Oportunidades de Fondos Externos

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UPR external funding success is of utmost importance to strengthen the connection between its investigators/faculty and funding entities who have the potential to sponsor their research and academic endeavors. This publication has been developed in order to summarize funding opportunities and promote the participation of faculty and collaborative research groups in their intent to apply for external funds. Such efforts are aligned with the UPR Strategic Plan 2017-2022: A New Era of Innovation and Transformation for Student Success; Certification 50 (2016-2017) of the Governing Board, December 19, 2016. Strategic Area: Research and Creative Work. Goal 2: Increase Applications for and awards of external funds for research and creative work.

SELECTED FUNDING OPPORTUNITIES

This is a selection of identified funding opportunities for the period ending 02/09/2021 and is in no way all-inclusive of funding opportunities available. Further information has been shared with External Resource Coordinators and Research Coordinators at each UPR campus by e-mail or MS Teams.

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1. Graduate Student Measurement Science and Engineering (GMSE) Fellowship Program, Department of Commerce, National Institute of Standards and Technology

Application Deadline: March 23, 2021

The NIST's Graduate Student Measurement Science and Engineering (GMSE) Fellowship Program is seeking applications from eligible applicants for activities to provide master's and doctoral-level graduate students with opportunities and financial assistance to obtain laboratory experiences within the NIST laboratories in the science, technology, engineering and mathematics (STEM) disciplines. The recipient will work with NIST to foster collaborative STEM research relationships among NIST, master's and doctoral-level graduate students, and the students' academic institutions.

The National Institute of Standards and Technology (NIST) is one of the nation's premiere research institutions for the physical and engineering sciences and, as the lead Federal agency for technology transfer, it provides a strong interface between government, industry and academia. NIST embodies a science culture, developed from a large and well-equipped research staff that enthusiastically blends programs that address the immediate needs of industry with longer-term research that anticipates future needs. In this context, NIST is soliciting proposals from eligible applicants to provide administrative support for the NIST Graduate Student Measurement Science and Engineering (GMSE) Fellowship Program. The awardee(s) in this program will enable graduate students accepted for the program to obtain laboratory experiences within the NIST laboratories in the science, technology, engineering and mathematics (STEM) disciplines that are pertinent to research priorities at NIST and support the students' work towards their graduate degrees.

The recipient will work with NIST to foster collaborative research relationships among NIST, master's and doctoral-level graduate students, and the students' academic institutions in STEM disciplines that are pertinent to research priorities at NIST. The recipient may cooperate with any accredited U.S. institution(s) of higher learning and/or other organization(s) in planning and implementing the GMSE Fellowship Program. The awardee(s) will administer the application process for potential graduate student participants and facilitate distribution of funds to students selected to participate in the GMSE program through their graduate institutions. The funding will be delivered to recipient institutions on behalf of participating students. The awardee(s) will also be responsible for collecting information related to the technical progress of the selected students during their tenure in the GMSE program. The awardee(s) will coordinate with the NIST International and Academic Affairs Office (IAAO) and NIST Technical Advisors (designated laboratory personnel) to identify potential collaborative research opportunities for students applying for the program.

Link to additional information: Go to www.grants.gov and search for Funding Opportunity Number **2021-NIST-GMSE-01**

2. SARS-CoV-2, COVID-19 and Consequences of Alcohol Use (R03), Department of Health and Human Services, National Institutes of Health

Application Deadline: April 14, 2021

This Funding Opportunity Announcement (FOA) will support research grants to address urgent, time-sensitive research questions on the relationships between alcohol consumption and COVID-19 related outcomes and consequences. The principal area of focus is research that can improve public health in the near term by informing responses to the current COVID-19 pandemic, in view of 1) the impact of alcohol misuse on incidence and severity of COVID-19 disease or 2) the effect of the COVID-19 disease and pandemic-induced restrictions on alcohol use and alcohol use disorder (AUD). Time-sensitive applications for which standard NIH review and funding timelines would compromise either the ability to conduct the research or the value of the knowledge and with the potential to inform responses to the current pandemic will be considered.

Alcohol consumption and COVID-19 potentially have multifaceted interactions, which arise from complicated biological, behavioral and psychosocial causes and consequences of alcohol use and misuse. Alcohol consumption is a common coping mechanism for psychological distress. The well recognized prolonged stress due to the COVID-19 pandemic might increase the risk of alcohol misuse, which in turn may lead to chronic heavy alcohol drinking and alcohol use disorder (AUD). Furthermore, physical distancing requirements may impact the design and delivery of treatment and prevention services, thus complicating the ability to mitigate pandemic-associated increases in alcohol consumption and misuse. Provision of services across the continuum of care, including both telehealth and in-person treatment, is also disrupted by the pandemic, impacting individuals with AUD. Increased stress and reduced access to social supports may also raise the risk for relapse among those in recovery from AUD.

Separately, alcohol misuse interferes with normal immune system function, and thus may elevate susceptibility to viral infections or the severity of COVID-19-associated symptoms. Alcohol misuse also disrupts neuroimmune interactions and is associated with neuroinflammation. The impacts of excessive alcohol consumption on the body and brain complicate physical and mental health outcomes in individuals with COVID-19. Acute alcohol intoxication can affect impulsivity and risk-taking behavior, which in turn

may have consequences for the spread of coronavirus infection. Public settings in which alcohol is consumed may pose particular hazards for virus transmission, and public policies have sought to limit such risks in bars, restaurants, and other gatherings. These and other potential biological and behavioral interactions between alcohol and the COVID-19 pandemic present a range of urgent research needs and opportunities.

As the pandemic continues to evolve, the long-lasting impact of SARS-CoV2 infection on physical, cognitive, and mental health have emerged as a new challenge. The post-acute sequelae appear to arise from the extended effects of SARS-CoV2 infection and its consequences on both peripheral and central systems, beyond the initial infection by SARS-CoV-2. It remains to be determined whether and how alcohol use and misuse may interact with or contribute to post-acute sequelae following acute SARS-CoV-2 infection.

Research is needed to understand the potentially complex, bi-directional relationships between alcohol consumption and COVID-19, as well as the impact of social and policy measures on alcohol consumption and related outcomes. Such studies also will help to lay the groundwork for responding to future public health emergencies. This Funding Opportunity Announcement (FOA) encourages applications to assess the impact of alcohol as a biological contributor to COVID-19 outcomes and sequelae, and to assess behavioral, social, and economic consequences of the pandemic and the restrictions that the pandemic has imposed, as they relate to alcohol consumption and related outcomes.

The FOA will support research project grants that address urgent, time-sensitive research questions for which standard NIH review and funding timelines would compromise either the ability to conduct the research or the value of the knowledge to be gained. A principal area of focus is research that can improve public health in the near term by informing responses to the current COVID-19 pandemic and its consequences.

Research Priorities

Research is needed that can inform and enhance the nation's response to the current pandemic by advancing understanding of the relationships between alcohol consumption and misuse, and COVID-19-related outcomes. NIAAA will support research on risks and outcomes associated with alcohol consumption, SARS-CoV-2 infection, and the COVID-19 pandemic in the general population and among underserved populations, such as racial, ethnic and gender minorities, individuals with low socioeconomic status, and those who are incarcerated or homeless.
Priority areas for consideration include but are not limited to:

- Conduct secondary analyses of COVID-19- and alcohol-related datasets.
- Determine the influence of alcohol drinking history, patterns, amount, and duration on susceptibility to SARS-CoV-2 infection and COVID-19 prevalence, severity, progression, and outcomes, including post-acute sequelae. If evidence of an adverse impact of alcohol is affirmed, pathophysiological research into the mechanisms of alcohol as a physiological effector, the results of which will inform therapeutic approaches during the current pandemic, are sought.
- Determine how alcohol misuse and AUD may contribute to neurological and psychiatric manifestation of COVID-19, such as cognitive impairment, sleep disruption, pain, anxiety, etc.
- Characterize changes in alcohol consumption levels and patterns during the pandemic and investigate the pandemic-related causes.
- Identify best practices in service delivery and barriers to service delivery during the pandemic, including telehealth and in-person options, across the continuum of care for individuals with AUD and in recovery.

