My research interests encompass plant evolution, community ecology, conservation and ethnobotany. The versatility of phylogenetics in elucidating plant evolutionary relationships, understanding the mechanisms that have produced current plant distributions, as well as its application in community ecology and herbal medicine make it indispensable to my research. The diversity of my research projects also makes it easy for students to find a project that will suit their own interests, from basic biological research as plant evolution to something more applied, such as herbal medicine.

***Community Ecology of Philippine Forests.*** In collaboration with the Smithsonian's Center for Tropical Forest Science (CTFS) we have collected DNA barcodes from tree species in the 16-hectare Palanan Forest Dynamics Plot to facilitate taxonomic identifications. We are also using these barcodes to reconstruct the community phylogeny to better understand what shapes community ecology and assembly in this Philippine lowland forest constantly beleaguered by typhoons. Ecological traits such as habitat associations may be explained by the community phylogeny, and future students can participate in this, using bioinformatics and ecological analyses on the data that we have already collected.

***Biology of Philippine Rafflesia.*** The panda of the plant world—*Rafflesia* is found only in the forests of tropical Southeast Asia, with Philippines as the seat of diversity. *Rafflesia* produces the biggest flowers in the world, but it is a parasite, bereft of stems, roots nor leaves, solely feeding off the tropical grapevine *Tetrastigma*. *Rafflesia* is the first plant we know of to have ditched its chloroplast genome (Molina et al. 2014, *Mol. Biol. Evol*.) that supposedly defines all plants, prompting Science News to ask, “When is a plant no longer a plant?”. Given the endangered status of *Rafflesia,* I am also working with the US Botanic Garden to propagate Philippine *Rafflesia* for ex situ conservation (Molina et al. 2017 *Sibbaldia*). With recent funding from NSF, this would be a great opportunity for students to learn more about the enigmatic biology of this evolutionary marvel.

***DNA Barcoding and Ethnobotany of Herbal Medicines.*** The confluence of diverse immigrant cultures in New York City and the accessibility of many of their traditional herbal medicines make this city an interesting venue to understand the dynamics of urban ethnobotany. Increased demand for these alternative medicines and lack of oversight from the US Food & Drug Administration (FDA) encourages unscrupulous herbal substitutions that may be revealed by DNA barcoding, which I have been conducting in my lab to validate herbal products sold in the US (Michel et al. 2016, *JARMAP*). The methodology is simple and cheap, that it can be a great way to involve high school students and interest them in molecular biology and research, while crowd-sourcing pharmacovigilance (Molina et al. 2018 *Open Life Sci.;* [*https://www.cshl.edu/high-schoolers-reveal-fraudulent-herbal-medicines/*](https://www.cshl.edu/high-schoolers-reveal-fraudulent-herbal-medicines/)*)*. Borrowing techniques from community phylogenetics, I am also exploring phylogenetic patterns in traditional herbal medicine use that may guide drug discovery efforts (Xavier and Molina 2016, *J. Herb. Med.;* Alrashedy & Molina 2016, *PeerJ*; Guzman & Molina 2018; Prasad et al. 2019). An outlier in my Philippine-based research projects, but nonetheless important, my growing interest in ethnobotany is driven by its importance in drug discovery, and the role of phylogenetics in uncovering novel drug sources.