Franz Johann Lichtner

719 Remsen Hall
Geisel School of Medicine
Dartmouth College
Hanover, New Hampshire

Franz.J.Lichtner@dartmouth.edu
(267)-614-6301
Citizenship: USA

## Education

Colorado State University
Department of Agricultural Biology
Fort Collins, Colorado
Doctor of Philosophy (PhD)
Plant Pathology 2018

Pennsylvania State University
State College, Pennsylvania
B.Sc. Biological Sciences 2009

## Research Experience

*2019-Present: Research Associate B*
Dartmouth College- Geisel School of Medicine
Molecular Systems Biology
Supervisor: Dr. Jay C. Dunlap
Postdoctoral Fellow performing bioinformatics and molecular biology of filamentous fungi.

- Fungal circadian clock regulation research
- Transcriptome wide analysis and statistical testing of targeted gene knockouts in fungi
- Transcription factor network modeling, neural network analysis with differential gene expression

*2018 - 2020: Fungal Geneticist*
USDA-ARS, Beltsville, MD
Supervisor: Dr. Wayne M. Jurick II
Postdoctoral Fellow performing bioinformatics and molecular biology of fungal diseases of fruit in cold storage.

- Whole genome assembly and annotation
- SNP calling and polymorphism detection across multiple whole genomes
- Molecular assay development and troubleshooting, SOP creation and revision
- Nucleic acid extraction, purification and sequencing
- Transcriptome, differential gene expression analysis
- Targeted fungal transformations (protoplast), construct design with selectable markers, southern blotting
- qRT-PCR, gel and capillary electrophoresis
- Manuscript and grant proposal preparation and submission

*2015 - 2018: PhD Candidate*
Colorado State University, Fort Collins, CO
Supervisor: Dr. Kirk Broders
PhD student focusing on fungal pathogens, post-harvest disease research, ecology and epidemiology in agricultural systems.

- Field scale inoculations of fungi, on cropping systems, isolated from endemic soils
- Quantitative measurements (qPCR, spore counting) of soil fungi
- Bioinformatics pipeline development, secondary metabolomics analysis (LC-MS and Q-TOF-MS)

- Statistical analyses
- Regression modeling of results in R
- Unix/Linux, Microsoft office environment expertise
- Grant proposal writing

*2012- 2015: PhD Student*
University of New Hampshire, Durham, NH
Supervisor: Dr. Kirk Broders
PhD student focusing on microbial community composition and dynamics, fungal pathogens, and epidemiology in agricultural systems.

- Next-generation sequencing with Illumina HiSeq (Soil microbiome)
- qPCR on soil 16S and ITS communities
- NGS library preparation and sample prep
- Comparative genomics of oomycetes
- Sanger sequencing
- Phylogenetic analyses

*2010 - 2012: Research Associate*
Walter Reed Army Institute of Research
Molecular Parasitology Research Lab in the Malaria Vaccine Development Division
Supervisor: Dr. Evelina Angov

- Protein purification
- DNA plasmid development
- Large-scale fermentation, cGMP
- ELISA
- Western blot
- Small mammal work
- *E. coli* /cell culturing

*2009-2010: Molecular Biology Technician*
Walter Reed Army Institute of Research
Viral Diseases Department of the Emerging Infectious Diseases Division
Supervisor: Dr. Cecily Washington

- Luminex Multiplex assay including PCR
- RNA extraction, cDNA creation
- RT-qPCR work and Affymetrix MicroArray assay experiments
- Bio Safety Level 2 training—viral pathogens and human samples

*2008-2009: Lab Technician*
Pennsylvania State University, State College, PA
Plant, Insect, and Disease Ecology Lab
Supervisor: Dr. Andrew Stephenson
Lab Technician determining whether cucumber beetles spread the bacterial pathogen *Erwinia tracheiphyla* through feces via the flower of the wild gourd, *C. pepo ssp. texana*.

- Inoculation/disease monitoring
- Data management

- qPCR
- DNA extraction

**Formative Experiences**

National Science Foundation – MicroTrop Fellowship 2014; Dakar, Senegal. Month long research and lecture course with leading tropical soil microbial biologists and ecologists from US, France, and Africa. French language skills required.

The Student Conservation Association – AmeriCorps at The Redwood National and State Parks for invasive plant species management. Orick, CA, directed by Stassia Samuels PhD.

