T Team Meeting

June 14, 2018

T Team Agenda

- Welcome & Introductions   Thomas A. Pearson, MD, PhD, MPH

PRE-AWARD

- T32 Status Updates   Wayne McCormack, PhD
- T32 Applications – Data Tables   Audrey Dickinson & Wayne McCormack, PhD
- Trainee Pipeline & NIH Support   Wayne McCormack, PhD
- Undergraduate Research Programs   David Julian, PhD
- Trainee Diversity   Talline Martins, PhD
- Training Elements   Wayne McCormack, PhD
  - Team Training
  - Rigor & Reproducibility
  - Research Skills (Competencies)
  - Career & Professional Development

POST-AWARD

- Post-Award Administration Advice   Ronda Breton, UF College of Dentistry
- Training Program Web Pages   Audrey Dickinson & Wayne McCormack, PhD
- NIH Site Visits   Lyle Moldawer, PhD

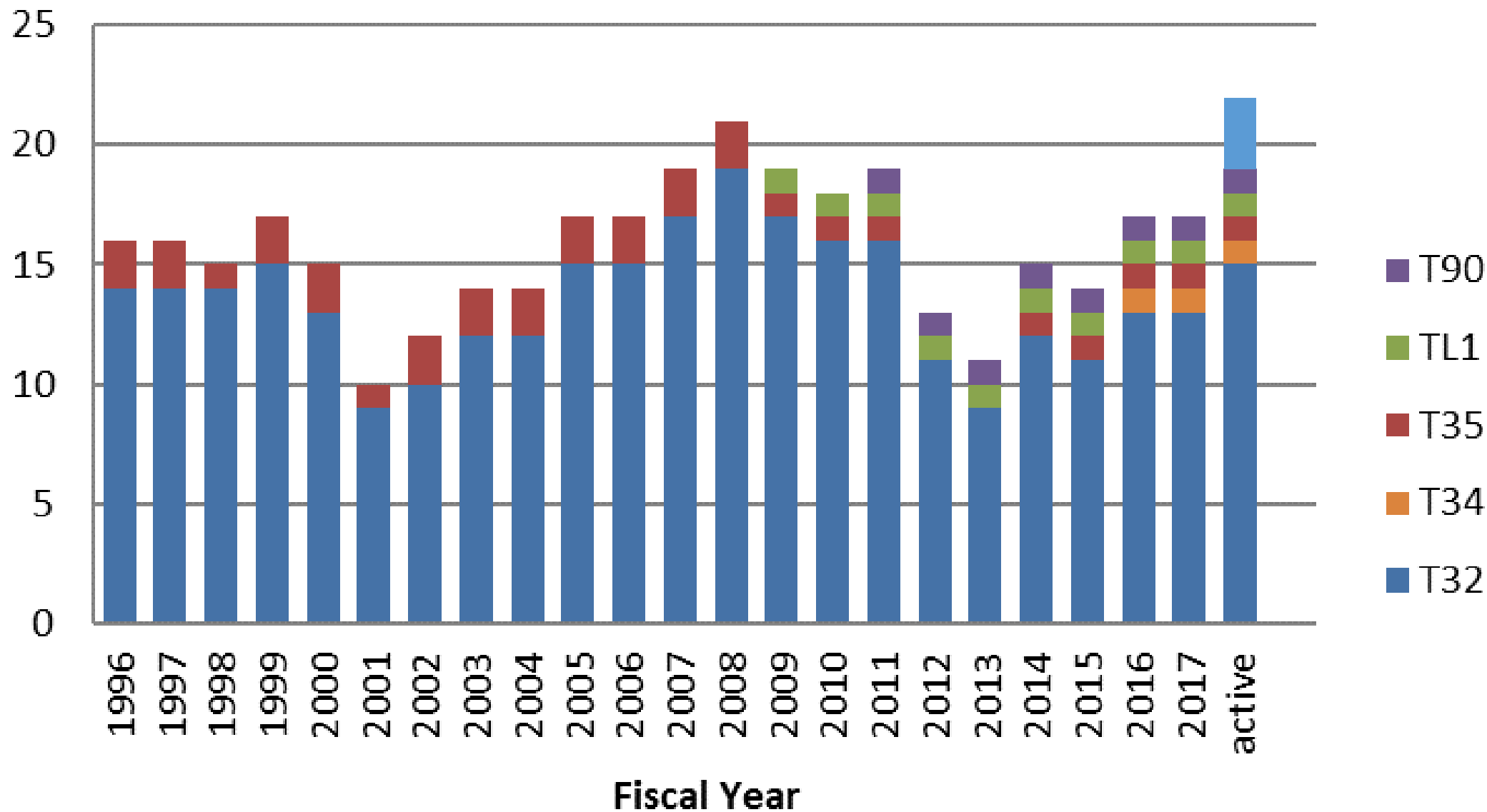# Welcome & Introductions
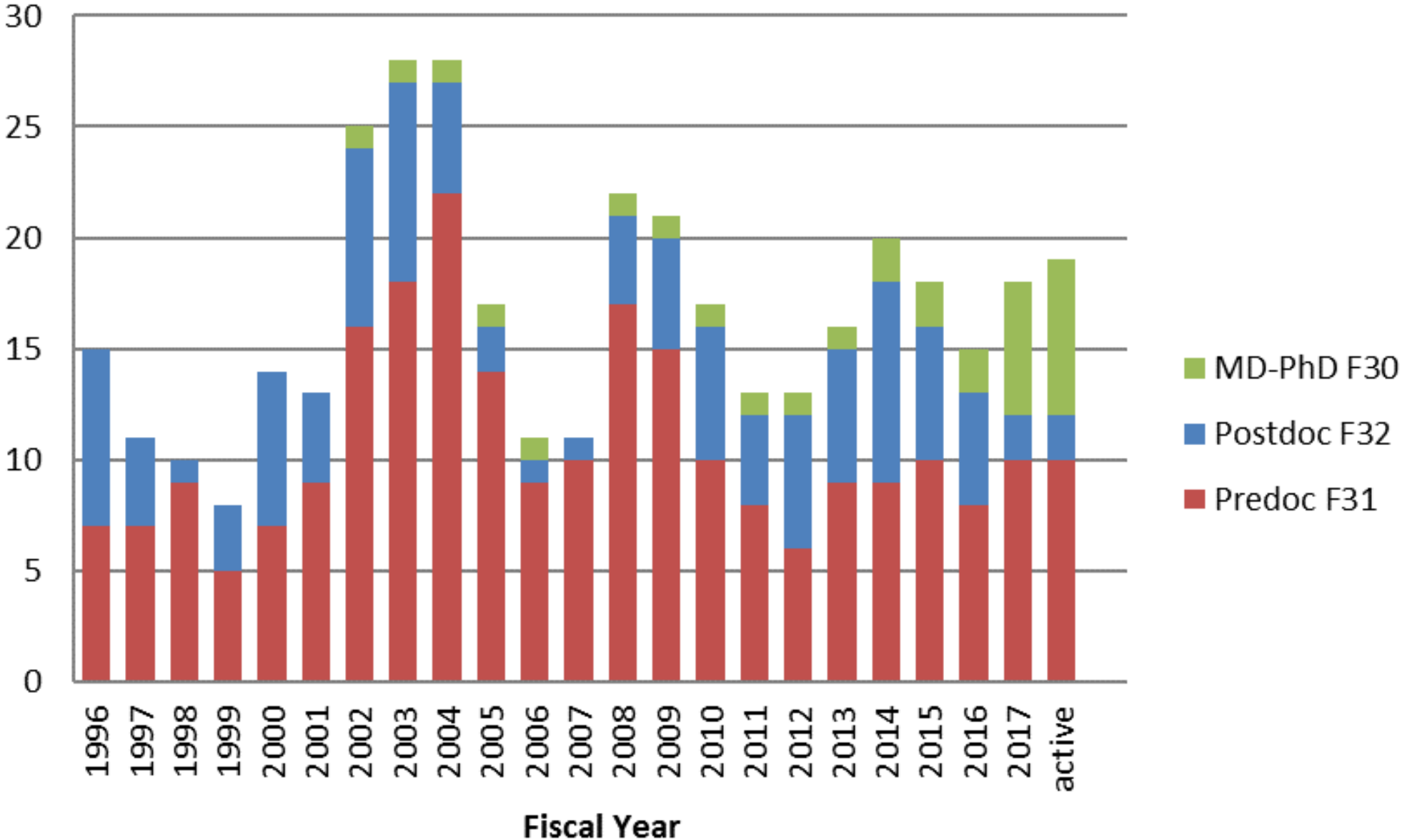
- Thomas A. Pearson, MD, PhD, MPH

T32 Status Updates

- Updated training grant list

NIH Training Grants

Fiscal Year

Legend: T90, TL1, T35, T34, T32

Data from NIH RePORTER

NIH Fellowships

Data from NIH RePORTER

T32 Applications – Notes about Data Tables

- Table 1
- Table 2
- Table 4
- Table 6A
- Table 8

Table 1. Census of Participating Departments and Interdepartmental Programs

Part I. Predoctorates

Participating Department or Program*	Total Faculty	Participating Faculty	Total Pre-doctorates	Total Pre-doctorates Supported by any HHS Training Award	Total Pre-doctorates with Participating Faculty	Eligible Pre-doctorates with Participating Faculty	TGE Pre-doctorates Supported by this Training Grant (Renewals/ Revisions)
Advertising	11	1	17	0	4	4	0
Anthropology	26	1	90	1	3	3	1
Biochemistry & Molecular Biology	18	1	20	3	2	2	0
Biomedical Engineering	22	2	100	4	11	9	3
Clinical & Health Psychology	18	3	67	7	9	9	1
Epidemiology	16	2	24	2	10	6	0
Food Science & Human Nutrition	26	1	44	0	4	4	0
Health Education & Behavior	8	1	15	0	2	2	0
Health Outcomes & Biomedical Informatics	13	2	12	0	5	3	0
Infectious Diseases & Immunology	20	4	16	1	7	6	1
Mechanical & Aerospace Engineering	52	2	218	2	12	9	0
Medicinal Chemistry	8	2	21	1	3	3	1
Medicine	65	2	12	1	5	4	0

Table 1

Listed by department, not by graduate program

Trainees must not be counted more than once

Table 1 – Page 1 of 4

Table 2

Need "Research Interest" descriptions to be short and sweet

These average 11 words

Some have been 30+

Table 2. Participating Faculty Members

Name	Degree (s)	Rank	Primary Department or Program	Research Interest	Training Role	Pre-doctorates in Training	Pre-doctorates Graduated	Pre-doctorates Continued in Research or Related Careers	Post-doctorates in Training	Post-doctorates Completed Training	Post-doctorates Continued in Research or Related Careers
Agbandie-Mckenna, Mavis	PhD	Prof & Center Dir	Biochemistry & Molecular Biology	Structural studies of ssDNA viruses, Parvoviridae, Geminiviridae, microviridae, and circovirdae	Preceptor	3	10	9	2	8	8
Aldrich, Jane	PhD	Prof	Medicinal Chemistry	Peptide medicinal chemistry, opioid peptides, anticancer peptides	Preceptor	4	4	4	1	7	7
Angelini, Thomas	PhD	Assoc Prof	Mechanical & Aerospace Engineering	Biomolecular self-assembly, mechanical instabilities in tissue cell assemblies, bacterial biofilm physics	Preceptor	5	2	2	1	0	0
Ash, John	PhD	Assoc Prof	Ophthalmology	Retinal degeneration	Preceptor	5	4	4	0	0	0
Atkinson, Mark A.	PhD	Eminent Scholar & Inst Dir	Pathology, Immunology & Laboratory Medicine	Role of environment in initiation of Type 1 diabetes, stem cells, pancreas regeneration, markers of tolerance and immune-regulation, gene therapy	Preceptor	3	5	4	0	8	7
Avram, Dorina	PhD	Prof	Medicine (Pulmonary, Critical Care, & Sleep Medicine)	Altered regulatory mechanisms of the immune system in autoimmune diseases & asthma	Preceptor	6	6	5	0	9	7
Bloom, David C.	PhD	Prof	Molecular Genetics & Microbiology	Regulation of *Herpes simplex* virus latency & reactivation; novel therapies to treat HSV recurrent disease	Preceptor	2	8	7	0	2	2

