Institutional Research and Academic Career Development Awards (IRACDA)

Postdoctoral Research, Instruction and Mentoring Experience (PRIME)

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Office of Postdoctoral Affairs,
WFU Graduate School of Biomedical Sciences
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Challenges to Research and Teaching as an Academic Career

Postdoctoral Training programs:
1. Research 100%
2. mentored teaching opportunities ??%

This leaves many highly trained researchers with a void in their academic experience even if they participated as teaching assistants as predoctoral trainees.

Institutional Research and Academic Career Development Awards (IRACDA)

Postdoctoral Training program embraces:
1. Research 75%
2. mentored teaching opportunities 25%

• NIGMS K12 program
• Consortia between a Research Intensive and an under-represented minority-serving Teaching Mission institution

Expected Outcomes:
• Postdoctoral scholars: success in research and teaching careers in academia
• Partner institutions: highly motivated young scientists
• Research Intensive and partner institutions: collaborations in research and teaching

IRACDA: 18 Participating Programs in 2015

IRACDA NY-CAPS Program
New York Consortium for the Advancement of Postdoctoral Scholars

• Primary Objective:
• “To implement a blended research and teaching postdoctoral training model that provides comprehensive preparation for postdoctoral scholars interested in pursuing a faculty career.”

• Year 1 (Pedagogy Course & Research)
• Year 2 (Research & Mentored Teaching)
• Year 3 (Research & Job Search)
NY-CAPS: Partner Institutions

- Stony Brook University (Research Intensive Institution)
- CUNY Brooklyn College (comprehensive)
- SUNY College at Old Westbury (primarily undergraduate)
- Suffolk County Community College (2-yr community college)

- All sectors of higher education settings
- Full range of faculty career pathways

IRACDA NY-CAPS: Major Components

- **Research Training**
  - External Scientific Meetings/Trainings
  - Local lab meetings, journal clubs

- **Pedagogy Course**
  - Curriculum development
  - Teaching Statement/Philosophy
  - Learning styles, Teaching strategies
  - Technology and web tools
  - Communicating Science
  - Culmination: Microteaching seminar

- **Professional Development Workshops**
  - Topic Based Lunch with Senior Leadership
  - Faculty Career Weeks
  - Practical Professional Skills
  - Conflict Resolution
  - Grantsmanship
  - Communicating Science

IRACDA Program (SPIRE)
University of North Carolina/Chapel Hill

Recruit diverse scholars that compliment the mission of NIGMS and the needs of our four partner campuses

- Provide research training for scholars and undergraduate students
- Provide a mentored teaching experience
- Provide training in professional skills to promote success in future academic positions

SPIRE Program Partnership

NCCU (Durham)
UNC CH
NCAT (Greensboro)
UNC P (Pembroke)
JCSU (Charlotte)

SPIRE Program Timeline

Year 1 | Year 2 | Year 3
--- | --- | ---
F | S | Su
F | S | Su
F | S | Su

- Research
- Teaching
- Support, Community, Evaluation
- Other Professional Development

SPIRE Outcomes

- 87 past and current scholars (2000-present)
  - 36% URM status (race/ethnicity/disability)
  - 68% Females
  - 183 Courses taught, 3,000 students served
  - 300 Students mentored in research

- Employment
  - 89% secured positions at educational institutions
  - 63% currently tenured, TT, or academic faculty
  - 12% at partner institutions
Medical & Health Professions Schools face a challenge:
1) health-professions schools teach compressed basic sciences in a clinical context,
2) teaching methods beyond lectures in contemporary curricula,
3) diverse student backgrounds in health professions schools,
4) research is translational and collaboration involves clinical applications.

YET, Few PhD students take classes along with health-professions students to experience these changes.

How do we prepare our biomedical sciences trainees to serve as educator-researchers in the medical/allied health professions?

The Postdoctoral Research, Instruction, and Mentoring Experience (PRIME) training program

PRIME program goals:
- to develop highly-skilled biomedical scientists to teach the next generation of clinical researchers and medical/allied health professionals
- to increase the numbers of academic researchers from under-represented minorities (URM) in the medical and allied health professions;
- to train postdoctoral scholars to utilize innovative methods that enhance the learning environment and support the career development of URM pre-professional and allied health professions students.

Implement PRIME goals via:
Mentored teaching opportunities that require our trainees to direct the scientific content specifically to the professional needs of the allied health audience. Formal instruction in:
• educational philosophy and teaching methodology,
• techniques to promote active learning and clinical application of scientific principles,
• ethics and responsible conduct of research.
Hallmarks of the PRIME Program

1. Train scholars in research with a faculty member in a WFU Graduate School programs in Integrative Physiology and Pharmacology, Neuroscience, Cancer Biology, Molecular Genomics, Molecular Medicine & Translational Sciences, Immunol & Virology, Biochemistry & Molecular Biology and Biomedical Engineering.

