NJIT Research Newsletter

Issue: ORN-2016-05

NJIT Research Newsletter includes ***Grant Opportunity Alerts,*** recent awards, and announcements of research related seminars, webinars and special events. The Newsletter is posted on the NJIT Research Website http://www.njit.edu/research/

Recent Research Grant and Contract Awards

Congratulations to faculty and staff on receiving research grant and contract awards!

PI: John Federici (PI)
Department: Physics
Grant/Contract Project Title: NJSGC Summer Bridge Programs - Research in Physics
Funding Agency: NASA
Duration: 02/01/16-11/01/16

PI: Ecevit Bilgili (PI)
Department: Chemical, Biological and Pharmaceutical Engineering
Grant/Contract Project Title: Feasibility Assessment of the Production of Stable Nano-suspensions of a Poorly Water-Soluble Active
Funding Agency: International Flavors & Fragrances, Inc.
Duration: 02/01/16-07/31/16

PI: William Marshall (PI)
Department: NJIT
Grant/Contract Project Title: Development, Integration, Testing, and Training (DITT) of Systems and Processes for Systems & Facilities Optimization
Funding Agency: US army
Duration: 02/04/16-09/30/16

Events and Announcements

Event: NJIT President's Forum and 2016 Faculty Research Showcase
When: February 22, 2016: 10.00 AM – 3.00 PM
Where: President's Forum and Keynote Address: Atrium, Campus Center
Faculty Research Presentations and Poster Session: Ballroom A

President's Forum Speaker: Michael, Doyle, Founding Chairman, Eolas Technologies; Founding Chairman, National Museum of Health and Medicine; Founding Chairman, CodeAbode

Title of the Talk: Treading Water in the Digital Ocean: Diving-In Over the Head Can Sometimes Lead to Surfing the Big Waves

Biographical Sketch of the Speaker: Dr. Michael Doyle is the Chairman and CTO of Eolas Technologies Inc., and is the founder and Chairman of the National Museum of Health and Medicine Chicago. He is an active angel investor and co-founder in several Chicago-area tech startups, and is the founder of CodeAbode, the nation's first code bootcamp focused in the areas of health, medicine and fitness. Prior to founding Eolas in 1994, Dr. Doyle served as Director for the Center for Knowledge Management at the University of California, San Francisco. While at UCSF Medical Center, in 1993, Dr. Doyle led the research team that invented the fundamental web technologies which enabled Web browsers for the first time to act as platforms for fully-interactive remotely-distributed applications, in the process pioneering the revolutionary Web technologies today known as streaming media and cloud computing. Dr. Doyle successfully guided Eolas through the development of several key technologies in use throughout the Internet. Dr. Doyle's seminal research in next-generation Web applications, hypermedia navigation, mobile telecommunications, 3-D biomedical visualization, and morpho-spatial genomic activity mapping has led to advances that have gained worldwide recognition. His invention of the field of transient-key cryptography led to x9.95 ANSI National Standard for secure timestamps, and forms the basis for the revolutionary new eCheck system.

From 2000-2004, Dr. Doyle served as Chief Scientist on the Visible Embryo Project Next Generation Internet Project with NIH funding on the development of new applications to work with powerful computers over high-speed networks. As part of this project, the University team reconstructed over 30 embryos from the Carnegie Collection and made them available on computers at the San Diego Supercomputer Center at the University of California San Diego. In 2012, Dr. Doyle led the development of the Eolas vScope interactive cloud-based streaming virtual microscope system, and its adaptation to create the first neuroanatomical atlas of Albert Einstein's brain as the Einstein Brain Atlas app in Apple's iPad app store, which received worldwide press coverage, including coverage on the Today Show and Good Morning America.

Dr. Doyle currently serves on the Board of Trustees of Beloit College, and the Advisory Council of the UIC College of Applied Health Sciences. He was the 2013 recipient of the UIC AHS Distinguished Alumni Achievement Award, and is a member of ACM, IEEE, Sigma Xi, Phi Kappa Phi, Mensa, the Triple Nine Society, and the Ultranet. He is an active philanthropist, supporting a variety of charitable causes in the sciences and the arts both personally and through his family foundation, the Buonacorsi Foundation.

Event Description: The 2016 NJIT Faculty Research Showcase will start with the President's Forum with the Keynote Address by Dr. Michael Doyle. The showcase will introduce new NJIT faculty who have joined us in academic year 2015-16 with brief presentations on their research work. New faculty presentations will be followed by the electronic posters and networking session featuring research projects with recipients of the 2015 NJIT Faculty Seed Grants. Faculty, staff and students are welcome to join us at this interdisciplinary networking event to learn about exciting ongoing research projects, and explore future collaborative opportunities.

