

STAR Program:

Process for Selecting STAR RFA Topics and Reviewing Applications

How are the topics for the Science to Achieve Results (STAR) solicitations selected?

National Program Directors and Research Coordination Teams (RCTs)

- Each major research program in ORD is led by a National Program Director (NPD). The NPD works with a research coordination team (RCT) composed of representatives from ORD's laboratories and centers and EPA's program and regional offices.
- The NPD leads the development of a Multi-Year Research Plan, working with EPA scientists from ORD and interested program and regional offices. The MYP is reviewed by external scientists, e.g. ORD Board of Scientific Counselors.
- The MYP builds from the over-arching EPA and ORD Strategic Plans, and addresses specific program needs identified by RCT members.
- A series of criteria are used to decide whether research would best be accomplished internally at ORD or externally through grants, cooperative agreements or contracts. These criteria include:
 - Which organization has the most appropriate expertise?
 - How urgently is the research needed? What is our available in-house capacity?
 - Does the proposed extramural research complement the intramural program?
- Based on the research needs identified in the MYP, and taking into consideration input from external sources (e.g., scientific meetings and workshops), NCER staff work with the RCTs to write the Request for Applications (RFAs).

What is the Review Process that NCER uses for all assistance applications?

Peer review is the cornerstone of high-quality scientific research. Because all NCER applications are subjected to a rigorous, independent peer review, only the most scientifically meritorious research is funded by the program. The external peer review process is managed entirely by a separate division of NCER, preserving independence from the NCER staff who prepare RFAs and manage grants.

External Peer Review

- NCER staff determine the types of expertise reviewers must possess given the technical requirements of the solicitation.
- Each application is reviewed and critiqued in-depth by at least three expert panelists and discussed by the full review panel.
- For *all* applications, each principal reviewer is required to, and non-principal reviewers may elect to, provide an overall rating of Excellent, Very Good, Good, Fair, or Poor.
- Ratings are tallied and averaged, and the lead principal reviewer prepares a summary evaluation that is consistent with this average rating.
- Applications receiving a Very Good or Excellent are sent to ORD's Programmatic Review Panel.

Programmatic Review Panel

- ORD's Programmatic Review Panel recommends proposals on the basis of relevancy to EPA's mission, balance of research portfolio, and capacity to complement in-house research.
- ORD's Programmatic Review Panel consists of members from ORD, Program and Regional Offices.

NCER Air RFA Topic Areas and Summary of Grants 1998-2009

RFAYear	RFA Topic Areas and Grant Research Area
1998	<p>Health Effects of PM and Associated Air Pollutants (10 grants total)</p> <ul style="list-style-type: none"> • PM and respiratory effects (7 grants) • PM and cardiovascular effects (2 grants) • PM and morbidity/mortality (1 grant)
1999	<p>Airborne Particulate Matter Health Effects (8 grants total)</p> <ul style="list-style-type: none"> • PM dosimetry (1 grant) • PM cardiopulmonary epidemiology (3 grants) • PM controlled exposure studies (3 grants) • Source evaluation of PM effects (1 grant) <p>Airborne Particulate Matter Centers (5 grants total) – Overall Themes:</p> <ul style="list-style-type: none"> • Exposure, susceptibility, and biological mechanisms • Health risks of PM components • Combustion-derived fine particle composition, exposures & health effects • Mobile source pollution and health effects • Health effects of ultrafine particles
2001	<p>Health Effects of Particulate Matter (4 grants total)</p> <ul style="list-style-type: none"> • Mechanisms of PM respiratory effects (3 grants) • Air pollutants and emergency room visits (1 grant)
2002	<p>Airborne PM Health Effects: Cardiovascular Mechanisms (4 grants total)</p> <ul style="list-style-type: none"> • Diesel exposures (3 grants) • Concentrated airborne particulate and ozone (1 grant) <p>Epidemiologic Research on Health Effects of Long-Term Exposure to Ambient PM and Other Air Pollutants (4 grants total) Four Cohorts:</p> <ul style="list-style-type: none"> • Seventh Day Adventists (California) • Multi-Ethnic Study of Atherosclerosis (MESA) • Medicare Data Base • U.S. Nurses' Health Study
2003	<p>Epidemiologic Research on Health Effects of Long-Term Exposure to Ambient PM and Other Air Pollutants (1 ten-year grant total)</p> <ul style="list-style-type: none"> • MESA – Air <p>The Role of Air Pollutants in Cardiovascular Disease (6 grants total)</p> <ul style="list-style-type: none"> • Animal models of human disease to evaluate mechanisms (3 grants) • PM effects on regulation of heart rhythm (1 grant)

