

# Andre Montes

PH.D. CANDIDATE · MECHANICAL ENGINEERING

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## University of California, Berkeley

M.S./PH.D. MECHANICAL ENGINEERING

- *Proposed Thesis*: Multiscale Cell Adhesion Mechanics and Integrin Mechanosensing *in silico*
- Advisers: Mohammad Mofrad, Ph.D. & Grace O'Connell, Ph.D.
- GPA: 3.96/4.00

Berkeley, CA

Aug 2019 - Present

## Colorado School of Mines

B.S. MECHANICAL ENGINEERING

- *Emphasis in Biomechanics*
- Adviser: Ozkan Celik, Ph.D.
- *Summa Cum Laude*

Golden, CO

Aug 2013 - Aug 2016

## Awards, Fellowships, & Grants

2023	<b>Graduate Research Grant</b> , Hearts to Humanity Eternal	\$ 10,000
	<b>Transfer-to-Excellence NSF REU Mentor</b> , UC Berkeley College of Engineering	\$ 1,000
2022	<b>Ford Predoctoral Fellowship</b> , National Academies of Science Engineering & Medicine	\$ 81,000
	<b>Professional Development Grant</b> , PPG Foundation	\$ 500
2021	<b>Robert N. Noyce Fellowship</b> , UC Berkeley College of Engineering	\$ 75,000
	<b>Diversity &amp; Community Fellowship</b> , UC Berkeley Graduate Division	\$ 16,500
	<b>SURF SMART Fellowship</b> , UC Berkeley Graduate Division	\$ 5,000
	<b>EDGE in Mentoring</b> , UC Berkeley CITRIS	\$ 1,000
	<b>Departmental Diversity Award</b> , UC Berkeley Dept of Mechanical Engineering	\$ 1,000
2020	<b>Graduate Remote Instruction Innovation Fellowship</b> , UC Berkeley Graduate Division	\$ 5,000
2019	<b>Graduate Student Research Fellowship</b> , UC Berkeley College of Engineering	\$ 18,000

## Publications

\*co-author

**Montes A**, Gutierrez G, Tepole AB, Mofrad MRK. 2023. Multiscale Computational Framework to Investigate Integrin Mechanosensing and Cell Adhesion. *Journal of Applied Physics*, 134, 114702. 2023.

**Montes A\***, McKinley J\*, Wang M, Kamath A, Jimenez G, Lim J, Marathe S, Mofrad MRK, O'Connell GD. 2022. Design of a flexing organ-chip to model *in situ* loading of the intervertebral disc. *Biomechanics*, 16, 054111.

**Montes A\***, Arevalo S\*, O'Connell GD. 2022. Research seminar designed for undergraduate students builds confidence and access to research opportunities. *Proceedings of ASEE Conference*. 37513

Harris M, McCarty M, **Montes A**, Celik, O. 2016. Enhancing Haptic Effects Displayed via Neuromuscular Electrical Stimulation. *Proceedings of DSC Conference*. V001T07A003.

## Presentations

\*presenting author

### CONFERENCE PRESENTATIONS

Accepted: **Montes A\***, Tepole AB, Mofrad MRK. Oct 2023. Mechanobiological Insights and Unfolding Molecular Dynamics of Cell-Matrix Bond Mutant. *Biomedical Engineering Society Annual Conference*. Podium Talk. Seattle, Washington.

**Montes A\***, Tepole AB, Mofrad MRK. Oct 2022. Towards a Multiscale Mechanical Model of Cell Adhesion Dynamics. *Biomedical Engineering Society Annual Conference*. Podium Talk. San Antonio, Texas.

**Montes A\***, McKinley J, Mofrad MRK, O'Connell GD. June 2021. *Summer Biomechanics, Bionengineering, and Biotransport Conference*. Podium Talk. Virtual.

**Montes A\***. Jan 2021. Spine-on-a-chip: We got your back. *Global Young Scientists Summit*. Video Abstract. Virtual.

Harris M\*, McCarty M, **Montes A**, Celik O. Apr 2016. Experiments on Inducing Haptic Effects on the Elbow via Neuromuscular Electrical Stimulation. *IEEE Haptics Symposium*. Podium Talk. Philadelphia, PA.

## MENTORED UNDERGRADUATE PRESENTATIONS

*Accepted*: Barroso A\*, **Montes A**, Mofrad MRK. Nov 2023. Fibronectin Binding Site Mutation Reroutes Force to Decrease Cell Adhesion. *Annual Biomedical Research Conference for Minoritized Scientists*. Poster. Phoenix, AZ.

*Accepted*: Wang W\*, **Montes A**, O'Connell GD. Oct 2023. Computational Examination of Mutant Fibronectin's Biophysical Dynamics. *SACNAS NDiSTEM Conference*. Poster. Portland, OR.

Gutierrez G\*, **Montes A**, O'Connell GD, Mofrad MRK. Aug 2022. Modeling Cell Adhesion Molecules as a Mechanical System. *NSF CAMP Symposium*. Poster. Berkeley, CA.

Baeza M\*, **Montes A**, Mofrad MRK. Nov 2021. Quantifying cell elasticity through a microchannel using finite element analysis. *McNair Scholars Research Conference*. Poster. Miami, FL.

Lim J\*, **Montes A**, Mofrad MRK. Aug 2021. Computationally revealing cell elasticity within a micro-stretching device. *Berkeley SURF Symposium*. Poster. Virtual.

Lindgren J\*, **Montes A**, Mofrad MRK. Aug 2021. Quantifying cell elasticity by modeling microfluidics. *Berkeley CalTeach Summer Research Symposium*. Poster. Virtual.

