Grant Opportunity Alerts: Issue: ORD-GOA-2015-10

In This Issue:

Event Reminders:

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:  
NASA: NASA STEM Fellowships; ROSES 2015 Advancing Collaborative Connections for Earth System Science  
NSF: Faculty Early Career Development (CAREER) program; Presidential Early Career Awards for Scientists and Engineers (PECASE)  
National Institute of Health: Exosomes in HIV Neuropathogenesis, Advancing Mechanistic Probiotic/Prebiotic and Human Microbiome Research (R01)

NASA Fellowships

Grant Program: NASA Office of Education (OE) MUREP Advanced STEM Training and Research (ASTAR) Fellowship  
Agency: NNH14ZHA001N-ASTAR  
RFP Website:  
**Brief Description:** NASA contributes to national efforts for achieving excellence in STEM education as discussed in the Education Opportunities in NASA STEM (EONS) solicitation. The future prosperity and well-being of our nation and its citizens depends on how well we educate our students today. Our future workforce needs demand that we have workers with advanced thinking, reasoning, and problem solving skills. The knowledge and STEM-related critical thinking demands on students are greater today than at any time in our nation’s history, as STEM skills are essential for the future economic success of the nation. NASA’s Office of Education’s mission is to advance high quality STEM education. Through this solicitation, NASA is strengthening involvement with higher education institutions to ensure that NASA can meet future workforce needs in STEM fields. Participation in NASA projects and research stimulates increasing numbers of students to continue their studies at all levels of the higher education continuum and earn advanced degrees in these critical fields.

NASA OE MUREP ASTAR Fellowships:

- Financially support and advance individuals early in their careers in NASA-related disciplines, who demonstrate the potential to contribute to NASA’s mission and future STEM workforce, through the use of innovative research ideas;
- Increase the number of historically underrepresented and underserved populations, such as women, minorities, persons with disabilities, and veterans, who are pursuing advanced degrees in STEM disciplines;
- Develop a highly trained quad of researchers and scientists whose skills and competencies directly contribute to the nation’s STEM workforce.

**Eligibility**

Be a U.S. citizen (permanent residents are not eligible) at the time of proposal submission. U.S. citizenship is required for participation in the mandatory CBRE. Hold a Bachelor’s degree in a STEM field earned prior to fall 2015. Be enrolled in a graduate degree program no later than fall 2015. Have a minimum 3.0 GPA on a 4.0 scale. Have a projected degree plan length of two years or more.

**Awards:**

- Student Stipend: $25,000 (Master's) / $30,000 (Doctoral)
- Tuition and Fees: $10,000
- CBRE Allowance: $8,000
- Health Insurance Allowance: $1,000
- University Faculty Research Advisor Allowance: $4,500
- Student Professional Development Allowance: $1,500

**Letter of Intent:** Not Required. A pre-proposal teleconference will be held on Thursday, March 31, 2015 at 4:00pm EST. The link for the session is [https://ac.arc.nasa.gov/nifs/](https://ac.arc.nasa.gov/nifs/). The teleconference technology is Adobe Connect. Please check the technology Adobe Connect Technical Specs before the teleconference at [https://helpx.adobe.com/adobe-connect.tech-specs.html](https://helpx.adobe.com/adobe-connect.tech-specs.html).

**Full Proposal Deadline:** All proposals must be submitted via NSPIRES in electronic format only. No mail-in materials will be accepted. Fellowship proposals must be submitted electronically by the Authorizing Official Representative (AOR) of the institution (see Step-by-Step Submission Instructions under “Other Documents” for more information) using the NSPIRES features according to the deadline listed in this appendix. Phase I proposals must be received by 11:59 p.m. Eastern Time on May 5, 2015. Proposals received after the deadline will not be accepted.
Grant Program: Advancing Collaborative Connections for Earth System Science  
Agency: NNH15ZDA001N-ACCESS  
ROSES 2015: Modeling, Analysis, and Prediction NNH15ZDA001N-MAP  
RFP Website:  
http://nspires.nasaprs.com/external/solicitations/summary.do?method=init&sollId={4477FA89-FA98-1CBC-3678-C7AB00B6E769}&path=init  
Summary of Solicitations Under ROSES 2015:  
http://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=448109/solicitationId=%7B4477FA89-FA98-1CBC-3678-C7AB00B6E769%7D/viewSolicitationDocument=1/ROSES%202015%20SoS.pdf  
Brief Description: ROSES-2015 is an omnibus NASA Research Announcement. It contains over 50 different proposal opportunities. In the "Announcement Documents" section above, the document 'Summary of Solicitation' describes the common requirements for all ROSES-2015 proposal opportunities; all proposers must satisfy the proposal requirements in the 'Summary of Solicitation'. The documents 'Table 2' contains the list of all proposal opportunities and their due dates. The document 'A.1 Earth Science Research Overview' describes research activities within the NASA science division that is managing the specific proposal opportunity on this page. The document 'A.36 Advancing Collaborative Connections for Earth System Science' describes the specific proposal opportunity on this page. All of these documents are kept up to date and incorporate amendments, clarifications, and corrections in a clearly identifiable manner.  
Table 2: ROSES 2015 List:  
http://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=442206/solicitationId=%7B4477FA89-FA98-1CBC-3678-C7AB00B6E769%7D/viewSolicitationDocument=1/Table%202%202015%20amend3.html  
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: April 3, 2015

