Gregory P. Way

Genomics · Machine Learning · Data Science

Smilow Center for Translational Research 3400 Civic Center Blvd, Philadelphia, PA 19104

(908) 938 9259 | gregory.way@gmail.com | https://gway-genomics.com | gwaygenomics | gregorypway | @gwaygenomics

"Improving human healthcare through genomics and machine learning"

Education

Perelman School of Medicine, University of Pennsylvania — *Philadelphia, PA*

Ph.D. Genomics and Computational Biology; Advisor: Casey Greene, Ph.D. — *Aug 2015 - Present*

- Building machine learning algorithms to interrogate gene expression data.
- Developing methods for improving cancer research using bulk tumor and single cell data.
- Collaborating as part of The Cancer Genome Atlas consortium.
- Training undergraduate and other staff on study design and implementation.

Geisel School of Medicine at Dartmouth — *Hanover, NH*

Ph.D. Quantitative Biomedial Science — *Aug 2014 - Aug 2015 (Transferred)*

- Transferred to Penn after 1 year when advisor moved.
- Completed coursework in bioinformatics, epidemiology, and biostatistics.
- Performed three research rotations studying cancer genomics and epidemiology.

Saint Joseph's University — *Philadelphia, PA*

M.S. Biology — *Aug 2012 - May 2014*

- HHMI Fellow, Alpha Epsilon Lambda Graduate Honor Society

The College of New Jersey — *Ewing, NJ*

B.S. Biology, Philosophy — *Aug 2007 - May 2011*

- Chairman of the Board Scholar, Edward J. Bloustein Scholar

Research Program

Using Deep Learning to Detect Gene Expression-Based Cellular States — *Philadelphia, PA*

University of Pennsylvania — *Dec 2016 - Present*

- Developing state-of-the-art deep learning models in the genomics domain.
- Building a generative adversarial net framework to identify stable cellular states
- Extending application for use with high-throughput FISH, RNAseq, and single cell RNAseq data.
- Identifying latent space of cellular activity to determine how aberrant genomic events and treatments shape tumor landscapes.

Machine Learning Classification of NF1 Status in Glioblastoma — *Philadelphia, PA*

University of Pennsylvania — *Aug 2015 - Jan 2017*

- Developed research strategy and computational pipeline.
- Trained logistic regression classifiers to detect when a brain tumor has inactivated NF1.
- Gained ability to detect "hidden responders" who may benefit from small molecule targetted treatment.
- Extending framework within The Cancer Genome Atlas consortium to detect other gene inactivation signatures.

High-Grade Serous Ovarian Cancer Subtypes — *Philadelphia, PA*

University of Pennsylvania — *Sept 2014 - Oct 2016*

- Developed research strategy and computational pipeline.
- Identified two robust subtypes that may inform treatments.
- Collaborated with UCLA and Mayo clinic to deposit 528 additional tumors to gene expression databases.
- Contributed several poster and oral presentations and publications.

Professional Experience

Project Cognoma — *Philadelphia, PA*

Co-Founder — *June 2016 - Present*

- Co-founded philanthropic working group in center city, Philadelphia - http://cognoma.org.
- Established purpose to put machine learning in the hands of cancer biologists.
- Facilitated initial research and development to provide the foundation of the web-app purpose.
- Provide support to new organization members and guide research questions and UI/UX decisions.

Morphotek Inc. *Exton, PA*

Research Scientist *May 2014 - July 2014*

- Performed a three month internship learning molecular biology research skills and study design.
- Conducted various cellular biotechniques including cell culture, cellular killing assays, and flow cytometry.
- Collaborated with Antibody Development Team to assess efficacy of antibodies in killing cancer cell lines.

Samzies Uniforms *Ewing, NJ*

Website Manager *Feb 2011 - Aug 2012*

- Managed sales and project development of a new online store specializing in police, fire, and EMT uniforms.
- Analyzed web traffic to develop more effective sales promotions and search engine optimization.
- Troubleshot all network, computer, and general technology problems.

Publications

2017 **Way, G.P.**, Allaway, R.J., Bouley, S.J., Fadul, C.E., Sanchez, Y., Greene, C.S. *A machine learning classifier trained on cancer transcriptomes detects NF1 inactivation signal in glioblastoma.* BMC Genomics. https://doi.org/0.1101/075382.

2017 **Way, G.P.**, Youngstrom, D.W., Hankenson, K.D., Greene, C.S., Grant, S.F.A. *Discovering candidate genes from GWAS signals using topologically associating domains* BioRxiv Preprint. https://doi.org/10.1101/087718.

2016 **Way, G.P.**, Rudd, J., Wang, C., Hamidi, H., Fidley, B.L., Konecny, G.E., Goode, E.L., Greene, C.S., Doherty, J.A. *Cross-population analysis of high-grade serous ovarian cancer reveals only two robust subtypes.* G3: Genes | Genomes | Genetics. https://doi.org/10.1534/g3.116.033514.

2016 **Way, G.P.**, Southwell, M., McRobert, S. *Boldness, aggression, and shoaling assays for zebrafish behavioral syndromes.* Journal of Visualized Experiments. https://doi.org/10.3791/54049.

2015 **Way, G.P** , Ruhl, N., Snekser, J., Kiesel, A., McRobert, S. *A comparison of methodologies to test aggression in zebrafish.* Zebrafish. https://doi.org/10.1089/zeb.2014.1025.

2015 Moss, S., Tittaferrante, S., **Way, G.P.**, Fuller, A., Sullivan, N., Ruhl, N., McRobert, S. *Interactions between aggression, boldness and shoaling in juvenile convict cichlid kin.* Behavioural Processes. https://doi.org/10.1016/j.beproc.2015.10.012.

2015 **Way, G.P.**, Kiesel, A., Snekser, J., Ruhl, N and McRobert, S.P. *Sex differences in a shoaling-boldness behavioral syndrome, but no link with aggression.* Behavioural Processes. https://doi.org/10.1016/j.beproc.2014.12.014.

Skills

Programming Python, R, Matlab, Bash
Machine Learning Sci-Kit Learn, Keras

Honors & Awards

Professional Affiliations

2017 **Student Member,** Admissions Committee: University of Pennsylvania *Philadelphia, PA*
2017 **Student Member,** Curriculum Committee: University of Pennsylvania *Philadelphia, PA*
2017 **Student Member,** National Science Foundation: Penn Pathfinders *Philadelphia, PA*
2017 **Associate Member,** American Society for Human Genetics *Philadelphia, PA*
2017 **Associate Member,** International Society for Computational Biologists *Philadelphia, PA*
2016 **Associate Member,** American Association for Cancer Research *Hanover, NH*
2014 **Associate Member,** Sigma Xi Research Society *Philadelphia, PA*
2014 **Associate Member,** Alpha Epsilon Lambda Graduate Honor Society *Philadelphia, PA*

Awards

2015 **2nd Place,** Norris Cotton Cancer Center Poster Competition *Hanover, NH*
2015 **Travel Award,** Graduate Student Council Conference Grant *Hanover, NH*

Fellowships

2014 **HHMI Graduate Fellowship,** Saint Joseph's University *Philadelphia, PA*
2010 **MUSE Fellowship,** The College of New Jersey *Ewing, NJ*
2007 **Chairman of the Board Scholar,** The College of New Jersey *Ewing, NJ*
2007 **Edward J. Bloustein Scholar,** The College of New Jersey *Ewing, NJ*