KEIRAN CANTILINA

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EDUCATION

University of Minnesota-Twin Cities, College of Food, Agriculture, and Nat. Resource. Sci, St. Paul, MN
Master of Science (MS) in Bioproducts and Biosystems Engineering, June 2018
Concentration: Bioinstrumentation

Cornell University, College of Agriculture and Life Sciences, Ithaca, NY
Bachelor of Science (BS) in Biological Sciences, May 2015
Concentration: Plant Science and Biotechnology
Minor: Music

WORK EXPERIENCE

Laboratory Service Technician   May 2015 – June 2016
M. Todd Walter Lab , Cornell University Department of Biological and Environmental Engineering
Provided laboratory members with full-time multidisciplinary assistance, including experimental design consulting, training in microbiological laboratory techniques, assistance with instrument software and hardware design and troubleshooting, and the creation of data processing scripts and programs • Carried out experimental and sampling protocols for laboratory members.

Head Chimesmaster   April 2012 – May 2014
Cornell University Chimes
Managed the activities of the chimesmasters, the student/alumni group that plays the 21-bell instrument atop Cornell University's iconic McGraw Tower • Corresponded with 35 clients per month • Administered the annual 10-week-long competition whereby new chimesmasters are auditioned and selected • Performed chimes concerts 3 times a week, taking impromptu song requests from visitors • Performed commissioned wedding/specialty concerts • Conducted tours and open-houses

PUBLICATIONS

- Gottula J, Lapato D, Cantilina K, Saito S, Bartlett B, Fuchs M, et al. (2013). Genetic variability, evolution, and biological effects of grapevine fanleaf virus satellite RNAs. *Phytopathology*, *103*(11), 1180-1187.
- Truhlar AM, Denes TG, Cantilina KK, Leung SK, Walter MT, et al. (2018). Absence of genetic selection in a pathogenic *Escherichia coli* strain exposed to the manure-amended soil environment. *PLOS ONE*, 13(12): e0208346.

RESEARCH EXPERIENCE

Graduate Research Assistant   August 2016 – May 2018
Marchetto Lab, University of Minnesota Department of Bioproducts and Biosystem Engineering
Developed novel environmental sensors • Repaired and constructed accessories for a variety of field-deployed water samplers.• Wrote research grant proposals, budgets, and conference abstracts and posters

Plant Genetics Research Assistant   Summer 2014
S.D. Yeh Lab, National Chung Hsing University Department of Plant Pathology, Taichung, Taiwan
Planned and initiated a cloning project aimed to develop a viral cross-protection vector for Vietnam-strain Papaya ringspot virus (PRSV) • Became familiar with cross-cultural research contexts

Plant Bioinformatics Summer Intern   Summer 2013
M. Fuchs Lab, Cornell University Department of Plant Pathology at the New York State Agricultural Experiment Station, Geneva, NY
Planned and contributed to cloning projects related to the improvement of Grapevine fanleaf virus (GFLV) as a virus induced gene silencing (VIGS) vector • Gained proficiency in confocal laser microscopy • Became familiar with UV photography

Plant Pathology Research Assistant   Summer 2012
M. Fuchs Lab, Cornell University Department of Plant Pathology at the New York State Agricultural Experiment Station, Geneva, NY
Learned sequence analysis, primer design, and phylogenetic analysis • Ran mid-scale IC-RT-PCR and agarose electrophoresis reactions, screening projects, and cloning projects • Learned laboratory

greenhouse skills such as planting, transplanting, inoculating, seed collecting, and sample collecting • Created and presented poster to share research results with research station faculty

RELEVANT SKILLS

Electronics Design and Fabrication
- Analog circuit design, prototyping, assembly (through-hole and SMD soldering), troubleshooting
- Proficiency with PCB layout and design using KiCAD
- Embedded microcontrollers (AVR, PIC, Arduino)
- Proficiency with test equipment: multimeter, digital and analog oscilloscope, sourcemeter, signal generator, spectrum analyzer
- Basic RF circuit and antenna design

