Optimizing NIH Efforts to Engage Pre-college Students in Biomedical Science

James M. Anderson, MD, PhD
Director DPCPSI

SMRB
July 7, 2014

The NIH Mission

"NIH's mission is to seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce illness and disability."

- to develop, maintain, and renew scientific human and physical resources that will ensure the Nation's capability to prevent disease
    - In STEM education NIH is primarily focused on workforce development

Leveraging the NIH investment in people and infrastructure for STEM education

- NIH supports more than 300,000 research personnel at over 2,500 universities and research institutions in every state, Puerto Rico and DC
- In addition, about 6,000 scientists work in NIH's own Intramural Research laboratories (six campuses in MD, NC, AZ, MT)
- No other agency has these unique resources to leverage for STEM
- How do we use them?

PAR-13-104: NIH Summer Re

grants.nih.gov/grants/guide/pa-files/PAR-13-104.html

Department of Health and Human Services

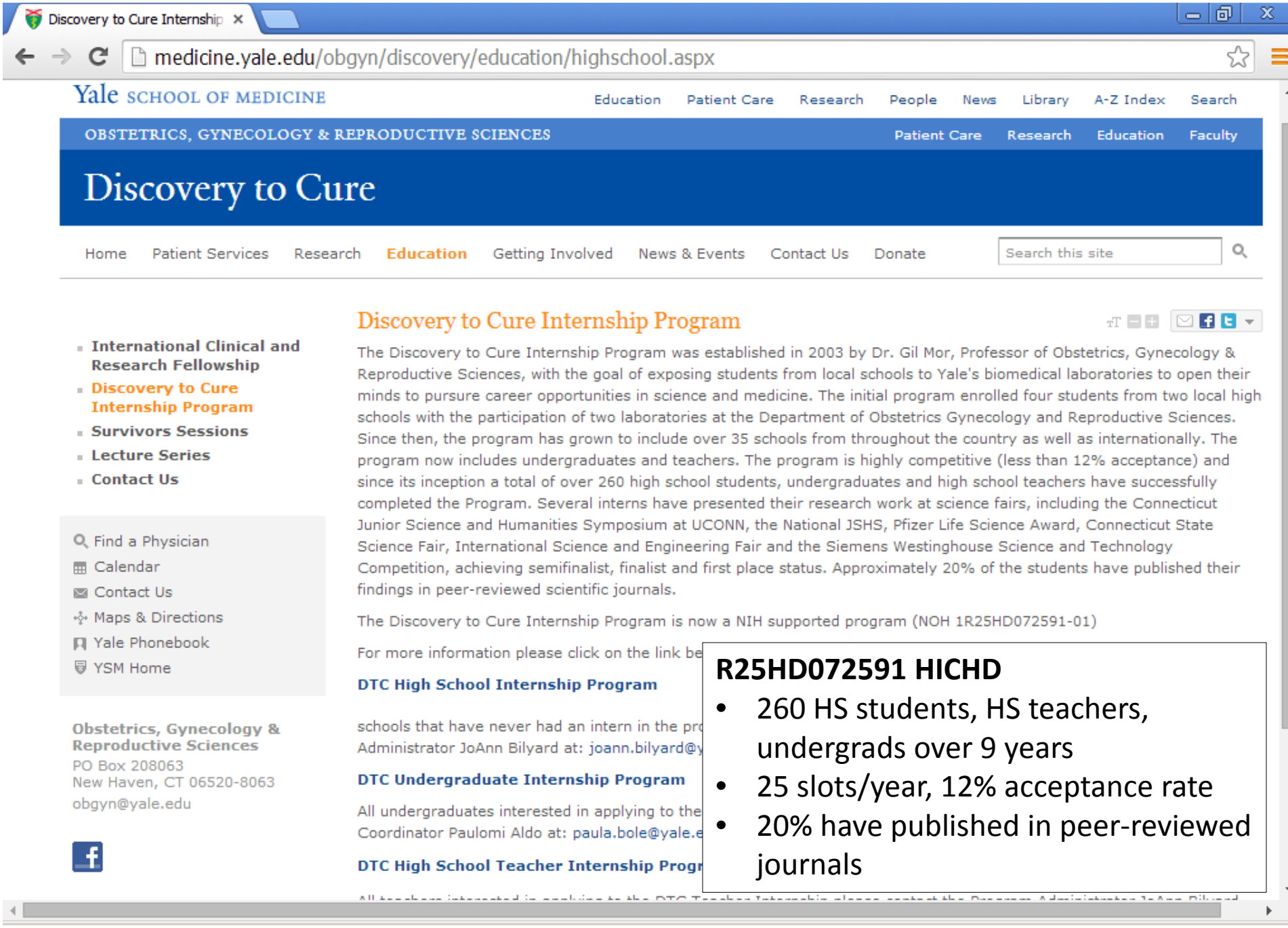
Part 1. Overview Information

Participating Organization(s)	National Institutes of Health (NIH)
Components of Participating Organizations	National Institute on Alcohol Abuse and Alcoholism (NIAAA) National Institute of Biomedical Imaging and Bioengineering (NIBIB) *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) National Institute of Dental and Craniofacial Research (NIDCR) National Institute on Drug Abuse (NIDA) National Institute of Environmental Health Sciences (NIEHS) National Institute of Mental Health (NIMH) National Institute of Neurological Disorders and Stroke (NINDS)
Funding Opportunity Title	NIH Summer Research Experience Programs (R25)
Activity Code	R25 Education Projects
Announcement Type	Reissue of PAR-11-
Related Notices	• June 4, 2014 are essential • May 30, 2013 Dates on or a September 2
Funding Opportunity Announcement (FOA) Number	PAR-13-104
Companion Funding Opportunity	None
Number of Applications	See Section III. 3. Ad
Catalog of Federal Domestic Assistance (CFDA) Number(s)	93.113, 93.121, 93.2
Funding Opportunity Purpose	The purpose of the N Program") is to provi science teachers during the summer academic break. The NIH expects that such programs will: help attract

R25

- 8 - 15 weeks
- S/F up to $5,000 per high school student, up to $6,000 per college student, and up to $21,000 per teacher
- $1000 training expenses

- 8 Institutes
- 38 active awards in FY14
- 25 states
- Total cost $7,882,804


Discovery to Cure Internship
medicine.yale.edu/obgyn/discovery/education/highschool.aspx