Link to additional information: http://grants.nih.gov/grants/guide/rfa-files/RFA-AA-21-003.html

3. Early Career Faculty (ECF), National Aeronautics and Space Administration

Application Deadline: March 24, 2021

The National Aeronautics and Space Administration (NASA) Headquarters has released a solicitation, titled Early Career Faculty (ECF), as an appendix to the Space Technology Mission Directorate (STMD) umbrella NASA Research Announcement (NRA) titled "Space Technology Research, Development, Demonstration, and Infusion 2021 (SpaceTech-REDDI-2021), on February 4, 2021. The solicitation is available by opening the NSPIRES homepage at http://nspires.nasaprs.com/, selecting "Solicitations," then selecting "Open Solicitations," and, finally, selecting "Early Career Faculty (ECF)." The Space Technology Research Grants (STRG) Program within STMD seeks proposals from accredited U.S. universities on behalf of their outstanding new faculty members who intend to develop academic careers related to space technology. NASA is seeking proposals that plan to pursue innovative, early-stage space technology research in the topic areas specifically enumerated in the solicitation.

Our Nation's universities couple fundamental research with education, encouraging a culture of innovation based on the discovery of knowledge. Universities are, therefore, ideally positioned to both conduct fundamental space technology research and diffuse newly-found knowledge into society at large through graduate students and industrial, government, and other partnerships. STMD investments in space technology research at U.S. universities promote the continued leadership of our universities as an international symbol of the country's scientific innovation, engineering creativity, and technological skill. These investments also create, fortify, and nurture the talent base of highly skilled engineers, scientists, and technologists to improve America's technological and economic competitiveness.

The following topics are anticipated for the final appendix:

- Topic 1 – Advanced Computational Techniques for the Development of Cryogenic Refrigeration Systems
- Topic 2 – High-Fidelity Emulation of Full-Physics Models in Earth Science
- Topic 3 – Joining Processes for Shape Memory Alloys to Enable Advanced Structural Applications

Only accredited U.S. universities are eligible to submit proposals on behalf of their outstanding new faculty members who intend to develop academic careers related to space technology. The proposed research must be led by a single, eligible Principal Investigator (PI). The PI must be an untenured Assistant Professor on the tenure track at the sponsoring U.S. university at the time of award. The PI must be a U.S. citizen or have lawful status of permanent residency. The PI must be the primary researcher on the effort; Co-Investigators are not permitted. Collaborators (other than NASA civil servants/JPL) are permitted. See the solicitation (Section 3.0) for complete requirements regarding eligibility and for definitions and restrictions regarding collaborators. A PI may submit only one proposal in response to this appendix.

NASA encourages submission of ECF proposals on behalf of early career faculty members at all U.S. universities and especially encourages proposals submitted on behalf of women, members of underrepresented minority groups, and persons with disabilities. The financial and programmatic support for ECF comes from the Space Technology Research Grants Program within the Space Technology Mission Directorate. Awards are planned to start in early October 2021. NASA plans to make approximately 6 awards as a result of this ECF solicitation, subject to the receipt of meritorious proposals and the availability of funds. The actual number of awards will depend on the quality of the proposals received; NASA reserves the right to make no awards under this solicitation.

All proposals must be submitted electronically through NSPIRES or through Grants.gov (www.grants.gov) by an authorized organizational representative. Notices of Intent are strongly encouraged by February 24, 2021. Proposals are due on or before March 24, 2021. Detailed submission instructions are provided in the solicitation. Potential proposers and their proposing organizations are urged to familiarize themselves with the submission system(s), ensure they are registered in NSPIRES, and submit the required proposal materials well in advance of the deadline.

Technical and programmatic comments and questions may be addressed by e-mail to the Space Technology Research Grants Program Executive, Claudia Meyer, at hq-ecf-call@mail.nasa.gov. Responses to inquiries will be answered by e-mail and may also be included in the Frequently Asked Questions (FAQ) documents located on the NSPIRES page associated with the solicitation; anonymity of persons/institutions who submit questions will be preserved.

Link to Additional Information: https://nspires.nasaprs.com/external/solicitations/summary.do?solId=%7BA51AB850-92C5-A9EC-DBAB-2B92A3777CB4%7D&path=&method=init

4. Screening for Conditions by Electronic Nose Technology (SCENT), Department of Health and Human Services, National Institutes of Health

Application Deadline: June 10, 2021

This FOA is seeking applications for a portable sensing device to detect volatile organic compounds (VOCs, i.e., scents or odors) emanating from skin and to develop a catalog of VOCs as distinct signatures for at least 20 human diseases and conditions. These sensing devices must be able to associate VOC patterns using artificial intelligence to patients with various conditions for diagnostic purposes along with capabilities to incorporate and integrate vital signs. For VOC monitoring, these sensing devices can be Electronic-nose (E-nose) technology, Gas Chromatography (GC) or any sensing technology able to detect VOC patterns associated with disease. This new program is called SCENT, which stands for Screening for Conditions by E-Nose Technology. To ensure project success, this FOA requires multidisciplinary collaborations and a team science approach. Groups may include a combination of the following: Biomedical engineers, material scientists, biosensing experts, software engineers, chemists, clinicians, clinical trialists, biostatisticians, data analysts and/or other relevant experts in academia and industry.

This initiative seeks to advance the development of novel, safe and effective biosensing and detection technologies for volatile organic compound (VOC) signatures of various human diseases and conditions from human skin and associated vital signs. To this end, leveraging dedicated engineering and artificial intelligence systems are required. This initiative anticipates the implementation of such technologies into everyday settings and routines for detection, diagnosis, prediction, and monitoring of disease conditions in clinical, community or applied settings. It is envisioned that these technologies will complement traditional blood analysis or invasive, painful, inconvenient, expensive, and highly technical procedures to monitor the onset, progression, and resolution of disease. Wearable devices and internet-of-things are highly encouraged.

1. Assembly and integration of the prototype SCENT platform: The SCENT platform must be comprised of a VOC sampler; a sensing technology for VOCs such as an electronic nose, or a gas chromatographic system (GC); sensors for vitals such as temperature, heart rate, respiration rate, etc.; AI/ML capabilities to distinguish the totality of vital signs and VOC skin signatures across many human diseases and conditions for accurate diagnosis; and an intuitive, user-friendly interface. Design of experiment (DoE) techniques are encouraged for minimizing unnecessary steps in device design and validation. These preclinical development strategies will increase the likelihood of success in meeting eventual clinical performance requirements. Additionally, a systems engineering approach must be applied to product development and preclinical performance testing of the proposed device to establish a robust proof-of-concept feasibility. The sampling system/s will have to be validated against standard mixtures of VOCs (see below) with and without *in vitro* skin models. Novel skin sampling designs are encouraged.

Quality by Design (QbD) is required and must be prominently described in the application. QbD will allow for ease and precision of future manufacturability (Good Manufacturing Practices) and ensure that device to device differences are at a minimum (e.g., synthesis of sensor arrays must be repeatable), while adverse events that are of device origin are limited. Adoption of human-factors-engineering and usability-engineering principles must also be considered as part of QbD during the development process. This includes criteria such as comfort and ease of use to ensure user acceptance and compliance. Additionally, VOC sensing approaches must incorporate design specifications and performance criteria for risk mitigation of potential measurement interferents including, but not limited to: compounds introduced during patient treatment such as drugs, plasma expanders, and anticoagulants; and substances ingested by the patient such as alcohol or nutritional supplements. Lastly, the proposed approaches must address other potential causes of examination (analytical) interferences, such as: chemical, physical and detection artifacts; non-selectivity and non-specificity of detection; and other sources of error that might affect disease diagnostics. Risk mitigation and alternative methods are expected.

Process analytical technologies (PATs) are required and must be prominently described in the application. PATs must be considered in the SCENT platform for accuracy and precision of measurements between devices and between patients. PATs for devices are needed to verify the working condition of each device within an acceptable range and may include standard VOC mixtures, pressure meters, temperature sensors, etc. PATs for patient-to-patient standardization are required to normalize for individual differences between patients that can affect the quantity (and perhaps quality) of VOCs sensed by the detectors and may include skin temperature sensors, skin permeability sensors (e.g., Transepidermal Water Loss [TEWL], skin impedance, etc.) or skin stiffness among others. Most of the technological components required to build the SCENT sensing platforms are already developed and used for other purposes (e.g., environmental monitoring). The innovation in this initiative will be to bring together expertise in these technologies and couple them with clinical and disease expertise to develop an integrative, noninvasive device that will be used for the diagnosis of a range of human diseases and conditions. The metrics/requirements for a successful SCENT platform are accuracy, sensitivity and selectivity comparable to or exceeding current standard, FDA-approved diagnostics. Portability, accessibility, and affordability are also key considerations for SCENT. Since SCENT can potentially have global applicability and use, it must follow the principles of ASSURED (affordable, sensitive, specific, user-friendly, rapid and robust, equipment-free and deliverable to end users) criteria, outlined by the World Health Organization (WHO), which provides a good framework for evaluating point of care devices specially for resource-limited environments.