Programming and Data Skills
- Languages: R, Arduino C++, Python
- Design and implementation of software-hardware interfaces
- Statistical analysis and graphical visualization of complex datasets
- Web-scraping and automated data collection
- Management of complex datasets and relational databases using R and SQL

Molecular Biology
- PCR and RT-PCR protocols and primer design
- Protein and nucleic acid electrophoresis
- ELISA immunodetection
- Multiple types of plant, bacterial, and soil DNA and RNA extraction techniques
- TOPO and LIC as well as conventional cloning design and execution
- Plasmid design
- Virus-induced gene silencing vector design
- Bacterial transformation by heat shock and electroporation
- Plant transformation by floral dip and biolistic particle delivery, etc.

Bioinformatics
- Proficiency using software including: DNAStar, DnaSP (nucleotide polymorphism analysis software), Vector NTI, Geneious, RaptorX (protein secondary structure modeling), SeaView (alignment software), Datamonkey (elucidation of genetic selection pressure), PyMOL

Microbiology
- Trained to Biosafety Level 2 (BSL-2) standards
- Solid and liquid culture and preparation of various solid and liquid media
- Sterile technique and use of autoclave and sonication sterilization
- Recovery of bacteria from soil
- Spot plating, colony enumeration, calculation of CFU from optical density, and serial dilution
- Small- scale density isolation by sucrose gradient centrifugation
- Standard microbiological assays (Congo Red curli tests, crystal violet biofilm assays, etc.)

Mechanical Design and Fabrication
- CAD software proficiency (AutoCAD, OpenSCAD, Autodesk Inventor)
- Design for 3D printing, use of 3D printers and slicing software, 3D printing troubleshooting
- Basic woodworking and welding
- Basic 2-phase and 3-phase electrical work
- Laser cutter use and maintenance
- Shop tools: Drill press, bandsaw, handbrake, etc

Other Instrumentation Training
- Brightfield, darkfield, dissecting, confocal, and laser scanning microscopy •
- Gas chromatography
- Fluorometer, plate-reader, other assorted 96-well instruments
- Standard hydrological field instruments including: time-domain reflectometer, water conductivity meter, pyrometer, acoustic Doppler flowmeter, hydrological sonde

CERTIFICATION & TRAINING	• General Class Amateur Radio License • EPA Pesticide applicator license	

LANGUAGES
- **English:** Native proficiency
- **Mandarin Chinese:** Bilingual-level working proficiency
- **Dutch**: Basic proficiency

HONORS & AWARDS

Belgian American Education Foundation Research Fellowship   July 2018 – June 2019
Belgian American Education Foundation
Yearlong all-inclusive fellowship to pursue intensive study of Belgium's
UNESCO-protected carillon culture at the Belgian Royal Carillon School
in Mechelen, Belgium.

Fulbright U.S. Student Researcher Grant (offered)   May 2018
U.S. Department of State
Award declined in order to accept the BAEF Research Fellowship

Diversity of Views and Experiences Fellowship   August 2016 – July 2017
University of Minnesota
Two-semester fellowship including tuition and stipend

2015 Plant Biology Student Excellence Award   May 2015
Cornell University Department of Plant Sciences

ACTIVITIES & INTERESTS

UMN Council of Graduate Students • Campanology and playing the carillon • Playing the organ • Building clocks • Baking bread • Hardware hacking • Amateur radio • Fountain pens • Failing at growing tomatoes indoors

REFERENCES

Dr. Peter Marchetto
Assistant Professor, Department of Bioproducts and Biosystems Engineering
University of Minnesota- Twin Cities
218 BioAgEng Building, 1390 Eckles Ave, St. Paul, MN 55208
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Dr. M. Todd Walter
Professor of Ecohydrology, Department of Biological and Environmental Engineering
Cornell University
Riley-Robb Hall, Cornell University, Ithaca, NY 14850
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Dr. Marc Fuchs
Associate Professor, Department of Plant Pathology and Plant-Microbe Biology Section
School of Integrated Plant Science, Cornell University
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Dr. Susan Henry
Professor of Molecular Biology and Genetics, Department of Molecular Biology and Genetics
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