THE LIFECYCLE OF A RESEARCH CAREER

Whether a researcher chooses to enter academia, the private sector, or start their own company, funding for federal research agencies — which is decided by Congress on an annual basis — is key to attract, sustain, and maintain a research workforce that advances the boundaries of science while inspiring the next generation to follow in their footsteps. In fact, funding predictability is essential for future researchers to envision STEM as a viable career path. But where do future scientists get started? The pathway to a career in STEM can begin as early as elementary school and continue to take shape through hands-on undergraduate, graduate, and postdoctoral experiences.

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The Women in Science and Engineering (WISE) program at the University of Michigan works to increase the participation by women and gender minorities in STEM academic programs and careers. WISE — one of the first university programs in the world of its kind — received a Recognition Award for the Integration of Research and Education (RAIRE) from NSF.

Northern Illinois University’s Research Rookies program is a yearlong opportunity tailored to undergraduate students interested in exploring a topic of research while gaining technical research skills and experience. Students serve as research assistants, establishing a working relationship with a faculty mentor, and participate in professional development workshops.

Next up — graduate school! In pursuing an advanced degree, future researchers get their first taste of a research career, crafting a compelling research question that will propel their course of study under the guidance of a faculty member. Graduate researchers will develop a proposal for a grant from a federal research agency and use the funding to conduct original research, establishing enduring relationships with federal agency partners that will benefit them throughout their careers.

But where do future scientists get started? The pathway to a career in STEM can begin as early as elementary school and continue to take shape through hands-on undergraduate, graduate, and postdoctoral experiences. Let’s take a look at the many ways public-university partnerships play a role in advancing STEM careers and in turn support the more than $600,000 strong research workforce.

Northern Illinois University

Potential pathways

Grad-school

Research

NIU’s Gateway Program provides a pathway to a STEM career with a hands-on experience and explore areas of interest while demonstrating the variety of career opportunities in STEM.

Promoted by support and expertise from federal research agencies, the outcome of a research career — whether it’s a groundbreaking discovery, mentoring a new generation of students interested in the STEM fields, or a spinoff company that underpins a local economy — makes funding from federal agencies an important contribution to the vitality and competitiveness of the American research enterprise.

As researchers’ careers progress, federal funding agencies continue to play an important role in propelling researchers forward and sustaining their work.

The National Science Foundation’s (NSF) Faculty Early Career Development (CAREER) Program supports “early-career faculty who have the potential to serve as academic role models in research and education and to lead advances in the mission of their department or organization.”

NASA’s Early Career Initiative “is focused on professional development for early career scientists, engineers, and technologists.”

The Department of Energy’s (DOE) Early Career Research Program “supports an individual research program of outstanding scientists early in their careers and stimulates research careers in the disciplines supported by the DOE Office of Science.”

Innovative discoveries, technological advancements, lifesaving treatments, and more all rely on a robust and sustained research workforce pipeline. The lifecycle of a research career is a natural fit. Principal investigators representing the mission of the NIH.”

CONCLUSION

The American scientific enterprise.

When Congress passes robust and reliable annual appropriations for federal research agencies and federal research agencies, it is an important role in propelling researchers forward and sustaining their work.

The National Science Foundation’s (NSF) Mid-Career Advancement program “enables a more diverse STEM workforce by facilitating research productivity and creativity from mid-career scientists and engineers.”

NSF’s Research Project Grant Program (R01) is intended to “support a discrete, specified, circumscribed project to be performed by the named investigator in an area representing the investigator’s specific interest and competencies, based on the mission of the NIH.”

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Launch a spinoff company from research: Universities are a hotbed for innovation, and oftentimes, researchers will use the proprietary insights gained through their work to found a spinoff company. The Science Coalition’s Speaking Economic Growth reports chronicle a collective 355 spinoff companies born from federally funded university research, which together have generated billions of dollars in economic impact and support thousands of jobs nationwide.

With funding from the National Institutes of Health (NIH), Zemer Gitai, a Professor in the Department of Molecular Biology at Princeton University, oversees the Gitai Lab, which brings together undergraduates, graduate, and postdoctoral researchers from diverse backgrounds. They are studying how the cell biology of bacteria affects host-pathogen interactions to drive innovations in novel antibiotics.

At the end of grad school, graduate researchers publish the results of their work in peer-reviewed publications and, in some cases, apply for patents for their inventions or software. For those interested in gaining further experience in their field of study, some may enter a postdoctoral fellowship.

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Early career research programs sponsored by federal research agencies are crucial in easing the transition from graduate researcher to career researcher while strengthening the relationship between researcher and agency.

Early career research program by federal research agencies.

Pathways from university research to STEM career include spinoff companies, private sector research, and building an academic career.

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