	<ul style="list-style-type: none"> • PM effects on the function of tissue lining blood vessels (2 grants) <p>Measurement, Modeling, and Analysis Methods for Airborne Carbonaceous Fine PM (PM_{2.5}) (16 grants total)</p> <ul style="list-style-type: none"> • Emission source estimates of primary organic aerosol (POA) and secondary organic aerosol (SOA) precursors (3 grants) • SOA formation mechanisms (4 grants) • Next generation receptor model (1 grant) • Advanced measurement techniques for source apportionment of organic PM (5 grants) • Differences in methods of analysis (2 grants) • Organic aerosol sampling artifacts (1 grant)
2004	<p>Source Apportionment of Particulate Matter (11 grants total)</p> <ul style="list-style-type: none"> • Receptor modeling (3 grants) • Integration of receptor, source-based & inverse modeling (4 grants) • Measurement methods for molecular tracer species and identification of new molecular tracers (4 grants)
2005	<p>Continuous Measurement Methods for Particulate Matter Composition (3 grants total)</p> <ul style="list-style-type: none"> • Instrument Development <p>Airborne Particulate Matter Research Centers (5 grants total) – Overall Themes:</p> <ul style="list-style-type: none"> • Johns Hopkins – National epidemiological study of the association of PM exposure and Medicare data on hospitalizations and mortality; toxicity of PM components • Southern California Particle Center – Investigate health effects, and biological modes of action, and how these vary with the source, chemical composition and physical characteristics of PM. • Harvard – Understand how specific PM characteristics and sources impact inflammation, autonomic responses and vascular dysfunction. • UC Davis – Study the properties of ambient and laboratory-generated particles, how these particles act within the body, and the consequences for long-term exposures, especially during growth and development. • University of Rochester – Investigate how fine and ultrafine particles from specific sources cause adverse cardiovascular effects, particularly in diabetics and those with cardiovascular disease.
2007	<p>Sources, Composition and Health Effects of Coarse Particulate Matter (5 grants total)</p> <ul style="list-style-type: none"> • Measurement focused on spatial distribution and urban-rural differences, including an epidemiological element (2 grants) • Toxicity (1 grant)

	<ul style="list-style-type: none"> • Exposure (1 grant) • Long-term epidemiological study (1 grant) <p>Sources and Formation of Organic Particulate Matter (7 grants total)</p> <ul style="list-style-type: none"> • Smog chamber experiments (3 grants) • Understanding the importance of in-cloud processing (1 grant) • Emissions from biomass burning, forests, and engines (3 grants)
2008	<p>Health Effects of Near-Roadway Exposures to Air Pollution Cooperative Agreement (1 cooperative agreement total)</p> <ul style="list-style-type: none"> • Epidemiological study of children with asthma <p>Innovative Approaches to PM Health, Composition and Source Questions (4 grants total)</p>
2009	Targeted Measurements (RFA in development)

An Introduction to NCER

Background

The National Center for Environmental Research (NCER) supports high-quality research by the nation's leading scientists and engineers to strengthen the basis for decisions about local and national environmental issues. NCER works with academia, state and local governments, other federal agencies and scientists in EPA to increase our knowledge of how to protect our health and natural resources through the competitive programs it administers.

Science to Achieve Results (STAR) Grants - Established in 1995, NCER expanded ORD's existing fellowship programs, acquired the Agency's SBIR program and launched its flagship program, the STAR Grants. Through competitive applications and a model independent peer-review process, STAR funds the highest quality scientific work. Outstanding STAR researchers have received many awards, including the Nobel Prize. STAR researchers regularly author highly cited publications and contribute their results to Agency publications and decisions.