2. Software Development. Use of commercially available pattern-recognition and machine learning software is allowed. The sensitivity and accuracy of the software must be tested on surrogate samples as above. In addition, reference/training and validation sets from actual clinical samples must be used to show proof of principle of the machine learning algorithm.

3. Testing SCENT on Patients. Data training sets must be collected on known positive, symptomatic patients, and negative/healthy subjects as benchmarked against the current standard FDA approved method. This FOA requires plans for the diagnosis of, at least, two (2) disease conditions by the end of the project's second year; five (5) by the end of the third year; ten (10) by the end of the fourth year and twenty (20) by the end of the project and, at least one wearable for a chronic disease. These numbers are based on the expectation that a SCENT prototype already exists in the applicants' portfolio of work at the start of the project. Thus, the first two years may require some minimal assembly, incorporation of vital signs sensors and validation of the prototype and the machine learning capabilities. This is to be demonstrated by the diagnosis of at least two (2) disease conditions. By the third year, collection of data for these two conditions may continue to further improve the training sets. Note again that negative control subjects are required. At the same time, the collection of data for another three (3) or more conditions must commence for a total of at least five (5) disease conditions diagnosed by the end of the third year. By the fourth year, the applicants' SCENT platform is required to be functioning as

expected based on QbD principles and another five (5) or more disease conditions diagnosed for a total of at least ten (10) disease conditions by the end of the fourth year. By the fifth year, all the ASSURED principles must be fully established by the diagnosis of a minimum of ten (10) additional disease conditions. A total of at least twenty (20) diseases should be available in the SCENT platform's repertoire of diagnostics by the end of the fifth year. At least, one wearable for a chronic disease (included in the 20) must be planned. An additional goal is the ability to discriminate closely related diseases such as hereditary breast and ovarian cancer, the seasonal flu and other respiratory diseases, or autism and disorders with similar symptoms (e.g., Williams Syndrome). The choice of diseases will be based on the capability of the applicants' multidisciplinary group or their access to specific patient group resources. If possible, the test conditions should include a combination of metabolic, neurological, chronic, infectious, inflammatory diseases, respiratory, cardiovascular, mental and psychiatric conditions etc. NCATS Clinical and Translational Science Awards (CTSA) hubs can be harnessed in the clinical validation for recruitment and trial implementation.

4. Regulatory (FDA) Approval Plan. A short plan for the regulatory approval of technologies, tests and approaches must be developed based on the data generated from the research objectives upon completion of the proposed project. The plan must describe the expected regulatory pathway for the technology and describe foreseeable regulatory risks that could impact the technology development. It must also describe how the technology would fit with current standard of care.

5. U01 Milestones: All projects must be milestone-driven with clear go/no-go criteria that are quantifiable. Prior to funding an application, the Program Official will contact the applicant to discuss the proposed U01 milestones and any changes suggested by NIH staff or the NIH review panel. The Program Official and the applicant will negotiate and agree on a final set of approved U01 milestones, which will be specified in the Notice of Award.

Link to Additional Information: http://grants.nih.gov/grants/guide/rfa-files/RFA-TR-21-009.html

5. National Robotics Initiative 3.0: Innovations in Integration of Robotics (NRI-3.0), National Science Foundation

Application Deadline: May 3, 2021

The National Robotics Initiative 3.0: Innovations in Integration of Robotics (NRI-3.0) program builds upon the preceding National Robotics Initiative (NRI) programs to support fundamental research in the United States that will advance the science of robot integration. The program supports research that promotes integration of robots to the benefit of humans including human safety and human independence. Collaboration between academic, industry, non-profit, and other organizations is encouraged to establish better linkages between fundamental science and engineering and technology development, deployment, and use. The NRI-3.0 program is supported by multiple agencies of the federal government including the National Science Foundation (NSF), the U.S. Department of Agriculture (USDA), the National Aeronautics and Space Administration (NASA), the Department of Transportation (DOT), the National Institutes of Health (NIH), and the National Institute for Occupational Safety and Health (NIOSH). Questions concerning a particular project's focus, direction, and relevance to a participating funding organization should be addressed to that agency's point of contact, listed in section VIII of this solicitation.

The NRI-3.0 program encourages cross-disciplinary projects. Collaboration among academic, industry, government, non-profit, and other organizations is encouraged to establish better linkages between fundamental science and engineering and technology development and use, through partnerships among researchers, applications developers, users, and industry. International collaborations that enhance and add significant value to the proposed research and education activities will also be considered. Fundamental research in integration of robotics is the focus of the NRI-3.0 program. Proposals focused on foundational robotics research in the Directorate for Computer and Information Science and Engineering (CISE) and the Directorate for Engineering (ENG) topics should not be submitted to this program.

To promote further exploration of the linkages of research on Integrated robots to one or more levels of K-16 education, NSF's Directorate for Education and Human Resources will provide funding at the lower end of the funding range. Successful projects will advance the vision of integrating technologies to make robots more capable by developing and testing innovative strategies for either: a) engaging students or teachers in the study of robotics in the context of science, technology, engineering, or mathematics (STEM) education; or b) designing, developing, optimizing or using robotics to enhance teaching and learning in formal or informal STEM education settings. Due to limited funds and the multi-agency nature of this solicitation, education-focused proposals are discouraged at the higher end of the funding range.

Link to Additional Information: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf21559

6. Exploratory studies to investigate mechanisms of HIV infection, replication, latency, and/or pathogenesis in the context of substance use disorders (R61/R33), Department of Health and Human Services, National Institutes of Health

Application Deadline: July 14, 2021

This broad PAR will support exploratory studies addressing mechanistic questions in HIV infection, replication, latency, and/or pathogenesis (including HAND) in the context of SUDs.

Research Objectives: The purpose of this FOA is to support exploratory studies developing or using novel tools or technologies or testing novel hypotheses to investigate mechanistic questions in HIV infection, replication, latency, and/or pathogenesis (including neuroHIV) in the context of Substance Use Disorders (SUDs). To facilitate this purpose, this FOA uses the phased R61/R33 activity code to enable researchers to submit high risk/high payoff exploratory applications with little or no pilot preliminary data. These applications may propose to develop a new technology or tool for HIV/SUD research or adapt or improve an existing tool or technology for HIV/SUD research. Applicants could also propose to test a novel or out of the box hypothesis in the HIV/SUD research area. Given the high risk/high pay off nature of the projects, the R61 phase will include milestones and go/no go decision criteria. At the end of the R61 phase, NIH staff will assess progress towards the proposed milestones and go/no go decision criteria and determine whether the project should proceed to the R33 phase for up to three additional years. To be considered responsive, all applications must include the components listed below. Applications deemed non-responsive to this RFA and will be withdrawn without review:

- The major thrust of the project MUST propose compelling studies to investigate mechanisms of HIV infection, replication, latency, and/or pathogenesis or the effects of ART on these processes.
- At least one aim MUST also involve either 1. opioid, cannabinoid, nicotinic, dopaminergic, or other signaling pathways relevant to addictive substance use, or 2. exposure to addictive substances, or 3. analysis of samples from patients that have used addictive substances or have SUDs. Substances of interest include: nicotine, cocaine, methamphetamine, stimulants, opioids, addictive prescription drugs, cannabinoids, alcohol, or combinations of these drugs. Applications focused solely on alcohol exposure will be considered non-responsive to this FOA. Studies proposing long term exposure to addictive substances are encouraged.
- The proposed project MUST focus on brain OR well-justified studies using blood, or lymphoid systems or on tissues or cells relevant to these systems. Proposed projects using tissues or cells relevant to cardiac, kidney, or liver systems will be considered non-responsive.
- The proposed project MUST focus on humans or primates, animals with humanized immune systems and/or cells (including organoids) derived from human or primates.
- Applicants MUST propose both an exploratory R61 phase and an R33 phase. The R33 phase should propose studies to functionally confirm a mechanistic role for discoveries made in the R61 phase.

Other application considerations:

- The R61 supports high-risk/high payoff projects. Pilot preliminary data in an HIV system may be included but are not expected.
- The research strategy should include proposed quantitative milestones and go/no go criteria that will be achieved during the R61 phase. Transition to the R33 phase will be evaluated by NIH staff based on progress made on the R61 quantitative milestones and go/no go criteria as well as the availability of funds.
- Patient samples should be well-characterized for stage/trajectory of SUD, type(s) of drug used, co-occurring conditions, gender, and age.
- Newly formed collaborations or teams to foster sharing of expertise between the fields of HIV, substance use disorders, and other research areas are encouraged.
- Studies leveraging biospecimens from other studies including NIDA-supported cohorts are encouraged.