Deadline: Full Proposal Deadline(s): Full Proposal Due: June 3, 2015

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


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

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**National Institutes of Health**

**Grant Program:** The Role of Exosomes in HIV Neuropathogenesis: R01 and R21

**Agency:** National Institutes of Health RFA- MH-16-100 RFA- MH-16-110


**Brief Description:** HIV-Associated Neurocognitive Disorders (HAND) remain prevalent despite the widespread use of potent anti-retroviral drug regimens. Low levels of viral replication and chronic inflammation continue to persist in the central nervous system (CNS) in well treated patients. There remain considerable gaps in our understanding of the pathophysiologic mechanisms driving HIV-1 associated neurocognitive decline in the setting of low level viral replication. The release of inflammatory mediators by macrophages/microglial cells and astrocytes contribute to the pathogenesis of HAND. The mechanisms by which HIV-related inflammation spreads within the CNS compartment is an area that requires further study. In particular there is a great need to define the communication pathways between macrophages, astrocytes and neuronal cells within the CNS in the setting of HIV-infection.

Exosomes have emerged as novel conduits for cell-cell communication and they have been shown to play a role in cancer biology and neurodegenerative diseases (Parkinson’s, Alzheimer’s disease and amyotrophic lateral sclerosis). Exosomes are small vesicles (30-100 nm) released from cells that carry RNA, protein or lipid to a distant cell with the potential to effect phenotypic changes within the recipient cell. The role of exosomes in cell-to-cell communication is an emerging area of biology that has been recognized as critical in understanding regulation of the innate and adaptive immune response, cancer cell biology, and neurological disorders.

In the context of HIV infection there is evidence that HIV-1 proteins regulate exosome release in vitro. For example, co-exposure of astrocytes to HIV-1 tat protein and morphine induces the release of exosomes that carry microRNA29. When applied to neurons, these exosomes carrying microRNA29 decrease neuronal viability. Another example are exosomes that are packaged and released with the trans-activation response element (TAR) microRNA. These exosomes have been found to be released from HIV-1 infected cells in culture and they have also been purified from human sera derived from HIV-infected individuals. When applied to cultured astrogliaoma cells, these exosomes carrying TAR microRNA increase the susceptibility of the cells to HIV-1 infection. While these studies suggest the impact of HIV infection on
exosome release and cargo content, this initiative encourages further research to examine whether normal exosome physiology is altered in the setting of HAND. Exosomal cargo may prove useful as clinical biomarkers for diagnosing HAND and also as CNS delivery vehicles for a therapeutic approach to HAND treatment. Exosomes are found in virtually all body fluids including blood, saliva, cerebrospinal fluid, breast milk and urine. Thus, diagnostic methods that use these fluids as sources of exosomes may be devised. In addition to body fluids, tissue sources of exosomes may also have biomarker potential where biopsies are possible. Exosomes have also been demonstrated to serve as delivery vehicles for treatment of inflammatory disorders. While the possibility of CNS-targeted delivery of exosomes has been described in the literature, further research on using this approach for treatment of HAND is needed.

**Purpose**
In summary, the goals of this FOA are to stimulate further research on defining the central role of exosomes in the neuropathogenesis of HAND and determining the potential use of exosomes as biomarkers for HAND or as delivery vehicles for CNS targeted therapeutics. Basic and translational research in domestic and international settings is of interest. Multidisciplinary research teams and collaborative alliances are encouraged but not required.

**Areas of Research Interest**
The research areas that are pertinent to this FOA include, but are not limited to:

- Assessing changes in the physiology of exosome release and cargo content from CNS-derived cells in the setting of HAND;
- Studying the impact of exosomes as novel conduits for cell-cell communication in the setting of HAND (For example, assessing the effect of exosomes derived from macrophages/astrocytes on neuronal apoptosis or neuroprotection);
- Studying the impact of HAART on the content, release and effect of exosomes derived from HIV-1 infected cells of the CNS;
- Studying the impact of exosome-mediated intercellular signaling on the development and maintenance of neural circuits in adult and pediatric populations in the setting of HIV-1 infection of the CNS;
- Assessing the potential role of exosomal cargo as biomarkers to serve as clinical diagnostics for HAND;
- Assessing the role of exosomes as delivery vehicles for CNS-targeted therapeutics;
- Studying the role of exosomes in cross talk between the periphery and CNS with particular focus on inflammatory mediators.

**Awards:** NIMH intends to commit an estimate of $2,000,000 in FY 2016 to fund 4-5 awards in response to this FOA and the companion R21 FOA. Future year amounts will depend on annual appropriations.

**Letter of Intent:** August 2, 2015

**Full Proposal Deadline:** September 2, 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.

**Grant Program:** Advancing Mechanistic Probiotic/Prebiotic and Human Microbiome Research (R01)
Agency: NIH PA-15-135
National Institute of Dental and Craniofacial Research (NIDCR)
Interest in developing the rational basis for conducting mechanistic studies of specific microbial origin is often connected with prebiotic secondary metabolism, there is much 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

**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

**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)**
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:

1. **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.

2. **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.

3. **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.