**Grant Opportunity Alerts: Issue: ORD-GOA-2015-09**

**In This Issue:**

**Events:**

**Event:** Innovation Day
**When:** March 25, 2015; 9.00 AM to 12.00 Noon
**Where:** Ballroom A and B, Campus Student Center
**Brief Description:** 40 Undergraduate Research and Innovation projects will be featured with the winners and finalists from several programs and competitions including TechQuest Innovation, McNair Scholars, Capital One-Bank Innovation Challenge, Newark Innovation Acceleration Challenge, Global Gaming, and URI Student Seed Awards programs. Dr. Ed Bishop, Associate Director of Analytical Development, Celgene Corporation, a pharmaceutical and biotechnology company will present the Keynote talk, **Innovation - the Lifeblood of Pharmaceutical Industry** at 10.00 AM.

**Event:** Murray Center's 20th Anniversary Conference: " Women Designing the Future "
**When:** March 27, 2015; 9.00 AM to 4.30 PM
**Where:** Ballroom A, Campus Student Center
**Brief Description:** Several presentations and workshops will be presented. Keynote presentation will be delivered by Ms. Leecia Eve, Vice President for State Government Affairs for the Tri-State Region at Verizon Communications Inc. at 10.00 AM. Ms. Danielle Feinberg, Director of Photography for Lighting at Pixar Animation Studios is the Featured Speaker at lunch. For more information and registration, please visit
https://eventbrite.com/event/15543752783/

**Grant Opportunities Alerts:**
Keywords and Areas Included in Funding Opportunities Alerts**:**
**NSF:** Faculty Early Career Development (CAREER) program**; Presidential Early Career Awards for Scientists and Engineers (PECASE),** Software Infrastructure for Sustained Innovation - S2I2, Structural and Architectural Engineering, Solar Terrestrial, Decision, Risk and Management Sciences, Dynamic Control and Systems Diagnostics,
**National Institute of Health**: Summer Institute for Research Education in Biostatistics (R25), Advancing Mechanistic Probiotic/Prebiotic and Human Microbiome Research (R01)
**NASA:** Early Career Fellowship Awards, Earth Science Model Analysis, ROSES 2015

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**National Science Foundation**

**Grant Program: Faculty Early Career Development Program (CAREER)**
**Includes the description of NSF Presidential Early Career Awards for Scientists and Engineers (PECASE)**
**Agency: National Science Foundation NSF 15-555**
Directorate for Biological Sciences
Directorate for Computer & Information Science & Engineering

Directorate for Education & Human Resources
Directorate for Engineering
Directorate for Geosciences
Directorate for Mathematical & Physical Sciences
Directorate for Social, Behavioral & Economic Sciences
Office of International and Integrative Activities

**RFP Website**: http://www.nsf.gov/pubs/2015/nsf15555/nsf15555.htm

**Brief Description:**

*CAREER*: The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations. Such activities should build a firm foundation for a lifetime of leadership in integrating education and research. NSF encourages submission of CAREER proposals from junior faculty members at all CAREER-eligible organizations and especially encourages women, members of underrepresented minority groups, and persons with disabilities to apply.

*PECASE*: Each year NSF selects nominees for the Presidential Early Career Awards for Scientists and Engineers (PECASE) from among the most meritorious recent CAREER awardees. Selection for this award is based on two important criteria: 1) innovative research at the frontiers of science and technology that is relevant to the mission of NSF, and 2) community service demonstrated through scientific leadership, education or community outreach. These awards foster innovative developments in science and technology, increase awareness of careers in science and engineering, give recognition to the scientific missions of the participating agencies, enhance connections between fundamental research and national goals, and highlight the importance of science and technology for the Nation's future. Individuals cannot apply for PECASE. These awards are initiated by the participating federal agencies. At NSF, up to twenty nominees for this award are selected each year from among the PECASE-eligible CAREER awardees who are most likely to become the leaders of academic research and education in the twenty-first century. The White House Office of Science and Technology Policy makes the final selection and announcement of the awardees.