Table 2 – Page 1 of 8

Table 4. Research Support of Participating Faculty Members

Faculty Member	Funding Source	Grant Number	Role on Project	Grant Title	Project Period	Current Year Direct Cost
Agbandie-McKenna, Mavis	NIH	5 R21 AI126583-02	PD/PI	Structure & Dynamics of the VP1u Infectivity Domain of the Parvoviridae	06/2016-05/2018	$158,030
Agbandie-McKenna, Mavis	NIH	4 R01 GM082946-09	PD/PI	AAV Capsids & their Cellular Interactions	09/2007-05/2018	$265,618
Agbandie-McKenna, Mavis	NIH	5 R01 GM109524-04	PD/PI	The Role of pH & Protease Activity in AAV Viral Transduction	09/2014-08/2018	$325,028
Agbandie-McKenna, Mavis	NIH	5 U24 GM116792-02	MPI	West/Midwest Consortium for High-Resolution Cryo Electron Microscopy	11/2016-06/2021	$38,889
Agbandie-McKenna, Mavis	Other	-	PD/PI	Characterizing the Role of AAV VP1u as a Determinant of Efficient Cellular Interaction	12/2014-06/2018	$70,563
Agbandie-McKenna, Mavis	Other	-	PD/PI	AAV1 Variants for CNS Targeted Therapies	01/2017-07/2018	$141,732
Aldrich, Jane V.	NIH	5 R01 DA023924-09	PD/PI	Peptidic Kappa Opioid Receptor Ligands as Potential Treatments for Drug Addiction	09/2007-03/2019	$441,263
Aldrich, Jane V.	Other	-	PD/PI	Novel Peptide Antagonists as Treatments for Substance Abuse	09/2015-08/2018	$238,920
Angelini, Thomas E.	Other	-	PD/PI	CAREER: Stability & Dynamics of Tissue Cell Assemblies in Yield Stress Materials	06/2014-05/2019	$65,486
Ash, John D.	NIH	3 U01 EY027267-02	MPI	Comparative Transcriptomic & Epigenomic Analysis of Muller GLIA Reprogramming	09/2016-08/2019	$118,949
Ash, John D.	NIH	3 U01 EY027267-02S1	MPI	Comparative Transcriptomic & Epigenomic Analysis of Muller GLIA Reprogramming-Supplement	09/2016-08/2019	$103,367
Ash, John D.	Other	-	PD/PI	Developing AAV Vectors for Drug-Related Expression of Neuroprotective Factors	06/2016-06/2019	$66,667
Atkinson, Mark A.	NIH	1 UC4 DK108132-01	PD/PI	Single-Cell Analyses of Human Islets in T1D Using Highly Multiplexed Imaging	09/2015-06/2020	$3,097,013
Atkinson, Mark A.	NIH	5 P01 AI042288-19 Sub: 6119	Project PI	Immune Regulation & Type 1 Diabetes Pathogenesis	05/2017-04/2018	$316,843
Atkinson, Mark A.	NIH	5 P01 AI042288-19	PD/PI	Immune Function & the Progression to Type 1 Diabetes	09/1997-04/2018	$794,931
Atkinson, Mark A.	NIH	5 P01 AI042288-19 Sub: 6120	PD/PI	Immune Function & the Progression to Type 1 Diabetes: Administrative Core	05/2017-04/2018	$64,358

Table 4

Current Year Direct Cost is divided by number of MPI

K award amounts are not counted twice if both Scholar and Mentor are listed

Table 4 – Page 1 of 14

Table 6A. Applicants, Entrants, and their Characteristics for the Past Five Years: Predoctoral

Part I. Counts

Table 6A

Predoc data reported by Graduate Program, not by Department

Most Recently Completed Year: 2016-2017 Current TL1 Funding Period	Total Applicant Pool	Applicants Eligible for Support	New Entrants to the Program	New Entrants Eligible for Support	New Entrants Appointed to this Grant (Renewal/Revision Applications Only)
Biomedical Sciences PhD Program	229	125	38	28	-
Biomedical Engineering PhD Program	128	75	11	11	-
Clinical & Health Psychology PhD Program	235	219	11	10	-
Epidemiology PhD Program	25	5	5	2	-
Food Sci. & Human Nutrition PhD Program	55	15	6	4	-
Health & Human Performance PhD Program	81	28	18	8	-
Health Outcomes & Policy PhD Program	5	2	1	0	-
Mass Communication PhD Program	47	16	10	7	-
MD-PhD Program	143	143	7	7	3
Nursing Sciences PhD Program	18	10	7	2	-
Pharmaceutical Sciences PhD Program	205	48	19	2	-
Rehabilitation Science PhD Program	29	14	10	6	-
Veterinary Medical Sciences PhD Program	17	6	6	4	-
Total	**1217**	**706**	**149**	**91**	**3**

Table 8A. Program Outcomes: Predoctoral

Part I. Those Appointed to the Training Grant

Table 8

Research Intensive *vs.* Research Related

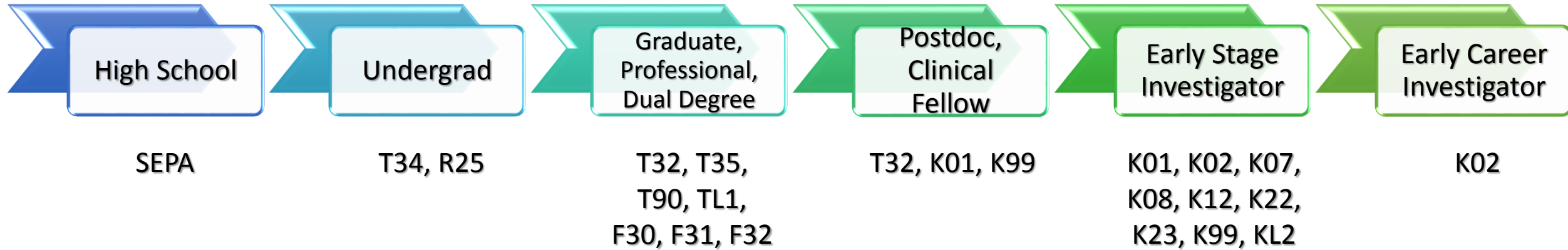Encourage mentors to contact former trainees for subsequent grants

Trainee	Faculty Member	Start Date	Summary of Support During Training	Terminal Degree (s) Received and Year(s)	Topic of Research Project	Initial Position Department Institution Activity	Current Position Department Institution Activity	Subsequent Grant(s)/ Role/Year Awarded
TL1 Trainees Supported by Previous UF CTSA Award								
Karnes, Jason H.	Johnson, Julie A. & Cooper-Dehoff, Rhonda M.	08/2006	TY 1: Univ RA TY 2: **TR TL1** TY 3: **TR TL1** TY 4: Univ RA	PhD 2012	Genetic, pharmacogenetic, & pharmacotherapeutic risk factors for Thiazide-induced dysglycemia	Postdoc Assoc Clin Pharmacology Vanderbilt Univ Further Training	Asst Professor Pharmacy Practice & Science Univ of Arizona Res Intensive	
Fox, Emily J.	Behrman, Andrea L.	01/2000	TY 1: Univ RA TY 2: Univ RA TY 3: **TR TL1** TY 4: **TR TL1**	PhD 2011	Locomotor control & recovery after human spinal cord injury	Postdoc Assoc Neuromuscular Physiology Lab Univ Florida Further Training	Res Asst Professor Physical Therapy Univ Florida Res Intensive	
Stamps, Jennifer J.	Bartoshuk, Linda M.	08/2007	TY 1: Univ RA TY 2: DC R01 TY 3: Univ RA TY 4: **TR TL1** TY 5: **TR TL1** TY 6: Univ RA	PhD 2014	Chemosensory function during healthy aging, Alzheimer's, & Parkinson's Disease	Postdoc Assoc Food Science & Human Nutrition Univ Florida Further Training	Postdoc Assoc Food Science & Human Nutrition Univ Florida Further Training	
Blanton, Dustin K.	Atkinson, Mark A. & Schatz, Desmond A.	08/2008	TY 1: Univ RA TY 2: **TR TL1** TY 3: Univ RA TY 4: Univ RA TY 5: Univ RA	PhD 2013	Genetic & immunologic biomarkers in Type 1 Diabetes	Instructor Biology Santa Fe College Res Related	Dean of Academic Affairs Keiser Univ Res Related	
Soustek, Meghan S.	Byrne, Barry J.	08/2008	TY 1: Univ RA TY 2: **TR TL1** TY 3: HL T32 TY 4: HL T32 TY 5: Univ RA TY 6: Univ RA	PhD 2014	Pathogenesis of Tafazzin deficiency in a murine model of Barth Syndrome	Research Fellow Cell Biology Dana-Farber Cancer Institute Further Training	Research Fellow Cell Biology Dana-Farber Cancer Institute Further Training	DK F32/PI/2015
Tran, Cuc H.	Morris, John G.	08/2011	TY 1: Univ RA TY 2: Univ RA TY 3: **TR TL1** TY 4: **TR TL1**	PhD 2015	Effective Strategies for Evaluating and Sustaining a Successful School-located Influenza Vaccination Program	Service Officer Epidemic Intelligence, CDC Res Intensive	Epidemiologist Poxvirus & Rabies CDC Res Intensive	

Trainee Pipeline & NIH Support

High School	Undergrad	Graduate, Professional, Dual Degree	Postdoc, Clinical Fellow	Early Stage Investigator	Early Career Investigator
SEPA	T34, R25	T32, T35, T90, TL1, F30, F31, F32	T32, K01, K99	K01, K02, K07, K08, K12, K22, K23, K99, KL2	K02

Trainee Pipeline & NIH Support

NIGMS Administered Training Programs

Pre-Kindergarten – High School				
Science Education Partnership Awards (SEPA)				

Undergraduate | Post-bacc | Graduate MS | Graduate PhD | Postdoctoral

RISE

RISE

BRIDGES to BACC ✔

PREP

BRIDGES to DOC

IRACDA

MARC ✔

NRSA Fellowships ✔

IMSD

IMSD

BUILD

✔ Diversity Supplement Program

T32 NRSA ✔

K Awards ✔

Undergraduate Research Programs

- David Julian, PhD

Trainee Diversity

- Talline Martins, PhD

Team Training Model

- Using TL1 Teams To Transform
  Clinical & Translational Science Training

If We Expect Future Scientists To Work in Teams, They Should Be Trained in Teams

"TL1 Teams"

Levels of Clinical & Translational Science (CTS) Engagement for UF PhD & Dual Degree Students

TL1 Training Grant
- CTS Co-Major
- TL1 Team
- Publish
- ACTS Conference

CTS PhD Co-Major
- CTS Core (8)
- Electives (6)
- Clin/Trans PhD Aim
- CTSI Research Day

