

# Falling into the #DangerZone

BARRIERS AND FACILITATORS TO SUCCESS OF FACULTY  
WHO RECEIVED A K AWARD

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TEAM #DANGERZONE LITeS REPORT: APRIL 2019

# The Team

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**Heather Anderson:** Associate Professor, School of Pharmacy



**Elizabeth Carlton:** Assistant Professor, Colorado School of Public Health



**Derek Fong:** Assistant Professor, OLAR/Department of Pathology, School of Medicine



**Jeffrey Jacot:** Associate Professor, Bioengineering



**Deborah Rinehart:** Associate Director of Research Methods Core, Denver Health



**Vijaya Vemulakonda:** Associate Professor of Pediatric Urology, Department of Surgery, School of Medicine

# Our motivation...

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A pixel art scene showing a character in a green shirt and pink pants fishing in a pond. The background consists of green trees and a brown ground. The text "Early Career Investigator" is overlaid in white.

Early Career Investigator

A pixel art scene showing a character in a green shirt and pink pants running towards a blue pond. The background is a light green wall with brown pillars. The text "#DangerZone" is overlaid in red.

#DangerZone

A pixel art scene showing a character in a green shirt and pink pants fishing in a pond. The background consists of green trees and a brown ground. The text "Independent Investigator" is overlaid in white. In the top left corner, there is a digital display showing "2000" and "19:57".

2000  
19:57  
Independent Investigator

# Focus on K awards

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# K to R Transitions Nationally

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## Females vs males:

- Lower rate of R01 submission and funding
- Less overall funding (\$780,000 vs \$1.12M)
- Fewer publications
- Lower likelihood of promotion or leadership roles

<sup>1</sup> [https://grants.nih.gov/training/K\\_awards\\_evaluation\\_finalReport\\_20110901.pdf](https://grants.nih.gov/training/K_awards_evaluation_finalReport_20110901.pdf)

<sup>2</sup> Jagsi R, et al, Annals Int Med 2009

# K to R Transitions at CU AMC

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<b>AMC Group</b>	<b>Transition to R01</b>
CHCO (N = 30)	33%
CCTSI KL2 (N = 22)	41%
DHHA (N = 10)	10%
Cumulative (N = 62)	32%

# Project Goals

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1. Describe academic success of K awardees at CU AMC
2. Identify barriers and facilitators to success
3. Identify key areas for improvement and suggest strategies

# Methods

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Key informant interviews with senior leadership across campus

- How do you define success for junior faculty?
- What are barriers/facilitators?
- What does CU AMC do well, what could it do better?

Structured survey of K awardees at CU AMC to assess success and barriers/facilitators



# Structured Survey

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# Survey Description

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Informed by current literature and interviews

27 questions administered via REDCap

Survey domains

- Demographics
- Metrics of success
- Barriers and facilitators to success
- Current employment at CU



# Survey Eligibility

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CU AMC faculty with K award from 2005-2015

- External and institutional awards (K01, K08, K23, K12/KL2)