**Publications**

**Lichtner, F.J**., Gaskins, V.L., Cox, K.D., Jurick, W.M.II. Global transcriptomic responses orchestrate difenoconazole resistance in Penicillium spp. causing blue mold of stored apple fruit. BMC Genomics 2020 *Under Review*

Jurick II, W.M., Peng, H., Beard, H., Garrett, W., **Lichtner, F.J.**, Luciano-Rosario, D., Macarisin, O., Liu, Y., Peter, K.A., Gaskins, V.L., Yang, T., Mowery, J., Bauchan, G., Keller, N.P., and Cooper, B. Blistering1 modulates *Penicillium expansum* virulence via vesicle-mediated protein secretion. Molecular and Cellular Proteomics. 2019 https://doi.org/10.1074/mcp.RA119.001831

**Lichtner, F.J**., Jurick II, W.M., Ayer, K.M., Gaskins, V.L., Villani, S.M., and Cox, K.D. *Venturia inaequalis* genome resource with multiple fungicide resistance phenotypes causing preharvest apple scab and postharvest pinpoint scab. Phytopathology. 2019 https://doi.org/10.1094/PHYTO-06-19-0222-A.

Wu G, Jurick II WM, **Lichtner F.J.**, Peng H, Yin G, Gaskins VL, Yin Y, Hua S-S, Peter KA, Bennett JW. Whole-genome comparisons of Penicillium spp. reveals secondary metabolic gene clusters and candidate genes associated with fungal aggressiveness during apple fruit decay. PeerJ 2019 7:e6170 http://doi.org/10.7717/peerj.6170

Lichtner F.J., Jurick, WM., Broeckling, C., Bauchan, G., Broders KD. A new Penicillium species from Colorado cropping soils that produces multiple metabolites and is antagonistic against postharvest phytopathogens. Frontiers in Microbiology 2020 *in prep.*

Lichtner F.J., Iriarte-Broders G, Smith R, Broders KD. Metagenomic analysis of microbial succession associated with a perennial forage crop across multiple landscapes. Phytobiomes 2020 *in prep*.

**Presentations & Talks**

2019 '-Omics'-Based Approaches to investigate Penicillium-Apple interactions. Invited talk at University of Wisconsin Madison, Nancy Keller's Lab.— Oral

2019 Genetic Society of America: Fungal Genetics Conference in Asilomar, CA—Transcriptomic analysis of resistant and susceptible isolates of *Penicillium expansum* to difenoconazole – Poster

2018 Southern Rocky Mountain Agriculture Conference — Integrated disease management of post-harvest pathogens in the San Luis Valley, grower options and research results. – Invited Speaker

2017 CSU San Luis Valley Research Center Field Day — Potato variety disease susceptibility testing under varied nitrogen rates as well as novel fungal bio-control efficacy. Center, CO – Oral

2017 American Phytopathological Society- Ecology and epidemiology of *Helminthosporium solani* and *Colletotrichum coccodes* on potato in the San Luis Valley of Colorado –Poster

2017 Soil Ecology Society – Ecology of temperate belowground fungi through ITS sequence analysis over four years in mixed successional perennial systems. Colorado State University, Fort Collins, CO –Poster

2016 Genomics of Adaptation to Human Contexts – Sudden Oak Death: human adaptation or evolution, a genomic inquisition of *Phytopthora ramorum*. Colorado State University, Fort Collins, CO –Oral

2016 Front Range Student Ecology Symposium- Soil Microbial Community Investigation. CSU, Fort Collins, CO –Oral

2015 Oklahoma State University Soil Biology Symposium- Soil microbial community investigation associated with *Lolium perenne* in northeastern United States. Oklahoma State University, Stillwater, OK –Poster

2014 American Phytopathological Society- Characterization of foliar pathogens infecting *Lolium perenne* in the northeastern U. S. Minneapolis, MN –Poster

2013 American Phytopathological Society- *Phytophthora ramorum:* a genome wide comparison of 11 isolates from the Pacific Northwest. Austin, TX –Poster