**Awards:** Total funding available: $222,000,000

The minimum CAREER award, including indirect costs, will total $400,000 for the 5-year duration with the following exceptions: proposers to the Directorate for Biological Sciences (BIO), the Directorate for Engineering (ENG), or the Division of Polar Programs (PLR) must submit budget requests for a minimum of $500,000 for the 5-year duration. The PECASE award is an honorary award for all NSF recipients and does not provide additional funds. CAREER awards are eligible for supplemental funding as described in the NSF Award & Administration Guide (AAG), Chapter I.E.4.

**Letter of Intent:** Not Required

**Cost Sharing Requirements:** Inclusion of voluntary committed cost sharing is prohibited.

**Deadlines:**

July 21, 2015:BIO, CISE, EHR
July 22, 2015: ENG
July 23, 2015: GEO, MPS, SBE

**Grant Program: Structural and Architectural Engineering**
**Agency: National Science Foundation PD-15-1637**
**RFP Website**: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13358
**Brief Description:** The overall goal of the Structural and Architectural Engineering (SAE) program is to evolve sustainable structures, such as buildings, that can be continuously occupied and /or operational during the structure's useful life. The SAE program supports fundamental research for advancing knowledge and innovation in structural and architectural engineering that enables holistic approach to design, construction, operation, maintenance, retrofit, repair and end-of-life disposal of structures. For buildings, holistic approach incorporates the foundation-structure-envelope-nonstructural system, as well as the façade and roofing. Research topics of interest for sustainable structures include the following: strategies for structures that over their lifecycle are cost-effective, make efficient use of resources and energy, and incorporate sustainable structural and architectural materials; deterioration due to fatigue and corrosion; serviceability concerns due to large deflections and vibrations; and advances in physics-based computational modeling and simulation. Research is encouraged that integrates discoveries from other science and engineering fields, such as materials science, building science, mechanics of materials, dynamic systems and control, reliability, risk analysis, architecture, economics and human factors. The program also supports research in sustainable and holistic foundation-structure-envelope-nonstructural systems and materials as described in the following reports:
• National Science and Technology Council, High Performance Buildings; Final Report: Federal R & D Agenda for Net Zero Energy, High-Performance Green Buildings. Building Technology Research and Development (BTRD) Subcommittee, OSTP, U.S. Government, September 2008. http://www.whitehouse.gov/files/documents/ostp/NSTC%20Reports/Federal%20RD%20Agenda%20for%20Net%20Zero%20Energy%20High%20Performance%20Green%20Buildings%20Oct2008.pdf
• Ochsendorf, John, Challenges and Opportunities for Low-Carbon Buildings, The Bridge; National Academy of Engineering, Vol. 42, No. 1; Spring 2012
http://www.nae.edu/Publications/Bridge/57865/58544.aspx
Structural health monitoring that focuses on decision-making systems for civil structures is of interest; however, research for new sensor technologies and data collection should be submitted to other programs. Proposals that focus on the performance and mitigation of structures subjected to natural hazards, such as earthquakes, windstorms (tornadoes and hurricanes), tsunamis, and landslides, should be submitted to the Engineering for Natural Hazards Program. Research addressing blast loads and fire effects on building systems, and computational modeling and simulation supported by the multi-Directorate Computational and Data-Enabled Science and Engineering, program are not supported by SAE.
**Awards:** Standard Grants.
**Letter of Intent:** Not Required
**Deadlines:** September 15, 2015

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**Grant Program: Software Infrastructure for Sustained Innovation - S2I2**
**Agency: National Science Foundation NSF 15-553**
**RFP Website**: http://www.nsf.gov/pubs/2015/nsf15553/nsf15553.htm
**Brief Description:** Software Infrastructure for Sustained Innovation ($SI^2$) is a long-term investment focused on realizing a portion of the Cyberinfrastructure Framework for 21st

Century Science and Engineering (CIF21, http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504730) vision and catalyzing new thinking, paradigms and practices in science and engineering. CIF21 envisions a linked cyberinfrastructure architecture that integrates large-scale computing, high-speed networks, massive data archives, instruments and major facilities, observatories, experiments, and embedded sensors and actuators, across the nation and the world, and that enables research at unprecedented scales, complexity, resolution, and accuracy by integrating computation, data, and experiments in novel ways.

