

# The Impact of a Preclinical Medical Student Mentored Summer Research Experience in Cardiovascular Disease on Scholarship and Career Trajectory: A Six-Year Report

Kramer Wahlberg MD,<sup>1,5</sup> Amreen Mughal PhD,<sup>2,5</sup> Zhaojin Li MS,<sup>3,5</sup> Mary Cushman MD, MSc,<sup>1,5</sup> Jonathan Flyer MD<sup>4,5</sup>

<sup>1</sup>Department of Medicine, <sup>2</sup>Department of Pharmacology, <sup>3</sup>Department of Neurological Sciences, <sup>4</sup>Department of Pediatrics, <sup>5</sup>The University of Vermont, Robert Larner MD College of Medicine



## BACKGROUND

- Developing a sustainable preclinical training infrastructure for future cardiovascular clinician-scientists is a priority.
- While more medical students are participating in research during school, data suggest research career interests diminish by graduation.
- We studied the impact of a mentored cardiovascular summer research fellowship (SRF) on medical student scholarship and career planning.**

## PROJECT DESCRIPTION AND METHODS

- Six-year study, competitive SRF: implemented by the Cardiovascular Research Institute of Vermont (CVRI-VT) at the University of Vermont Larner College of Medicine (LCOM).
- SRF: merit-based selection, mentored research experience between LCOM first and second year (Figure 1).
- Survey of all SRF awardees (2015-2020): current position, research engagement, SRF experience.
- Comparisons to national American Association of Medical Colleges Graduation Questionnaire (GQ) data from equivalent years were made using chi-squared tests.

## RESULTS

- Survey **response rate: 87%** (20/23); 55% female, 80% white. Older cohort age at graduation, compared nationally (p<0.0001).
- Median time from SRF completion: 2.0 years (IQR 0.75-2.25).
- 45% had published a peer-reviewed abstract or manuscript, equal to the national rate for graduating students (53%, p=0.47; Figure 2A).**
- 75%** were still enrolled in medical school.
- 80%** were involved in other research projects during medical school.
- 90% anticipate a career involving research (vs 53% nationally, p<0.001; Figures 2B-C, Table 1); 75% plan to pursue a career in cardiovascular medicine.**

- Participants identified valuable SRF experiences:
  - Mentorship (80%)
  - Research stipend (75%)
  - Protected time for research (65%)

## CONCLUSIONS AND NEXT STEPS

- LCOM students who completed a cardiovascular SRF after their first year **anticipated careers in cardiovascular research and published equivalent to the national rate for graduating peers, even though the majority had yet to graduate.**
- Longer-term SRF study is needed to understand the impact of preclinical mentored research experiences on clinician-scientist scholarship and academic career performance.

LCOM students completing a **cardiovascular summer research fellowship** after their first year **publish at the national average for graduates** and **anticipate careers in research.**

## Figure 1. CVRI-VT SRF Timeline

- 1. Summer Research Fellowship Announcement**  
The CVRI Summer Research Fellowship is announced to first year medical students in conjunction with other summer research opportunities offered at LCOM.
- 2. Project and Mentor Search**  
Through medical school informational sessions and CVRI outreach, students identify potential projects and mentors.
- 3. Project Pre-proposal Due**  
Key components include brief description of the project, mentor information and anticipated funding sources. If approved, students will then be asked to prepare a full proposal.
- 4. Project Full Proposal Due**  
Formal proposal including specific aims, background, methods with rationale and future directions. This proposal is authored under guidance from the mentor, who also provides a letter of support
- 5. Summer Research Fellowship Award Announcement**  
Selected students notified of their award, receive up to \$3,000 in support.
- 6. Summer Research Fellowship**  
Seven-week mentored research experience during first and second years of medical school
- 7. Research Reports Due**  
Students submit final research report summarizing their work along with reflections on the experience and a letter from their mentor.
- 8. Research Award Announced**  
The CVRI Early Career Advisory Committee reviews submitted research reports and selects the winner of the Summer Research Fellowship Merit Award.