Some examples of research projects appropriate for this FOA include, but are not limited to the development of tools or technologies or novel hypotheses that will significantly improve or enable our ability to:

- Identify genes, molecular pathways, cell types (including non-neuronal cell types), or circuits involved in aspects of HIV infection, replication, latency, and/or pathogenesis (including neuroHIV) in the context of SUD and/or SUD therapies.
- Explore and understand the roles of epigenomic or transcriptional regulation, 3D nuclear structure, nuclear bodies, brain biomolecule condensates (BMCs), transcriptomics, non-coding RNAs, epitranscriptomics, extracellular vesicles or other molecular processes in HIV biology in the context of SUD

- Monitor HIV infection or latency in the CNS and/or determine the size and nature of the viral reservoir under the influences of SUD
- Understand the underlying molecular mechanisms by which HIV latency is initiated, established, and maintained in the CNS
- Decipher the contributions of addictive substances and inflammatory stimuli on HIV infection, latency or pathogenesis
- Identify HIV and SUD interactions and how they might be influenced by SARS-CoV2, sex differences, and/or sleep disturbance
- Explore and develop potential biomarkers or therapeutic targets to prevent, treat, and/or eliminate CNS HIV reservoirs in the context of SUD

Link to Additional Information: http://grants.nih.gov/grants/guide/rfa-files/RFA-DA-22-004.html

7. Research on Biopsychosocial Factors of Social Connectedness and Isolation on Health, Wellbeing, Illness, and Recovery (R01), Department of Health and Human Services, National Institutes of Health

Application Deadline: March 17, 2021

This funding opportunity announcement (FOA) invites research projects that seek to model the underlying mechanisms, processes, and trajectories of social relationships and how these factors affect outcomes in health, illness, recovery, and overall wellbeing. Both animal and human subjects research projects are welcome. Researchers proposing basic science experimental studies involving human participants should consider this FOAs companion for basic experimental studies with humans.

This FOA invites R01 applications that may range between 2-5 years. The R01 mechanism, common to all NIH ICOs participating in this FOA, was chosen expressly to empower investigators to propose innovative scopes of work with correspondingly appropriate budgets. Regardless of the number of project-years proposed, investigators should budget each year for travel to an annual meeting of grantees on or near the NIH Campus in Bethesda, MD, to share research methods and findings. Awardees will be encouraged to work together on some shared scientific opportunities at the annual meeting and across the award period. Three areas of focus especially of interest to OppNet and participating NIH ICO's include, but are not limited to, those listed below:

1. Effects of social connectedness, connection, and isolation across the lifespan

- Affective and cognitive function during the aging process
- Contextual factors that increase or mitigate impact of disruption or isolation at different developmental time points, including but not limited to:
    - Caregivers of people with dementia, severe illness, end-of-life
    - Chronic illness or limited mobility
    - Perceived strength or quality of extant social connections
    - Recent diagnosis with a serious medical illness
    - Sleep changes across the lifespan (e.g., during adolescence, early parenthood, menopause)
- Molecular markers and mechanisms (e.g., epigenetic modifications, gene expression, microbiome alterations, telomere attrition) associated with changes in social connectedness
- Neurobiological developmental trajectories
- Protective and/or risk factors associated with isolation or connection disruption at different times in development and over the lifespan
    - (e.g., adolescence, death of mate/parent, middle-age males, onset of serious medical diagnosis)
- Aggressive behaviors and/or risky sexual activity associated with connection trajectories

2. Mechanisms of connectedness, connection, and isolation

- Neurobiological factors
    - Impact on structure and function of the nervous system (central, peripheral, autonomic)
    - Impact of neuroimmune and neuroendocrine systems
    - Impact on neural systems associated with basic affective, cognitive, and social processes
    - Importance of inter-individual neural synchrony in mediating or moderating effects in relationship trajectories
    - Neurobiological biosignatures that predict sensitivity to connection disruption or isolation
    - Neurobiological processes that could be targets to ameliorate negative effects of disruption or isolation
    - Neurophysiological consequences of disruption or isolation on substance use disorders (SUDs) and mental illness
- Behavioral and environmental factors
    - The consequences of *perceived* isolation (e.g., loneliness) and/or objective/observed isolation on behavioral and clinical outcomes in adolescence and adulthood
    - Connections between social disruption/isolation in specific populations and/or health/illness contexts, e.g.,

        - Sex/gender differences; sexual and gender minorities
        - Racial/ethnic differences, acculturation/bicultural adaptations and contributions to social integration versus isolation
        - Autism, HIV, mental illness, recovery status, substance use disorder
    - Whether the source of connection disruption leads to different processes or outcomes
        - E.g., Self-induced isolation versus isolation by others, or sense of undesired loneliness vs. sought solitude

3. Knowledge representation and behavioral ontology development

- Development of clearly defined vocabularies and taxonomies
- Elucidating relationships across constructs and between constructs and measures
- Integration of knowledge related to social connectedness, connection, and isolation into existing interoperable and sharable measures or ontology frameworks

Link to Additional Information: http://grants.nih.gov/grants/guide/pa-files/PAR-21-145.html

8. Spectrum Innovation Initiative: National Center for Wireless Spectrum Research, National Science Foundation

Application Deadline: April 30, 2021

The worldwide growth of wireless communication, navigation, and telemetry has provided immense societal benefits including mobile broadband data, Internet of Things (IoT), mobile healthcare, and intelligent transportation systems. These and other applications call for innovations that can circumvent the challenges of radio spectrum scarcity and interference, and foster the growth of ubiquitous, high speed, low latency connectivity. Commercial applications like the above must operate in harmony with scientific uses of spectrum (e.g., radio astronomy, Earth and atmospheric sciences, and polar research) and other nationally vital spectrum-dependent services (e.g., weather prediction). The National Science Foundation (NSF) continues to support wireless spectrum research and the scientific uses of the electromagnetic spectrum through multiple programs that enable fast, accurate, dynamic coordination and usage of the limited spectrum resource. These programs have created an opportune ground to build and create a large center-based ecosystem for spectrum research, which is the target of this SII-Center program. NSF's goal is to promote transformative use and management of the electromagnetic spectrum, resulting in profound benefits for science and engineering, industry, and other national interests. The focus of a spectrum research SII-Center must chart out a trajectory to ensure United States leadership in future wireless technologies, systems, and applications in science and engineering through the efficient use and sharing of the radio spectrum. The SII-Center should also seek to foster scientific and technical collaboration. The establishment of an SII-Center will have a transformational impact on wireless spectrum research by serving as a connecting point for the biggest and most challenging questions in spectrum management that the nation is facing. The SII-Center is expected to educate and develop an agile workforce needed to support industries of the future which will rely heavily on wireless technologies.

The worldwide growth of wireless communication, navigation, and telemetry has provided immense societal benefits including mobile broadband data, Internet of Things (IoT), mobile healthcare, and intelligent transportation systems. These and other applications call for innovations that can circumvent the challenges of radio spectrum scarcity and interference, and foster the growth of ubiquitous, high speed, low latency connectivity. Active commercial applications like the above must operate in harmony with scientific uses of the spectrum (e.g., radio astronomy, Earth and atmospheric sciences, and polar research) and other nationally vital spectrum-dependent activities (e.g., weather prediction). The National Science Foundation (NSF) continues to support wireless spectrum research and the scientific uses of the electromagnetic spectrum through multiple programs that enable fast, accurate, dynamic coordination and usage of our limited spectrum resource. These programs have created an opportune ground to build and create a large center-based ecosystem for electromagnetic spectrum research, which is the target of this SII-Center program. In 2020, NSF launched the Spectrum Innovation Initiative (SII) that provides investment in the following three R&D areas:

- Spectrum flexibility and agility
- Near real-time spectrum awareness
- Improved spectrum efficiency/effectiveness through secure/autonomous spectrum decision making

The goal of this program is to chart out a trajectory to ensure United States leadership in future wireless technologies, systems, and applications in science and engineering through the efficient use and sharing of the radio spectrum. A key expectation is establishing harmony between scientific uses of the electromagnetic spectrum and the forthcoming technological advances for high-speed, low latency, secure connectivity among pervasive devices, autonomous vehicles, and numerous other platforms.

