Institutional Research and Academic Career Development Awards (IRACDA)

Postdoctoral Research, Instruction and Mentoring Experience (PRIME)

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2015 IAMSE Webinar Series: Feb 5

WAKE FOREST
UNIVERSITY

GRADUATE SCHOOL of ARTS & SCIENCES

The Office of Postdoctoral Affairs

Wake Forest®
School of Medicine

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:
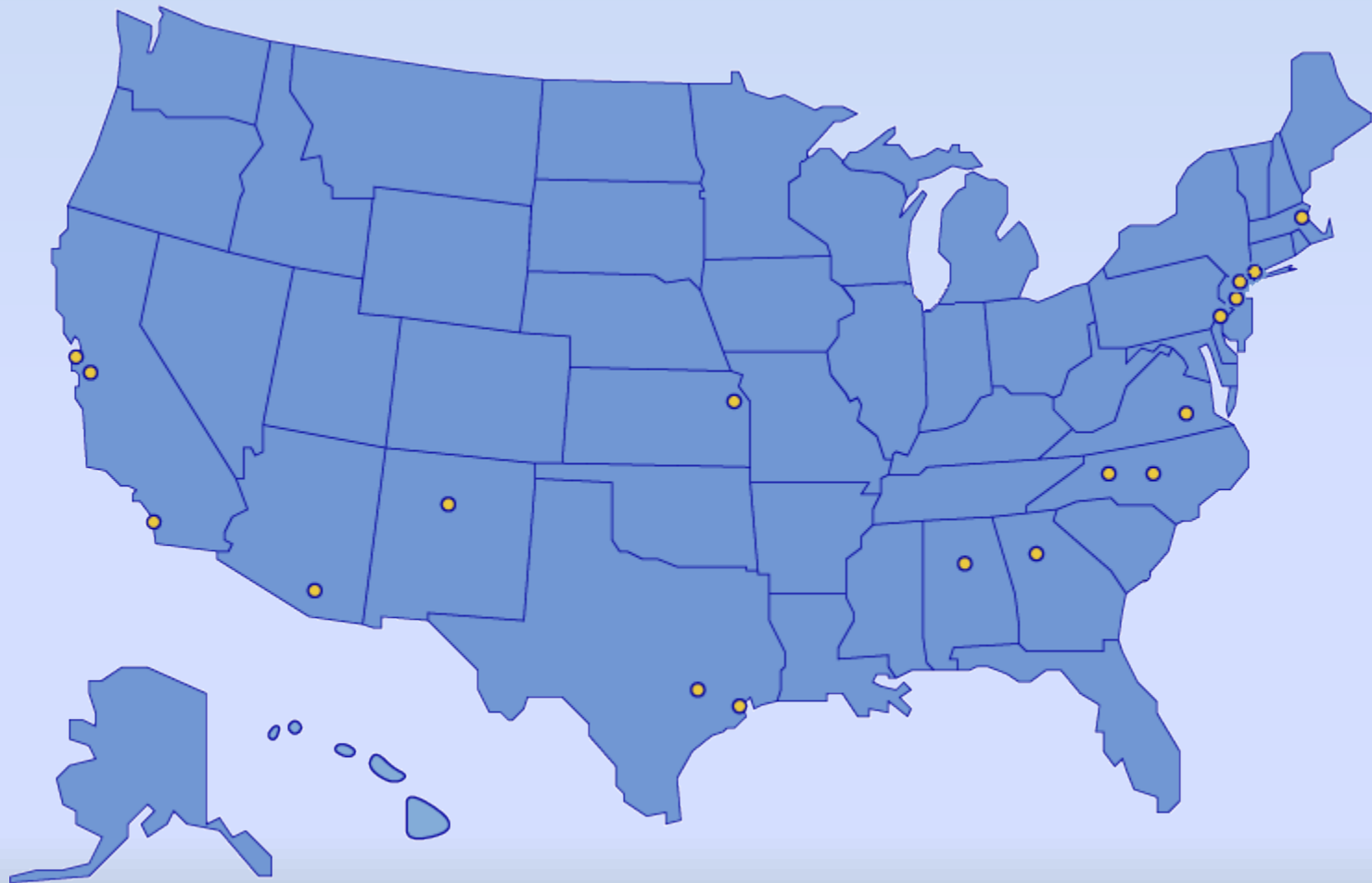1. Research 75%
2. mentored teaching opportunities 25%