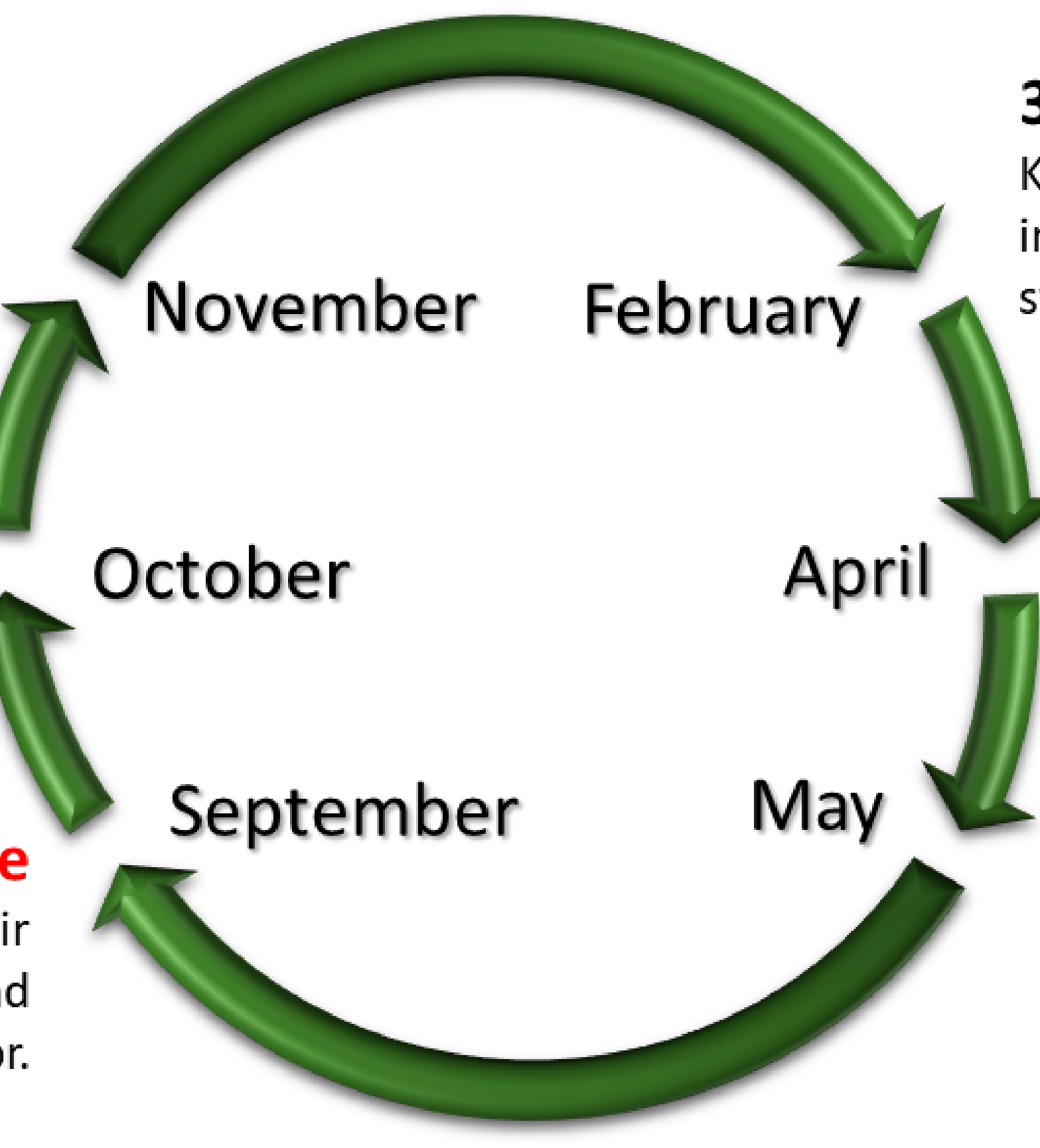


Figure 2. SRF Scholarship and Career Planning

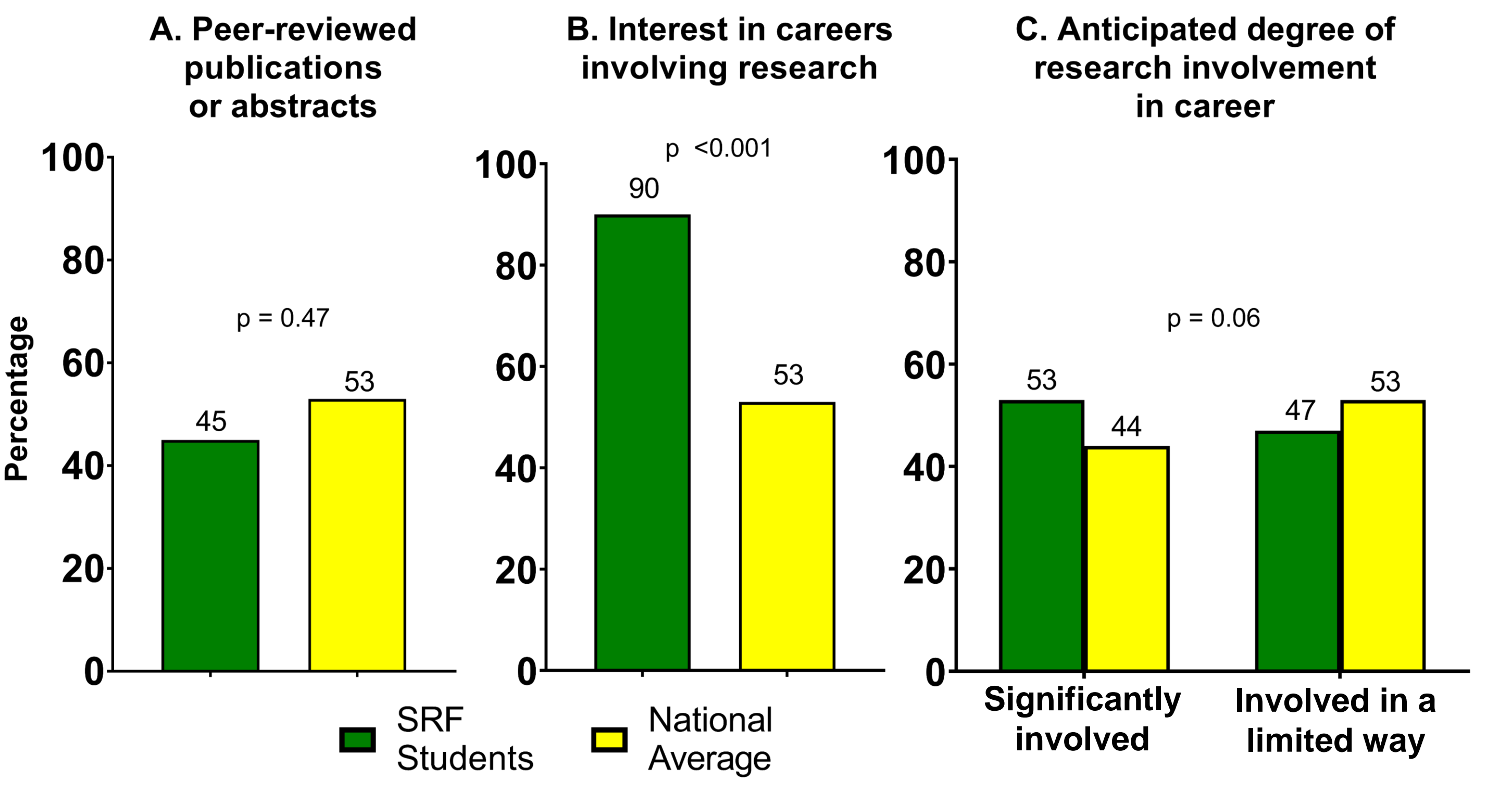


Table 1. SRF Career Interests, Mentorship & Scholarship

	Survey responses (%)	National average (%)	p value
Participation in other research projects during medical school unrelated to SRF	16 (80)		
If in residency, participating in research	3 (60)		
Awarded grants/funding related to SRF	6 (30)		
Research award or honors	6 (30)		
<b>Future career interests:</b>			
Patient Care	19 (95)	97	0.60
Research	18 (90)	53	<0.001
Teaching	17 (85)	83	0.81
Medical school faculty	13 (65)	45	0.07
Public health	6 (30)	29	0.92
Administration	5 (25)	28	0.77
Military service	0 (0)	4	0.36
Other	0 (0)	3	0.43
<b>Satisfaction with mentoring during SRF:</b>			
Very satisfied	15 (75)		
Satisfied	5 (25)		

## DISCLOSURE INFORMATION

The authors have no disclosures to report. A similar abstract was submitted to the American College of Cardiology 2021 Scientific Sessions.