CTS Graduate Certificate
- CTS Core Curriculum (8 credits)
- Electives (3 credits)
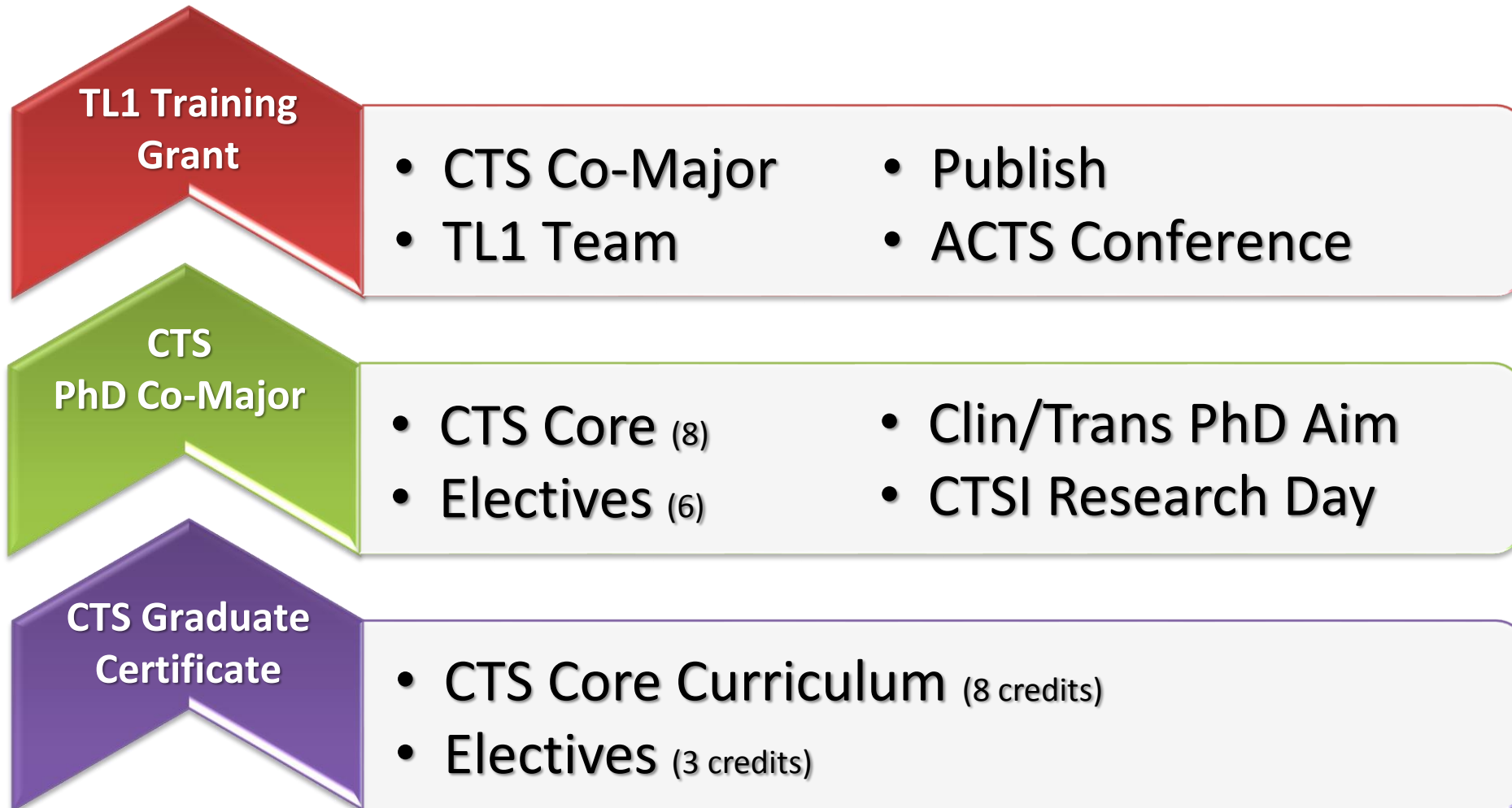
CTS PhD Curriculum

Year 1

- **Translational Research & Therapeutics: Bench, Bedside, Community, & Policy** (3)
- **Team Science** (1)
- Responsible Conduct of Biomedical Research (1)

Year 2

- CTS Journal Club (1)
- CTS Seminar (2)

Electives (6)

- Experimental Design
- Quantitative Skills
- Professional Development

Translational Research & Therapeutics: Bench, Bedside, Community, & Policy (GMS 6847)

- Interdisciplinary teams identify unmet health need of common interest

- T Phases
  - Lectures, readings
  - Immediate application by Team-Based Learning (TBL)
  - Apply to unmet health need
  - Team reports

- Final report
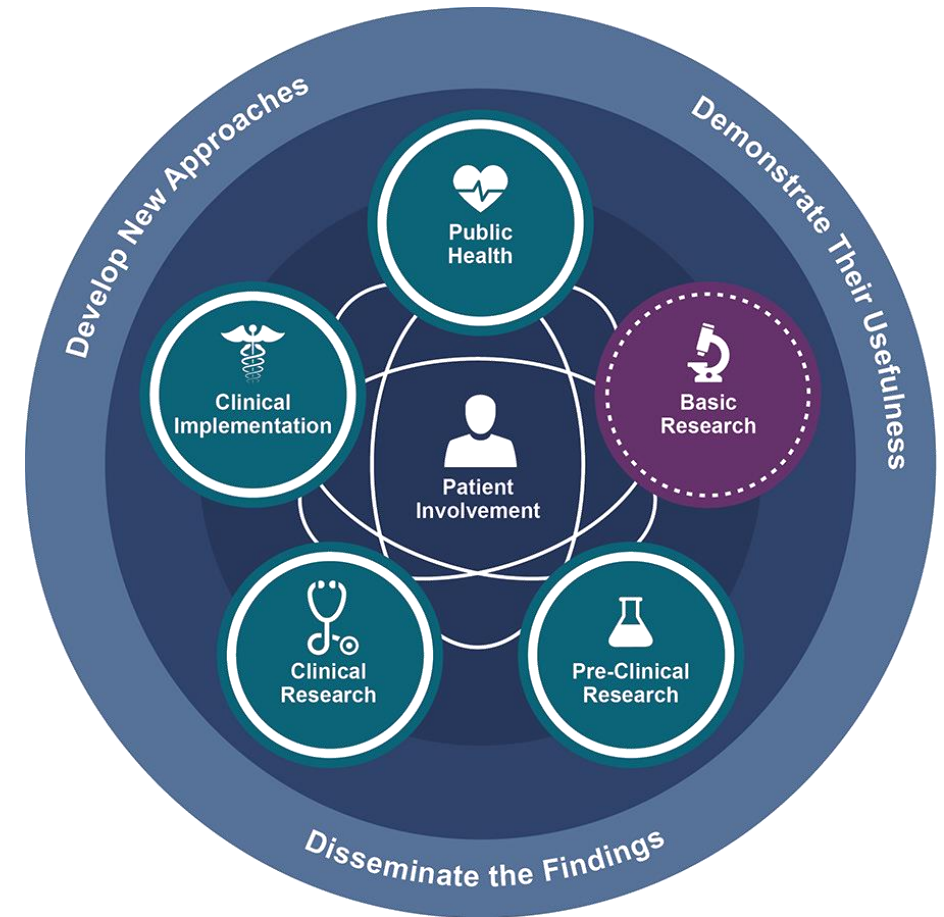
Team Science (GMS 6945)

- Intro to Team Science
- Preparing for Team Science
- Team Leadership
- Building a Research Team
- Writing a Collaboration Plan
- Managing Research Teams
- Conflict Management
- Team Monitoring
- Team Evaluation

Principles, Strategies

Evidence

Application
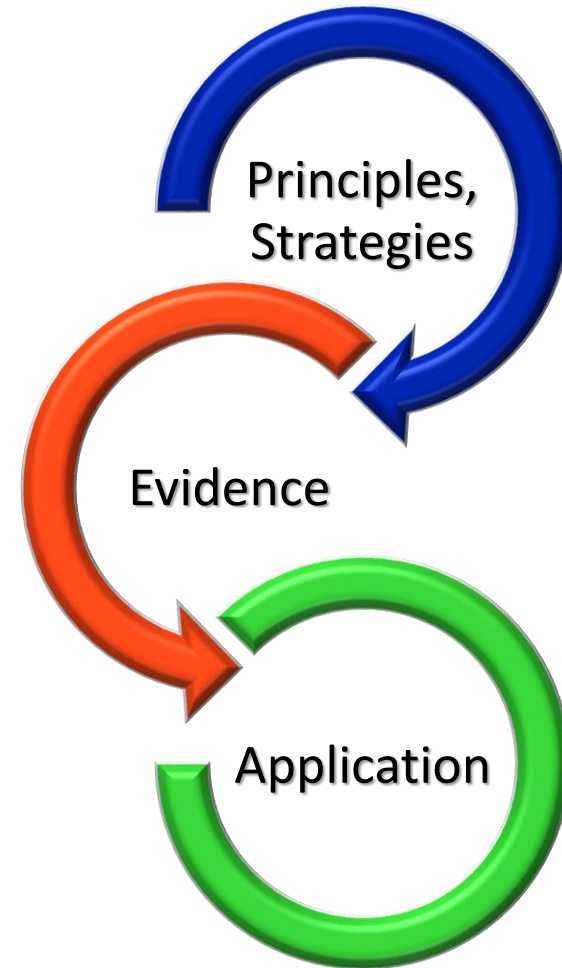
Team Science (GMS 6945)

- Intro to Team Science
- Preparing for Team Science
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- Building a Research Team
- Writing a Collaboration Plan
- Managing Research Teams
- Conflict Management
- Team Monitoring
- Team Evaluation

| Behavioral Self-Assessment (DISC) |
| Vision/Mission/Values |
| Needs Assessment | 2018 |
| Collaboration Plan |
| Team Dimensional Training |
| Team Evaluation | 2018 |

TL1 Teams

- **Team members**
  - **Must be from different PhD programs, in different colleges**
    - ✓ Must apply before defending dissertation proposal
- **TL1 Co-Mentors**
- **Extent of TL1 Team collaboration**
  - **Team specific aim(s)**
    - ✓ Overcome a barrier to progress or expand scope of inquiry
    - ✓ Level of interdependence
    - ✓ Synergy between individual projects
    - ✓ Impact on individual dissertation research projects

2017 TL1 Teams

Team	PhD Majors	Team Project
1	Mechanical Engineering Cancer Biology	Detection of Metastases in Osteosarcoma Patients Using Microfluidic Devices
2	Genetics & Genomics Biological Anthropology	Associations Between Genetic and Social Factors Affecting Blood Pressure in African-Americans
3	Neuroscience Clinical & Health Psychology	Translating Reward into Action: Mechanisms Underlying Motivational Disturbances in Parkinson's Disease
4	Mechanical Engineering Molecular Cell Biology	Transdifferentiation Therapy of 3D Glioblastoma Tumor Models

Rigor & Reproducibility

The Growing Challenge

- Noted by research community; in multiple publications

  - Across research areas

  - Especially in preclinical research

Why animal research needs to improve

Many of the studies that use animals to model human diseases are too small and too prone to bias to be trusted, says **Malcolm Macleod**.

The Economist | World politics | Business & finance | Economics | Science & technology | Culture

Unreliable research

Trouble at the lab

Scientists like to think of science as self-correcting. To an alarming degree, it is not

Oct 19th 2013 | From the print edition

Beware the creeping cracks of bias

Evidence is mounting that research is riddled with unchecked, this could erode public trust, warns

Believe it or not: how much can we rely on published data on potential drug targets?

Florian Prinz, Thomas Schlange and Khusru Asadullah

False-Positive Psychology: Undisclosed Flexibility in Data Collection and Analysis Allows Presenting Anything as Significant

Reforming Science: Methodological and Cultural Reforms

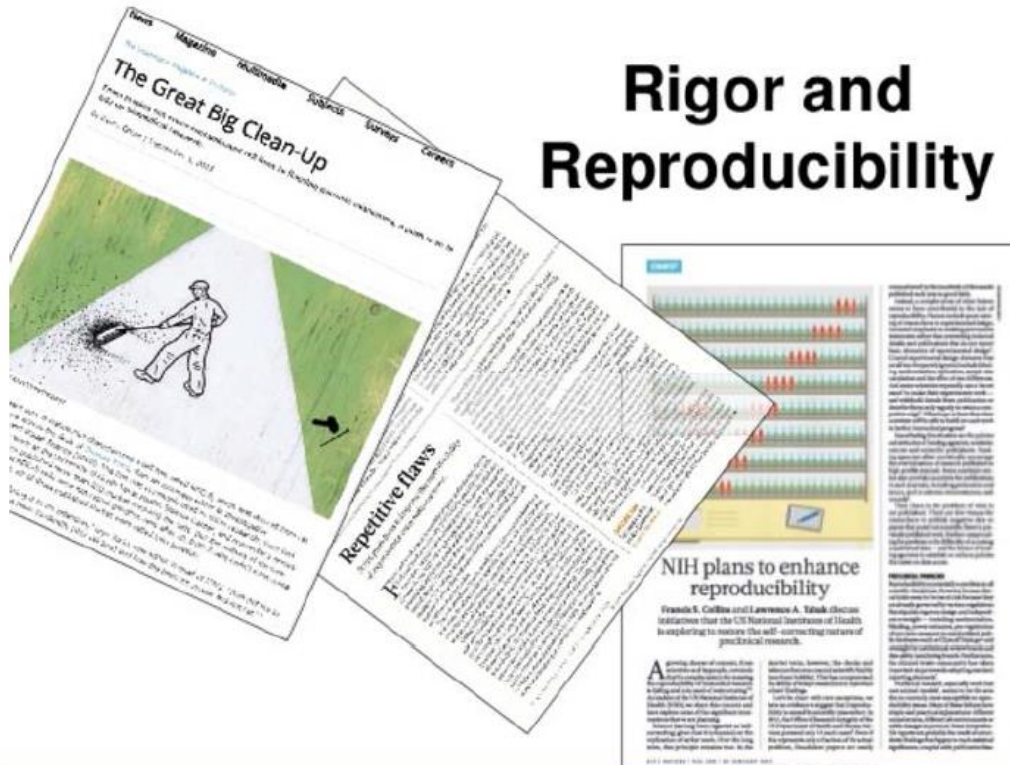## Raise standards for preclinical cancer research

C. Glenn Begley and **Lee M. Ellis** propose how methods, publications and incentives must change if patients are to benefit.

