Albert C. Vill, Ph.D.

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Education

Doctor of Philosophy — Cornell University May 2022
Field of Genetics, Genomics & Development
Thesis: "Metagenomic Methods to Investigate Mobile Element Context and Nascent Transcription in the Human Gut Microbiome"

Bachelor of Science, *Magna Cum Laude* — Gettysburg College May 2016
Biochemistry and Molecular Biology major, 3.70 GPA
Lincoln Scholar – highest merit-based scholarship awarded

Research Experience

Graduate Research Assistant — Lab of Dr. Ilana Brito, Cornell University May 2017 – May 2022
Designing and implementing methods to quantify changes in the composition and function of the human gut microbiome during perturbation and disease

HHMI Summer Research Fellow — Gettysburg College Summers 2014 & 2015
Characterizing bacteriophages by host-range screens and comparative genomics

Publications

Vill AC, Rice EJ, De Vlaminck I, Danko CG, Brito IL. Run-on sequencing reveals nascent transcriptomics of the human microbiome. Preprint

Vill AC, Delesalle VA, Tomko BE, Lichty KB, Simões MS, Guffey AA, Burton EA, Tanke NT, Krukonis GP. Comparative genomics of six lytic *Bacillus subtilis* phages from the Southwest United States. *PHAGE*. 3(3):171-178. 2022

Delesalle VA, Tomko BE, **Vill AC**, Boas K, Krukonis GP. Forty Years without Family: Three Novel Bacteriophages with High Similarity to SPP1 Reveal Decades of Evolutionary Stasis since the Isolation of Their Famous Relative. *Viruses*. 14(10):2106. 2022

Kent AG, **Vill AC**[†], Shi Q, Satlin MJ, Brito IL. Widespread transfer of mobile antibiotic resistance genes within individual gut microbiomes revealed through bacterial Hi-C. *Nature Communications*. 11(1):4379. 2020
[†] *co-first author*

Delesalle VA, Tanke NT, **Vill AC**, Krukonis GP. Testing hypotheses for the presence of tRNA genes in mycobacteriophage genomes. *Bacteriophage*. 6(3):e1219441. 2016

Pope WH, Bowman CA, Russell DA, Jacobs-Sera D, Asai DJ, Cresawn SG, Jacobs WR, Hendrix RW, Lawrence JG, Hatfull GF; **Science Education Alliance Phage Hunters Advancing Genomics and Evolutionary Science** [‡]; Phage Hunters Integrating Research and Education; Mycobacterial Genetics Course. Whole genome comparison of a large collection of mycobacteriophages reveals a continuum of phage genetic diversity. *eLife*. 4:e06416. 2015
[‡] *consortium member, data contributor*

Honors and Awards

Travel Award Recipient, Cornell Center for Vertebrate Genomics 2022

Seed Grant Recipient, Genomics Innovation Hub 2020

Distinguished Scholar, Cornell Center for Vertebrate Genomics 2019

Honorable Mention, NSF Graduate Research Fellowship 2018

Herzog Teaching Fellow, Gettysburg College 2015

HHMI Summer Research Fellow, Gettysburg College 2014 & 2015

Presentations

Poster — Molecular Genetics of Bacteria and Phages 2022
Run-on sequencing enables nascent transcriptomics of the human microbiome

Poster — Lake Arrowhead Microbial Genomics Meeting (canceled) 2021
Bacterial nascent transcriptomics with precision run-on sequencing

Poster — Biomedical Engineering Society Annual Meeting 2019
Monitoring the Transfer of Antibiotic Resistance Genes in Patients with Neutropenia using Bacterial Hi-C

Service and Outreach

Coordinator, Cornell Center for Vertebrate Genomics Journal Club Fall 2021 – Spring 2022

Graduate Mentor, Microbial Friends & Foes Research Experience for non-Cornell Undergraduates Summer 2019

Workshop Facilitator, 4-H Career Explorations "Engineering the Microbiome" Focus Program June 2018

Graduate Fellow, Cornell Graduate Student School Outreach Program Spring 2018

Skills

R programming language
- tidyverse evangelist
- ggplot2 devotee

Linux-based NGS software
- samtools
- bedtools
- bwa, bowtie2, minimap2

Bash programming language / shell scripting
- awk, sed, grep
- Sun Grid Engine queuing system

Microbiology
- anaerobic and BSL-2 culture
- phage isolation and propagation

Nucleic acid sequencing
- metagenomic sequencing, assembly, binning, and annotation
- RNA-seq and differential expression analysis