

Concept Clearance

Branch: Genes, Environment and Health

Council Period: 201710

Concept Title: Virtual Consortium for Transdisciplinary/Translational Environmental Research (ViCTER) 2.0 (R01)

Introduction

Current ViCTER Program

Environmental health sciences research has traditionally been organized into broad areas of scientific interest with limited integration across disciplines. This approach is reflective in the NIEHS grants portfolio, which includes diverse research activities to understand the impact of environmental agents on human health using *in vitro* cell culture systems, *in vivo* animal exposures, and population-based studies. New methodological and technological advances to environmental health research have the promise to provide unprecedented insight into the dynamic and complex nature of biological systems. Investigators in the field of environmental health sciences have started to integrate these approaches into their investigations to better characterize exposure and disease relationships including early biological perturbations, genetic and epigenetic variations, vulnerable populations, and complex mixtures. However, these multi-factorial (disciplinary) efforts usually occur in select or limited laboratories and institutions due to lack of availability of resources or expertise. Many investigators could greatly benefit from a more coordinated and integrated approach to facilitate translational/transdisciplinary research among basic laboratory-based research, population studies, and clinical programs.

NIEHS recognizes that to achieve an integrated translational and/or transdisciplinary research agenda, many experimental approaches need to be employed in a systematic and sustained fashion. Many of NIEHS' larger programs such as the Centers for Children's Environmental Health and Disease Prevention Research, Breast Cancer and the Environment Research Program and Centers for Neurodegeneration Science have moved in this direction by supporting both basic and human-based translational research and in many cases community engagement activities. However, these programs are large multicomponent grants that require strong preliminary evidence in areas of research with solid evidence of exposure/disease relationships. A similar mechanism had not been available to scientists proposing to develop new collaborations for projects that are exploratory in nature, may not yet be supported by preliminary data and are high risk/high payoff. To address this gap, NIEHS implemented the Virtual Consortium for Translational/Transdisciplinary Environmental Research (ViCTER) program in 2010. This program aimed to foster transdisciplinary collaboration and promote translational research efforts between basic (technology and mechanism oriented), clinical (patient-oriented) and population-based researchers who have come together to study particular environmental stressor(s) of interest.

Research Goals and Scope

The original purpose in creating the Virtual Consortia Program was to support the exchange of knowledge among individuals from a diverse set of disciplines and accelerate the translation of scientific research into meaningful improvements in human health in those areas where environmental factors are known or suspected to influence the development or progression of disease. This Virtual Consortium Program was expected to initiate research in the development and application of novel approaches for understanding the role of environmental chemicals in the etiology of disease as well as the diagnosis, prevention, and treatment/intervention of harmful exposures. It was envisioned that these new Virtual Consortia would augment existing research teams with additional expertise and use of basic mechanistic, clinical, epidemiological, computational, engineering, and/or health risk communication approaches, to focus on a central theme relevant to environmental exposures or exposure-related diseases.

One of the critical components of the ViCTER Program has been their virtual aspect. This allowed researchers at remote locations to form a consortium to integrate their research through the development of a virtual center that "houses" the ViCTER and includes a consortium director (also referred to as the PD/PI of the consortium) who is responsible for overall coordination and communication among team members.

The following examples demonstrate the variety of collaborative models that were encouraged under the ViCTER program.

- Environmental health scientist (PD/PI of consortium) examining the effects of chemical X on disease Y in a human epidemiology study develops a consortium with an animal researcher examining adult exposure to X and disease Y, and an animal researcher studying developmental exposures to X and disease Y in order to better understand metabolism, effect of timing and doses and mechanism of chemical X on disease Y across species.

- An environmental health scientist (PD/PI of consortium) measuring the epigenome of a tissue in response to chemical X develops a consortium with two other environmental health researchers measuring the epigenome in response to chemical X in other glands/tissues, in order to develop a comprehensive epigenome of chemical X across tissues.
- An environmental health scientist (PD/PI of consortium) examining an exposure that has the potential to be a risk for a disease outcome collaborating with two other researchers who can expand this idea using new tools (optogenetics, imaging, etc.) as well as clinical expertise in the relevant disease.

Current ViCTER Program Requirements and Challenges:

The current ViCTER funding announcement uses a revision award mechanism (formerly known as a competitive supplement). The ViCTER program requires Principal Investigators (PIs) to have an existing NIEHS-supported R01 research grant and bring in two new collaborators to the research team. To meet the objective of creating new partnerships, new collaborators must not have published with the PI within the last 5 years and all proposed research aims were to be new research collaborations (i.e., consortium members should not have published an original research article together on these specific topics previously). Although it is strongly recommended that at least one new collaborator be at a different institution from the PI, it was not required. Applicants can request direct costs of up to \$300,000 per year for a project period of two or three years to accomplish the research.

As a supplement program, the structure of ViCTER poses numerous challenges that impede the successful completion of the program's objectives. For example, the ViCTER program requires the PI to be a current NIEHS-supported R01 awardee with a minimum 2 years remaining on the parent grant from the earliest start date. This requirement severely restricts the number of potential applicants and provides limited time to collaborate and be productive with new collaborators. Additionally, the small amount of supplement funding makes it difficult to successfully complete multi-disciplinary and/or translational projects across multiple investigators. Most troublesome, the number of applications received has been consistently low compared to the first year of the program.

Mechanism and Justification

New ViCTER Program Proposal – "ViCTER 2.0"

Despite these challenges, the ViCTER program has met its intended goals including stimulating new transdisciplinary/translational research. Early outcomes, such as interdisciplinary publications and continued collaborations on subsequent grant applications, attest to the success of the program. Furthermore, positive feedback from several former ViCTER awardees provides evidence that this supplement was instrumental in helping them pursue new directions in their research. To build on these successes and to address the aforementioned challenges, a novel mechanism for the ViCTER program is needed.

We propose the development of an RFA to replace the current announcement (RFA-ES-17-002) that has remaining application receipt dates in 2018 and 2019. Importantly, the new plan (entitled "ViCTER 2.0") would retain all essential elements and goals of the current ViCTER program with the following exceptions:

- The supplement mechanism is replaced with an R01 mechanism that will no longer require an applicant to have an active NIEHS R01 to eligible
- The funding opportunity is open to all environmental health investigators who are willing to recruit at least two new collaborators to expand on a previously-funded or new area of research
- By removing the required linkage to a parent R01 grant, all ViCTER applicants may request up to three years of support.
- Awards will be increased to and capped at \$400K direct cost per year to fund 3-4 grants for a total cost of \$2.5 million/year (which is similar to the current NIEHS ViCTER investment).

Proposed Timeline for Implementation of ViCTER 2.0

Council Concept Clearance: September 2017

RFA Release Date: November 2017

Application Due Dates: March 2018, March 2019, March 2020

Peer Review Dates: Summer 2018, Summer 2019, Summer 2020

Council Review Dates: September 2018, September 2019, September 2020

Earliest Anticipated Start Date: December 2018, December 2019, December 2020