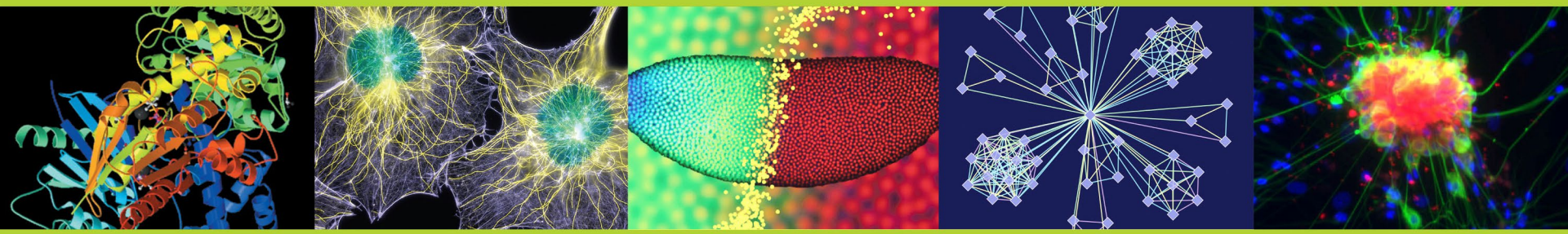
National Institute of General Medical Sciences

NIGMS Funding Opportunities in Bioinformatics and Computational Biology

Jean Yuan, PhD
Chief, Bioinformatics and Computational Biology Branch
Division of Biophysics, Biomedical Technology, and Computational Biology
National Institute of General Medical Sciences (NIGMS)