Software is a primary modality through which CIF21 innovation and discovery will be realized. It permeates all aspects and layers of cyberinfrastructure (from application codes and frameworks, programming systems, libraries and system software, to middleware, operating systems, networking and the low-level drivers). The CIF21 software infrastructure must address the complexity of this cyberinfrastructure, accommodating: disruptive hardware trends; ever-increasing data volumes; data integrity, privacy, and confidentiality; security; complex application structures and behaviors; and emerging concerns such as fault-tolerance and energy efficiency. The programs must focus on building robust, reliable and sustainable software that will support and advance sustained scientific innovation and discovery.

The Division of Advanced Cyberinfrastructure in the Computer & Information Science & Engineering Directorate (CISE/ACI) is partnering with Directorates and Offices across the NSF to support $SI^2$, a long-term comprehensive program focused on realizing a sustained software infrastructure that is an integral part of CIF21. The goal of this program is to catalyze and nurture the interdisciplinary processes required to support the entire software lifecycle, resulting in sustainable community software elements and reusable components at all levels of the software stack. The program addresses software in all aspects of cyberinfrastructure, from embedded sensor systems and instruments, to desktops and high-end data and computing systems, to major instruments and facilities.

The goal of the overall $SI^2$ program is to create a software ecosystem that scales from individual or small groups of software innovators to large hubs of software excellence. It is envisioned that the $SI^2$ program will collectively support vibrant partnerships between academia, government laboratories and industry, including international entities, for the development and stewardship of a sustainable software infrastructure that can enhance productivity and accelerate innovation in science and engineering.

The $SI^2$ program includes three classes of awards:

1. **Scientific Software Elements (SSE):** SSE awards target small groups that will create and deploy robust software elements for which there is a demonstrated need that will advance one or more significant areas of science and engineering.
2. **Scientific Software Integration (SSI):**SSI awards target larger, interdisciplinary teams organized around the development and application of common software infrastructure aimed at solving common research problems faced by NSF researchers in one or more areas of science and engineering. SSI awards will result in a sustainable community software framework serving a diverse community or communities.
3. **Scientific Software Innovation Institutes ($S^2I^2$):** $S^2I^2$s are an integral part of the $SI^2$ software ecosystems and focus on the establishment of long-term hubs of excellence in software infrastructure and technologies, which will serve a research community of substantial size and disciplinary breadth. The outcomes of $S^2I^2$ go beyond the software itself, including the software development infrastructure and process, successfully responding to science challenges, and enabling transformative new science. These institutes will provide expertise, processes and architectures, resources and implementation mechanisms to

transform computational science and engineering innovations and community software into robust and sustained software infrastructure for enabling science and engineering, which in turn will transform research practices and productivity. $S^2I^2$ proposals will bring together multidisciplinary teams of domain scientists and engineers, computer scientists and software engineers, technologists and educators.

***Implementation Proposals:***

**Implementation proposals may only be submitted in the specific topic(s) listed in this solicitation, which define particular areas in which NSF sees a need for an institute as evidenced by prior community activity, for example, an institute conceptualization award, a Research Coordination Network (RCN) award, etc., and has reserved budget resources from the directorates and divisions that would be impacted by such an institute.**

***Conceptualization Proposals:***

Successful conceptualization proposals must reflect the quality, commitment, and planning that will be needed to lead to full Implementation awards.

