Andre Montes

Ph.D. Candidate · Mechanical Engineering

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Education

University of California, Berkeley *Berkeley, CA*

M.S./Ph.D. Mechanical Engineering *Aug 2019 - Present*

- *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

Colorado School of Mines *Golden, CO*

B.S. Mechanical Engineering *Aug 2013 - Aug 2016*

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

Awards, Fellowships, & Grants

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

Publications

**co-author*

Submitted to Journal of Applied Physics: **Montes A**, Gutierrez G, Tepole AB, Mofrad MRK. 2023. Multiscale Computational Framework to Investigate Integrin Mechanosensing and Cell Adhesion. *bioRxiv*. `https://doi.org/10.1101/2023.03.24.533575`

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. *Biomicrofluidics*, 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; + mentored undergraduate*

Conference Presentations

Accepted Talk: **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.

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.

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.

Invited Talks

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

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

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

Teaching Experience

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

Professional Experience

Dec 2019 – Jun 2020 **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 succsessful first phase submission for the NSF SBIR grant.

Aug 2016 – Jun 2019 **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.

Outreach & Professional Development

Service and Outreach

Jan 2023	**Bioengineering Faculty Search**, Student Committee Chair	*UC Berkeley*
Fall 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*

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

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