Event: NSF Webcast: CDL - Molecular Programming: Chemistry as a New Information Technology
When: February 10, 2016: 2.00 PM – 3.00 PM
Website: http://www.nsf.gov/events/event_summ.jsp?cntn_id=137578&org=NSF
Event Description: Information processing is at the core of biological organisms and is essential to their extraordinary ability to fabricate and operate intricate machinery from the molecular scale up to the macroscopic scale. Inspired by this natural technology, research in synthetic biology and molecular programming aims to create information-based chemical systems capable of carrying out human-defined molecular programs that input, output, and manipulate molecules and molecular structures. For chemistry to become the next information technology substrate, we must (1) develop systematic molecular architectures capable of carrying out a wide variety of molecular-scale tasks, from self-assembly to signal processing; (2) establish rigorous mathematical foundations and build effective software tools for designing, simulating, and analyzing complex molecular circuits and systems; (3) explore the theoretical foundations of molecular computing systems, their capabilities, and their limitations; and (4) demonstrate how molecular programming can be used to create previously-unthinkable applications in biology, chemistry, physics, and materials science. Using nucleic acid nanotechnology as a model system, I will discuss how computer-aided design enables the synthesis of complex self-assembled molecular structures; how programming languages and compilers are being developed for biochemical reaction circuitry; and how theory is illuminating the remarkable potential of massively parallel systems of unreliable, stochastic, and slow molecular machines.
Speaker Bio: Erik Winfree is Professor of Computer Science, Computation & Neural Systems and Bioengineering at Caltech. He is the founder of two NSF "Expeditions in Computing", the Molecular Programming Project (2008-2013) and Molecular Programming Architectures, Abstractions, Algorithms, and Applications (2013-2018). Winfree, inducted as a Fellow of the AAAS in 2015, is the recipient of the Feynman Prize for Nanotechnology (2006), the NSF PECASE/CAREER Award (2001), the ONR Young Investigators Award (2001), a MacArthur Fellowship (2000), the Tulip prize in DNA Computing (2000), and MIT Technology Review's first TR100 list of "top young innovators" award (1999). Prior to joining the faculty at Caltech in 1999, Winfree was a Lewis Thomas Postdoctoral Fellow in Molecular Biology at Princeton, and a Visiting Scientist at the MIT AI Lab. Winfree received a B.S. in Mathematics and Computer Science from the University of Chicago in 1991, and a Ph.D. in Computation & Neural Systems from Caltech in 1998.
To Join the Webinar: Please register at: https://nsf.webex.com/nsf/j.php?RGID=rca2a270c760094a655a46c3307077998 by 11:59pm EST on Tuesday, February 9, 2016.

Special NSF I-Corps Mini Grants for NJIT Students

NJIT has been designated as an NSF I-Corps Site and through the NJIT School of Management and NJ Center for Innovation Acceleration, we will provide specialized training and mini grants of up to $3,000 to teams interested in exploring the commercial viability of their ideas for products and businesses that are based on their own inventions or NJIT intellectual property. NJIT students are invited to submit proposals on technology development towards starting a company for commercialization.

Students receiving grants will also earn the lean start up methodology – an approach that has significant advantages over traditional business planning / new product development approaches. They will have opportunities to communicate with potential customers to discover how the technology in the lab could effectively 'solve' unmet needs in the market. They will connections with experienced entrepreneurs and investors that can lead to potential follow-on support or collaboration

Eligibility: I-Corps mini grants are available to teams made up NJIT students and faculty. Each team must have:

- an entrepreneurial lead(typically an NJIT undergraduate or graduate student(s))
- an academic lead researcher/advisor (faculty member)
- a business mentor with significant entrepreneurial business experience.

The NJIT I-Corps Program Managers (Dr. Michael Ehrlich and Ms. Judith Sheft) will provide assistance to complete teams as necessary. You must have at least 2 teams members identified to apply. All team members must be able to participate for the 6 month project duration.

Deadlines:

Deadline for Submissions: Monday February 15, 2016
Interviews of Finalists: Monday – February 22-26th 2016
Announcement of Awards – Wednesday March 2, 2016
Mandatory Team Orientation – Friday March 11, 2016 (Common Hour)

Expectations over Grant Period: Following the Mandatory Team Orientation meeting, the teams will be expected to participate in a self paced learning exercise for the Lean Startup Method, which is being set up on Moodle. There are video lessons, written assignments, and quizzes to help you keep on track. Teams will also be expected to get out of the building/lab and to interview prospective customers.

This first phase should be completed within three months and could be done in as little as 30 days. Funding will be released in conjunction with this learning activity.

For the remainder of the grant period, we expect teams to advance the commercialization of their new technology to get to a GO/NO-GO point at which they will know whether they want to proceed.

