

UCR

Funding Opportunities for Microbiome Science

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- Microbiome Interagency Working Group (MIWG), an interagency working group within the National Science and Technology Council
 - Understand microbiome function and how to manipulate those functions in eight target areas: agriculture, aquatic, human, laboratory, built environment, terrestrial (non-agricultural), energy (non-agricultural), atmospheric
 - Develop technologies, strategies, and standards to maximize our ability to understand microbiomes and maximize the utility of generated data
 - Expand skillsets of the microbiome workforce by training researchers in bioinformatics, programming, data analytics, computational modeling

- **Mechanistic Probiotic/Prebiotic and Human Microbiome Research – R01**
Expires Sept. 2021
 - Oral cavity, dental diseases (NIDCR)
 - Cancer prevention, development, treatment (NCI)
 - Skin microbiome at homeostasis or during skin therapy (NIAMS)
 - Drugs of abuse w/ concurrent infections (HIV or HCV) or liver disease (NIDA)
 - RFP: <https://grants.nih.gov/grants/guide/pa-files/PA-18-876.html>

- **Translational and Clinical Probiotic/Prebiotic and Human Microbiome Research – R01**
Expires Sept. 2021
 - Safety and efficacy studies of functional benefits and mechanism of action of probiotic/prebiotic components and/or their combinations (NCI, NCCIH, ODS)
 - RFP: <https://grants.nih.gov/grants/guide/pa-files/PA-18-902.html>

- **Role in Pathobiology of Heart, Lung, Blood, and Sleep Diseases – R01**
Expires Sept. 2021
 - Gut, lung, and/or oral cavity may affect organ/mucosal sites through microbial translocation (NHLBI)
 - RFP: <https://grants.nih.gov/grants/guide/pa-files/PA-18-784.html>

- **Gut Microbiology for Warfighting Resilience Program**

Due September 28, 2018

- Host-intestinal microbial interactions (gut microbiota) in response to stressors during training or deployment. Gut microbiota role in mediating physiological, psychological, and possible cognitive effects from stressors due to the gut-brain axis.
- RFP: <https://www.onr.navy.mil/en/Science-Technology/Departments/Code-34/All-Programs/warfighter-protection-applications-342/Gut-Microbiology>

➤ **Division of Environmental Biology (DEB) Core Programs**

No deadline, \$100 M for FY19, 120 awards

- Overview: evolutionary and ecological processes at level of populations, species, communities, and ecosystems
- e.g., how do agricultural crops get their microbiomes? Vertical transmission vs. horizontal transmission affect microbiome establishment, adaptation, and function
- RFP: <https://www.nsf.gov/pubs/2018/nsf18587/nsf18587.pdf>

➤ **Division of Integrative Organismal Systems (IOS) Core Programs**

No deadline, \$60 M per FY, 250 awards

- Overview: why organisms are structured the way they are and function as they do
- e.g., microbiome influences on neuroendocrine regulation of social behavior of animals
- RFP: <https://www.nsf.gov/pubs/2018/nsf18586/nsf18586.pdf>

➤ **Division of Molecular and Cellular Biosciences (MCB) Core Programs**

No deadline, \$90 M per FY, 110 awards

- Overview: subcellular and cellular processes using theory and technologies from life and physical sciences, math, computational sciences, and engineering
- e.g., use of empirical and computational networks to predict microbiome community structures that result in parasite resistance
- RFP: <https://www.nsf.gov/pubs/2018/nsf18585/nsf18585.pdf>

➤ **Dimensions of Biodiversity (DEB)**

FY19 RFP is anticipated

- Overview: multiple dimensions of biodiversity addressed simultaneously, to understand ecological and evolutionary processes that drive biodiversity
- e.g., how do native pests maintain tree biodiversity in forests
- RFP: <https://www.nsf.gov/pubs/2018/nsf18512/nsf18512.pdf>

➤ **Plant Genome Research Program (IOS)**

No deadline, \$20 M for FY19, 10-15 awards

- Overview: how plant genomes, and their interactions with other genomes and with the environment, give rise to phenotype
- e.g., interaction among tree genetics, soil type, and bacterial strains affect tree growth
- RFP: <https://nsf.gov/pubs/2018/nsf18579/nsf18579.pdf>

➤ **NSF-NIFA Plant Biotic Interactions Program (IOS)**

No deadline, \$18.5 M for FY19, 25-30 awards per FY

- Overview: processes mediating interactions b/w plants and plant-associated organisms
- e.g., colonization mechanisms and functions of bacteria in root microbiomes
- RFP: <https://www.nsf.gov/pubs/2018/nsf18590/nsf18590.pdf>

