Kat Terwelp Curriculum Vitae

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EDUCATION
Bachelors of Science, Microbiology, *summa cum laude*. May 2022
Clemson University, Clemson, South Carolina
Biomedicine Concentration
GPA 4.00/4.00

RESEARCH EXPERIENCE
Research Technician II
June 2022 - July 2024
Duke University, Molecular Genetics and Microbiology Department, Microbiome Core Facility
Durham, NC

- Develop the 16S rRNA V1-V3 amplicon library preparation service. Identify template-primer mismatch with an upper-respiratory commensal which led to biased results. Create new degenerate primers which are more concordant with metagenomics results.
- Create the analysis service by developing a reproducible analysis pipeline to analyze amplicon sequencing data on Duke's Computing Cluster (DCC). Improve reproducibility and portability by incorporating Git version control. Continuously update pipeline to use current best-practice software to analyze microbiome data.
- Concisely present a summary of amplicon analysis findings in a meeting with the principal investigator and collaborators of a project for the Core Facility analysis service.

Undergraduate Research Assistant
August 2019-June 2022
Clemson University, Biological Sciences Department, Dr. Matthew Turnbull Lab
Clemson, SC

- Developed two proximity tagging expression plasmids to identify protein-protein interactions that enable Polydnavirus (PDV) to form gap junctions in insect hosts using the *Spodoptera frugiperda Sf9* (caterpillar) cell model.
- Verified expression of these constructs in Sf9 cells using immunomicroscopy.

Summer Research Intern
May 2021-August 2021
Wake Forest School of Medicine, Center for Precision Medicine, Dr. Kim Reeves Lab
Winston-Salem, NC

- Tested protocols to isolate RNA from COVID-19+ patients to assess the impact of host and microbial RNA composition on COVID-19 reinfection. Verified the quality of extracted RNA using the High Sensitivity Agilent ScreenTape and DeNovix RNA assays.
- Developed protocols to isolate viable microbial DNA from acellular dermal matrices (ADM) used in implant-based breast reconstruction to assess the impact of microbial contamination on surgery success rate. Verify PMAxx reduced non-viable DNA amplification using qPCR. Sequenced amplified viable DNA using Oxford Nanopore.

Undergraduate Research Assistant
Jan 2019-May 2021
Clemson University, Biological Sciences Department, Dr. Megan Novak

- Assisted Dr. Megan Novak in fieldwork to collect data for her dissertation to study the metapopulation dynamics and habitat use of the green salamander.
- Collected environmental data and aseptically acquired DNA samples from salamanders. Gain skills in wild animal handling.

Summer Creative Inquiry Research Intern
May 2020-July 2020
Clemson University, Biological Sciences Department, Dr. Matthew Turnbull Lab
Wauwatosa, WI

- Assessed parasitoid wasp diversity by identifying and sorting thousands of insects captured in a malaise trap.

Undergraduate Research Assistant
June 2018-May 2019
Clemson University, Department of Genetics and Biochemistry, Dr. Michael Sehorn Lab
Clemson, SC

- Assisted Dr. Michael Sehorn on a project to test whether Mei5's binding activity was essential for homologous DNA repair.
- Generate a mutant Mei5 expression construct with two mutations that block DNA binding activity via mutagenic PCR

AWARDS & HONORS

Clemson National Scholars Program Scholarship, >$220,000	2018-2022
1st place in Undergraduate Lightning Talks, CBASS	2022
Clemson Science Student Advisory Board Outstanding Member Award	2022
Departmental Honors in Microbiology	2022
President's List	2018-2022

GRANTS

Sigma Xi Grant in Aid of Research, $500	2022-2023
Clemson Science Student Advisory Board Grant in Aid of Research, $500	2020-2021
Clemson Honors Summer Mini-Grant, $500	2020
Clemson Departmental Honors Research Grant, $500	2019
Clemson Departmental Honors Research Grant, $500	2018

RESEARCH TALKS

Terwelp, Kat. Development of a proximity tagging expression construct to test Polydnavirus-Host protein-protein interactions in Sf9 Cells. Seminar presented at Clemson Biological Sciences Undergraduate Research Symposium (BSURS); 2022, April 29. Clemson, SC.
Terwelp, Kat. Development of a proximity tagging expression construct to test Polydnavirus-Host protein-protein interactions in Sf9 cells. Lightning talk presented at Clemson Biological Sciences Annual Student Symposium (CBASS); 2022, April 2. Clemson, SC. (Virtual)

POSTER PRESENTATIONS

Terwelp, Kat, Matthew S. Kelly, So Young Kim, Jason W. Arnold. A Comparative Analysis of Species-Level Resolution Across Sequencing Platforms in Low-Biomass Samples. Poster presentation at 2024 North Carolina Microbiome Symposium (NCBC); 2024, May 22. Durham, NC.

Carter, Rachel, Miller, Kelsey, **Terwelp, Kat**, Yoh, Alexis, Howard, Daniel, Zhang, Peng, Turnbull, Matthew. Development of Tools for the Study of Host-Pathogen Interaction in the Symbiotic Polydnaviruses. Poster presentation at Clemson University 17th Annual Focus on Creative Inquiry Forum; 2022, April 22. Clemson, SC

Terwelp, Kat, Deese, Chandler. Microbiologic Profiling of Acellular Dermal Matrices Used in Implant-Based Breast Reconstruction. Poster presented at Wake Forest Center for Precision Medicine Student Symposium 2021; July 29. Winston-Salem, NC.

Terwelp, Kat, Moss, Harrison, Acherman, Lindsay, Cobb, Meredith, Yoh, Alexis. Parasitoid wasp sampling for the study of polydnavirus evolution. Poster presented at 4th Annual Summer Creative Inquiry & Undergraduate Research Showcase 2020; August 17. Clemson, SC. (Virtual)

LEADERSHIP & SERVICE

- CU Anschutz ORE Leadership Academy Fellow 2024
- Vice President of Clemson's Microbiological Society Club 2021-2022
- Vice Chair of the Clemson Science Student Advisory Grant Board 2021-2022
- Clemson University Science Student Advisory Board 2020-2022
- Clemson Writing Fellow 2019-2021

MEMBERSHIP

- North Carolina branch of American Society of Microbiology 2023
- Phi Kappa Phi 2021-2022
- Clemson University Microbiological Society 2021-2022
- Clemson University Honors College 2018-2022
- Clemson University National Scholars Program 2018-2022

TECHNICAL SKILLS

- Programming languages: R and bash
- QIIME2 and Phyloseq
- Version control with Git
- Apptainer/Singularity containers
- Microsoft Excel
- High-performance computing and job scheduling with SLURM
- High-throughput genomic DNA extraction
- 16S and 18S amplicon library preparation
- Miniprep and midiprep for plasmid DNA extraction
- RNA extraction
- RNA/DNA QC with Agilent Bioanalyzer and TapeStation
- Protocol development and testing
- qPCR and PCR
- Eukaryotic cell culture and cell transfection
- Immunomicroscopy
- Western blots