Yale SCHOOL OF MEDICINE
Education Patient Care Research People News Library A-Z Index Search
OBSTETRICS, GYNECOLOGY & REPRODUCTIVE SCIENCES
Patient Care Research Education Faculty
Discovery to Cure
Home Patient Services Research Education Getting Involved News & Events Contact Us Donate
Search this site
International Clinical and Research Fellowship
Discovery to Cure Internship Program
Survivors Sessions
Lecture Series
Contact Us
Find a Physician
Calendar
Contact Us
Maps & Directions
Yale Phonebook
YSM Home
Obstetrics, Gynecology & Reproductive Sciences
PO Box 208063
New Haven, CT 06520-8063
obgyn@yale.edu
Discovery to Cure Internship Program
The Discovery to Cure Internship Program was established in 2003 by Dr. Gil Mor, Professor of Obstetrics, Gynecology & Reproductive Sciences, with the goal of exposing students from local schools to Yale's biomedical laboratories to open their minds to pursure career opportunities in science and medicine. The initial program enrolled four students from two local high schools with the participation of two laboratories at the Department of Obstetrics Gynecology and Reproductive Sciences. Since then, the program has grown to include over 35 schools from throughout the country as well as internationally. The program now includes undergraduates and teachers. The program is highly competitive (less than 12% acceptance) and since its inception a total of over 260 high school students, undergraduates and high school teachers have successfully completed the Program. Several interns have presented their research work at science fairs, including the Connecticut Junior Science and Humanities Symposium at UCONN, the National JSHS, Pfizer Life Science Award, Connecticut State Science Fair, International Science and Engineering Fair and the Siemens Westinghouse Science and Technology Competition, achieving semifinalist, finalist and first place status. Approximately 20% of the students have published their findings in peer-reviewed scientific journals.
The Discovery to Cure Internship Program is now a NIH supported program (NOH 1R25HD072591-01)
For more information please click on the link be
DTC High School Internship Program
schools that have never had an intern in the pr
Administrator JoAnn Bilyard at: joann.bilyard@y
DTC Undergraduate Internship Program
All undergraduates interested in applying to the
Coordinator Paulomi Aldo at: paula.bole@yale.e
DTC High School Teacher Internship Progr
R25HD072591 HICHD
260 HS students, HS teachers, undergrads over 9 years
25 slots/year, 12% acceptance rate
20% have published in peer-reviewed journals

