ERAN AGMON, Ph.D.

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PROFESSIONAL APPOINTMENTS

University of Connecticut Health Center, Farmington, CT *2022–present*
Assistant Professor of Molecular Biology and Biophysics,
Center for Cell Analysis and Modeling,
Biomedical Engineering Department

Stanford University, Stanford, CA *2017–2022*
Postdoctoral Research Fellow, Department of Bioengineering
Funding: NIH F32 Fellowship

Columbia University, New York City, NY *2016–2017*
Postdoctoral Research Scientist, Department of Biological Sciences

EDUCATION

Indiana University, Bloomington, IN *2016*
Joint Ph.D., Informatics and Computing, and Cognitive Science
Funding: NSF Integrative Graduate Education and Research Traineeship (IGERT)

Portland State University, Portland, OR *2011*
M.Sc. in Systems Science

University of California, San Diego, San Diego, CA *2009*
B.S., Cognitive Science (minor in Biology)

PUBLICATIONS

1. Sauro, H. M., **Agmon, E.**, Blinov, M. L., Gennari, J. H., Hellerstein, J., Heydarabadipour, A., ... & Moraru, I. (2025). From FAIR to CURE: Guidelines for Computational Models of Biological Systems. *arXiv*.
2. Lyons, B., Mogre, S. S., Vegesna, K., Jessica, S. Y., Hansen, M., Raghunathan, A., ... & Akamatsu, M. (2025). Comparing simulations of actin filament compression reveals tradeoff between computational cost and capturing supertwist. *microPublication Biology*.
3. Smith, L. P., Malik-Sherif, R. S., Nguyen, T. V., Hermjakob, H., Karr, J., Shaikh, B., ... & Sauro, H. (2025). Using SED-ML for reproducible curation: Verifying BioModels across multiple simulation engines. *bioRxiv*.
4. Suhail, Y., Liu, Y., Du, W., Afzal, J., Qiu, X., Atiq, A., Vera-Licona, P., **Agmon, E.**, and Kshitiz. (2024). Oscillatory hypoxia induced gene expression predicts low survival in human breast cancer patients. *Molecular Carcinogenesis*.
5. **Agmon, E.** (preprint). Foundations of to a Compositional Systems Biology. *arXiv*.
6. Hickey, J.W., **Agmon, E.**, Horowitz, N., Tan, T.-K., Lamore, M., Sunwoo, J.B., Covert, M.W., and Nolan, G.P. (2024). Integrating multiplexed imaging and multiscale modeling identifies tumor phenotype conversion as a critical component of therapeutic T cell efficacy. *Cell Systems*.
7. Vegesna, K.R., Mogre, S.S., Yu, J., Lyons, B., Raghunathan, A., **Agmon, E.**, Akamatsu, M., and Johnson, G.T. (2024). Comparing spatial biophysical simulations across scales and methods. *Biophysical Journal*.
8. Hickey, J. W., Haist, M., Horowitz, N., Caraccio, C., Tan, Y., Rech, A. J., ... and Nolan, G. P. (2023). T cell-mediated curation and restructuring of tumor tissue coordinates an effective immune response. *Cell Reports*, 42(12).