Next steps for a GO decision could include an application for a $50,000 NSF I-Corps Grant, Submission of an SBIR application for $75,000-150,000, Submission of a NSF PFI-AIR-TT grant for $200,000, Pitches before Angel Investors, or Other Steps.

Contact for Questions:

Dr. Michael Ehrlich – NJIT School of Management and Co-Director of the NJ Innovation Acceleration Center - ehrlich@njit.edu
Judith Sheft Co- Director of the NJ Innovation Acceleration Center - sheft@njit.edu

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Grant Opportunity Alerts

Keywords and Areas Included in Grant Opportunity Alerts**:**

NSF: Enhancing Access to the Radio Spectrum (EARS) - Addressing Future Challenges; Expeditions in Computing; Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring; Software Infrastructure for Sustained Innovation (SI2: SSE & SSI)

NIH: Mechanistic Basis of Diffuse White Matter Disease in Vascular Contributions to Cognitive Impairment and Dementia (R01); Targets of Low Dose Alcohol in the Brain (R01) (R21); Imaging and Biomarkers for Early Detection of Aggressive Cancer (U01)

Department of Defense/US Army/DARPA/ONR: Army Research Institute for the Behavioral and Social Sciences FY16 Foundational Science Research Unit Broad Agency Announcement, Neural Engineering System Design (NESD)
Department of Energy: 2016 Vehicle Technologies Program Wide Funding Opportunity Announcement
National Endowment of Arts: 2017 National Heritage Fellowship Awards Program

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Grant Opportunities

National Science Foundation

Grant Program: Enhancing Access to the Radio Spectrum (EARS) - Addressing Future Challenges
Agency: National Science Foundation NSF 16-537
RFP Website: http://www.nsf.gov/pubs/2016/nsf16537/nsf16537.htm
Brief Description: The National Science Foundation's Directorates for Computer and Information Science and Engineering (CISE), Engineering (ENG), and Mathematical and Physical Sciences (MPS) are coordinating efforts to identify bold new concepts with the potential to contribute towards significant improvements in the efficiency of radio spectrum utilization, protection of passive sensing services, and the ability for traditionally underserved Americans to benefit from current and future wireless-enabled goods and services. This EARS program solicitation seeks to fund innovative collaborative research addressing large-scale challenges that transcend the traditional boundaries of existing programs.
Awards: Approximately 6 - 8 awards are anticipated, each up to $1,500,000 total and up to 3 years in duration, subject to the availability of funds and quality of proposals received.
Letter of Intent: Not Required
Full Proposal Deadlines: May 03, 2016
Contacts:

- Wenjing Lou, CISE/CNS, telephone: (703) 292-8950, email: wlou@nsf.gov
- Thyagarajan Nandagopal, CISE/CNS, telephone: (703) 292-8950, email: tnandago@nsf.gov
- Chengshan Xiao, ENG/ECCS, telephone: (703) 292-4753, email: cxiao@nsf.gov

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Grant Program: Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring
Agency: National Science Foundation NSF 16-534
RFP Website: http://www.nsf.gov/pubs/2016/nsf16534/nsf16534.htm
Brief Description: The Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM) is a Presidential award established by the White House in 1995. The PAESMEM program is administered by the National Science Foundation (NSF) on behalf of the White House Office of Science and Technology Policy (OSTP).

Nominations, including self-nominations, are invited for "Individual" and "Organizational" PAESMEM awards. Individuals and organizations in all public and private sectors are eligible including industry, academia, K-12, military and government, non-profit organizations, and foundations. Exceptional STEM or STEM-related mentoring in both formal and/or informal settings is eligible for the PAESMEM award.

Nominations are encouraged from all geographical regions in the U.S. including its territories and particularly jurisdictions designated by Congress under NSF's Experimental Program to Stimulate Competitive Research (EPSCoR). NSF EPSCoR-designated jurisdictions are: Alabama, Alaska, Arkansas, Delaware, Guam, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Puerto Rico, Rhode Island, South Carolina, South Dakota, Vermont, Virgin Islands, West Virginia, and Wyoming. Nominations from the U.S. Territories are particularly encouraged. Each "Individual" or "Organizational" PAESMEM awardee will receive a $10,000 award and a commemorative Presidential certificate. Awardees are also invited to participate in an award recognition ceremony in Washington, DC that includes meetings with STEM educators, researchers and policy leaders. Up to 16 awards may be made from the nominations received on or before June 17, 2016.

Awards: Approximately 16 nominees total from both categories will be recommended to the White House for award recognition from the 2016-2017 competition. These awardees will represent the 2017 cohort of PAESMEM awardees. Anticipated Funding Amount: $160,000.

