POST DOC POSITION
Department: Ag Botany / Plant Path (ABP)
Position Title: Postdoctoral Scholar
Job Title: Postdoctoral Scholar
Appointment Type: Academic Teaching/Research Faculty
Job Location: Corvallis, OR
Appointment Percent: 100
Appointment Basis: 12
Start Date: May 1, 2023 (Or as negotiated)
End Date: April 30, 2024
Notes on end date: 12-months after start date, may be extended for an additional three years
Notes on Full Consideration Date: Open until filled
Faculty Status: Post Doctorate
Tenure Status: Fixed-Term
Pay Method: Salary
Salary: $54,840

Project Abstract
The goal of this research is to investigate how endosymbiotic bacteria (EB) contribute to ecological community assembly and evolutionary diversification of early-divergent fungi in the phylum Mucoromycota. Mucoromycota are ubiquitous soil fungi with global distribution and immense ecological and economical significance. They include obligate plant mutualists (Glomeromycotina) as well as decomposers and root endophytes (Mucoromycotina and Mortiellomycotina). Mucoromycota-EB symbioses are highly coevolved, ancient, and functionally diverse. The understanding of how of and how EB shape global diversity of Mucoromycota is limited. To fill this knowledge gap, we plan to sample similar, physically isolated and leverage culture-independent approaches to test hypotheses concerning the roles of dispersal, abiotic and biotic filtering in shaping Mucoromycota communities. Further we plan to employ culture-dependent methods to evaluate therole of endobacteria in shaping Mucoromycota taxonomic diversification. We will integrate these data, allowing for inferences about the significance of EB in micro- and macroevolution of Mucoromycota. The objectives of the position are to support research on fungal bacterial interactions in the Botany and Plant Pathology Department at Oregon State University. This position will support the lab in **1)** Conducting field, lab and computational research projects on bacterial fungal symbioses; **2)** Culturing and sequencing microbial diversity including fungi and bacterial symbionts; **3)** Surveying the microbial communities through collecting and analyzing molecular data (i.e. DNA/RNA) **4)** Developing integrative approaches to study fungal bacterial interactions in *in vitro* (on plates in lab) and in green house studies in plant based interaction settings; **5)** Assisting in lab management, ordering materials, and training. **6)** Maintaining laboratory notebooks, protocols and reagents to maximize the efficient use of resources; **7)** Maintaining current knowledge of EHS & OSHA safety rules and ensure that all laboratory personnel are informed and aware of all rules and regulations; **8)** Generating and analyzing data and contributing writing to scientific manuscripts; **9)** provides educational and outreach activities to describe the research to the K-12 level education system in Oregon.

SUMMARY: This position will support the soil microbiology and ecology programs that **1)** surveys the microbial communities through collecting and analyzing field samples (i.e. soils and plant biomass); **2)** utilizes clearing and competition assays to evaluate the functional repercussions of fungal bacterial symbioses using transcriptomics, metabolomics, and proteomics; **3)** develops

integrative approaches to analyze several sources of genomics data sets; **4)** disseminates the research findings to the public and industries through extension action.

Minimum/Required Qualifications
Ph.D. in molecular biology, bioinformatics, microbial ecology, evolutionary biology, microbiology, or plant-fungal-bacterial interactions. Experience in computational biology, generating genomics data sets, programming preferably in Python and R, Mycology/Bacteriology/Microbiology coursework, field work, and expertise in ecological theory.

Preferred (Special) Qualifications
Strong writing skills and publication record, public speaking experience, working knowledge of Microsoft Office Programs such as WORD, EXCEL, and OUTLOOK, knowledge of pacific northwest flora, fungal bacterial interactions experimental design, and microfluidics.

Working Conditions / Work Schedule
Full time, on-site in Corvallis, with intermittent field work in California and South Africa.