- **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

- **<u>Primary Objective:</u>**

- "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
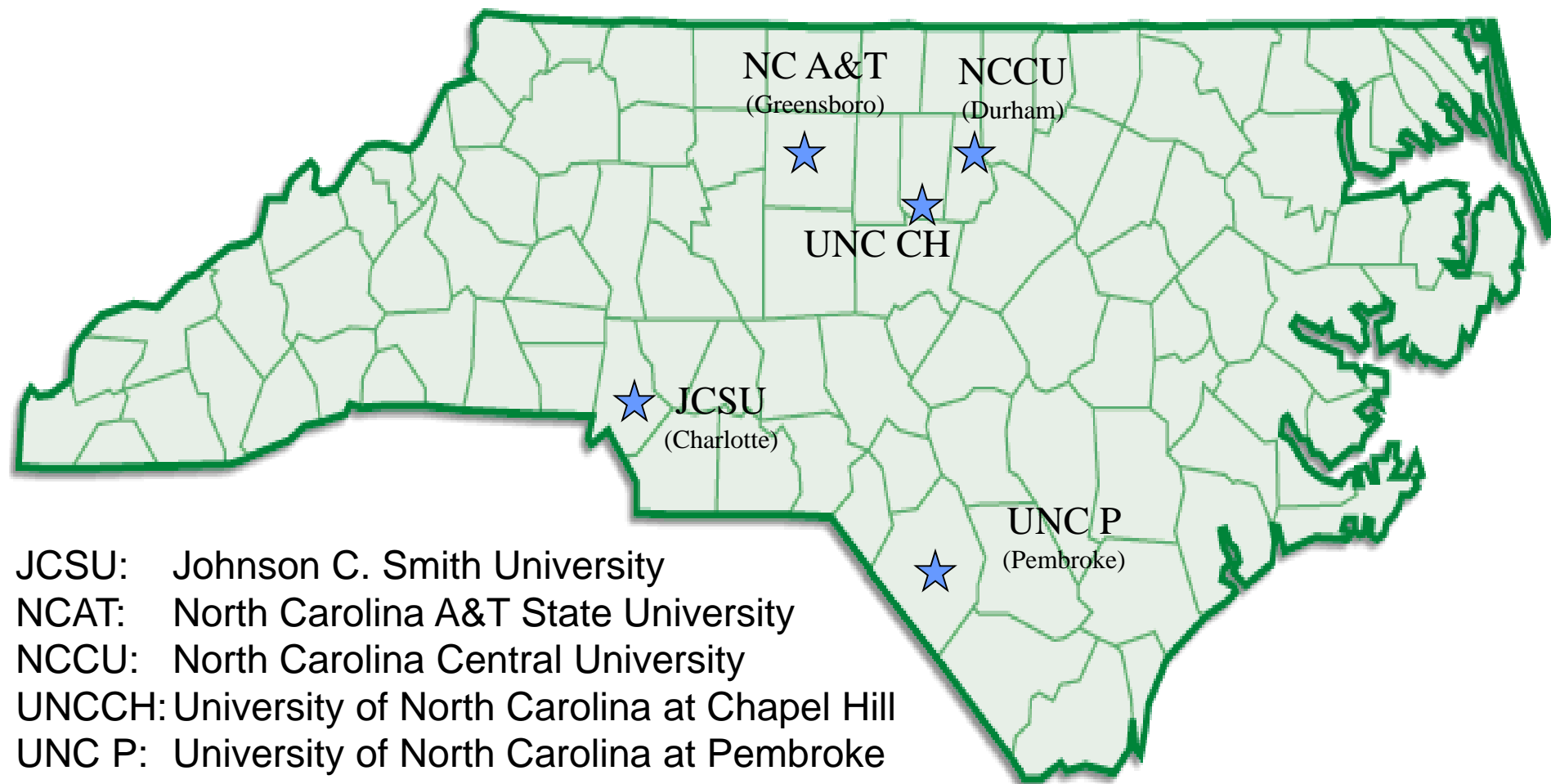
Provide research training for scholars and undergraduate students

Provide a mentored teaching experience

Provide training in professional skills to promote success in future academic positions
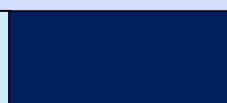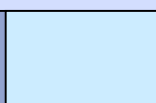
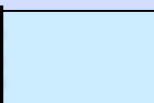# SPIRE Program Partnership