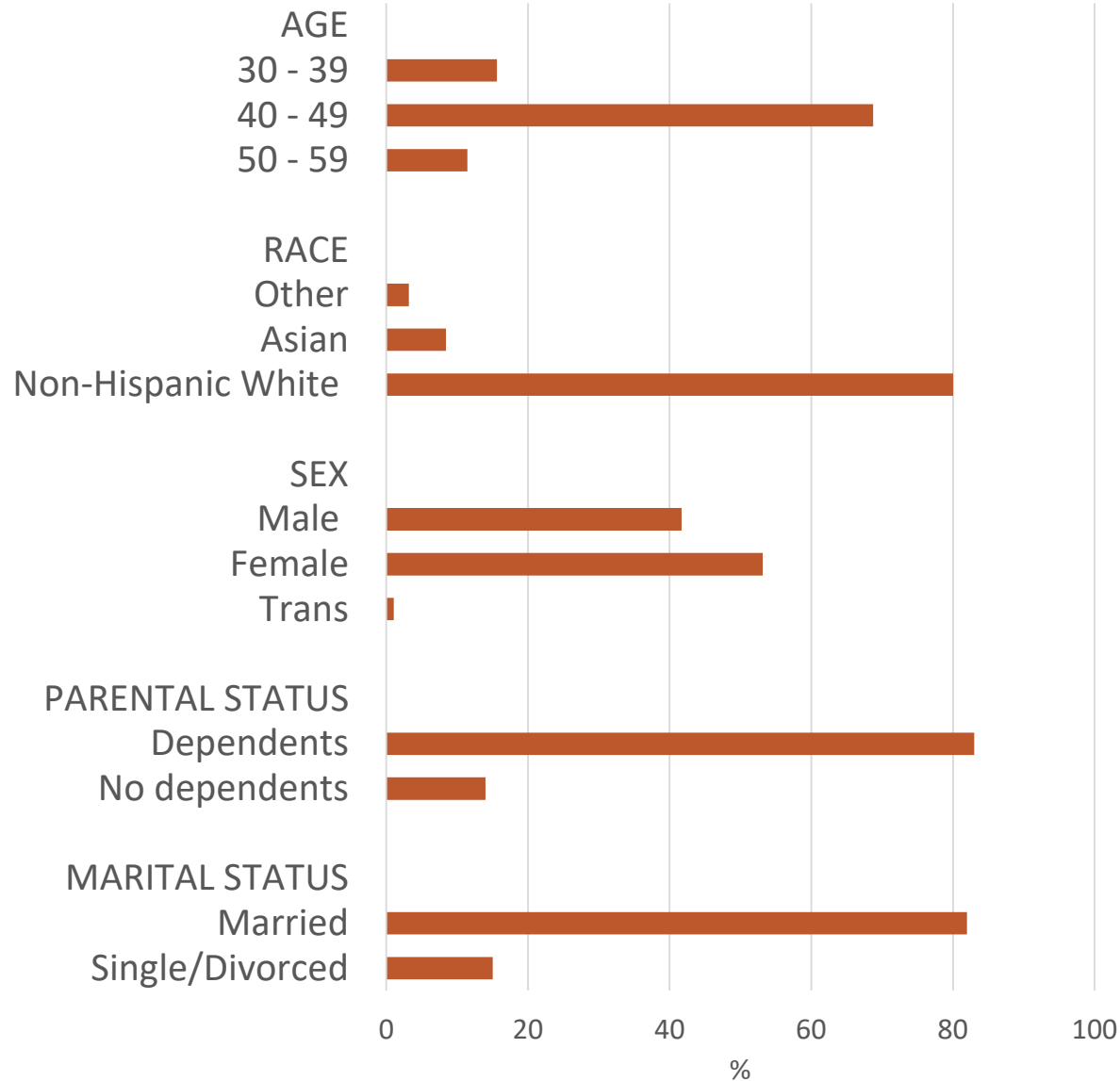
Awardees identified through CU Office of Grants and Contracts, Denver Health Sponsored Programs and Research Office, NIH Reporter

Survey sent to 221 eligible K awardees

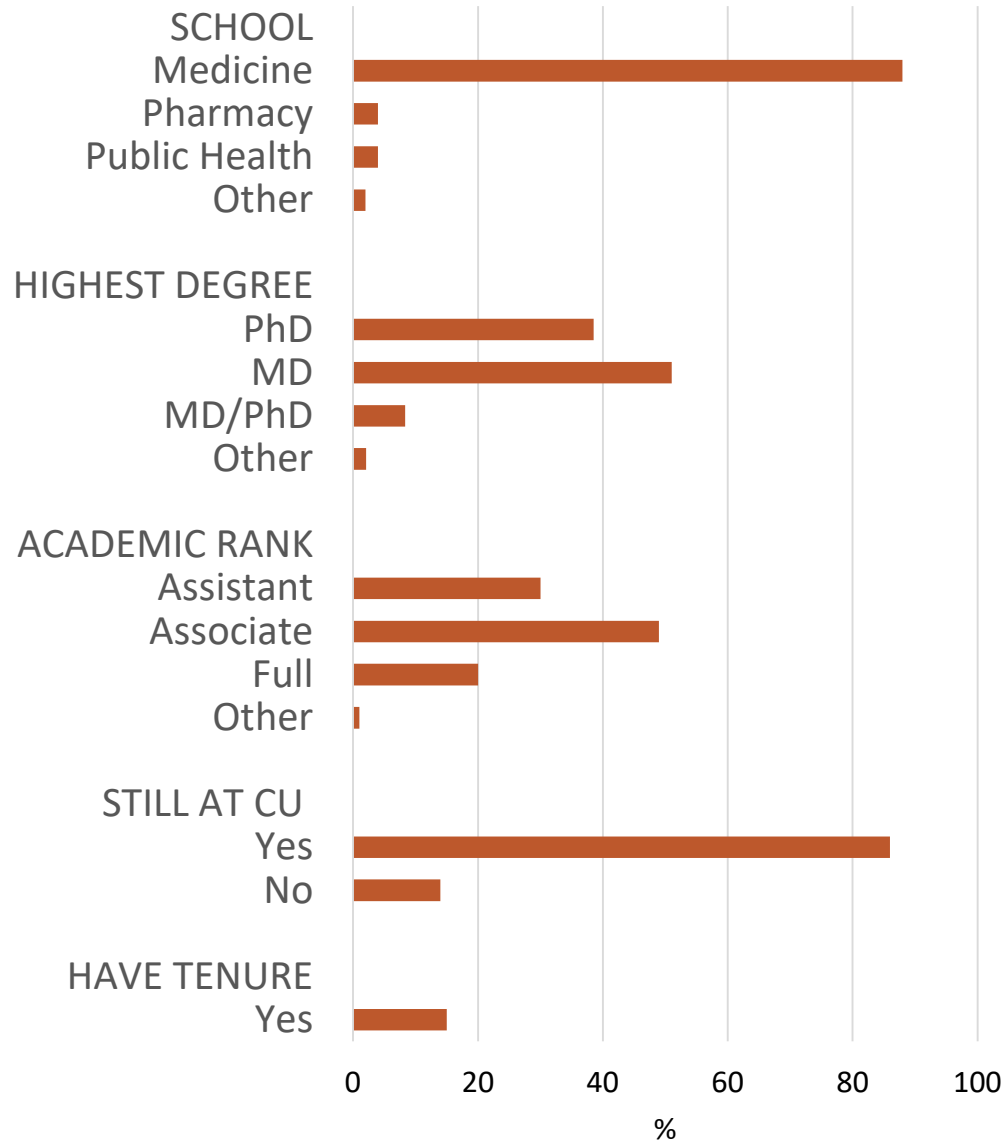
- Response rate\* = 48% (105/221)

