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THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

Yale University  
Assistant Professor Position  
Faculty Search Committee  
New Haven, CT

Dear Search Committee Members,

I am writing to express my interest in the recently advertised tenure track faculty position in Ecology and Evolutionary Biology at Yale. Please accept this letter and the accompanying materials as my application.

I am an evolutionary geneticist who is interested in understanding speciation and adaptation in natural plant communities. My research integrates quantitative genetic, population genomic, developmental, and experimental approaches to study the origin and persistence of species in nature. My dissertation research focused on dissecting the evolutionary drivers and genetic basis of one of the most common and important reproductive barriers in seed plants; hybrid seed inviability. During this work, I discovered a cryptic perennial species in one of the most widely studied plant models for evolution, ecology, and genetics; the *Mimulus guttatus* species complex. By leveraging natural variation in hybrid seed inviability between *M. guttatus* and the phenotypically cryptic *M. decorus*, I discovered that hybrid seed inviability has rapidly and repeatedly evolved in this group, and that patterns of hybrid seed inviability support a role of conflict between maternal and paternal interests in resource allocation to offspring (i.e. parental conflict) in generating this barrier. In addition, hybrid seed inviability is associated with nuclear, parent-of-origin effect loci, suggesting that divergence in genomic imprinting may underlie this barrier. In my postdoc, I use population genomics to understand the consequences of introgression in natural and synthetic hybrid zones to understand how environment, divergence between parents, and the types and extent of reproductive isolation influence introgression in both *Drosophila* and *Mimulus*. In my own lab, I plan to integrate population genomics with quantitative genetics and evolution to study speciation and adaptation in *Mimulus*. *Mimulus* is an exceptional system for the study of evolutionary genomics, as it offers tremendous ecological and genetic diversity, as well as excellent genetic and genomic tools and a rich natural history.

Yale is an ideal location to pursue integrative plant biology using *Mimulus* as a model system. Yale offer several resources which would facilitate my research, including modern greenhouses through the Marsh Botanical Garden, state-of-the-art microscopy and flow cytometry facilities through the Imaging and Flow Cytometry facilities on Science Hill, in-house sequencing services through the Yale Center for Genomic Analysis, fantastic computational resource via the Yale High Performance Computer Group, and the potential to perform nearby field experiments using the Peabody Natural Lands and Yale Forest. Together, these facilities would allow me to pursue a

holistic research program that integrates quantitative and population genomics, development, and common garden experiments to understand speciation and adaptation in the wild.

One of the most important resources that Yale offers is the exceptional group of colleagues that are positioned there. In my own future lab, I hope to build a collaborative and integrative research program, and I believe that Yale EEB would be an excellent place to achieve this goal. The EEB department, in addition to the MCDB Department and Plant Molecular Biology Program, are filled with world renown researchers doing cutting edge work related to my own. I feel that my knowledge and skillset as an evolutionary geneticist will compliment current members of these departments, while also allowing me to create a novel, and independent research program. As a member of this extraordinary group, I would be excited to collaborate with a number of faculty members, offering a unique perspective when I can, and learning from others' expertise in fields outside of my own.

Lastly, Yale offers an exciting venue for outreach and teaching opportunities. The natural diversity of Connecticut is a one-of-a-kind resource for bolstering excitement about the natural world and engaging students of all ages. I am excited about the opportunity to integrate field trips to the Marsh Botanical Gardens and Greenhouses, Peabody Museum, Yale Forest and nearby city and state parks into courses and workshops on evolution and genomics for both Yale students, as well as the general public. Bolstering excitement about the natural world and affording individuals of all background the ability to experience nature is an important step in diversifying STEM fields and providing equitable access to education. Outreach programs that center around natural resources can serve as an exceptional tool to introducing people to the natural world. The university's commitment to diversity is of utmost importance to me, and designing outreach programs and university courses that cater to people of all backgrounds is a goal I strive for.

I enclose a copy of my CV, research statement, a teaching statement, statement on my commitment to diversity, inclusion, and equitable access to education, and three representative manuscripts. John Willis ([jwillis@duke.edu](mailto:jwillis@duke.edu), Duke University), Daniel Matute ([dmatute@email.unc.edu](mailto:dmatute@email.unc.edu), University of North Carolina, Chapel Hill), and Mohamed Noor ([noor@duke.edu](mailto:noor@duke.edu), Duke University) are willing to write me letters of support for my application. Thank you for your consideration, and I look forward to your response.

Sincerely,  
Jenn Coughlan, PhD  
University of North Carolina, Chapel Hill

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