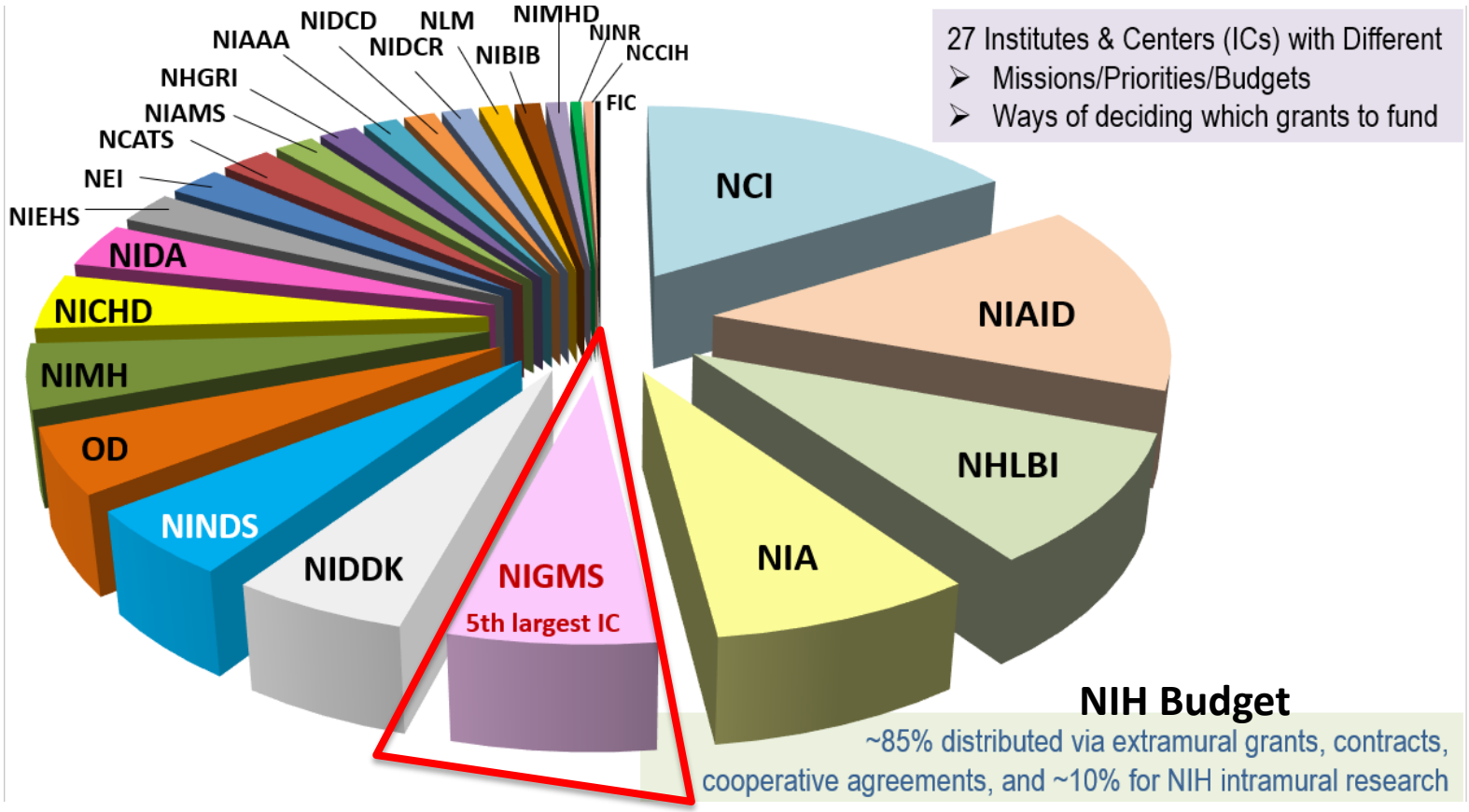
BIBM 2022 Funding Panel



National Institute of General Medical Sciences

National Institutes of Health (NIH)

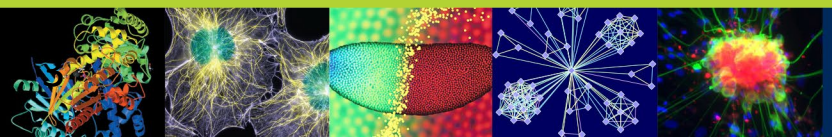
NIH is composed of 27 Institutes and Centers (ICs)



NIGMS Mission

The National Institute of General Medical Sciences **(NIGMS)** supports basic research that increases **understanding of basic biological processes** and lays the **foundation** for future advances in disease diagnosis, treatment, and prevention.

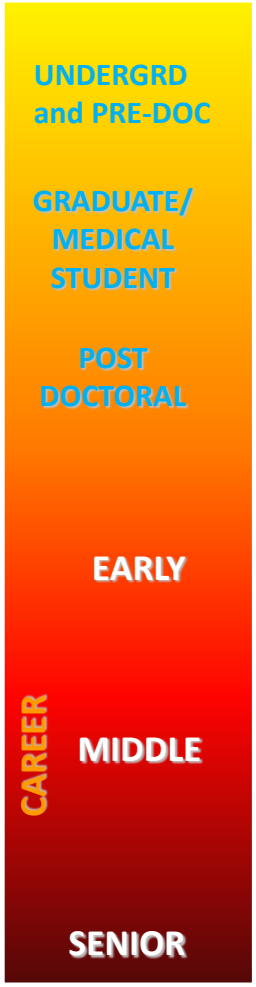
- NIGMS-funded scientists investigate how living systems work at a range of levels, from molecules and cells to tissues and organs, in research organisms, humans, and populations.
- NIGMS supports **research and technology development** that is aimed at understanding general principles, mechanisms, and processes.
- NIGMS **does not support research that focuses on single classes of cells, tissues, organs, or diseases** unless they are used as models for elucidating basic principles.



Overview of NIGMS/NIH Grant Mechanisms

Approx. Career Stage

Support for Career Development
(http://grants2.nih.gov/training/extramural.htm)



Grants for Independent Research

R01 (4-5yrs)
NIGMS MIRA R35 (5yrs)
R21 (2yrs)
R15 (3yrs)
R03 (2-3yrs)

Bridges to the Baccalaureate (T34), U-RISE(T34)
Postbaccalaureate Research Edu Program (PREP) (R25)
Pre-doctoral Institutional Training Grant (T32)
Pre-doctoral Individual NRSA (F31)
Pre-doctoral Individual MD/PhD NRSA (F30)

Postdoctoral Institutional Training Grant (T32)
Postdoctoral Individual NRSA (F32)

NIH Pathway to Independence Award (K99/R00)

Mentored Research Scientist Development Award (K01)
Mentored Clinical Scientist Development Award (K08)

Mentored Patient-Oriented Research Career Development Award (RCDA) (K23)
Mentored Quantitative RCDA (K25)