Letter of Intent: Not Required

Full Proposal Submission Window: January 25, 2016 - June 17, 2016

Contacts:

- Martha L. James, Program Officer, Division of Human Resource Development, 815, telephone: (703) 292-7772, fax: (703) 292-9019, email: mjames@nsf.gov
- Nafeesa Owens, Program Officer, Division of Human Resource Development, 815, telephone: (703) 292-5120, fax: (703) 292-9019, email: nowens@nsf.gov
- Nicole Gass, Program Specialist, Division of Human Resource Development, 815, telephone: 703-292-8378, fax: 703-292-9019, email: ngodwin@nsf.gov

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Grant Program: Expeditions in Computing

Agency: National Science Foundation NSF 16-535

RFP Website: http://www.nsf.gov/pubs/2016/nsf16535/nsf16535.htm

Brief Description: The far-reaching impact and rate of innovation in the computing and information disciplines has been remarkable, generating economic prosperity and enhancing the quality of life for people throughout the world.

The Directorate for Computer and Information Science and Engineering (CISE) has created the *Expeditions in Computing* (*Expeditions*) program to provide the CISE research and education community with the opportunity to pursue ambitious, fundamental research agendas that promise to define the future of computing and information.

In planning *Expeditions* projects, investigators are encouraged to come together within or across departments or institutions to combine their creative talents in the identification of compelling, transformative research agendas that promise disruptive innovations in computing and information for many years to come.

Funded at levels up to $2,000,000 per year for five years, *Expeditions* represent some of the largest single investments currently made by the directorate. Together with the Science and Technology Centers CISE supports, *Expeditions* form the centerpiece of the directorate's center-scale award portfolio. With awards funded at levels that promote the formation of research teams, CISE recognizes that concurrent research advances in multiple fields or sub-fields are often necessary to stimulate deep and enduring outcomes.The awards made in this program will complement research areas supported by other CISE programs, which target particular computing or information disciplines or fields.

Awards: Up to $30,000,000 total for each competition, subject to the availability of funds. *Expeditions* projects with annual budgets up to $2,000,000 for durations of five years will be supported.
Letter of Intent: Preliminary Proposal Due: May 03, 2016
Full Proposal Deadlines: January 18, 2017
Contacts: Mitra Basu, Program Director, 1115, telephone: (703) 292-8910, email: mbasu@nsf.gov

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Grant Program: Software Infrastructure for Sustained Innovation (SI2: SSE & SSI)
Agency: National Science Foundation NSF 16-532
RFP Website: http://www.nsf.gov/pubs/2016/nsf16532/nsf16532.htm
Brief Description: Software is an integral enabler of computation, experiment and theory and a primary modality for realizing the Cyberinfrastructure Framework for 21st Century Science and Engineering (CIF21) vision, as described in NSF 10-015. Scientific discovery and innovation are advancing along fundamentally new pathways opened by development of increasingly sophisticated software. Software is also directly responsible for increased scientific productivity and significant enhancement of researchers' capabilities. In order to nurture, accelerate and sustain this critical mode of scientific progress, NSF has established the Software Infrastructure for Sustained Innovation (SI^2) program, with the overarching goal of transforming innovations in research and education into sustained software resources that are an integral part of the cyberinfrastructure.

The goal of the SI^2 program is to create a software ecosystem that includes all levels of the software stack and scales from individual or small groups of software innovators to large hubs of software excellence. The program addresses all aspects of cyberinfrastructure, from embedded sensor systems and instruments, to desktops and high-end data and computing systems, to major instruments and facilities. Thus, SI^2 will continue to nurture the interdisciplinary processes required to support the entire software lifecycle, and will successfully integrate software development and support with innovation and research. Furthermore, it will result in the development of sustainable software communities that transcend scientific and geographical boundaries. SI^2envisions vibrant partnerships among academia, government laboratories and industry, including international entities, for the development and stewardship of a sustainable software infrastructure that can enhance productivity and accelerate innovation in science and engineering. Furthermore, SI^2 recognizes that integrated education activities will play a key role in sustaining the cyberinfrastructure over time and in developing a workforce capable of fully realizing its potential to transform science and engineering.
Awards: Standard Grants
Letter of Intent: Not Required
Full Proposal Deadlines: April 26, 2016 for SSE Proposals; September 19, 2016 for SSI Proposals
Contacts:

- Rajiv Ramnath, Program Director, CISE/ACI, telephone: (703) 292-4776, email: SI2Queries@nsf.gov
- Daniel S. Katz, Program Director, CISE/ACI, telephone: (703) 292-2254, email: SI2Queries@nsf.gov

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National Institutes of Health