About SPUR/SPUR-DAN | The

ctbr.hunter.cuny.edu/content/about-spur

HUNTER

2012 Fellows

Home Research Community

About SPUR/SPUR-DAN

Program Dates: June - August, 2014
Application Deadline: February 1 (Annually), 5pm EST

The CTBR's Summer Program for Undergraduate Research (SPUR) is an 8-week program that gives undergraduates hands-on experience in one of 53 research laboratories at Hunter College, CUNY in NYC. Our goal is to train and encourage under students to pursue graduate study in bio research, and in drug abuse/addiction ar neuroscience.

The SPUR program is now supported by Institute on Drug Abuse (NIDA) through a NIDA's mission is to lead the nation's sc research on prevention, treatment, and consequences of drug addiction. This funding enables us to offe specialized research track in drug abuse/addiction and neuroscience, in addition to our general biomedi more information about research opportunities on these two tracks, click here.

Research

- Faculty Researchers
- Core Facilites
- Support and Services
- Federal Funding
- **Undergraduate Training**
  - SPUR Research Tracks
  - How to Apply to SPUR

R25 DA032520 NIDA

160 undergraduate since 1994

outcomes

- 8 in Ph.D. programs
- 5 in M.D. programs
- 2 received MS
- 1 MPH

Administrative Supplements

www.niehs.nih.gov/careers/research/trainingfrom/supplements/student/

National Institutes of Health - U.S. Department of Health and Human Services

NIH National Institute of Environmental Health Sciences
Your Environment. Your Health.

GO

Health & Education | Research | Funding Opportunities | Careers & Training | News | About NIEHS

A+ A- Share

Careers & Training

- Research Training
  - Training, Fellowship, and Career Awards
    - Supplements for Special Populations
      - Diversity in Health-Related Research
      - **Supplements for Summer Research Experiences for Students and Science Teachers**
      - Reentry into Biomedical Research
      - Supplements to Support Research Capacity in Developing Nations

Administrative Supplements for Summer Research Experiences for Students and Science Teachers

Administrative Supplements for Summer Research Experiences for Students and Science Teachers

