

Aaron J. Dy

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EDUCATION

Massachusetts Institute of Technology, Cambridge MA 2014-Present

PhD in Biological Engineering

- Thesis committee: James J. Collins (Advisor), Domitilla Del Vecchio (Advisor), Mark Bathe (Chair), & Sangeeta Bhatia

Indiana University, Bloomington IN 2010-2014

B.S. in Physics (applied physics track)

- Advisor: James A. Glazier
- Thesis title: Developing A Novel Microcavity Surface Plasmon Resonance (MSPR) Sensor Instrument for Optical Protein Detection and Potential Single-Cell Studies

RESEARCH INTERESTS

Deployable synthetic biology: cell-free systems and engineering generally considered safe organisms can allow for broader impact of genetic circuits for human health.

Biosensors for global health: expanding the available inputs for synthetic gene circuits to include arbitrary nucleic acid sequences and protein activity will allow for detection of key disease biomarkers.

Efficient design for synthetic biology: modeling informed design can help avoid biochemically wasteful designs that can cause loss of function and prevent assembly of larger and more complex systems.

PUBLICATIONS

* denotes equal authorship

5. E. Yeung, **A. J. Dy**, K. B. Martin, A. H. Ng, D. Del Vecchio, J. L. Beck, J. J. Collins, and R. M. Murray. "The Effect of Compositional Context on Synthetic Gene Networks." *Cell Systems* (2017) [*in press*]
4. J. S. Gootenberg*, O. O. Abudayyeh*, J. W. Lee, P. Essletzbichler, **A. J. Dy**, J. Joung, V. Verdine, N. Donghia, N. M. Daringer, C. A. Freije, C. Myhrvold, R. P. Bhattacharyya, J. Livny, A. Regev, E. V. Koonin, D. T. Hung, P. C. Sabeti, J. J. Collins, and F. Zhang. "Nucleic acid detection with CRISPR-Cas13a/C2c2." *Science* 356.6336 (2017) 438-442.
3. D. Del Vecchio, **A. J. Dy**, and Y. Qian. "Control theory meets synthetic biology." *Journal of The Royal Society Interface* 13.120 (2016): 20160380. [*review*]
2. **A. J. Dy**, and J. J. Collins. "Engineering Models to Scale." *Cell* 165.3 (2016): 516-517. [*preview*]
1. **A. J. Dy**, A. Cosmanescu, J. Sluka, J. A. Glazier, D. Stupack, D. Amarie. "Fabricating microfluidic valve master molds in SU-8 photoresist." *Journal of Micromechanics and Microengineering* 24.5

(2014): 057001.

AWARDS

Distinguished Alumni Award (2015) - Indiana 21st Century Scholars Program
NSF Graduate Fellowship (2015-2020) - National Science Foundation
Phi Beta Kappa (2014) - Indiana University
Herman B Wells Scholarship (full ride merit scholarship) (2013) - Indiana University
Malcolm A. Kochert Scholarship (2013) - Indiana University College of Arts and Sciences
Brown Memorial Scholarship (2013) - Indiana University Department of Physics
Della J. Evans Scholarship (2010-2014) - Indiana University Hutton Honors College

TEACHING

Communication Fellow - MIT BE Communication Lab Spring 2016 - Present
Coaching students and staff to improve scientific communication.

Undergraduate Instructor (UGI) - IU Math Dept. Spring 2013, Spring 2014
Tutor in the Math Learning Center
MATH V118 "Finite Mathematics with Applications"

Undergraduate Teaching Assistant (UTA) - IU Biology Dept. Spring 2014
BIOL L112 "Foundations of Biology: Biological Mechanisms"

Graduate Teaching Assistant (TA) - MIT Biological Engineering Dept. Spring 2016
20.380 "Biological Engineering Design"

SCIENTIFIC OUTREACH

Community Editor for PLOS Synbio Community Blog March 2016 - Present
Building with Biology event volunteer
MIT Engineering STEM Mentor

POSTER PRESENTATIONS

A. J. Dy, D. Del Vecchio, and J. J. Collins. Rapid detection of HPV genotypes using cell-free circuits *MIT Synthetic Biology Center (SBC) Symposium*, Cambridge, MA (2017)

A. J. Dy, J. J. Collins, and D. Del Vecchio. Biophysical Limits of Control Implementations in Synthetic Gene Networks *Synthetic Biology: Engineering, Evolution & Design (SEED)*, Chicago, IL (2016)

A. J. Dy, D. Amarie, A. Cosmanescu, J. Clendenon, Dwayne Stupack and J. A. Glazier. Optical Detection of Biomolecules for Single-Cell Applications *NSF IDBR: Workshop on Successful Approaches for Development and Dissemination of Instrumentation for Biological Research* (2014)

A. J. Dy, R. Erickson, and R. Jimenez. Fabrication of a 3D Microflow Cytometer *Biomedical Engineering Society (BMES) Annual Meeting*, Seattle, WA. (2013)

A. J. Dy, K. Shahnazi, and S. B. Klein. Extracting a Neutron Dose using only TLDs (Thermoluminescent Dosimeters) *American Association of Physicists in Medicine Annual Meeting*, Indianapolis, IN (2013)