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Investigator

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Post-doctoral positions: Plant Microbiome Research

Are you fascinated with how microbial communities assemble and function? Do the mechanisms of how successful commensal microorganisms manage the host innate immune system keep you awake at night? Are you keen to work with a diverse, international group of dedicated scientists on projects that can alter how we deploy the plant-associated microbiome in crops?

My lab is looking to recruit two new post-docs to our Plant Microbiome research team in 2023. Successful candidates will have expertise and success in one of the relevant areas noted below, as demonstrated by *first author* papers in highly ranked international journals. These positions are for at least three years. We especially encourage applications from women and under-represented groups.

Skills required: This project requires expertise with *one or more* of the following: large scale genomics and HT DNA sequencing technologies (Nanopore and/or Illumina), plant genetics, plant immune system biology, microbial ecology and evolution, comparative genomics, statistical genetics and familiarity with R, microbial community metabolic function; microbial and/or plant natural products, plant or microbial population genetics; root biology, and an appreciation for organizational skills that define success in this arena.

Send CV, brief letter of introduction stating why you are interested in joining the lab, and the names and contact information of three references to:

dangl@email.unc.edu

Plant associated microbiomes. Land plants grow in intimate association with complex microbial communities both above ground (phyllosphere) and below ground in the area immediately surrounding roots (rhizosphere) and inside the roots (endophytes). The relationships between a microbiota (the community of microbes intimately associated with a plant) and the host can vary from pathogenic to mutualistic or commensal, and can change in different environments. Rules governing the assembly of the root and phyllosphere microbiota have not been uncovered, but demonstrably exist and must operate in the face of the sophisticated plant immune system. The endophyte and phyllosphere metagenomes (the set of genes encoded by any particular microbiota) can provide the host plant with one or more critical nutrients, protection from plant pathogens, production of functional plant hormones, and tolerance to abiotic stress.

Our projects involve computational collaboration with and co-mentoring by Prof. Corbin Jones at UNC and various other groups. We work across natural and reduced systems to discover and dissect the causes and consequences of variation in plant microbiomes. We use next gen DNA/RNA sequencing to define root-associated microbiomes and to sequence metagenomes; we use plant and microbial genetics to define the loci that control assembly of specific microbial consortia, with a focus on how the beneficial members of the microbiome and plant immune system reach a functional detente; and we reconstruct increasingly complex synthetic communities of fully sequenced bacteria to uncover rules governing microbiome assembly. Emerging research themes in the lab include investigating the transition from commensal to pathogenic lifestyle, understanding how to derive strains that successfully invade and persist into existing communities and understanding how abiotic and biotic stress alters microbiome assembly and function, with an emphasis on drought.

Lab publications:
http://labs.bio.unc.edu/dangl/pub/index.htm
https://scholar.google.com/citations?user=IeBc5OsAAAAJ&hl=en

Mentoring and career development: Our lab is diverse; 10 scientists from 9 countries; 10 undergrads, 7 of whom are children of recent immigrants from 6 countries. We provide active mentoring and use career development plans to enhance post-doc training. Opportunities for teaching exist. Mentoring of undergraduate researchers is expected. Recent former post-docs are now faculty at universities and senior research leaders at Biotech companies around the world.

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