Overview of NIH/NCI Grants

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Division of Cancer Biology

National Cancer Institute
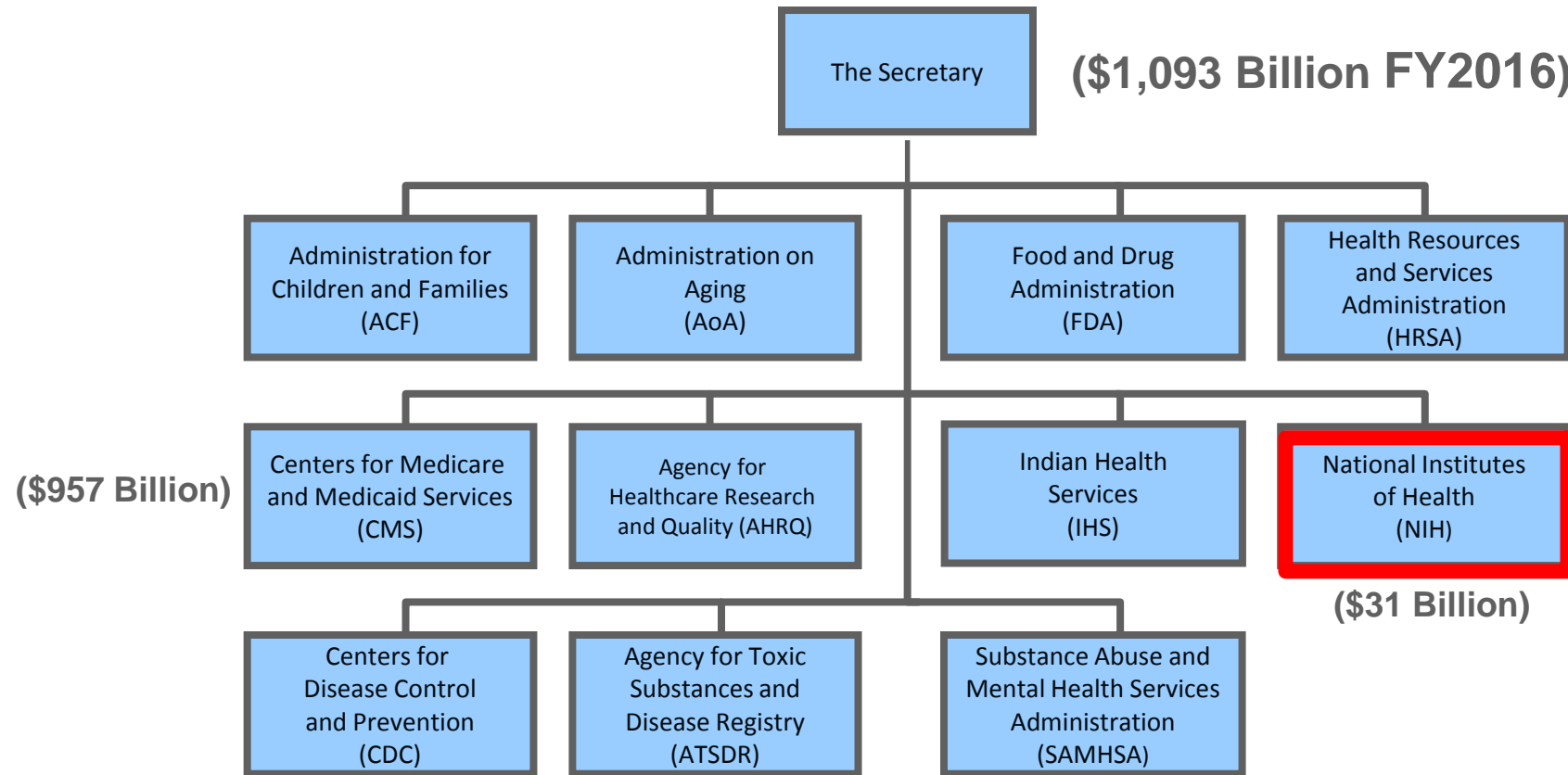
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NIH › NATIONAL CANCER INSTITUTE

