Arthur Prindle

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Education & Training

2014 – 2017	Postdoctoral Fellow, University of California, San Diego, CA
2009 – 2014	PhD, Bioengineering, University of California, San Diego, CA
2005 – 2009	BS, Chemical Engineering, California Institute of Technology, Pasadena, CA

Professional Appointments

2023 – present	Assistant Professor (by courtesy), Department of Microbiology-Immunology Feinberg School of Medicine, Northwestern University, Chicago, IL
2020 – present	Assistant Professor, Department of Chemical and Biological Engineering Northwestern University, Evanston, IL
2019 – present	Assistant Professor (by courtesy), Department of Biomedical Engineering Northwestern University, Evanston, IL
2017 – present	Assistant Professor, Department of Biochemistry and Molecular Genetics Feinberg School of Medicine, Northwestern University, Chicago, IL

Institutional Service

2021 – present	Teaching – ChE 323 (Undergraduate Mass Transfer)
2021 – 2023	Microbiology-Immunology Faculty Search Committee
2020 – present	Center for Synthetic Biology (CSB) NRT Recruitment/Retention Committee
2020 – 2022	Cell & Developmental Biology Faculty Search Committee
2019 – present	DGP Admissions Committee
2019 – present	MSTP Admissions Committee
2019 – 2023	LSAC Advisory Committee (ad hoc)
2018 – present	Teaching – IGP 442 (Graduate Microbiology)

Active Grant Support

2023 – 2028	National Science Foundation, “CAREER: Uncovering new rules of multicellular life using synthetic microbial communities”, NSF 2239567 (PI), $76,184 annual direct support
2022 – 2027	National Institutes of Health, “Emergent metabolic coordination and cell-to-cell signaling in bacterial biofilms”, 1R35GM147170-01 (PI), $250,000 annual direct support
2021 – 2026	Army Research Office, “Deciphering the role of endogenous neurotransmitters in bacterial biofilms”, W911NF-21-1-0291 (PI), $138,800 annual direct support
2019 – 2025	The Pew Charitable Trusts, “Deciphering electrochemical mechanisms of undomesticated biofilm dispersal”, Contract ID 00033063 (PI), $75,000 annual direct support
2018 – 2026	David and Lucile Packard Foundation, “Translating an ancient bioelectric language for synthetic biology”, Contract ID: 2018-68055 (PI), $157,500 annual direct support

Completed Grant Support

2019 – 2022	Army Research Office, Young Investigator Program (YIP) Award
2016 – 2021	Burroughs Wellcome Fund, Career Award at the Scientific Interface (CASI) Fellowship
2014 – 2017	Helen Hay Whitney Foundation, Simons Foundation Fellowship
2010 – 2013	Army Research Office, National Defense Science and Engineering Graduate (NDSEG) Fellowship

Awards & Honors

2022	Eisenberg Foundation Research Scholar Award
2021	Early Career Award for Scientists and Engineers (ECASE-Army)
2019	Hippocratic Cancer Research Foundation Scholar Award
2019	Pew Biomedical Scholar
2018	David and Lucile Packard Fellowship for Science and Engineering
2018	H Foundation Intra-Programmatic Synergy Award
2018	Defense Advanced Research Projects Agency (DARPA) Riser, DARPA
2014	Damon Runyon Cancer Research Foundation Postdoctoral Fellowship (declined)

Conference Talks & Department Seminars (International)

03/2023	Pew Scholars Meeting, San Juan, Puerto Rico
05/2020	Centre for Genomic Regulation, Universitat Pompeu Fabra, Barcelona, Spain (COVID postponed)
03/2019	International Workshop on Electrical Cell Biology, University of Warwick, Coventry, UK
07/2013	SB6.0: The Sixth International Meeting on Synthetic Biology, Imperial College, London, UK

Conference Talks & Department Seminars (National)