The SII-Center will serve as a focal point for sustained research in the most challenging topics in spectrum. Research in these areas is expected to create advanced wireless technologies and systems that benefit society, of which 5G and future wireless broadband

networks are an example. The SII-Center is also expected to facilitate the education and development of an agile workforce needed to support industries of the future. These industries will rely heavily on wireless technologies and will require new advanced and automated spectrum management techniques. NSF's goal is to promote transformative use and management of the electromagnetic spectrum, resulting in profound benefits for science, engineering, industry, and other national interests.

The successful SII-Center is expected to develop partnerships or arrangements with other universities, colleges, or institutions, such as national laboratories, private sector research laboratories, federal, state and local government laboratories, and international organizations, as appropriate to enable the SII-Center to attain its strategic goals. The SII-Center is expected to make a transformational impact on spectrum research, by serving as a connecting point for the biggest and most challenging questions in wireless spectrum and spectrum access that the nation faces.

Link to Additional Information: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf21558

9. NEA Research Grants in the Arts, FY2022, National Endowment for the Arts

Application Deadline: March 29, 2021

NEA support of a project may start on or after January 1, 2022. Grants generally may cover a period of performance of up to two years, with an exception for projects that include primary data collection as part of the proposed activity. Projects that include primary data collection may request up to three years. A grantee may not receive more than one National Endowment for the Arts grant for the same project during the same period of performance. The National Endowment for the Arts invites applicants to engage with the agency's five-year research agenda through two funding opportunities for research projects:

- Research Grants in the Arts funds research that investigates the value and/or impact of the arts, either as individual components of the U.S. arts ecology or as they interact with each other and/or with other domains of American life. Matching/cost share grants of $10,000 to $100,000 will be awarded. Research Grants in the Arts support research studies that investigate the value and/or impact of the arts, either as individual components of the U.S. arts ecology or as they interact with each other and/or with other domains of American life. Research Grants in the Arts provides an opportunity to engage with the National Endowment for the Arts' five-year agenda for 2017-2021. The research agenda offers guidance on the types of study questions and topics that appeal to the agency's long-term research goals.

  We are interested in research that identifies and examines:

  - Factors that enhance or inhibit arts participation or arts/cultural assets;
  - Detailed characteristics of arts participation or arts/cultural assets, and their interrelationships;
  - Individual-level outcomes of arts participation, specifically outcomes corresponding with the following domains:
    - social and emotional well-being
    - creativity, cognition, and learning
    - physiological processes of health and healing; and
  - Societal or community-level outcomes of arts/cultural assets, specifically outcomes corresponding with the following domains:
    - civic and corporate innovation
    - attraction for neighborhoods and businesses
    - national and/or state-level economic growth

    Research studies that address research recommendations and priorities published in recent National Endowment for the Arts publications are also welcome. Examples of recent Arts Endowment reports that include research recommendations are *Living Traditions: A Portfolio Analysis of the National Endowment for the Arts' Folk & Traditional Arts Program* and *The Arts in Neighborhood Choice*.

- NEA Research Labs funds transdisciplinary research teams grounded in the social and behavioral sciences, yielding empirical insights about the arts for the benefit of arts and non-arts sectors alike. Matching/cost share cooperative agreements of up to $150,000 will be awarded. The National Endowment for the Arts' five-year research agenda aims to build public knowledge about the arts' contributions to individuals and society. Through NEA Research Labs, we extend this agenda and its impact by cultivating a series of transdisciplinary research partnerships, grounded in the social and behavioral sciences, to produce and report empirical insights about the arts for the benefit of arts and also for non-arts sectors such as healthcare, education, and business or management. Institutions of higher education and/or nonprofit research and policy organizations may submit applications to be NEA Research Labs. NEA Research Labs will define their own related agendas; conduct project activities to implement that agenda; and prepare reports and other products or services that will contribute substantively to a wider understanding of one of three areas of special interest to the Arts Endowment:

- The Arts, Entrepreneurship, and Innovation
- The Arts, Creativity, Cognition, and Learning
- The Arts, Health, and Social/Emotional Well-Being

Research Grants in the Arts offers grants, and NEA Research Labs offers cooperative agreements. The difference between grants and cooperative agreements is the Arts Endowment's involvement. The Arts Endowment is substantially involved with cooperative agreements. Therefore, the Arts Endowment will be substantially involved in the direction and accomplishments of NEA Research Labs.

Link to Additional Information: https://www.arts.gov/grants/research-awards/

10. Measurement Science and Engineering (MSE) Research Grant Programs, Department of Commerce, National Institute of Standards and Technology

Application Deadline: Applications will be accepted and considered on a rolling basis as they are received.

NIST is soliciting applications for financial assistance for Fiscal Year 2021 (FY21) within the following NIST grant programs:

1. **Associate Director for Innovation and Industry Services (ADIIS)** research areas:
   a. advance early-stage research and development for industry;
   b. enhance opportunities in manufacturing through innovation;
   c. strengthen supplier programs for small and medium manufacturers;
   d. encourage the transfer and commercialization of research and technology from institutions of higher education, federal laboratories, other federally funded research programs, and nonprofit research institutes, as well as research or evaluate the impacts of such transfer and commercialization;
   e. create jobs or promote workforce development; and
   f. realize or sustain metrology needs in American industry, including through technical metrology training programs for manufacturers.
2. **Associate Director for Laboratory Programs (ADLP)** - The ADLP Grant Program provides financial assistance to support the conduct of research or a recipient's portion of collaborative research consistent with the NIST mission in areas consistent with the interests of NIST research programs including but not limited to bioscience, communications, advanced manufacturing, artificial intelligence, resilience, quantum information science, etc.
3. **Communications Technology Laboratory (CTL)** - The CTL Grant Program provides financial assistance to support the conduct of research or a recipient's portion of collaborative research consistent with the CTL mission in broad areas that support the accelerated development, testing, and deployment of advanced communications technologies in support of both commercial and government applications including: high-speed electronics, wireless systems metrology, antenna and RF capabilities, high-speed and high frequency measurement capabilities, advanced optics, quantum communications, network design and optimization, network modeling, spectrum sharing, and public safety network communications.
4. **Engineering Laboratory (EL)** - The EL Grant Program provides financial assistance to support the conduct of research or a recipient's portion of collaborative research consistent with the EL's mission to support research in the following fields: advanced manufacturing; additive manufacturing; robotics; intelligent systems and information systems integration for applications in manufacturing; polymeric materials; heating, ventilation, air conditioning, and refrigeration (HVAC & R) equipment performance; mechanical systems and controls; heat transfer and alternative energy systems; indoor air quality and ventilation; cyber-physical systems; smart grid; Internet of Things; and applied economics.
5. **Fire Research (FR)** - The FR Grant Program provides financial assistance to support the conduct of research or a recipient's portion of collaborative research in areas of current interest to the Fire Research Division. The Fire Research Division develops, verifies, and utilizes measurements and predictive methods to quantify the behavior of fire and means to reduce the impact of fire on people, property, and the environment. This work involves integration of laboratory measurements, verified methods of prediction, and large-scale fire experiments to demonstrate the use and value of the research products.
6. **Information Technology Laboratory (ITL)** - The ITL Grant Program provides financial assistance to support the conduct of research or a recipient's portion of collaborative research consistent with the ITL's missions to support research in the following fields: Advanced Network Technologies, Applied and Computational Mathematics, Artificial Intelligence, Big Data, Biometrics, Cloud Computing, Cyber-Physical Systems, Cybersecurity, Forensic Science, Health Information Technology, Human Factors and Usability, Information Access, Information Processing and Understanding, Internet of Things (IoT), Metrology Infrastructure for Modeling and Simulation, Privacy Engineering, and Statistics for Metrology.
7. **International and Academic Affairs Office (IAAO)** - The IAAO Grant Program has been designed to support activities that strengthen and enhance the international metrology community and promote U.S. innovation and industrial competitiveness in support of the NIST mission. NIST seeks to promote the efforts of International Organizations with a metrology mission, Regional Metrology Organizations, National Metrology Institutes and Designated Institutes to bolster the global metrology

system and regional metrology cooperation and enhance quality infrastructure. The IAAO Grant Program will support scientific, industrial and/or legal metrology activities and related quality infrastructure endeavors with an emphasis on the Western Hemisphere, Asia Pacific and Africa.