Grant Program: Mechanistic Basis of Diffuse White Matter Disease in Vascular Contributions to Cognitive Impairment and Dementia (VCID)(R01)
Agency: National Institutes of Health RFA-NS-16-021
RFP Website: http://grants.nih.gov/grants/guide/rfa-files/RFA-NS-16-021.html
Brief Description: Diffuse brain white matter disease is highly prevalent in the elderly, and has been clinically associated with vascular contributions to cognitive impairment and dementia (VCID) in both men and women. Diffuse white matter disease is thought to include a variety of pathologies including demyelination and/or fiber loss due to multifocal infarction and local ischemia. It is often accompanied by arteriosclerosis in deep penetrating arteries, multiple infarcts in the basal ganglia, brainstem or cerebellum. Though most commonly extending out from the periventricular surfaces, it may also occur in subcortical white matter. Diffuse white matter disease is typically detected in clinical settings as hyperintensity on magnetic resonance imaging (MRI) or signal loss on computed tomography x-ray (CT) scan; diffuse white matter disease can be detected histologically as well, for example in human pathology and in studies using animal models. Despite the prevalence and potential significance of white matter disease for cerebrovascular disease etiology and cognitive outcomes, much remains to be learned about the cellular and molecular causes, regional vulnerability, and progression over time. The physiological consequences of diffuse white matter disease on local axon and neural circuit function are almost completely unknown. The purpose of this FOA is to address some of the many gaps in knowledge of the biologic mechanisms of the commonly occurring, cerebrovascular disease and age-related diffuse white matter disease at the molecular, cellular, tissue and brain circuit level. The ultimate goal of this fundamental research is to inform future efforts to reduce the burden of illness due to age-related vascular contributions to cognitive impairment and dementia. This FOA is informed by the outcomes of the 2013 Alzheimer's Disease-Related Dementias Conference (ADRD 2013) held in response to the National Plan to Address Alzheimer's Disease, and by the 2014 Small Blood Vessels: Big Health Problems Workshop.
Characteristics of Responsive Applications
Projects that elucidate cellular and molecular causes, progression and neural consequences of diffuse white matter disease including deep, small vessel cerebrovascular disease such as multifocal, small, silent brain infarcts frequently associated with VCID are within the scope of this FOA. Diffuse white matter disease preferentially affects deep brain regions, and as such has been more difficult to study than cortical based vascular or tissue pathology. Applications may focus on diffuse white matter disease extending out from the periventricular surfaces, diffuse white matter disease in subcortical white matter, or diffuse white matter disease that is accompanied by arteriosclerosis in deep penetrating arteries and with multiple infarcts in the basal ganglia, brainstem or cerebellum. This FOA specifically promotes research utilizing methods that can address mechanisms of pathological events in vessels and tissue that were previously poorly accessible and therefore may not have been as well studied, such as periventricular white matter, basal ganglia, brainstem, deep cerebellum or subcortical white matter. Applications may use (or further develop) state of the art and emergent technologies that are poised to advance mechanistic understanding of diffuse white matter disease in VCID. Accordingly, new tools, some developed as part of the BRAIN Initiative, may be useful to approach the scientific questions posed by this FOA.

Proposed research may be performed using model systems, including in vivo and ex vivo models, as well as models established using cells, including but not limited to human cells.

Human subjects research may be proposed only if it further informs cellular and molecular mechanistic studies that are the main focus here.

Cognitive assessments (in humans and animals) as they relate to disease mechanisms and progression are within the scope of this FOA; however, molecular, cellular, tissue mechanisms and the consequences of diffuse white matter disease on neural circuit function are the main foci of interest. Cognitive assessments are not a requirement to be responsive.

Studies that investigate the interplay of vascular mechanisms as well as co-morbidities with diffuse white matter cerebrovascular disease may be of interest, including, for example: hypertension, diabetes and other metabolic disorders, Alzheimer's type dementia, cerebral amyloid angiopathy, inflammation, dyslipidemia, and other known risk factors in cerebro- and cardiovascular disease.

The physiological consequences of diffuse white matter disease on local axon and neural circuit function are almost completely unknown, and are within the scope of this FOA.

Awards: Application budgets are limited $500,000 direct costs, annually.

Letter of Intents: March 19, 2016

Deadline: April 19, 2016, 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.

Late applications will not be accepted in response to this FOA.

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 Targets of Low Dose Alcohol in the Brain (R01) and (R21)

Agency: National Institutes of Health RFA-AA-16-008

RFA-AA-16-009, R21 Exploratory/Developmental Grant

RFP Website: http://grants.nih.gov/grants/guide/rfa-files/RFA-AA-16-008.html

Brief Description: This Funding Opportunity Announcement (FOA) solicits research grant applications that define molecular targets and neuropathways mediating alcohol effects at concentrations of 10 mM and below. Although previous studies have established that alcohol at relatively high concentrations modulate a variety of neurobiological systems and neurocircuits, significant gaps remain in understanding the targets of low dose alcohol (10 mM or less) in the brain. Recent advances in neuroscience techniques and methods allow precise detection of neuronal activity and regulation of specific neuronal populations and neuronal pathways both in vivo and in vitro. These advances provide an unprecedented opportunity to understand effects of low-dose alcohol at molecular, cellular, and circuit levels. Research supported by this announcement will advance the mechanistic understanding of alcohol–sensitive circuitry. One potential benefit of the validation of low dose causal target(s) will be the ability to block alcohol effects by inactivation of one or multiple molecular targets.