▶ Table of Contents

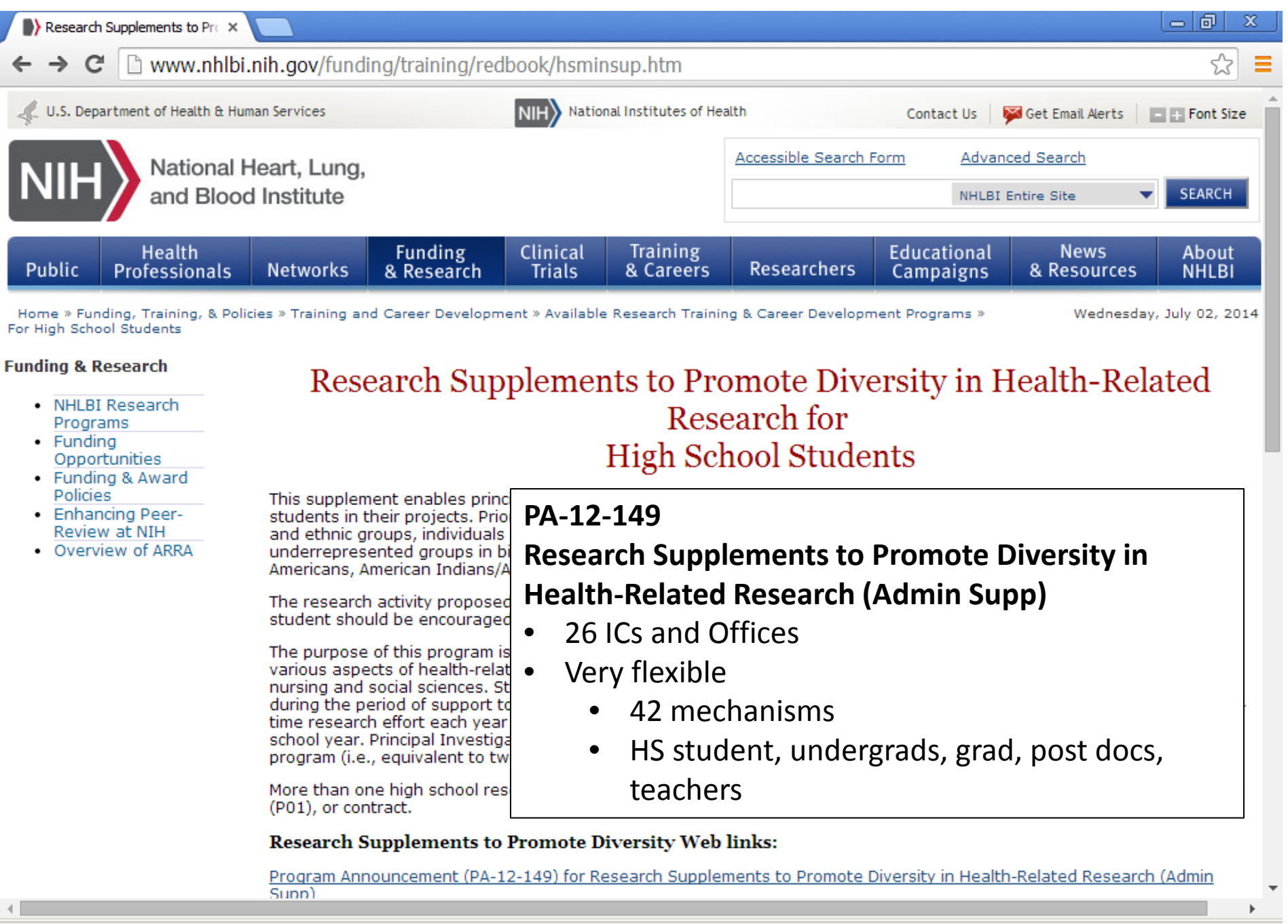
Purpose

As noted in the NIEHS 2006 Strategic Plan, the NIEHS will enhance opportunities for young, motivated high school and undergraduate students, and science teachers, to actively participate in environmental health research. The NIEHS hereby notifies Principal Investigators with R01, R15, R37, or P01 awards that funds are available for administrative supplements to support summer research experiences for talented and gifted high

Administrative Supplements for individuals to research awards

- summer research experiences for high school students, college undergraduates, and science teachers
- R01, R15, R37, or P01 awards

Any NIEHS-supported R01, R15, R37, or P01with a minimum of one year of funding remaining at the time of