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

Year 1	Year 2	Year 3

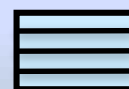| F	S	Su	F	S	Su	F	S	Su

Research

Teaching

Support, Community, Evaluation

Other Professional Development

Teaching Preparation

2 semesters teaching

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

Human Performance and Biodynamics Laboratory

WINSTON SALEM STATE UNIVERSITY | SCHOOL OF HEALTH SCIENCES | Wake Forest School of Medicine

Research is:
Cross-disciplinary
Clinically oriented
Translational

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

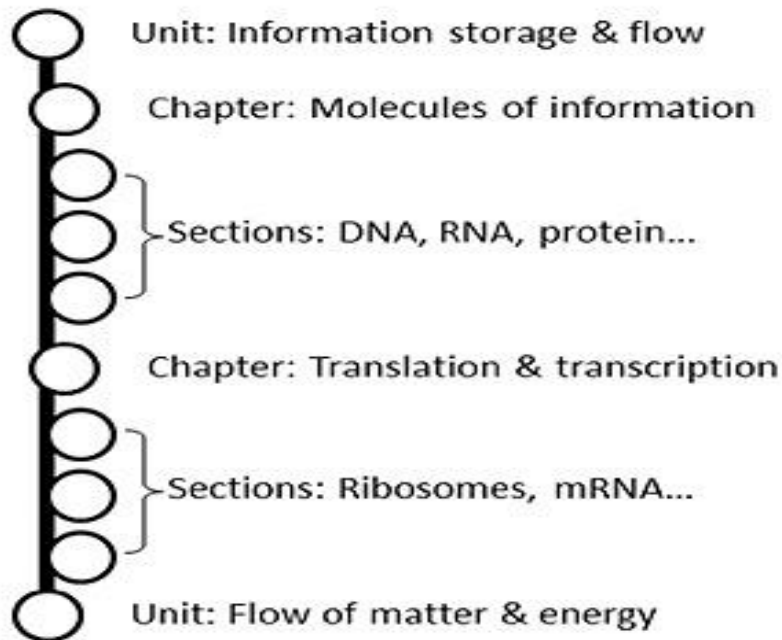# Instructional Experience in a Clinical Discipline

Case-based learning throughout the instruction is encouraged.

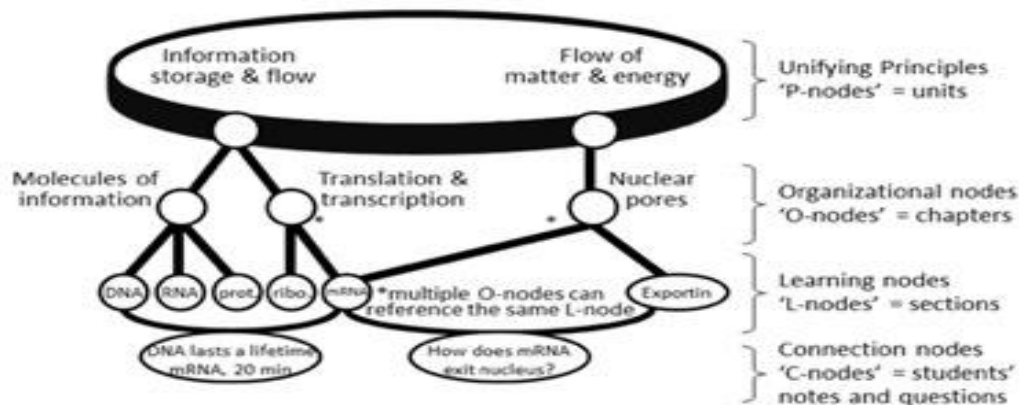Simulation Hospital for teaching physiology principles

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

DNA   RNA   prot.   ribo.   mRNA   *multiple O-nodes can reference the same L-node   Exportin

Learning nodes
'L-nodes' = sections

DNA lasts a lifetime, mRNA, 20 min

How does mRNA exit nucleus?

Connection nodes
'C-nodes' = students' notes and questions

The Adapa Project

Helping ALL students learn science successfully

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.