The sensitivity of neurons and the associated neuronal pathways to alcohol stems from the modulatory actions of alcohol on its molecular targets. Alcohol allosterically modulates a variety of receptors, channels, and signaling molecules with a wide range of sensitivity. Although numerous studies have used relatively high concentrations of alcohol to obtain the maximal and consistent alcohol effects, a few studies, using recombinant systems or brain slices, have shown that low doses of alcohol modulate several types of receptors and ion channels in a subunit dependent manner. For example, alcohol modulates subtypes of NMDA receptors, glycine receptors, nicotinic receptors, GABAA receptors, BK channels, T-type calcium channels, and BDNF at 10 mM in vitro. However, there are often mismatches between the sensitivities in heterologous systems and that detected in brain slices or in vivo, suggesting that factors present in intact neuronal networks play an important role in alcohol sensitivity. Thus, studies are

needed to define which types of receptors or channels mediate sensitivity to low dose alcohol in which cells and circuits in vivo. In addition, given that diverse protein subunit compositions exist in different sub-populations of neurons, in vivo studies will be a critical step in identifying the most sensitive targets to low dose alcohol. Recent advances in molecular, structural and functional analyses have identified the amino acid residues that are critical for alcohol's action and have revealed potential alcohol binding sites in several receptors and channels. These advances in combination with powerful new techniques for manipulating protein structure, as well as in vivo approaches, which enable one to detect and manipulate gene expression and neuronal activity in real time with high temporal and/or spatial resolution, will provide a great opportunity to identify the targets mediating effects of low dose alcohol at the molecular, cellular, and circuit level and to achieve mechanistic understanding of alcohol and the target interaction.

In summary, although substantial information has been gained on neurobiological mechanisms contributing to alcohol use disorders, significant challenges remain in understanding how the brain responds to low doses of alcohol and what molecular and cellular targets mediate the low dose effects of alcohol. Recent emerging neuroscience techniques, which allow the detection of neuronal activity with high temporal and/or spatial resolution in vivo, in combination with other research tools, will provide a great opportunity to address this challenge.

Research Objectives

NIAAA encourages applications that define the targets of low dose (≤10mM) alcohol at the molecular, cellular, and circuit level. Research areas of interest include, but not limited to:

- Determine the dynamic responses of neurochemically defined neuronal activity with high temporal and spatial resolution to low doses of alcohol in real time in vivo.
- Define specific types of neurons and associated neural pathways that are most sensitive to alcohol.
- Investigate how changes in neural pathways and circuits orchestrate the sensitivity to low dose alcohol.
- Identify specific subunit compositions of receptors, channels, or other signaling molecules that mediate the high neuronal sensitivity to alcohol in vivo.
- Understanding the molecular mechanisms underlying the interactions of alcohol with the most sensitive targets.

The goal of the FOA is to identify molecular targets of low dose alcohol. Applications that propose to study alcohol effects during the developmental stage and aging process are not responsive to this FOA. Validation that tissue alcohol concentration is at 10 mM or less is required, and blood alcohol measures must be included to allow consideration of applications. Applicants are *strongly* encouraged to consult the Scientific/Research Contact listed below to discuss the alignment of their proposed work with the objectives of this FOA.

Awards: Applications for an R01 award need to reflect the actual needs of the proposed project. Application budgets are limited to $250,000 direct costs annually.

Letter of Intent: March 21, 2016

Deadline: April 21, 2016, 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.

No late applications will be accepted for this Funding Opportunity Announcement.

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: Imaging and Biomarkers for Early Detection of Aggressive Cancer (U01)
Agency: National Institutes of Health PAR-16-089
RFP Website: http://grants.nih.gov/grants/guide/pa-files/PAR-16-089.html
Brief Description: The purpose of this Funding Opportunity Announcement (FOA) is to: (i) invite researchers to submit collaborative research project (U01) applications to improve cancer screening, early detection of aggressive cancer, assessment of cancer risk and cancer diagnosis aimed at integrating multi-modality imaging strategies and multiplexed biomarker methodologies into a singular complementary approach, and (ii) establish a Consortium for Imaging and Biomarkers (CIB) to perform collaborative studies, exchange information, share knowledge and leverage common resources. The research will be conducted by individual multi-disciplinary research teams, hereafter called Units. All Units are expected to participate in collaborative activities with other Units within the Consortium.

