The Leadership Alliance
A Continuum of Mentoring Leads to a Legacy of Scholars

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The Leadership Alliance
Executive Office Team
Presentation Outline

✔ Provide context for our work
✔ Provide an overview of the Leadership Alliance
✔ Describe our programs and resources
✔ Discuss what we’re learning
✔ Present NEXT-STEPS
National Education and Workforce Data in Science and Engineering by Race and Ethnicity

Shares of science and engineering degrees and jobs for underrepresented racial and ethnic minority groups

National Education and Workforce Data in Science and Engineering by Gender

Shares of science and engineering degrees and jobs for women

- U.S. Residential Population: 50.8%
- College degree holders: 50.0%
- Science and engineering highest degree holders: 40.0%
- Science and engineering occupations: 28.0%

Addressing the shortage of underrepresented students in PhD programs and the Research workforce

1990
Vartan Gregorian
• Brown University President (1989-1997)

1992
James Wyche
• Founding Executive Director (1992-2003)
Our mission is to develop underrepresented students into outstanding leaders and role models in academia, the public and private sectors.

Brooklyn College  Princeton University
Brown University  Spelman College
Chaminade University  Stanford University
Claflin University  Tougaloo College
Columbia University  Tufts University
Cornell University  University of Chicago
Dartmouth College  University of Colorado at Boulder
Dillard University  University of Maryland, Baltimore County
Harvard University  University of Miami
Heritage University  University of Pennsylvania
Howard University  University of Puerto Rico
Hunter College  University of South Florida
Johns Hopkins University  University of Virginia
Montana State University  Vanderbilt University
Morehouse College  Washington University in St. Louis
Morgan State University  Xavier University of Louisiana
New York University  Yale University
North Carolina A&T State University
We develop programs across the academic pathway.
Leadership Alliance Resources
https://leadershipallianceresources.blog/category/resources/

Tips for Applying to Graduate School

Mentor Guide

Print versions available upon request
Mentoring at the Critical Transitions

- Undergrad to Grad
- Grad to Postdoc
- Postdoc to Research Career
Summer Research Early Identification Program offers research experiences in all disciplines

Participants by discipline
1993-2018 (n=5,783)

- Biological Sciences: 53.5%
- Humanities and Social Sciences: 9.3%
- Math, Computer Science, and Engineering: 8.3%
- Physical Sciences: 20.9%
- Psychology: 8.0%

n=includes repeat participants

Participants by Class
- Rising Seniors: 56.4%
- Rising Juniors: 32.7%
- Rising Sophomores: 10.8%
We are mentoring a diverse group of students

Racial Identification*

- Black/African American
- White
- Asian American/Pacific Islander
- Native American/Alaska Native
- Other Race/Decline to Indicate

*Students were allowed to select multiple racial identifications

Gender Identification

- 63% of Students Identify as Women

Economic and Academic Indicators

- 41.2% attend an MSI
- 37.5% are First-Gen Students
- 52.8% are Pell Grant Eligible

Ethnic Identification

- 37% of Students Identify as LatinX
What We’re Learning

Fine-Tuning Summer Research Programs to Promote Underrepresented Students’ Persistence in the STEM Pathway

Medeva Ghee,†* Micere Keels,‡ Deborah Collins,† Cynthia Neal-Spence,§ and Earnestine Baker‖

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The SR-EIP builds research skills and increases awareness of graduate programs and career opportunities.

Students’ self-assessment of their knowledge of research skills and career intentions. Each bar represents the percent that reported “intermediate” or “high” from participants who completed the pre- and post-survey (2013–2015 summer cohorts; n = 450). Students were asked to report their level of knowledge of each item on a scale of 1 through 4 (1 = none; 2 = beginning; 3 = intermediate; 4 = high). All differences significant at $p < 0.01$. 
## Quality and Type of Mentoring Relationship

<table>
<thead>
<tr>
<th>Mentor quality variables</th>
<th>Satisfaction with mentor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Showing interest in your research and being supportive of your ideas</td>
<td>0.733</td>
</tr>
<tr>
<td>Making you feel like an integral part of the research project</td>
<td>0.731</td>
</tr>
<tr>
<td>Being available to discuss and respond to questions about your research</td>
<td>0.721</td>
</tr>
<tr>
<td>Offering guidance and advice on your research</td>
<td>0.710</td>
</tr>
<tr>
<td>Giving you a good sense of how your project fit within the overall goals of the project</td>
<td>0.715</td>
</tr>
<tr>
<td>Introducing you to a range of methodological techniques in research</td>
<td>0.691</td>
</tr>
<tr>
<td>Providing you with constructive feedback on your academic career development</td>
<td>0.604</td>
</tr>
<tr>
<td>Demonstrating knowledge/expertise in your field</td>
<td>0.592</td>
</tr>
<tr>
<td>Helping you make the distinction between undergraduate research and large-scale projects</td>
<td>0.586</td>
</tr>
<tr>
<td>Helping you establish relationships by introducing you to other faculty, graduate students and researchers</td>
<td>0.567</td>
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</tbody>
</table>
MSI+R1 faculty engagement to expose students to research: First Year Research Experience (FYRE)