\* sample size for each item varies because not all respondents answered all items

# Survey Respondents - Demographics



# Survey Respondents, continued



# Metrics of Success: Funding

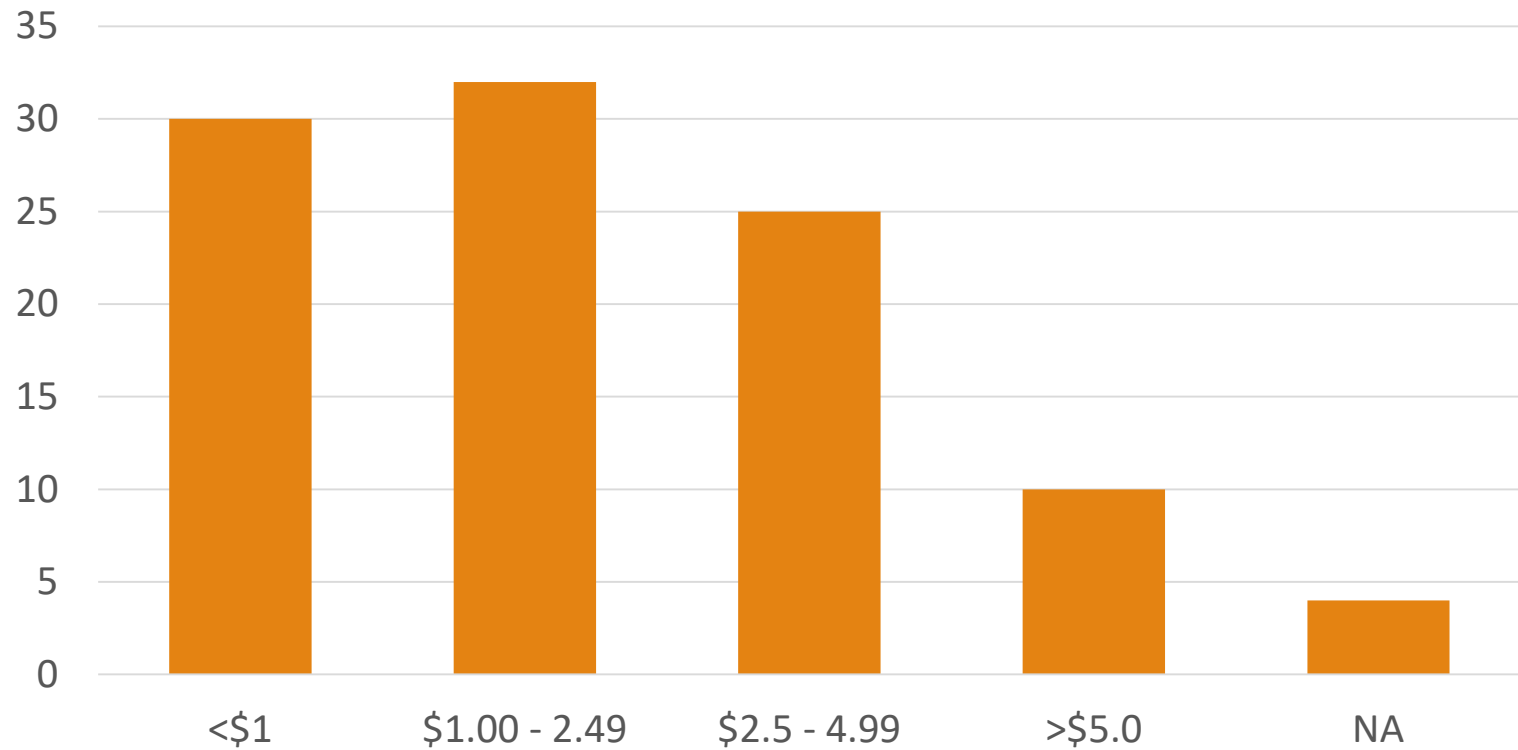
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	# Applications		Received
	$\geq 1$	Mean (range)	
R01/equivalent	87%	3 (0-15)	63%
Center grant	39%	1 (0-4)	23%
Other R-level grant/equivalent	77%	2 (0-16)	47%
Pilot grant	80%	3 (0-20)	68%
Other *	67%	2 (0-10)	55%

