

# Haleh Alimohamadi

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## Research Interests

**Cell mechanics, Soft matter physics, Transport in biological systems, Continuum mechanics, Biofluid**

## Education

- 2016–Present **PhD candidate**, *University of California San Diego (UCSD)*, La Jolla, USA.  
Mechanical and Aerospace Engineering, Supervisor: Professor Padmini Rangamani
- 2012–2014 **Master of Science**, *University of Tehran*, Tehran, IR.  
Mechanical Engineering
- 2008–2012 **Bachelor of Science**, *University of Tehran*, Tehran, IR.  
Mechanical Engineering

## Research Experience

- 2016–Present **Laboratory for Computational Cellular Mechanobiology**, *UCSD*, La Jolla, USA.  
Mechanical and Aerospace Engineering, Supervisor: Professor Padmini Rangamani
- 2015–2016 **Industrial and Biological Multiphysics Laboratory**, *University of British Columbia*, Vancouver, CA.  
Mechanical Engineering, Supervisor: Professor Dana Grecov
- 2012–2014 **Non-Newtonian Fluid Mechanics Laboratory**, *University of Tehran*, Tehran, IR.  
Mechanical Engineering, Supervisor: Professor Kayvan Sadeghy
- 2011–2012 **Hydraulic Machinery Research Institute**, *University of Tehran*, Tehran, IR.  
Mechanical Engineering, Supervisor: Professor Mehrdad Raisee Dehkordi
- 2010–2011 **Vehicle, Fuel, and Environment Research Institute**, *University of Tehran*, Tehran, IR.  
Mechanical Engineering, Supervisor: Professor Vahid Esfahanian

## Awards and Honors

- 2020 **Selected as the Siebel Scholar** (\$35,000) [[UCSDnews](#)], the most prestigious annual award for academic excellence and demonstrated leadership from leading graduate schools in Bio-engineering.
- 2020 **Distinguished PhD Student Fellowship** (\$20,000), recognized as a distinguished graduate students with exceptional performance in the research, teaching activities, publications, and service to the community. Mechanical and Aerospace Engineering, UCSD.
- 2019 **Selected as the Rising Stars**, Mechanical Engineering, Stanford University.
- 2019 **Travel Grant Award**, American Society of Cell Biology (ASCB).
- 2017 **Outstanding Graduate Students Award**, Mechanical and Aerospace Engineering, UCSD.
- 2016-2018 **Visible Molecular Cell Consortium (VMCC) Fellowship**, UCSD
- 2016 **Mechanical and Aerospace Engineering Recruitment Fellowship**, UCSD.
- 2015 **Four Years Graduate Fellowship (4YF)**, the most prestigious graduate scholarship at University of British Columbia.
- 2012 **Exempted from Nationwide M.Sc. Entrance Exam as an Exceptionally Talented Undergraduate**, University of Tehran.
- 2008-2012 **Full Undergraduate Scholarship Award**, University of Tehran.
- 2008-2012 **Exceptional Elite Scholarship**, University of Tehran.
- 2008 **Ranked 366th** amongst more than 400,000 competitor in Nationwide University Entrance Exam for B.Sc. degree.