Overdiagnosis and false positives present significant clinical problems in the prevention, detection and treatment of cancer. Therefore, there is an unmet clinical need to more accurately identify early-stage aggressive cancers and distinguish lesions that are life threatening from those that are not. The specific objective of this FOA is to stimulate and support cancer imaging and biomarker research to develop, optimize, and clinically validate novel methods to:

- Detect aggressive cancers at the earliest stages possible;
- Reduce overdiagnosis;
- Reduce false positive tests; and
- Identify lethal cancers from non-lethal disease.

These goals can be met by a research strategy involving preclinical and clinical investigations to improve early cancer detection and diagnosis where validated cancer biomarkers can be combined with experimental imaging methods, or conversely, where established clinical imaging methods can be combined with experimental biomarkers. It is also possible that experimental imaging and biomarker integration strategies may be combined in such a manner that a clear path to clinical application is maintained. For example, clinically established imaging approaches or validated multiplexed biomarker(s) tests may not be currently available, well defined and suitable for direct incorporation into multi-site validation studies, i.e., experimental imaging combined with experimental biomarker(s) or the development of novel imageable biomarkers. For grant applications involving such a strategy, an established reference standard or gold standard (e.g., histology or immunohistochemistry) is required and should be clearly defined within the grant application in order to perform ongoing or future verification, pre validation and clinical validation studies.

This FOA will utilize the Research Project Cooperative Agreement (U01) mechanism to increase collaborative imaging and biomarker research. Applicants may take advantage of the option to designate multiple Program Directors/Principal Investigators (PDs/PIs), each of whom would contribute unique expertise and scientific insights toward the successful completion of the proposed research..
Awards: Application budgets are not limited but need to reflect the actual needs of the proposed project.
Letter of Intent: 30 days prior to the application due date.
Deadline: July 11, 2016; December 14, 2016; July 10, 2017; December 11, 2017; July 10, 2018; December 11, 2018, 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.

Department of Defense/US Army/DARPA/ONR

Grant Program: Army Research Institute for the Behavioral and Social Sciences FY16 Foundational Science Research Unit Broad Agency Announcement
Agency: Department of Defense, US Army BAA W911NF-16-R-0005
RFP Website:
https://www.fbo.gov/index?s=opportunity&mode=form&tab=core&id=fb6e18d6d4d610f0560ca02e05e6795d
Brief Description: This Broad Agency Announcement (BAA) for the Foundational Science Research Unit (FSRU) of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) solicits new proposals for its fiscal year 2016 program of basic research in behavioral science. It is issued under the provisions of paragraph 6.102(d) (2) and 35.016 of the Federal Acquisition Regulation (FAR), which provides for the competitive selection of proposals. Proposals submitted in response to this BAA and selected for award are considered to be the result of full and open competition and in full compliance with the provisions of Public Law 98-369, the Competition in Contracting Act of 1984, and subsequent amendments.

The U.S. Army Research Institute for the Behavioral and Social Sciences is the Army's lead agency for the conduct of research, development, and analyses for the improvement of Army readiness and performance via research advances and applications of the behavioral and social sciences that address personnel, organization, training, and leader development issues. The basic research program supports research projects that are designed to expand fundamental knowledge and discover general principles in the behavioral and social sciences.

Proposals should describe their contribution to theory and how their results might lead to basic behavioral research that would be meaningful to the Army. Those contemplating submission of a proposal are encouraged to submit a white paper before submitting a full proposal. This sequence allows earliest determination of the potential for funding and minimizes the labor and cost associated with submission of full proposals that have minimal probability of being selected for funding. Costs associated with white paper or full proposal submissions in response to this BAA are not considered allowable direct charges to any resulting award. These costs may be allowable expenses to normal bid and proposal indirect costs specified in FAR 31.205-18. Offerors submitting proposals are cautioned that only a Government Contracting or Grants Officer may obligate the Government to any legal instrument involving expenditure of Government funds.

Decisions to award new basic research awards are subject to funds availability, and ARI may choose to not award any new basic research awards due to unavailability of funds or other factors. Due to Government budget uncertainties,

(1) no specific dollars have been reserved for total awards under this BAA, and

(2) no award floor or ceiling thresholds have been established for individual awards under this BAA.

Proposals are sought from educational institutions, non-profit/not-for-profit organizations, and commercial organizations, domestic or foreign, for research and development (R&D) in those areas specified in SECTION A of the Broad Agency Announcement. Foreign owned, controlled, or influenced organizations are advised that security restrictions may apply that could preclude their participation in these efforts. Government laboratories, Federal Funded Research and Development Centers (FFRDCs), and U.S. Service Academies are not eligible to participate as prime contractors or recipients. However, they may be able to participate as subcontractors or subrecipients (eligibility will be determined on a case by case basis).