Research Supplements to Pr
www.nhlbi.nih.gov/funding/training/redbook/hsminsup.htm
U.S. Department of Health & Human Services
National Institutes of Health
Contact Us
Get Email Alerts
Font Size
National Heart, Lung, and Blood Institute
Accessible Search Form
Advanced Search
NHLBI Entire Site
SEARCH
Public
Health Professionals
Networks
Funding & Research
Clinical Trials
Training & Careers
Researchers
Educational Campaigns
News & Resources
About NHLBI
Home » Funding, Training, & Policies » Training and Career Development » Available Research Training & Career Development Programs » For High School Students
Wednesday, July 02, 2014
Funding & Research
NHLBI Research Programs
Funding Opportunities
Funding & Award Policies
Enhancing Peer-Review at NIH
Overview of ARRA
Research Supplements to Promote Diversity in Health-Related Research for High School Students
This supplement enables princ
students in their projects. Prio
and ethnic groups, individuals
underrepresented groups in bi
Americans, American Indians/A
The research activity proposed
student should be encouraged
The purpose of this program is
various aspects of health-relat
nursing and social sciences. St
during the period of support to
time research effort each year
school year. Principal Investiga
program (i.e., equivalent to tw
More than one high school res
(P01), or contract.
Research Supplements to Promote Diversity Web links:
Program Announcement (PA-12-149) for Research Supplements to Promote Diversity in Health-Related Research (Admin Supp)
PA-12-149
Research Supplements to Promote Diversity in Health-Related Research (Admin Supp)
26 ICs and Offices
Very flexible
42 mechanisms
HS student, undergrads, grad, post docs, teachers

Office of Research Infrastru ×

dpcpsi.nih.gov/orip/CM/index

U.S. Department of Health & Human Services | National Institutes of Health | Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI)

NIH National Institutes of Health
Office of Research Infrastructure Programs

Printer Friendly | Text Size A A A

SEARCH GO

- ORIP HOME
- ABOUT ORIP
- DIVISION OF COMPARATIVE MEDICINE
  - Aquatics
  - Comparative Models
  - Genetic, Biological, & Information Resources
  - Nonhuman Primates
  - Rodents
  - Small Business Opportunities
  - Career Development Opportunites
  - Support for Conferences and Scientific Meetings
- DIVISION OF CONSTRUCTION AND INSTRUMENTS
- OFFICE OF SCIENCE EDUCATION/SCIENCE EDUCATION PARTNERSHIP AWARDS (SEPA)
- RESEARCH FUNDING

DPCPSI Home > ORIP Home > Division of Comparative Medicine

Division of Comparative Medicine

ORIP's **Division of Comparative Medicine** helps meet the needs of biomedical researchers for high-quality, disease-free animals and specialized animal research facilities. The Division supports both individuals and research organizations.
See the latest news, policies, education and training materials, and information about animals in research on the NIH Medical Research with Animals website.

- Aquatics
- Comparative Models
- Genetic, Biological, and Information Res
- Nonhuman Primates
- Rodents
- Small Business Opportunities
- Career Development Opportunities
- Support for Conferences and Scientific Meetings

SELECTED SUPPORTED SCIENTIFIC ADVANCES:

modulators of inflammation and immunity (PGE2, TSG6, and STC1)
Stem Cells. 2013; 31(11):2443-56. PMC3834191

demethylation and a blastocyst-like state in ES cells

COMPARATIVE MEDICINE LINKS

- Staff Contacts

Leveraging Research Centers and Resources

Yerkes -- ION@Yerkes Accep

www.yerkes.emory.edu/about/news/2014_ION_Applications.html

SCHOOLS LIBRARIES RESOURCES This Site All Emory Peopl SEARCH

EMORY | YERKES NATIONAL PRIMATE RESEARCH CENTER

Advancing Science, Improving Healt

HOME ABOUT RESEARCH EDUCATION SUPPORT YERKES! SEARCH YERKES

- About
- Vision, Mission and Values
- Stuart Zola, PhD, Yerkes Director
- History
- Research Advances
- News
  - Animal Resources
  - Behavioral Neuroscience and Psychiatric Disorders
  - Developmental and Cognitive Neuroscience
  - Microbiology and Immunology
  - Neuropharmacology and Neurologic Diseases
  - Pathology
  - Honors
- Animals

Home » About » News »

ION@Yerkes Accepting Applications; Summer 2014 Program Open to High School Students and Middle and High School Teachers

January 23, 2014

Media Contacts

Lisa Newbern, 404-727-7709, lisa.newbern@emory.edu

The Yerkes National Primate Res
with the Center for Behavioral N
Neuroscience (ION)@Yerkes, an
looking for highly motivated high
and high school teachers.