9. Skalnik, C. J., Cheah, S. Y., Yang, M. Y., Wolff, M. B., Spangler, R. K., Talman, L., Morrison, J.H., Peirce, S.M., **Agmon, E.**, and Covert, M. W. (2023). Whole-cell modeling of E. coli colonies enables quantification of single-cell heterogeneity in antibiotic responses. *PLoS Computational Biology*, 19(6), e1011232.
10. Johnson, G. T., **Agmon, E.**, Akamatsu, M., Lundberg, E., Lyons, B., Ouyang, W., Quintero-Carmona, O. and Riel-Mehan, M., Rafelski, S., and Horwitz, R. (2023). Building the next generation of virtual cells to understand cellular biology. *Biophysical Journal*.
11. Shaikh, B., Smith, L. P., Vasilescu, D., Marupilla, G., Wilson, M., **Agmon, E.**, [...] and Karr, J. R. (2022). BioSimulators: a central registry of simulation engines and services for recommending specific tools. Nucleic Acids Research: https://doi.org/10.1093/nar/gkac331
12. **Agmon, E.**, Spangler, R.K., Skalnik, C.J., Poole, W., Morrison, J.H., Peirce, S.M., and Covert, M.W. (2022). Vivarium: an interface and engine for integrative multi-scale modeling in computational biology. *Bioinformatics*, 38(7), 1972-1979.
13. Covert, M.W., Gillies, T.E., Kudo, T., and **Agmon, E.** (2021). A forecast for large-scale, predictive biology: lessons from meteorology. *Cell Systems*, 12: 6.
14. **Agmon, E.**, and Spangler, R.K. (2020). A multi-scale approach to modeling *E. coli* chemotaxis. *Entropy*, 22: 1101.
15. Macklin, D.N., Ruggero, N.A., Carrera, J., Choi, H., Horst, T.A., Mason, J.C., Sun, G., **Agmon, E.**, DeFelice, M.M., Maayan, I., Lane, K., Spangler, R.K., Gillies, T.E., Paull, M.L., Akhter, S., Bray, S.R., Weaver, D.S., Keseler, I.M., Karp, P.D., Morrison, J.H., and Covert, M.W. (2020). Simultaneous cross-evaluation of heterogeneous *E. coli* datasets via mechanistic simulation. *Science*, 369, eaav3751.
16. Talman, L., **Agmon, E.**, Peirce, S.M., and Covert, M.W. (2019). Multiscale models of infection. *Current Opinion in Biomedical Engineering*, 11, 102-108.
17. **Agmon, E.**, Solon, J., Bassereau, P., and Stockwell, B.R. (2018). Modeling the effects of lipid peroxidation during ferroptosis on membrane properties. *Scientific Reports*, 8(1): 5155.
18. **Agmon, E.** and Stockwell, B.R. (2017). Lipid homeostasis and regulated cell death. *Current Opinion in Chemical Biology*. 39: 83-89.
19. **Agmon, E.**, Gates, A.J., and Beer, R.D. (2016). The structure of ontogenies in a model protocell. *Artificial Life* 22 (4): 499-517.
20. Taylor, T., Bedau, M. A., Channon, A., et al. (2016). Open-Ended Evolution: Perspectives from the OEE1 Workshop in York. *Artificial Life* 22 (3): 408-423.
21. **Agmon, E.**, Gates, A.J., Churavy, V. and Beer, R.D. (2016). Exploring the space of viable configurations in a model of metabolism-boundary co-construction. *Artificial Life*, 22 (2): 153-171.
22. **Agmon, E.**, & Beer, R. D. (2014). The evolution and analysis of action switching in embodied agents. *Adaptive Behavior*, 22(1), 3-20.
23. **Agmon, E.** (2014). Action Switching in Brain-Body-Environment Systems. In *Guided Self-Organization: Inception* (pp. 295-318). Springer Berlin Heidelberg.

GRANTS

NIH Complement-ARIE New Approach Methodologies	pending
Simulation of Immune and Biological Networks (SIMBION)	*PI*
NSF Science and Technology Center	Pending
Center for Chemical Currencies of a Microbial Planet Phase 2	*PI*
DARPA Simulating Microbial Systems	starting 2025
Modeling E. coli for biomanufacturing and antibiotic efficacy prediction	*PI, $1,500,000*
Environmental Molecular Science Laboratory (EMSL)	2025-present
Limited Scope Award: Workflow for an E. coli Whole-Cell Model	*PI, $10,000 "in kind"*
DARPA Discovering Unknome Functions	2024-present
An Integrated Discovery Workflow for an E. coli Whole-Cell Model	*PI, $248,266*
John Templeton Foundation	2024-present
A-Life Meets B-Life	*PI, $343,918*

NSF Science and Technology Center 2022-present
Center for Chemical Currencies of a Microbial Planet *Faculty Affiliate, $142,000*

NIH P41 2022-present
Center for Reproducible Biomedical Modeling *Co-I, $2,253,194*

NIH F32 Postdoctoral Fellowship 2020-2022
Adding an environment and motility in a whole-cell model of Escherichia coli

NSF IGERT Fellowship. *Brain-Body-Environment Systems in Behavior and Cognition.* 2011–2015

HONORS AND AWARDS

Inaugural Faculty Fellow, *NSF Center for Chemical Currencies of a Microbial Planet (C-CoMP)* 2023

Outstanding Dissertation Award, *Indiana University Cognitive Science.* 2017

Best Paper Award, *European Conference on Artificial Life.* 2015

1st Place Poster, *NSF IGERT Research Showcase.* 2015

Outstanding Teaching Award, *Indiana University Cognitive Science.* 2014

1st Place Poster, *NSF IGERT Research Showcase.* 2014

Supplemental Research Fellowship, *Cognitive Science Program.* 2014

OTHER AFFILIATIONS

NASA Ames Research Center Moffett Field, CA
Research Affiliate, Center for the Emergence of Life *2021*
• Collaborated on machine learning approaches to modeling RNA synthesis and selection at the origin of life.

Institute for Advanced Study Princeton, NJ
Visiting Scholar, Program in Interdisciplinary Studies *2016–2017*
• Co-founded YHouse, a research institute focused on artificial intelligence and the science of awareness.

Tokyo Institute of Technology Tokyo, Japan
Visitor, Earth-Life Science Institute Origins Network *2017*
• Worked with an interdisciplinary group of scientists to model molecular evolution at the origins of life.

TEACHING AND MENTORSHIP

University of Connecticut *2022–present*
Lab leader
• Many postdocs, grad students, undergraduates

Stanford University Bioengineering *2019–2022*
Research Mentor
• Mentored eight BS and PhD students in whole-cell modeling of *E. coli*.
• Organized meetings to teach systems biology concepts, review code, and establish collaborative practices.