- Susan A. McCarthy
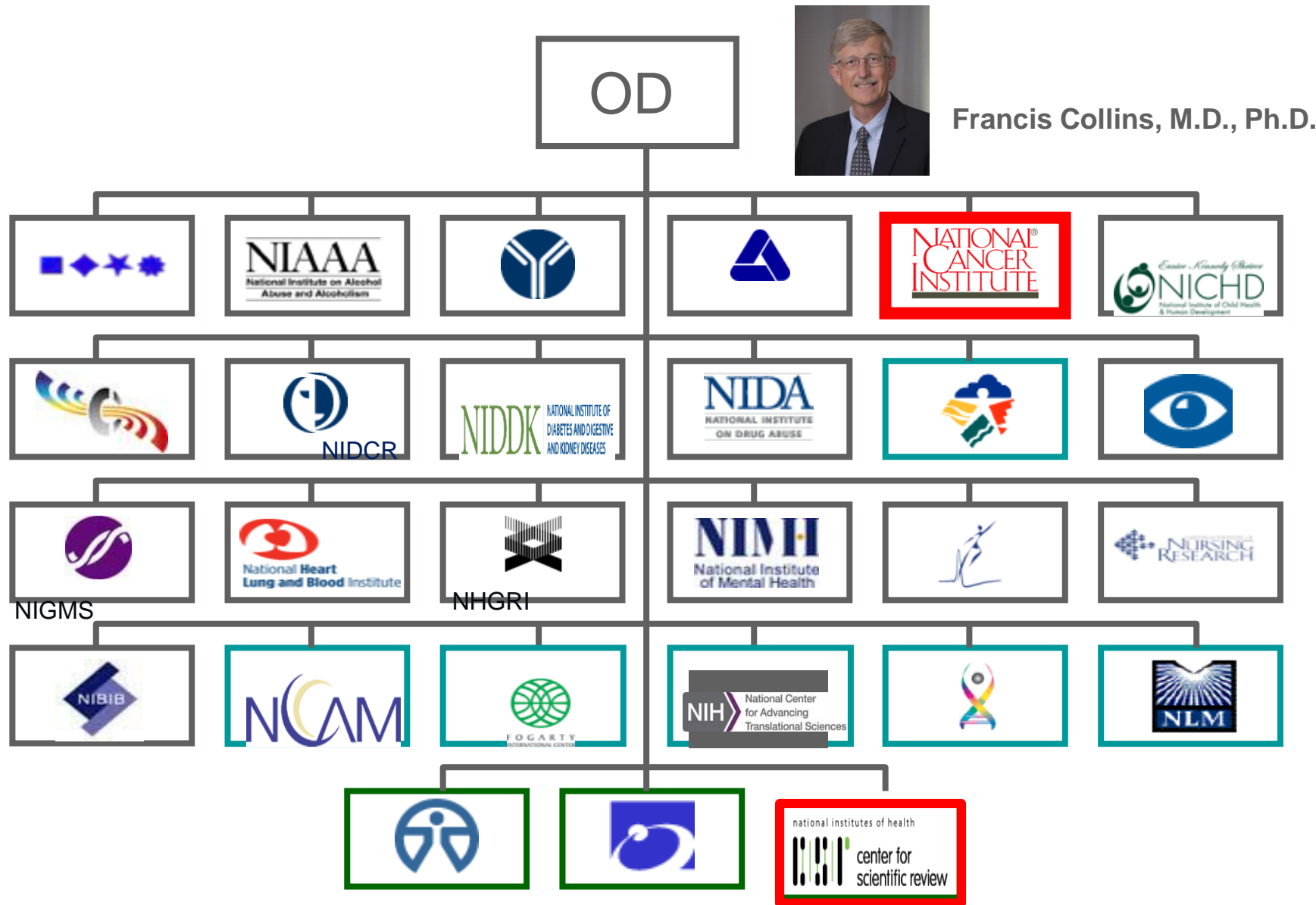
- No Relationships to Disclose

Three Topics for Today …

1. What the NIH and the NCI have to offer

2. Get in the game

3. Make the most of your grant

NIH is an agency within the
U.S. Department of Health and Human Services (DHHS)