The program, which will begin Ju

Week one – Scholars will partici
Yerkes National Primate Researc
and hands-on activities. Scholar
art research techniques and par
communication, scientific ethics

Next seven weeks – Scholars wi
mentored research may take place at Yerkes, Emory University, Georgia State University, the Georgia Institute of Technology or Morehouse College. Teacher Scholars will be

P51 National Primate Research Center

- Participants: The Yerkes Center, Emory University, Georgia State University, the Georgia Institute of Technology and Morehouse College
- 10 high school students/year
- 3-4 middle or high school science teachers/year
- Institutionally supported

ASSET:
Advancing Secondary Science Education thru Tetrahymena

Home | About the program | Modules | Workshops | **Photos** | Resources | Forms

P40 Resource Center for Tetrahymena thermophila
R25 Science Education Partnership Award (SEPA)

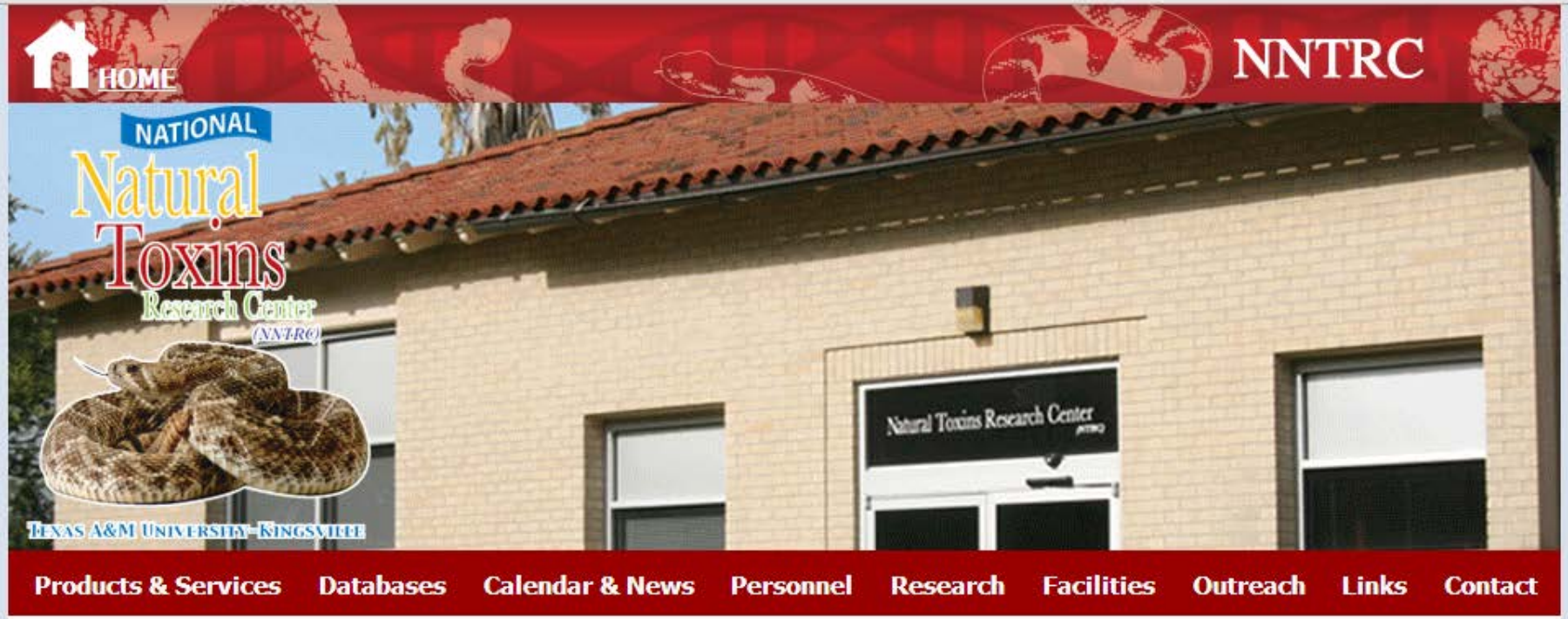
- Cornell University College of Veterinary Medicine

