



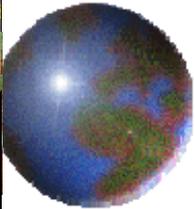
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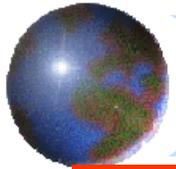
*NSF Funding Opportunities
in
Biological Sciences*

Patrick P. Dennis

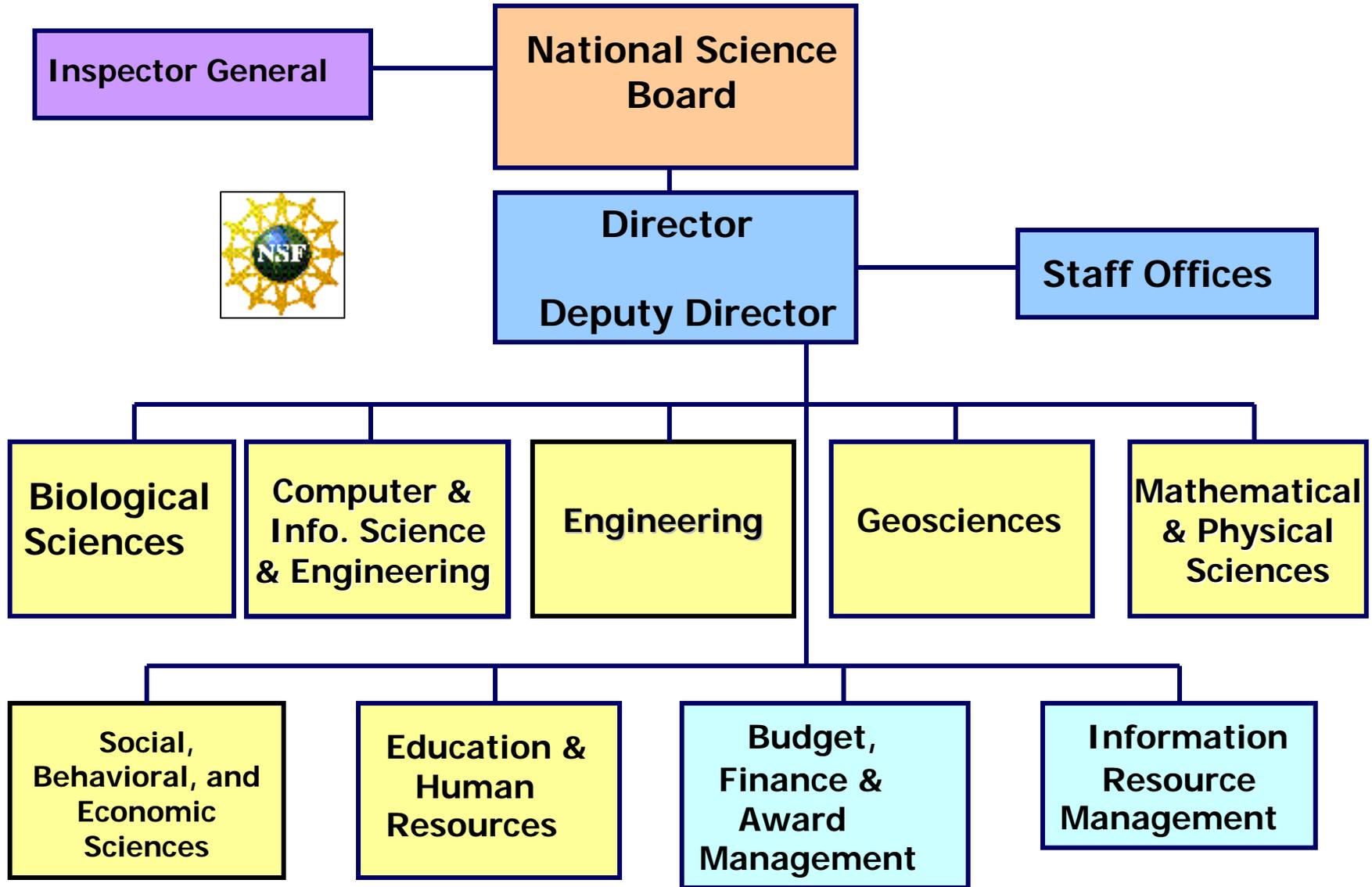
Program Director

Division of Molecular and Cellular Biosciences





National Science Foundation



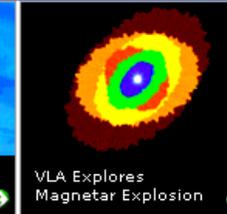


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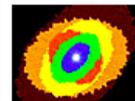
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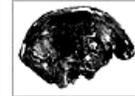
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Directorate for Biological Sciences (BIO)