2012 American Society for Tropical Medicine and Hygiene:
**Passively Transferred *P. falciparum* MSP1P42- Specific Antibodies Mediate Protection Against Challenge with Blood Stages of *PF*MSP1P19 Transgenic *P. berghei* Parasites**
Elke S. Bergmann-Leitner[1], Heather Hosie[1], Franz Lichtner[1], Lorraine Soisson[2], Joe Cohen[3], Brendan Crabb[4], Christian Ockenhouse[1], Carter Diggs[5], Michele Spring[1], Tania de Koning-Ward[6], Evelina Angov[1]
*[1]Walter Reed Army Institute of Research, Silver Spring, MD, United States, [2]United States Agency for International Development, Washington, DC, United States, [3]GlaxoSmithKline Biologicals, Rixensart, Belgium, [4]The Macfarlane Burnet Institute for Medical Research and Public Health, Melbourne, Australia, [5]United States Agency for International Development, Washington, DC, United States, [6]Deakin University, Melbourne, Australia*

2011 American Society for Tropical Medicine and Hygiene:
**Vaccine Delivery Platform Impacts Inhibitory Antibody Cross-Reactivity of $MSP1_{42}$-Based Vaccine**
Heather Hosie, Elke S. Bergmann-Leitner, Pinto Valerian, Elizabeth Moran, Jessica Whittington, Narendranath Bhokisham, Franz Lichtner, Tim Alefantis, Paul Grewal, Vito G. DelVecchio, Evelina Angov
*Division of Malaria Vaccine Development, Walter Reed Army Institute of Research, Silver Spring, MD 20910; Vital Probes, Inc., Mayfield, PA. Division of Bacterial and Rickettsial Diseases, WRAIR, Silver Spring, MD*

2010 American Society for Tropical Medicine and Hygiene:
**Inactivated Escherichia coli Express Properly Disulfide-bridged *Plasmodium falciparum* FVO $MSP\text{-}1_{42}$ from Different Cellular Localizations**
Heather Hosie[1], Elke S. Bergmann-Leitner[1], Elizabeth H. Duncan[1], Liana Sherrod[1], Franz Lichtner[1], Zachary Tycz[1], Narendranath Bhokisham[1], Jessica Trichilo[2], …&, Tania de Koning-Ward[3], and Evelina Angov[1]
*[1]Walter Reed Army Institute of Research, Silver Spring, MD, United States; [2]Vital Probes, Inc., Mayfield, PA, United States; [3]Microbiology & Immunology School of Medicine*
*Deakin University Pigdons Road Waurn Ponds, Victoria, 3217 Australia*.

**Formal Acknowledgements**

**Strain-specific *Plasmodium falciparum* growth inhibition among Malian children immunized with a blood-stage malaria vaccine.** Laurens MB, Kouriba B, Bergmann-Leitner E, Angov E, Coulibaly D, et al. (2017) PLOS ONE 12(3): e0173294. https://doi.org/10.1371/journal.pone.0173294

**Temperature sensitivity of respiration differs among forest floor layers in a *Pinus resinosa* plantation**. Glenna M. Malcolm, Juan C. Lopez-Gutierrez and Roger T. Koide, Soil Biology and Biochemistry (2009) 41(6): 1075-1079

**Ectomycorrhizal fungi from Alaska and Pennsylvania: adaptation of mycelia respiratory response to temperature?** Juan C. Lopez-Gutierrez, Glenna M. Malcolm, Roger T. Koide and David M. Eissenstat New Phytologist (2008) 180**:** 741-744

## Awards/Funding/Submitted Proposals

2020 USDA NIFA Plant Health and Production Grant Submitted as co-PI
2019 USDA NIFA Colletotrichum Planning Grant co-PI ($60,000)
2018 USDA SBIR Funding Proposal with Revive Genomics (Doylestown, PA) – Submitted as co-PI ($100,000)
2017 Colorado Potato Administration Committee, Silver Scurf Research – Co-PI ($46,000)
2015 University Programs for Research and Scholarly Excellence Fellowship ($5000)
2014 NSF Fellowship MicroTrop Research Opportunity- Senegal, Africa
2012 Graduate Research Assistantship USDA OREI UNH
2008 Undergraduate Summer Discovery Grant, The Pennsylvania State University
2007 Eberly College of Science Travel Grant, The Pennsylvania State University
2007 The University of Leeds Travel Award Leeds, England.
2005 The Boy Scouts of America: Eagle Scout

## Teaching and Leadership

2016 Colorado State University- Elements of Plant Pathology, Teaching Assistant
2015 Colorado State University- Introductory Biology, Teaching Assistant
2015 Colorado State University- Front Range Student Ecology Symposium Organizer
2014 University of New Hampshire Department of Biology, Graduate Seminar Organizer
2012 University of New Hampshire- Mycology, Teaching Assistant