STAR Graduate Environmental Research Fellowships and Greater Research Opportunities (GRO) Undergraduate Fellowships - Developing the next generation of environmental scientists and engineers is one of NCER's most important objectives. Each year, NCER helps students achieve degrees in environmental science and engineering through its STAR and GRO fellowship awards. Students have moved on to careers in government, academia, state environmental agencies or furthering their studies through postdoctoral positions at universities.

Small Business Innovative Research (SBIR) - Small business entrepreneurs are developing needed environmental technologies under EPA's SBIR program, and have created new businesses and jobs from these new technologies. In this area of high-risk, cutting-edge inventions where trial and error is often the norm, SBIR-funded projects have led to hundreds of patents and many commercialized technologies.

EPA's P3 Award Competition - EPA's P3 Award Competition is a recent addition to NCER's portfolio. This unique competition awards \$10,000 grants to multidisciplinary teams of college and university students to design a solution to a challenge in sustainability and compete for \$75,000 to take their concept to the next level. In its fifth year, the competition has infused traditional engineering curricula with sustainability principals, launched numerous small businesses and forged exciting collaborations between the schools and their local communities.

What are the science questions to be answered?

To say that NCER's programs address a broad range of science questions is an understatement. Over the course of the organization's relatively short existence, the research supported and the results produced have contributed leading-edge knowledge in every area of environmental science from human health to nanotechnology and every environmental media—air, water, and land.

What will ORD contribute and when?

STAR grants and fellowships, SBIR awards to small businesses and the newly minted P3 awards have been made in every state in the country. With the help of STAR and SBIR scientists and engineers, we learn more each day about how to protect human health and the environment.

Additional information available upon request: *insert name and phone number*

National Center for Environmental Research website: <http://es.epa.gov/ncer/>

Applying for a STAR Research Grant or Fellowship

NCER opens its STAR RFAs throughout the year. A list of current and projected RFAs is posted on the NCER web site. (<http://www.epa.gov/ncer>) RFA announcements are posted on the NCER web site as well as on Grants.gov. Applications may be submitted electronically or by hardcopy. A list serve is available for email notification of newly opened RFAs.

Small Business Innovative Research Program (SBIR)



NCER supports the development of innovative environmental technologies and products through its Small Business Innovation Research program (SBIR). Small firms are eligible to apply for annual solicitations focused in areas of the Agency's interest.

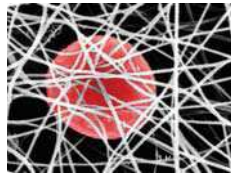
* Annual Phase 1 solicitations open in March each year

* Phase 1 contracts are funded up to \$70,000 each

* Successful Phase 1 recipients can apply for a Phase 2 grant up to \$225,000



NITON's XLp 300 Series Lead Analyzer, pictured above, can measure the concentration of lead in paint even when covered by 50 or more layers of non-lead paint of unknown thickness and composition.



eSpin Technologies' SBIR contract was used to develop nanofibers for air filters to stop particulates smaller than 3 microns

STAR Centers

NCER periodically establishes research centers through the same competitive process, on areas of national concern.

Current centers focus on:

- *Children's health
- *Particulate matter (PM)
- *Computational toxicology
- *Biological threats to homeland security

Research areas of previous centers have included hazardous substances, estuarine and coastal ecosystems, and environmental statistics.

The Children's Environmental Health Research Centers are investigating environmental risks to children and making important discoveries on how to best protect children from toxic exposures.



Our PM Centers are identifying the mechanisms causing cardiovascular and other health effects, mapping health risks, and researching the properties and metabolism of PM exposure that cause chronic effects.



NCER Research Improving Our Health and Environment

With the help of STAR, GRO, and SBIR, scientists we are learning more each day about how to protect our health and environment.

125 of our funded scientists are on ISI's Highly Cited Researchers list, representing more than one third of the researchers in the ecology and environment category.