Specific NSF unit interests follow, though these are not meant to limit potential proposals:

- The CISE Division of Advanced Cyberinfrastructure is particularly interested in proposals that address the set of broad issues related to general $SI^2$ software, including sustainability, software lifecycle/ecosystem, governance, verification & validation, reproducibility, etc.
- The Biological Sciences Directorate is particularly interested in proposals that focus on high priority research problems and that will significantly leverage existing investments in ways that transform the infrastructure in support of BIO and BIO-related research. For further information about BIO's interests in $S^2I^2$ see the Dear Colleague Letter of November 22, 2011 (NSF-12-019).
- The Engineering Directorate is not participating in the conceptualization portion of this solicitation.
- The MPS/Astronomy Division will consider supporting proposals that would have a clearly demonstrated impact on a significant portion of the astronomy research community.
- The MPS/Materials Research Division is particularly interested in proposals that advance priorities in the Materials Genome Initiative.
- The MPS/Division of Mathematical Sciences is particularly interested in proposals that include the creation, development, and application of new mathematical and statistical theories and tools.

The MPS/Physics Division will consider proposals that will significantly advance fundamental research in Physics.

**Awards:** Standard Awards; $13.5 Million available

**Limit on Number of Proposals per Organization:** 3

**Letter of Intent:** Not Required

**Deadline: Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time): June 03, 2015 Implementation Proposals

**Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time)**:** Proposals Accepted Anytime Conceptualization Proposals

**Grant Program: Solar Terrestrial**
**Agency: National Science Foundation PD-98-1523**
**RFP Website**: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12741
**Brief Description:** Supports research on the processes by which energy in diverse forms is generated by the Sun, transported to the Earth, and ultimately deposited in the terrestrial environment. Major topics include space weather impacts, helioseismology, the solar dynamo, the solar activity cycle, magnetic flux emergence, solar flares and eruptive activity, coronal mass ejections, solar wind heating, solar energetic particles, interactions with cosmic rays, and solar wind/magnetosphere boundary problems.
**Awards:** Standard Grants
**Letter of Intent:** Not Required
**Full Proposal Deadline:** Accepted anytime. There are no deadlines or target dates for proposals sent in to any of the UARS base programs. However, we recommend that PIs try to send in proposals early in the fiscal year.

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**Grant Program: Decision, Risk and Management Sciences**
**Agency: National Science Foundation PD-98-1321**
**RFP Website**: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5423
**Brief Description:** The Decision, Risk and Management Sciences program supports scientific research directed at increasing the understanding and effectiveness of decision making by individuals, groups, organizations, and society. Disciplinary and interdisciplinary research, doctoral dissertation research improvement grants (ddrigs), and workshops are funded in the areas of judgment and decision making; decision analysis and decision aids; risk analysis, perception, and communication; societal and public policy decision making; management science and organizational design. The program also supports small grants that are time-critical (Rapid Response Research - RAPID) and small grants that are high-risk and of a potentially transformative nature (EArly-Concept Grants for Exploratory Research - EAGER). For detailed information concerning these two types of grants, please review Chapter II.D of the NSF Grant Proposal Guide.
Funded research must be grounded in theory and generalizable. Purely algorithmic management science proposals should be submitted to the Operations Research Program rather than to DRMS.
General Guidance concerning the DRMS Doctoral Dissertation Research Improvement Grants (DDRIGs) funding opportunity includes the following:

- To assure that the proposal is appropriate for DRMS, the advisor of the doctoral student is strongly encouraged to contact one of the DRMS Program Directors by e-mail prior to the preparation of the DDRIG proposal.
- DRMS DDRIG awards have a recommended maximum duration of 12 months.
- The proposal title should start with “Doctoral Dissertation Research in DRMS:”.
- On the FastLane Cover Sheet, the advisor should be listed as the Principal Investigator (PI) and the doctoral dissertation student as the Co-PI.
- DDRIG awards are designed to cover expenses such as travel, special equipment, and participation fees.
- DRMS does not provide general stipends or cost-of-living support for DDRIG awards.
- Your DDRIG proposal's project desciption should be essentially a research design (statement of the research problem, literature review, hypotheses, research site, data to be collected, methods of analysis, and schedule).

