

Tal Danino, Ph.D.

Associate Professor of Biomedical Engineering, Columbia University

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EDUCATION

- Ph.D., Bioengineering, University of California, San Diego (2011)
- B.S., Physics, University of California, Los Angeles (2005)
- B.S., Mathematics, University of California, Los Angeles (2005)
- B.S., Chemistry, University of California, Los Angeles (2005)

POSITIONS

- Associate Professor (tenured), Department of Biomedical Engineering, Columbia University, 2023 - present
- Associate Professor (tenure-track), Department of Biomedical Engineering, Columbia University, 2020 - 2023
- Assistant Professor, Department of Biomedical Engineering, Columbia University, 2016 - 2020
- Member, Herbert Irving Comprehensive Cancer Center, Columbia University, 2016 - present
- Member, Data Science Institute, Columbia University, 2016 - present
- Postdoctoral Fellow, Koch Institute for Integrative Cancer Research, Massachusetts Institute of Technology, Dr. Sangeeta N. Bhatia, 2011-2015
- Ph.D student, Department of Bioengineering, University of California-San Diego, Dr. Jeff Hasty, 2005-2011

HONORS AND AWARDS

- 2020 Cancer Research Institute (CRI) Lloyd J. Old Scientist's Taking Risks (STAR) Award
- 2020 Pershing Square Sohn Prize for Young Investigators in Cancer Research
- 2019 NSF CAREER Award
- 2018 ALCF Young Innovators Team Awards (YITA)
- 2017 Breast Cancer Research Foundation-AACR Career Development Award
- 2017 Department of Defense Era of Hope Breast Cancer Scholar Award
- 2015 NIH Pathway to Independence Award (K99/R00)
- 2015 TED Fellow
- 2014 New England Biolabs Passion in Science Award
- 2012 NIH Ruth L. Kirschstein National Research Service Award (NRSA)
- 2011 Misrock Postdoctoral Fellowship
- 2006 Department of Energy Computational Science Graduate Fellowship (DoE CSGF)
- 2002 Arthur Beckman Undergraduate Research Scholar
- 2001 California Governor's Math and Science Scholar

PUBLICATIONS

* indicates corresponding senior author(s). ‡ equal contribution. Underline indicates Danino and lab members.

Manuscript Pre-prints, Submitted, and Under Review

3. Singer, Z.‡, Pabon, J.‡, Huang, H., Rice, C., Danino, T.* [Engineered bacteria launch and control an oncolytic virus. *bioRxiv* Submitted \(2023\)](#)
2. Redenti, A.‡, Im, J.‡, Redenti, B., Li, F., Rouanne, M., Sheng, Z., Sun, W., Gurbatri, C. R., Huang, S., Jang, Y., Hahn, J., Komaranchath, M., Ballister, E., Vincent, R. L., Vardoshivilli, A., Danino, T.*, Arpaia, N.* Probiotic neoantigen delivery vectors for precision cancer immunotherapy. Submitted (2023)
1. Gurbatri, C.‡, Radford, L.‡, Vrbanac, L., Chien, T., Taylor, S.R., Coker, C., Sivan, A., Im, J., Rhee, K., Saleh, A.A., Zandkarimi, F., Lia, I., Lannagan, T.R.M., Wang, T., Wright, J.A., Thomas, E., Kobayashi, H., Ng, J.Q., Lawrence, M., Sammour, T., Thomas, M., Lewis, m., Papanicolas, L., Perry, J., Fitzsimmons, T., Kaazan, P., Lim, A., Marker, J., Ostroff, C., Rogers, G., Arpaia, N., Worthley, D.L., Woods, S.L.*, Danino, T.* [Colorectal cancer screening and treatment with engineered probiotics. *bioRxiv* In revision \(2023\)](#)