05/2024	University of Chicago, Department of Molecular Genetics & Cell Biology, Chicago, IL
03/2024	University of Illinois Chicago, Center for Biomolecular Sciences, Chicago, IL
10/2023	Michigan State University, Department of Biomedical Engineering, East Lansing, MI
09/2023	The University of North Carolina at Chapel Hill, Department of Microbiology, Chapel Hill, NC
09/2023	Packard Fellows Meeting, Colorado Springs, CO
08/2023	Living Sensor/Actuator Workshop, Rice University, Houston, TX
06/2023	Synthetic Biology: Engineering, Evolution & Design, Los Angeles, CA
04/2023	Illinois Microbial Early-career Researchers Association, Keynote, Champaign, IL
01/2023	Bacterial Locomotion & Signal Transduction (BLAST) Meeting, Session Chair, Charleston, SC
11/2022	Hartwell Foundation
10/2022	Midwest Microbial Pathogenesis Conference (MMPC), Madison, WI
09/2022	Packard Fellows Meeting, Monterey, CA
09/2022	US Frontiers of Engineering Workshop (FOE), National Academy of Engineering (NAE), Seattle, WA
04/2022	Illinois Institute of Technology, Department of Biological Sciences, Chicago, IL
03/2022	Pew Scholars Meeting, Newport Coast, CA
09/2021	Packard Fellows Meeting
08/2021	NSF SemiSynBio Workshop
03/2021	Pew Scholars Meeting
10/2020	Life Sciences Meeting on Innovations in Bioscience Sensing and Signaling, Army Research Office
09/2020	Packard Fellows Meeting
08/2020	Workshop on Biological Control Mechanisms, Group Lead, Army Research Office
03/2020	Pew Scholars Meeting (COVID postponed)
11/2019	Simpson Querrey Center for Epigenetics International Symposium, Chicago, IL
09/2019	Packard Fellows Meeting, Monterey, CA

06/2019 Synthetic Biology: Engineering, Evolution & Design, New York, NY
05/2019 Exploring Frontiers: Nature's Blueprint, The Allen Institute, Seattle, WA
04/2019 NSF STC Workshop, Rice University, Houston, TX
11/2018 NSF-Simons Conference on Quantitative Approaches in Biology, Evanston, IL
10/2018 Hartwell Foundation, Charlotte, NC
09/2018 DARPA RISER at D60: DARPA's 60th Anniversary Symposium, Washington, D.C.
11/2017 Simons Foundation-HHWF Fellows Meeting, Dedham, MA
02/2017 UIUC, Bioengineering Dept, Urbana, IL
01/2017 Yale University, MCDB Dept, New Haven, CT
12/2016 Rice University, Bioengineering Dept, Houston, TX
11/2016 Caltech, Bioengineering Dept, Pasadena, CA
01/2016 UC Irvine, Biomedical Engineering Dept, Irvine, CA
01/2016 Populations, Evolution & Physics, Aspen Center for Physics, CO
10/2015 7th ASM Conference on Biofilms, Chicago, IL
07/2014 Synthetic Biology: Engineering, Evolution & Design, Manhattan Beach, CA
02/2014 The Second Annual Winter q-bio Meeting, Waikoloa Village, HI
02/2013 The First Annual Winter q-bio Meeting, Waikiki, HI

Conference Talks & Department Seminars (Local)

09/2023 Northwestern University, Biochemistry, Epigenetics, and Metabolism (BEaM) Forum, Chicago, IL
12/2022 Northwestern University, Center for Synthetic Biology Research Day, Chicago, IL
01/2022 Northwestern University, Biochemistry and Molecular Genetics Dept, Chicago, IL
05/2021 Northwestern University, Biomedical Engineering Dept, Chicago, IL
08/2020 Northwestern University, Center for Synthetic Biology Retreat (virtual)
03/2019 Northwestern University, Civil and Environmental Engineering Dept, Evanston, IL
12/2018 Northwestern University, Murphy Scholars Meeting, Evanston, IL
10/2018 Northwestern University, McCormick Advisory Council Meeting, Evanston, IL
04/2018 Northwestern University, Biochemistry and Molecular Genetics Dept, Chicago, IL
02/2018 Northwestern University, Quantitative Biology Networking Lunch, Evanston, IL
02/2018 Northwestern University, Biochemistry and Molecular Genetics Dept, Chicago, IL
11/2017 Northwestern University, GeneMods Synthetic Biology Group, Evanston, IL
09/2017 Northwestern University, Chemical and Biological Engineering Dept, Evanston, IL
04/2017 Northwestern University, Biomedical Engineering Dept, Evanston, IL
03/2017 Northwestern University, Biochemistry and Molecular Genetics Dept, Chicago, IL

