

Stanford



Amalia Hadjitheodorou

Ph.D. Student in Bioengineering, admitted Autumn 2014

Bio

EDUCATION AND CERTIFICATIONS

- MSc, University Of Oxford , Biomedical Engineering (2014)
- Diploma, University Of Patras , Physics (2012)

STANFORD ADVISORS

- Russ Altman, Doctoral (Program)
- Robert Tibshirani, Doctoral Dissertation Reader (AC)
- Stephen Quake, Doctoral (Program)
- Manu Prakash, Doctoral Dissertation Reader (AC)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Neutrophils are the most abundant circulating leukocytes in humans, comprising the first line of innate immune defense. As neutrophils migrate towards sites of infection and inflammation they encounter a highly heterogeneous environment. Tasked to navigate through microscale obstacles, neutrophils often develop multiple competing fronts, raising the question of how the cell is able to select which front to maintain and which front(s) to abandon. To answer this question, I challenge chemotaxing HL-60 neutrophil-like cells with microfluidic devices containing obstacles and combine quantitative microscopy with sub-cellular optogenetics, statistical learning, and data science.

Publications

PUBLICATIONS

- **Directional reorientation of migrating neutrophils is limited by suppression of receptor input signaling at the cell rear through myosin II activity.** *Nature communications*
Hadjitheodorou, A., Bell, G. R., Ellett, F., Shastry, S., Irimia, D., Collins, S. R., Theriot, J. A.
2021; 12 (1): 6619
- **Quantitative comparison of principal component analysis and unsupervised deep learning using variational autoencoders for shape analysis of motile cells** *bioRxiv*
Chan, C. K., Hadjitheodorou, A., Tsai, T. Y., Theriot, J. A.
2020
- **Neutrophil-like HL-60 cells expressing only GFP-tagged β -actin exhibit nearly normal motility.** *Cytoskeleton (Hoboken, N.J.)*
Garner, R. M., Skariah, G. n., Hadjitheodorou, A. n., Belliveau, N. M., Savinov, A. n., Footer, M. J., Theriot, J. A.
2020

- **Efficient Front-Rear Coupling in Neutrophil Chemotaxis by Dynamic Myosin II Localization.** *Developmental cell*
Tsai, T. Y., Collins, S. R., Chan, C. K., Hadjitheodorou, A. n., Lam, P. Y., Lou, S. S., Yang, H. W., Jorgensen, J. n., Ellett, F. n., Irimia, D. n., Davidson, M. W., Fischer, R. S., Huttenlocher, et al
2019; 49 (2): 189–205.e6
- **Analytical and numerical study of diffusion-controlled drug release from composite spherical matrices** *MATERIALS SCIENCE & ENGINEERING C-MATERIALS FOR BIOLOGICAL APPLICATIONS*
Hadjitheodorou, A., Kalosakas, G.
2014; 42: 681-690
- **Quantifying diffusion-controlled drug release from spherical devices using Monte Carlo simulations** *MATERIALS SCIENCE & ENGINEERING C-MATERIALS FOR BIOLOGICAL APPLICATIONS*
Hadjitheodorou, A., Kalosakas, G.
2013; 33 (2): 763-768