## Publications

### Journals:

- PLoS Comput. Bio, 2020 **H. Alimohamadi**, A. Smith, R. Nowak, V. Fowler, P. Rangamani, "Non-uniform distribution of myosin-mediated forces governs red blood cell membrane curvature through tension modulation, *PLoS Computational Biology*, vol. 16, no. 5, pp. e1007890, 2020.
- Sci. Rep. 2020 **H. Alimohamadi**, B. Ovryn, P. Rangamani, "Modeling membrane nanotube morphology: the role of heterogeneity in composition and material properties, *Nature, Scientific Reports*, vol. 10, no. 1, pp. 1-15, 2020.
- Soft Matter. 2020 R. R. Molina, S. Liese, **H. Alimohamadi**, P. Rangamani, A. Carlson "Diffuso-kinetic membrane budding dynamics, Accepted *Soft Matter*, 2020.
- biorxiv, 2020 **H. Alimohamadi** , M. Bell, S. Halpain, P. Rangamani, J. C. Stachowiak, "Mechanical principles governing the shapes of dendritic spines,  *biorxiv*, 2020.
- biorxiv, 2020 F. Yuan, **H. Alimohamadi**, B. Bakka, A. N. Trementozzi, N. L. Fawzi, P. Rangamani, J. C. Stachowiak, "Membrane bending by protein phase separation,  *biorxiv*, 2020.
- Mol. Biol. Cell 2018 **H. Alimohamadi\***, R. Vasan\*, J. Hassinger, J. Stachowiak, P. Rangamani, "The role of traction in membrane curvature generation , *Molecular Biology of the Cell*, vol. 29, no. 16, pp. 2024-2035, 2018. (\* denotes equal contribution.)
- Biomolecules 2018 **H. Alimohamadi**, P. Rangamani, "Modeling membrane curvature generation due to membrane-protein interactions, *Biomolecules*, vol. 8, no. 4, pp. 120-145, 2018.  
\* Our paper has been selected as a hot paper by the editors and has been posted at the Editor's Choice Articles page [Link].
- Korea-Aust Rheol J 2016 **H. Alimohamadi**, M. Akram, K. Sadeghy, "Flow of a casson fluid through a locally-constricted porous channel: a numerical study, *Springer/Korea-Australia Rheology Journal*, vol. 28, no. 2, pp. 129137, 2016.
- J. Rheol 2016 **H. Alimohamadi**, K. Sadeghy, "On the use of magnetic fields for controlling the temperature of hot spots on porous plaques in stenosis arteries, *Journal of the Society of Rheology*, vol. 43, pp. 135-144, 2016.
- IJFMR 2015 **H. Alimohamadi**, M. Imani, B. Forouzandeh "Computational analysis of transient non-Newtonian blood flow in magnetic targeting drug delivery in stenosed carotid bifurcation artery, *International Journal of Fluid Mechanics Research*, vol. 42, no.2, pp. 149-169, 2015.
- IJCMESM 2014 **H. Alimohamadi**, M. Imani, "Transient non-Newtonian blood flow under magnetic targeting drug delivery in an aneurysm blood vessel with porous walls, *Taylor and Francis/ International Journal for Computational Methods in Engineering Science & Mechanics*, vol. 15, no. 6, pp. 522-533, 2014.
- IJCMESM 2014 **H. Alimohamadi**, M. Imani, "Finite element simulation of two-dimensional pulsatile blood flow through a stenosed artery in the presence of external magnetic field, *Taylor and Francis/ International Journal for Computational Methods in Engineering Science & Mechanics*, vol. 15, no. 4, pp. 390-400, 2014.

### Conferences:

- Biophysical 2020 **H. Alimohamadi**, A. Smith, R. Nowak, V. Fowler, P. Rangamani, "Red blood cell curvature is controlled by the non-uniform distribution of myosin-mediated forces and membrane tension, *Biophysical Society*, pp. 231a, 2020.
- Biophysical 2020 C. Uysalel, **H. Alimohamadi**, A.M. Sokac, P. Rangamani, Computational analysis of BAR domain dependent membrane modeling of microvilli formation during drosophila cellularization, *Biophysical Society*, 2020.
- GRC 2019 **H. Alimohamadi**, R. Vasan, S. Rudraraju, K. Garikipati, V. Fowler, A. Smith, M. Akamatsu, P. Rangamani, "From phenomenology to membrane biology, *Gordon Research Conferences* , 2019.

- Biophysical 2018 R. Vasani, J. Hassinger, **H. Alimohamadi**, David Drubin, P. Rangamani, "Energetics and stability of neck formation in yeast and mammalian endocytosis, *Biophysical Society*, pp. 281a, 2018.
- Biophysical 2018 **H. Alimohamadi**, B. Ovaryn, P. Rangamani, "Protein-mediated beads-on-a-string structure formation along membrane nanotubes in live cells, *Biophysical Society*, pp. 392a, 2018.
- Biophysical 2018 **H. Alimohamadi**, R. Vasani, J. Hassinger, J. Stachowiak, P. Rangamani, "The role of traction in membrane curvature generation, *Biophysical Society*, pp. 281a, 2018.
- ASME 2013 P. Sarmadi, **H. Alimohamadi**, M. Raisee, "Modeling and comparing pressure and temperature contours of synovial fluid in healthy knee and osteoarthritis knee joint, *Annual International Conference on Mechanical Engineering*.

