteristics, price points, or production capacity of plant-based, fermentation-derived, or cultivated meat.
- **Contribution to the scientific community**
Plan for sharing project protocols, data, results, and/or research tools and materials with the larger scientific community and alternative protein industry.
- **Project planning**
Feasibility of project goals (including realistic timeline and budget as well as clarity, soundness, and logic of research plan) and suitability of project team to successfully carry out project goals
- **Commercial relevance**
Ability to outline a path for research outcomes to meaningfully advance the alternative protein industry. This includes the potential commercial applicability of research and relevance to industry.

We recognize that our requirement for proposals to be written in English means that many researchers may be writing in a non-native language. This will be taken into consideration when we are evaluating the proposals, and we will not penalize researchers who may be writing in a second or third language.

GFI reserves the right to negotiate with project leaders regarding any of the content within their proposal including project aims and scope, budget, and timeline prior to making any final funding decisions. All decisions made related to funding, project duration extensions, and budget increases shall be made at the GFI review committee's sole discretion and may not be appealed.

For more detailed information about our proposal review process, please refer to our [Frequently Asked Questions](#).

Award Administration

Prior to disbursement of any funding, the lead researcher, faculty advisor (if lead researcher is a graduate student or postdoc), and university official (if required) must sign an award agreement with GFI to ensure that both parties are in agreement regarding the terms of the grant award. The award agreement will detail the award specifics as well as the requirements for award recipients (see below). Please find our standard award agreement [HERE](#).

The entire project budget will be disbursed within three weeks from receipt of the signed award agreement.

Proposals that are accepted by GFI and that result in the granting of funds will have the following information made public: the project title; project summary; project team members' names, titles, and affiliations; and other information deemed relevant by GFI, such as a description of the proposed project scope, purpose, and grant amount. Information within a proposal that applicants wish to remain confidential must be clearly marked as confidential, privileged, or proprietary within the proposal. GFI will hold this information in confidence to the extent permitted by U.S. law, but reserves the right to require removal of such confidentiality requirements as part of accepting the proposal and awarding funds if the proposal is otherwise accepted. For proposals that do not receive funding, GFI will release no details about the researchers involved or the content within the proposals. We may release anonymized aggregated statistics regarding the number of proposals received, the types of institutions they came from (i.e., public vs. private), and the countries of the researchers' institutions, but no identifying information will be included in these statistics. Applicants have the right to withdraw applications at any time by sending a request indicating their desire to do so to research_grants@gfi.org.

Requirements for Award Recipients

Expectations of and specific requirements for award recipients will be explained in the award agreement that must be signed by authorized officials from both GFI and the grantee's organization prior to receipt of any funding.

The basic requirements include but are not limited to:

- Regular communication with GFI's Science and Technology team throughout the duration of the project to ensure consistent progress.
- Disseminating the project results in a publicly accessible manner.
- Consent to be featured on GFI's website, blog, and social media with a short description of your project goal(s).
- A brief written update to GFI about every 3 months to provide brief information regarding project progress, results, and any technical challenges that have arisen.
- A brief written summary outlining the project outcomes, potential next steps, and final expense report for how funds were utilized must be submitted within 30 days of the conclusion of the project. This summary should also include instructions for accessing data or obtaining research materials generated from the project.

Thank you for your interest in the GFI Research Program. Please email any questions related to the Program or this RFP to research_grants@gfi.org. Additional program information can be found at gfi.org/researchgrants.