8. **Material Measurement Laboratory (MML) -** The MML Grant Program provides financial assistance to support the conduct of research or a recipient's portion of collaborative research in the following fields: materials science and engineering, materials measurement science, biosystems and biomaterials, biomolecular measurements, chemical sciences, and applied chemicals and materials.
9. **NIST Center for Neutron Research (NCNR) -** The NCNR Grant Program provides financial assistance to support the conduct of research or a recipient's portion of collaborative research involving neutron scattering and the development of innovative technologies that advance the state-of-the-art in neutron research.
10. **Physical Measurement Laboratory (PML) -** The PML Grant Program provides financial assistance to support the conduct of research or a recipient's portion of collaborative research consistent with the PML mission to support research in the broad areas of mechanical metrology, semiconductors, ionizing radiation physics, medical physics, biophysics, neutron physics, atomic physics, optical technology, optoelectronics, electromagnetics, time and frequency, quantum physics, weights and measures, quantum electrical metrology, temperature, pressure, flow, far UV physics, nanotechnology, and metrology with synchrotron radiation.
11. **Special Programs Office (SPO) -** The PML Grant Program provides financial assistance to support the conduct of research or a recipient's portion of collaborative research consistent with the PML mission to support research in the broad areas of mechanical metrology, semiconductors, ionizing radiation physics, medical physics, biophysics, neutron physics, atomic physics, optical technology, optoelectronics, electromagnetics, time and frequency, quantum physics, weights and measures, quantum electrical metrology, temperature, pressure, flow, far UV physics, nanotechnology, and metrology with synchrotron radiation.
12. **Standards Coordination Office (SCO) -** The SCO conducts standards-related programs and provides knowledge and services that strengthen the U.S. economy and improve the quality of life. The SCO goals include enhancing coordination of the U.S. standards system with government and private sector organizations and supporting U.S. industry with the standards-related tools and information necessary to effectively compete in the global marketplace.

Link to Additional Information: Go to www.grants.gov and search for opportunity number **2021-NIST-MSE-01**

11. FY21 Young Investigator Program, Department of Defense, Office of Naval Research

Application Deadline: March 26, 2021

The Office of Naval Research (ONR) is interested in receiving proposals for its Young Investigator Program (YIP). ONR's Young Investigator Program seeks to identify and support academic scientists and engineers who are in their first or second full-time tenure-track or tenure-track-equivalent academic appointment, who have received their PhD or equivalent degree on or after 01 January 2013, and who show exceptional promise for doing creative research. The objectives of this program are to attract outstanding faculty members of Institutions of Higher Education (hereafter also called "universities") to the Department of the Navy's Science and Technology (S&T) research program, to support their research, and to encourage their teaching and research careers. Individuals who are holding U.S. non-profit equivalent positions are also encouraged to apply.

Proposals addressing research areas (as described in the ONR Science and Technology Department section of ONR's website at www.onr.navy.mil) which are of interest to ONR program officers will be considered. Contact information for each division (a subgroup of an S&T Department) is also listed within the S&T section of the website. Applicants are STRONGLY ENCOURAGED to contact the appropriate Program Officer who is the point of contact for a specific technical area to discuss their research ideas. A list of most Program Officers and their contact information can be found at: https://www.onr.navy.mil/our-research/technology-areas or at: https://www.onr.navy.mil/our-research/our-program-managers.

Brief informal pre-proposals may be submitted to facilitate these discussions but are not required. Such discussions can clarify the content and breadth of the priority research areas and enhance the match between a subsequent proposal and Department of the Navy research needs. Please allow adequate time for such discussions with the ONR Program Officer. The brief informal pre-proposal should be emailed to the ONR Program Officer with ONRYIP@navy.mil on the cc: line. An individual wishing to apply for the Young Investigator Program MUST submit a research proposal and at least one Letter of Support through the appropriate university officials. Refer to Section II. E. 1. "Evaluation Criteria" regarding the importance of the Letter(s) of Support in the overall evaluation criteria and Section II. D. "Application and Submission Information" regarding its content. Applications received without at least one letter of support will be considered incomplete and will not be considered for award.

The ONR YIP is a single principal investigator (PI) award. Co-principal investigators (Co-PIs) are not allowed.

Link to Additional Information: https://www.onr.navy.mil/work-with-us/funding-opportunities/announcements

12. Understanding the Rules of Life: Emergent Networks, National Science Foundation

Application Deadline: May 10, 2021

In 2016, the National Science Foundation (NSF) unveiled a set of "Big Ideas," 10 bold, long-term research and process ideas that identify areas for future investment at the frontiers of science and engineering (see https://www.nsf.gov/news/special_reports/big_ideas/index.jsp). The Big Ideas represent unique opportunities to position our Nation at the cutting edge of global science and engineering by bringing together diverse disciplinary perspectives to support convergence research. As such, when responding to this solicitation, even though proposals must be submitted to the Division of Emerging Frontiers in the Directorate for Biological Sciences (BIO/EF), once received, the proposals will be managed by a cross-disciplinary team of NSF Program Directors. The Understanding the Rules of Life: Predicting Phenotype "Big Idea" is based on developing a predictive understanding of how key properties of living systems emerge from interactions of factors such as genomes, phenotypes, and evolving environments. This activity has launched a series of new research programs designed to elucidate "minimal rules" (building a synthetic cell), "rules of complexity" (epigenetics), and "rules of interaction" (microbiome). A list of Understanding the Rules of Life awards made thus far can be found on the NSF Awards Search.

This Understanding the Rules of Life: Emergent Networks (URoL:EN) solicitation adds to those previous foundational activities to now understand "rules of emergence" for networks of living systems and their environments. Emergent networks describe the interactions among organismal, environmental, social, and human-engineered systems that are complex and often unexpected given the behaviors of these systems when observed in isolation. The behavior of emergent networks of living systems depends on, but are not wholly predicted by, chemical and physical principles and unit-level biological properties (molecule/cell/organism/population), as well as communication and information flows among nodes in the network. Networks of living systems are reciprocally coupled with natural, built, and social environments in ways that are complex and difficult to predict. The often-unanticipated outcomes of these interactions can be both wide-ranging and enormously impactful. Prediction is further hampered by accelerating perturbations within evolving environments and the associated increase in the frequency of previously rare or extreme events. Determining the emergent properties of these networks, which arise from complex and nonlinear interactions among the different systems that in isolation do not exhibit such properties, is a critical and unsolved problem.

One of many examples of this could include the emerging network of interactions across scales that arose from the arrival of the nonnative pathogen, *Cryphonectria parasitica*, or Chestnut blight, introduced with nursery stock. This pathogen effectively eliminated a dominant overstory tree species, American chestnut (Castanea dentata), across North America and had concomitant impacts on and feedbacks between biotic, abiotic, and social networks. For example, the economic impacts of this pathogen ranged from local agricultural and social impacts to global scale impacts on the timber industry. Successful projects of the URoL:EN program are expected to use convergent approaches that explore emergent network properties of living systems across various levels of organizational scale and, ultimately, contribute to understanding the rules of life through new theories and reliable predictions about the impact of specific environmental changes on behaviors of complex living systems, or engineerable interventions and technologies based on a rule of life to address associated outcomes for societal benefit.

The convergent scope of URoL:EN projects also provides unique STEM education and outreach possibilities to train the next generation of scientists in a diversity of approaches and to engage society more generally. Hence, the URoL:EN program encourages research projects that integrate training and outreach activities in their research plan, provide convergent training opportunities for researchers and students, develop novel teaching modules, and broaden participation of under-represented groups in science. The URoL:EN Program will support projects with a total budget of up to $3,000,000 and an award duration of up to 5 years.

Link to Additional Information: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf21560

13. High-End Instrumentation (HEI) Grant Program (S10), Department of Health and Human Services, National Institutes of Health

Application Deadline: June 1, 2021

The High-End Instrumentation (HEI) Grant program encourages applications from groups of NIH-supported investigators to purchase or upgrade a single item of high-end, specialized, commercially available instruments or integrated systems. The minimum award is $600,001. There is no maximum price limit for the instrument; however, the maximum award is $2,000,000. Instruments supported include, but are not limited to, biomedical imagers, high throughput robotic screening systems, X-ray diffractometers, mass spectrometers, nuclear magnetic resonance (NMR) spectrometers, DNA and protein sequencers, biosensors, electron and light microscopes, and cell sorters.

The purpose of this funding opportunity is to continue the High-End Instrumentation (HEI) Grant Program administered by the Office of Research Infrastructure Programs (ORIP). The objective of the Program is to make available to institutions high-end cutting-edge research instruments that can only be justified on a shared-use basis and that are needed for NIH-supported projects in basic, translational, and clinical biomedical or biobehavioral research. The HEI program provides funds to purchase or upgrade a single item of expensive, leading-edge, specialized, commercially available instrument or an integrated instrumentation system. An integrated instrumentation system is one in which the components, when used in conjunction with one another, perform a function that no single component can provide. The components must be dedicated to the system and not used independently.

