National Science Foundation mentorship and training plan requirements

Slide deck presented at a Virginia Tech Graduate School Mentoring Workshop on Oct. 24, 2024 by Chris Smith, Postdoctoral Affairs Program Administrator

Slide 1: Title Slide: New NSF Mentorship and Training Plan Requirements.

Chris Smith, Postdoctoral Affairs Program Administrator, Thursday, October 24, 2024

Slide 2: Title: NSF and Mentoring Activities of Trainees Listed on Grants

The National Science Foundation (NSF) now requires that any proposal requesting funds for graduate students or postdoctoral researchers must include, as a supplementary document, a description of the mentoring activities provided for such individuals.

This mentoring plan must describe in no more than one page the mentoring provided to all graduate students and/or postdoctoral researchers supported by the project.

A mentoring plan is not required, however, for postdoctoral fellows, who are listed as senior personnel on the NSF budget.

Slide 3: Title: NSF and Mentoring Activities of Trainees Listed on Grants (continued)

Examples of mentoring activities listed in the NSF Grant Proposal Guide include:

- Career counseling;
- Training in preparation of grant proposals, publications, and presentations;
- Guidance on ways to improve teaching and mentoring skills;
- Guidance on how to effectively collaborate with researchers from diverse backgrounds and disciplinary areas; and
- Training in responsible professional practices

Slide 4: Title: Potential Points to Include in a Mentoring and Training Plan

- Discuss early expectations setting and plans
  - Including
    - Research and project deliverables
    - Career and professional development plans (IDPS, which we will discuss later)
- Assess trainee's skills and areas for growth and development

- o Consider the NPA Core Competencies
  (https://nationalpostdoc.org/page/CoreCompetencies)
  - 1. Discipline-specific conceptual knowledge
  - 2. Research skill development
  - 3. Communication skills
  - 4. Professionalism
  - 5. Leadership and management skills
  - 6. Responsible conduct of research

Slide 5: Title: Potential Points to Include in a Mentoring and Training Plan (continued)

- Discuss how the trainee will be oriented to the specific research project in your lab
  - o Requisite training in methods, tools, programs
  - o Responsible Conduct of Research trainings
    - https://research.vt.edu/research-development/professional-development/required.html
- Meetings and mentoring
  - o Discuss frequency of meetings between trainee, supervisor and other collaborators/mentors on the project
  - o Mention planned interactions and opportunities for the trainee to engage with the lab/group, department/unit, college, university, and professional organizations (by attending and presenting at conferences)
  - o Ensure it is clear that funds and resources will be provided to assist trainees in attending conferences

Slide 6: Title: Potential Points to Include in a Mentoring and Training Plan (continued)

- Mentoring PI will encourage trainees to attend relevant campus events and programs, including those from:
  - o Career and Professional Development
  - o The Graduate School
  - o Office of Postdoctoral Affairs
  - o Research Development
  - o Etc.
- Ensure it is clear how PI will assist trainee in developing skills needed to become an independent researcher (grantsmanship, scientific publications, etc.)
- Indicate plans for 6- and 12-month reviews of "milestones" and progress toward research and career and professional development goals outlined in the Individual Development plan

Slide 7: Title: Resources for Writing Mentoring and Training Plans for NSF Grants

- Boilerplate text resources available to Virginia Tech postdocs for use in grant applications (https://bit.ly/VT-postdoc-resources-for-grant-apps)
- Example NSF postdoc mentoring plans and templates (https://drive.google.com/drive/folders/1I4ua7im2rGdv7zquoQPOg2CMenjBCxWj?usp=sharing)

Slide 8: Title: Individual Development Plans (IDPs)

The updated NSF PAPPG (https://new.nsf.gov/policies/pappg/24-1/summary-changes) states postdoctoral scholars or graduate students who receive substantial NSF support must have an Individual Development Plan (IDP), which is required to be updated annually.

The IDP does not need to be submitted to NSF, but should be "on file."

Certification by the PI is required in annual and final annual reports to NSF.

And IDP is a process and a product.

An IDP is a dynamic self-evaluation and career exploration tool that can be used by graduate students and postdocs to set goals for research projects, skills development, and career planning.

For those with NIH (National Institutes of Health) support, as part of progress resports submitted via RPPR (https://grants.nih.gov/grants/guide/notice-files/not-od-14-113.html), PIs are expected to describe how IDPs are used to identify and promote the career goals of graduate students and postdoctoral researchers associated with the award.

Slide 9: Title: What comprises an IDP?

The 2 primary features of any IDP should be

1. Professional development, including research development, which helps the trainee become a productive and independent researcher
2. Career development, which provides guidance and resources for identifying and achieving the **next career milestone**.

