Omer Acar

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Education

2017–Present	**Joint Computational Biology Ph.D.**, *Carnegie Mellon University-University of Pittsburgh*, Pittsburgh, PA.
GPA:	3.84/4.0
2012-2017	**B.Sc., Materials Science and Engineering**, *Sabanci University, Istanbul*, Turkey.
Minor:	Physics
GPA:	3.6/4.0

Research Experience

2018–Present — **Carvunis Lab**, *University of Pittsburgh*, Pittsburgh, PA, Graduate Research Assistant.
Advisor: Dr. Anne-Ruxandra Carvunis
Projects:
- Developed simulation methods to analyze large yeast genetic interaction dataset using graph theory.
- Developed multiple sequence alignment analysis and clustering pipeline in R and Python to identify evolutionary changes in open reading frames.
- Used membrane molecular dynamics and structural prediction tools to understand the evolution of transmembrane domains in *de novo* genes.

2016 — **Computational Molecular Biology Lab**, *Freie Universität Berlin*, Berlin, Germany, Undergraduate Researcher.
Advisor: Dr. Christoph Wehmeyer
Developed algorithms for automated umbrella sampling simulations on Markov Chain Monte Carlo systems as part of summer internship project.

2013–2017 — **MIDSTLAB**, *Sabanci University, Istanbul*, Turkey, Undergradute Research Assistant.
Advisor: Dr. Canan Atilgan
Projects:
- Applied statistical physics and molecular dynamics to understand self-assembly of lipidoids to develop robust drug delivery systems.
- Used molecular dynamics, free energy perturbations, and steered molecular dynamics to study DHFR mutations causing antibiotic resistance in E.Coli.

Awards

Travel grants

2021 — University of Pittsburgh Biomedical Graduate Student Association (BGSA) Travel grant

Fellowships

2012–2017 — Sabanci University B.Sc. Merit Scholarship covering full tuition upon success in nationwide university entrance exam

Honors

2014-2017 Placed in Dean's High Honor list (7 semesters)

Work Experience

2015 **Tusas Engine Industries (TEI)**, Eskisehir, Turkey, Intern.
Developed Microsoft Excel macros to automate analysis of mechanical properties of alloys

Technical Experience

Extremely Proficient With

languages Python, R

technologies BioConductor, Tidyverse, BioPython, Scikit-Learn, Igraph, Networkx, LaTeX, Bash Scripting, Git, Vim, MS Office Products

Have Experience With

languages PHP, C++

technologies MySQL, RShiny, NAMD, Amber, PyMol, VMD, Adobe Illustrator

Publications

Journal Articles

[1] Nikolaos Vakirlis, **Omer Acar**, Brian Hsu, Nelson Castilho Coelho, S. Branden Van Oss, Aaron Wacholder, Kate Medetgul-Ernar, Ray W. Bowman, Cameron P. Hines, John Iannotta, Saurin Bipin Parikh, Aoife McLysaght, Carlos J. Camacho, Allyson F. O'Donnell, Trey Ideker, and Anne-Ruxandra Carvunis. De novo emergence of adaptive membrane proteins from thymine-rich genomic sequences. *Nature Communications*, 11(1):781, Feb. 2020.

[2] Haleh Abdizadeh, Yusuf Talha Tamer, **Omer Acar**, Erdal Toprak, Ali Rana Atilgan, and Canan Atilgan. Increased substrate affinity in the Escherichia coli L28R dihydrofolate reductase mutant causes trimethoprim resistance. *Physical Chemistry Chemical Physics*, 19(18):11416–11428, 2017.

Talks

2021 **Network Biology (Virtual)**, *Cold Spring Harbor Labs*, Cold Spring Harbor, NY, Detecting effector and sensor genes in genetic networks.

Posters

[1] **Omer Acar**, Aaron Wacholder, and Anne-Ruxandra Carvunis. Exploring the evolution of young gene function through genetic interaction networks. In *CSHL Network Biology Conference*, Cold Spring Harbor, NY, March 2019.

[2] **Omer Acar**, Aaron Wacholder, and Anne-Ruxandra Carvunis. Exploring de novo gene emergence through genetic interaction networks. In *Evolution in Philadelphia Conference, EPiC*, Philedelphia, PA, September 2019.

[3] **Omer Acar**, Aaron Wacholder, and Anne-Ruxandra Carvunis. Exploring de novo gene

emergence through genetic interaction networks. In *CMU-University of Pittsburgh Computational Biology Program Retreat*, Pittsburgh, PA, August 2019.