**SEEDS You Choose Application Cover Page**

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<tr>
<th><strong>Name:</strong></th>
<th>Priyamvada Rai, PhD</th>
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<tr>
<td><strong>Position:</strong></td>
<td>Assistant Professor</td>
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<tr>
<td><strong>Department:</strong></td>
<td>Medicine/Gerontology; Faculty Member, Graduate Program in Cancer Biology</td>
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<tr>
<td><strong>School:</strong></td>
<td>Miller School of Medicine</td>
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<tr>
<td><strong>Email:</strong></td>
<td><a href="mailto:prai@med.miami.edu">prai@med.miami.edu</a></td>
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<tr>
<td><strong>Tel. no:</strong></td>
<td>305-243-3312</td>
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<tr>
<td><strong>Address:</strong></td>
<td>RMSB 7094, Locator Code D-503 Miller School of Medicine Miami, FL 33136</td>
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Abstract

Women, and particularly minority women, are underrepresented in the upper echelons of academic science. Having served as a research mentor for a number of female undergraduate students, I have observed firsthand some of the incentives as well as potential obstacles that can affect the choices of these young women with regarding to pursuing a career in academic science. Early opportunities to work in a research laboratory and frequent access to a female mentor who can answer their questions and provide guidance in negotiating the challenges of a scientific career can strongly impact their decision to continue on in the field of academic science. On the flipside, unaddressed concerns about a research career being inimical to women, and misperceptions as to what it takes to succeed in academic science are leading reasons why female students with scientific aptitude opt out of STEM fields. Accordingly, if these students can be provided with access to a local female mentors and be exposed to examples of the various different paths taken by successful women scientists in their careers, this would go a long way towards allaying their unease and encouraging their own scientific aspirations. To this end, I am requesting SEEDS funding to organize a day-long symposium and mentoring event for female students and trainees at the University of Miami and nearby institutions. The event would consist of presentations by female faculty in the sciences at different career stages followed by a small-group interactive event intended to introduce the participants to potential female mentors. The goal is for the faculty to share some of the personal challenges and triumphs that have made science an exciting and fulfilling career for them and for interested female students to obtain a local research or academic mentor who is willing to invest in their career development.
Activity Goals:

I am requesting SEEDS funding to organize a day-long symposium and mentoring event for female undergraduate and graduate students as well as postdoctoral trainees from University of Miami and nearby institutions who are interested in pursuing a career in academic science. Although there are many such symposia and conferences organized at the statewide and nationwide levels, the biggest drawback of these events is that there is little opportunity for long-term follow-up between the presenters and participants or the potential for building a sustained mentor-mentee relationship.

The primary goal of my proposed event is to bring prominent local women scientists together with female students and trainees interested in a scientific career. The intention is for the presenters to discuss their career trajectories, highlighting not only their research achievements and other fulfilling aspects of their career but also a candid discussion of the challenges they have faced along the way. These can include perceptions of women not being suited to STEM careers by teachers and peers, discrimination during hiring or promotion, juggling family and career, and other relevant issues. This type of presentation is intended to demonstrate that there are multiple ways for female scientists to deal with common prevailing personal and professional obstacles in order to survive and thrive in an academic career. The follow-up small group event is intended to foster mentor-mentee relationships between the participating female faculty and students/trainees.

Event details: Registration would be free and limited to 150 participants, with priority given to undergraduate students. Depending on the funding level, we can increase the number to 200 and/or open the event to women at FIU and Miami-Dade, possibly in conjunction with the Undergraduate Research Programs office.

The event would open with a continental buffet breakfast with a faculty member assigned to each table, to facilitate informal discussions. Following breakfast, approximately ten female professors at different career stages will each speak for 15 minutes with another 5-10 minutes reserved for a question/answer session. During the lunch break, students will again be given the opportunity to eat with the participating faculty. In the afternoon, there will be an interactive group event consisting of approximately 20 female faculty, each of whom will be assigned to a group of 7-10 student participants. The goal of this session will be to address individual questions and also for the students to learn about research opportunities in the laboratories of the participating faculty.

Although the participants have not been finalized, the following are some examples of those faculty members who will be invited:
Dr. Kerry Burnstein (professor and head of the Cancer Biology Program), Dr. Fulvia Verde (tenured associate professor in Pharmacology and NSF/NIH grant awardee), Dr. Kathleen Tosney (Chair of the Biology Department), Dr. Alexandra Wilson (tenured associate professor in Biology), Dr. Grace Zhai (tenured associate professor and Pew Scholar), Dr. Sandra Lemmon (professor and head of the MD/PhD program), Dr. Cherie Stabler (associate professor in Bioengineering), and Dr. Irina Agoulnik (FIU associate professor
and PLoS One Editorial Board member). A selection of junior female faculty will also be invited, and suggestions from the senior faculty will be solicited.

