

FYRE First Year Research Experience

Richard Moore in Botany is looking for First Year students to become part his research projects through the new FYRE program.

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Botany FYRE- STEM

More information about on going projects on Richard's web site

<http://www.cas.muohio.edu/botany/bot/rmoore.html>

Relevance of our research

As an evolutionary geneticist I combine the fields of genomics, developmental genetics, and molecular biology to discern the molecular mechanisms underlying the origin and evolution of morphological diversity. While I use plants as my model system, the evolutionary genetic questions that I focus upon are of relevance to all organisms. Specifically, I am interested in the origin and evolution of sex chromosomes and the origin of morphological diversity via the process of gene duplication. We address these questions at the level of the gene and genome, and the skills and techniques that we utilize are common to many fields of molecular research, regardless of the model system, be it plant or animal.

The evolution of plant sex chromosomes

Unlike the sex chromosomes of humans, most plant sex chromosomes are of recent origin. In particular, those of tropical fruit crop, papaya, are some of the youngest in the plant kingdom. By analyzing the patterns of variation and divergence of sex-linked genes in papaya we hope to learn more about the evolutionary forces which govern the initial stages of sex chromosome evolution.

Techniques used: PCR, DNA sequencing, computer analyses

The evolution of recently duplicated genes

Gene duplication is a fundamental mechanism by which new genes are added to all genomes. We are interested in understanding the functional diversification and evolutionary forces governing the establishment of recent gene duplicates in genomes. We use the plant version of the fruit fly, *Arabidopsis thaliana*, as our model system for genetic and functional analyses. Techniques used: PCR, DNA sequencing, RNA expression analysis, functional analysis of mutants