Source: *http://www.hhs.gov/budget*

The National Institutes of Health
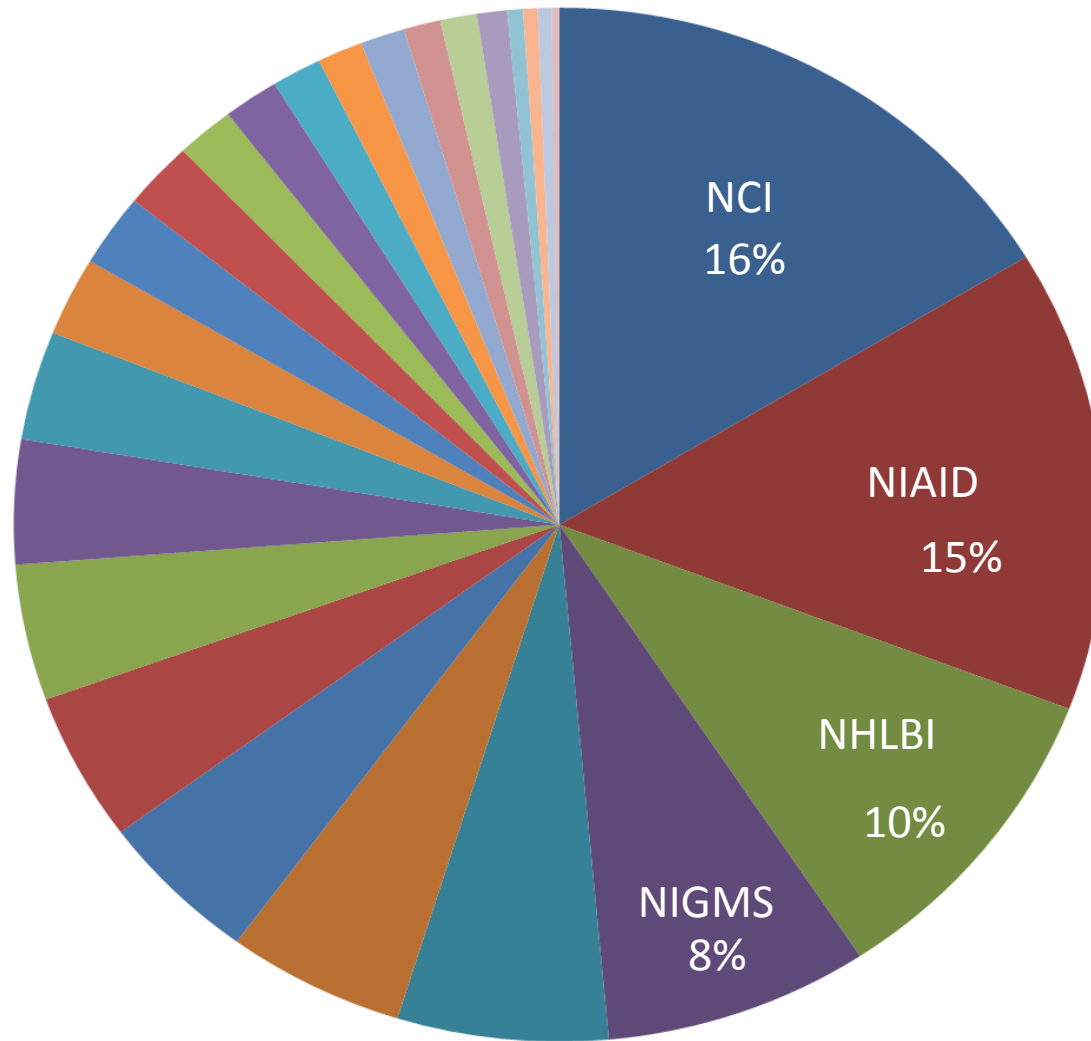

Francis Collins, M.D., Ph.D.