**Impact statement:** Increasing and maintaining the number of women in the STEM fields depends strongly on their having sustained access to a support network and mentoring relationships that encourage them to develop their strengths and overcome their unique challenges. Accordingly, the goal of this grassroots event is two-fold:

1) To increase the number of female and minority female students who participate in substantive research opportunities at the University of Miami and,

2) To provide female students and trainees with access to a local female mentor who will assist them in developing the scientific acumen and personal skills that will enable them to be competitive for graduate programs in the sciences, and who will provide a source of advice and career guidance.
Personal Goals Statement

I have served as a research mentor for several female students both as a postdoctoral fellow and then as a faculty member at the University of Miami (see list below). These young women have been, for most part, extraordinarily motivated and hardworking and have benefited my research program greatly. Many of them have been co-authors on my publications (see highlighted publications in my attached CV) and are currently in prestigious graduate or medical research programs. It has been one of the most fulfilling aspects of my career to see these young women develop into confident and knowledgeable junior scientists with a passion for research, and to hear from them that my mentorship and the supportive environment of my laboratory has positively impacted their career choices. I would like to facilitate such opportunities for as large a number as possible of female students within the University of Miami community and other nearby institutions. This event will allow me to participate in the recruitment of motivated students to my laboratory and those of my colleagues. Additionally, the experience of organizing such an event will serve as an example of my service and leadership in the research community, which will benefit the evaluation of my progress towards tenure and promotion.

List of female undergraduate student mentees:

At University of Miami

2013-present  Nicole Koutsodendris
2013-present  Brooke Zarouri (Honors Thesis)
2013          Josephine Gonzalez, Minority Leadership Alliance summer student, California State University, San Marcos
2012-2013     Kendria Velez, Anabel Miguelez
2011-2012     Melissa Escobar
2010-2012     Anisleidys Munoz
2010          Claudia Rodriguez
2009-2011     Maria Giribaldi (Honors Thesis)
2009          Diana Cuesta (Harvard University summer student)

At Whitehead Institute/MIT

2006-2008     Jennifer Young
2005-2006     Irina Shklyar
2005          Ann Du, Research Science Institute undergraduate scholar
Budget and budget justification:

Refreshments for approximately 200 people: $2000
Breakfast will consist of coffee, juice and pastries.
Lunch will consist of sandwiches, cookies and soft drinks.
Catering estimates will be obtained from local food establishments in the
Application is funded.

Miscellaneous fees for reserving space for the event: $500
Locations will be assessed on the Coral Gables campus for auditorium and/or parking.
NAME
Priyamvada Rai

POSITION TITLE
Assistant Professor

eRA COMMONS USER NAME (credential, e.g., agency login)
PRIYARAI

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Institute of Technology, Pasadena, CA</td>
<td>BS</td>
<td>1997</td>
<td>Biology</td>
</tr>
<tr>
<td>University of California, Berkeley, CA</td>
<td>PhD</td>
<td>2003</td>
<td>Biophysics</td>
</tr>
<tr>
<td>Whitehead Institute for Biomedical Research/MIT (Robert Weinberg’s Laboratory)</td>
<td>Postdoctoral Training</td>
<td>2003-2008</td>
<td>Tumor Cell Biology</td>
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A. Personal Statement
The long-term goal of my research program is to identify molecular pathways that can be modulated to effect optimal tumor suppressor response to stresses inherent in developing tumors or induced by chemotherapy. During my graduate training, I used chemical and biophysical approaches to understand mechanisms of oxidative DNA damage. As a postdoctoral fellow, I took on a completely new research direction in order to gain experience in cell and molecular biology so I could study problems of biomedical significance. As a result, I was able to extend my biochemical knowledge into a novel experimental system that allowed me to isolate the effects of oxidative DNA damage on cellular proliferation and survival in normal and oncogene-transformed cells, without the confounding pleiotropic effects of increasing cellular reactive oxygen species (ROS). Due to my unique training, I am an expert in the biology and chemistry of ROS and oxidative DNA damage, particularly their role in inducing cellular senescence, a phenomenon that can be tumor-suppressive or confer tumor-promoting properties. Understanding the cellular contexts that determine which role predominates is a key research focus in my laboratory.

B. Positions and Honors

Positions and Employment

1995 Undergraduate Research Assistant, Caltech, in the laboratory of Dr. Paul Sternberg, Pasadena, CA
1995–1996 Undergraduate Research Fellow, Caltech, in the laboratory of Dr. Giuseppe Attardi, Pasadena, CA
1997 Undergraduate Research Assistant, Caltech, in the laboratory of Dr. Thomas J. Meade, Pasadena, CA
1997–2003 Graduate student, University of California, Berkeley in the laboratories of Dr. Stuart Linn and Dr. David Wemmer, Berkeley, CA
2003–2008 Postdoctoral fellow, Whitehead Institute for Biomedical Research, in the laboratory of Dr. Robert Weinberg, Cambridge, MA
2008-present Assistant Professor, Division of Gerontology and Geriatric Medicine, Department of Medicine, University of Miami Miller School of Medicine, Miami, FL
2009-present Member, Sylvester Comprehensive Cancer Center/Molecular Oncology and Experimental Therapeutics (MOET) Focus; Faculty Member, Program in the Biomedical Sciences/Graduate Program in Cancer Biology
Other Experience and Professional Memberships