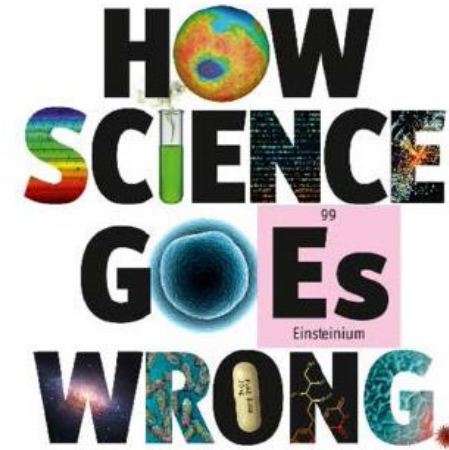# "Reproducibility" is a problem

Science has lost its way, at a big cost to humanity

Researchers are rewarded for splashy findings, not for double-checking accuracy. So many scientists looking for cures to diseases have been building on ideas that aren't even true.

October 27, 2013 | Michael Hiltzik

The Great Big Clean-Up

Rigor and Reproducibility

Repetitive flaws

NIH plans to enhance reproducibility

The Economist

Washington's lawyer surplus
How to do a nuclear deal with Iran
Investment tips from Nobel economists
Junk bonds are back
The meaning of Sachin Tendulkar

HOW SCIENCE GOEs WRONG.

NIH National Institute of General Medical Sciences

From "Overview of NIGMS Training and Diversity Program" presented by Allison Gammie at the NIGMS Training, Workforce Development and Diversity Program Directors Meeting, June 2017

Challenges to Ensuring Rigor and Transparency in Reporting Science: Underlying Issues

Incentives
Publish or perish!   Grant support
Impact factor   Innovation
Significance   Poor training   Novelty: No negative data

From "Sharing, Reproducibility, Replication – An NIH View", presented at ACS National Meeting, March 24, 2015 by Philip E. Bourne, PhD, Associate Director for Data Science, NIH

The research incentive structure is sometimes in conflict with training - trainees vs. workforce?
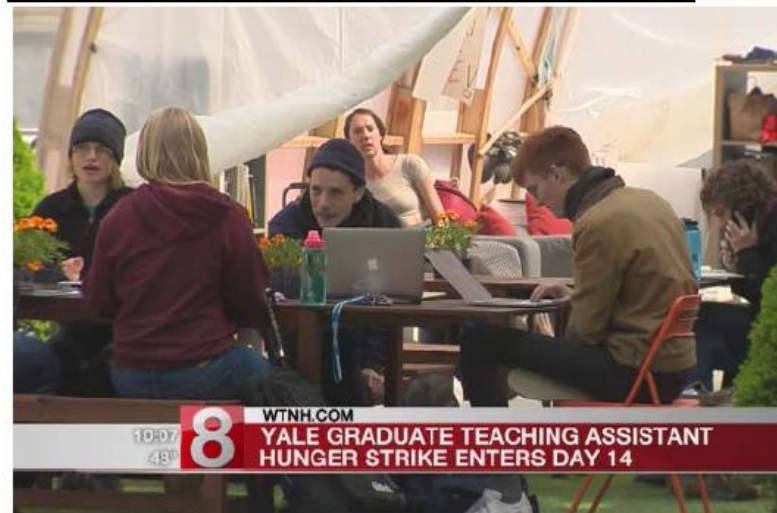
NIH plans to enhance reproducibility

Francis S. Collins and **Lawrence A. Tabak** discuss initiatives that the US National Institutes of Health is exploring to restore the self-correcting nature of preclinical research.

A growing chorus of concern, from scientists and laypeople, contends that the complex system for ensuring the reproducibility of biomedical research is failing and is in need of restructuring[1,2]. As leaders of the US National Institutes of Health (NIH), we share this concern and here explore some of the significant interventions that we are planning.

Science has long been regarded as 'self-correcting', given that it is founded on the replication of prior work. Over the long term, that principle remains true. In the shorter term, h...

balances that onc... have been hobble... the ability of today... others' findings.

Let's be clear: ... have no evidenc... ducibility is abo... In 2011, the Offi... the US Departm... Services pursu... Even if this repr... the actual proble...

> "Efforts by the NIH alone will not be sufficient to effect real change in this unhealthy environment."

Solution:

NIH plans to enhance reproducibility

Francis S. Collins and **Lawrence A. Tabak** discuss initiatives that the US National Institutes of Health is exploring to restore the self-correcting nature of preclinical research.

consideration of sex and other biological variables

$$t = \frac{(\bar{x} - \mu)\left(\frac{\sigma}{\sqrt{n}}\right)}{\left(\frac{s}{\sqrt{n}}\right)}$$

rigorous experimental design

scientific premise

authentication of key resources

http://www.nih.gov/science/reproducibility/index.htm
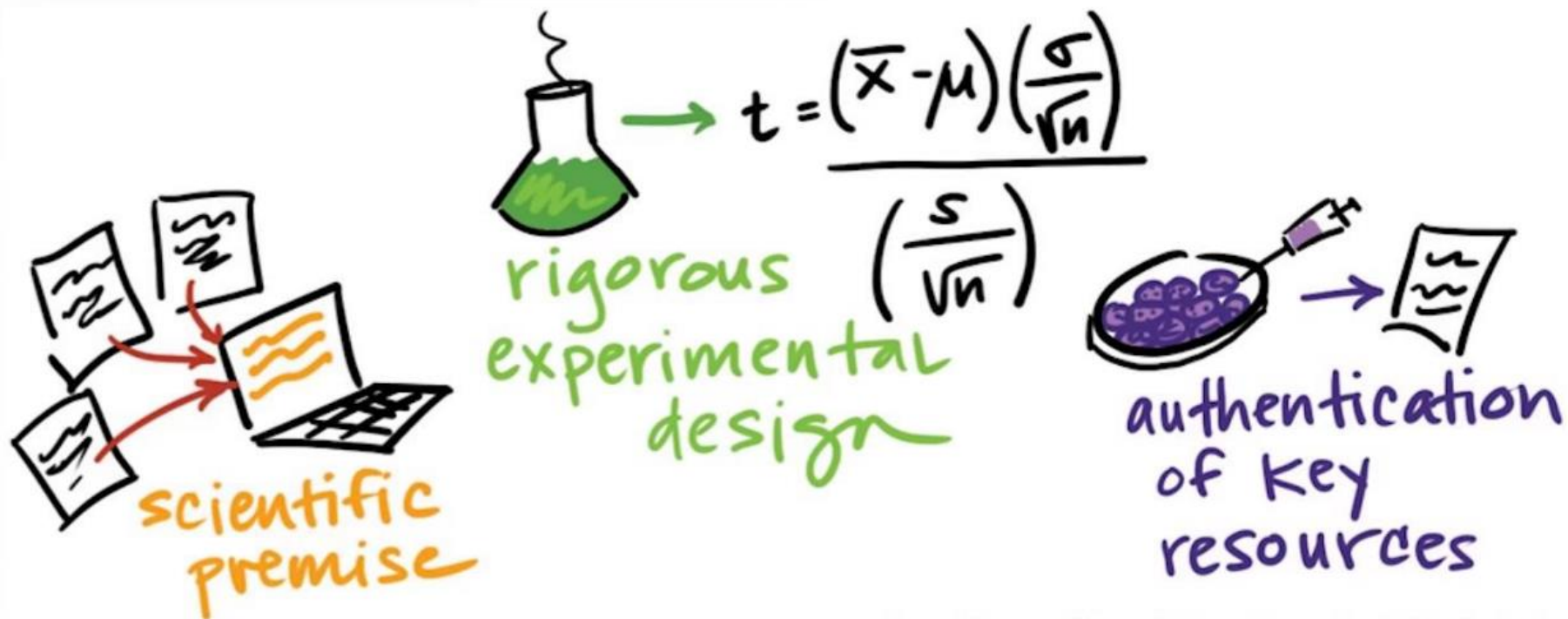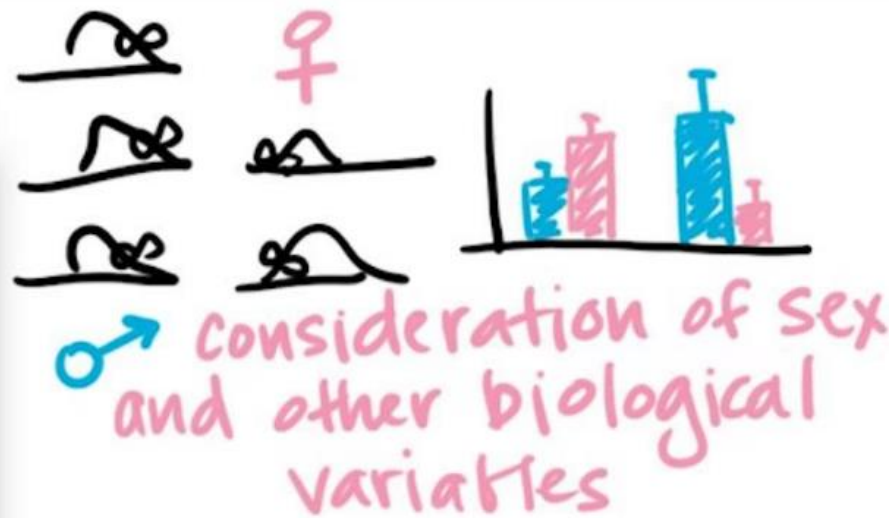
NEW GRANT GUIDELINES

what you need to know

WHY UPDATE THE GUIDELINES?

The updates focus on four areas deemed important for enhancing rigor and transparency:

1 PREMISE
The scientific premise forming the basis of the proposed research

2 DESIGN
Rigorous experimental design for robust and unbiased results

3 VARIABLES
Consideration of relevant biological variables

4 AUTHENTICATION
Authentication of key biological and/or chemical resources

Send inquiries to reproducibility@nih.gov

See also NIH Notice NOT-OD-16-011
http://grants.nih.gov/grants/guide/notice-files/NOT-OD-16-011.html

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WHAT ARE THE UPDATES?

1 UPDATES TO RESEARCH STRATEGY GUIDANCE

The research strategy is where you discuss the significance, innovation, and approach of your research plan. Let's look at an R01, for example:

- Introduction to resubmission and revision applications
- Specific aims
- Research strategy
- Commercial-ization plan
- Biographical sketch

The new **research strategy** guidelines require that you:

- State the strengths and weakness of published research or preliminary data crucial to the support of your application

- Describe how your experimental design and methods will achieve robust and unbiased results

- Explain how biological variables, such as sex, are factored into research design and provide justification if only one sex is used

2 NEW ATTACHMENT FOR AUTHENTICATION OF KEY BIOLOGICAL AND/OR CHEMICAL RESOURCES

From now on, you must briefly describe methods to ensure the identity and validity of key biological and/or chemical resources used in the proposed studies.

These include, but are not limited to:

CELL LINES → **SPECIALTY CHEMICALS**

ANTIBODIES → **OTHER BIOLOGICS**

Standard laboratory reagents that are not expected to vary do not need to be included in the plan. Examples are buffers and other common biologicals or chemicals.

