Institutional Research and Academic Career Development Awards (IRACDA)

Postdoctoral Research, Instruction and Mentoring Experience (PRIME)

Allyn C. Howlett, PhD, Director
Office of Postdoctoral Affairs,
WFU Graduate School of Biomedical Sciences

2015 IAMSE Webinar Series: Feb 5
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
Institutional Research and Academic Career Development Awards (IRACDA)

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.”
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

JCSU: Johnson C. Smith University
NCAT: North Carolina A&T State University
NCCU: North Carolina Central University
UNCCH: University of North Carolina at Chapel Hill
UNC P: University of North Carolina at Pembroke
# SPIRE Program Timeline

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<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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## Research

- Year 1: Teaching Preparation
- Year 2: 2 semesters teaching
- Year 3: 2 semesters 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.
Medical & Health Professions Schools face a challenge:

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

PRIME program goals:

to increase the numbers of academic researchers from under-represented minorities (URM) in the medical and allied health professions;
The Postdoctoral Research, Instruction, and Mentoring Experience (PRIME) training program

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

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

Research is:
Cross-disciplinary
Clinically oriented
Translational

Physical therapists, biomedical engineers, medical students, and orthopedic surgeons are all involved in the research activities.
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
Instructional Experience in a Clinical Discipline

Case-based learning throughout the instruction is encouraged.

Simulation Hospital for teaching physiology principles
Traditional Textbook
reading order is set by publisher

Unit: Information storage & flow
Chapter: Molecules of information
  Sections: DNA, RNA, protein...

Chapter: Translation & transcription
  Sections: Ribosomes, mRNA...

Unit: Flow of matter & energy

Non-linear eText
reading order is personalized by student

Information storage & flow
Flow of matter & energy

Unifying Principles
‘P-nodes’ = units

Molecules of information
Translation & transcription
Nuclear pores

Organizational nodes
‘O-nodes’ = chapters

Learning nodes
‘L-nodes’ = sections
Connection nodes
‘C-nodes’ = students’ notes and questions

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 Aurther Vining Davis Foundation

http://news.wfu.edu/2011/04/08/biobook-etext-evolved/
http://news.wfu.edu/2013/05/09/biobook-to-bring-new-generation-of-e-learning/
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.
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.
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/
TLC workshops can be taken for GRAD 711 and GRAD722 credit.
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

CHALLENGES:

- Time management in a teaching mission environment
  - Teaching deadlines dominate teaching time
  - 9-month teaching + 3-month Summer research
- Laboratory management using undergraduates and MS students as personnel
- Research limitations
  - Animal housing
  - Facilities support
  - Grants management
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
Mentoring Experiences

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
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

**Workshop 1**

<table>
<thead>
<tr>
<th>IPP 711 (1 credit)</th>
<th><strong>Topics in Translational &amp; Educational Research</strong></th>
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<tbody>
<tr>
<td>Date</td>
<td>Time</td>
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</table>
| 1       | June 5, 2014 | 8am-12pm       | - Getting Started with Translational Research  
- Inter-professional Research | Dr. Allison Nancy Smith |
| 2       | June 5, 2014 | 1pm-5pm | - Conducting Clinical Trials: Getting your first study, Study Start-up and Study activities | Vicky Driver |
| 3       | June 6, 2014 | 8am-12pm  | - Strategies for Research Success  
- Collaborate or Perish  
- Maximizing Mentor-Mentee Relationship  
- Success strategies in Publication | Allyn Howlett  
Judy Foxworth, WSSU & WSM Adjunct Orthopedic  
Ann Vansant, Journal Editor |
| 4       | June 6, 2014 | 1pm-5pm  | - Educational Research Methods  
- Novel Educational Technologies | Nancy Smith  
Dan Johnson & Nancy Smith |
## Workshop 2
### CPTS 760 (1 credit)

### Topics in Detecting and Understanding Health Disparities

<table>
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<tr>
<th>Date</th>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
</tr>
</thead>
</table>
| June 19, 2014 | 8am-12pm       | • Defining health disparities and health equity  
• Landmark reports on health disparities | Ronny Bell, PhD                        |
| June 19, 2014 | 1pm-5pm         | • Measuring health disparities  
• Disparities in T2DM and obesity | Alain Bertoni, MD  
Kristen Hairston, MD |
| June 20, 2014 | 8am-12pm       | • Determinants of health and health care disparities  
• Determinants of social health disparities  
• Determinants of health care system disparities | Brenda Latham-Sadler, MD  
Ronny Bell, PhD |
| June 20, 2014 | 1pm-5pm         | • Ethics in Research  
• Innovation in Healthcare | Nancy King, JD  
John Stewart, MD |
## PRIME IRACDA
### Maya Angelou Center for Health Equities
#### Summer Workshops

**Workshop 3**

**CPTS 760 (1 credit)**

### Topics in Promoting Health Equity

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<tr>
<th>Date</th>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>9 July 17, 2014</td>
<td>8am-12pm</td>
<td>• Organizational and community points of interest to reduce health disparities, (introduce working in collaborations)</td>
<td>Doug Easterling</td>
</tr>
<tr>
<td>10 July 17, 2014</td>
<td>1pm-5pm</td>
<td>• Developing strategies for policy intervention to address health disparities (promote health equity)</td>
<td>Mark Wolfson, Erin Suffin, Kate Weaver</td>
</tr>
<tr>
<td>11 July 18, 2014</td>
<td>8am-12pm</td>
<td>• Research dissemination (involving faith community and community organizations &amp; agencies)</td>
<td>Melicia Whitt-Glover, David Mount, Scott Rhodes</td>
</tr>
</tbody>
</table>
| 12 July 18, 2014 | 1pm-5pm  | • Service Learning Courses  
• Incorporating research/service into the classroom                                                                                                                                             | Allyn Howlett, Amal Abu-Shakra               |
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
Opportunities for Speaking at academic institutions locally and nationally