\* Other includes bridge funding, foundations, young investigator awards

# Funding raised as PI or co-PI, in millions

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# Other Metrics of Success

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## Promotion

- All who have applied have been promoted

## Publications

- First/senior author: mean 16.5, range 2-80
- Any author: mean 23, range 4-165

## Patents

- 7% awarded  $\geq 1$  patent



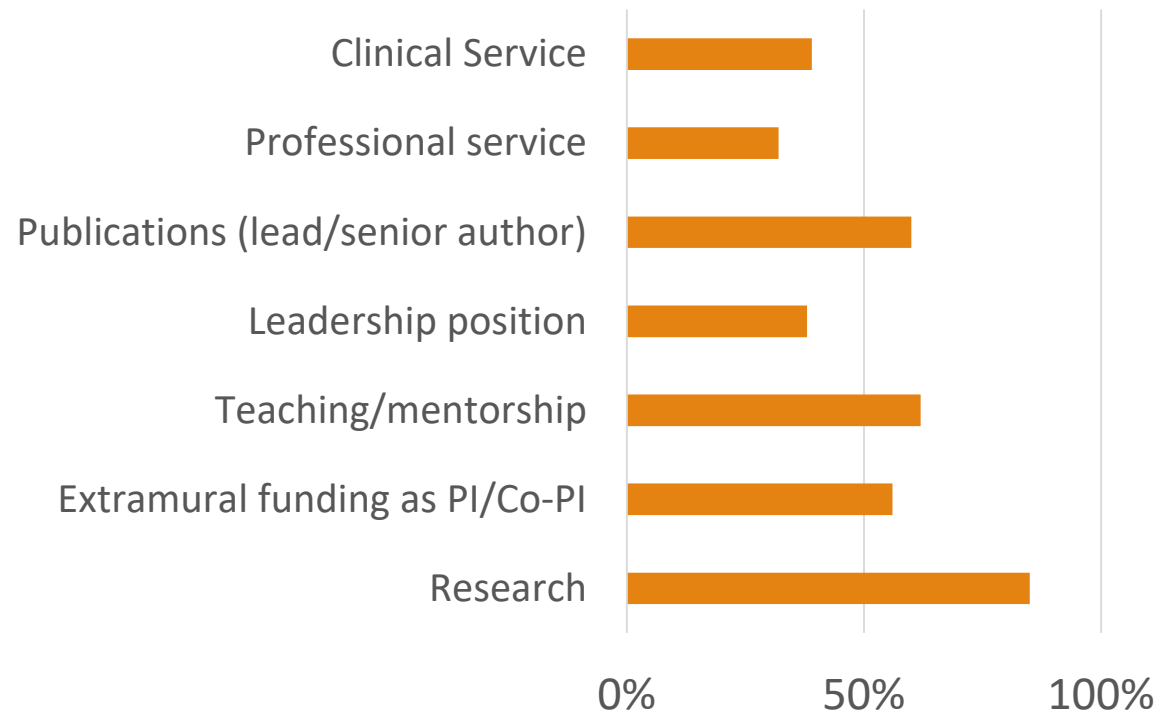
# Self-Assessment of Success

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How successful have  
been in your  
academic career?