Peer-Reviewed Publications

39. Vincent, R.‡, Gurbatri, C.‡, Redenti, A., Coker, C., Arpaia, N., Danino, T.* [Probiotic-guided CAR-T cells for universal solid tumor targeting. *Science* In press \(2023\)](#)
38. Hahn, J., Ding, S., Im, J., Harimoto, T., Leong, K. W., Danino, T.* Bacterial therapies at the interface of synthetic biology and nanomedicine. *Nature Reviews Bioengineering* In press (2023)
37. Doshi, A., Shaw, M., Tonea, R., Moon, S., Doshi, A., Laine, A., Guo, J., Danino, T. [Engineered bacterial swarm patterns as spatial records of environmental inputs. *Nature Chemical Biology* \(2023\) doi: 10.1038/s41589-023-01325-2](#)
36. Serebrinsky-Duek, K., Barra, M., Danino, T., Garrido, D. [Engineered bacteria for short-chain-fatty-acid-repressed expression of biotherapeutic molecules. *Microbiology Spectrum* 11:2 \(2023\)](#)
35. Savage, T., Vincent, R., Hanrahan, S., Huang, L., Ahn, A., Pu, K., Li, F., Coker, C., Danino, T., Arpaia, N. [Chemokines expressed by engineered bacteria recruit and orchestrate antitumor immunity. *Science Advances* 9:10 \(2023\)](#)
34. Deb, D., Wu, Y., Coker, C., Harimoto, T., Huang, R., Danino, T.* [Design of combination therapy for engineered bacterial therapeutics in non-small cell lung cancer. *Scientific Reports* 12:21551 \(2022\)](#)
33. Gurbatri, C., Arpaia, N., Danino, T.* [Engineering bacteria as interactive cancer therapies. *Science* 378\(6622\), 858-864 \(2022\)](#)
32. Harimoto, T.‡, Hahn, J.‡, Chen, Y., Im, J., Zhang, J., Hou, N., Coker, C., Gray, K., Harr, N., Chowdhury, S., Pu, K., Nimura, C., Arapaia, N., Leong, K.*, Danino, T.* [A programmable encapsulation system improves delivery of therapeutic bacteria in mice. *Nature Biotechnology* 40,1259–1269 \(2022\)](#)
31. Deb, D.‡, Zhu, S.‡, LeBlanc, M., Danino, T.* [Assessing chemotherapy dosing strategies in a spatial cell culture model. *Frontiers in Oncology* 24 \(2022\)](#)
30. Doshi, A.‡, Shaw, M.‡, Tonea, R., Minety, R., Moon, S., Laine, A., Guo, J.*, Danino, T.* [A deep learning pipeline for segmentation of *Proteus mirabilis* colony patterns. *IEEE 19th International Symposium on Biomedical Imaging \(ISBI\)* 1-5 \(2022\)](#)
29. Zhu, N.‡, Liu, C.‡, Singer, Z., Danino, T., Laine, A., Guo, J. [Segmentation with residual attention U-Net and an edge-enhancement approach preserves cell shape features. *IEEE Engineering in Medicine and Biology Society \(EMBC\)* \(2022\)](#)
28. Harimoto, T., Deb, D., Danino, T.* [A rapid screening platform to coculture bacteria within tumor spheroids. *Nature Protocols* \(2022\)](#)
27. Kobayashi, H., Gieniec, K.A., Lannagan, T.R.M., Wang, T., Asai, N., Mizutani, Y., Iida, T., Ando, R., Thomas, E.M., Sakai, A., Suzuki, N., Ichinose, M., Wright, J.A., Vrbanac, L., Ng, J.Q., Goyne, J., Radford, G., Lawrence, M.J., Sammour, T., Hayakawa, Y., Klebe, S., Shin, A.E., Asfaha, S., Bettington, M.L., Rieder, F.L., Arapaia, N., Danino, T., Butler, L.M., Burt, A.D., Leedham, S.J., Rustgi, A.K., Mukherjee, S., Takahashi, M., Wang, T.C., Enomoto, A., Woods, S.L., Worthley, D.L., [The origin and contribution of cancer-associated fibroblasts in colorectal carcinogenesis. *Gastroenterology* 162\(3\), 890-906 \(2021\)](#)