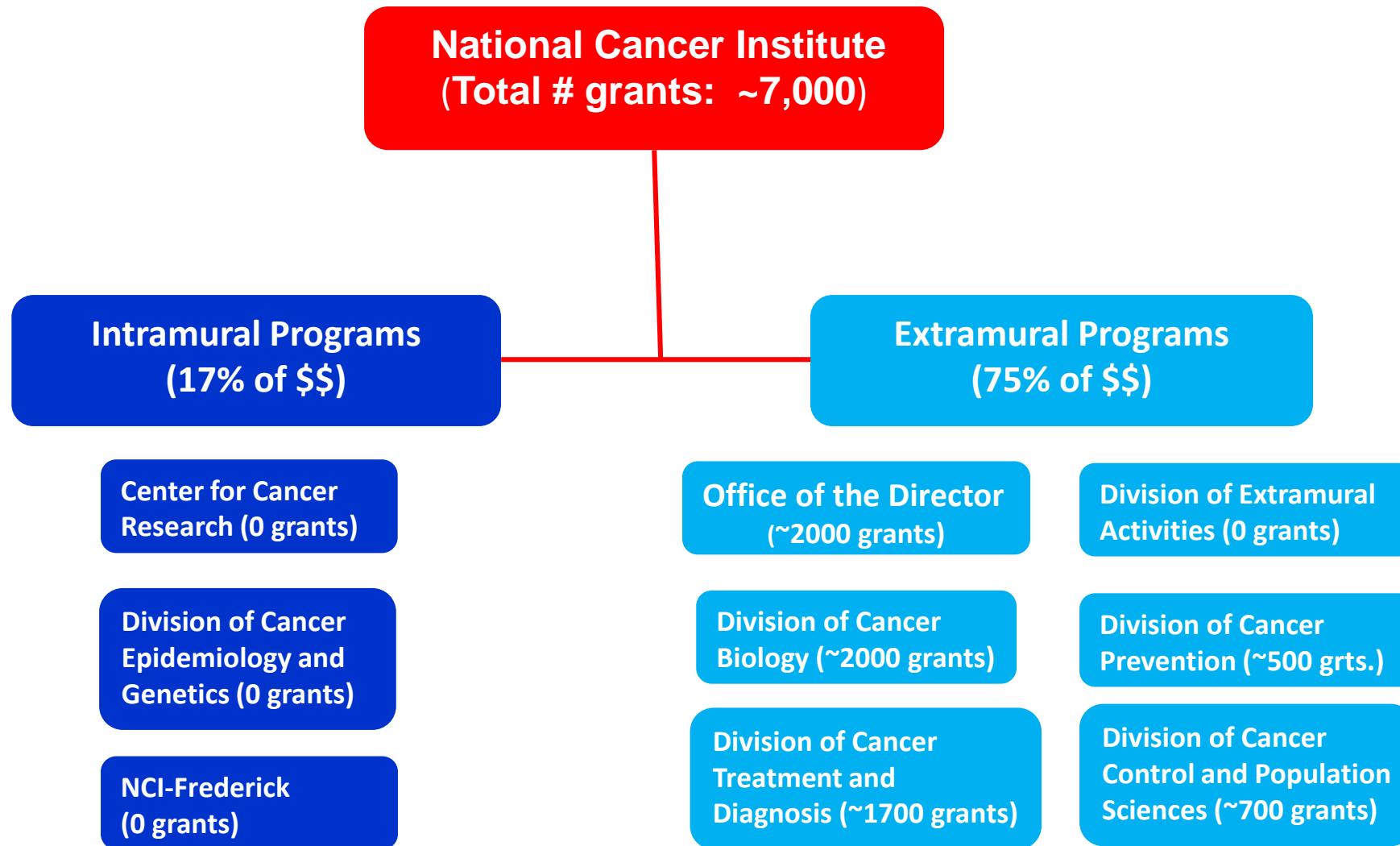# Appropriations: Funding The NIH

➢ The NIH budget is specified by Congress through a yearly appropriations bill which is signed into law by the President.

➢ Provides each NIH Institute and Center (IC) with specific funds to carry out its respective programs and missions.

➢ The fiscal year begins October 1.

NIH Budget Allocation by Institute/Center

NCI
16%

NIAID
15%

NHLBI
10%

NIGMS
8%

Organization of the National Cancer Institute

National Cancer Institute
(Total # grants: ~7,000)

Intramural Programs
(17% of $$)

Extramural Programs
(75% of $$)

Center for Cancer Research (0 grants)

Division of Cancer Epidemiology and Genetics (0 grants)

NCI-Frederick (0 grants)

Office of the Director (~2000 grants)

Division of Extramural Activities (0 grants)

Division of Cancer Biology (~2000 grants)

Division of Cancer Prevention (~500 grts.)

Division of Cancer Treatment and Diagnosis (~1700 grants)

Division of Cancer Control and Population Sciences (~700 grants)

How Does the NIH Solicit Applications?

- **Funding Opportunity Announcements (FOA)** published through the NIH Guide (http://grants.nih.gov/grants/guide/)

- Parent Announcements cover basic mechanisms (R01; PA-16-160) https://grants.nih.gov/grants/guide/pa-files/PA-16-160.html
  - investigator-initiated research projects

- Special/Topical Announcements to fill gaps
  - Requests for Applications (RFA)
  - Program Announcement (PA)
  - Program Announcement with Special Review (PAR)
  - Program Announcement with Set-Aside (PAS)

https://www.cancer.gov/grants-training/grants/funding-opportunities

Examples of Recent NCI DCB-sponsored FOAs

Targeted FOAs are developed by NCI staff to address identified gaps
and potential opportunities to move the field forward.

PAR-16-344 Biological Comparisons in Patient-Derived Cancer Models (U01)

PA-16-177 Pilot and Feasibility Studies Evaluating the Role of the Epitranscriptome (R21)

PAR-16-105 Cancer Tissue Engineering Collaborative: Enabling Biomimetic Tissue-Engineered Technologies for Cancer Research (U01)

PAR-16-058 Collaborative Research Projects to Enhance Applicability of Mammalian Models for Translational Research (R01)

(PA-16-251, PA-16-252 Gene Fusions in Pediatric Sarcomas (R01, R21)

PA-16-425, PA-16-426 "High" or "Medium" Priority AIDS Research on Non-AIDS-defining or AIDS-defining Cancers

PAR-15-092, PAR-15-093 Basic Cancer Research in Cancer Health Disparities (R21, R01)

PAR-16-226, PAR-16-227 The Role of Mobile Genetic Elements in Cancer (R21, R01)