DO NOT put experimental methods or preliminary data in this section

DO focus on authentication and validation of key resources

3 NEW REVIEWER GUIDELINES

Here are the additional criteria the reviewers will be asked to use:

→ Is there a **strong scientific premise** for the project?

→ Have the investigators presented adequate plans to address **relevant biological variables**, such as sex, for studies in vertebrate animals or human subjects?

→ Have the investigators presented strategies to ensure a **robust and unbiased approach**, as appropriate for the work proposed?

Reviewers will also be asked to comment on that new attachment (see Update 2)!

Advanced Notice of Coming Requirements for Formal Instruction in Rigorous Experimental Design and Transparency to Enhance Reproducibility: NIH and AHRQ Institutional Training Grants, Institutional Career Development Awards, and Individual Fellowships

Notice Number: NOT-OD-16-034

Key Dates

Release Date: December 17, 2015

Related Announcements

NOT-OD-16-081
NOT-OD-16-058
NOT-OD-15-102
NOT-OD-15-103
NOT-OD-16-004
NOT-OD-16-011
NOT-OD-16-012

Issued by

National Institutes of Health (NIH)
Agency for Healthcare Research and Quality (AHRQ)

Purpose

This Notice informs the biomedical and health services research communities of NIH and AHRQ plans to require formal instruction in scientific rigor and transparency to enhance reproducibility for all individuals supported by institutional training grants, institutional career development awards, or individual fellowships. Implementation of these requirements will be as early as FY 2017 but will not be in 2016 as indicated in NOT-OD-16-004. An extension of the anticipated implementation date is to ensure that applicants for NIH or AHRQ institutional training grants, institutional career development awards, and individual fellowships have time to access resources and develop substantive instructional plans to ensure that all supported individuals receive in-depth training in rigorous experimental design and data interpretation. NIH and AHRQ will issue a Notice at a future date to provide an updated timeline for implementing this requirement.

NIH Rigor and Reproducibility Training Modules

Module 1: Lack of Transparency
Download the video (93 MB)
Video transcript pdf
Discussion material pdf

Module 2: Blinding and Randomization
Download the video (123 MB)
Video transcript pdf
Discussion material pdf

Module 3: Biological and Technical Replicates
Download the video (63 MB)
Video transcript pdf
Discussion material pdf

Module 4: Sample Size, Outliers, and Exclusion Criteria
Download the video (139 MB)
Video transcript pdf
Discussion material pdf

- Video modules with accompanying discussion materials
- Focus on integral components of reproducibility and rigor in the research endeavor, *e.g.*, bias, blinding, and exclusion criteria

- Also: Online course "Pragmatic and Group Randomized Trials in Public Health and Medicine" by the NIH Office of Disease Prevention
  - Detailed guide to designing and analyzing group-randomized trials
  - Includes video presentations, slide sets, suggested reading materials, and guided activities

https://www.nih.gov/research-training/rigor-reproducibility/training

New NIGMS Institutional Predoctoral Training Grant Funding Opportunity Announcement

Posted by Dr. Alison Gammie, Dr. Kenneth Gibbs and Dr. Shiva Singh on October 19, 2017
Post a Comment | No Comments ↓

We've just released a new training funding opportunity announcement (FOA) specifically tailored for predoctoral graduate programs in the basic biomedical sciences. Through this FOA, we intend to encourage changes in biomedical graduate training that allow it to keep pace with the rapid evolution of the research enterprise, which is increasingly complex, quantitative, interdisciplinary, and collaborative.

The overarching objective of this new predoctoral T32 training program is to develop a diverse pool of well-trained scientists who have the following:

- A broad understanding across biomedical disciplines, and the skills to independently acquire the knowledge needed to advance their chosen field.
- The ability to think critically, independently, and to identify important biomedical research questions and approaches that push forward the boundaries of their areas of study.
- A strong foundation in scientific reasoning, rigorous research design, experimental methods, quantitative and computational approaches, as well as data analysis and interpretation.
- A commitment to approaching and conducting biomedical research responsibly and with integrity.
- Experience initiating, conducting, interpreting, and presenting rigorous and reproducible biomedical research with increasing self-direction.
- The ability to work effectively in teams with colleagues from a variety of cultural and scientific backgrounds, and to promote inclusive and supportive scientific research environments.

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News

https://loop.nigms.nih.gov/2017/10/new-nigms-institutional-predoctoral-training-grant-funding-opportunity-announcement/

Plan for Instruction in Methods for Enhancing Reproducibility (max 3 pages)

- Describe how trainees will be instructed in principles important for enhancing research reproducibility
  - scientific premise
  - rigorous experimental design and data interpretation
  - relevant biological variables
  - authentication of key biological and/or chemical resources
  - data and material sharing
  - record keeping
  - transparency in reporting
- Describe how instruction strategies are:
  - well integrated into the overall curriculum
  - taught at multiple stages of trainee development in a variety of formats and contexts
- Describe how all program faculty will reiterate and augment key elements of methods for enhancing reproducibility when trainees are performing research in their laboratories

UF Plan for Instruction in Methods for Enhancing Reproducibility (max 3 pages)

- Describe how trainees will be instructed in principles important for enhancing research reproducibility
  - scientific premise
  - rigorous experimental design and data interpretation
  - relevant biological variables
  - authentication of key biological and/or chemical resources
  - data and material sharing
  - record keeping
  - transparency in reporting
- Describe how instruction strategies are:
  - well integrated into the overall curriculum
  - taught at multiple stages of trainee development in a variety of formats and contexts
- Describe how all program faculty will reiterate and augment key elements of methods for enhancing reproducibility when trainees are performing research in their laboratories

What is our plan? What can we do together?

Rigor & Reproducibility

NEW GRADUATE COURSE:

"Ensuring Rigor and Reproducibility in Clinical and Translational Research"

- 1 credit, online, synchronous
- Being piloted in Summer 2018
- Matthew J. Gurka, PhD, Professor and François Modave, PhD, Associate Professor, Health Outcomes & Biomedical Informatics, College of Medicine
- Principles and best practices required to conduct rigorous and reproducible research across the translational spectrum; sound study planning and design, consideration of all relevant biomedical variables, sound data management practices, statistical considerations and techniques, and transparency in reporting research results

Research Skills (Competencies)
Career & Professional Development

New NIGMS Institutional Predoctoral Training Grant Funding Opportunity Announcement

Posted by Dr. Alison Gammie, Dr. Kenneth Gibbs and Dr. Shiva Singh on October 19, 2017
Post a Comment | No Comments ↓

We've just released a new training funding opportunity announcement (FOA) specifically tailored for predoctoral graduate programs in the basic biomedical sciences. Through this FOA, we intend to encourage changes in biomedical graduate training that allow it to keep pace with the rapid evolution of the research enterprise, which is increasingly complex, quantitative, interdisciplinary, and collaborative.

The overarching objective of this new predoctoral T32 training program is to develop a diverse pool of well-trained scientists who have the following:

- A broad understanding across biomedical disciplines, and the skills to independently acquire the knowledge needed to advance their chosen field.
- The ability to think critically, independently, and to identify important biomedical research questions and approaches that push forward the boundaries of their areas of study.
- A strong foundation in scientific reasoning, rigorous research design, experimental methods, quantitative and computational approaches, as well as data analysis and interpretation.
- A commitment to approaching and conducting biomedical research responsibly and with integrity.
- Experience initiating, conducting, interpreting, and presenting rigorous and reproducible biomedical research with increasing self-direction.
- The ability to work effectively in teams with colleagues from a variety of cultural and scientific backgrounds, and to promote inclusive and supportive scientific research environments.

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NIH Office of Extramural Research Blog

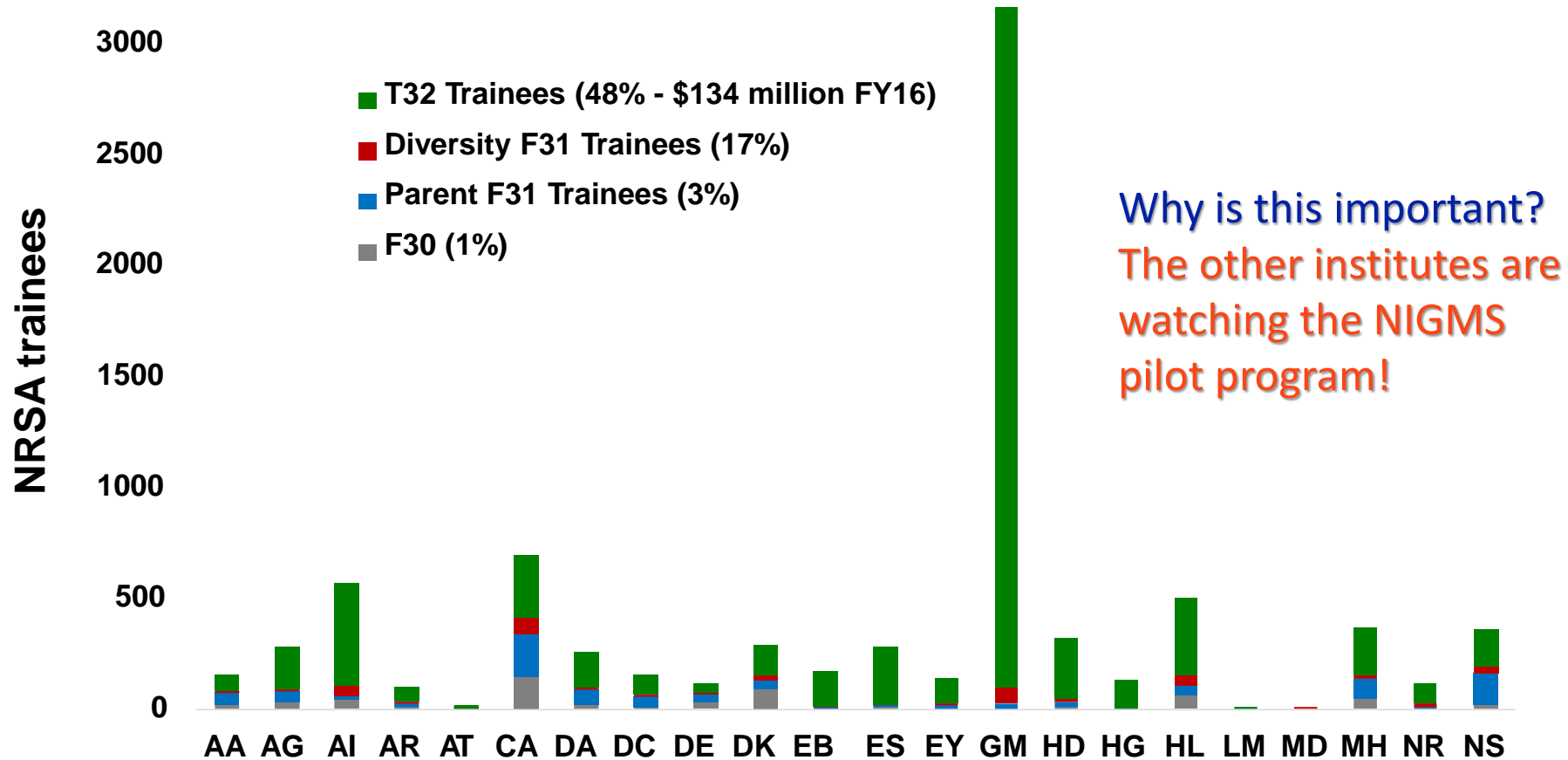**Categories**
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Funding Trends
Job Announcements
Meetings/Events
News

Looking Ahead: Predoctoral T32 NIGMS is committed to supporting predoctoral training

Legend:
- T32 Trainees (48% - $134 million FY16)
- Diversity F31 Trainees (17%)
- Parent F31 Trainees (3%)
- F30 (1%)

Y-axis: NRSA trainees

X-axis categories: AA, AG, AI, AR, AT, CA, DA, DC, DE, DK, EB, ES, EY, GM, HD, HG, HL, LM, MD, MH, NR, NS

Why is this important? The other institutes are watching the NIGMS pilot program!