26. Chien, T.[‡], Harimoto, T.[‡], Kepecs, B., Gray, K., Coker, C., Pu, K., Azad, T., Nolasco, A., Pavlicova, M., Danino, T.* [Enhancing the tropism of bacteria via genetically programmed biosensors.](#) *Nature Biomedical Engineering* 6, 94-104 (2021)
25. Singer, Z., Ambrose, P., Danino, T.*, Rice, CM.* [Quantitative measurements of early alphaviral replication dynamics in single cells reveals the basis for superinfection exclusion.](#) *Cell Systems* 12(3), 210-219 (2021)
24. Chien, T., Jones, D.R., Danino, T.* [Engineered bacterial production of volatile methyl salicylate.](#) *ACS Synthetic Biology* 10(1), 204-208 (2020)
23. Gurbatri, C., Lia, I., Vincent, R., Coker, C., Castro, S., Treuting, P.M., Hinchliffe, T.H., Arpaia, N., Danino, T.* [Engineered probiotics for local tumor delivery of checkpoint blockade nanobodies.](#) *Science Translational Medicine* 12(530), eaax0876 (2020)
22. Barra, M., Danino, T., Garrido, D. [Engineered Probiotics for Detection and Treatment of Inflammatory Intestinal Diseases.](#) *Frontiers in Bioengineering and Biotechnology* 8, 265 (2020)
21. Harimoto, T., Singer, Z., Velazquez, O., Zhang, J., Castro, S., Hinchliffe, T., Mather, W., Danino, T.* [Rapid screening of engineered microbial therapies in a 3-D multicellular model.](#) *PNAS* 116(18), 9002-9007 (2019)
20. Chowdhury, S., Castro, S., Coker, C., Hinchliffe, T.E., Arpaia, N.*, Danino, T.* [Programmable bacteria induce durable tumor regression and systemic antitumor immunity.](#) *Nature Medicine* 25(7), 1057-1063 (2019)
19. Fedorec, A J.H., Ozdemir, T., Doshi, A., Rosa, L., Velazquez, O., Danino, T., Barnes, C P. [Two new plasmid post-segregational killing mechanisms for the implementation of synthetic gene networks in E. coli.](#) *iScience* 14, 323-334 (2019)
18. Harimoto, T., Danino, T.* [Engineering Bacteria For Cancer Therapy.](#) *Emerging Topics In Life Science* 3(5), 623-629 (2019)
17. Ozdemir, T., Fedorec, A J.H., Danino, T., Barnes, C P. [Synthetic Biology and Engineered Live Biotherapeutics: Toward Increasing System Complexity.](#) *Cell Systems* 7 (1), 5-16 (2018)
16. Chien, T.[‡], Doshi, A.[‡], Danino, T.* [Advances in bacterial cancer therapies using synthetic biology.](#) *Current Opinions in Systems Biology* 5,1-8 (2017)
15. Geller, L. T.[‡], Barzily-Rokni, M.[‡], Danino, T., Jonas, O.H., Shental, N., Nejman, D., Gavert, N., Zwang, Y., Cooper, Z., A., Shee, K., Thaiss, C., A., Reuben, A., Livny, J., Avraham, R., Frederick, D., T., Ligorio, M., Chatman, K., Johnston, S., E., Mosher, C., M., Brandis, A., Fuks, G., Gurbatri, C., Gopalakrishnan, V., Kim, M., Hurd, M., W., Katz, M., Fleming, J., Maitra, A., Smith, D., A., Skalak, M., Bu, J., Michaud, M., Trauger, S., A., Barshack, I., Golan, T., Sandbank, J., Flaherty, K., T., Mandinova, A., Garrett, W., S., Thayer, S., P., Ferrone, C., R., Huttenhower, C., Bhatia, S., N., Gevers, D., Wargo, J., A., Golub, T., R. Straussman, R. [Tumor-microbiome mediated resistance to gemcitabine.](#) *Science* 357 (6356), 1156-1160 (2017)
14. Moon, S.[‡], Fritz, I.[‡], Singer, Z.[‡], Danino, T.* [Spatial Control of Bacteria Using Screen Printing.](#) *3D Printing and Additive Manufacturing* 3(4), 194-203 (2016)
13. Din, M.[‡], Danino, T.[‡], Prindle, A., Allen, K., Skalak, M., Bhatia, S., Hasty, J. [Synchronized cycles of bacterial lysis for in vivo delivery.](#) *Nature* 536(7614), 81-85 (2016)
12. Luna, J., Scheel, T., Danino, T., Shaw, K., Takacs, C., Mele, A., Fak, J., Nishiuchi, E., Cantanese, M., Rice, C., Darnell, R. [Hepatitis C virus RNA functionally sequesters miR-122.](#) *Cell* 160(6), 1099-1110 (2015)
11. Danino, T.[‡], Prindle, A.[‡], Kwong, G., Skalak, M., Li, H., Allen, K., Hasty, J., and Bhatia, S. [Programmable probiotics for cancer detection in urine.](#) *Science Translational Medicine* 7, 289ra84 (2015)
10. Danino, T.* , Prindle, A.* , Hasty, J., and Bhatia, S. [Measuring growth and gene expression dynamics of tumor-targeted S. typhimurium bacteria.](#) *Journal of Visualized Experiments* 77, e50540 (2013)
9. Danino, T., Lo, J., Prindle, A., Hasty, J., and Bhatia, S. [In vivo gene expression dynamics from tumor-targeted bacteria.](#) *ACS Synthetic biology* 1(10), 465-470 (2012)
8. Prindle, A., Danino, T., Selimkhanov, J.S., Samayoa, P., Goldberg, A., Bhatia, S., and Hasty, J. [Genetic circuits in Salmonella typhimurium.](#) *ACS Synthetic biology* 1(10), 458-464 (2012)
7. Cookson, N.A., Mather, W.H., Danino, T., Mondragon-Palomino, O., Williams, R. J., Tsimring, L. S., and Hasty, J. [Queueing up for enzymatic processing: Correlated signaling through coupled degradation.](#) *Molecular Systems Biology* 7,561 (2011)
6. Prindle, A., Samayoa, P., Razinkov, I., Danino, T., Tsimring, L.S. and Hasty, J. [A sensing array of radically coupled genetic biopixels.](#) *Nature* 481, 39-44 (2011)