- The review process for DDRIG proposals may involve only mail reviews, or it may include both mail reviews and assessment by the DRMS advisory panel.

Outstanding DDRIG proposals specify how the knowledge to be created advances our theoretical understanding of the subject.
**Awards:** Standard Grants
**Letter of Intent:** Not Required
**Full Proposal Deadline:** August 18, 2015

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**Grant Program: Dynamics, Control and Systems Diagnostics (DCSD)**
**Agency: National Science Foundation PD-15-7569**
**RFP Website**:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505182&org=NSF&sel_org=NSF&from=fund
**Brief Description:** The Dynamics, Control and Systems Diagnostics (DCSD) program supports fundamental research on the analysis, measurement, monitoring and control of dynamic systems, including development of new analytical, computational and experimental tools, and novel applications to engineered and natural systems. Dynamics is the science of systems that change in time. Control concerns the use of external influences to produce desired dynamic behaviors. Systems diagnostics concerns the use of observation to infer information about a dynamic system. Objectives of the DCSD program are the discovery of new phenomena and the investigation of innovative methods and applications in dynamics, control and diagnostics. The intellectual merit of proposals submitted to the DCSD program will be evaluated on the basis of fundamental innovation in foundational areas, on alignment with the core disciplines of the CMMI Division, and on potential for transformative impact within and across disciplinary boundaries.
Research topics of current interest include, but are not limited to, complex dynamical and structural systems; fundamental studies on stability, phase transitions, and wave propagation in complex and non-local media; integrity monitoring, reliability and safety of complex or stochastic engineered systems; unconventional applications of control; control and diagnostics of complex, distributed, interconnected and/or constrained systems; and control concepts inspired by nature.
**Awards:** Standard Grants
**Letter of Intent:** Not Required
**Full Proposal Deadline:** September 15, 2015

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**National Institutes of Health**

**Grant Program: Summer Institute for Research Education in Biostatistics (R25)**
**Agency: National Institutes of Health RFA-HL-16-017**
**RFP Website**: http://grants.nih.gov/grants/guide/rfa-files/RFA-HL-16-017.html
**Brief Description:** The objective of this FOA is to support awards to teach summer courses in biomedical statistics for advanced undergraduates and beginning graduate students in order to encourage them to pursue careers in biostatistics. It is not intended to provide an in-depth basic course in the subject, nor is it intended to be a standard introductory course in statistics. It would, instead, comprise an innovative introduction to some basics of probability

and elementary statistical methods motivated by a series of examples illustrating the use of probability and statistical reasoning applied to the design and analysis of data from studies including those of the heart, lung, blood, and sleep disorders. There is a wealth of data from observational cohort studies and numerous clinical trials (http://biolincc.nhlbi.nih.gov/home/) that can be used to demonstrate the essential role biostatistics plays in medical research. An essential aspect of the course will be the training in problem solving and hands-on experience through a research project with analysis of real data. Students get exposure to how biostatistics is being used in ongoing medical research and how biostatisticians can effectively work in a multi-disciplinary research setting and how to communicate with other researchers. Instruction of basic programming languages, such as R or S-plus, would comprise part of the early classroom instruction. The curriculum will include an introduction to biomedical big data. Applicants are encouraged to be as creative as possible, including utilization of web platforms and social media, to achieve the primary goal of attracting the interest of potential biostatistics students. Depending on the level and interest of the students, the following are examples of the concepts to be covered and the approach to be used in their assignments.