Types of supported instruments include, but are not limited to: X-ray diffractometers, mass spectrometers, nuclear magnetic resonance (NMR) spectrometers, DNA and protein sequencers, biosensors, electron and light microscopes, cell sorters, high throughput robotic screening systems, and biomedical imagers. Applications for standalone computer systems (supercomputers, computer clusters and data storage systems) will only be considered if the system is solely dedicated to biomedical research.

In particular, the HEI program enables the introduction of advanced cutting-edge technologies providing new capabilities to biomedical research. In such cases, a risk-return trade-off is expected and allowed. Due to the novelty of the technologies and the uniqueness of their implementation, specialized and technologically savvy groups of investigators will be qualified to lead the adoption of such advanced instruments for biomedical research and to the development of innovative biomedical applications. Therefore, if such a novel instrument is requested, the applicant should demonstrate special technical expertise, merging multiple fields of science and technology, such as biology, physics, and bioinformatics. For integrated systems, the applicant must provide a detailed description about how the system will be put together and about the technical expertise of the individual(s) who will be responsible for assembling the system. The applicant must also provide a detailed description of training for the investigators listed in the application about the use of the novel technology in advancing their research. Accordingly, the HEI program requires that any unique instrument or an integrated system must be developed by reliable commercial vendors and guaranteed by the manufacturer's one-year warranty.

All instruments and integrated systems must be dedicated to biomedical research only. Foreign-made instruments are allowed. In order to promote cost effectiveness, encourage optimal sharing, and foster a collaborative multidisciplinary environment, the instrument should be integrated in a core facility, whenever possible. In rare special circumstances when an institution cannot justify sole use of the high-end instrument for NIH-supported and other biomedical research, the institution may request a Special Use Instrument (SUI). Eligibility requirements for SUI requests are described in Section III.3.

The HEI Program will ***not*** support requests for:

- An instrument with a base cost of less than $600,001;
- Multiple instruments bundled together;
- Purely instructional equipment;
- Instruments that are not commercially available and do not have a manufacturer warranty.
- Institutional administrative management systems, clinical management systems, or instruments to be used purely for clinical (billable) care;
- Software, unless it is integrated in the operation of the instrument and/or necessary for the generation of high-quality output experimental data from the instrument;
- Additional stand-alone workstations for data processing, licenses, and duplicate software items;
- General purpose equipment (such as standard machine shop equipment), instruments to furnish a research facility (such as autoclaves, hoods, equipment to upgrade animal facilities), and equipment for routine sustaining infrastructure (such as standard computer networks or data storage systems).
- Disposable devices, office furniture, and supplies;
- Alteration or renovation of space to house the instruments.

Applicants are advised to discuss with the HEI Scientific/Research Contact (See Section VII) any questions about appropriate types of equipment, eligibility, and Program requirements, prior to submitting an application for an integrated instrumentation system.

Link to Additional Information: http://grants.nih.gov/grants/guide/pa-files/PAR-21-126.html

14. Shared Instrumentation Grant (SIG) Program (S10), Department of Health and Human Services, National Institutes of Health

Application Deadline: June 1, 2021

The Shared Instrument Grant (SIG) Program encourages applications from groups of NIH-supported investigators to purchase or upgrade a single item of high-priced, specialized, commercially available instruments or integrated instrumentation system. The minimum award is $50,000. There is no maximum price limit for the instrument; however, the maximum award is $600,000. Instruments supported include, but are not limited to: X-ray diffractometers, mass spectrometers, nuclear magnetic resonance spectrometers, DNA and protein sequencers, biosensors, electron and light microscopes, cell sorters, and biomedical imagers. Applications for standalone computer systems (supercomputers, computer clusters and data storage systems) will only be considered if the system is solely dedicated to biomedical research. All instruments, integrated systems, and computer systems must be dedicated to research only. Foreign-made instruments are allowed.

The purpose of this funding opportunity is to continue the Shared Instrumentation Grant (SIG) Program administered by ORIP. The objective of the Program is to make available to institutions high-priced research instruments that can only be justified on a shared-use basis and that are needed for NIH-supported projects in basic, translational, or clinical biomedical and bio-behavioral research. The SIG Program provides funds to purchase or upgrade a single item of expensive, state-of-the-art, specialized, commercially available instrument or an integrated instrumentation system. An integrated instrumentation system is one in which the components, when used in conjunction with one another, perform a function that no single component can provide. The components must be dedicated to the system and not used independently.

The SIG Program will not support requests for:

- An instrument with a base cost of less than $50,000;
- Multiple instruments bundled together;
- Purely instructional equipment;
- Instruments used for clinical (billable) care;
- Instruments that are not commercially available and do not have a manufacturer warranty
- Institutional administrative management systems, clinical management systems;
- Software, unless it is integrated in the operation of the instrument and/or necessary for generation of high-quality experimental data from the instrument;
- Multiple stand-alone workstations for data processing, software licenses, and duplicate software items;
- General purpose equipment (such as standard machine shop equipment), instruments to furnish a research facility (such as autoclaves, hoods, equipment to upgrade animal facilities), equipment for routine sustaining infrastructure (such as standard computer networks or data storage systems);
- Disposable devices, office furniture, and supplies;
- Alteration or renovation of space to house the instruments.

Applicants are advised to discuss with the SIG Scientific/Research Contact (See Section VII) any questions about appropriate types of equipment, eligibility, and Program requirements, prior to submitting an application for an integrated instrumentation system.

In order to promote cost effectiveness, to encourage optimal sharing among individual investigators, research groups and departments, and to foster a collaborative multidisciplinary environment, the instrument should be integrated in a core facility or another shared resource, whenever possible.

Each applicant institution must propose a Program Director/Principal Investigator (PD/PI) who can assume administrative and scientific oversight responsibility for the requested instrumentation. See Section III.1 for qualifications for the PD/PI. The PD/PI also will be responsible for:

- Requesting no-cost extensions of the project period, if needed;
- Preparing (and working with the institution to submit) a Final Research Performance Progress Report (Final RPPR) at the end of the project period. See Section VI.3 for the content of a Final RPPR;
- Submitting Annual Usage Reports (AURs) of the instrument to the NIH for a period of four years after the project end date, see Section VI.3.

An Advisory Committee must be named to assist the PD/PI in administering the grant and overseeing the usage of the instrument. For details on the composition of the Advisory Committee, see Section IV.2 under "Administration." The PD/PI and the Advisory Committee are responsible for the development of guidelines for:

- Maximum utilization of the instrument, including time allocation;
- A detailed plan for the day-to-day management and safe operation of the instrument;
- A plan to ensure that access to the instrument is limited to users whose projects have received approval from the Institutional Review Board, the Institutional Animal Care and Use Committee or a biosafety committee, as applicable;
- A financial plan for the long-term operation and maintenance of the instrument during the post-award period;
- A relocation of the instrument within or outside the institution or change(s) of ownership, if such changes are necessary;
- Recommending a new PD/PI, if such a need arises.

The PD/PI and the Advisory Committee should convene meetings and issue annual reports on the instrument status, including their recommendations for the instrument operations.

Link to Additional Information: http://grants.nih.gov/grants/guide/pa-files/PAR-21-127.html

15. Limited Competition: Basic Instrumentation Grant (BIG) Program (S10), Department of Health and Human Services, National Institutes of Health

Application Deadline: June 1, 2021

The BIG Program supports acquisitions of scientific instruments that are justified by investigators' needs to pursue their scientific projects in basic, translational, or clinical fields. The program requires that three Major Users with NIH-funded research projects demonstrate significant need for the requested instrument – see Section III.3. Additional Information on Eligibility for the Major User Group requirement. Moreover, a broader research community at the applicant or regional institution(s) should benefit from access to the instrument. It is expected that the instrument, by augmenting institutional research capabilities, will invigorate current research, contribute to opportunities for novel research projects, stimulate new collaborations, and increase overall research competitiveness.

The BIG Program provides funds to purchase a single costly, specialized, commercially available instrument or an integrated instrumentation system. An integrated instrumentation system is one in which the components, when used in conjunction with one another, perform a function that no single component can provide. The components must be dedicated to the system and not used independently. Types of instruments supported include, but are not limited to, basic cell sorters, confocal microscopes, ultramicrotomes, gel imagers, or computer systems. Applications for standalone computer systems (supercomputers, computer clusters, and data storage systems) will only be considered if the system is solely dedicated to biomedical research. All instruments, integrated systems, and computer systems must be dedicated to research only. Foreign-made instruments are allowed.