5. Mondragon-Palomino, O., [Danino, T.](#), Selimkhanov, J., Tsimring, L.S., and Hasty, J. [Entrainment of a population of synthetic genetic oscillators.](#) *Science* 333(6047), 1315-1319 (2011)
4. Boyer, D., Mather, W., Mondragon-Palomino, O., Orozco-Fuentes, S., [Danino, T.](#), Hasty, J., and Tsimring, L. S. [Buckling instability in ordered bacterial colonies.](#) *Physical Biology* 8, 026008 (2011)
3. [Danino, T.](#), Volfson, D., Bhatia, S., Tsimring, L., and Hasty, J. [In-silico pattern formation of vascular mesenchymal stem-cells in three-dimensions.](#) *PLoS ONE* 6(5), e20182 (2011)
2. Mather, W., Mondragon-Palomino, O., [Danino, T.](#), Hasty, J., and Tsimring, L.S. [Streaming instability in growing cell populations.](#) *Physical Review Letters* 104(20), 208101 (2010)
1. [Danino, T.](#)[‡], Mondragon-Palomino, O.[‡], Tsimring, L., and Hasty, J. [A synchronized quorum of genetic clocks.](#) *Nature* 463, 326-330 (2010)

Perspectives, News, Books, and Book Chapters

8. [Danino, T.](#) Beautiful Bacteria. *Rizzoli* [book] (2024)
7. [Redenti, A.](#), [Hahn, J.](#), [Danino, T.](#)* [Bacterial couriers as cancer vaccines.](#) *Nature Biomedical Engineering* 6, 3–5 (2022)
6. [Deb, D.](#), [Shoreibah, S.](#), [Danino, T.](#)* [Reimagining cancer research with art.](#) *Nature Reviews Cancer* (2022)
5. [Vincent, R.](#)[‡], [Danino, T.](#)* [CAR-T cells SEAK help from enzymes.](#) *Nature Chemical Biology* 18(1); 1-2 (2021)
4. [Schuerle, S.](#), [Danino, T.](#) [Bacteria as Living Microrobots to Fight Cancer.](#) *The Scientist* (2020)
3. [Ruskin, E.](#), [Danino, T.](#) Syndemic: Using game-based learning to engage students in the human microbiome. *Connecting Sustainability Research and Teaching: Discourses on Justice, Inclusion, and Authenticity* (2022)
2. [Danino, T.](#) Microuniverse. *Being Material* p. 20-30 (2019)
1. [Gurbatri, C.](#), [Harimoto, T.](#), [Danino, T.](#) Engineering bacterial therapeutics. *Active Matter* p. 70-82 (2017)