1 (lowest)	1%
2	0%
3	24%
4	50%
5 (highest)	24%

Areas of success



# Top Barriers and Facilitators

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## Common Barriers:

- 1. Lack resources to help with research (tech/space/students) (50%)**
2. Lack of resources to help with work-life balance (33%)

## Common Facilitators:

- 1. Strong mentorship (60%)**
2. Strong collaborators (60%)
3. Protected time for research (56%)
4. Dean or department chair support (36%)
5. Strong family/social support (35%)
6. Resources to help with research (33%)

# Barriers and Facilitators Associated with Success

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Success defined as receiving R01 or equivalent or center grant as PI/Co-PI (68% of respondents)

People who had been awarded a large grant were...

- 3.1 times less likely to report lack of **collaborators** as a barrier
- 2.3 times less likely to report lack of **protected time** as a barrier
- 2.8 times more likely to report having strong **collaborators** as a facilitator

Success did not vary significantly by gender or parental status

Analysis: Logistic regression adjusted for time since K award (n=96)

# Senior Leadership Interviews

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# Key Informants

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- Dr. Romana Hasnain-Wynia, Denver Health Chief Research Officer
- Dr. Jon Samet, Dean of Colorado School of Public Health
- Dr. Robert Eckel, Interim Vice Chancellor for Research
- Dr. Doug Fish, Chair of Department of Clinical Pharmacy
- Dr. Anne Libby, Vice Chair for Academic Affairs, Department of Emergency Medicine
- Dr. Allison Kempe, Director, ACCORDS
- Dr. Elias Provencio-Vasquez, Dean of College of Nursing
- Dr. David Schwartz, Chair of Department of Medicine
- Dr. Ronald Sokol, CCTSI Director
- Dr. Judith Regensteiner, Center for Women's Health Research Founder & Director



# What Constitutes Success?

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R-Level Funding

High Quality  
Publications

Leadership Roles

# Who is the Ideal K Awardee?

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Collaborators interested in multidisciplinary research/team science

Self-aware of strengths and weaknesses

“Finishers” motivated to complete papers, research aims

Passion for the work

Fit between researcher and environment




# What do Senior Leaders see as Key Barriers and Facilitators?

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## Barriers:

- Lack of clear metrics for success or “independence”
- Variable support for research and mentorship based on department and research focus
- Variable training to prepare for independence

## Facilitators:

- Strong mentorship teams that extend beyond K application
  - Protected time and resources to strengthen R application
  - Multidisciplinary collaboration
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# Conclusions and Recommendations

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# Conclusions

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K awardees and senior leadership generally concordant

- There are multiple definitions of success – it's not just about an R01
- Strong mentorship is crucial

Importance of the right environment

- Having strong collaborators was a key predictor of success
- Lack of protected time and lack of resources to support research were major barriers to success

# Recommendations to Improve K to R Transition

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## Accountability and Recognition of Successful Mentors

- Expand existing training opportunities (e.g, CO-Mentor, LITeS)
- Incentivize mentorship (i.e., protected time) for mentors with track record of success
- Increase mentorship outside department through P&T or financial incentive
- Recruit and hire based on mentorship history and potential

# Recommendations to Improve K to R Transition

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## Increase financial support for K to R transition

- Competitive bridge funding including salary support for bridge from K to R
- Provide resources at reduced or no cost to K recipients (e.g, statistical support, clinical trials support, core laboratory resources)
- Providing resources could allow earlier R submission and reduce bridge funding

# Recommendations to improve K to R transition

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## Create a culture of collaboration and creativity on campus

- Development of cross-institutional peer mentorship for institutional and extramural K awardees (e.g., K WIPs, CFSP for K to R transition)
- Leverage existing projects to create a shared space for collaboration (e.g, CU AMC Health Sciences Building)
- Reduce barriers for interdepartmental collaboration (e.g., indirect cost sharing, Dean's fund to support collaboration)
- Expand existing centers for team science (e.g., CCTSI, ACCORDS, CPM)
- Prioritize cross-school/department cluster hires into areas of strength

# Acknowledgements

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LITeS leadership team

- Judith Albino, Susan Johnson, Scott Markowitz, Galit Mankin

Campus leadership who participated in interviews

Survey respondents

Claudia Mata (administered REDCap survey)

2018-2019 LITeS cohort

CCTSI for use of REDCap and excellent training programs!

- Supported by NIH/NCATS Colorado CTSA Grant Number UL1 TR002535. Contents are the authors' sole responsibility and do not necessarily represent official NIH views.