

Ava Pardis Soleimany

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EDUCATION **Harvard University**, Cambridge, MA 2016–present
PhD Candidate, Biophysics Program

Massachusetts Institute of Technology (MIT), Cambridge, MA 2012–2016
Bachelor of Science, Computer Science and Molecular Biology
GPA: 5.0/5.0 **Concentration:** Education

EXPERIENCE **Laboratory for Multiscale Regenerative Technologies**, MIT April 2017–Present
Thesis research on engineering novel technologies for disease diagnosis and monitoring via multiplexed protease activity profiling both *in vivo* and *ex vivo*.

Laboratory for Multiscale Regenerative Technologies, MIT January 2017–April 2017
Rotation project studying magnetotactic bacteria and potential applications for living cancer therapy.

Molecular Systems Lab, Harvard Wyss Institute September 2016–December 2016
Rotation project on strategies for conditional genome editing.

Synthetic Biology Group, MIT RLE September 2013–June 2016
Synthetic recombinase-based state machines in living cells.

Seven Bridges Genomics June 2015–September 2015
Development of the Seven Bridge Cancer Genomics Cloud and extensions to the Seven Bridges API.

Wang Genomics Lab, Keck School of Medicine, USC May 2013–September 2013
Single cell transcriptomics.

ALEKS Corporation, Irvine, CA June 2011–August 2012
Creation of example problems for a new Pre-Algebra textbook written as a supplement to the ALEKS learning software.

Chubb-Wright Lab, University of California, Irvine February 2011–August 2011
Psychophysical representation of visual texture recognition.

PUBLICATIONS *Co-first authors.

[12] Mehta, N.K., Pradhan, R.V., **Soleimany, A.P.**, Moynihan, K.D., Rothschilds, A.M., Momin, N., Rakhra, K., Mata-Fink, J., Bhatia, S.N., Wittrup, K.D., Irvine, D.J. Pharmacokinetic tuning of protein–antigen fusions enhances the immunogenicity of T-cell vaccines. *Nature Biomedical Engineering*, 2020.

[11] **Soleimany, A.P.**, Bhatia, S.N. Activity-based diagnostics: an emerging paradigm for disease detection and monitoring. *Trends in Molecular Medicine*, 2020.

[10] Kirkpatrick, J.D.*, Warren, A.D.*, **Soleimany, A.P.***, Westcott, P.M.K., Voog, J.C., Martin-Alonso, C., Fleming, H.E., Tammela, T., Jacks, T., Bhatia, S.N. Urinary detection of lung cancer in mice via noninvasive pulmonary protease profiling. *Science Translational Medicine*, 2020.

[9] Schuerle, S., Furubayashi, M., **Soleimany, A.P.**, Gwisai, T., Huang, W., Voigt, C.A., Bhatia, S.N. Genetic encoding of targeted MRI contrast agents for tumor imaging. *ACS Synthetic Biology*, 2020.

[8] **Soleimany, A.P.**, Suresh, H., Gonzalez Ortiz, J. J., Shanmugam, D., Gural, N., Gutttag, J., Bhatia, S.N. Image segmentation of liver stage malaria infection with spatial uncertainty sampling. *arXiv*,

2019.

- [7] Amini, A., Schwarting, W., **Soleimany, A.**, Rus, D. Deep evidential regression. *arXiv*, 2019.
- [6] Loynachan, C.N.*, **Soleimany, A.P.***, Dudani, J.S., Lin, Y., Najer, A., Bekdemir, A., Chen, Q., Bhatia, S.N., Stevens, M.M. Renal clearable catalytic gold nanoclusters for *in vivo* disease monitoring. *Nature Nanotechnology*, 2019.
- [5] Amini, A.*, **Soleimany, A.***, Schwarting, W., Bhatia, S.N., Rus, D. Uncovering and mitigating algorithmic bias through learned latent structure. *AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society*, 2019.
- [4] Schuerle, S., **Soleimany, A.P.**, . . . , Bhatia, S.N. Synthetic and living micropropellers for convection-enhanced nanoparticle transport. *Science Advances*, 2019.
- [3] Chen, Y., et al. Single-cell digital lysates generated by phase-switch microfluidic device reveal transcriptome perturbation of cell cycle. *ACS Nano*, 2018. (11th out of 18 authors.)
- [2] Amini, A., **Soleimany, A.**, Karaman, S, Rus, D. Spatial uncertainty sampling for end-to-end control. *Neural Information Processing Systems Workshop on Bayesian Deep Learning*, 2017.
- [1] Roquet, N., **Soleimany, A.P.**, Ferris, A.C., Aaronson, S., Lu, T.K. Synthetic recombinase-based state machines in living cells. *Science*, 2016.

TEACHING

Lead Organizer and Lecturer, Introduction to Deep Learning (6.S191), MIT January 2018, January 2019, January 2020

Developed, organized, and taught MIT's official introductory course on deep learning methods and applications to a class of over 300 students.

Teaching Assistant, General Biochemistry (7.05), MIT Spring 2015, Spring 2016

Lectured on course material in a weekly recitation section of 25 students. Led review sessions open to the 200 students in the course, wrote problem sets, and facilitated and graded exams.

Visiting Teacher, Liceo Scientifico Nomentano, Rome, Italy January 2014

Taught physics, chemistry, and English to Italian high school students as a full time teacher.

Tutor, Biology Department, MIT September 2013–June 2016

Tutor, Chemistry Department, MIT Spring 2014

AWARDS

National Science Foundation Graduate Research Fellowship 2017

Henry Ford II Scholar Award, MIT 2016

To a senior engineering student who has maintained a cumulative average of 5.0 at the end of his/her seventh term and has exceptional potential for leadership.

AMITA Senior Academic Award, MIT 2016

To an outstanding senior woman who has demonstrated the highest level of academic excellence through her coursework and related professional activities at MIT.

Vikki Auzenne Memorial Women's Tennis Leadership Award, MIT 2016

To a member of the MIT varsity women's tennis team who best exemplifies the qualities of leadership through mentoring, advising, and counseling others, both on and off the court.

SuperUROP Outstanding Research Project Award, MIT 2015

MIT-EECS Wertheimer Undergraduate Research and Innovation Scholar 2014-2015

LEADERSHIP

MIT Varsity Women's Tennis, Captain 2014-2016 2012-2016

MIT Leadership Training Institute, Managing Director 2014-2016 2012-2016
Directed a service-focused leadership program for underserved high school students from the Boston area.

MIT Freshman Leadership Program, Counselor 2014-2016
Developed and counseled in annual pre-orientation program for MIT freshmen centered on personal empowerment, inclusivity and diversity, and leadership skill-building.

MIT Community Catalyst Leadership Program 2014-2016
Engaged in mentoring relationship with MIT alumnus.

SKILLS

Laboratory skills: experience with small animal pre-clinical models, including injections (intravenous, intraperitoneal, subcutaneous), blood collection, urine collection, necropsy, MR and intravital imaging; immunohistochemistry; cryosectioning; enzyme activity assays; nanoparticle synthesis and characterization; ICP-MS; Western blotting; ELISA; mammalian and bacterial cell culture; plasmid construction/cloning; PCR and qPCR; FACS

Programming and data analysis: Python; Java; MATLAB; Unix/BASH; R; deep learning including CNNs, RNNs; machine learning including SVM, KNN, decision trees, random forest; bioinformatics tools

Languages: English (native), Farsi (fluent)