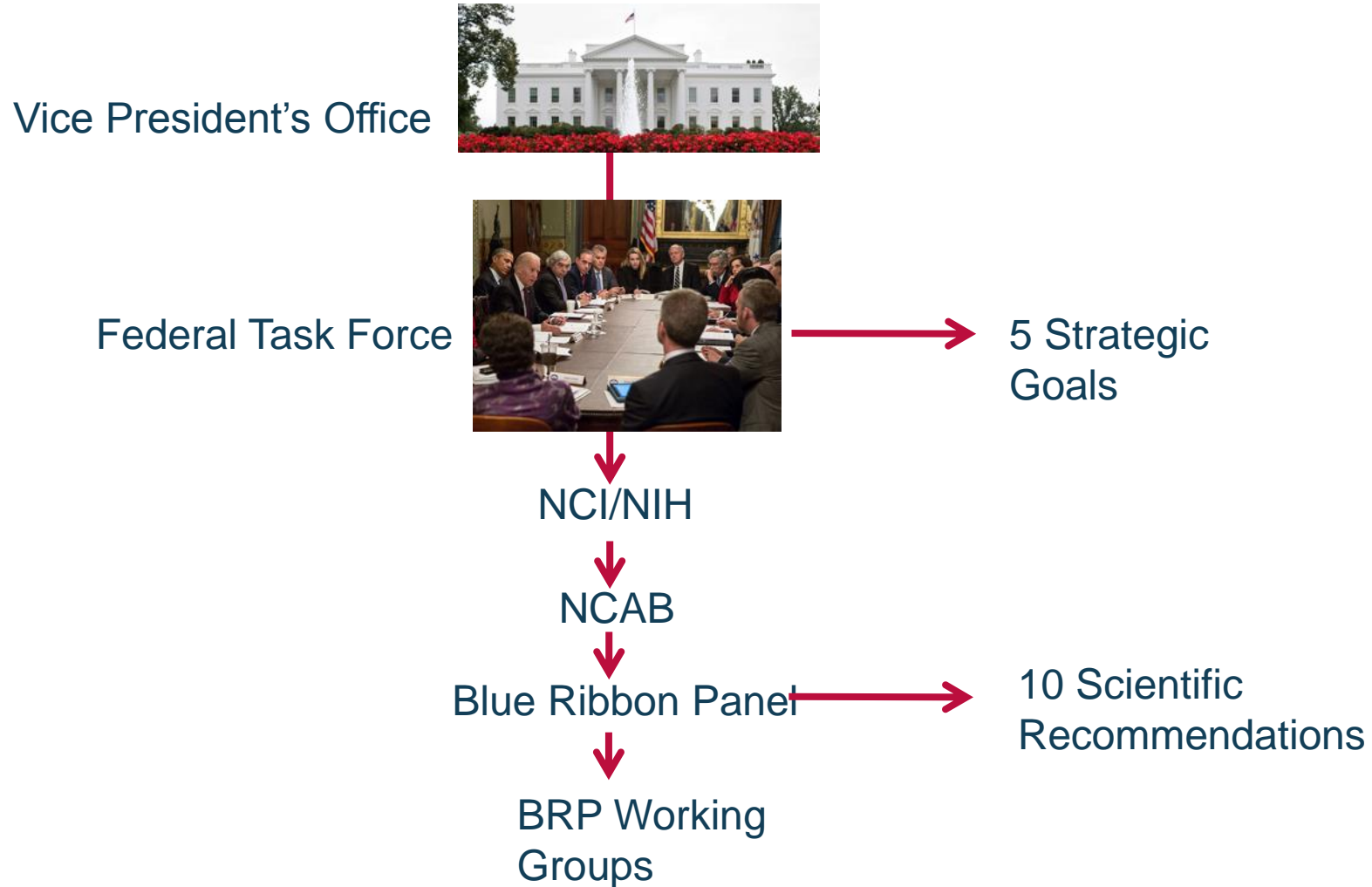PAR-16-228, PAR-16-229 Metabolic Reprogramming to Improve Immunotherapy (R21, R01)

PAR-16-245, PAR-16-246 Neural Regulation of Cancer (R21, R01)

NCI's Provocative Questions (PQ) Initiative

- The NCI's PQ Initiative has assembled a list of 12 important, but non-obvious or understudied, questions based on input from the NCI's extramural research community to stimulate use of laboratory, clinical, and population sciences in especially effective and imaginative ways to answer the questions.

- Applications in response to a selected PQ should build on specific advances in our understanding of cancer and cancer control, address broad issues in biology of cancer that have proven difficult to resolve, take into consideration the likelihood of progress in the foreseeable future (e.g. 5 to 10 years), and address ways to overcome obstacles to achieving long-term goals.

  https://provocativequestions.nci.nih.gov/

The "Cancer Moonshot" Program

Vice President's Office

Federal Task Force → 5 Strategic Goals

NCI/NIH

NCAB

Blue Ribbon Panel → 10 Scientific Recommendations

BRP Working Groups

Summary of the "Cancer Moonshot" Recommendations

A. Establish a network for direct patient involvement
B. Create a translational science network devoted to immunotherapy
C. Develop ways to overcome resistance to therapy
D. Build a national cancer data ecosystem
E. Intensify research of the major drivers of childhood cancer
F. Minimize cancer treatment's debilitating side effects
G. Expand use of proven prevention and early detection strategies
H. Mine past patient data to predict future patient outcomes
I. Develop a 3D cancer atlas
J. Develop new cancer technologies

NIH Common Fund: Opportunities and Resources

- [B4D Nucleome](#)
- [Big Data to Knowledge](#)
- [Epigenomics](#)
- [Extracellular RNA Communication](#)
- [Genotype-Tissue Expression (GTEx)](#)
- [Glycoscience](#)
- [Human BioMolecular Atlas Platform (HuBMAP)](#)
- [Human Microbiome Project](#)

