

# Geoffrey Daniel Hannigan

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<http://microbiology.github.io/>

## Summary

Solutions-oriented leader and scientist in biotech and pharma. Scientific expertise in computational and molecular biology, with publications and patent in data science, machine learning, microbiology, and immunology. Broad experience across business value streams including drug discovery, drug development and manufacturing (GMP), business development, and organizational leadership. Demonstrated ability to bring groups together while leveraging both scientific and business acumen.

## Education

University of Pennsylvania – PhD, Cell & Molecular Biology, 2015

University of Minnesota Duluth – BS, Cell & Molecular Biology, 2011

## Relevant Experience

### **EXECUTIVE DIRECTOR & CO-FOUNDER, MERCK DIGITAL SCIENCES STUDIO – 2022 - PRESENT**

Executive lead and co-founder of Merck Digital Sciences Studio, a startup accelerator program focused on digital enablement of drug discovery & development. Leverage scientific and business acumen to accelerate startups toward success, including fostering engagements between Merck and startups.

### **PRINCIPAL SCIENTIST, MERCK RESEARCH LABS – 2020 - PRESENT**

Computational biologist leading and contributing to discovery research which blends computational, machine learning, and molecular approaches. Led external partnership to establish a large observational clinical study for drug discovery. Led internal design and development of a GxP platform to improve manufacturing and commercialization.

### **ASSOCIATE PRINCIPAL SCIENTIST, MERCK RESEARCH LABS – 2017 - 2020**

Computational biologist and founding team member that co-developed the DeepBGC algorithm for using deep learning to identify biosynthetic gene clusters from microbial genomes and metagenomes. Established a flexible and scalable microbiome analysis platform for use on-prem as well as on cloud compute resources.

### **SCIENTIFIC ADVISOR, SMARTPHAGE – 2015 - 2017**

Scientific advisory board member for SmartPhage, a biotech focused on the development of effective, precise therapies based on modern disease models. Contributed to facilitating academic collaborations, exploring grant and other funding opportunities, and providing insight into future scientific directions of the company.

## Skills

Scientific Skills: R, Python, Julia, MySQL, Neo4j/Cypher, GNU Make, Nextflow, AWS, Unix/Linux, Machine Learning, Microbiome Processing, Genomic Processing, RNA-seq Processing & Analysis, Cell Culture, Illumina Next Generation Sequencing, PCR, Western Blot, In Vivo Models

Business/Leadership Skills: Team Management, Organizational Management, Organizational Strategy, Business Development, Budgeting, Contracting, Program Administration, Negotiations, Alliance Management

## Professional Development & Certifications

Duke University – Corporate Education Certificate, Business Leadership Program, 2020

Howard Hughes Medical Institute – Certificate, Med Into Grad Scholar, 2015

## Select Publications

Total of 16 publications: 2 senior author publications and 10 first author publications.

Gokul Swaminathan, et al, **Geoffrey D Hannigan**. 2021. Vaccine Hyporesponse Induced by Individual Antibiotic Treatment in Mice and Non-Human Primates Is Diminished upon Recovery of the Gut Microbiome. *Vaccines*. doi: 10.3390/vaccines9111340

David Prihoda, et al, **Geoffrey D Hannigan**. 2021. The application potential of machine learning and genomics for understanding natural product diversity, chemistry, and therapeutic translatability. *Natural Product Reports*. doi: 10.1039/D0NP00055H

**Geoffrey D Hannigan**, et al. 2019. A Deep Learning Genome-Mining Strategy For Biosynthetic Gene Cluster Prediction. *Nucleic Acids Research*. doi: 10.1093/nar/gkz654

**Geoffrey D Hannigan**, et al. 2018. Biogeography and Environmental Conditions Shape Bacteriophage-Bacteria Networks Across the Human Microbiome. *PLOS Computational Biology*. doi: 10.1371/journal.pcbi.1006099

**Geoffrey D Hannigan**, et al. 2018. Diagnostic Potential & the Interactive Dynamics of the Colorectal Cancer Virome. *mBio*. doi: 10.1128/mBio.02248-18

**Geoffrey D Hannigan**, et al. 2015. The human skin dsDNA virome: Topographical and temporal diversity, genetic enrichment, and its dynamic associations with the host microbiome. *mBio*. 6(5):e01578-15. doi: 10.1128/mBio.01578-15

## Patents

**Geoffrey D Hannigan**, Prihoda D, Soukup J, Woelk CH, Bitton DA. 2018. Identifying Biosynthetic Gene Clusters. 62/779.697

## Software Publications

**Geoffrey D Hannigan**, Loesche MA, Hodgkinson BP, Mehta S and Grice EA. **Creator** (cre), **Author** (aut). patPRO: Visualizing Temporal Microbiome Data. <http://CRAN.R-project.org/package=patPRO>

Oksanen J, et al. **Contributor** (ctb). Vegan: R Package for Community Ecologists. <http://CRAN.R-project.org/package=vegan>

## References

Available up request