

William Herbert
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Education

Doctor of Philosophy, Biomedical Engineering and Physiology **September 2025**
Mayo Clinic Graduate School of Biomedical Sciences
Thesis: A critical analysis of monotherapy cancer drug-blind response prediction

Bachelor of Science in Bioengineering **May 2019**
Minor in Computer Science, Concentration in Computational and Systems Biology
University of Illinois at Urbana-Champaign

Research Interests

Machine learning and artificial intelligence – Data-centric methods
Women's health – Endometrial cancer, idiopathic infertility, fallopian tube physiology
Human microbiome – Reproductive tract microbiome, microbiome in cancer, computational microbiome analysis methods

Research Experience

Walther-Antonio Lab **April 2020 – October 2025**
Microbiome Program, Department of Obstetrics and Gynecology, Department of Surgery, Mayo Clinic

- Analyzed aspects of *in vitro* cancer drug response datasets that are detrimental to model learning and future clinical translation
- Developing contrastive learning model for few-shot learning of individualized drug response
- Performed genomic analysis for species of *Porphyromonas* correlated with endometrial cancer incidence and shown to invade endometrial cells
- Analyzed mutation data to identify genetic alteration patterns in *Nostoc spp.* sent to the International Space Station to determine the effects of space radiation

Ramanathan Lab **June 2023 – August 2023**
Visiting Graduate Student, Data Science and Learning Division, Argonne National Laboratory

- Explored translation of lab published genomic large language model (GenSLM) from viral genomes to human genomes
- Applied prompt-tuning to existing genomic large language models to identify potential downstream applications

Jensen Lab **August 2016 – June 2019**
Department of Bioengineering, University of Illinois at Urbana-Champaign

- Designed and implemented bacterial DNA barcoding system for automated, high-throughput sequencing experiments
- Prepared and submitted microbial genome assembly for a novel species of *Streptococcus*

Segre Lab **June 2017 – August 2017**
BRITE REU, Bioinformatics Department, Boston University

- Developed random forest model for prediction of bacterial community function to compete with established microbiome functional inference models

Publications

1. **Herbert, William G.**, Nicholas Chia, Paul A. Jensen, Marina RS Walther-Antonio. "Monotherapy cancer drug-blind prediction is limited to intraclass generalization." *In Review*.
2. Liu, Yuguang, Patricio Jeraldo, **William Herbert**, Samantha McDonough, Bruce Eckloff, Jean-Pierre De Vera, Charles Cockell et al. "Non-random genetic alterations in the cyanobacterium *Nostoc* sp. exposed to space conditions." *Scientific reports* 12, no. 1 (2022): 12580.
3. Liu, Yuguang, Patricio Jeraldo, **William Herbert**, Samantha McDonough, Bruce Eckloff, Dirk Schulze-Makuch, Jean-Pierre De Vera et al. "Whole genome sequencing of cyanobacterium *Nostoc* sp. CCCryo 231-06 using microfluidic single cell technology." *Iscience* 25, no. 5 (2022): 104291.
4. Crooks, Taylor A., Joseph D. Madison, Dana M. Walsh, **William G. Herbert**, Patricio R. Jeraldo, Nicholas Chia, William A. Cliby, Scott H. Kaufmann, Marina R.S. Walther-Antonio. "Porphyromonas somerae Invasion of Endometrial Cancer Cells." *Frontiers in microbiology* (2021): 2006.
5. Graham, Madeline E. *, **William G. Herbert***, Stephanie D. Song, Harshini N. Raman, Jade E. Zhu, Paulina E. Gonzalez, Marina RS Walther-Antônio, Marc J. Tetel. "Gut and vaginal microbiomes on steroids: implications for women's health." *Trends in Endocrinology & Metabolism* (2021).
6. Sales, Mia J., **William G. Herbert**, Yuting Du, Amitha S. Sandur, Naaman M. Stanley, Paul A. Jensen. "Complete Genome Sequences of *Streptococcus sobrinus* SL1 (ATCC 33478= DSM 20742), NIDR 6715-7 (ATCC 27351), NIDR 6715-15 (ATCC 27352), and NCTC 10919 (ATCC 33402)." *Microbiology resource announcements* 7, no. 3 (2018): e00804-18.

Honors and Awards

American Association of Cancer Research, Scholar-in-Training Award	June 2025
American Association for the Advancement of Science, CASE Workshop, Travel Award	April 2024
Dean's Fellowship, Mayo Clinic Graduate School of Biomedical Sciences	2019 - 2021
Edmund J. James Scholar Honors Program, University of Illinois at Urbana-Champaign	2015 - 2019
Cancer Scholars Program, University of Illinois at Urbana-Champaign, Department of Bioengineering	2015 - 2019

Teaching Experience

Teaching Assistant, CORE6300 Molecular Biophysics, Mayo Clinic Graduate School of Biomedical Sciences

Projects and Presentations

Poster Presentation, American Association for Cancer Research, AI/ML Special Session Project Title: Monotherapy cancer drug-blind prediction is limited to intraclass generalization	July 2025
Poster Presentation, Biomedical Engineering Society National Conference Project Title: Tracking synthetic bacterial communities with combinatorial DNA barcoding	October 2018
Poster Presentation, Annual Biomedical Research Conference for Minority Students Project Title: Predicting microbial community function from 16s rRNA sequencing via Random Forest	October 2017
Project Lead, Real-time Prediction of Epidemic Behavior University of Illinois Engineering Open House	March 2017