Data: FY15 QVR/FTK Predoctoral T32, Parent F31 (PA-11-111, 14-147), Diversity F31 (PA-11-112, 14-148); Kenny Gibbs
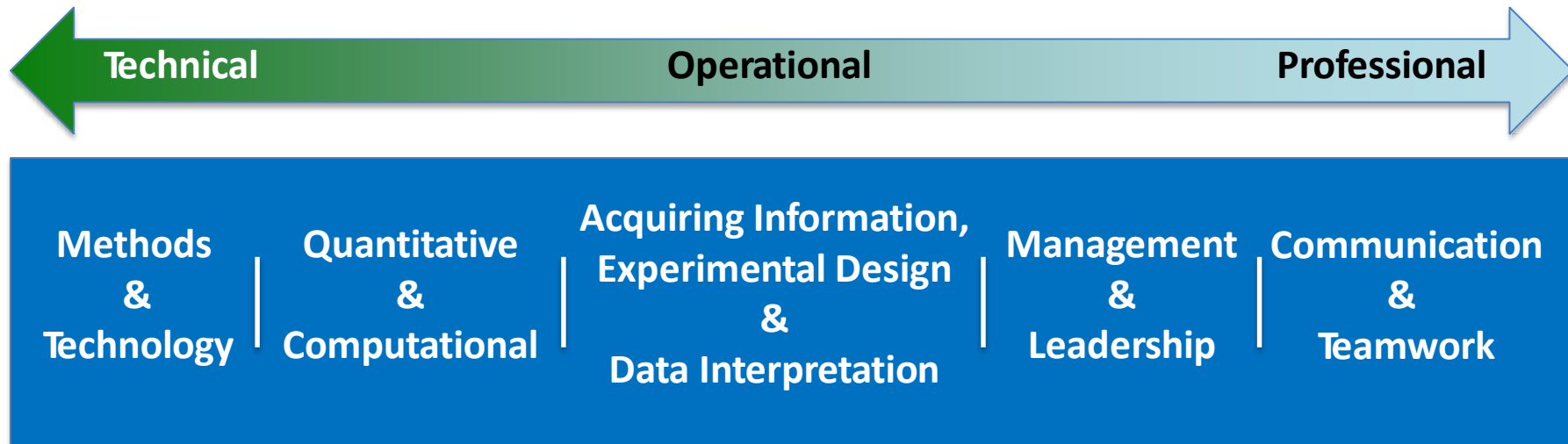
TWD PD Meeting June 2017

Gathering Information

Catalyzing the Modernization of Graduate Education

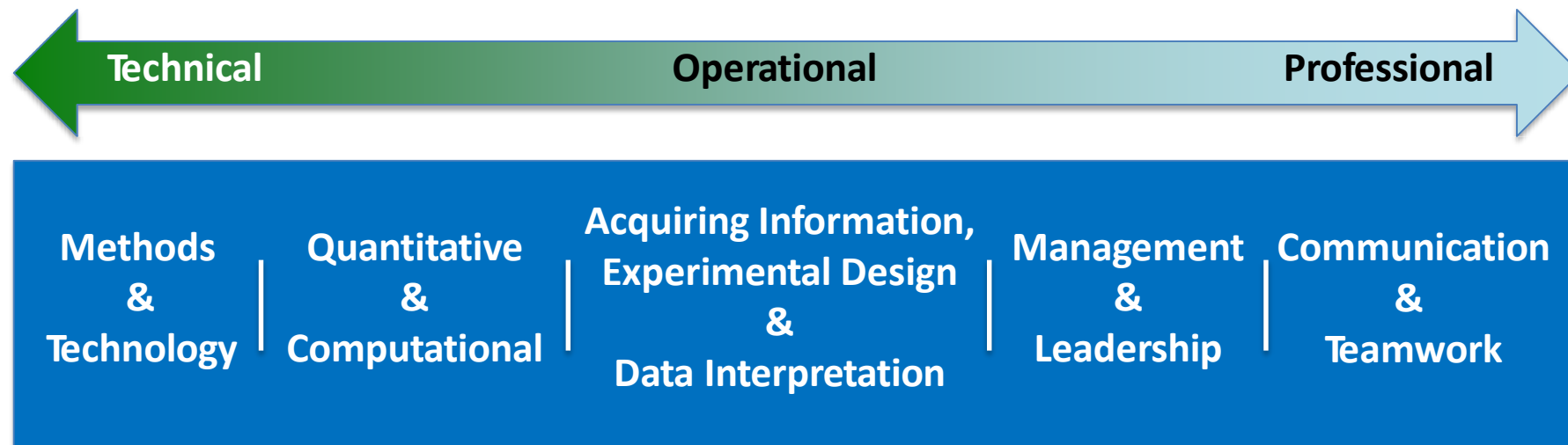Posted by Dr. Shiva Singh, Dr. Alison Gammie and Dr. Jon Lorsch on November 30, 2015
Post a Comment | View Comments (9) ↓

A major overhaul of how we educate graduate students in biomedical research is long overdue.

Technical ← → **Operational** → **Professional**

| Methods & Technology | Quantitative & Computational | Acquiring Information, Experimental Design & Data Interpretation | Management & Leadership | Communication & Teamwork |

NEW NIGMS-specific funding announcement

- Emphasize trainee development.

- Focus on <u>skills development</u>, <u>rigor & reproducibility</u>, <u>diversity & inclusion</u>, and <u>responsible conduct</u>.

- <u>Address conflicts in the incentive structure</u> of the research enterprise.

- Encourage the use of <u>evidence-based, innovative educational practices</u>.

- Require the collection and <u>dissemination of data on the success/failure</u> of educational interventions.

- Emphasize improvements in <u>career preparation</u> (broadly defined) and <u>dissemination of career outcomes</u> on publicly available sites.
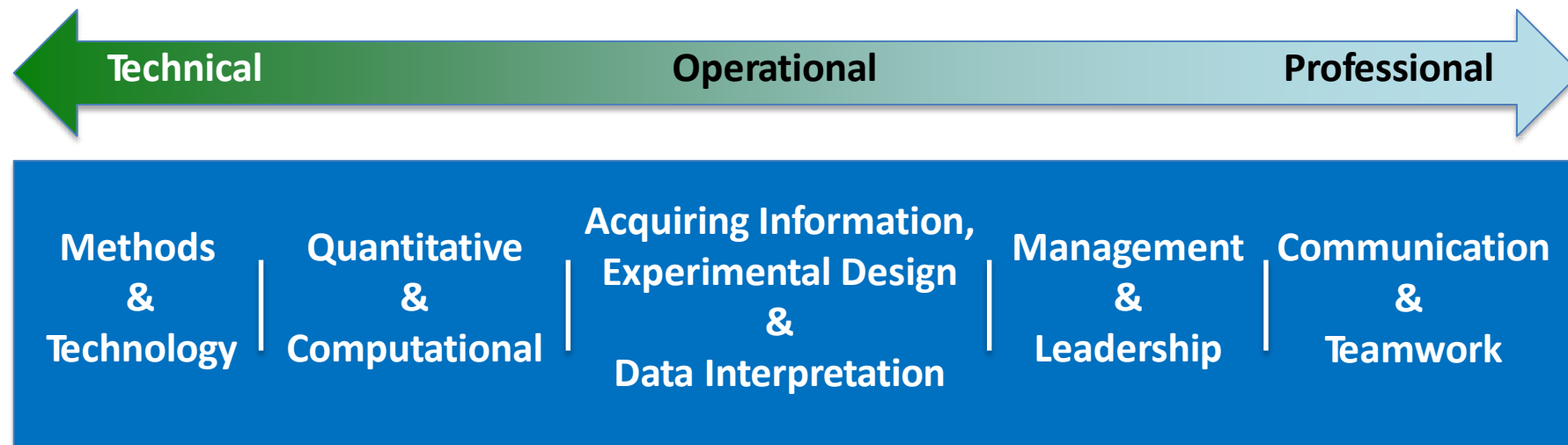
Technical   **Operational**   **Professional**

Methods & Technology	**Quantitative & Computational**	**Acquiring Information, Experimental Design & Data Interpretation**	**Management & Leadership**	**Communication & Teamwork**

From "Overview of NIGMS Training and Diversity Program" presented by Allison Gammie at the NIGMS Training, Workforce Development and Diversity Program Directors Meeting, June 2017

Program Objective Change

The Objective of the Institutional Research Training Grant Program is to:

- **OLD**: <u>develop and/or enhance research training opportunities</u> for individuals interested in careers in biomedical, behavioral and clinical research that are relevant to the NIH mission. The training program should provide…. (a set of experiences)
- **NEW:** <u>develop a diverse pool of ethical, well-trained, rigorous scientists </u>who have ….. (a set of skills, described in the next slides)
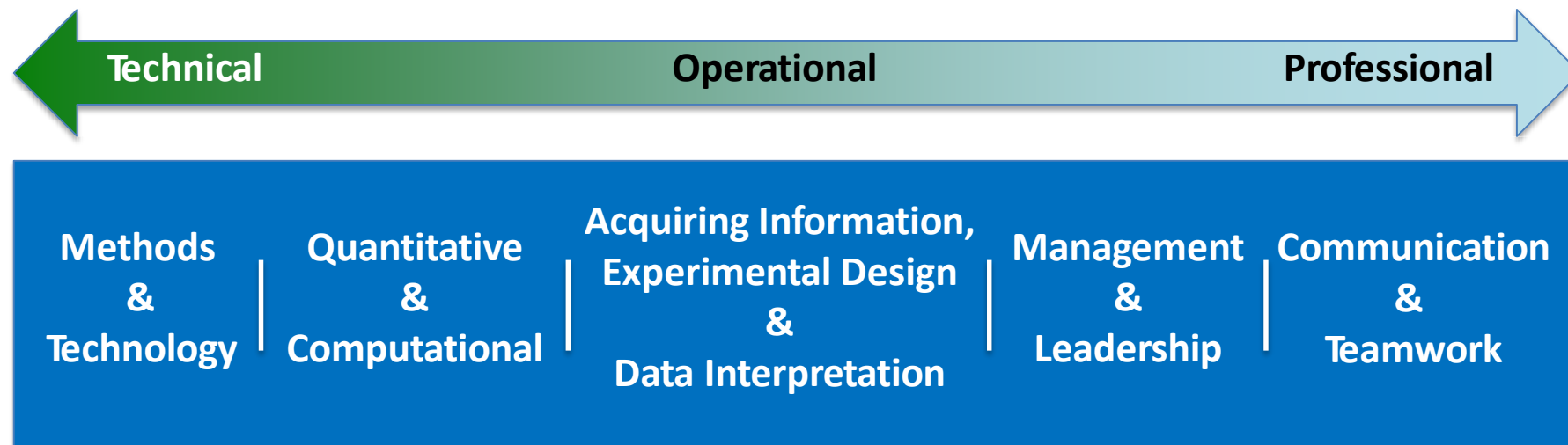
Proposed *Trainee* Focused Objectives: Technical/Operational Skills

- Broad understanding across biomedical disciplines, and the skills to independently acquire the knowledge needed to advance their chosen field
- The ability to think critically, independently and to identify important biomedical research questions and approaches that push forward the boundaries of their area of study
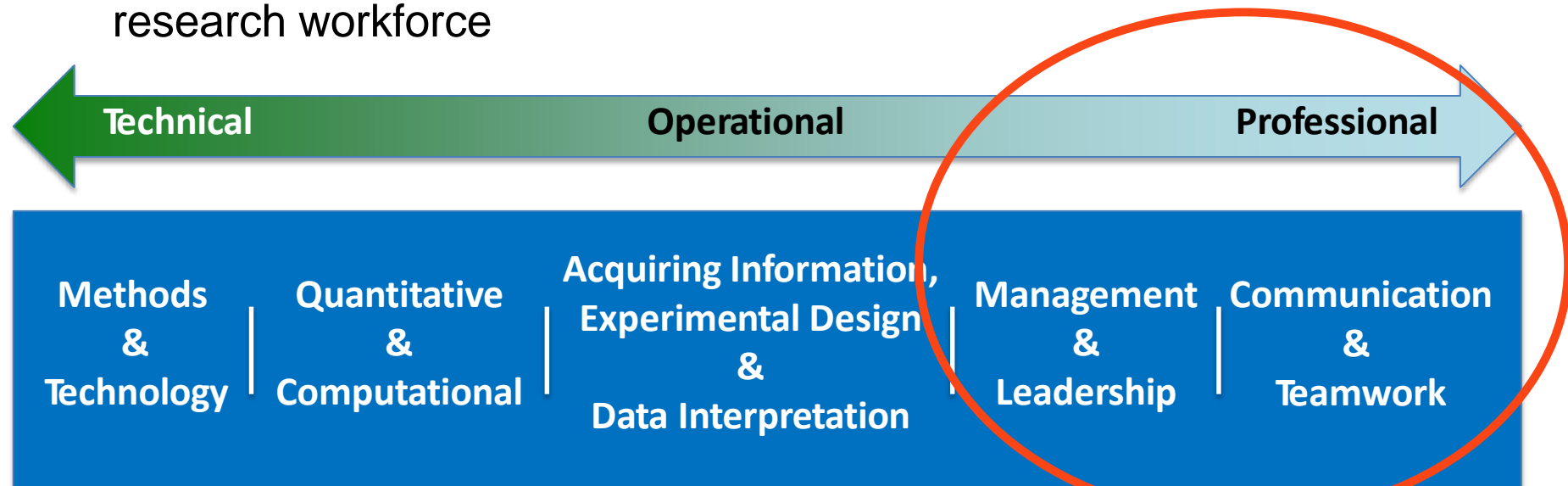
Technical ← ——— **Operational** ——— → **Professional**