Patents

15. Intracellular delivery of therapeutic cargos and viral RNAs by engineered salmonella (Provisional)
14. Colorectal cancer screening, prevention, and treatment with engineered probiotics (Provisional)
13. Engineered bacteria as spatial records of environmental inputs (Provisional)
12. Programmable nanoencapsulation for delivery of probiotics (WO2022241107A1)
11. Probiotically-guided CAR-T cells (ProCARs) (WO2022178113A1)
10. Bacteria containing biosensors for precision targeting and containment (US20220265730A1)
9. Three-dimensional co-culture system for high-throughput testing of therapeutics and diagnostics (WO2020123015A1)
8. Programmable bacteria for the treatment of cancer (US20210308195A1)
7. Programmable drug delivery profiles of tumor-targeted bacteria (WO2014043593A3)
6. Compositions and methods for cancer diagnosis (WO2014146035A3)
5. Engineered bacteria for production and release of therapeutics (US20180148729A1)
4. Programmable bacterial tattoos (US20160339120)
3. Communication using programmable materials (US20170325737A1)
2. Cumulative biosensor system to detect alcohol (US20220386954A1)
1. Dynamic biological and chemical sensor interfaces (US20170071536A1)

Entrepreneurship

3. Co-founder, GenCirq (San Diego, CA). [GenCirq](#) uses synchronized lysis circuit (SLC) technology to effectively deliver bacterial therapeutics *in vivo*
2. Co-founder, LogicInk (San Francisco, CA). [LogicInk](#) develops wearable sensors through engineered biological systems
1. Scientific Advisory Board, Pulmobiotics (Barcelona, Spain). [Pulmobiotics](#) engineers *M. pneumoniae* for lung disease

TEACHING

- Instructor, Art of Engineering E1102: Department of Biomedical Engineering Project (2019-present)
- Instructor, Biomedical Engineering 4520: Introduction to Synthetic Biology, Design Principles of Genetic Circuits (2017-present)
- Instructor, Biomedical Engineering 6003: Computational Modeling of Physiological Systems (2017-present)
- Guest Instructor, Center for Theoretical Biological Physics Summer School (Rio de Janeiro, Brazil): Experimental and Mathematical models in Synthetic Biology (2017)
- Guest Instructor, Q-bio Summer School (San Diego, CA): Experimental methods in Synthetic Biology (2013)
- Teaching Assistant, Bioengineering 125, Computational Molecular Biology, UCSD (2008)

MENTORSHIP

- *Associate Research Scientists*: Jade Pereira de Andrade Peres (current), Zakary Singer (current), Ed Ballister (current), Dhruva Deb (current)
- *Postdoctoral Scientists*: Shu Zhu (2018), Zakary Singer (2021), Dhruva Deb (2021), Ed Ballister (2021), Bentley Shuster (2022), Ayelet Sivan (2022), Jaeseung Hahn (current), Candice Gurbatri (current)
- *Ph.D. Graduates*: Sreyan Chowdhury (CMBS, 2021), Tiffany Chien (BME, 2022), Candice Gurbatri (BME, 2022), Tetsuhiro Harimoto (BME, 2022), Anjali Doshi (BME, 2023), Amanda Decker (CMBS, 2023), Lior Kriendler (BME, current), Zeren Sheng (BME, current), Sophia Windemuth (BME, current), Linda Chen (BME, current), Andrew Redenti (CMBS, current), Marian Shaw (BME, current), Jonathan Pabon (CMBS, current), Jongwon Im (BME, current), Rosa Vincent (BME, current)
- *M.S. Graduates*: Gabe Reder (M.S. APAM 2016), Shikha Sharma (M.S. BME 2017), Yangfan Wu (M.S. BME 2020), Nicholas Hou (M.S. BME 2020), Michael le Blanc (M.S. BME 2021), Akshada Pradhan (M.S. BME 2022), Meghna Komaranchath (M.S. BME 2022), David Jang (M.S. BME 2022), Shunyu Huang (M.S. BME 2022), Zihan Wang (M.S. BME present), Jicheng You (M.S. BME present), Hannah Kim (M.S. BME present)
- *Undergraduates*: Andrew Vallejos, Edward Ko, Leigh West, Jil Berenblum, Phoenix Lai, Benjamin Kepecs, Soonhee Moon, Emma Ruskin, Ben Kepecs, Samuel Castro, Joanna Zhang, Marian Shaw, Ioana Lia, Kelly Pu, Kelsey Gray, Clare Nimura, Ruxandra Tonea, Stefani Shoreibah, Andoni Nolasco, Tamjeed Azad, Stan Liao, Nicole Harr, Emily Sieler, Tasfia Haque, Jiaqi Liu, Nathan Ocampo, Rosalia Minyety, Linnaea Kavulich, Hsinyen Huang, Eva Cruz, Steven Wang, Ayman Siam, Ijeoma Obi, Julian Michaud, William Sun, Mohammed Yusufali, Skylar Li, Lauren Goralsky, Rohin Patel, Mohammed Yusufali, Veni Dole, Kyle Murray, Kailyn Grant, Krishnaveni Dole, Stephanie Tarrab