- Self-contained biology teaching modules for use in high school and middle school
- Modules utilize live cultures of *Tetrahymena thermophila*, a safe, easy to grow protozoan
- Hands-on, inquiry-based approach designed to address core biological concepts
- Multi-tiered for use in middle or high school classes
- Summer teacher workshop

Yesterday we did our first Tetrahymena experiment by feeding them India Ink particles to observe food vacuole formation over a period of time. Today we analyzed the data and brainstormed other ways to test food vacuole formation.

Groton NY Science Fair 2011

Three students from Mr. DeVoe's 7th Grade Life Sciences class designed an experiment utilizing Tetrahymena thermophila to studied the effects of temperature on the feeding behavior of tetrahymena



P40 Viper Resource Center - The National Natural Toxins Research Center

- ORIP/DPCPSI
- Texas A&M University-Kingsville
- 2014 - Nine High School students
- DoEd Upward Bound Math & Science

Student Training

- **Purification and characterization of venoms:**
  - *High Performance Liquid Chromatography (HPLC)*
  - *SDS Electrophoresis*
  - *Electrophoretic Titration*
- **Various activity assays:**
  - *Hemorrhagic*
  - *Proteolytic*
  - *Coagulation*
  - *Fibrinolytic*
  - *Aggregation*
- **Cloning from cDNA libraries for disintegrin molecules**
- **Tissue culture assays**
  - *Cell binding*
  - *Cell migration*
- **Creation of Research**

Viper Resource Center - The National Natural Toxins Research Center

Student comments from the 2009 Summer Research Program at NNTRC

Jennifer Allen:
"Working at the NNTRC has allowed me the opportunity to learn lab techniques alongside several accomplished researchers and professors. Prior to joining the NNTRC, I did not have any research experience. I am now aware of how venom proteins may be able to cure or prevent illnesses."

Tracey Alvarado:
"I was able to learn about the different instruments used and how to apply these techniques to important biochemical research. This opportunity has opened my eyes to the career of doing biomedical research."

Cody Bigelow:
"I'm a sophomore in high school. Before attending this research program, I had no background in a research lab. Thanks to this program, I have learned about the different types of instruments that are used in the lab and how to use and apply them in different assays."

Kelsi Gulick:
"I have learned many concepts in the field of Molecular Biology that correlates with medical research. After being so directly involved in medical research I have now gained a new respect for people who work so diligently to develop a new drug."

NIH Intramural Summer Internship Program

- Eight+ week research experience at all levels
  - High School
  - College
  - Medical/Dental
  - Graduate (MS. PhD, PharmD, PsyD, etc)
- Many workshops and other educational opportunities
- Access to pre-graduate advising
- End-of-summer poster session

- ~ 1200 students each summer (25% HS students)
- ~1250 intramural labs with ~ 7,500 investigators and trainees

http://www.training.nih.gov/student/sip/

Observations

- Leveraging the investment in people and research infrastructure is the unique contribution NIH can make in STEM

- There are many approaches
  - Group training programs
  - Individual supplements to existing research awards
  - Appropriate use of NIH-supported resources with co-funding

- It is widely done (but challenging to quantify)