**Khalil Eldeeb, Ph.D.**
Wake Forest University Health Sciences
Department of Physiology and Pharmacology
E-mail: keldeeb@wakehealth.edu
Availability: Spring 2015
Seminar title: “CB1 Receptor Intracellular Loop 4 Modulates G Protein Activation and cAMP Production in Human Neuroblastoma”

**Doris P. Molina, Ph.D.**
Wake Forest University Health Sciences
Department of Physiology and Pharmacology/Neuroscience
E-mail: dmolina@wakehealth.edu
Availability: Fall 2014
Seminar title: “Mechanisms of Seizure Activity”

**Elsa I. Silva López, Ph.D.**
Wake Forest University Health Sciences
Department of Molecular Medicine
E-mail: esilvalo@wakehealth.edu
Availability: Spring 2015
Seminar title: “Effects of Oxidation in the Structure and Functionality of Akt2 and its Implications in Disease”

**Postdoctoral Scientific Seminar Speakers**
The NIGMS Division of Training, Workforce Development, and Diversity (TWD) shares information about potential speakers to grantees of the Bridges, RISE, MARC, PREP, IMSD and other student training programs. The IRACDA scholars in this resource are listed by participating institution.
Individual Development Plans

National Postdoctoral Association (NPA)
Core Competencies Self-Assessment Checklist
1 Discipline-Specific Conceptual Knowledge
2 Professional/Research Skill Development
3 Communication Skills
4 Professionalism
5 Leadership & Management Skills
6 Responsible Conduct of Research

Rate your current level of development in each of the following, with 1 being "Needs attention" and 9 being "extremely competent."

For more information on these competencies, please visit www.nationalpostdoc.org/competencies.
Individual Development Plans

myIDP is a unique, web-based career-planning tool tailored to meet the needs of PhD students and postdocs in the sciences.

AAAS Careers site: MyIDP

Self-assessments:
SKILLS
INTERESTS
VALUES

http://myidp.sciencecareers.org/
## Individual Development Plans

<table>
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<tr>
<th>Year</th>
<th>Summer Semester May-Aug</th>
<th>Fall Semester Sep-Dec</th>
<th>Spring Semester Jan-Apr</th>
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<td>Research Orientation:</td>
<td>Research, seminars, JC</td>
<td>Research, seminars, JC</td>
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<td></td>
<td>Research Development Plan</td>
<td>Define Individual</td>
<td>Co-Facilitator for RCR</td>
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<tr>
<td></td>
<td>Initiate Research project</td>
<td>Plan</td>
<td>WSSU A&amp;P 2-week module</td>
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<td></td>
<td>Research, seminars, JC</td>
<td>BIO783</td>
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<tr>
<td>Year 1</td>
<td>Jul-Aug</td>
<td>Research Seminar on dissertation work</td>
<td>Co-Facilitator for RCR</td>
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<tr>
<td>Year 2</td>
<td>Research, seminars, JC</td>
<td>Give MARC/RISE Seminar</td>
<td>WSSU Pharmacology teach 1-2</td>
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<td></td>
<td>Mentor MARC student</td>
<td>Submit abstract to meeting</td>
<td>lectures case-based learning</td>
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<tr>
<td></td>
<td>WSSU Physiology 1-2</td>
<td>Co-Instruct RCR at WSSU</td>
<td>module</td>
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<tr>
<td></td>
<td>lectures</td>
<td>WSSU Biomolecules teach two-week module Mentor MARC student</td>
<td>Teaching Observation</td>
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<td>Workshop: Digital Teaching</td>
<td>WFU TLC Workshop</td>
<td>Host Prof Dev Speaker</td>
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<td>Tools</td>
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<td>Mentor MARC student</td>
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<td>Year 3</td>
<td>Research, seminars, JC</td>
<td>Research, seminars, JC</td>
<td>Research, seminars, JC</td>
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<tr>
<td></td>
<td>Prepare and submit NIH</td>
<td>Submit abstract to meeting</td>
<td>Co-Facilitator for RCR</td>
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<td>grant</td>
<td>Prepare first draft of publications</td>
<td>WSSU A&amp;P 2-week module</td>
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<td>WSSU DPT Physiology 2-week segment</td>
<td>Give Job search Research Seminar</td>
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<td>Develop web-based Physiol</td>
<td>WSSU Biomolecules develop and teach one 2-week module</td>
<td>Co-Facilitator for RCR</td>
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<td>module</td>
<td>Mentor MARC student</td>
<td>WSSU Pharmacology teach 1-2</td>
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<td>Workshop Clinical Research</td>
<td>Start academic job search</td>
<td>lectures case-based learning</td>
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<td>May-Jun</td>
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<td>Employment interviews</td>
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<td>Prepare for academic</td>
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<td>Submit/revise NIH grant</td>
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<td>position or continued</td>
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<td>minority WFU TLC Workshops</td>
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### Notes:
- Each Scholar should define his/her short-term goals.
- Year 1:
  - Jul-Aug: Research Orientation; Define Individual Development Plan; Initiate Research project
  - May-Jun: Prepare for academic position or continued research
- Year 2:
  - Research, seminars, JC; Mentor MARC student; WSSU Physiology 1-2 lectures; Workshop: Digital Teaching Tools
- Year 3:
  - Research, seminars, JC; Prepare and submit NIH grant; WSSU DPT Physiology 2-week segment; Develop web-based Physiology module; Workshop Clinical Research
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