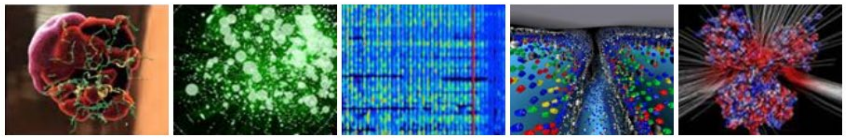
Midcareer Investigator Award in Patient-Oriented Research (K24)

Bioinformatics and Computational Biology Branch (BCB)

NIGMS BCB branch supports research in developing bioinformatics and computational methods (computer sciences, engineering, mathematics, biostatistics and physics) in addressing biomedical problems; develop general approaches for broad usage

Bioinformatics and Computational Biology

This branch supports bioinformatics and computational approaches that join biology with the computer sciences, engineering, mathematics, biostatistics and physics as well as general approaches that have the potential for broad applicability and usage by investigators with support from across NIH and other agencies. The branch also collaborates with the National Science Foundation to support a program in mathematical biology.

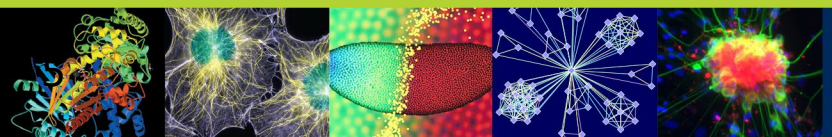


Program Areas

- Models of Infectious Disease Agent Study (MIDAS)
- Mathematical Biology
- Investigator-Initiated Research Grants
- Small Business Grants

Research topics of interest:

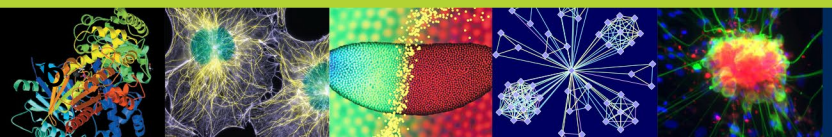
- Modeling and computational methods development for biomedical problems
- Biostatistics, and quantitative analysis of biological data
- Bioinformatics tools/platforms, knowledgebase and data repository
- Health informatics
- Infectious disease modeling



Bioinformatics and Computational Biology Branch (BCB)

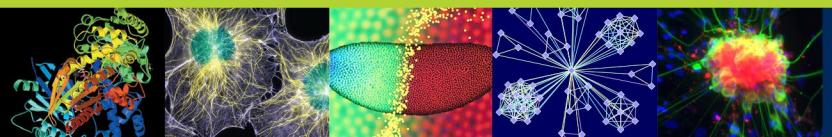
Funding areas/mechanisms:

- Investigator-initiated research grants: **R01, R21**, R13/U13, R15, **MIRA R35**
- **Software/Computing in Biotechnology Development Program**
- **Mathematical Biology**: joint DMS/NIGMS initiative to support research at the interface of the biological and mathematics (Solicitation 22-600)
- Models of Infectious Disease Agent Study (MIDAS): computational modeling to improve the detection, control, and prevention of emerging infectious diseases
- Research program in collaboration with other NIH ICs
  - U24 Biomedical Knowledgebase (PAR-20-097) and Biomedical Data Repository (PAR-20-089)
- Other mechanisms: Small Business Innovation Research and Small Business Technology Transfer grants; Training grants



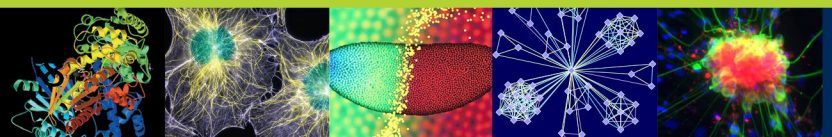
NIGMS Maximizing Investigators' Research Award (MIRA R35)

- Provides investigators with greater
  - Stability: 5 years support; PI may spend less time writing applications and have more time for research and mentoring
  - Flexibility: No specific aims required; PI may follow important new research directions
- Two MIRA FOAs
  - Early-Staged Investigators: PAR-20-117/NOT-GM-23-017 (re-issuing with two submissions)
  - Established Investigators and New Investigators: PAR-22-180 (January and May submissions)