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/

Join us for the
Teaching and Learning Center Spring Ahead Workshop Series
January 12 & 13, 2015, 8:30 – 3:00
Biotech Place (575 N Patterson Ave), Conference Room 155 A&B

Come to one or come to all!
Open to all TAs and Postdocs at Wake Forest

	Monday, January 12	Tuesday, January 13
8:30-9:00	Breakfast	Breakfast
9:00-10:15	**Set Up Your ePortfolio**	**Teaching Inclusively: Creating a Climate for Learning**
	Writing Effective Learning Objectives	**Active Learning: Why and How to Incorporate Active Learning into the Classroom**
10:30-11:45	**Syllabus Design**	**Writing a Teaching Philosophy**

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

Maximizing Access to Research Careers

MARC U*STAR

Undergraduate Student Training in Academic Research

MARC U*STAR
Maximizing **A**ccess to **R**esearch **C**areers for **U**ndergraduate **S**tudent **T**raining in **A**cademic **R**esearch

MBRS-RISE:
Minority **B**iomedical **R**esearch **S**upport-**R**esearch **I**nitiative for **S**cientific **E**nhancement

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

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

Workshop 1 IPP 711 (1 credit)		**Topics in Translational & Educational Research**		
	Date	Time	Title	Speaker
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

PRIME IRACDA
Maya Angelou Center for Health Equities
Summer Workshops

Workshop 2 CPTS 760 (1 credit)			Topics in Detecting and Understanding Health Disparities		
	Date	Time	Title		Speaker
5	June 19, 2014	8am-12pm	• Defining health disparities and health equity • Landmark reports on health disparities		Ronny Bell, PhD
6	June 19, 2014	1pm-5pm	• Measuring health disparities • Disparities in T2DM and obesity		Alain Bertoni, MD Kristen Hairston, MD
7	June20, 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
8	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	
	Date	Time	Title	Speaker
9	July 17, 2014	8am-12pm	• Organizational and community points of interest to reduce health disparities, (introduce working in collaborations	Doug Easterling
10	July 17, 2014	1pm-5pm	• Developing strategies for policy intervention to address health disparities (promote health equity)	Mark Wolfson, Erin Sutfin, Kate Weaver
11	July 18, 2014	8am-12pm	• Research dissemination (involving faith community and community organizations & agencies)	Melicia Whitt-Glover David Mount Scott Rhodes
12	July 18, 2014	1pm-5pm	• Service Learning Courses • Incorporating research/service into the classroom	Allyn Howlett Amal Abu-Shakra

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.
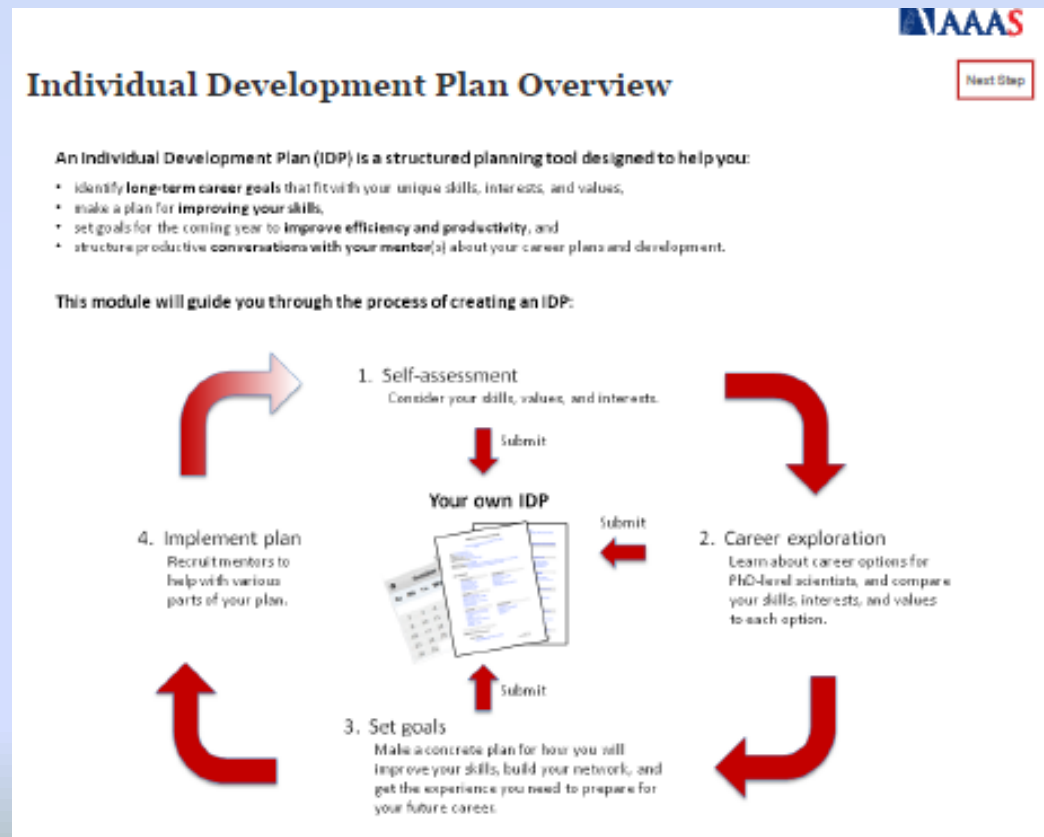
AAAS Careers site: MyIDP