- **Computational and Data-Enabled Science and Engineering in Mathematical and Statistical Sciences (CDS&E-MSS)**
Due September 16, 2019
Total funding not specified
 - Overview: Mathematical and statistical methods to address computational or big-data challenges. PI or co-PI must be from math or statistics
 - e.g., new mathematical framework that uses the big data approach of compressive sensing to perform microorganismal community profiling (determine identity and abundance of microbial organisms in an environmental sample through their sequenced DNA)
 - RFP: https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504687

- **DMS/NIGMS Initiative to Support Research at the Interface of the Biological and Mathematical Sciences**
Due October 18, 2018; September 18, 2019
\$5 M per FY, 12 to 20 awards
 - Overview: Mathematical, computational, or statistical models needed to solve problems in biological and biomedical sciences
 - e.g., computational methods for studying human microbiome at the strain level
 - RFP: <https://www.nsf.gov/pubs/2018/nsf18566/nsf18566.pdf>

➤ **AFRI Foundational and Applied Science**

Deadlines vary between July – Oct. 2018

➤ **Plant Health and Production and Plant Products (\$43.9 M)**

- Agricultural Microbiomes in Plant Systems and Natural Resources. Max. \$750K
Characterize agricultural microbiomes to reduce use of chemicals, optimize nutrient utilization. Low-cost sequencing and “omics” technologies to study and manipulate microbiome function
- Pests and Beneficial Species in Agricultural Production Systems. Max. \$500K per project
Interactions of plant pests or beneficial species with other pests, beneficial species, climate variability, pesticides, toxins

➤ **Bioenergy, Natural Resources, and Environment (\$21.7 M)**

- Sustainable Agroecosystems: Functions, Processes, and Management. Max. \$500K
Improve soil health (microbiome, water, nutrients, carbon, chemicals of environmental concern), or ecosystem services (management practices)

➤ **Food Safety, Nutrition, and Health (\$26.2 M)**

- Microbial, chemical, and physical safety and quality of foods. Max. \$500K

➤ RFP: <https://nifa.usda.gov/sites/default/files/rfa/FY2018-AFRI-Foundational-RFA-20180723.pdf>

➤ **AFRI Sustainable Agricultural Systems**

LOI due June 27, 2018. Invited proposal due Oct. 10, 2018.

\$80 M for FY18, \$10 M per award

- Address one or more of five goals defined in RFP. One goal is to improve water and nitrogen and phosphorus nutrient use efficiency by 50 percent, e.g., manipulate microbiomes
- RFP: <https://nifa.usda.gov/sites/default/files/rfa/FY-2018-AFRI-SAS.pdf>

- **Systems Biology Enabled Research on the Roles of Microbial Communities in Carbon Cycle Processes**
 - Systems biology studies on regulatory and metabolic networks of microbes, microbial consortia, and microbe-plant interactions involved in biogeochemical cycling of carbon
 - -omics approaches to investigate microbial community functional processes involved in carbon cycling in terrestrial ecosystems
 - Past RFP from 2015:
https://science.energy.gov/~media/grants/pdf/foas/2016/SC_FOA_0001458.pdf

- Anticipate similar RFP in Fall 2018
~\$10M to 15M total, with individual awards up to \$1.25M

➤ **Research and Technology Development to Support Crew Health and Performance in Space Exploration Missions**

Appendix 1, Step-1 proposals due Sept. 5, 2018

Invited proposals due Nov. 30, 2018

- Effect of spaceflight on microbes associated with crew and environment. Risk of adverse health effects due to host-microorganism interactions (model commensal enteric pathogens, opportunistic pathogens, obligate pathogens)

- Website:

<https://humanresearchroadmap.nasa.gov/risks/risk.aspx?i=80>

- **The Global Grants for Gut Health**

Due Nov. 30, 2018

3 awards, \$100K per award, 1 year

- Impact of gut microbiota on human health

- structure, function and diversity of the human microbiome

- gut-associated immune system and the microbiota's immunomodulatory capacity

- role of the gut microbiota in inflammatory and metabolic diseases

- role of the microbiota in the gut–brain axis

- Modulation of the gut microbiota, for example through diet, prebiotics, probiotics, transplantation of fecal microbiota or selected species and communities, and modulators of the microbiota composition.

- Website: <https://www.guthealth-grants.com/>

Thank you for your attention!