According to myIDP from Science Careers, there are three types of goals a trainee should be considering in their IDP:

- **Career advancement goals** to help you move forward with your career
- **Skill development goals** to improve upon skill and knowledge areas in which you may be deficient
- **Project completion goals** to help you stay on top of the various projects on which you are working

Slide 10: Title: Online Tools to Assist with the IDP Process

Humanities and Social Sciences: https://www.imaginephd.com/assessment

STEM fields, especially biological and biomedical sciences: https://myidp.sciencecareers.org

Chemical sciences: https://chemidp.acs.org

These tools should be used by graduate students and postdocs to:

- Assess their skills, interests, and values
- Explore potential career paths
- Make a plan for their project completion, skill development, and career advancement, which they may want to share with their advisor(s) or supervisor(s).

11: Title: IDP Resources

Link to drive with example IDP templates (blank and completed) and other resources: bit.ly/VT-postdoc-IDP-resources-2024

- Link includes folder with template IDP forms for new VT postdocs and those nearing their annual check-in.

Resources from other institutions:

- https://grad.berkeley.edu/idp/
- https://grad.wisc.edu/professional-development-individual-development-plan
- https://career.ucsf.edu/IDP

Slide 12: Title: Additional Resources

- NPA's Online Resource Library: https://www.nationalpostdoc.org/page/ResourceLibrary
  - Join NPA for free to access resources at: https://bit.ly/VT-NPA-membership
- Postdoc Academy: http://www.postdocacademy.org/
  - The academy hosts two online courses: Succeeding as a Postdoc and Building skills for a Successful Career, plus a section with mentoring tools: https://www.postdocacademy.org/mentoring/
- Additional online career and professional development resources: https://bit.ly/online-pd-resources
- Virginia Tech Graduate School mentoring toolbox: https://virginiatech.sharepoint.com/:f:/s/GraduateProgramDirectorsResources/Eg_PAdTUTuFCh9RxQykSMWABp-2GRjv7S_B1B2rZ8v84kA?xsdata=MDV8MDJ8Y2hyaXN0c21pdGhAdnQuZWR1fDgyMWZmOTNjMmYwYjQyMDNmYmNjMDhkY2U4NWY1MjEwfDYwOTU2ODg0MTBhZDQwZmE4NjNkNGYzMmMxZTNhMzdhfDB8MHw2Mzg2NDA3NDMzMTE1MTQ3NzV8VW5rbm93bnxUV0ZwYkdac2IzZDhleUpXSWpvaU1DNHdMakF3TURBaUxDSlFJam9pVjJsdU16SWlMQ0pCCV

Slide 13: VT Research and Innovation, Virginia Tech
(https://www.research.vt.edu/about/postdoctoral-associates.html)

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Slide 14: NPA's Core Competencies for Postdoctoral Training

Discipline specific Conceptual Knowledge

An overall understanding of implications of work on broader field, the importance of innovation and creativity, and grasp of cultural, language, and technical discipline-specific knowledge

- Analytical approach to defining scientific questions
- Design of scientifically testable hypotheses
- Broad-based and cross-disciplinary knowledge acquisition
- Interpretation and analysis of data

Research Skill Development

Ensure that postdocs are adequately equipped to carry out independent research, whether in bench- or non-bench-related professions

- Research techniques and laboratory safety
- Experimental design
- Data analysis and interpretation
- Statistical analysis
- Effective search strategies and critical evaluation of the literature
- Principles of the peer review process

Communication Skills

Postdocs should master communications skills that ensure that messages are heard and understood by the appropriate audience.

- Writing (scientific publications, grants/applications, career documents)
- Speaking (presentations, interviews)
- Teaching
- Interpersonal skills (style, negotiation, reviews/feedback, networking, conflict resolution, media management)

Professionalism

Postdocs instill and enforce the virtues of honor, integrity, compassion, and cooperation, and reliability, and enhance the perception of this work in society

- Workplace professionalism (diverse teams)
- Institutional professionalism (connecting at/across/with institutions as employees or representatives)
- Collegial professionalism (engaging as a citizen to scholarships)
- Universal professionalism

Leadership and Management Skills

Postdocs should understand which leadership styles are appropriate for any given time and situation to increase performance and productivity. Leaders must also be able to competently manage projects, budgets, and staff.

- Management skills (research staff management, project management, data and resource management, general management
- Leadership skills (identifying and clarifying goals, motivating/inspiring others, serving as a role model

Responsible Conduct of Research (RCR)

The pursuit and advancement of knowledge depend on openness, honesty, objectivity, and trust. Therefore, postdocs are responsible for upholding and engaging the ethical norms of their fields.

- Data ownership and sharing
- Publication practices and responsible authorship
- Research with human subjects or animals (where applicable)
- Identifying and investigating research misconduct
- Conflicts of interest