

Federal Funding Sources for Interdisciplinary Graduate Training in the U.S.

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The U.S. Funding Landscape: Research v. Training

In the United States, federal funding is dispersed unevenly for interdisciplinary *research* and for interdisciplinary *training* of students. Federal funding agencies in the United States have long recognized the value of funding interdisciplinary research for faculty, particularly in scientific and medical fields. Although there are too many to name individually, a few examples include:

- The National Academies Keck Futures Initiative has annually convened researchers on a rotating cross-disciplinary theme since 2003.¹
- The National Institutes of Health (NIH) funded nine university-based interdisciplinary research consortia through its Common Fund (also known as the NIH “Roadmap”) from 2005-2012.²
- The National Science Foundation (NSF) continually funds both solicited and unsolicited interdisciplinary research projects, particularly in designated “Areas of National Importance,” as well as research channeled through one of its many Science and Technology Centers.³

Although less varied opportunities exist at the federal level for funding interdisciplinary research *training*, some clear avenues do exist. The NSF Graduate Research Fellowship Program is expanding its training elements that fund fellows’ research-related travel and other enrichment activities.⁴ Historically, NIH has invested heavily in building the biomedical research workforce and its diversity, including with new initiatives on innovations in graduate training and a “Big Data to Knowledge” program, and numerous graduate students have been supported on NIH Roadmap projects. By far the most sustained federal initiative to fund interdisciplinary research training, however, has historically been the National Science Foundation’s Integrative Graduate Education and Research Traineeship (IGERT) program. A consistent source of funding for graduate student training for 18 years, IGERT was re-imagined this year (2014) as the NSF Research Traineeship (NRT). A brief outline of the NRT program follows.

History of the NRT

In 1997, NSF founded the Integrative Graduate Education and Research Traineeship (IGERT)

¹ National Academies Keck Futures Initiative. (2012). The informed brain in a digital world: Interdisciplinary team summaries. Conference proceedings. Irvine California, November 15-17, 2012. Washington, DC: National Academies Press.

² National Institutes of Health. (2012). Interdisciplinary research: Overview. Retrieved from <https://commonfund.nih.gov/Interdisciplinary/overview#>

³ National Science Foundation. (2014). Interdisciplinary research: Introduction. Retrieved from http://www.nsf.gov/od/iia/additional_resources/interdisciplinary_research/

⁴ National Science Foundation. (2014). NSf Graduate Research Fellowship Program Website: About the program. Retrieved from http://www.nsfgrfp.org/about_the_program

to fund STEM-field graduate students for interdisciplinary training and collaboration skills. IGERT awards consisted of about \$3 million for a program spread over five years, including yearly stipends of \$30,000 for PhD students as well as training expenses. Although this program allowed many diverse students to engage in more flexible training than they might otherwise have done, no structures remained to continue offering interdisciplinary training on a larger scale once those students graduated. The training program was limited to the fully funded students within the IGERT program. In order to address this “capacity building” issue, in 2013 the program was reimagined as the NRT program. Although no NRT funds have yet been awarded, NSF anticipates this program will continue for many years into the future.

Selected Attributes of the NRT Program

NRT retains many of the successful aspects of IGERT, but places emphasis on promoting “scalable *models* for STEM graduate student training” (Murthy & Tankersley, 2014, emphasis mine). Like the IGERT, NRT focuses on interdisciplinary STEM research areas. A key difference between IGERT and NRT is a new flexibility. This flexibility is reflected in:

1. An understanding of *training* to include not only research skills but also broad technical skills and career skills not limited to only academic career training.
2. The definition of *trainees* as anyone who completes the components of the NRT program regardless of their funding source. Therefore NRT funds can now benefit a much wider population, including non-U.S. citizens, master’s degree students, and postdocs.
3. The ability of awardees to use NRT funds to build infrastructure for training large numbers of students rather than having to be used to fund individual students.

Notably, the NRT program includes a broader understanding of the career pathways of STEM graduate students. This is an important aspect of any graduate student training mechanism. Current data tell us only the minority of employed U.S. PhD graduates find themselves working at a postsecondary education institution at least ten years after graduation. The numbers range from 23% in engineering to 44% in the physical sciences (and even these figures do not reflect those graduates performing primarily academic research functions, since they include positions such as academic administrators and professors at teaching-centered institutions).⁵ Thus training for a broad range of professional activities seems advised. Beyond these compelling statistics, however, lies a more basic truth: flexible skills drawn from a base of strong interdisciplinary training will strengthen whatever profession these STEM graduate students ultimately pursue, including (but not limited to) academic research.

NRT explicitly encourages “strategic collaborations with the private sector, non-governmental organizations (NGOs), government agencies, museums, and academic partners.”⁶ Some possible forms of this collaboration include the establishment of internship or externship opportunities, or collaborating on the design or delivery of content. No doubt these partnerships will give graduate students exposure to and contacts in sectors beyond academia. Interdisciplinarity seems the ideal location for such relationships—it recognizes the inherent unruliness of a world whose challenges do not respect disciplinary boundaries.

⁵ National Science Foundation. (2010). National survey of college graduates. Public use data.

⁶ National Science Foundation. (2014). Program Solicitation NSF 14-548. Retrieved from <http://www.nsf.gov/pubs/2014/nsf14548/nsf14548.htm>