- [Illuminating the Druggable Genome](#)
- [Knockout Mouse Phenotyping](#)
- [Library of Integrated Network-Based Cellular Signatures (LINCS)](#)
- [Metabolomics](#)
- [Protein Capture Reagents](#)
- [Single Cell Analysis](#)
- [Transformative High Resolution Cryo-Electron Microscopy](#)

https://commonfund.nih.gov/

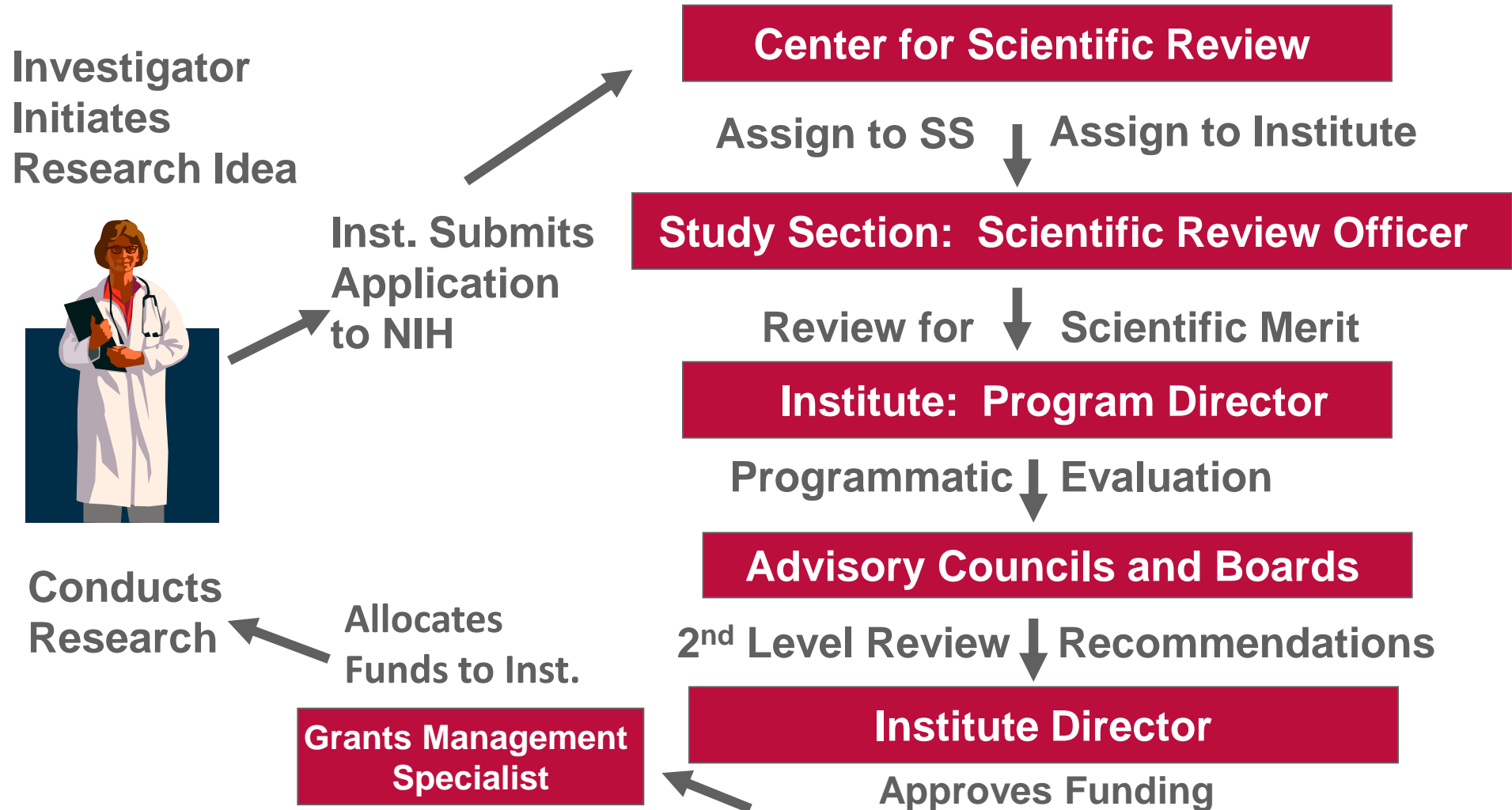# NIH Common Fund: Special Funding Mechanisms

- **High-Risk High-Reward Research**

  - **NIH Director's New Innovator Award**

  - **NIH Director's Pioneer Award**

  - **NIH Director's Transformative Research Awards**

https://commonfund.nih.gov/

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The NIH Grant Application Cycle

