Amir H. K. Ashkezari

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Areas of Interest

Mechanobiology • receptor–ligand interactions • microfluidics • platelet biology • immunoengineering

Current Position

2021– Graduate Research Assistant at Cellular and Molecular Biomechanics Laboratory (Prof. Cheng Zhu), George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, USA

Qualifications

2021– PH.D. Mechanical Engineering (bioengineering direction), Georgia Institute of Technology, Atlanta, GA, USA

2019–2021 M.Sc. Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA, USA

2018–2021 Research Assistant, Nano-Bioengineering and Microfabrication Laboratory, Sharif University of Technology

2014–2019 B.Sc. Major in Mechanical Engineering, Minor in Mathematics, Sharif University of Technology
CGPA: **18.78/20** (**4.0/4.0** according to WES criteria); Minor GPA: **19.35/20.00**

Publications

* *denotes equal contribution.*

2026 Martyanov, A. A., Paul, D. S., **Ashkezari, A. H. K.**, Seung, A., Mikloscz, J., Boggio, F., Lee, R. H., Zhu, C., Reeves, B., & Bergmeier, W. PI3K-dependent platelet priming drives a pro-thrombotic intermediate-affinity αIIbβ3 state in MPN. *Science Translational Medicine.* Accepted.

2026 Li, M., Lyu, J., Li, K., Dravid, A., Balasubramani, D., **K. Ashkezari, A. H.**, Choi, H. K., Kwong, G. A., Singh, A., & Zhu, C. SynNotch receptors for visualizing immunoreceptor force transmission and downstream signaling in vivo. *Advanced Science*, e77318.

2026 Mao, L., Kwak, M., **Ashkezari, A. H.**, Li, Z., Cong, P., Chen, Y., Phee, J. H., Kang, S., Li, J., & Zhu, C. DynMoCo: A novel AI framework to reveal modular substructures of protein from molecular dynamics. *Biophysical Journal.* (Cover art selected.)

2026 **Kazemipour Ashkezari, A. H.***, Travaglino, S.*, Li, M., Watson, V. E., Cong, P., Doudy, L., Choi, H. K., & Zhu, C. Evaluating the effects of CD8/CD4 on T cell function in terms of TCR–pMHC–coreceptor catch and slip bonds. *Frontiers in Immunology*, 17, 1757198.

2025 Zhang, Y., Liang, Y., **Kazemipour Ashkezari, A. H.**, Wang, C., Chang, C. W., Bai, Y., Huang, X., Mack, A., Yang, H., Cong, P., & Cheng, N. Direct binding of Lyn to GPIbβ transmits 2-way GPIb-IX signaling to stimulate platelet activation and VWF binding. *Circulation Research*, 137(12), 1480–1497.

2025 Pourghasemian, M., H., Barzoki, A. K., Dizani, M., **Ashkezari, A. H.**, & Shamloo, A. Rapid and low-cost droplet PCR using a novel microfluidic setup with a numerical study on micromixer effects. *Sensors and Actuators Reports*, 9, 100327.

2024 **Ashkezari, A. H. K.**, Dizani, M., & Shamloo, A. Integrating hydrodynamic and acoustic cell separation in a hybrid microfluidic device: a numerical analysis. *Acta Mechanica*, 233(5).

2022 Yuan, Z., O'Melia, M. J., Li, K., Lyu, J., Rosado, A. M., Watson, V. E., **Ashkezari, A. H.**, Zhou, F., Kansal, V., Kinney, B., Travaglino, S., et al. Tumor microenvironment impaired T cell antigen recognition and function were restored by Lovastatin therapy. *bioRxiv*, 2022-09.

2021 Jalili, A., Bagheri, M., Shamloo, A., & **Kazemipour Ashkezari, A. H.** A plasmonic gold nanofilm-based microfluidic chip for rapid and inexpensive droplet-based photonic PCR. *Scientific Reports*, 11(1), 1–13.

Oral Presentations

Ashkezari, A. H. K., Travaglino, S., Mousavi, S., Dezhkam, R., Ke, Y., & Zhu, C. Structural and intracellular regulation of BCR affinity and catch bond (Oral Presentation / Short Talk). *FASEB Immunoreceptors and Immunotherapy*. 2026

Posters

Ashkezari, A. H. K., Travaglino, S., Mousavi, S., Dezhkam, R., Ke, Y., & Zhu, C. Structural and intracellular regulation of BCR affinity and catch bond. *FASEB Immunoreceptors and Immunotherapy*. 2026

Ashkezari, A. H. K., Chen, Y., Cong, P., Du, X., & Zhu, C. Regulation of the glycoprotein Ib-IX complex inside-out signaling by 14-3-3 protein and Src family kinase, Lyn. Gordon Research Conference, Cell Biology of Megakaryocytes and Platelets. 2025