**Goals of FYRE**

1. Introduce first year undergraduates from MSI partners to an external research experience

2. Create opportunities to build/strengthen relationships among faculty and administrators at partner institutions

3. Attract and retain students in research

4. Enhance the educational experience

**FYRE 2015 Cohort**
FYRE Self Confidence

Percentage “strongly agree” with Confidence Prompts – Pre-Survey v. Post-Survey

- Ability to have a successful career: 32% (Pre-survey), 60% (Post-survey)
- Motivation/persistence required: 47% (Pre-survey), 60% (Post-survey)
- Interest in pursuing career: 21% (Pre-survey), 64% (Post-survey)
- Overcome barriers may encounter: 21% (Pre-survey), 64% (Post-survey)
- Understand research procedures: 53% (Pre-survey), 64% (Post-survey)
- Prepared for more demanding research: 32% (Pre-survey), 60% (Post-survey)
FYRE Career Development

Percentage “strongly agree” or “agree” with statement – Pre-Survey v. Post-Survey
FYRE increases student retention in research and competitiveness for graduate programs

<table>
<thead>
<tr>
<th>Total Number of FYRE Students to Date</th>
<th>N</th>
<th>Total eligible</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>FYRE Students who returned to research (2015-2017)$^1$</td>
<td>21</td>
<td>36</td>
<td>58%</td>
</tr>
<tr>
<td>FYRE Students who returned to SR-EIP (2015-2017)$^2$</td>
<td>13</td>
<td>21</td>
<td>62%</td>
</tr>
<tr>
<td>FYRE Students in Graduate school (2015)$^3$</td>
<td>3</td>
<td>5</td>
<td>60%</td>
</tr>
</tbody>
</table>

$^1$These are students who participated in a summer research experience after FYRE through any program, including SR-EIP.

$^2$These are only students who returned to an SR-EIP program. This could be at any SR-EIP site, not just those who returned to their FYRE institution.

$^3$FYRE students from the 2016 cohort are currently awaiting responses from graduate school applications. An update will be provided at the next business meeting.
SR-EIP Outcome Data

55% matriculating into any PhD program

47% matriculate into a STEM PhD program
Mentoring at the Critical Transitions

- Recruiting and cultivating talent from MSIs broadens participation
- Mentoring matters
- Introducing research to first year students increases their competitiveness for PhD programs
Mentoring at the Critical Transitions

Undergrad to Grad

Grad to Postdoc

Postdoc to Research Career
Leadership Alliance National Symposium

NIH Innovative Programs to Enhance Research Training Program (IPERT)
R25GM125707
The Career Development Workshop is valuable to students at Research Intensive institutions

- “TLA Talks”
- “What Am I Doing Right? – Individual Development Plans”
- “Your Plan, Your Resume, Your Pitch”
- “Using Workforce Data to Guide Career Development”
- “How to Identify and Highlight your Experiences for the Right Career Opportunity”
- Speed Mentoring with Professional Career Mentors
Percentage “strongly agree” with Confidence Prompts – Pre-Survey v. Post-Survey
CDW Improves Job Market Skills

Percentage “strongly agree” with Confidence Prompts – Pre-Survey v. Post-Survey
Mentoring at the Critical Transitions

- Undergrad to Grad
- Grad to Postdoc
- Postdoc to Research Career

- New network that allows participants to explore and prepare for research careers
- Increases knowledge of how to market themselves for diverse careers
- Catalyzes the development of a professional toolkit
Mentoring at the Critical Transitions

- Undergrad to Grad
- Grad to Postdoc
- Postdoc to Research Career
To date, we have a total of 523 Doctoral Scholars.
We have complete tracking data on 330 Doctoral Scholars.
Grant Writing Coaching Groups

- Leveraged NRMN Model
- Recruited faculty from MSIs
- Recruited coaches trained by NRMN
- 2 TLA Alums receiving grants
Do career interests change over time?

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Topics Surveyed</th>
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| • Survey was sent to Leadership Alliance Doctoral Scholars in STEM
  • N=330
  • 43% response rate                              | • Career intentions before and after completion of doctoral programs
  • Level of career planning support during graduate and postdoctoral training
  • Current career interests and aspirations        |

Survey adapted from: Gibbs et al., *Biomedical Science Ph.D. Career Interest Patterns by Race/Ethnicity and Gender*. PLoS ONE 9(12): e114736
Mean agreement on a five-point Likert-type Scale

Career Intentions

*I p ≤ .001
n=147
Career Pathway Interest

* $p < .001$

$n=147$

Mean response on a six-point Likert-type Scale measuring level of interest
Preliminary Results

Findings
• Intentions to pursue a faculty career decreases over time.
• Alumni show less interest in faculty careers and increased interest in non-academic research careers over time.

Future Research
• Interviews with alumni to better understand the mechanisms underlying career choice
Mentoring at the Critical Transitions

- Undergrad to Grad
- Grad to Postdoc
- Postdoc to Research Career

- Community
- Ongoing skill development
- Networking
- Learn more about factors that impact career decisions
Voices of Brown’s Legacy
Where do we go from here? What are our next steps?

**Undergrad to Grad**
- Recruiting and cultivating talent from MSIs broadens participation
- Mentoring matters
- Introducing research to first year students increases their competitiveness for PhD programs

**Grad to Postdoc**
- New network that allows participants to explore and prepare for research careers
- Increases knowledge of how to market themselves for diverse careers
- Catalyzes the development of a professional toolkit

**Postdoc to Research Career**
- Community
- Ongoing skill development
- Networking
- Learn more about factors that impact career decisions
NEXT-STEPS
National Expansion of Infrastructure for Student Transitions in Engineering and Physical Sciences

NEXT-STEPS Expansion from Regional to National Scale

SCI-TEPS REGION

- SCI-TEPS Institutions
- National Labs
- Leadership Alliance Institutions
Questions?