Awards: Grant awards greater than $100,000.00 require a certification of compliance with a national policy mandate concerning lobbying.
White Paper Submission: March 11, 2016
Deadline: May 06, 2016

Grant Program: Neural Engineering System Design (NESD)
Agency: Department of Defense DARPA - Biological Technologies Office
DARPA-BAA-16-09
RFP Website: https://www.fbo.gov/spg/ODA/DARPA/CMO/DARPA-BAA-16-09/listing.html
Brief Description: DARPA seeks proposals to design, build, demonstrate, and validate a neural interface system capable of recording from more than one million neurons and stimulating more than one hundred thousand neurons in proposer-defined regions of the human sensory cortex (e.g., visual cortex or auditory cortex). The complete system must demonstrate high-precision detection, transduction, and encoding of neural activity.
Awards: Cooperative Agreement.
Letter of Intent: Contact David Swan III, BAA Coordinator; DARPA-BAA-16-09@darpa.mil .
Deadline: April 14, 2016

Department of Energy

Grant Program: Fiscal Year 2016 Vehicle Technologies Program Wide Funding Opportunity Announcement
Agency: Department of Energy DE-FOA-0001384
RFP Website: https://eere-exchange.energy.gov
Brief Description: Amendment 000001 to DE-FOA-0001384. To view the changes associated with this amendment, please refer to the EERE Exchange website. The Office of Energy Efficiency and Renewable Energy is issuing, on behalf of the Vehicle Technologies Office, this Funding Opportunity Announcement, entitled Fiscal Year 2016 Vehicle Technologies Program Wide Funding Opportunity Announcement. This Funding Opportunity Announcement supports a broad portfolio of advanced highway transportation technologies that reduce petroleum consumption and greenhouse gas emission, while meeting or exceeding vehicle performance and cost expectations. Projects will focus on reducing the cost and improving the performance of a mix of near-and-long-term vehicle technologies. Activities will contribute to achieving the goals of the EV Everywhere Grand Challenge, with a focus on accelerating the development of advanced batteries, power electronics, and lightweight materials technologies, while also supporting technology development to reduce petroleum consumption through advancements in combustion engines, alternative fuels, and other enabling technologies. The Funding Opportunity Announcement also supports Clean Cities initiatives to overcome market barriers. The full Funding Opportunity Announcement is posted on the EERE eXCHANGE website at https://eere-exchange.energy.gov. Applications must be submitted through the EERE eXCHANGE website to be considered for award. Information on where to submit questions regarding the content of the announcement and where to submit questions regarding submission of applications is found in the full FOA posted on the EERE Exchange website.
Awards: Up to $3,750,000. Minimum: $500,000
Deadline: Mar 28, 2016 Please refer to the FOA for application and submission deadline Information. The FOA is contained in the EERE eXHANGE system.

National Endowment of Arts

Grant Program: 2017 National Heritage Fellowship Awards Program
Agency: National Endowment of Arts
RFP Website: https://www.arts.gov/program-solicitation/2017-national-heritage-fellowships
Brief Description: The purpose of this Program Solicitation is to select an organization to assist the National Endowment for the Arts with the 2017 National Heritage Fellowships Awards program by coordinating a concert, ceremony and reception, awardee dinner, and associated events.

Each year, the National Endowment for the Arts awards a limited number of lifetime honors to individuals in recognition of their outstanding contributions to our nation's artistic heritage. One of these programs, the NEA National Heritage Fellowship Awards, pays tribute and draws public attention to the excellence and diversity of our nation's folk and traditional arts. The one-time-only awards go to significant traditional artists from across the country in recognition of their contributions to a particular traditional art form and to the American public through their artistic work. Since 1982, new awardees have travelled to Washington, DC to receive our nation's highest honor in this field in a public ceremony and perform in a concert.
Through this Program Solicitation, the National Endowment for the Arts seeks a Cooperator to assist in the production and execution of the award program's public events including bringing the recipients to Washington, DC and coordinating the various events surrounding the official presentation of the 2017 National Heritage Fellowship awards.
Awards: Up to $310,000
Letter of Intent: Contact the agency https://www.arts.gov/contact-us
Deadline: April 5, 2016; The National Endowment for the Arts requires organizations to submit their proposals electronically through Grants.gov, the federal government's online application system. The Grants.gov system must receive your validated and accepted proposal no later than 11:59 p.m., Eastern Time, on the deadline date above. We strongly recommend that you **submit your application by March 25, 2016** to give yourself ample time to resolve any problems that you might encounter