Wang M\*, **Montes A**, McKinley J, O'Connell GD, Mofrad MRK. May 2021. Determining Mechanical Strains of Cells in 2D vs 3D Culture within a Deforming Microphysiological Chip. *Berkeley Bioengineering Research Symposium*. Poster. Virtual.

Cruz F\*, **Montes A**, McKinley J, O'Connell GD, Mofrad MRK. Aug 2020. Spine-on-a-chip: Finite Element Modeling of Strains in the Annulus Fibrosus. *Berkeley CalTeach Summer Research Institute Symposium*. Poster. Virtual.

## INVITED TALKS

May 2023. *Cell Adhesion via Integrin Mechanosensing in silico*. Speaker. Biomedical Engineering Research Seminar for Wis-Prof Future Faculty Workshop, University of Wisconsin, Madison.

March 2023. *Cell Adhesion and Integrin Mechanosensing*. Speaker. Guest lecture for Molecular Biomechanics and Mechanobiology of the Cell, UC Berkeley.

March 2022. *Multiscale Modeling in Cell Biomechanics*. Speaker. Special Topics in Biomechanical Engineering Seminar, UC Berkeley.

## Teaching Experience

Summer 2021	<b>ME W85 Introduction to Solid Mechanics</b> , Graduate Student Instructor	UC Berkeley
Spring & Fall 2021	<b>ME 198/298 Finding Your Research Pathway</b> , Instructor	UC Berkeley
Fall 2020 Spring 2021	<b>E295 Communications for Engineering Leaders</b> , Graduate Student Instructor	UC Berkeley
Spring 2015	<b>ENGN150 Multidisciplinary Engineering Lab</b> , Undergraduate Teaching Assistant	CSM

## Professional Experience

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- Dec 2019 **Research Engineer**, *Samay (formerly Respira Labs)* - Wearable acoustic device for diagnosing and monitoring COPD. Developed and tested flexible composite prototypes that improved skin adhesion and comfort while minimizing signal noise. Led and completed successful first phase submission for the NSF SBIR grant.
- Jun 2020
- Aug 2016 **R&D Engineer**, *Philips Healthcare* - Developed and tested cardiovascular wires and catheters to diagnose and treat arterial blockages in the heart and the legs. Optimized acoustic pressure output to disrupt simulated lesions while improving catheter durability to repeated acoustic shocks.
- Jun 2019

## Outreach & Professional Development

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### SERVICE AND OUTREACH

- Sept 2023 **Biomechanics and Modeling in Mechanobiology Journal**, Reviewer
- Jan 2023 **Bioengineering Faculty Search**, Student Committee Chair UC Berkeley
- Aug 2022 **Discipline Cluster**, Graduate Student Instructor Workshop Leader UC Berkeley
- Fall 2021 **First Steps in Research**, Founder and Director UC Berkeley
- Fall 2020 **Latino/a Assoc. of Grad Students in Engineering & Science**, Outreach Chair UC Berkeley
- Fall 2020 **First-Gen &/or Low-Income Grads**, Co-founder UC Berkeley

### PANELS & EVENTS

- Mar 2023 **Diversity Days at Cal**, Lead Organizer - Office for Grad Diversity UC Berkeley
- Mar 2023 **Minoritized Grad Student Experience at Cal**, Host - Office for Grad Diversity UC Berkeley
- Mar 2023 **Path to the Professoriate - Qualifying Exam**, Panelist - Office for Grad Diversity UC Berkeley
- Jan 2023 **MechE Grad Student Recruitment Panel**, Panelist - Mechanical Engineering UC Berkeley
- Nov 2022 **Garden State LSAMP Conference**, Grad Recruiter - Office for Grad Diversity NJIT
- Nov 2022 **CA Forum for Grad Diversity in Education**, Grad Recruiter - Office for Grad Diversity Long Beach
- Oct 2022 **Ford Predoctoral Fellowship Workshop**, Host and Panelist - Office for Grad Diversity UC Berkeley
- Oct 2022 **Graduate Diversity Admissions Fair**, Host and Panelist - Office for Grad Diversity UC Berkeley
- Apr 2022 **Exchange by the Gate**, Organizer - Office for Grad Diversity UC Berkeley
- Nov 2021 **Town Hall for Foster and System-Impacted Youth**, Organizer - Office for Grad Diversity UC Berkeley

### DEVELOPMENT

**WiscProf Future Faculty In Engineering 2023**, *Madison, WI* | Designed for doctoral students within their last two years of study and postdoctoral scholars in the last year of their research, this exciting, expenses-paid four-day program is an invaluable opportunity to learn more about academic careers and how to succeed in a faculty position.

**NextProf Nexus Future Faculty Workshop 2022**, *Berkeley, CA* | A multi-day program that is part of a nationwide effort to strengthen and diversify the next generation of academic leaders in engineering. Sponsored by: Michigan, UC Berkeley and Georgia Tech.

**Global Young Scientist Summit 2021**, *online* | This conference brings together bright young researchers and top scientific minds from around the world to discuss science and technology trends and how research could address major global challenges.

## References

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Mohammad Mofrad, PhD | Professor of Bioengineering and Mechanical Engineering | UC Berkeley | mofrad@berkeley.edu  
Grace O'Connell, PhD | Professor of Mechanical Engineering | UC Berkeley | g.oconnell@berkeley.edu  
Adrian Buganza Tepole, PhD | Associate Professor of Mechanical Engineering | Purdue University | abuganza@purdue.edu