Reviewing & Study Section Participation

07/2023 UK Research & Innovation (UKRI) Biotechnology & Biological Sciences Research Council (BBSRC)
06/2022 NSF SemiSynBio-III Review Panel
10/2021 Israel's Ministry of Science and Technology (MOST) Program: Synthetic Biology
05/2020 NSF SemiSynBio-II Review Panel
01/2020 Genome Canada's Genomic Applications Partnership Program (GAPP)
10/2017 – present Ad hoc reviewer for *Nature Biotechnology*, *Nature Microbiology*, *Nature Chemical Biology*, *Nature Communications*, *Proceedings of the National Academy of Sciences*, *Science Advances*, *Cell Systems*, *Molecular Systems Biology*, *ACS Synthetic Biology*, *eLife*, *Journal of Biological Engineering*, *Biotechnology Advances*, *mBio*, *Frontiers in Microbiology*

Publications as Senior Author

31. Kennelly C, Tran P, **Prindle A**. Extracellular purines decrease *Pseudomonas aeruginosa* biofilm formation by disrupting c-di-GMP metabolism. *Nature Communications* (in preparation).

30. Quillin S, Gavagan A, **Prindle A**, Seifert H. A new digital droplet PCR-based method to detect 3C1 variant antigenic variation frequency in *Neisseria gonorrhoeae*. *Nucleic Acids Research* (in preparation).
29. Karim A, Brown D, Archuleta C, Grannan S, Aristilde L, Goyal Y, Leonard J, Mangan N, **Prindle A**, Rocklin G, Tyo K, Zoloth L, Jewett M, Calkins S, Kamat N, Tullman-Ercek D, Lucks J. Deconstructing synthetic biology: a conceptual approach for training synthetic biologists. *Nature Communications* (in revision).
28. Gu A, Tran P, **Prindle A**, Kamat N, Steinkühler, J. Remodeling of lipid-foam prototissues by network-wide tension fluctuations induced by active particles. *Nature Communications* (in revision).
27. Tran P, Lander S, **Prindle A**. Active pH regulation facilitates biofilm development in minimally buffered environments. *Proceedings of the National Academy of Sciences* (in revision).
26. Xia J, Hepler C, Tran P, Waldeck N, Bass J, **Prindle A**. Engineered calprotectin sensing probiotics for IBD surveillance in humans. *Proceedings of the National Academy of Sciences* (2023).
25. Everett B, Tran P, **Prindle A**. Toward manipulating serotonin signaling via the microbiota-gut-brain axis. *Current Opinion in Biotechnology* (2022).
24. Boyd M, Davis A, Chamber N, Tran P, **Prindle A**, Kamat N. Vesicle-based sensors for extracellular potassium detection. *Cellular and Molecular Bioengineering* (2021).
23. Quillin S, Tran P, **Prindle A**. Potential roles for gamma-Aminobutyric acid (GABA) signaling in bacterial communities. *Bioelectricity* (2021).
22. Tran P, **Prindle A**. Synthetic biology in biofilms: Tools, challenges, and opportunities. *Biotechnology Progress* (2021).
21. Ford N, Fisher G, **Prindle A***, Chopp D* **(*co-corresponding authors)**. A two-dimensional model of potassium signaling and oscillatory growth in a biofilm. *Bulletin of Mathematical Biology* (2021).
20. Schofield Z, Meloni GN, Tran P, Zerfass C, Sena G, Hayashi Y, Grant M, Contera SA, Minteer SD, Kim M, **Prindle A**, Rocha P, Djamgoz MBA, Pilizota T, Unwin PR, Asally M, Soyer OS. Bioelectrical understanding and engineering of cell biology. *Journal of the Royal Society Interface* (2020).
19. Yang CY, Bialecka-Fornal M, Weatherwax C, Larkin J, **Prindle A**, Liu J, Garcia-Ojalvo J, Süel G. Encoding spatial memory within a bacterial biofilm community. *Cell Systems* (2020).
18. Martinez-Corral R, Liu J, **Prindle A**, Süel G, Garcia-Ojalvo J. Metabolic basis of brain-like electrical signaling in bacterial communities. *Philosophical Transactions B* (2019).
17. Larkin J, Zhai X, Kikuchi K, Redford S, **Prindle A**, Liu J, Greenfield S, Walczak A, Garcia-Ojalvo J, Mugler A, Süel G. Signal percolation within a bacterial community. *Cell Systems* (2018).

