MicroRNA pathways and their role in aging and neurodegeneration in *Drosophila.*

By: Dr. Geetanjali Chawla

Abstract:MicroRNAs(miRNAs) are a class of small non-coding RNAs that usually function by silencing complementary target messenger RNAs (mRNAs) to regulate a number of biological processes. A number of human diseases including late onset neurodegenerative disorders and cancer are associated with aberrant expression of microRNAs and molecules that alter the function or abundance of miRNAs are emerging as potential therapeutic agents to treat diseases. My work has focused on the regulation and functional analysis of a highly conserved cluster of three miRNAs encoded by the *let-7-Complex (let-7-C)* locus. Using the fruit fly model system, I have shown that the miRNAs (*miR-100, let-7* and *miR-125*) encoded by *let-7-C* are regulated at both transcriptional and post-transcriptional levels. Functional analysis of this cluster of miRNAs in adults has established a role for *let-7* and *miR-125* in aging and maintenance of long-term neuronal integrity. More recently, I have been addressing the role of these miRNAs in caloric/dietary restriction-a nutrient intervention that extends healthy lifespan and delays late onset diseases in diverse species. These studies have identified miRNAs that are regulated by dietary restriction and has opened up the possibility that miRNAs can function as dietary restriction mimetics.