2009-2010 Scientific grant reviewer, Genesis Oncology Trust, New Zealand
2013 Scientific grant reviewer, Hong Kong Health and Medical Research Fund
2009-present Ad hoc journal reviewer for PNAS, Mutation Research, Cell Cycle, Methods in Molecular Biology, PLoS One, FEBS Journal, Journal of Molecular Endocrinology, Research Reports in Biochemistry, Food and Chemical Toxicology
2009-present Course developer/instructor, Graduate Program in Biomedical Sciences (PIBS) 602, Module: ‘DNA Damage and Cancer’, University of Miami
2013-present Instructor, Graduate Program in the Biomedical Sciences/CAB BOMB Modules: ‘Tumor suppressors: p53’, ‘Cell immortalization and transformation’. University of Miami
2013 Instructor, Graduate Program in the Biomedical Sciences/MDB 665, Module: ‘Apoptosis’. University of Miami
2011-present Member, Postdoctoral Programs Steering Committee
2012–present Program in Biomedical Sciences Academic and Operating Committee (PIBS-AOC) Member, Cancer Biology Program (CAB) representative
2012-present Alternate member, VA Scientific Review Subcommittee

Honors
1995-1996 Summer Undergraduate Research Fellowships, California Institute of Technology, Pasadena, CA
1997 Frederic W. Hinrichs Jr. Memorial Award, California Institute of Technology, Pasadena, CA
1998 Young Investigator Award, Fourth Annual Conference of the Society for Free Radical Biology and Medicine, Washington, DC
1999 Lester Packer Award for Best Presentation, Oxygen Club of California International Congress
1999 Biophysics Graduate Group Merit Scholarship, University of California, Berkeley, CA
2001 Outstanding Graduate Student Instructor Award, University California, Berkeley, CA
2005-2008 Leukemia and Lymphoma Society Postdoctoral Fellow
2006 Paul F. Glenn Award for meritorious postdoctoral research 35th AGE conference, Boston, MA
2009-2012 James and Esther King Florida Biomedical New Investigator Research Award
2009-2010 University of Miami/SCCC Papanicolaou Corps Developmental Cancer Research Award
2010-2011 University of Miami Stanley J. Glaser Foundation Research Award
2011 Research mentor for Maria Giribaldi, Awardee for Best Senior Honors Thesis in Biology, University of Miami
2012-2015 Bankhead-Coley Florida Biomedical New Investigator Research Award
2013-2014 Dean’s Bridge Fund Awardee

C. Peer-reviewed Publications (in chronological order)

*** Undergraduate mentee co-authors are highlighted


* Corresponding author

**Book chapter:**


**D. Research Support**

**Ongoing Research Support**

3BN05 (PI: Rai) 7/2/2012 – 7/1/2015 20%
Implications of Cellular Senescence As a Treatment Response in Prostate Cancer
To assess whether pro-survival/pro-inflammatory factors associated with an androgen deprivation-induced senescent microenvironment promotes outgrowth of androgen-refractory cells.

1R01CA175086  NIH/NCI (PI: Rai)  06/2013-06/2018  32%
$1,912,500
MutT Homolog 1 as a Novel Mediator of RAS Oncogene-Induced Pro-Malignant Pathways
To assess how MTH1 modulates multiple tumor-promoting pathways induced by oncogenic RAS in a lung cancer model.

Completed Research Support
S0900031 (PI: Rai)  6/1/09-5/30/10
UM/Sylvester Pap Corps Developmental Cancer Research Grant  $60,000
Defining Pro-tumorigenic Mechanisms Associated with Elevated Levels of the Redox Regulatory Protein, Thioredoxin (TRX)
To study the mechanisms by how the thiol protein, thioredoxin, promotes tumor progression and chemoresistance.

687987 (PI: Rai)  6/1/10-5/31/2011  30%
UM/Stanley J. Glaser Research Foundation  $40,000
Oxidative Stress-Protective Proteins as Novel Molecular Targets for Improving Efficacy of Androgen Ablation Therapy in Androgen-Responsive Prostate Cancer
To investigate the impact of redox stress-protective proteins Thioredoxin-1 (TRX1) and MutT Homolog 1 (MTH1) on survival of prostate cancer cells under androgen deprivation and their role in promoting outgrowth of cell subpopulations that give rise to castration-resistant prostatic tumors.

09KN11 (PI: Rai)  7/1/09 – 12/31/2012  25%
FL Biomedical  $125,000
Exploring a Role for Oxidative Stress and Oxidative DNA Damage in Limiting the Progression of Non-Small Cell Lung Carcinomas (NSCLCs)
To assess whether inhibiting MTH1 expression affects oncogenic RAS-induced transformation and limits xenograft tumor growth by NSCLC cells sustaining KRAS mutations and varying p53 status.