Special Instructions to Applicants
When applying you will be required to attach the following electronic documents:
1) A resume/CV; and
2) 2 page Research Interest Statement
3) A cover letter indicating how your qualifications and experience have prepared you for this position.
4) You will also be required to submit the names of at least three professional references, their e-mail addresses and telephone numbers as part of the application process.
For additional information, please contact: Jessie Uehling at Jessie.Uehling@oregonstate.edu

This position requires driving a University vehicle or a personal vehicle on behalf of the University; therefore, the incumbent must successfully complete a Motor Vehicle History Check, possess and maintain a current, valid driver's license in their state of residence, be determined to be position qualified and self-report convictions as per OSU STANDARD 576-056-0000 et seq. Offers of employment are contingent up on meeting all minimum qualifications including the Motor Vehicle Check Requirement.

OSU commits to inclusive excellence by advancing equity and diversity in all that we do. We are an Affirmative Action/Equal Opportunity employer, and particularly encourage applications from members of historically underrepresented racial/ethnic groups, women, individuals with disabilities, veterans, LGBTQ community members, and others who demonstrate the ability to help us achieve our vision of a diverse and inclusive community.

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PROJECT ABSTRACT:
The goal of this research is to investigate how endosymbiotic bacteria (EB) affect virulence of their hosts and human fungal pathogens in the phylum
Mucoromycota. This position focuses on question 3 below and requires accountability for evaluating evolutionary questions using primarily computational population genomics approaches. Microbes in the soil are in an arms race, surrounded by friends and foes, that has been going on for millennia. The evidence of this is recorded in their genomes: individual organisms have evolved genetic tools to resist their enemies. There is also evidence of long-standing partnerships between microbes known as endosymbioses, where bacteria live inside fungal cells. Partnerships between bacteria and fungi can allow them to escape amoebae that prey on them in the environment. We hypothesize that the need for fungi and their resident endosymbionts to regularly escape predatory soil amoebae may enable fungal evasion of the phagocytic process. This project brings together three groups with unique expertise in endosymbiosis, fungal pathogenesis, and amoeba biology to investigate three questions:
1) How often do bacteria and fungi collaborate to avoid amoebae?
2) What are the mechanisms for this?
3) How do these partnerships impact the long-term evolution of the individual members, and the team?

POSITION DESCRIPTION:
The objectives of the position are to support research on fungal bacterial interactions in the Botany and Plant Pathology Department at Oregon State University. This position will support the lab in:
• Evaluating microbial pathogenic potential through collecting and analyzing computational molecular data (i.e., DNA/RNA)
• Developing integrative approaches to study fungal bacterial interactions in *in vitro* (on plates in lab) and *in vivo* utilizing phagocytosis assays
• Culturing and sequencing fungal and bacterial symbionts
• Conducting collaborative international field work, lab work, and computational research projects on bacterial fungal symbioses
• Assisting in lab management, ordering materials, and training
• Maintaining laboratory notebooks, protocols and reagents to maximize the efficient use of resources
• Maintaining current knowledge of EHS & OSHA safety rules and ensure that all laboratory personnel are informed and aware of all rules and regulations

• Generating and analyzing data and contributing writing to scientific manuscripts
• provides educational and outreach activities to describe the research to the K-12 level education system in Oregon

SUMMARY:
This position will support microbiological research that 1) surveys endosymbiont diversity in environmental and clinical Mucoromycota fungi 2) utilizes comparative evolutionary genomics to quantify the effects on fungi for hosting bacterial symbionts using genomics and transcriptomics; 3) develops integrative approaches to analyze several sources of genomics data sets; 4) disseminates the research findings to the public and industries through extension action.

MINIMUM REQUIREMENTS: Ph.D. in molecular medical mycology, bioinformatics, microbial ecology, evolutionary biology OR experience in computational biology, generating genomics data sets, programming in Python and R, Mycology/Bacteriology/ Microbiology coursework, field work, and experience isolating fungi from soils, animal tissues, and working with pathogenic fungi.

PREFFERED QUALIFICATIONS: Strong writing skills and publication record, public speaking experience, working knowledge of Microsoft Office Programs such as WORD, EXCEL, and OUTLOOK, biosafety level 2 or 3 training, fungal bacterial interactions experimental design, population genomics experience.

Working Conditions / Work Schedule
Full time, on-site in Corvallis

Special Instructions to Applicants
When applying you will be required to attach the following electronic documents:
1) A resume/CV; and
2) 2 page Research Interest Statement
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