Self-assessments:

SKILLS

INTERESTS

VALUES

http://myidp.sciencecareers.org/

Individual Development Plans

Prototypical Development Plan for a PRIME Scholar (Each Scholar should define his/her short-term goals.)

	Summer Semester May-Aug	Fall Semester Sep-Dec	Spring Semester Jan-Apr
Year 1	Jul-Aug **Research Orientation: Define Individual Development Plan Initiate Research project**	**Research ,seminars and JC Research Seminar on dissertation work Co-Facilitator for RCR Tutor WSSU Life Sciences Students**	**Research, seminars, JC Co-Facilitator for RCR WSSU A&P 2-week module BIO783**
Year 2	**Research , seminars, JC Mentor MARC student WSSU Physiology 1-2 lectures Workshop: Digital Teaching Tools**	**Research , seminars, JC Give MARC/RISE Seminar Submit abstract to meeting Co-Instruct RCR at WSSU WSSU Biomolecules teach two-week module Mentor MARC student WFU TLC Workshop**	**Research, seminars, JC Grant-writing workshop WSSU Pharmacology teach 1-2 lectures case-based learning module Teaching Observation Host Prof Dev Speaker Mentor MARCstudent**
Year 3	**Research , seminars, JC Prepare and submit NIH grant WSSU DPT Physiology 2-week segment Develop web-based Physiol module Workshop Clinical Research**	**Research , seminars, JC Submit abstract to meeting Prepare first draft of publications Give Job search Research Seminar WSSU Biomolecules develop and teach one 2-week module Mentor MARC student Start academic job search**	**Research, seminars, JC WSSU Pharmacology teach 3-4 lectures plus PT Simulation demo Employment interviews Submit/revise NIH grant minority WFU TLC Workshops**
	May-Jun **Prepare for academic position or continued 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**
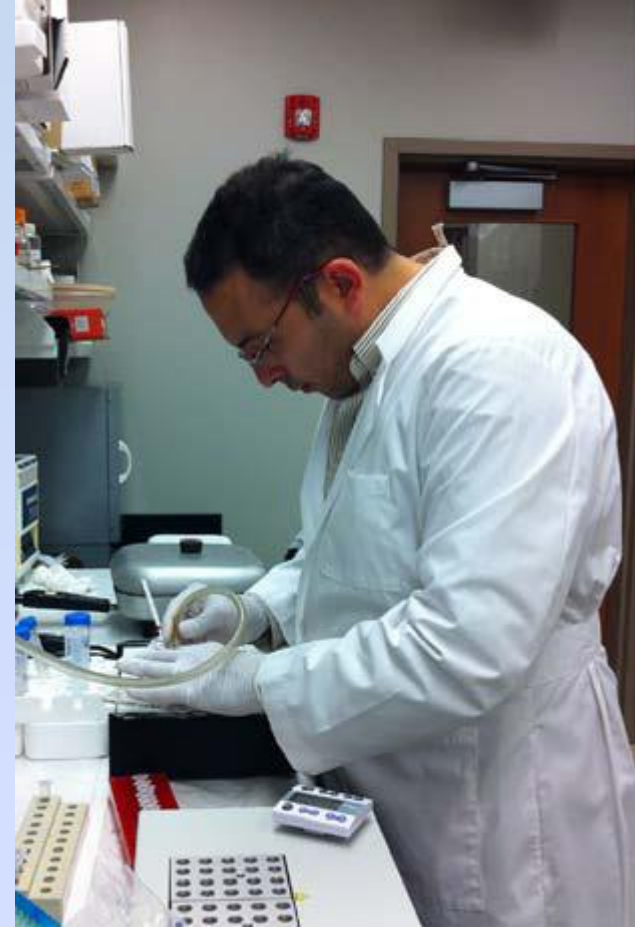
4. Facilitate mentoring skills
Outcomes: **Laboratory and Personnel Management**

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