NCER funded researchers have published more than 8,000 articles in peer reviewed scientific journals. More than one third of our researchers publications in the area of air toxics and particulate matter and in human health are highly cited articles in Thomson's Essential Science Indicators database.

Important Findings

- * Children living within 75 meters of a major roadway have an increased risk of developing asthma
- * 40% of babies exposed to polycyclic aromatic hydrocarbons before birth have genetic damage linked to increased cancer risk.
- * Noninvasive biomarkers like saliva, hair and meconium are good measures of pesticide exposure.
- * Community intervention programs can reduce early childhood exposures to pesticides and insect allergens in the home.
- * Prenatal exposure to lead or tobacco smoke can be linked to Attention Deficit Disorder (ADD).
- * Bird diversity drops significantly when more than 14% of the land is developed within 500 meters of a wetland.
- * Changes in phytoplankton community composition are important indicators of estuarine and coastal ecological health.
- * Benign carbon-dioxide based solvents have been developed and can replace dangerous chlorinated solvents in the dry cleaning and printed circuit board industries.
- * Biodegradable plastics made from corn were developed and are now used in the food packaging industry.
- * Community based conservation has been demonstrated to effect land use practices and reduce deposition of damaging sediments on coral reefs.



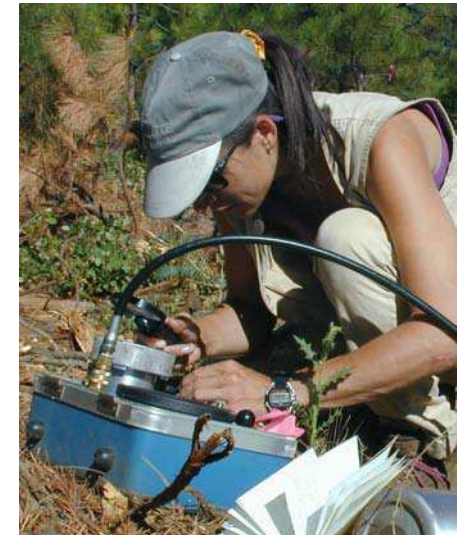
NCER Leadership:
 Director, Dr. William H. Sanders
 Deputy Director, Christopher Zarba

For more info on how to apply see:

<http://www.epa.gov/ncer>

National Center for Environmental Research

Building a scientific foundation for sound environmental decisions



National Center for Environmental Research

Who Are We?

The National Center for Environmental Research (NCER) is one of seven research organizations that comprise EPA's Office of Research and Development (ORD).

NCER's mission is to support high-quality research by the nation's leading scientists that will improve the scientific basis for national environmental decisions.

NCER and ORD mirror the National Academy of Sciences' risk assessment paradigm by focusing research on:

Exposure, Effects, Risk Assessment, and Risk Management

NCER supports leading-edge, extramural research in each of these areas through competitions for grants, fellowships, and innovative small business research contracts.

Science to Achieve Results - STAR

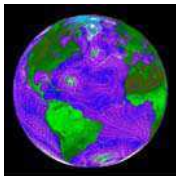
NCER's Science to Achieve Results program funds research grants, cooperative agreements, and fellowships in numerous environmental science and engineering disciplines.

STAR Grants Research Program:

- * Engages the nation's best scientists and engineers in targeted research
- * Compliments EPA's intramural and other federal partner programs
- * Is funded through a competitive solicitation process using Requests for Applications (RFAs)
- * Topics are derived from ORD strategic and research plans
- * RFAs are prepared in cooperation with EPA program offices on significant mission areas
- * Reviews all applications using independent peer review

STAR RFAs have focused on:

- * air toxics & health effects of particulate matter
- * drinking water & water quality
- * global change
- * ecosystem assessment & restoration
- * human health risk assessment
- * endocrine disrupting chemicals
- * pollution prevention & new technologies
- * children's environmental health
- * economics & decision sciences
- * computational toxicology
- * nanotechnology
- * biomarkers



NCER receives approximately 2000-2500 proposals every year and awards about 150 research grants and 125 graduate fellowships. NCER also makes awards under joint RFAs with partnering agencies.