The BIG Program will not support requests for:

- An instrument with a base cost of less than $25,000;
- Multiple instruments bundled together;
- Purely instructional equipment;
- Instruments used for clinical (billable) care;
- Instruments that are not commercially available and do not have a manufacturer warranty
- Institutional administrative management systems, clinical management systems;
- Software, unless it is integrated in the operation of the instrument and/or necessary for generation of high-quality experimental data from the instrument;
- Multiple stand-alone workstations for data processing, software licenses, and duplicate software items;
- General purpose equipment (such as standard machine shop equipment), instruments to furnish a research facility (such as autoclaves, hoods, equipment to upgrade animal facilities), equipment for routine sustaining infrastructure (such as standard computer networks or data storage systems);
- Disposable devices, office furniture, and supplies;
- Alteration or renovation of space to house the instruments.

Applicants are advised to discuss with the BIG Scientific/Research Contact (See Section VII) any questions about appropriate types of equipment, eligibility, and Program requirements, prior to submitting an application for an integrated instrumentation system. In order to promote cost effectiveness, to encourage optimal sharing among individual investigators, research groups and departments, and to

foster a collaborative multidisciplinary environment, the instrument must be integrated in a core facility, another shared resource, or a shared laboratory space.

Each applicant institution must propose a Program Director/Principal Investigator (PD/PI) who can assume administrative and scientific oversight responsibility for the requested instrumentation. See Section III.1for qualifications for the PD/PI. The PD/PI also will be responsible for:

- Requesting no-cost extensions of the project period, if needed;
- Preparing (and working with the institution to submit) a Final Research Performance Progress Report (Final RPPR) at the end of the project period. See Section VI.3 for the content of a Final RPPR;
- Submitting Annual Usage Reports (AURs) of the instrument to the NIH for a period of four years after the project end date, see Section VI.3.

An Advisory Committee must be named to assist the PD/PI in administering the grant and overseeing the usage of the instrument. For details on the composition of the Advisory Committee, see Section IV.2 under "Administration." The PD/PI and the Advisory Committee are responsible for the development of guidelines for:

- Maximum utilization of the instrument, including time allocation;
- A detailed plan for the day-to-day management and safe operation of the instrument;
- A plan to ensure that access to the instrument is limited to users whose projects have received approval from the Institutional Review Board, Institutional Animal Care and Use Committee or a biosafety committee, as applicable;
- A financial plan for the long-term operation and maintenance of the instrument during the post-award period;
- A relocation of the instrument within or outside the institution or change(s) of ownership, if such changes are necessary;
- Recommending a new PD/PI, if such a need arises.

The PD/PI and the Advisory Committee should convene meetings and issue annual reports on the instrument status, including their recommendations for the instrument operations

Link to Additional Information: http://grants.nih.gov/grants/guide/pa-files/PAR-21-125.html

16. Human Immunology Project Consortium (U19), Department of Health and Human Services, National Institutes of Health

Application Deadline: June 4, 2021

This Funding Opportunity Announcement (FOA) for the Human Immunology Project Consortium (HIPC) solicits applications from single institutions, or consortia of institutions, to participate in a network of human immunology profiling research groups in the area of infectious diseases, including HIV. The purpose of this FOA is to characterize human immune responses/mechanisms elicited by vaccinations, vaccine adjuvants or natural infections by capitalizing on recent advances in immune profiling technologies. Studies supported under this FOA will measure the diversity and commonalities of human immune responses under a variety of conditions and longitudinally using high-throughput systems immunology approaches coupled with detailed clinical phenotyping in well-characterized human cohorts. The resulting data will be used to develop molecular signatures that define immune response profiles and identify biomarkers that correlate with the outcomes of vaccinations, vaccine adjuvants or natural infections in humans. An additional goal of this program is to promote rapid public access to HIPC-supported data and meta-data through public portals such as ImmPort. A companion FOA will support development and operation of a HIPC Coordinating Center that will be responsible for fostering collaborations amongst HIPC-funded investigators; facilitating public dissemination of integrated HIPC findings and knowledge; and supporting development or adoption of new, robust methods for data integration, analysis, presentation, and visualization to further research and development in this field.

While this program will ***not*** support clinical trials requiring an Investigational New Drug (IND) authorization or IND equivalent, it will support clinical trials that do not require an IND. In addition, this program will support clinical studies using U. S. Food and Drug Administration (FDA) approved interventions (e.g., licensed vaccines) that are prescribed for use per indication (as described in the intervention's product label) and are exempt by regulatory authorities from needing an IND. Applicants should directly contact the FDA or the equivalent non-US regulatory authority (if applicable) to discuss whether an IND (or equivalent) application is required and obtain a waiver if it is required. NIAID reserves the right to decide whether a proposed clinical trial is responsive to the FOA based on the definitions and guidance provided herein. To clarify any clinical trial related matter, applicants are strongly encouraged to contact the Scientific/Research Contacts listed in Section VII of this initiative. When clinical studies are a component of the research proposed, NIAID policy requires that studies be monitored commensurate with the degree of potential risk to study subjects and the complexity of the study (https://www.niaid.nih.gov/research/guidance-policies-and-standard-operating-procedures). An

updated NIAID policy was published in the NIH Guide on July 8, 2002, and is available at: https://grants.nih.gov/grants/guide/notice-files/NOT-AI-02-032.html. The full policy, including terms and conditions of award, is available at: https://www.niaid.nih.gov/grants-contracts/niaid-clinical-terms-award.

The individual HIPC U19 awardees will be responsible for conducting immune profiling studies and developing and validating immune signatures associated with disease outcomes and vaccine efficacy, including identification of immune correlates of protection or disease progression/pathogenicity.

Examples of research areas of interest include, but are not limited to:

- Measurement of dynamic, longitudinal changes in immune profiles following vaccination, adjuvant administration, or natural infection with a pathogen that correlate with clinical outcome.
- Comparison of longitudinal immune profiles among ethnically diverse or special populations (e.g., infants, neonates, older adults, atopic individuals, transplant recipients, patients with autoimmune disease) after natural infection or administration of a vaccine or adjuvant, including examination of differential responses in males versus females.
- Analyses of cellular populations and tissue/organ compartments associated with development and maintenance of long-term immunological memory to infection and vaccination.
- Identification of immune profiles that correlate with vaccine efficacy or surrogates of efficacy.
- Comparison of immune profiles in vaccinated populations to immune profiles in populations with naturally acquired infections.
- Identification of markers of mucosal, tissue/organ or skin immune responses that reflect or contrast with markers of systemic response.
- Systems serology and other high throughput characterization of humoral immunity.
- Dissociation of markers of protective immunity from markers of vaccine toxicity/reactogenicity.
- Examination of the role of the human microbiome in modifying immune responses to vaccinations or natural infections.

For HIV-related research:

HIV-focused applications are defined as: Immune profiling applications that focus entirely on HIV immunogens (i.e., HIV infection or individuals receiving HIV vaccines (+ or - adjuvant)). The key requirement for HIV applications should be a coherent set of interrelated research aims with a clear overall focus on the use of immune profiling to advance research progress toward a safe and efficacious HIV vaccine. In that context it would be acceptable to propose work with non-HIV immunogens to address specific knowledge gaps about HIV vaccine design by obtaining comparative information from immune responses to HIV and non-HIV immunogens. Examples of HIV-related studies include, but are not limited to:

- Measurement of dynamic changes in immune profiles following natural coinfection or superinfection with two or more distinct HIV viruses that correlate with favorable immunological and/or clinical outcome.
- Studies of immune responses to HIV vaccine candidates on an IND (where the clinical trial is supported and conducted by sources outside HIPC). Examples of specific areas of HIV vaccine research interest include:
    - identifying the epitopic specificity and other qualities of antibody responses that can provide protective immunity by inducing durable broad-coverage virus neutralizing antibody responses, or inducing durable, broad-coverage antibody responses with other specific, protective antiviral function(s); or examination of the developing role of Fc receptors in HIV vaccine antibody responses;
    - exploring vectors/adjuvants/delivery technologies that facilitate the induction of different qualities and specificities of durably protective antibody responses;
    - studying envelope isolates, constructs, modifications, fragments, combinations and sequences to induce broadly protective antibody coverage;
    - determining the role of baseline inflammation in shaping HIV-vaccine induced innate and adaptive immunity; exploring pre-vaccination interventions, such as probiotics or anti-inflammatory drugs, to steer immune responses to yield effective protection.

Link to Additional Information: http://grants.nih.gov/grants/guide/rfa-files/RFA-AI-20-079.html


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