GFI research grant program white space collaborations

September 2021

REQUEST FOR PROPOSALS (RFP)

Applications due: **November 1, 2021**

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 the Research Grant 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. More information about the specific ASAP solutions that are priority areas for this RFP can be found in the funding opportunity priority areas section of this document.

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

For additional information on GFI's research funding and grant recipients, please visit: 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 areas

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 one of the two following white space opportunities. Proposals that do not address one of the following two opportunities 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.

White space funding priority #1: generating cell lines for cultivated meat research

Production platform: cultivated meat
Technology sector: cell line development
For more information: cell line repositories

Current challenge
Isolating cells is a primary initial R&D challenge for many cultivated meat companies. Procuring existing cell lines or establishing new lines also presents a barrier to entry for academic researchers wishing to contribute to advances in cultivated meat. As a result, both public and

private research efforts are slowed by lack of access to cell lines, and a great deal of duplicated effort is expended to isolate new cell lines that end up not being widely used. Furthermore, the lack of widely accessible cell lines hampers reproducibility and benchmarking of experiments across different research groups.

Proposed solution
Because of the increased interest in cultivated meat research on mammalian species (such as cow and pig) and easier access to source material, cell lines and isolation protocols for these species are more readily available than for avian and aquatic species. Thus, for this RFP we are accepting proposals to generate one or more of the following avian and aquatic species cell lines:

- Chicken - induced pluripotent stem cells (iPSCs), embryonic stem cells (ESCs), or adult stem cells
- Turkey - iPSCs, ESCs, or adult stem cells
- Duck - iPSCs, ESCs, or adult stem cells
- Goose - iPSCs, ESCs, or adult stem cells
- Crab - iPSCs or adult stem cells
- Lobster - iPSCs or adult stem cells
- Tuna (bluefin, bigeye, or yellowfin preferred to skipjack - see note below) - iPSCs or adult stem cells
- Billfish (including marlin and swordfish) - iPSCs or adult stem cells
- Orange roughy - iPSCs or adult stem cells
- Grouper - iPSCs or adult stem cells
- Sea cucumber - iPSCs or adult stem cells
- Sole - iPSCs or adult stem cells
- Flatfish - iPSCs or adult stem cells

Some of these categories represent a colloquial grouping of a variety of species, and you are encouraged to consider both the value of a specific species from a food perspective as well as its conservation status (e.g. according to the IUCN red list) when selecting a specific species to work with.

We encourage proposals that generate bonafide immortalized cell lines from the following starting adult stem cell types: mesenchymal stem cells, myoblasts, fibroadipogenic progenitors, fibroblasts, and adipose progenitor cells. Spontaneous or forced immortalization protocols will be considered.

Additionally, we will consider proposals that generate engineered versions of cell lines wherein the engineering permits seamless differentiation to skeletal muscle or white adipose lineages or the engineering results in a stable cell line that can be used for a broad set of R&D purposes. Strategies may include stable or inducible overexpression of target genes (e.g., Pax7, MyoD), stable lines outfitted with relevant CRISPR, CRISPR-based activation or inhibition machinery, or other gene editing machinery, or other stable cell lines that could have broad utility for R&D purposes.

We will not accept proposals that include antibiotic-inducible systems or stable cell line generation that relies on antibiotic resistance genes.

Successful proposals will include a plan for broadly sharing the protocol(s) used to generate the cell line(s), outline the cell culture media used and any strategies employed to reduce the use of animal serum or other animal ingredients, and explain how the cell line(s) and any plasmids or reagents used to generate them will be shared broadly within academia and potentially also licensed to companies. Please note that the Kerafast cultivated meat repository established in partnership with GFI is available as an option to manage license agreements, maintenance, and shipping of cell lines.

For cell lines that are intended for commercial use (non-exclusively) in addition to research purposes, it is important to consider the additional documentation and experimental steps necessary for submission of regulatory paperwork, such as documentation of parental cell lines. While the exact documentation needed for regulatory approval is still unclear, and may differ between jurisdictions, keeping thorough documentation may increase the chances of a cell line's applicability in a commercial context. We encourage you to include in your proposal details of how the origins of the cell line and any manipulations performed will be documented. GFI will be happy to provide guidance to the funded research team(s) as new information regarding documentation required for regulatory approval becomes available.

For any researcher interested in proposing the creation of a different species or cell type in response to this RFP, please first reach out to GFI's research grant team at research_grants@gfi.org to explain your reasoning.

White space funding priority #2: producing plant-based or fermented fats for use in plant-based meat

Production platforms: plant-based meat; fermentation
Technology sectors: ingredient optimization; end product formulation & manufacturing; target molecule selection
For more information:
-Fat and moisture encapsulation techniques for alternative protein applications
-Producing animal-like fats through microbial fermentation
-Fat production & encapsulation within oleaginous yeast
-Affordable animal-free omega-3 ingredients for alternative seafood and other alternative protein applications
-Novel methods for long-chain omega-3 fatty acid production
-Preventing oxidation of omega-3 fatty acids before and after addition to alternative seafood products

Current challenge
In animal meat, fats are essential for the juiciness, tenderness, and palatability of the product. Similarly, omega-3 fatty acids found in seafood contribute to its flavor and are a crucial feature of the product's health appeal. However, because plant-based formulations tend to be made in aqueous conditions, homogeneously incorporating hydrophobic fats into emulsion-based meats has been a challenge. A bottleneck to making marbled meats has been creating solid fat that is differentiated from protein and has a melting temperature gradient above room temperature. Furthermore, very few plant-based sources exist for many of the fat types that are most abundant in animal-sourced fats, such as saturated fats and polyunsaturated

omega-3 fatty acids. As demand for plant-based meat and seafood grows, new sources and production methods will be required to ensure sufficient supply of fats that can mimic the structure, flavor, and melt profile of fats found in animal meat.

Proposed solution
Fats made from plant-derived sources or by microbial fermentation that mimic key properties of animal fats—such as being solid at room temperature and exhibiting a gradient melt temperature—are extremely desirable ingredients for the plant-based meat industry. Novel manufacturing methods for producing fats—such as using microbial strains with engineered lipid synthesis pathways or structurally modifying readily available plant fats to endow them with functional properties similar to animal fats—will be required to meet anticipated future demand for fats with animal fat-like properties. Moreover, some animal fats are of particular interest from both a sensory and a nutritional perspective such as long-chain omega-3s typically found in fish. Optimizing animal-free omega-3 fatty acid sources and successfully incorporating them into alternative meat products is an active area of research and is especially important for alternative seafood products. Methods for preventing *in situ* oxidation of animal-free omega-3s in alternative seafood products will be critical for promoting health equivalence with fish-based sources, as well as for maintaining sensory appeal.

Successful proposals for this RFP will develop novel fats and/or fatty acids for use in alternative meat or seafood using plant sources, microbial fermentation, or *in vitro* enzymatic methods. Methods for fat encapsulation or other means of stably incorporating fat into alternative meat products and preventing their degradation will also be considered. Proposals creating animal fat through animal cell cultivation are beyond the scope of this RFP since several startup companies are already tackling this approach. Strong justification for scalable and sustainable sourcing and/or production, reasonable cost at scale, and consideration of both techno-functionality and nutrition are desired.

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 grant

To apply for funding for a white space collaboration grant, 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: GFI-WhiteSpaceCollaborations-LoS-PIFamilyName-Date(mm/yyyy).pdf

Applications are accepted until the **November 1, 2021** 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 one of the research challenges or opportunities specified in this RFP.

- **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 Grant 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.