

NON-TECHNICAL ABSTRACT: *(State in layman's terms the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project.)*

Birth defects remain a significant cause of morbidity and mortality throughout the world. Most of these affect development during the first three months of pregnancy, and their causes are largely unknown. To better understand the basic mechanisms of organ development in embryos, we use the model organism *Drosophila melanogaster* (fruit fly). The *Drosophila melanogaster* salivary gland has been used extensively to study organ development. Previous work in our lab and others' has identified many of the genes involved. Our current studies will help to connect these genes into a coherent network that links early signaling to later cell migration and differentiation. The high degree of conservation among animals suggests that the interactions we discover will be shared in common with other organisms including humans, and may provide a better understanding of the genes involved in early organ development that can serve as novel targets for therapies.