## Teaching Assistant

- Spring 2019 **Continuum Mechanics Applied to Medicine/Biology (MAE/BENG 209)**, UCSD, MAE Department.  
Instructor: Prof. Padmini Rangamani  
\* [100 % recommend me as a TA for this course](#)
- Winter 2019 **Thermodynamics (MAE 11)**, UCSD, MAE Department.  
Instructor: Prof. Padmini Rangamani,  
\* [189 students in the class, 86% recommend me as a TA for this course](#)
- 2013-2015 **Lecturer: Teaching Physics and Mathematics to high school students**, Kherad high school, Tehran.

## Talks and Presentations

- Feb. 2020 Poster presentation in Biophysical Society, San Diego.
- Dec. 2019 Poster presentation in American Society of Cell Biology (ASCB), Washington D.C.
- Oct. 2019 Poster presentation in Mechbio symposium, University of California Irvine.
- Jan. 2019 Poster presentation in CTSBB/VMCC workshop, Jacobs School of Engineering, UCSD.
- April. 2018 Poster presentation in Research Expo'18, UCSD, Jacobs School of Engineering, La Jolla.
- Feb. 2018 Talk in Biophysical Society, San Francisco.
- Feb. 2018 Poster presentation in Biophysical Society, San Francisco.
- April. 2017 Poster presentation in Research Expo'17, Jacobs School of Engineering, UCSD, La Jolla.
- Aug. 2013 Poster presentation in ICEEE conference, Tehran.
- May. 2013 Poster presentation in ASME conference, Tehran.

## Mentorship

- Volunteered to participate in several programs aiming to support undergraduate and minority research.
- o **MAE mentorship program**: an undergraduate mentorship program for mechanical and aerospace engineering, UC San Diego.  
2019-2020 Richard Escamilla, Dhanvi Desu, and Dustin Tengdyantono
  - o **JUMP**: an undergraduate mentorship program at UC San Diego.  
2018-2019 Josephine Shia, Robert Korman, and Nerija Janovskyte
  - o **ENLACE**: a bi-national summer research program at tries to encourage the participation of high school and college students in research, while promoting cross-border friendships in the Baja California/San Diego.

## Service

### Reviewer

- o Journal of Biomechanics
- o Computer Methods in Biomechanics and Biomedical Engineering

- International Journal for Computational Methods in Engineering Science & Mechanics
- Ain Shams Engineering Journal
- Journal of Porous Media
- Special Topics & Reviews in Porous Media
- Thermal and Fluids Engineering Conference

## Outreach

- Volunteer for tutoring at Math Open House at UCSD (2020).
- Grading master comprehensive exam in the MAE department at UCSD (June and December, 2019).
- Volunteer for PhD visiting day in the MAE department at UCSD (March, 2019).
- Volunteer for the Johns Hopkins Center for Talented Youth workshop at UCSD (Oct, 2016).
- Organizing committee member of the Mechbio symposium at UCSD (Aug, 2016).
- Member of MAE Graduate Women's Group at UCSD (2016-Present).
- Organizing committee member of 17<sup>th</sup> International Conference of Mechanical Engineering (ISME), University of Tehran (Dec, 2008).

## Professional Memberships

- American Physical Society (2020).
- American Society of Cell Biology (2018-present).
- Biophysical Society (2016-present).

## References

- **Dr. Padmini Rangamani**, Associate Professor  
Department of Mechanical and Aerospace Engineering, University of California San Diego  
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- **Dr. Velia Fowler**, Professor and Chair  
Department of Biological Sciences, University of Delaware  
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- **Dr. Jeanne Stachowiak**, Associate Professor  
Department of Biomedical Engineering, University of Texas at Austin  
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- **Dr. Andrew McCulloch**, Distinguished Professor  
Department of Bioengineering Engineering and Medicine, University of California San Diego  
✉ amcculloch@ucsd.edu ☎ +1 (858) 534-2547 🌐 [Homepage](#)
- **Dr. Juan C. Lasheras**, Stanford S. and Beverly P. Penner Distinguished Professor  
Department of Mechanical and Aerospace Engineering, University of California San Diego  
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## Personal

Residency: U.S. Permanent Resident.