- Descriptive statistics (measures of central tendency and dispersion, histograms, box plots) are formally presented followed by a PC-based demonstration using real data. Student assignments would repeat these calculations on individually chosen samples from real data sets.
- Students learn to draw random samples from data sets and compute measures of central tendency and sample proportions. With this skill they explore the nature of the distributions of these quantities in the context of repeated sampling from a large data set. This sets the stage for introducing the normal, Student's t, and binomial probability distributions.
- Using an epidemiology cohort study data set, possibly from one of those funded by NHLBI, instructors demonstrate the concept of adjusted (for age, race, gender, etc.) rates of disease incidence and mortality. Students learn how to compute and compare these rates in different subsets of the cohort.
- A classroom exposition of some of the details underlying the results of an actual epidemiologic cohort study reported in the media.
- The principles underlying the randomized clinical trial are introduced using data from one of the clinical trials related to disorders of the heart, lung, blood, or sleep. Students learn some of the subtleties of the conduct and interpretation of data using, for example, the Cardiac Arrhythmia Suppression Trial as a case study.
- A review of several published studies where flawed analyses have produced misleading results.
- Guest lectures by one or more investigators who have recently completed studies that have attracted media attention.
- An illustration of the problems of multiple hypothesis testing that arise in genome-wide association studies.
- An illustration of how computing aids interpretation of very complex data.

The course will take a creative approach to engaging students' interest, perhaps through data associated with topics pertaining to their own particular interest. They should be expected to spend time outside of class on individual assignments involving research education projects that address questions related to selected data sets. The courses and research experiences should be augmented by mentoring activities to provide advice, insight, and professional career skills to participants in order to encourage them to pursue biostatistics related careers. Assuming a summer schedule of classes with perhaps four hours of class and laboratory each

day over a five-to-seven week period, the course may reasonably qualify as a one-year credit course in basic statistics that many undergraduate curricula require.
Research education programs may complement ongoing research training and education occurring at the applicant institution, but the proposed educational experiences must be distinct from those training and education programs currently receiving Federal support. R25 programs may augment institutional research training programs (e.g., T32, T90) but cannot be used to replace or circumvent Ruth L. Kirschstein National Research Service Award (NRSA) programs.
**Awards:** The total institutional direct costs may not exceed $235,000 each year. The costs should reflect the actual needs of the proposed project.
**Letter of Intent:** May 1, 2015
**Full Proposal Deadline:** June 1, 2015, by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on this date.
Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

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**Grant Program: Advancing Mechanistic Probiotic/Prebiotic and Human Microbiome Research (R01)**
**Agency: NIH PA-15-135**
National Institute of Dental and Craniofacial Research (NIDCR)
National Cancer Institute (NCI)
*Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD)
National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)
National Institute on Drug Abuse (NIDA)
National Institute of General Medical Sciences (NIGMS)
National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
National Center for Complementary and Integrative Health (NCCIH)
Office of Dietary Supplements (ODS)
**RFP Website**: http://grants.nih.gov/grants/guide/pa-files/PA-15-135.html
**Brief Description:** ***Probiotics*** are defined as "*live microorganisms which, when administered in adequate amounts confer a health benefit on the host*". This definition is sufficiently inclusive of a broad range of microbes and applications, and captures the essence of probiotics (microbial; viable; and beneficial to health).
***Prebiotics*** are considered as "*non-viable food component that confers a health benefit on the host associated with modulation of the microbiota".*
Despite the exponential growth in the marketing of prebiotic/probiotic products, fundamental knowledge gaps regarding their health benefits remain, including the understanding of their molecular mechanisms of action, long-term effects and their potential interactions with the host physiology. For example, in order to design therapeutic/preventive manipulations of the gut microbiota, it is critical to understand the evolutionary and ecologic interplay among the GI microbiota and host physiology. This FOA will support the generation of valid and reliable evidence to show that prebiotic/probiotics as singular or combination formulations can stimulate specific measurable and beneficial functions of the host microbiota. The study of biochemical and genomic expression pathways and host-microbial interactions among prebiotic compounds, probiotic strains and the host microbiota will provide a sound basis for

developing effective singular or combination pre/probiotic applications for enhancing or restoring functional health.

