

January 25, 2019

Dear Colleague:

The National Cancer Institute (NCI), Center for Cancer Research (CCR) Intramural Research Program (IRP) operates a Graduate Partnerships Program (GPP) that offers opportunities for veterinarians to obtain postgraduate training in partnerships with college of veterinary medicine graduate programs. This distinctive NIH GPP training initiative known as the NIH Comparative Biomedical Scientist Training Program (CBSTP) has operated since 2003 to provide innovative interdisciplinary approaches to developing DVM/PhD clinician-scientists jointly at a university partner and within the NIH IRP laboratories. The NIH sponsored research training is available in a variety of disciplines, creating a fusion in comparative biomedical science linking animal health with human disease research. To continue this widely-respected initiative in comparative medicine and biomedical science education as a vital means for enhancing the nation's health care workforce, the CCR intends to consider applications from new and existing university partners, for the purpose of creating new, as well as continuing, university partnerships for the operation of this program. As an initial step, and preliminary to making a request for full applications, **the NCI welcomes letters of interest from graduate programs in veterinary medicine to form U.S. based NIH-university partnerships to jointly train clinician-scientists as comparative biomedical scientists in both institutions.**

Additional program information is appended below to provide background, progress and prospect on the collaboration sought, as well program historical accomplishments. We appreciate respondents commenting on the design and foundation of the program, as well as your vision articulated for its future in a collaboration. Please feel free to constructively indicate your willingness to be considered for an invitation to apply. Responses from universities indicating their interest to participate in partnership with CBSTP will be considered as prospects, in forming a trans-institutional agreement with the NIH IRP. Such collaborations are logically informed by: **1) The university's program and vision for integrated graduate partnership training between the NIH IRP and the host institution, 2) The quality of graduate research training program, and 3) Capacity to provide high quality diagnostic pathology (or other proposed specialty) training experience as a component of graduate education in the formal pathway that combines specialty and research training (defined in the appendix).** Following review of letters of interest from prospective university partners, the NCI anticipates inviting programs it deems to hold the greatest collaborative potential to apply. As is our current structure, the NCI expects to select multiple university partners for the CBSTP. Participation as a university partner in this program does not assure any particular quota of sponsored partnership trainees by the NCI or the university.

Universities can send letters of interest of a **maximum of four pages length** to:

Mr. John Hickerson, Senior Program Analyst
NIH Comparative Biomedical Scientist Training Program
Building 37, Room 2007
National Cancer Institute, Center for Cancer Research
9000 Rockville Pike
Bethesda, Maryland 20892
ncimolpathol@mail.nih.gov

Additional inquiries may be directed to email: ncimolpathol@mail.nih.gov

Deadline for receipt is March 28, 2019, by 5:00 PM, eastern time.

Sincerely,

R. Mark Simpson, DVM, PhD, and '
Hibret A. Adissu, DVM, PhD, DVSc '

NIH Comparative Biomedical Scientist Training Program
Laboratory of Cancer Biology and Genetics

NIH-University Graduate Partnership
National Institutes of Health (NIH)
Comparative Biomedical Scientist Training Program (CBSTP)
A National Cancer Institute-Administered Graduate Partnerships Program (GPP)

Appendix

PROGRAM OVERVIEW DESCRIPTION

NIH Graduate Partnerships Program – Comparative Biomedical Scientist Training Program

Background: This novel graduate training curriculum addresses the shared medical characteristics that exist between humans and animals. In addition, the intersections in disease causations and processes among species, including humans, necessitate interdisciplinary and comparative understanding of biomedicine. The inherent comparative nature of veterinary medical education, which is derived through the investigation of diseases and patient care of multiple animal species, contributes to an understanding that is vital to improving human, animal and ecosystem health.

Preparation of veterinary clinician-scientists depends upon strong and comprehensive training in both clinical medicine and biomedical research. The general graduate educational model being used by this NIH GPP program is a curriculum comprised of postgraduate specialization integrated within graduate education in basic biomedical research training. The various phases of this inclusive curriculum are designed to provide the necessary fusion required in training future comparative biomedical investigators for the nation's healthcare workforce.

To obtain the necessary integrated educational curriculum sought, the CBSTP operates through partnerships between universities and the IRP of one or more of the NCI, the National Heart, Lung and Blood Institute (NHLBI), the National Institute of Allergy and Infectious Diseases (NIAID), and the National Institute of Neurological Disorders and Stroke (NINDS). As a component of this program, the CBSTP provides access to outstanding university-based graduate training as well as NIH fellowship

resources for career and professional development. A variety of scientific pursuits in interdisciplinary human disease research are available in the CBSTP through the sponsoring NIH institutes.

There are currently two pathways for trainees to enter the CBSTP training program: **Pathway A)** veterinarians pursuing fellowships for both specialty and research training in an integrated combined graduate PhD research program, and **Pathway B)** veterinarians who primarily pursue research training within the CBSTP, leading to the PhD, subsequent to obtaining specialty training under other (non-NIH) institutional support. In this discovery of interest in collaboration, the CCR is seeking partners to jointly train students under the pathway described as A) above. Sponsored graduate veterinarians undertake combined diagnostic pathology training (or other suitable specialty) coupled with research training leading to a PhD and eligibility for specialty board certification. Trainees typically spend the initial two years of the program at a partnership university completing PhD didactic graduate coursework and core experience in diagnostic pathology training before transferring to NIH laboratories for PhD dissertation research. Students continue their enrollment as graduate students at the partner university while satisfying PhD dissertation research at NIH, which typically takes an additional 4+ years.