James Collins, Assistant Director
Joann Roskoski, Executive Officer

Information and Automation
Resources Unit
(IAR)

Division of
Biological
Infrastructure
(DBI)

Human
Resources

Research
Resources

Plant Genome
Research Program

Division of
Environmental
Biology
(DEB)

Ecological Biology

Ecosystem
Science

Population &
Evolutionary Processes

Systematic Biology &
Biodiversity Inventories

Division of
Integrative
Organismal Biology
(IOB)

Behavioral
Systems

Developmental
Systems

Environmental &
Structural Systems

Functional &
Regulatory Systems

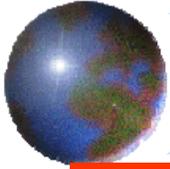
Division of
Molecular and
Cellular
Biosciences
(MCB)

Biomolecular
Systems

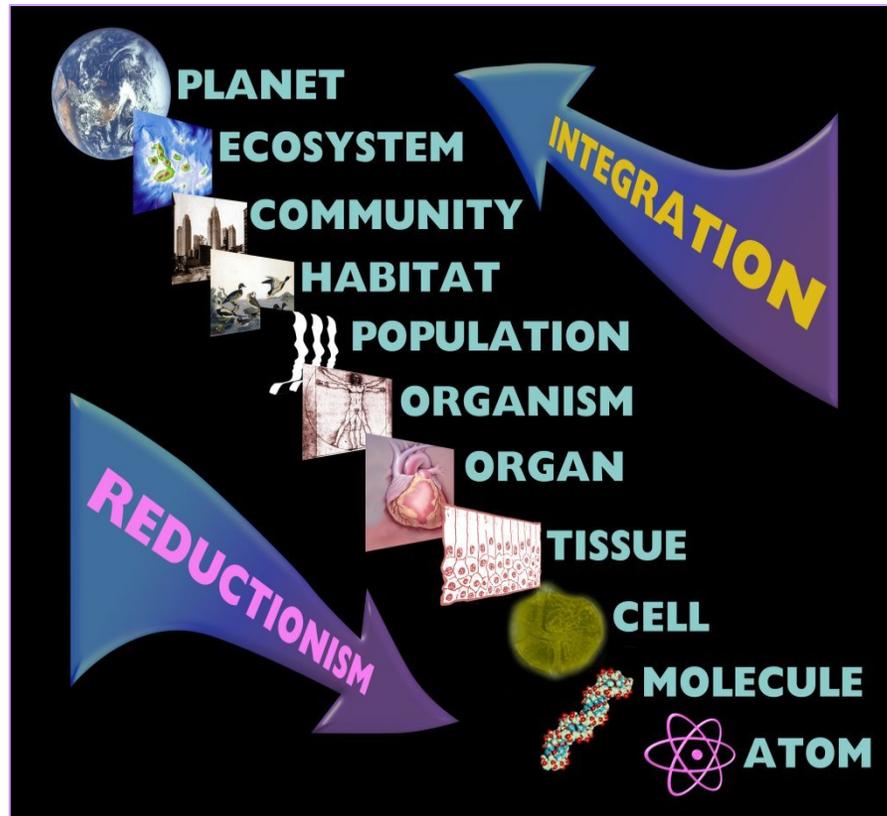
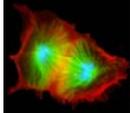
Cellular Systems

Genes and Genome
Systems

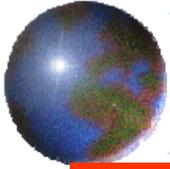
Emerging Frontiers (EF)



Challenges for 21st Century Biology



- Multidisciplinary and integrative
- Informational science
- Broaden participation, diversity and inclusiveness
- Internationally engaged
- Education oriented
- Facilitate public understanding of science
- Provide research infrastructure



Division of Molecular and Cellular Biosciences (MCB)

Fundamental understanding of life processes at the molecular, subcellular, and cellular levels