Publications as Trainee

16. Lee D, **Prindle A**, Liu J, Süel G. Electrochemical communication in biofilms. *Cell* (2017).
15. Liu J, Martinez-Corral R, **Prindle A**, Lee D, Larkin J, Gabalda-Sagarra M, Garcia-Ojalvo J, Süel G. Coupling between distant biofilms and emergence of nutrient time-sharing. *Science* (2017).
14. Humphries, J, Xiong L, Liu J, **Prindle A**, Yuan F, Arjes HA, Tsimring L, Süel G. Species-independent attraction to biofilms through electrical signals. *Cell* (2017).
13. Din MO, Danino T, **Prindle A**, Skalak M, Selimkhanov J, Allen K, Julio E, Atolia E, Tsimring L, Bhatia SN, Hasty J. Synchronized cycles of bacterial lysis for in vivo delivery. *Nature* (2016).
12. **Prindle A**, Liu J, Asally M, Ly S, Garcia-Ojalvo J, Süel G. Ion channels enable electrical communication in bacterial communities. *Nature* (2015).
11. Liu J, **Prindle A**, Humphries J, Gabalda-Sagarra M, Asally M, Lee D, Ly S, Garcia-Ojalvo J, Süel G. Metabolic co-dependence gives rise to collective oscillations within biofilms. *Nature* (2015).
10. Danino T, **Prindle A**, Kwong G, Skalak M, Li H, Allen K, Hasty J, Bhatia SN. Programmable probiotics for detection of cancer in urine. *Science Translational Medicine* (2015).
9. **Prindle A**, Selimkhanov J, Li H, Razinkov I, Tsimring L, Hasty J. Rapid and tunable post-translational coupling of genetic circuits. *Nature* (2014).
8. Danino T, **Prindle A**, Hasty J, Bhatia SN. Measuring growth and gene expression dynamics of tumor-targeted S.

typhimurium bacteria. *Journal of Visualized Experiments* (2013).
7. **Prindle A**. Synthetic biology at all scales. *Trends in Biotechnology* (2013).
6. **Prindle A**, Stanton B. The First Annual Winter q-bio Meeting: Quantitative biology on the Hawaiian Islands. *ACS Synthetic Biology* (2013).
5. **Prindle A**, Hasty J. Making gene circuits sing. *Proceedings of the National Academy of Sciences* (2012).
4. **Prindle A**, Selimkhanov J, Danino T, Samayoa P, Goldberg A, Bhatia SN, Hasty J. Genetic circuits in Salmonella typhimurium. *ACS Synthetic Biology* (2012).
3. Danino T, Lo J, **Prindle A**, Hasty J, Bhatia SN. In vivo gene expression dynamics of tumor-targeted bacteria. *ACS Synthetic Biology* (2012).
2. **Prindle A**, Samayoa P, Razinkov I, Danino T, Tsimring L, Hasty J. A sensing array of radically coupled genetic 'biopixels'. *Nature* (2012).
1. **Prindle A**, Hasty J. Stochastic emergence of groupthink. *Science* (2010).