Research Experience at WFSM, a Research Intensive Institution

- 75% effort in research, with 90% effort during the first six months.
- Participation in journal clubs and seminars
- Presentations at scientific meetings
- Publication of research in peer-reviewed journals

Research at Partner Institution Winston-Salem State University (WSSU)

WSSU Biomedical Research Infrastructure Center

Research Options are Expanded
Teaching mentors guide scholars in time management

Research at Partner Institution Winston-Salem State University (WSSU)

Research Options can interface with teaching activities
Physical therapists, biomedical engineers, medical students, and orthopedic surgeons are all involved in the research activities.

Hallmarks of the PRIME Program

2. Train scholars in mentored teaching experiences at WSSU for the entire three year training, including tutoring, lecturing, laboratory design and development, guiding students through simulations, case-based learning (CBL), and open-source digital teaching tools.

Postdoctoral Research, Instruction and Mentoring Experience: PRIME

Experience in teaching for pre-doctoral and post-doctoral trainees in biomedical sciences

GRAD720 Topics in College Level Teaching

- Pre-professional Anatomy & Physiology
- Applied Physiology (Physical Therapy)
- Pharmacology (Physical Therapy)
**Instructional Experience in a Clinical Discipline**

- 25% effort in teaching, in 2-3 week blocks of time throughout the entire 3-year program.
- Participation in lectures, laboratories, demos
- Developing case-based learning and simulations
- Developing board-style examination questions

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**Traditional Textbook**

- Reading order is set by publisher
- Sections: DNA, RNA, protein...

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**The Adapa Project**

**DIGITAL TOOLS for eTEXTBOOK**

**Non-linear Learning Modalities**

Evaluation and adoption of BioBook
Launch of the first evaluation module for ChemBook
Expansion of The Adapa Project's toolset for developers, teachers, and students.

Supported by Arthur Vining Davis Foundation

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**Hallmarks of the PRIME Program**

3. Introduce PRIME scholars to current pedagogical techniques and educational philosophy through a semester-long course, and short workshops from the WFU Teaching and Learning Center and others.

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**Training in Instructional Methods**

**BIO783 Instructional Methods for College Science**

Participants use best-practices to design a course:
- set general learning outcomes
- and assessable performance goals,
- delivered sessions from their course using a mix of traditional didactic lecture and cases, field exercises, other active learning methods.

Participants evaluate their peers and provide feedback using a modified Reformed Teaching Observation Protocol.

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**Teaching and Learning Center**

WFU TLC offers a PORTFOLIO PROGRAM in College Level Teaching

“Tools to Enhance Your Teaching” Workshops include
- Learning and Learner Centered Teaching
- Grading with Rubrics
- Using clickers to engage student learning
- Encouraging Student Reflections with Blogs
- Incorporating Writing While Minimizing the Grading Burden
- Preparing to Teach: Objectives through Assessment
- The Syllabus Reconsidered: Learning Tool NOT a Legal Contract!
- The First Class: Making it Count

[http://tlc.wfu.edu/resources-for/graduate-teaching-assistants/](http://tlc.wfu.edu/resources-for/graduate-teaching-assistants/)
Mentoring Experiences

CHALLENGES:
- Time management in a teaching mission environment
- Teaching deadlines dominate teaching time
- Laboratory management using undergraduates and MS students as personnel
- Research limitations
  - Animal housing
  - Facilities support
  - Grants management

Hallmarks of the PRIME Program

4. Facilitate mentoring skills by pairing PRIME scholars with WFSM faculty to oversee the research training of WSSU MARC U*STAR and MBRS-RISE undergraduates, and PREP post-bac students.

Mentoring Experiences

NIGMS programs for undergraduates

MARC U*STAR
Maximizing Access to Research Careers for Undergraduate Student Training in Academic Research
MBRS-RISE:
Minority Biomedical Research Support-Research Initiative for Scientific Enhancement

Translational Science Institute
Medical Student Summer Research Program

MS in Biomedical Sciences: Med Prep
MS Project to prepare for Medical School

Undergraduate Summer Programs
Excellence in Cardiovascular Research
Wake Forest Institute of Regenerative Medicine

Hallmarks of the PRIME Program

5. Train PRIME scholars in translational research practices and grant writing.

CHALLENGES:
- Collaborating faculty will be clinical professionals
- Laboratory management using students as personnel
- Research facilities may be in a clinical environment
- Yet, Bench science rarely provides opportunity for translational research
PRIME IRACDA
Maya Angelou Center for Health Equities
Summer Workshops