Mathematical Biology: Joint NSF-DMS/NIH Program

- Program Solicitation 22-600 : supports research at the interface of the biological and mathematical sciences and statistics to answer questions in the biological and biomedical sciences
- Responsive applications: Integrate math and biology
  - ✓ Address biomedical/biological questions that fit NIGMS mission
  - ✓ Develop innovative mathematical/statistical/computational methods
- Two Tracks:
  - Track1 (up to $600K for 3yrs: Exploratory projects (high risk/high reward) and/or new teams
  - Track 2 (up to $1.2M for 3-4yrs): Large scope projects from well-established teams
- One submission each year: to NSF between September 1 - 19



NIGMS Biomedical Technology Program

From Untested Concepts to Broad Dissemination

Untested Concepts

Proof-of-Concept

PAR-22-126
Innovative prototype and exploratory technology (R21)

Examples: instruments, **algorithms and software**, etc.

Testing, Evaluation, Prototype

Feasibility

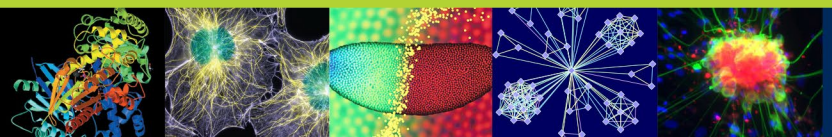
PAR-22-127
Focused Technology Research and Development (R01)

Optimization & Dissemination

Broad Application

PAR-20-104
Biomedical Technology Development and Dissemination Center (BTDD, RM1)

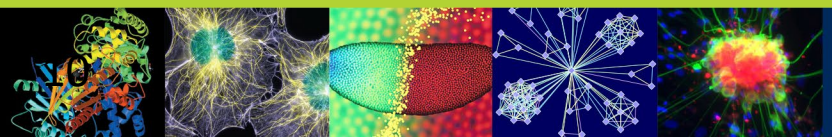
Parent R01
Commercialization (SBIR/STTR)



Checklist for Preparation of Applications

- ❑ Research ideas: W's and How
- ❑ NIGMS mission relevance: If you are uncertain, contact me and Program Officer (POs) for advices
- ❑ Grant application writing for NIH
  - Read and follow instructions
  - Good grantsmanship
    - Refer to literature accurately and thoroughly
    - Include well-designed tables and figures
- ❑ Include potential pitfalls & alternative approaches
- ❑ Get feedback from investigators familiar with NIH applications; Ask for advice from trusted colleagues, mentors
- ❑ Allow time for submission, avoid last minute before deadline
- ❑ Send in supplemental materials if allowed by the FOA (check with SRO)

Ask your NIH POs



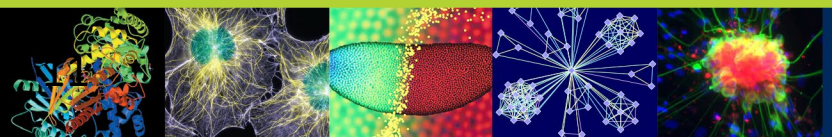
Useful Websites

NIH Funding Opportunity Announcements (FOAs) can be found at the **NIH Guide**
http://grants.nih.gov/grants/guide/index.html
NIGMS MIRA Programs and FOAs
https://www.nigms.nih.gov/research/mechanisms/MIRA/pages/default.aspx
NIGMS Tech Dev Programs and FOAs
https://www.nigms.nih.gov/grants/Pages/Technology-Development-Programs.aspx
NIH Common Fund Programs and FOAs
https://commonfund.nih.gov/grants/fundedresearch

Some Resources:

Samples applications: https://www.niaid.nih.gov/grants-contracts/apply-grant
ESI FAQ: https://grants.nih.gov/policy/early-investigators/faqs.htm
NIH Grants FAQ: https://grants.nih.gov/grants/frequent_questions.htm
Finding your potential NIH IC and PO: https://reporter.nih.gov/matchmaker
Finding your potential study section: https://public.csr.nih.gov/ForApplicants/ArtHome
Open Mike: https://nexus.od.nih.gov/all/category/blog/open-mike/

Sign-up and follow Weekly updates of NIH Funding Opportunities and Notices at
http://grants.nih.gov/grants/guide/listserv.htm
Sign-up and follow NIGMS at https://loop.nigms.nih.gov/



Any Questions?

Jean.Yuan@nih.gov