SELECTED TALKS

- Genomics and Computational Systems Biology seminar series, Weill Cornell Medicine (2023)
- Bioengineering seminar series, Stanford University (2023)
- Center for Targeted Therapeutics and Translational Nanomedicine (CT3N), University of Pennsylvania (2022)
- UVA School of Medicine (Distinguished Guest Lecture), University of Virginia (2022)
- Tina's Wish Ovarian Cancer Summit, New York, NY (2022)
- Cornell University Microbiology Symposium (Keynote) (2022)
- HICCC 50th Anniversary Industry Workshop (2022)
- International Cancer Immunotherapy Conference (CICON) STARs Workshop (2022)
- NIH National Cancer Institute Microbial-based Cancer Theranostics (2022)
- Synthetic Biology: Engineering, Evolution and Design (SEED) Conference (Keynote) (2022)
- UK Microbiome Institute, London, UK (virtual) (2021)

- Synthetic Biology Young Speaker Series (SynBSS), St. Louis, MO (virtual) (2021)
- New York Genome Center Research Series, New York, NY (virtual) (2021)
- Infection and Cancer Workshop, Umea, Sweden (virtual) (2021)
- NIH Synthetic Biology Consortium Conference, Bethesda, MD (virtual) (2021)
- NIH Immuno-oncology Translational Network Series, Bethesda, MD (virtual) (2021)
- Cancer Research Center of Lyon (CRCL) Scientific Day, Lyon, France (virtual) (2021)
- Computational and Quantitative Biology Lecture Series, Univ. Federico II of Naples, Italy (virtual) (2021)
- Bioengineering Seminar Series, University of Maryland, MD (virtual) (2021)
- SEED, San Francisco, CA (2020) (cancelled)
- NIH The Cancer, Autoimmunity, and Immunology Conference, Bethesda, MD (2020)
- Memorial Sloan Kettering Cancer Center, Molecular Pharmacology, New York, NY (2020)
- University of California, Los Angeles, Bioengineering, Westwood, CA (2020)
- NIH/NCI Advanced Microbiome Therapeutics meeting, Bethesda, MD (2019)
- NIH/NCI SYNDICATE meeting, Bethesda, MD (2019)
- Simons Foundation Symposium, New York, NY (2018)
- NYU Department of Systems Biology and Genomics, New York, NY (2019)
- UC Merced NSF CREST Center (Keynote), Merced, CA (2018)
- Veterinary Seminar Series, University of Pennsylvania, PA (2018)
- Ideas Festival Aspen Institute, Abu Dhabi, UAE (2018)
- Being Material, MIT, Cambridge, MA (2017)
- Biotrans, University of Granrio, Rio de Janeiro, Brazil (2017, Keynote)

SELECTED MEDIA

- Can bioengineered bacteria make cancer treatments better? NIH/NIBIB Science Highlights [\[Link\]](#)
- Seek and destroy: beneficial bacteria programmed to fight cancer, BBC Science Focus [\[Link\]](#)
- Programmable bacteria as cancer therapy, Nature Medicine, News & Views [\[Link\]](#)
- New Weapons Against Cancer: Millions of Bacteria Programmed to Kill, New York Times [\[Link\]](#)
- Scientists Are Retooling Bacteria to Cure Disease, New York Times [\[Link\]](#)
- Programming bacteria to detect and treat cancer, TED talk (Vancouver, Canada) [\[Link\]](#)
- Synthetic biology: Bacteria synchronized for drug delivery, Nature News & Views on Din et al. Nature 2016 [\[Link\]](#)
- Synthetic Biology: Synchronized bacterial clocks, Nature commentary, Synthetic Systems Biology special feature [\[Link\]](#)
- Bacteria make waves, Nature produced Youtube video [\[Link\]](#)