**Topics in Translational & Educational Research**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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</thead>
<tbody>
<tr>
<td>June 19</td>
<td>8am</td>
<td>Getting Started with Translational Research</td>
<td>Dr. William Henry</td>
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<tr>
<td>June 19</td>
<td>1pm</td>
<td>Inter-professional Research</td>
<td>Maya Angelou</td>
</tr>
<tr>
<td>June 19</td>
<td>5pm</td>
<td>Conducting Clinical Trials: Getting your first study, Study Start-up</td>
<td>Maya King</td>
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<tr>
<td>June 19</td>
<td>12pm</td>
<td>Strategies for Research Success</td>
<td>Maya Angelou</td>
</tr>
<tr>
<td>June 20</td>
<td>8am</td>
<td>Collaborate or Perish</td>
<td>Nancy Smith</td>
</tr>
<tr>
<td>June 20</td>
<td>1pm</td>
<td>Maximizing Mentor-Mentee Relationship</td>
<td>Nancy Smith</td>
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<tr>
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<td>Strategies for Research Success</td>
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<tr>
<td>June 20</td>
<td>12pm</td>
<td>Innovative Research Methods</td>
<td>Nancy Smith</td>
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<tr>
<td>June 21</td>
<td>8am</td>
<td>Novel Educational Technologies</td>
<td>Nancy Smith</td>
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**Topics in Detecting and Understanding Health Disparities**

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</thead>
<tbody>
<tr>
<td>June 21</td>
<td>8am</td>
<td>Defining health disparities and health equity</td>
<td>Nancy Smith</td>
</tr>
<tr>
<td>June 21</td>
<td>1pm</td>
<td>Landmark reports on health disparities</td>
<td>Nancy Smith</td>
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<tr>
<td>June 21</td>
<td>5pm</td>
<td>Measuring health disparities</td>
<td>Nancy Smith</td>
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<tr>
<td>June 21</td>
<td>12pm</td>
<td>Disparities in T2DM and obesity</td>
<td>Nancy Smith</td>
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<tr>
<td>June 22</td>
<td>8am</td>
<td>Determinants of health and health care disparities</td>
<td>Nancy Smith</td>
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<tr>
<td>June 22</td>
<td>1pm</td>
<td>Determinants of social health disparities</td>
<td>Nancy Smith</td>
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<tr>
<td>June 22</td>
<td>5pm</td>
<td>Determinants of health care system disparities</td>
<td>Nancy Smith</td>
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<tr>
<td>June 22</td>
<td>12pm</td>
<td>Ethics in Research</td>
<td>Nancy Smith</td>
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<tr>
<td>June 22</td>
<td>8am</td>
<td>Innovation in Healthcare</td>
<td>Nancy Smith</td>
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**Topics in Promoting Health Equity**

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<tbody>
<tr>
<td>June 23</td>
<td>8am</td>
<td>Organizational and community points of interest to reduce health disparities, introduce working in collaborations</td>
<td>Maya King</td>
</tr>
<tr>
<td>June 23</td>
<td>1pm</td>
<td>Developing strategies for policy intervention to address health disparities (promote health equity)</td>
<td>Nancy Smith</td>
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<tr>
<td>June 23</td>
<td>5pm</td>
<td>Research dissemination (involving faith community and community organizations &amp; agencies)</td>
<td>Nancy Smith</td>
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<tr>
<td>June 24</td>
<td>12pm</td>
<td>Service Learning Courses</td>
<td>Nancy Smith</td>
</tr>
<tr>
<td>June 24</td>
<td>8am</td>
<td>Incorporating research/service into the classroom</td>
<td>Nancy Smith</td>
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**Hallmarks of the PRIME Program**

6. Train PRIME scholars to become leaders in Responsible Conduct of Research (RCR) education programs.

**CHALLENGES:**
- Laboratory student personnel need RCR training
- Federal funding requires an ongoing RCR training program
- Department faculty may be clinical, not researchers

**Problem-based learning curriculum in Scientific Integrity**

**GRAD713-714**
Faculty member plus a Postdoc trainee co-facilitate a group (6-8) year-1 graduate students
- Cases presented one week; expert speaker introduces topic
- Students investigate issues and discuss on a second week
- Cases address all required components for NIH-trainees

PRIME Scholars are working with other postdocs having clinical degrees to build new Cases directed at clinical and translational research ethics. Cases will be incorporated for training of pre-med undergraduates, and post-bac and MS medical sciences students at both institutions.

**Professional Development Leadership Activities**

WFU Postdoctoral Association: President, Secretary
National Postdoctoral Association
NC Academy of Sciences: Poster Presentation Judges, Organizers
Regional Scientific Societies: Meeting organizer

Textbook Production: SmartWork Author (W. W. Norton & Co): general chemistry; SmartWork student learning objectives and problems (online homework system) for chemistry; assistance in editing of a Chemistry book.
Individual Development Plans

SUMMARY Outcomes of the PRIME Program
1. Train scholars in research
   Outcomes: Publications and funding
2. Mentored teaching experiences
   Outcomes: Skills in teaching clinical scholars
3. Train scholars in pedagogical techniques and educational philosophy
   Outcomes: Biomedical Educators
4. Facilitate mentoring skills
   Outcomes: Laboratory and Personnel Management
5. Train scholars in translational research
   Outcomes: Clinical and Translational Research
6. Train scholars in Responsible Conduct of Research education
   Outcomes: Scientific ethics for biomedical and clinical researchers

Postdoctoral Research, Instruction, and Mentoring Experience (PRIME) training program

Further information can be found at:
http://www.wakehealth.edu/School/Hypertension-and-Vascular-Research-Center/PRIME-Program.htm