Investigator Initiates Research Idea

Inst. Submits Application to NIH

Center for Scientific Review

Assign to SS → Assign to Institute

Study Section: Scientific Review Officer

Review for → Scientific Merit

Institute: Program Director

Programmatic → Evaluation

Advisory Councils and Boards

2nd Level Review → Recommendations

Institute Director

Approves Funding

Grants Management Specialist

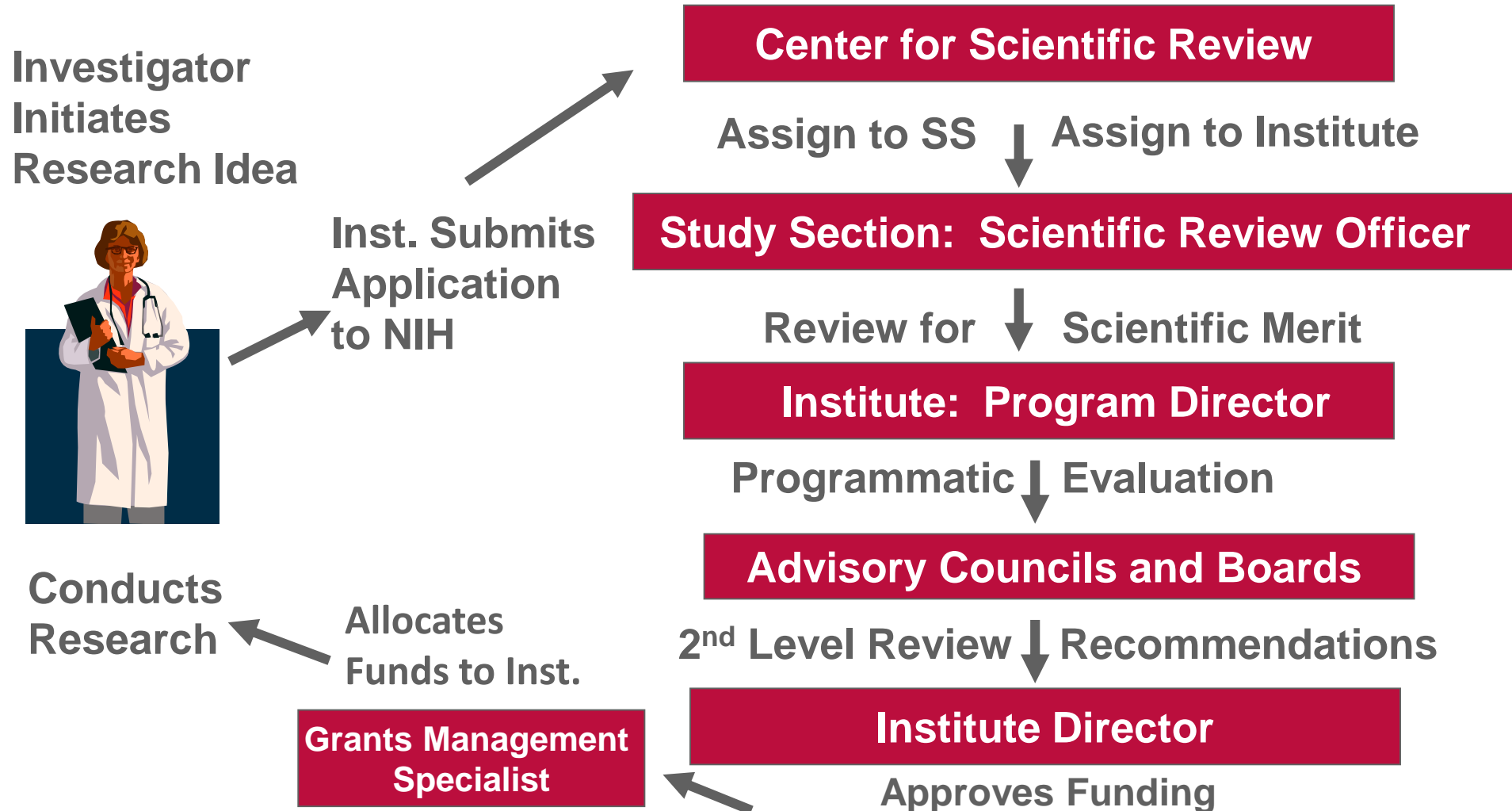Allocates Funds to Inst.

Conducts Research

Scientific and Grants Management Personnel

- Scientific Review Officer (SRO):

  - Responsible for the scientific/technical review of applications

- Program Director (PD):

  - Responsible for the scientific, technical, and programmatic aspects of grants

- Grants Management Specialist (GMS):

  - Responsible for administrative, fiscal, policy aspects of grants

  (Our feelings get hurt when you mix us up…)

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Conducts Research

Talk to an NIH/NCI Program Director (PD). Do it sooner, rather than later.

- Find a PD via NIH/NCI websites and/or your colleague network.