FUNDING

Active Research Funding

11. **R01EB029750** (PI: Danino) *Engineering S. typhimurium for metastatic colorectal cancer.*
NIH/NIBIB [06/15/2020-09/30/2024] – Allocation to Danino: \$900,000 (amounts in direct costs)
10. **R01EB030352** (PI: Danino) *Probiotic guided CAR-T therapy (ProCARs) for breast cancer.*
NIH/NIBIB [09/15/2020-05/31/2024] – Allocation to Danino: \$1,741,503
9. **R01CA249160** (PI: Danino) *Modulation of the tumor microenvironment with probiotic therapies.*
NIH/NCI [4/03/2020-03/31/2025] – Allocation to Danino: \$1,130,000
8. **R01EB034302** (PI: Danino, Arpaia, Leong) *Programmable encapsulation systems to improve delivery of therapeutic bacteria.* NIH/ NIBIB [6/01/2023-5/30/2027] –Allocation to Danino: \$1,500,000
7. **R01AI161444** (PI: Rice, Danino) *Tracking SARS-CoV-2 one molecule at a time: Spatiotemporal investigation of coronavirus replication dynamics and host response in single cells.*
NIH/NIAID [02/11/2022–01/31/2027] – Allocation to Danino: \$320,730

6. **R01CA259634** (PI: Arpaia; Co-I: Danino) *Engineering E. coli Nissle 1917 to induce ROR γ t⁺ Tregs and prevent colon cancer.* NIH/NCI [05/01/2021–04/30/2026] – Allocation to Danino: \$500,000
5. **U01CA247573** (PI: Danino, Arpaia) *Engineering immunotherapeutic probiotics to mitigate irAEs.* NIH/NCI/NIAID [01/01/2020 -12/31/2024] – Allocation to Danino: \$750,000
4. **R21AI171819** (PI: Danino) *Engineering probiotics for tuberculosis therapy.* NIH/NIAID [09/01/2022–08/31/2024] – Allocation to Danino: \$275,000
3. **NSF1847356** (PI: Danino) *CAREER: Engineering Bacteria Swarming for Biotechnology.* NSF [03/01/2019–2/29/2024] – Allocation to Danino: \$356,214
2. **CRI3446** (PI: Danino) *Engineering probiotics as cancer immunotherapies.* Cancer Research Institute [08/01/2020–07/30/2025] – Allocation to Danino: \$1,250,000
1. **ARPA-H** (PI: Kwong, Qiu, Blazeck, Danino, Xue) *Mapping the cancer and organ degradome atlas (CODA) to unlock synthetic biomarkers for multi cancer early detection.* [10/01/2023–09/30/2028] – Allocation to Danino: \$6,865,607

Selected Completed Research Funding

6. **W81XWH-17-1-0356** (PI: Danino) *Programmable probiotics for primary and metastatic breast cancer.* DoD BRCP [07/15/2017–01/14/2023] – Allocation to Danino: \$2,469,595
5. **Young Innovators Team Award** (PI: Danino, Arpaia) *Engineered probiotics for precision lung cancer immunotherapy.* Bonnie J. Addario Lung Cancer Foundation [12/01/2018–11/30/2020] – Allocation to Danino: \$100,000
4. **ECCRF709591** (PI: Danino, Arpaia) *Engineered probiotics for precision lung cancer immunotherapy.* Emerson Collective Health Fund [12/01/2018–11/30/2020] – Allocation to Danino: \$100,000
3. **R01GM069811** (PI: Hasty, Tsimring, Danino) *Engineered gene circuits for basic science and biotechnology.* NIH/NIGMS [10/01/2016–07/31/2020] – Allocation to Danino: \$450,000
2. **W81XWH-17-1-0395** (PI: Danino) *Programmable probiotics for early detection of lung cancer.* DoD [07/01/2017–06/31/2019] – Allocation to Danino: \$270,000
1. **R00CA197649** (PI: Danino) *Programmable probiotics for cancer.* NIH/NCI [07/01/2017–06/30/2019] – Allocation to Danino: \$750,000

Last updated: October 5, 2023