“Macroevolutionary dynamics of form and function in vertebrate radiations: lessons from the adaptive diversification of cichlids and bats “

The diversity of form and function is unevenly distributed across the tree of life. While this pattern can be generated under neutral processes (e.g., greater accumulation of diversity in older clades), it may also be driven by changes in how clades diversify. Within my research, I focus on 1) how changes in the tempo and mode of evolution can drive patterns of modern morphological diversity, and 2) whether such changes are linked to ecological adaptation. I highlight the results of research projects in bats and Neotropical cichlid fishes, two widely distributed groups showing exceptional ecological diversity. I use phylogenetic comparative methods to bring together evolutionary trees, as well as morphological and functional trait data from dissections, histology and CT scanning to test macroevolutionary models of trait diversification. I find that trait evolution may be modulated by ecological opportunity (the availability of niches). However morphological evolution tied to dietary, sensory and behavioral adaptations may impact the diversification of radiations at different times, and in different ways across associated anatomical structures.