

Characterization of DmNAT2 in *Drosophila melanogaster*

Olivia Corradin

Marquette University

Mentor: Dr. Edward Blumenthal

DmNAT2 is in a family of genes that encode nutrient amino acid transporters. The function of this gene has not yet been determined. A mutant lacking five or six genes including DmNAT2 displayed an inability to lay eggs that was rescued by feeding the flies octopamine or tyramine. This led to the hypothesis that DmNAT2 is a potential neuronal tyrosine transporter necessary for octopamine synthesis.

My goal was to create genetic tools to characterize the function of DmNAT2. A transgene was made with 2100bp of the DmNAT2 promoter and a vector containing GAL4 coding sequences. This will be used to determine where the gene is expressed. Another transgene was constructed with the cDNA of DmNAT2 behind an Upstream Activating Sequence (UAS) promoter. This will be used to drive expression of DmNAT2 in specific tissues of the flies. Transgenic flies are currently being raised.

Egg laying assays were conducted to determine if DmNAT2 is necessary for egg laying. The egg laying ability of flies with a smaller deficiency including DmNAT2 was measured. In addition, lines of flies with a UAS-DmNAT2 RNAi transgene were crossed with Actin-GAL4 lines to knock down expression of DmNAT2 in all tissues. All of these flies displayed the ability to lay eggs. Real time PCR is being conducted to determine the efficiency of RNAi in knocking down expression of DmNAT2. Also, overall egg laying was low so this experiment will be repeated with younger progeny. It is still unclear if DmNAT2 is a neuronal tyrosine transporter or if it is necessary for egg laying.