● **Biomolecular Systems**

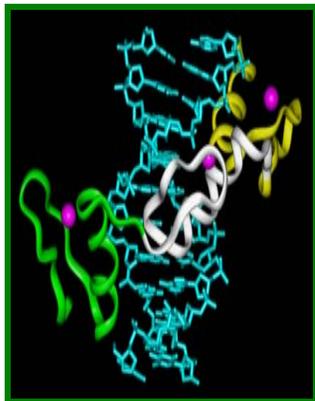
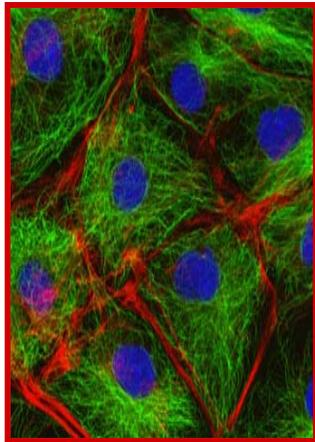
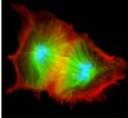
- ❏ Structure, function, dynamics, interactions, and interconversions of biological molecules

● **Cellular Systems**

- ❏ Emphasizes the structure, function, and regulation of plant, animal and microbial cells, and their interactions with the environment and with one another

● **Genes and Genome Systems**

- ❏ Emphasizes genomes and genetic mechanisms in all organisms, whether prokaryote, eukaryote, phage, or virus





Integrative Organismal Systems



● Behavioral Systems

- Animal behavior

● Developmental Systems

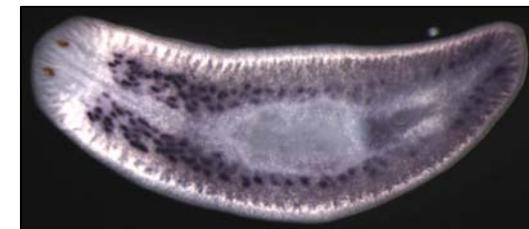
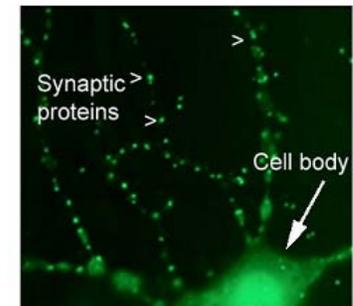
- Animal Developmental Systems
- Plant, Fungal and Microbial developmental systems
- Evolution of Developmental Systems

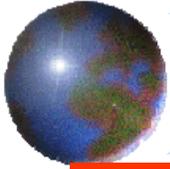
● Neural Systems

- Behavioral Neuroscience
- Cellular and Developmental Neuroscience
- Computational Neuroscience
- Neuroendocrinology
- Sensory Systems

● Physiological and Structural Systems

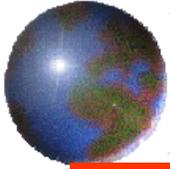
- Organism-Environment Interaction
- Symbiosis, Defence and Self Recognition
- Processes, Structure and Integrity





Division of Environmental Biology (DEB)

- **Ecological Biology**
 - ❏ Species interactions, community ecology, food webs, landscape ecology, paleoecology, co-evolution
- **Ecosystem Science**
 - ❏ Whole-system processes, biogeochemistry, decomposition, productivity
- **Population and Evolutionary Processes**
 - ❏ Population dynamics, evolutionary ecology, evolutionary genetics, molecular population biology
- **Systematic Biology & Biodiversity Inventories**
 - ❏ Plant and animal classification, systematics, phylogenetics, taxonomy, biodiversity,



Division of Biological Infrastructure (DBI)

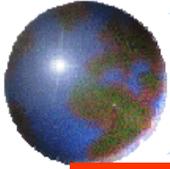
● Human Resources

- ❑ Cross-disciplinary Research at Undergraduate Institutions (C-RUI)
- ❑ Research Experience for Undergraduates and Undergraduate Mentoring in Environmental Biology
- ❑ Postdoctoral Research Fellowships for minorities and in Biological Informatics

● Research Resources

- ❑ Biological Databases and Informatics
- ❑ Biological Research Collections
- ❑ Instrumentation





Funding Opportunities

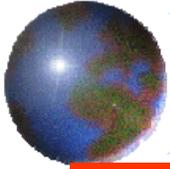
● **Unsolicited Proposals in Disciplinary Programs**

- ❑ Regular research grants- RUI
- ❑ CAREER program
- ❑ SGER and conference grants

● **Solicited proposals for specific programs**

- ❑ C-RUI grants
- ❑ Supplements for broadening participation and for enhancing research impacts
- ❑ Center grants- S&T centers, MRSEC, NSEC
- ❑ Training grants- IGERT, REU sites, GK12
- ❑ Instrumentation grants
- ❑ Priority areas





Regular Research Grants

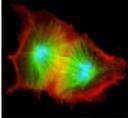
- **Unsolicited**

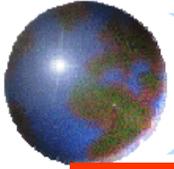
- **Any topic**

- ❑ BIO Directorate does not consider disease related research proposals.

