

++++ MOCK FUNDING OPPORTUNITY ANNOUNCEMENT ++++

Department of Health and Human Services

Part 1. Overview Information

Participating Organization(s)

National Institutes of Health ([NIH](#))

Components of Participating Organizations

Office of Behavioral and Social Sciences Research ([OBSSR](#))

National Cancer Institute ([NCI](#))

National Institute of Environmental Health Sciences ([NIEHS](#))

Funding Opportunity Title

Systems Science and Health in the Behavioral and Social Sciences (R01)

Activity Code

[R01](#) Research Project Grant

Funding Opportunity Announcement (FOA) Number

PAR-15-048

Companion Funding Opportunity

[PAR-15-047](#) , [R21](#) Exploratory/Developmental Grant

Key Dates

Open Date (Earliest Submission Date)

January 5, 2015

Application Due Date(s)

[Standard dates](#) 2/5, 6/5, 10/5, by 5:00 PM local time of applicant organization

Part 2. Full Text of Announcement

Section I. Funding Opportunity Description

Purpose

This FOA encourages R01 applications that apply system science approaches such as system dynamic modeling, agent-based modeling, social network analysis, discrete event analysis, and Markov modeling to better understand complex and dynamic behavioral and social sciences processes and problems relevant to health. Research projects applicable to this FOA are those that are either applied or basic in nature (including methodological development), have a human behavioral and/or social science focus, and employ systems science methodologies, a suite of methods suited to addressing the complexity inherent in behavioral and social phenomena.

Research Objectives

This FOA is intended to increase the breadth and scope of topics that can be addressed with systems science methodologies. This FOA calls for research projects that are applied and/or basic in nature (including methodological and measurement development), have a human behavioral and/or social science focus, and employ methodologies suited to addressing the complexity inherent in behavioral and social phenomena, referred to as systems science methodologies. Additionally, this FOA seeks to promote interdisciplinary collaboration among

health researchers and experts in computational approaches to further the development of modeling- and simulation-based systems science methodologies and their application to important public health challenges.

Systems science methodologies are specific methodological approaches that have been developed to understand connections between a system's structure and its behavior over time. "Systems science methodologies" is an umbrella term that refers to a variety of such methodologies including, but not limited to, agent-based modeling, microsimulation, system dynamics modeling, network analysis, discrete event analysis, Markov modeling, control systems engineering and related engineering methods, and a variety of other dynamic and computational modeling and simulation approaches.

A system, in this context, refers to the particular configuration of all relevant entities, resources, and processes that together adequately characterize the problem space under study (i.e., a system is defined by the boundaries that stakeholders use to determine which acts/observations are relevant for their inquiry as well as the interpretations/judgments that they use to guide decisions or actions). Systems science methodologies are valued for their ability to address the complexity inherent in behavioral and social phenomena. For example, these approaches excel at identifying non-linear relationships, bi-directional feedback loops, time delayed effects, emergent properties of the system, and oscillating system behavior.

Therefore, the Institutes, Centers, and Offices of NIH that are listed as participating in this FOA issue this announcement in response to the above developments, to encourage basic and applied research projects that address behavioral and social aspects of health and utilize systems science methodologies.

Specific Areas of Research Interest

Examples of research topics encouraged under this FOA include, but are not limited to, those listed below.

National Cancer Institute (NCI) is interested in research projects that address the cause, diagnosis, prevention, and treatment of cancer, rehabilitation from cancer, and the continuing care of cancer patients and the families of cancer patients. Further information on NCI's interests can be found at <http://www.cancer.gov/aboutnci/overview/mission>. The Behavioral Research Program (BRP) is within the National Cancer Institute's Division of Cancer Control and Population Sciences. BRP initiates, supports, and evaluates a comprehensive program of research ranging from basic behavioral research to the development, testing, and dissemination of interventions in areas such as tobacco use, screening, dietary behavior, and sun protection. Projects that utilize systems science methodologies to increase the breadth, depth, and quality of behavioral research in cancer prevention and control would be appropriate to this FOA and of interest to the NCI.