Many events can shape or alter microbial communities. For example, human/microbial co-evolution is uniquely selected for coupling structure-specific nutrient (prebiotic) substrates with (probiotic) strain-specific functions to promote growth of a 'healthy' microbiota in breast-fed infants. Diet may potentially serve as the primary modulator of mammalian microbiota for infant growth and development. However, competing selective pressures (e.g., from exposures to xenobiotics or broad-spectrum antibiotics) disturb the normal ecological balance of host-microbial interactions. Current knowledge of the molecular interface between pre/probiotic factors and host-specific interactions with resident microbes is limited. Therefore, omics-based and other novel approaches are needed for elucidating the functional effects of pre/probiotic singular or combination formulations and microbial metabolites on the host and for the study of the taxonomic composition of the microbiome. Well characterized probiotic strains (e.g.,selected lactobacillus; bifidobacterium) secrete a variety of signaling molecules that can modify inter-bacterial signaling (quorum sensing) and potentially suppress the expression of virulence genes and pathogenic-strain growth patterns. Thus, there is a need for identifying the functional roles of bacterially derived low molecular weight (LMW) bioactive molecules including bacteriocins and others that affect human health. The LMW microbial metabolites and signal molecules in human physiologic fluids may have diagnostic value or provide key information to design products with specific nutritional and medicinal effects. Because in vivo production of bioactive small molecules of human and microbial origin is often connected with prebiotic secondary metabolism, there is much interest in developing the rational basis for conducting mechanistic studies of specific pre/probiotic singular or combination formulations for nutritional and medical purposes for specific health functions in the host.

**A wide variety of concepts and technologies can guide research in this area to include:**

*Structure/function relationships within endogenous microbial populations* – Metagenomic reconstruction of community metabolism has shown that similar metabolic networks are common among individual strains suggesting functional redundancy within microbial consortia. Systems-level approaches can be utilized to determine microbial community function particularly at the metagenomic, and chemical and biological levels in diverse communities.

*Functional Omics-based Technologies and Biologic Signatures of Host-Microbial Interactions* – High dimensional methods including meta-omic approaches that provide qualitative and quantitative information on genes, transcripts, proteins and metabolites present in microbial communities at specific points in space and time. Such approaches will highlight the intricate cross-feeding and signaling pathways between the human and microbial ecosystems by deciphering differential gene expression profiles, microbial biotransformation pathways, host epigenetic patterns and protein functions for development and safety testing of pre/probiotics in the future.

*Modeling Microbial-Host Metabolite Interactions* – To better understand the complexity of interactions of pre/probiotics and/or their combinations in different host anatomical sites, host-microbial modeling will require further development and refinement to include:

*Basic Modeling* – Robust in vivo, in vitro and ex vivo models, used singly or in combination, which will allow high-throughput first-pass experiments aimed at proving cause-and-effect relationships prior to hypothesis testing in animal models.

*Animal Modeling* - Use of animal models (germ free, gnotobiotic or others such as CONV-R treated with antibiotics) to understand the causal relationship between microbiota and host interactions.

*Systems Biology Modeling* – In silico models in combination with in vitro, ex vivo and in vivo experimental data are promising approaches to predict metabolic interactions between gut microbes and their host in both diseased and healthy states.
**Awards:** Application budgets may not exceed $200,000 per year in direct costs and should reflect the actual needs of the proposed project. $2,500,000 available.
**Letter of Intent:** Not Required
**Full Proposal Deadline:** Standard dates apply, by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on these dates.
Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