- ❑ BIO Directorate does not consider duplicate proposals unless you are a beginning investigator.

- **Research Programs and Clusters are described on the web page.**





CAREER Proposals

Faculty Early Career Development (CAREER) Program

● Eligibility

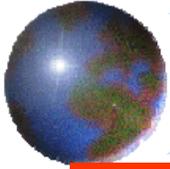
- untenured assistant professors

● Features

- Plans for research and education for five years
- Minimum of \$500,000 for five years
- Once a year
- Some CAREER awardees receive PECASE awards

● Check the program announcement



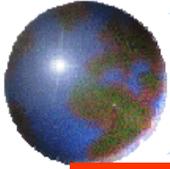


RIG CAA: Research Initiation Grants and Career Advancement Awards For Broadening Participation

- **Objective**
 - ❑ To provide starter funding so that PIs can obtain competitive research funding for broadening participation
- **Eligibility**
 - ❑ Faculty from underrepresented groups
 - ❑ Minority serving institutions
 - Others with plans to increase minority participation

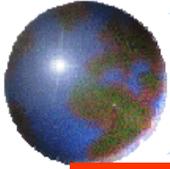
Types

 - ❑ RIG – New Investigators
 - ❑ CAA – May have previous or current research funding
- **Budget**
 - ❑ Includes \$150k - 24 months, \$25k equipment



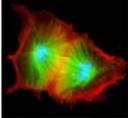
Other BIO-wide opportunities

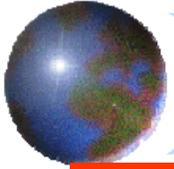
- **Tree of Life**
 - Systematics and classifying organisms
- **Frontiers in Integrated Research (FIBR)**
- **Arabidopsis 2010**
- **Plant Genome**
- **Ecology of Infectious Diseases (EID)**
- **Research Coordination Networks (RCN)**
 - Collaboration among scientists across geographic, disciplinary, and organizational boundaries, new research directions
- **Microbial Observatories (MO) and Microbial Interactions and Processes (MIP)**
- **Microbial Genome Sequencing**



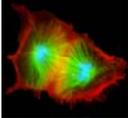
Award Supplement Opportunities

- **Research Experiences for Teachers (RET)**
- **Research Experiences for Undergraduates (REU)**
- **Research Opportunity Awards (ROA)**
- **Research Assistantships for Minority High school Students (RAMHSS)**
- **Informal Science Education Supplements**
- **International Research and Education Supplements**

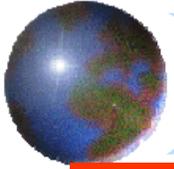




Biological Databases and Informatics



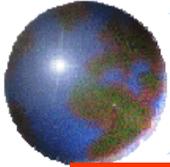
- **Computational aspects funded in all programs in the BIO directorate**
- **BDI focuses on generalizable applications and tools and solutions across biology areas**
- **BDI covers all areas of biology, from ecoinformatics to microarrays**



Plant Genome Research Program

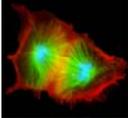


- **Overall Program Goals:**
- Support research on the structure, organization and function of plant genomes, biological processes
- Accelerate the acquisition and utilization of new knowledge and innovative technologies in plants
- Focus is on plants of economic importance and plant processes of potential economic value.



The 2010 Project: FY2006

The goal is to determine the function of all genes
in *Arabidopsis thaliana* by the year 2010



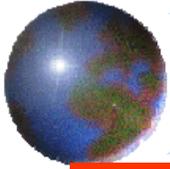
✦ *Arabidopsis* Genome Sequenced, Dec 2000
NSF initiated the 2010 project in 2001

Emphasis Areas

- ✦ Benchmarking the Gene Function
 - A function determined for the entire genome
- ✦ Methods and Resources
 - Arabidopsis-specific
- ✦ Exemplary Networks
 - Computational and experimental tools

Budget

- ✦ Total
 - 25 mil
- ✦ Projects
 - Up to 5 mil for up to 5 years
 - Resource projects no more than 3 years



FIBR: Frontiers in Integrative Biological Research

- **Goal:** To support integrative research which addresses major questions in the biological sciences.
- **FIBR** encourages PIs
 - ❏ to identify major under-studied or unanswered questions in biology
 - ❏ to develop innovative approaches to address them
 - ❏ to integrate the scientific concepts and research tools of biology, math and the physical sciences, engineering, social sciences and the information sciences.
- Up to 5 mil for up to 5 years