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Proposed *Trainee* Focused Objectives: Technical/Operational Skills

- A strong foundation in rigorous research design, experimental methods, quantitative literacy & reasoning skills, data analysis & interpretation
- Experience initiating, conducting, interpreting, and presenting rigorous and reproducible biomedical research with increasing self-direction

Technical	Operational	Professional

Methods & Technology	Quantitative & Computational	Acquiring Information, Experimental Design & Data Interpretation	Management & Leadership	Communication & Teamwork

Proposed *Trainee* Focused Objectives: Professional Skills

- The ability to work effectively in teams with colleagues from diverse cultural and disciplinary backgrounds, and to promote an inclusive and supportive scientific research environment

- The skills and opportunities to communicate scientific research methodology and findings to a wide variety of audiences (e.g., discipline-specific, across disciplines, and the public)

- The knowledge, professional skills and experiences required to identify and transition into productive careers in the biomedical research workforce

Technical   Operational   Professional

| Methods & Technology | Quantitative & Computational | Acquiring Information, Experimental Design & Data Interpretation | Management & Leadership | Communication & Teamwork |

UFHealth

Grad Student & Postdoc Career and Professional Development (GradDev)

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GradDev Calendar

OCT 20 Basics of Bioinformatics
From 9:00am until 5:00pm

OCT 20 T-Team Workshop
From 2:00pm until 5:00pm

OCT 23 Pilot Workship
From 9:00am until 12:00pm

OCT 24 Startup Job & Internship Fair
From 1:00pm until 4:00pm

» VIEW ALL EVENTS

Professional Skills

Doctoral research training focuses on the scientific method of hypothesis-based research and technical skills, but usually does not include training on other professional skills (referred to by some as "soft skills") that are just as important to potential employers. A recent Council of Graduate Schools survey revealed that employers believe graduate degree holders often lack "skills related to working in a team environment, creating and delivering presentations, business acumen (skills necessary to deliver outcomes on schedule and on budget), project management, and the ability to discuss technical issues with nontechnical individuals." (Council of Graduate Schools and Educational Testing Service. 2012. *Pathways Through Graduate School and Into Careers*. Report from the Commission on Pathways Through Graduate School and Into Careers. Princeton, NJ: Educational Testing Service.)

These professional skills will be important for your job success and satisfaction no matter which career pathway you choose to follow. They can be learned and improved upon with practice, but are often left to be learned only after one assumes a managerial position. Rather than waiting until you are "on the job" and need to use these skills, it may be to your advantage to become familiar with these professional skills before you enter the workplace. We have organized these along four themes: Research Management, Communication, Leadership, and Teaching.

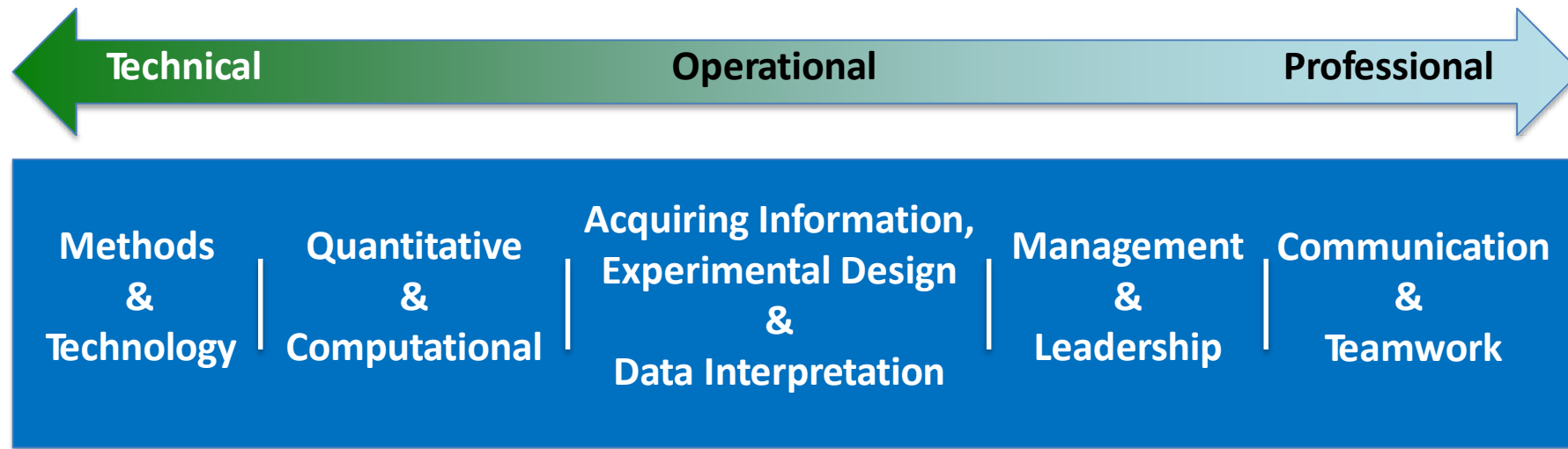🏷 Tagged as: graduate students, postdoctoral, professional development

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UNIVERSITY OF FLORIDA HEALTH

Together we discover. Together we teach.
Together we care for our patients and our communities.
Together we create unstoppable momentum.

MAKE A GIFT

Professional Development

	Theme	Sample Topics
1	Communication	Effective Listening Skills
2	Mentoring	Mentoring & Being Mentored
3	Res Management	Getting Funded
4	Leadership	Laboratory Leadership in Science
5	Collaboration	Introduction to the Science of Team Science
6	Teaching	How to Make Lectures More Effective
7	Communication	Effective Science Communication in the Internet Age
8	Mentoring	Diversity and Bias in Mentoring
9	Res Management	Staffing Your Laboratory
10	Leadership	Embracing and Leading Change
11	Collaboration	Building a Research Team - Who and Why
12	Teaching	University Structure & Planning for T&P
13	Communication	Communicating with a Lay Audience
14	Mentoring	Intro to Mentoring and Giving Feedback
15	Res Management	Time & Project Management
16	Leadership	Team Dynamics and Leading Teams
17	Collaboration	Writing a Collaboration Plan
18	Teaching	The ABC's of Grading
19	Communication	Communication and Conflict Management
20	Mentoring	Coaching vs. Mentoring
21	Res Management	IP – Where Science Meets Business
22	Leadership	Understanding Behavioral Styles & Leadership
23	Collaboration	Best Practices to Enhance Team Effectiveness
24	Teaching	Teaching as Scholarship

Technical — Operational — Professional

| Methods & Technology | Quantitative & Computational | Acquiring Information, Experimental Design & Data Interpretation | Management & Leadership | Communication & Teamwork |

Science PhD Core Competencies

1. Broad Conceptual Knowledge of a Scientific Discipline
2. Deep Knowledge of a Specific Field
3. Critical Thinking Skills
4. Experimental Skills
5. Computational Skills
6. Collaboration and Team Science Skills
7. Responsible Conduct of Research and Ethics
8. Communication Skills
9. Leadership Skills
10. Survival Skills

Verderame MF, Freedman VH, Kozlowski LM, McCormack WT. 2018. Competency-based assessment for the training of PhD students and early-career scientists. **eLife** 7:e34801. Available at https://elifesciences.org/articles/34801

Competency-Based Assessment

	Novice	Advanced Beginner	Competent	Proficient	Expert
Dreyfus & Dreyfus Levels of Skill Acquisition	Rule-based behavior, limited, inflexible	Incorporates aspects of the situation	Acts consciously from long-term goals and plans	Sees situation as a whole and acts from personal conviction	Has intuitive understanding of situations, zooms in on central aspects
Training Stages	Beginning PhD Student	Advanced PhD Student	PhD Graduate	Early Career Scientist or Postdoctoral Trainee	Science Professional

Example	MILESTONES				
Critical Thinking Skills: Design a single experiment (answer questions, controls, *etc.*)	**Follow** experimental protocols, **seek** help as needed, **describe** critical role of controls	**Plan** experimental protocol; **include** relevant controls; **choose** appropriate methods; **troubleshoot** experimental problems	**Design and execute** hypothesis-based experiments independently; **evaluate** protocols of others; **predict** range of experimental outcomes	Consistently **design and execute** experiments with appropriate controls; **assess** next steps; **critique** experiments of others	**Teach** experimental design; **guide** others doing experiments

Verderame MF, Freedman VH, Kozlowski LM, McCormack WT. 2018. Competency-based assessment for the training of PhD students and early-career scientists. **eLife** 7:e34801. Available at https://elifesciences.org/articles/34801

Review Criteria: Overall Impact

Overall Impact: Reviewers will provide an overall impact score to reflect their assessment of the likelihood that the proposed training program…

OLD

…will prepare individuals for successful, productive scientific research careers and thereby exert a sustained influence on the research field(s) involved.

NEW

…through courses, structured training activities, and mentored research experiences will produce well-trained, ethical, rigorous and diverse scientists with the **technical, operational, and professional skills** necessary to transition into productive biomedical research **careers**. ✓

Review Criteria - Training Program and Environment

Questions focused on:

OLD

- Research Environment
- Training Program Plan
- Institutional Commitment Sufficient
- Distinct from other funded programs

NEW – additional questions concerning

- Mission, Objectives, and Overall Training Plan
  - ○ Should state measurable, obtainable objectives
- ✓ Institutional and Departmental Commitment
- ✓ Enhancements to the Training Environment
  - ○ Evidence-based approaches to teaching, mentoring and inclusion
- ✓ Mentor Selection Process and Mentor Training
- ✓ Career Development
- ✓ Program Evaluation Plan Aligned with Objectives

Grad Student & Postdoc Career and Professional Development (GradDev)

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Tech Transfer & Entrepreneurship

Career Interest Teams

Career Interest Teams are being developed to provide broad-based introductory experiences for UF Health PhD students and postdocs to become familiar with possible career options in the biomedical sciences. Participation is entirely voluntary. Grad students and postdocs may explore sessions in multiple interest groups according to their individual interests. These introductory career experiences leverage existing institutional resources to broaden training experiences for biomedical science predoctoral and postdoctoral trainees. For each Career Interest Team, participants will have options available to them for additional career training opportunities at UF, some of which offer certificates or degree programs.