SSRP-Amgen Scholars Program *2021*
Research Mentor
• This program provides training to undergraduate students who, by reason of their background would bring diversity to graduate study in the biomedical and biological sciences.

Build-A-Cell Chemical Reaction Network modeling tutorials *2020*
Co-instructor

Stanford International Genetically Engineered Machine (iGEM) competition *2019*
Mentor

Course: Autonomous Robotics 2014, 2016
Associate Instructor, Indiana University

Course: Brains & Minds, Robots & Computers 2013
Associate Instructor, Indiana University

SELECTED PRESENTATIONS

1. **Agmon E.** "Integrative, Multiscale Modeling of Cellular Systems." *DARPA Discovering Unknown Function (DUF) Workshop, 2023.*
2. **Agmon E.** "Process Bigraph Schema: A Framework for Integrative, Multiscale Modeling." *International Conference for Systems Biology, 2023.*
3. **Agmon E.** "Biosimulators-Vivarium." *SYBEL workshop: FAIR in Systems Biology, 2023.*
4. **Akamatsu M. & Agmon E.** "Modular multiscale simulations of endocytic actin networks using Vivarium." *Find Your Inner Modeler V, 2022.*
5. **Agmon E.** "Vivarium: an interface and engine for integrative multi-scale modeling." *COMBINE 2021.*
6. **Agmon E.** "Vivarium: an interface and engine for multi-scale modeling in computational biology." *Build-A-Cell workshop.* NIST, Gaithersburg, MD, 2020.
7. **Agmon E.** "Structural coupling of a Potts model cell." *14th European Conference on Artificial Life.* Lyon, France, 2017.
8. **Agmon E.** "Computational models of heterogeneous lipid membranes." *Frontiers in Computing Systems.* Columbia University, NY, 2017.
9. **Agmon E.** "Simulations of Ferroptosis." *p53 Multi-Group meeting.* Columbia University, NY, 2017.
10. **Agmon E.** "The biological foundations of enactivism." *Workshop on the Biological Foundations of Enactivism, at Artificial Life 16.* Cancun, Mexico, 2016.
11. **Agmon E.** "Whole-cell models and perturbation-based analysis." *Department of Biological Sciences.* Columbia University, NY, 2016.

SELECTED WORKSHOPS AND SEMINARS

DARPA Discovering Unknown Function (DUF). *Boston.* 2023

Build-A-Cell. *Stanford University.* 2022

Find Your Inner Modeler. *University of Illinois, Chicago.* 2022

COMBINE (virtual). 2021

Build-A-Cell. *California Institute of Technology.* 2022

Build-A-Cell (virtual). *Hosted by NIST.* 2020

Build-A-Cell. *NASA Ames, Mountain View, CA.* 2020

qBio. *San Francisco, CA.* 2019

Agency in the Physical Sciences, at Artificial Life 17. *Lyon, France.* 2017

Frontiers in Computing Systems. *Columbia University.* 2017

Expanding Views on the Emergence of the Biosphere: 5th ELSI International Symposium. 2017
Tokyo Institute of Technology, Tokyo, Japan.

The Biological Foundations of Enactivism, at Artificial Life 16. *Cancun, Mexico.* 2016

Re-conceptualizing the Origins of Life. *Carnegie Institution for Science, Washington D.C.* 2015

Self-organization in brain-body-environment systems. *University of Cincinnati.* 2015

Towards an Integrative Approach to the Study of Awareness. *Kobe University.* 2015

Causal Factors of Robustness and Plasticity in Living Systems. *Indiana University.* 2014

New England Complex Systems Institute. *Massachusetts Institute of Technology.* 2010

PROFESSIONAL SERVICE

Editorial Team *Frontiers in Systems Biology,* Multiscale Mechanistic Modeling. 2023

Reviewer. *PLoS Cmputational Biology.* 2022-present

Reviewer. *Bioinformatics.* 2022-present

Reviewer. *International Workshop on Bio-Design Automation (IWBDA).* 2022

Member. *Engineering Biology Research Consortium (EBRC).* 2022-present

Member. *Biomedical Engineering Society (BMES).* 2021-present

Reviewer. *IEEE International Conference on Bioinformatics & Biomedicine (BIBM).* 2019

Program committee. *International Conference on Complex Systems (ICCS).* 2018

Associate Editor. *Journal of Adaptive Behavior.* 2016-present

Program committee. *Conference on Complex Systems.* 2017

Organizer. *Workshop on Agency in the Physical Sciences, at the ECAL 17* 2017

Organizer. *The Biological Foundations of Enactivism, at Artificial Life 16* 2016

Program committee. *Conference on Artificial Life.* 2016–2020

Program committee. *Artificial Life 15: The Fifteenth International Conference on the Synthesis and Simulation of Living Systems.* 2016

Reviewer. *Artificial Life Journal* 2015–present

Organizer. *E-cog: weekly meeting on Embodied, Embedded, and Enactive approaches in Cog Sci* 2013–2015

Organizer. *Workshop on the Causal Factors of Robustness and Plasticity in Living Systems.* 2014