Example projects that would be appropriate to this FOA and of interest to the NCI include, but are not limited to:

- Develop decision models to assist states and communities in their efforts to promote effective dissemination, implementation of multi-pronged and coordinated approaches to cancer control and health promotion.
- Elucidate the relationships between healthcare delivery processes (e.g., network measures of referral patterns) and health outcomes across the entire system of care -- from structural factors to healthcare process to patient health outcomes.
- Study features of complex social/environmental cancer-related health behaviors (e.g., physical activity, diet/nutrition, sun exposure, and tobacco use) in order to identify underlying mechanisms and leverage points for intervention.
- Examine multi-level effects of health promotion and disease prevention interventions, for example, to investigate whether the effects of interventions aimed at the individual level

- have effects on the network in which individuals are embedded, or to assess how changes at higher levels (e.g., policy) affect individual behavior.
- Build on traditional cancer surveillance models to examine the interactivity among units of analysis (e.g., social, political, cultural, economic, and individual determinants of risk factor changes, screening behavior, and treatment choices), and include dynamic feedback loops to provide a more comprehensive understanding of the impact of trends across the cancer control spectrum.
 - Capture the interaction of psychosocial and behavioral intervention mechanisms with genetic dispositions and stratification by condition. Such models could capture transmission of attitudes across networks, an understanding of the follow-through effects, and impacts on multiple related health behavior outcomes exhibited or avoided over time, and effects of social environments altered by interventions on all of the above as a dynamical system.
 - Investigate possible benefits and/or unintended consequences of community, city, or state policies designed to affect behavior change among cancer-related health behaviors such as physical inactivity, unhealthy diet, sun exposure, and tobacco use.
 - Model idiographic changes in behavior over time (e.g., increases and decreases in physical activity or smoking) using temporally dense sensor and ecological momentary assessment data to better understand the influences of these cancer risk behaviors.

National Institute of Environmental Health Sciences (NIEHS) supports research that spans the range from basic mechanistic research, research involving laboratory animal models and systems, to clinical and epidemiologic studies using human subjects (see <http://www.niehs.nih.gov/research/supported/index.cfm>).

NIEHS is particularly interested in projects that address complex, multi-faceted problems related to how environmental pollutants impact human health. Projects should involve environmental scientists and test scientific questions and/or develop simulations models to examine how environmental exposures (physical, chemical, and biological) interact with social and behavioral conditions to influence the development and progression of human disease. The ultimate goal of this research should be to generate knowledge that can inform the development and prioritization of environmental policies, interventions, and programs that are designed to promote healthier lives. Specific topics that would be appropriate to this FOA and of interest to the NIEHS include, but are not limited to projects that utilize systems science methodologies to:

- Examine how environmental pollutants interact with both harmful and beneficial aspects of the social and physical environment that are differentially distributed by neighborhoods and how such interactions may result in a greater impact of environmental exposures on certain groups (e.g., by socio-economic status or ethnicity).
- Examine the cumulative health impacts of multiple environmental exposures (physical, chemical, biological, social, and psychosocial) at multiple levels (i.e., the home, workplace, neighborhoods, and community/population).
- Understand why the implementation of policies, programs, and/or interventions designed to reduce exposure to environmental contaminants that are known to cause or exacerbate adverse health outcomes sometimes fails (e.g., asthma and air pollution, adaptive responses to the health impacts of climate change)

Section II. Award Information

Funding Instrument

Grant: A support mechanism providing money, property, or both to an eligible entity to carry out an approved project or activity.

Funds Available and Anticipated Number of Awards

The number of awards is contingent upon NIH appropriations and the submission of a sufficient number of meritorious applications.

Award Budget

Application budgets are not limited but need to reflect the actual needs of the proposed project. The annual direct costs are up to \$500,000 for R01. For R21, **\$275,000** over two-year period. No more than \$200,000 in direct costs are allowed in any single year.

Award Project Period

The maximum project period is 5 years for R01, two years for R21.

Section III. Eligibility Information

Eligible Individuals (Program Director/Principal Investigator)

Any individual(s) with the skills, knowledge, and resources necessary to carry out the proposed research as the Program Director(s)/Principal Investigator(s) (PD(s)/PI(s)) is invited to work with his/her organization to develop an application for support. Individuals from underrepresented racial and ethnic groups as well as individuals with disabilities are always encouraged to apply for NIH support.