GradDev Calendar

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OCT 24 — Startup Job & Internship Fair
From 1:00pm until 4:00pm

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Review Criteria: Principal Investigator

- **OLD**
  - ○ Expertise, leadership and time commitment
  - ○ Somewhat discouraging of multiple PI's
- **NEW**
  - ✓ Expertise, leadership, *record of rigorous research,* time commitment, *trained in mentoring, diversity and inclusion*
  - ✓ Encourage multiple PI's with complementary expertise in training

Review Criteria: Preceptors/Mentors

OLD

- Focused on numbers, funding, and scientific expertise

NEW

✔ Numbers, funding and expertise

✔ Bandwidth and commitment *to training*

✔ Must provide research opportunities and teach: experimental design, rigor & reproducibility

✔ Trained mentors

✔ Commitment to diversity and a supportive research environment

✔ Actively promote career development

Review Criteria: Trainees

OLD

- Mostly whether there are sufficient numbers of "well-qualified" students

- Must have an appointment plan

NEW

- ✓ Encourages recruiting and appointing trainees from **diverse backgrounds** (broadly defined) with the potential to become outstanding scientists (e.g., a **holistic review process** when accepting and appointing students)

- ✓ Emphasizes a **retention plan** with oversight throughout the entire time in graduate training

Review Criteria: Training Record

OLD

- Completion
- Research accomplishments: (e.g., "high-impact" publications, awards, careers in research, leadership positions)
- Evaluations

NEW

- ✓ Completion and time to degree (well- *vs*. under-represented similar)
- ✓ Demonstrate rigorous research activity that advanced scientific knowledge and/or technologies (*e.g.*, peer-reviewed papers, presentations at scientific meetings, etc.)
- ✓ Plans for career tracking
- ✓ Recruitment plans for students from underrepresented groups
- ✓ Evaluation, outcomes, and dissemination plans; responsive improvements
- Recruitment plans for diversifying the faculty

Biomedical Science PhD Career Outcomes Beyond Postdoc

(N=465)

Timeline

- **NIH Guide publication:** September 2017 (estimated)

- **Application receipt:** May 2018

- **Initial review:** Oct/Nov 2018

- **NAGMS Council review:** January 2019

- **Earliest award date:** July 2019
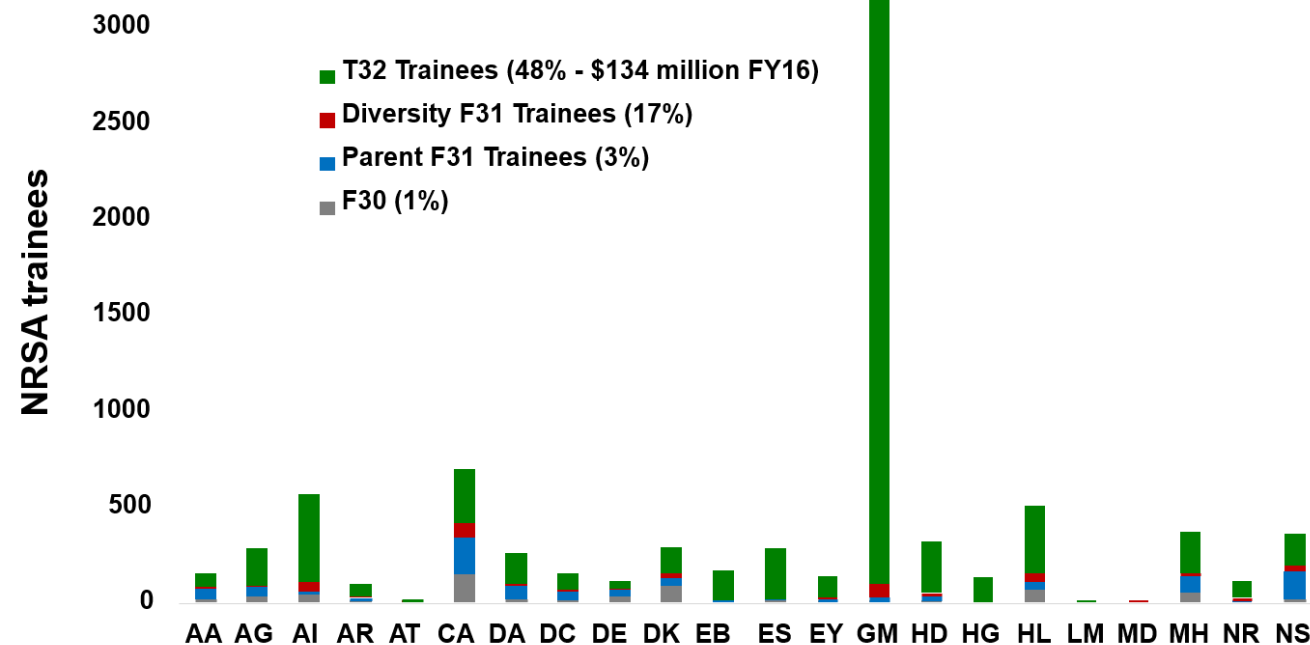
Department of Health and Human Services
Part 1. Overview Information

Participating Organization(s)	National Institutes of Health (NIH)
Components of Participating Organizations	National Institute of General Medical Sciences (NIGMS)
Funding Opportunity Title	National Institute of General Medical Sciences Ruth L. Kirschstein National Research Service Award (NRSA) Predoctoral Institutional Research Training Grant (T32)
Activity Code	T32 Institutional National Research Service Award (NRSA)
Announcement Type	New
Related Notices	None
Funding Opportunity Announcement (FOA) Number	PAR-17-341

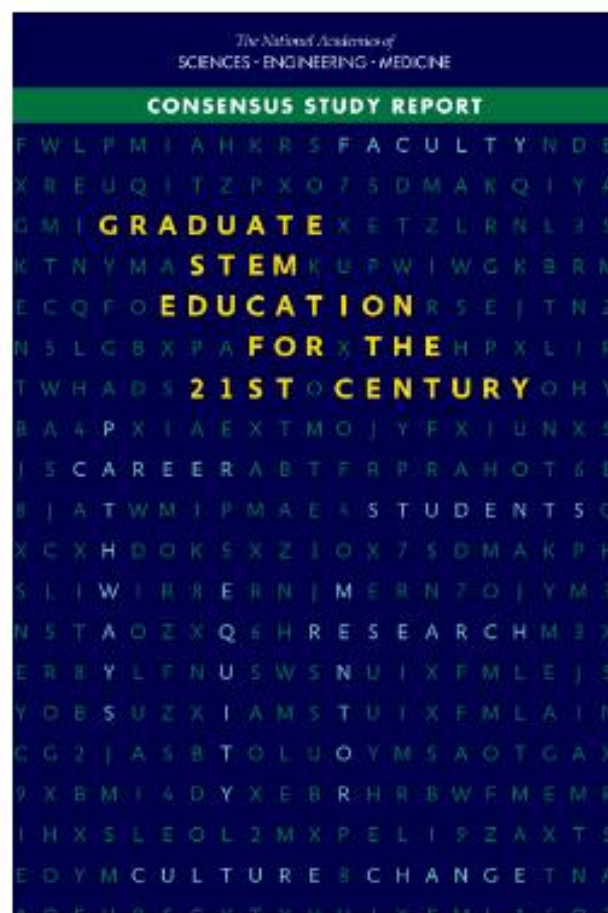https://grants.nih.gov/grants/guide/pa-files/PAR-17-341.html
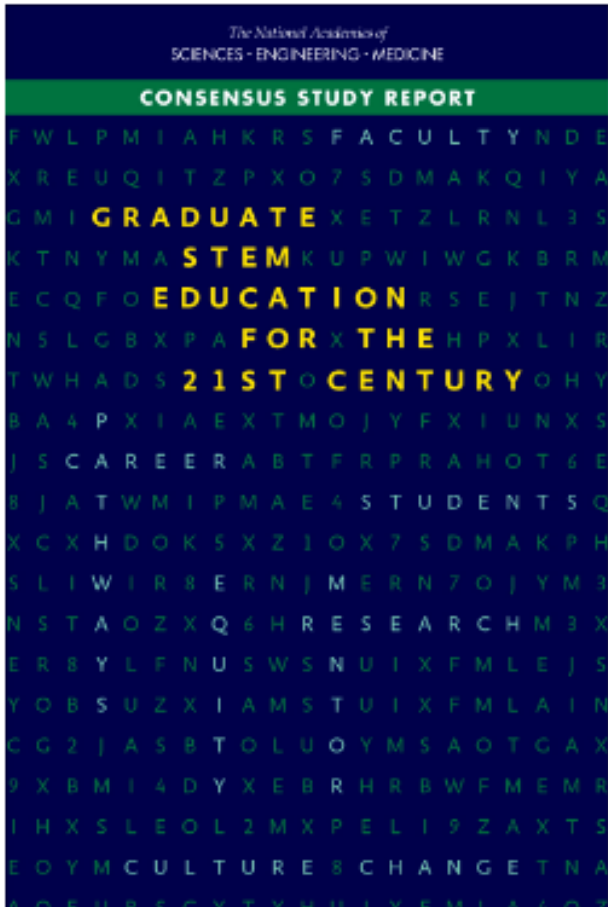
Why is this important?

- The institute that funds (or will fund) YOUR T32 is watching!
- It is only a matter of time before such changes impact all T32s
- Let's be proactive and build our T32 strategy together

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23

Graduate STEM Education for the 21st Century

Core Competencies for the STEM PhD Degree

1. Develop Scientific and Technological Literacy and Conduct Original Research
   a. specialized expertise
   b. transdisciplinary literacy
   c. identify important problems, articulate original research questions
   d. design a research strategy (quantitative, analytical, theoretical approaches)
   e. evaluate outcomes and select outcomes to pursue
   f. rigorous standards of investigation and mastery of skills
   g. apply professional norms and practices, ethical standards

2. Develop Leadership, Communication, and Professional Competencies
   a. work in collaborative multicultural and multidisciplinary team settings
   b. communicate significance and impact of research to multiple audiences
   c. professional competencies

Recommendations
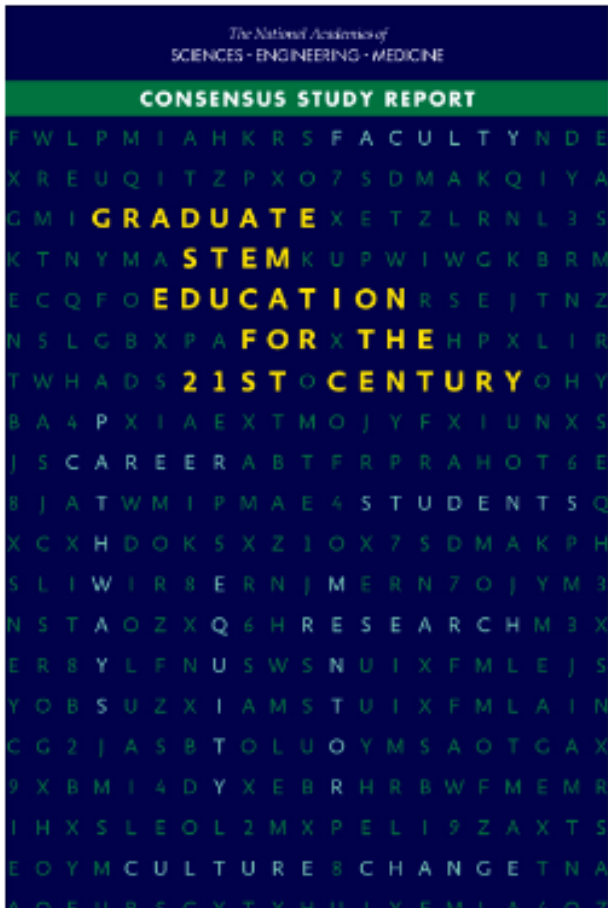
- Rewarding Effective Teaching and Mentoring
- **National and Institutional Data on Students and Graduates**
- Ensuring Diverse, Equitable, and Inclusive Environments
- **Career Exploration and Preparation** for Graduate Students
- Structure of Doctoral Research Activities
- Funding for Research on Graduate STEM Education
- Stronger Support for Graduate Student Mental Health Services

Post-Award Administration Advice

Ronda Breton, Senior Grants Specialist, College of Dentistry
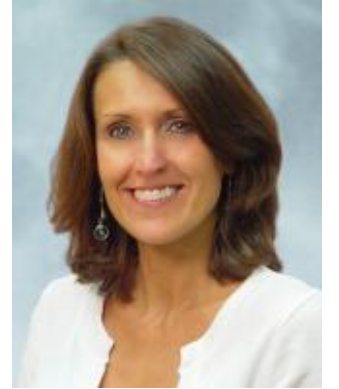
- health insurance, appointments, taxes, budget

Training Program Web Pages

- Consistent format
- Career outcomes graphics

NIH Site Visits

- Lyle Moldawer, PhD

  - trainee diversity
  - PI succession plan
  - trainee interview/selection process
  - mentor/mentee expectations (IDP)
  - evaluation/education standards