These grants and fellowships have been awarded to universities and non-profit research institutions in all 50 states, Guam, Puerto Rico, and the District of Columbia.



Over \$1 Billion Awarded through more than 1400 STAR Grants and 1300 STAR Fellowships to more than 500 Academic Institutions across the US since 1995

On an annual basis, NCER manages about 500-600 active research grants and 300 fellowships. About 6 percent of the applications submitted to STAR are funded after peer review.

STAR has leveraged its resources through joint solicitations with 12 federal and private-sector research partners.

Grooming the Next Generation of Environmental Scientists and Engineers

One of NCER's highest priorities is ensuring that we have an adequate and well trained scientific workforce that can address tomorrow's complex environmental issues. To respond to this need, NCER supports several fellowship programs focusing on current and future environmental professionals through competitions for grants, fellowships, and innovative small business research contracts.

STAR Fellowships

The STAR Graduate Fellowship Program supports some of the nation's most promising masters and doctoral candidates working towards advanced degrees and careers in environmental science and engineering.

More than 1,300 applicants compete each year for approximately 100 fellowships through a rigorous merit review process. Students can pursue degrees in traditionally recognized environmental disciplines as well as other fields such as social anthropology, urban and regional planning.



STAR Fellowships:

- * Are eligible for US citizens and permanent residents
- * Support full-time 2-year masters or 3-year doctoral degree program
- * Can be used at any accredited US college or university
- * Provide up to \$37,000 per year of support which covers a monthly stipend of \$1,667 for up to 12 months, \$5,000 for authorized expenses, and up to \$12,000 for tuition and fees.
- * See web competitive announcement in August each year, applications due in November

GRO Fellowships

The GRO Graduate Fellowship Program is part of the national effort to help to increase the amount of environmentally-related research being performed at institutions of higher education that receive limited federal research and development funding, including institutions with substantial minority enrollment.

The GRO fellowship program has benefited both the public and private sectors by consistently providing the nation with well trained environmental specialists to meet environmental challenges in our society.



GRO Fellowships:

- * Are eligible to applicants attending fully accredited four year U.S. institutions of higher education
- * Schools must be on the NSF list of institutions receiving \$35 million or less in federal research & development funding
- * Applicants attending eligible institutions with substantial minority enrollment are particularly encouraged to apply
- * Graduate fellowships fund Masters candidates for 2 years and PHD candidates for 3 years
- * Graduate fellowships provide up to \$37,000 per year
- * Undergraduate GRO fellowships encourage students to pursue careers in environmentally related fields and to attain advanced degrees beyond the baccalaureate level
- * Undergraduate GRO fellowships provide up to \$41,500 over a maximum 2 year period

Other Fellowship Programs Supported by NCER:

* American Association for the Advancement of Science (AAAS) Science and Engineering Fellows Program

- Fellows train in offices throughout the EPA on projects in science and policy.

* Association of Schools of Public Health (ASPH) Fellows Program

- professional development program for graduates of accredited US Schools of Public Health

- one-year placements in EPA laboratories/offices to train on high-priority, environmental, public health issues

* EPA Marshall Scholarship Program

- three talented individuals with strong backgrounds in environmentally relevant sciences are selected each year to receive up to five years of graduate education assistance

- 2 years of support are provided by the UK at a university in the UK



GRO Fellow Brent Chavous became a high school biology teacher

People, Prosperity, and the Planet Program



The P3 program was designed to demonstrate the possibilities of innovative, inherently benign, integrated, and interdisciplinary designs that simultaneously benefit people, promote prosperity, and protect and preserve the planet.

NCER's P3 Program funds 1 year Phase 1 grants to undergraduate teams to participate in an annual sustainable design competition.

- * Phase 1 grants are \$10,000 per team
- * About 60 Phase 1 grants awarded each year
- * Teams are required to participate in the National Sustainable Design Expo
- * Phase 2 P3 Award winners receive \$75,000 over a 2 year period to further their designs, implement them in the field, and move them to the marketplace.