Section IV. Application and Submission Information

Letter of Intent

Although a letter of intent is not required, is not binding, and does not enter into the review of a subsequent application, the information that it contains allows [institute](#) and [center](#) staff to estimate the potential review workload and plan the review.

Prospective applicants are asked to submit a letter of intent that includes the following information:

- Descriptive title of proposed activity
- Name(s), address(es), and telephone number(s) of the PD(s)/PI(s)
- Names of other key personnel
- Participating institution(s)

Page Limitations

Specific Aims: 1 page

Research strategy: 12 pages (R01), 6 pages (R21)

Biographic Sketch: 5 pages

Section V. Application Review Information

1. Criteria

Only the review criteria described below will be considered in the review process. As part of the [NIH mission](#), all applications submitted to the NIH in support of biomedical and behavioral research are evaluated for scientific and technical merit through the NIH peer review system.

Overall Impact

Reviewers will provide an overall impact score to reflect their assessment of the likelihood for the project to exert a sustained, powerful influence on the research field(s) involved, in consideration of the following review criteria and additional review criteria (as applicable for the project proposed).

Scored Review Criteria

Reviewers will consider each of the review criteria below in the determination of scientific merit, and give a separate score for each. An application does not need to be strong in all categories to be judged likely to have major scientific impact. For example, a project that by its nature is not innovative may be essential to advance a field.

Significance

Does the project address an important problem or a critical barrier to progress in the field? If the aims of the project are achieved, how will scientific knowledge, technical capability, and/or clinical practice be improved? How will successful completion of the aims change the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field? Will the proposed research contribute significantly to the existing body of behavioral and social sciences research while addressing an important health topic?

Investigator(s)

Are the PD(s)/PI(s), collaborators, and other researchers well suited to the project? If Early Stage Investigators or New Investigators, or in the early stages of independent careers, do they have appropriate experience and training? If established, have they demonstrated an ongoing record of accomplishments that have advanced their field(s)? If the project is collaborative or multi-PD/PI, do the investigators have complementary and integrated expertise; are their leadership approach, governance and organizational structure appropriate for the project? ? Does the investigative team have sufficient expertise in the proposed systems science methodology? Does the investigative team have appropriate behavioral and/or social science expertise? Does the investigative team have appropriate content area expertise in the relevant health domain(s)?

Innovation

Does the application challenge and seek to shift current research or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions? Are the concepts, approaches or methodologies, instrumentation, or interventions novel to one field of research or novel in a broad sense? Is a refinement, improvement, or new application of theoretical concepts, approaches or methodologies, instrumentation, or interventions proposed?

Approach

Are the overall strategy, methodology, and analyses well-reasoned and appropriate to accomplish the specific aims of the project? Are potential problems, alternative strategies, and benchmarks for success presented? If the project is in the early stages of development, will the strategy establish feasibility and will particularly risky aspects be managed?

If the project involves human subjects and/or NIH-defined clinical research, are the plans to address 1) the protection of human subjects from research risks, and 2) inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity, as well as the inclusion or exclusion of children, justified in terms of the scientific goals and research strategy proposed?

Does the project propose to utilize systems science methodologies? Are the methodologies proposed appropriate for the research question being addressed? Is there a strong rationale for use of the selected methodologies over non-systems science methods?

Environment

Will the scientific environment in which the work will be done contribute to the probability of success? Are the institutional support, equipment and other physical resources available to the investigators adequate for the project proposed? Will the project benefit from unique features of the scientific environment, subject populations, or collaborative arrangements?

2. Review and Selection Process

Applications will be evaluated for scientific and technical merit by (an) appropriate Scientific Review Group(s).

As part of the scientific peer review, all applications:

- May undergo a selection process in which only those applications deemed to have the highest scientific and technical merit (generally the top half of applications under review) will be discussed and assigned an overall impact score.
- Will receive a written critique.

Applications will be assigned on the basis of established referral guidelines to the appropriate NIH Institute or Center. Applications will compete for available funds with all other recommended applications submitted in response to this FOA. Following initial peer review, recommended applications will receive a second level of review by the appropriate national Advisory Council or Board. The following will be considered in making funding decisions:

- Scientific and technical merit of the proposed project as determined by scientific peer review.
- Availability of funds.
- Relevance of the proposed project to program priorities.