- We might discuss your general idea for an application, whether it is "proper size", what is proper funding mechanism, whether to apply soon or wait for more progress, whether it is right for NCI, what our budget rules are, which study section to request, whether to submit it as a Multi-PI application, etc.

- Follow-up might include my sending a draft of your Specific Aims page to Scientific Review Officers (SROs) for study section recommendations, tracking down budget or deadline rules, etc.

- We try hard to be of service to the PI, to help the PI optimize his/her application, so that we can fund the best science.

Develop Project – Science Aspects

- Have a Clear Punch Line

- Be Intellectually Ambitious/Aggressive

- Be Logistically Realistic

- Have Identifiable "Deliverables"

- Review of application comes down to: "Is it worth doing, and is it do-able?"

Develop Application – Logistical Aspects

- Start early – there are *so many steps* …

- Follow the rules – there is *so much stuff*…

- Keep tabs on application's progress after submission

Talk to an NIH/NCI Program Director (PD), Again.

- When you have received score, or (better yet) both score and summary statement, contact the PD (initial email preferred) listed on your eRA Commons site.

- We may discuss possibility/likelihood that your application will be selected for funding, NCI procedures for funding decisions, NCI funding policies, reviewer comments/concerns and how they might be addressed in a future resubmission A1 application if needed, your options for future submissions (what, when, pros/cons, etc.).

- PD follow-up might include reading new Specific Aims and Introduction pages for an A1 re-submission application, more discussions regarding content, study section and funding Institute /Center (IC) options, etc.

- We are willing and able to be a sounding board as you re-think your project and prepare your future application(s), etc.

NCI Funding Selection Process – Research Project Grants

- **Fundable Range/Payline Selections**

  - Percentile or Impact Score within which applications will likely be funded after administrative review

- **Scientific Program Leaders (SPL) Selections**

  - Applications outside funding policy score range

  - Large/complex/special funding mechanisms

- **SPL Selection Considerations**

  - Peer review

  - Filling gaps in cancer research portfolio

  - Especially novel or promising scientific approach

  - Commitment to New and Early Stage R01 Investigators

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What to expect when your application is a winner

- There will be *more* paperwork – Just in Time (JIT) info

  - Updated Other Support, IACUC/IRB approvals, etc.

  - Documented training attendance

  - Foreign collaborator clearance

  - Etc., etc., etc.

- Probable budget adjustments – "Policy Reductions"

  - Larger policy reduction → Each grant gets less $$...☹ →

    Lower average cost → Fund more grants …☺

  - Smaller policy reduction → Each grant gets more $$... ☺ →

    Higher average cost → Fund fewer grants …☹

  - NCI currently: 8.5% on modular grants, 17% on larger grants

Annual "Non-Competing" Progress Reports

- Most are about 2-4 pages; list and follow order of Specific Aims

- Most have figures, some don't

- All discuss successes, some discuss problems/failures

- Some present (minor) modified plans -- past tense or future tense

- Most take the PI a day or two to prepare -- not an hour, not a week

- **"Too much" data/progress:** Is this really an accounting of just one year of progress, from just this grant? Does it make clear whether some data come from other funding to PI's lab, which may synergize with this project? Revise, if needed.

- **"Too little" data/progress:** Is this really an accurate account of PI's total progress for the grant's most recent year? PI may need to revise to provide sufficient information on progress, results, difficulties, etc. PD and PI may need to discuss problems PI is having, are they recurring issues, PI's plans for getting back on track, what PD can do to help, etc., especially for New PIs.

How to make your grant $$ go farther

- Administrative Supplements

  - Solicited by NIH: Moonshot, Common Fund, other programs

  - Unsolicited: New research opportunity within parent grant's scope; equipment breaks, mouse colony problems, etc.

  - Diversity Supplements: support trainees within your lab
    http://www.cancer.gov/about-nci/organization/crchd/diversity-training/cure/DSGuidelines

- Revision ("Competitive") Supplements

  - For substantial new work related to parent grant, but outside the score of the current Specific Aims

  - Goes to Study Section for review; usual payline/funding process

- Fellowships, Training Grants

  - For your students and post-doctoral fellows; many options

  - http://www.cancer.gov/grants-training/training/funding

Keep in touch with your NIH/NCI Program Director

- We always appreciate seeing your cool new papers, and hearing your next great idea –

    - We do journal clubs and overview seminars on hot topics

    - We are asked for "advances" from Congress, NIH/NCI OD, etc.

    - We develop concepts for Funding Opportunities, PQs, etc.

    - We organize NIH/NCI scientific workshops (if invited, say YES!)

    - We organize symposia at conferences (if invited, say YES!)

    - We recommend potential reviewers for study sections

- We can help you brain-storm your next step

    - Is it time to submit another application on a second project or spin-off topic – R21, R01?

    - When to submit a renewal of current grant? Or maybe a "new" application rather than a renewal?

    - Or maybe also get involved in a bigger program – P01?

Thanks for joining us today!