

# John Christian Gaby

## Research Microbiologist



Resume Last Updated:  
28 August 2021



Gainesville, Florida, USA



[chrisgaby.github.io](https://chrisgaby.github.io)



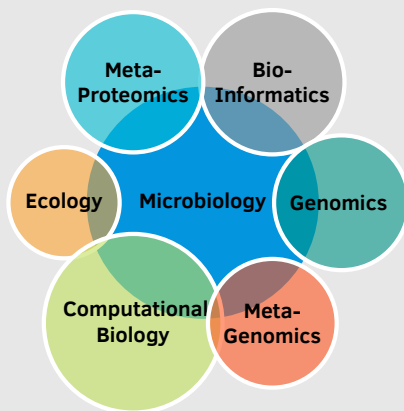
[/in/john-gaby-56525410b/](https://in/john-gaby-56525410b/)



[chrisgaby](https://github.com/chrisgaby)

## Knowledge

### Domains



## About Me

John Christian Gaby is a Research Microbiologist with the Genomics and Bioinformatics Research Unit (GBRU) of the United States Department of Agriculture (USDA) Agricultural Research Service (ARS). His research interests include microbial ecology, biological nitrogen fixation, the nitrogen cycle, biogas production, genomics, metagenomics, metaproteomics, bioinformatics, and computational biology. He currently works on the development of machine learning models to predict prokaryotic phenotype from genome sequence data.

## Education

### Ph.D., Microbiology

Minors: Genomics and Ecology  
Cornell University  
2013 Ithaca, NY

### B.S., Biology

The University of Tennessee  
2002 Knoxville, TN

## Skills

### Programming

Python & Jupyter  
Conda  
R & RMarkdown  
SQL  
UNIX Shell  
Docker  
NextFlow  
LaTeX  
Markdown  
Git & GitHub

### Bioinformatics

HPC and Cloud  
Slurm, GCP  
Homology Search  
BLAST, Diamond, HMMer  
Read Mapping  
BowTie, BWA  
Assembly  
SPAdes, MegaHIT  
Genome Binning  
MaxBin, metaBAT  
metaGenomics  
CheckM, GTDB-Tk

### Gene Finding

Prodigal, GeneMark  
Gene Annotation  
InterProScan, dbCAN, Pfam  
Databases  
NCBI Assembly, Genbank, SRA, *nifH*, Silva rRNA  
Similarity Search  
MASH & fastANI  
metaProteomics  
MaxQuant, Perseus

### Methodologies

Machine Learning  
Ecological Stats.  
DNA Extraction  
Amplicon Seq.  
Nanopore Seq.  
Sanger Seq.  
PCR & qPCR  
Acetylene Reduc.  
Enrichment  
Isolation  
Nitrogen Analyses  
Soil Analyses  
Field Studies

## Experience

- 2020 - Present **Research Microbiologist Research Associate** [USDA ARS GBRU](#)  
Machine Learning Prediction using Genomic Data
- 2016 - 2020 **Postdoctoral Researcher** [The Norwegian University of Life Sciences \(NMBU\)](#)  
Functional Multi-omics of Biogas Reactors and Gut Microbiomes
- 2013 - 2016 **Postdoctoral Researcher** [The Georgia Institute of Technology](#)  
Nitrogen Fixation in Terrestrial and Marine Ecosystems
- 2011 - 2012 **Fulbright United States Student Fellow** [Corporacion Corpogen](#)  
Nitrogen Cycling in the Colombian Paramo
- 2005 - 2011 **Graduate Researcher** [Cornell University](#)  
The Diversity and Ecology of Nitrogen-fixing Bacteria
- 2003 - 2005 **Volunteer** [United States Peace Corps](#), Niger, West Africa  
Agriculture and Natural Resources Management Group
- 2002 **Research Assistant** [The University of Tennessee](#)  
*Mycobacterium ulcerans*
- 2001 **HHMI Summer Research Fellow** [University of Pittsburgh](#)  
Genetics of Alternative Cobamide Utilization in *Salmonella*
- 2000 **DOE Energy Research Undergraduate Laboratory Fellow** [ORNL](#)  
Fluorescence-based Biosensor Development

## Publications, 5 Selected of 17 Total

**941 citations** according to [my Google Scholar page](#) as of August 28, 2021  
Peer reviewed articles: 6 first author, 9 co-author, 1 corresponding author

- [1] L. Michalak, J. C. **Gaby**, L. Lagos, S. L. La Rosa, T. R. Hvidsten, C. Tétard-Jones, W. G. Willats, N. Terrapon, V. Lombard, B. Henrissat, J. Dröge, M. Ø. Arntzen, L. H. Hagen, M. Øverland, P. B. Pope, and B. Westereng. Microbiota-directed fibre activates both targeted and secondary metabolic shifts in the distal gut. *Nature Communications*, 11(1), 2020.
- [2] J. C. **Gaby**, M. Zamanzadeh, and S. J. Horn. The effect of temperature and retention time on methane production and microbial community composition in staged anaerobic digesters fed with food waste. *Biotechnology for Biofuels*, 10(1):302, 2017.
- [3] J. C. **Gaby** and D. H. Buckley. A comprehensive aligned *nifH* gene database: A multipurpose tool for studies of nitrogen-fixing bacteria. *Database: The Journal of Biological Databases and Curation*, 2014:bau001, 2014.
- [4] J. C. **Gaby** and D. H. Buckley. A comprehensive evaluation of PCR primers to amplify the *nifH* gene of nitrogenase. *PLoS ONE*, 7(7):e42149, 2012.
- [5] J. C. **Gaby** and D. H. Buckley. A global census of nitrogenase diversity. *Environmental Microbiology*, 13(7):1790–1799, 2011.