Elissa Danielle Foss

Education

Meredith College- Raleigh NC (Fall 2014- Spring 2017)
GPA 3.8 Magnum Cum Laude
B.S. Biology, Minor in Physical Chemistry

CIEE Tropical Ecology and Diversity- Monteverde Costa Rica (Fall 2015)
Study abroad program focused on exploring principles of tropical ecology throughout the country of Costa Rica.

Duke University – Durham NC (Fall 2019 – Present)
Genetic and Genomics PhD program.
Thesis advisor: Anne Yoder

Research Experiences

Food and Drug Administration, Lab of Mucosal Pathogen and Cellular Immunology
ORISE Research Fellow (Summer 2017- Summer 2019) Advisor: Paul Carlson, PhD.
Evaluating the efficacy of Fecal Microbiota Transplantation sample storage, and the safety of FMT donor screening methods. Determining limit of clinical diagnostic PCR protocols for bio safety level two pathogens. Exploring the interactions of MAIT cells and the gut microbiome during *C. difficile* infection. Analyzing and visualizing RNAseq data of viral influenza strains.

NC State University, CVM Department of Population Health and Pathobiology
Undergraduate Research Assistant (Fall 2016 – Spring 2017) Advisor: Casey Theriot, PhD.
Isolating strains of *C. difficile* found in the animal population, and identifying the strains by ribotyping and toxin genes present. Characterization of different clinically relevant *C. difficile* strains by growth kinetics and toxin activity.

The University of Chicago, Department of Molecular, Genetics and Cell Biology
REU Program researcher (Summer 2016) Advisor: Jean Greenberg, PhD.
Determined the activation site of effector protein HopZ3 inside of *Pseudomonas syringae* bacteria. Analyzed the activation sites of other effector proteins inside the bacteria.

CIEE Tropical Ecology and Diversity Program
Undergraduate researcher (Fall 2015) Advisor: Alan Masters, PhD.
Designed a field study to analyze the effectiveness of a defense mechanism of Swallowtail butterfly larvae against army ants.

Publications

Giordano N, Hastie JL, Smith AD, **Foss ED**, Gutierrez-Munoz DF, Carlson PE Jr. (2018). Cysteine Desulfurase IscS2 Plays a Role in Oxygen Resistance in *Clostridium difficile*. Infect Immunology 23;86(8).

Kochan TJ, Shoshiev MS, Hastie JL, Somers MJ, Plotnick YM, Gutierrez-Munoz DF, **Foss ED**, Schubert AM, Smith AD, Zimmerman SK, Carlson PE Jr, Hanna PC (2018). Germinant Synergy Facilitates *Clostridium difficile* Spore Germination under Physiological Conditions. mSphere. 5;3(5).

Ashley D. Smith; **Elissa D. Foss**; Irma Zhang; Jessica L. Hastie; Nicole P. Giordano; Lusine Gasparyan; Alyxandria M. Schubert; Deepika Prasad; Vahan Simonyan; Siobhán C. Cowley; Paul Carlson Jr. Microbiota of MAIT cell Deficient Mice Confer Resistance Against *Clostridium difficile* Infection. Accepted: PLoS One July 2019

Foss ED, Smith AD, Hastie JL, Carlson PE Jr. Safety and Efficacy of *Clostridium difficile* FMT Donor Screening Methods. (manuscript in preparation, expected submission date October 2019

Presentations

Keystone Microbiome Symposia – Montreal, Quebec, CA (2019)
Poster: "Microbiota of MR1 deficient mice confer resistance against *Clostridium difficile* infection"

NIH-FDA Joint Microbiome Workshop- Rockville, MD, USA (2018)
Poster: "Evaluating the efficacy of FMT donor screening methods"

FDA CBER Science Symposium- Silver Spring, MD, USA (2018)
Poster: "Evaluating the efficacy of FMT donor screening methods"

The University of Chicago REU Symposium- Chicago, IL, USA (2016)
Poster, Talk: *"*Activity of effector proteins inside *Pseudomonas syringae"*

State of North Carolina Undergraduate Research & Creative Symposium
- Durham, NC, USA (2016)
Poster, Talk: *"*Activity of effector proteins inside *Pseudomonas syringae"*

CIEE Undergraduate Research Symposium- Monteverde, Costa Rica (2015)
Talk: *"*Osmeterium as a Defense Against Army Ants In *Papilio Polyxenes"*

Research Skills

Wet Lab

- Anaerobic chamber experience
- RNA isolation
- DNA extraction
- RT- qPCR
- PCR trouble shooting
- Primer design
- Cell Culture
- Western Blots
- Scanning Electron Microscopy

Mouse model

- Daily monitoring/handling/husbandry
- Oral gavage
- Necropsy tissue collection
- Gnotobiotic mouse work

Computational

- Targeted amplicon sequencing with Mothur and QIIME
- Metagenomics with Metaphlan2
- RNAseq with DESeq2
- Visualization with ggplot2
- Coding experience in Python, R, and Linux command line

Outreach and Service

DEI&A committee member - Duke University (2019 – present)

SciRen contributor – Wake County (2019 - present)

Wise volunteer – Duke University (2019 - present

DoinGG volunteer- Duke University (2019 - present)

Outbreak Exhibit Docent- Smithsonian National Museum of Natural History (2018–2019)

First Year Student mentor - Meredith College (2016–2017)

Animal Biology Teaching Assistant- Meredith College (Spring 2015–Spring 2017)

Honors and Awards

Marcy Spear Award of Excellence - Duke UPGG (Fall 2020)

Integrative Bioinformatics for Investigate and Engineering Microbiomes Trainee – Duke University (Spring 2020)

Debra K Senior Excellence in Biology Award – Meredith College (Spring 2017)

Kappa Nu Sigma Honor Society – Meredith College (Spring 2017)

John Yarbrough Excellence in Biology Award – Meredith College (Spring 2016)

Beta Beta Beta Biology Honor Society – Meredith College (Spring 2016)