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**NASA**

**Grant Program: Early Career Fellowship Awards**
**Agency: NASA NNH15ZDA001N-SSO**
**RFP Website**:
http://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=448086/solicitationId=%7B43B0244D-01BB-CBFC-5254-76902DF6A397%7D/viewSolicitationDocument=1/C.6%20SSO.pdf
**Brief Description:** Solar System Observations supports both ground- and space-based astronomical observations and suborbital investigations of our Solar System involving sounding rockets and balloons. Proposals are solicited for observations over the entire range of wavelengths, from the ultraviolet to radio, that contribute to the understanding of the nature and evolution of the Solar System and its individual constituents. Additionally, Solar System Observations supports NASA's commitment to discover and inventory potentially hazardous near Earth objects with sizes down to at least ~100 meters and to characterize that population through determination of their orbital elements. This program element will also consider proposals that characterize a representative sample of these objects by measuring their sizes, shapes, and compositions.
Early career researchers are encouraged to apply for the Early Career Fellowships (ECF) Program. The purpose of the ECF program (see C.16) is to support the development of individual research programs of outstanding scientists early in their careers and to stimulate research careers in the areas supported by the Planetary Sciences Division. This Program is based on the idea that supporting key individuals is a critical mechanism for achieving high impact science that will lead the field forward with new concepts, technologies, methods, and more. In the case of the NEOO Program, the ECF award is named for Dr Stephen J. Ostro, a pioneer in NEO observation research using planetary radar techniques.
Applicants requesting consideration for ECF may include an additional page to their Curriculum Vitae to provide information that can be used by reviewers to evaluate the Principal Investigator's (PI's) future research contributions and the potential for leadership within the scientific community. Please see C.16 of ROSES for more information on the two-step process for the ECF program and the criteria for evaluating candidates.
**Awards:** $200,000 per year for three years
**Letter of Intent:** March 20, 2015
**Full Proposal Deadline:** April 17, 2015

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**Grant Program: Research Opportunities in Space and Earth Sciences (ROSES) - 2015**
**Agency: NASA NNH15ZDA001N;**
**ROSES 2015: Modeling, Analysis, and Prediction NNH15ZDA001N-MAP**
**RFP Website**:
http://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=448116/solicitationId=%7B4FCC09A9-DFF6-4DF5-EC7A-3881AF72A6A3%7D/viewSolicitationDocument=1/Full%20ROSES%202015%20amend1.pdf

**Summary of Solicitations Under ROSES 2015:**
http://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=448109/solicitationId=%7B9F1341A9-6D0F-F075-C993-276263B186ED%7D/viewSolicitationDocument=1/ROSES%202015%20SoS.pdf

**Brief Description:** This National Aeronautics and Space Administration (NASA) Research Announcement (NRA), entitled Research Opportunities in Space and Earth Sciences (ROSES)–2015, solicits basic and applied research in support of NASA's Science Mission Directorate (SMD). ROSES is an omnibus with many individual program elements, each with its own due dates and topics and all together these cover all aspects of basic and applied supporting research and technology in space and Earth sciences, including, but not limited to: theory, modeling, and analysis of SMD science data; aircraft, scientific balloon, sounding rocket, International Space Station (ISS), CubeSat and suborbital reusable launch vehicle investigations; development of experiment techniques suitable for future SMD space missions; development of concepts for future SMD space missions; development of advanced technologies relevant to SMD missions; development of techniques for and the laboratory analysis of both extraterrestrial samples returned by spacecraft, as well as terrestrial samples that support or otherwise help verify observations from SMD Earth system science missions; determination of atomic and composition parameters needed to analyze space data, as well as returned samples from the Earth or space; Earth surface observations and field campaigns that support SMD science missions; development of integrated Earth system models; development of systems for applying Earth science research data to societal needs; and development of applied information systems applicable to SMD objectives and data.
**Awards:** Awards range from under $100K per year for focused, limited efforts (e.g., data analysis) to more than $1M per year for extensive activities (e.g., development of science experiment hardware).
**Letter of Intent:** March 27, 2015
**Deadline: Full Proposal Deadline(s)**: Full Proposal Due: May 29, 2015