Note that the CBSTP program primarily trains veterinarians in diagnostic and investigative pathology; however, an overarching NIH objective includes addressing needs for training clinician-scientists in the broadest sense. Thus, NCI will consider collaborative approaches focused to one, or adapted for more than one, discipline.

Program Outcomes to Date: Twenty veterinarians have completed CBSTP training. Current and former trainee educational experience includes outstanding research accomplishments resulting in high impact publications and recognition with numerous individual awards. CBSTP trainees have received travel, young investigator and presentation awards from the AACR Scholar-in-Training Award in Memory of William Manness; AACR Outstanding poster presentation at the International Mammalian Genome Conference, and the ACVP; as well as recognitions including the Sallie Rosen Kaplan Postdoctoral Fellowship for Women Scientists in Cancer Research, and grant awards such as the NCI Director's Intramural Innovation Award and the NCI Flex Grant Award. Fellows have completed PhD thesis research on diverse topics including pandemic influenza A virus infection, atherosclerosis, myeloma genetics, prostate cancer metastasis, brain microenvironment in breast cancer metastasis, and emergent human Nipah virus and Middle East Respiratory Syndrome (MERS) coronavirus pathogenesis, T-cell acute lymphoblastic leukemia, and traumatic brain injury, as a few examples. DVM/PhD, CBSTP graduates are highly sought after and hold a variety of academic and non-academic research positions. Academic positions held include tenured, tenure-track, and clinical-educator track faculty at both veterinary and human medical schools. CBSTP graduates are also employed as research/discovery pathologists within contract research organizations, pharmaceutical companies, medical research hospital foundations, and US government biomedical research laboratories, where they interact throughout the nation with veterinarians and other health care investigators and basic research scientists.

Rationale for Competitive Partnership Program Continuation: Maintaining and building on the outstanding accomplishments of this innovative and distinctive program is a key priority. The success of the CBSTP has been realized through creation of an amalgam of high caliber university program partners, talented trainees, and NIH IRP participation. As the lead institution, the NCI, CCR believes that program success rests upon optimal university-NIH partnerships, and that recurring periodic review and reassessment of programmatic needs is essential for nourishing healthy and mutually beneficial educational collaborations. With this goal in mind, the NCI is seeking an application process to evaluate existing, and potential new, CBSTP GPP university partnerships. University partners will be selected based on criteria for assessing research and education collaborative potential. Evaluation criteria specifics

will be distributed as a part of the anticipated formal application request. Training partnership arrangements will continue to be subject to a periodic review and reevaluation, in the interest of maintaining robust and productive research and education collaborations.

The NCI acknowledges that most training programs are part of multidisciplinary veterinary departments; therefore, collaborative concepts may encompass elements of graduate/postdoctoral education in the context of a multidisciplinary graduate program department, to the extent possible.

Please consider the following information about our intramural research program collaborations. We note optimal collaborators:

- 1) Have accredited graduate education programs in colleges and schools of veterinary medicine within the United States.
- 2) Have sufficient resources, personnel, case load and species diversity, and trainee research opportunities to provide for outstanding training environments appropriate to the program goals. Able to provide diagnostic training as a component of graduate education providing experience towards eligibility for board certification.
- 3) Are willing to actively participate in jointly recruiting highly qualified individuals. This may include announcements of partnership training opportunities through the university and other means. Ability to enroll trainees in university graduate school as candidates for the PhD degree. Both the university and the NCI make independent decisions on all admissions, and subsequently coordinate on informing applicants.
- 4) Are capable of curriculum flexibility allowing the completion of university-required didactic graduate course work and core clinical experience as graduate students, within the initial two-years of the training program support while at the university. Required didactic graduate course curricula sufficient to satisfy graduate degree requirements (exclusive of dissertation research credits) must be completed within a maximum of this two-year timeframe.
- 5) Facilitate curricula enabling supported students, who must relocate from the university to NIH during the fellowship at most two years after their initial enrollment at the university, so that they may complete research training within NIH laboratories. The NIH mentor assignments and required curriculum must be acceptable to the host university in satisfaction of its PhD degree requirements.
- 6) Are capable of granting graduate credit for research conducted at the NIH and be able to award doctoral degrees to degree candidates who have successfully completed the requirements as specified by the university and its faculty, as well as NIH mentors.
- 7) Are committed to supporting and educating CBSTP trainees with the NIH, while acknowledging NIH-supported fellows are considered employed by NIH in accordance with NIH fellowship policies.
- 8) Seek to negotiate acceptable arrangements with the NCI/CBSTP for educational support including graduate tuition payments and provision of the student stipend and other support.

- 9) Acknowledge that payments for indirect overhead costs are not a feature of collaborative agreements with the NIH IRP.
- 10) Acknowledge that partnership agreements are subject to subsequent review by both parties for periodic updating. Either party may choose to discontinue the partnership upon providing written notification to the other in accordance with the Memorandum of Understanding. In such a case, both NIH and partner university shall continue their support for trainees that are already enrolled in the program in good academic standing to ensure the seamless progress and completion of degree requirements. CBSTP partnership agreements are subject to periodic open reevaluation at an interval and a process chosen by the NCI.

Additional information regarding the current program is available at
<http://nih-cbstp.nci.nih.gov>