Ashkezari, A. H. K., Lyu, J., Choi, H.-K., Travaglino, S., Singh, A., & Zhu, C. Epigenetic control of B cell receptor mechanics: EZH2 Y641F mutation alters force-dependent signaling and antigen affinity. PS-ON / Cancer TEC joint annual meeting. 2025

Cong, P., Kim, S., Watson, V., Faniel, M., Lyu, J., Ashkezari, A. H. K., Robbins, P., Rosenberg, S., Mariuzza, R., & Zhu, C. Characterization and engineering of p53R175H-specific TCR for cancer adoptive cell therapy. Winship Scientific Symposium, Emory University. 2025

Rosado, A. M., Yuan, Z., Kansal, V., Travaglino, S., Lyu, J., Ashkezari, A. H. K., Kinney, B., Li, K., Schmitt, N., & Zhu, C. Statin drugs modulate T cell antigen sensing to enhance $CD8^+$ T cell cytotoxic function. Winship Scientific Symposium, Emory University. 2025

Accolades

GaTech Woodruff School WoW Fellowship for mentoring undergraduate and exchange researchers in biophysical methods 2026

The 2025 POOIA Student Excellence Award from the Professional Organization of Iranian Americans (POOIA) – Runners-up 2025

Histochemical Society Travel Award for attendance at Marine Biological Laboratory course in Analytic and Quantitative Light Microscopy (AQLM) 2025

Chairperson's Fellowship for the Ph.D. Program in Mechanical Engineering, University of Virginia (not attended) 2020

Scholarship for the Master's Programme in Applied and Computational Mathematics, KTH Royal Institute of Technology (not attended) 2021

E3 summer internship program scholarship, EPFL (not attended) 2018

Ranked 83rd among nearly 170,000 participants in University Entrance Exam – Math and Physics 2016

Ranked 3rd among nearly 110,000 participants in University Entrance Exam – Foreign languages 2016

Major Projects

Regulation of platelet GPIb and integrin mechanobiology by intracellular binding partners (Dr. C. Zhu) 2022–

B cell receptor isotypes exhibit differential mechanosensitivity, directed by their intracellular tails (Dr. C. Zhu) 2024–

Evaluating the effects of CD8/CD4 on T cell function in terms of TCR–pMHC–coreceptor catch and slip bonds (Dr. C. Zhu) 2024–

B.Sc. Thesis: Design and fabrication of a novel microfluidic PCR device (Dr. A. Shamloo) 2020–2021

Real-time droplet-based PCR device equipped with fluorescent detection system (Dr. A. Shamloo) 2020–2021

Molecular dynamics simulation to investigate adsorption properties of CMC by varying the degree of substitution using Materials Studio (Dr. A. Shamloo) 2020–2021

Teaching

Cellular Engineering (Dr. Zhu) – Teaching Assistant (Fall 2022) 2022

Fluid Mechanics I (Dr. Shamloo) – Teaching Assistant (Spring 2018–2019 and Spring 2019–2020)
Numerical Computations (Dr. Nourani) – Teaching Assistant for MATLAB (Spring 2019–2020)
Fundamentals of Biological Engineering (Dr. Shamloo) – Teaching Assistant (Fall 2020–2021)

Selected Courses

PhD courses

Cellular Engineering – Dr. C. Zhu (grade: A)
Macromolecular Structure – Dr. L. Williams (grade: A)
Biotransport – Dr. D. Ku (grade: A)
Biosurfaces – Dr. R. Kane (grade: A)

MSc or advanced BSc courses (grades out of 20)

Fundamentals of Biological Engineering (grade: 18)
Micro and Nano Flows (grade: 19.5)
Interfacial Fluid Mechanics (grade: 20)
Applied Micro-Nano Technology (grade: 20)
Introduction to Computational Fluid Dynamics (grade: 20)
Regression Analysis (Introduction to Statistical Learning Methods) (grade: 20)

Skills

Experimental Skills

- Mammalian cell culture
- Platelet and B-cell isolation / phlebotomy-associated workflows
- Site-directed mutagenesis
- Cloning and subcloning
- Protein purification and analysis
- Confocal microscopy
- Single-molecule localization microscopy
- Flow cytometry
- Microfabrication techniques
- Microfluidic PCR
- RT-qPCR
- Microfluidic flow chamber
- Single-molecule force spectroscopy

Software and Programming – Advanced

- C++
- ImageJ
- SnapGene
- R
- MATLAB
- ANSYS Fluent
- COMSOL
- LaTeX
- SolidWorks
- Microsoft Office
- Arduino
- Avogadro
- LabVIEW
- Julia

Software and Programming – Intermediate

- LAMMPS
- NAMD
- VMD
- EES
- Tecplot 360
- RISA 3D
- Materials Studio
- Python
- Premiere
- Proteus

References

- **Dr. Cheng Zhu**
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  Georgia Tech
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- **Dr. Amir Shamloo**
  Full Professor
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- **Dr. David Ku**
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