

Currently
Postdoc @ EMBL

Aaron Brooks/PhD

Genetics of complex adaptive (**synthetic**) biological systems

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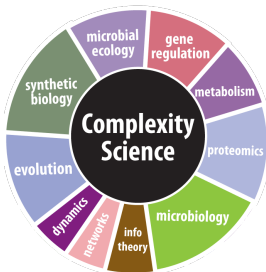
Web

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Research Interests



Publications

AN Brooks, AL Hughes, S Clauder-Munster, LM Steinmetz. **Extensive transcriptomic diversity induced by genome SCRaMbLEing.** *In preparation.*

AN Brooks, A Johansson, LM Steinmetz. **Scalable hybrid assembly of genomes with complex structural rearrangements using multiplexed Cas9-assisted targeted capture.** *In preparation.*

AN Brooks*, N. Paczia*, C. Zhu, M. Nguyen, C. Jann, P. Jung, CL Linster, LM Steinmetz. **Phased measurement of the yeast metabolome reveals widespread effects on amino acid metabolism originating from a single genetic locus .** *In preparation.*

SK Strauss, D Schirman, G Jona, **AN Brooks**, ..., Y Pilpel. (2019) **Evolthon: A Community Endeavor to Evolve Lab Evolution.** *PLoS Biol* 17(3): e3000182

AN Brooks, WF Mueller, LM Steinmetz (2016) **SYGNALing a Red Light for Glioblastoma.** *Cell Systems* 3 (2), 118-120

S Imam, S. Schaeuble, **AN Brooks**, NS Baliga, ND Price. (2015) **Data-driven integration of genome-scale regulatory and metabolic network models.** *Front. Microbiol.* 6:409

CL Plaisier, FY Lo, J Ashworth, **AN Brooks**, KD Beer, A Kaur, M Pan, DJ Reiss, FT Facciotti, NS Baliga. (2014) **Evolution of Context Dependent Regulation by Expansion of Feast/Famine Regulatory Proteins.** *BMC Systems Biology* 8(1):122.

H Westerhoff*, **AN Brooks***, E Simeonidis*, R Garcia-Contreras*, F Boogerd, F He, VJ Jackson, V Goncharuk, A Kolodkin. (2014) **Macromolecular networks and intelligence in microorganisms.** *Front. Microbiol.* 5:379.

AN Brooks*, DJ Reiss*, A Allard, W Wu, DM Salvanha, CL Plaisier, S Chandrasekaran, M Pan, A Kaur, NS Baliga. **A system-level model for the microbial regulatory genome.** *Mol Syst Biol.* (2014) 10: 740.

AN Brooks, S Turkarslan, KD Beer, FY Lo, NS Baliga. (2011) **Adaptation of cells to new environments.** *Wiley Interdiscip Rev Syst Biol Med.* 3(5): 544–561.

* Denotes equal contribution

Research

2015 - now **Postdoc**

EMBL | Genome Biology Unit

Project: "Molecular consequences of large-scale genetic variation in synthetic yeast."

Advisor: Prof. Lars Steinmetz, Professor of Genetics, Stanford University, Co-Director, Stanford Genome Technology Center, Group Leader and Senior Scientist, EMBL, Germany

Key skills developed: Long-read DNA/RNA sequencing, pipeline development, scalable computing, containerized computing, grantsmanship (1.4M received), project leadership and management

Wetlab Education

DNA/RNA Sequencing

2008 - 2014 **PhD Molecular and Cellular Biology** [University of Washington](#)
Dissertation: "Data-driven inference of dynamic transcriptional regulatory mechanisms in prokaryotes: a systems perspective."

Long read sequencing (Nanopore)

Advisor: Prof. Nitin Baliga, SVP and Director, Institute for Systems Biology
Key skills developed: Machine learning (ensemble learning), full-stack software development, scientific writing, scientific collaboration

Microbial culture

2002 - 2007 **BS Biochemistry & BA Political Science** [University of New Mexico](#)
Thesis: "Characterization of the dynamic interactions of cytoplasmic poly(A) binding protein with poly(A) RNA."

Thesis Honors: Robert B. Loftfield Award

Advisor: Prof. David G. Bear

Summa Cum Laude

General University Honors

Minor: Philosophy

Key skills developed: Basic laboratory skills

Computational

Common languages

(Python, R, Bash, HTML/JS)

Pipeline development (Snakemake)

Parallel environments (SLURM, SGE)

Containerization (Singularity, Docker)

Database management (SQL and NoSQL)

Web frameworks (Django, Shiny)

In the news

05/2014 **Knowing Networks** [NIH NIGMS Inside Life Science](#)
Outreach at USA Science and Engineering Festival

Awards

2016-2019 **EMBL Interdisciplinary Postdoctoral Fellowship (EIPOD)** [EU Marie Curie Actions](#)

2010-2013 **Office of Science Graduate Fellowship** [Department of Energy](#)

2007-2008 **Postbaccalaureate Research Education Program (PREP)** [NIH](#)

2006-2007 **Initiative for Maximizing Student Development (IMSD)** [NIH](#)

2006 **Goldwater Scholarship** [Barry M. Goldwater Foundation](#)

Teaching & Outreach

2019	Advanced Training with Oxford Nanopore Technologies <i>Speaker</i>	EMBL, Heidelberg
2018	Using Nanopore Technology for Real Time, Direct, Scalable DNA/RNA Sequencing <i>Speaker</i>	EMBL, Heidelberg
2015	Data Mining and Integration with Networks <i>Co-organizer, Speaker</i>	EMBL, Heidelberg
2014	USA Science and Engineering Festival <i>Designed and facilitated a hands-on activity and web-based game to understand the structure and function of networks. Over 300 students have played the online game.</i>	Washington, D.C
2011	Introduction to Systems Biology <i>Co-organizer, Speaker</i>	Institute for Systems Biology
2009-2015	Science Communication Fellow	Pacific Science Center, Seattle WA

Students mentored

2019	Ramya Vijayram	MS student at IIT Madras, India
2016-2017	Marc Rubsam	MS student at Heidelberg University, Germany
2016	Felix Frauhammer	PhD student at Heidelberg University, Germany
2012	Robin Green Currently at Fred Hutchinson Cancer Research Center	PhD student at University of Washington, WA
2011	Darach Miller Currently PhD student at NYU	Undergraduate at UC Davis, CA
2010	Alexis Valauri-Orton Currently Ocean Acidification Intern at Ocean Conservancy	Undergraduate at Davidson College, NC

Other

2011	Complex Systems Summer School	Santa Fe Institute
2010	MCB Student Symposium <i>Co-organizer, Bioplasticity: flexibility within and beyond the code</i>	Fred Hutchinson Cancer Research Center

References

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EMBL / Stanford

Institute for Systems Biology

University of Manchester

EMBL, Head of Genomics Core Facility

University of Washington