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Eaat1 and Sleep in the Fruit Fly *Drosophila melanogaster*

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The biological mechanisms of sleep are poorly understood. Recent research has suggested that glial cells, the non-neuronal cells of the brain, play a role in regulating sleep behavior. My research is focused on the glial protein Eaat1, which seems to affect sleep by regulating glutamate signaling between neurons. To examine this relationship, I measured the sleep patterns in flies in which the expression of Eaat1 was altered. This was done using our video based system DART and the infrared beam DAM system at Paul Shaw's lab at Washington University. Currently, we have measured the sleep of over three hundred flies using these systems. Preliminary analysis has confirmed that Eaat1 is associated with irregularities in sleep. I am working on setting up programs that will analyze the data in a more sophisticated way and allow us to describe the changes in sleep behavior more precisely. I am also creating genetic crosses to decrease Eaat1 expression in more specific groups of cells. After that, the next steps will include analysis of Eaat1 mutants, imaging of Eaat1 at synapses, and targeted reduction of glutamate release in neurons associated with sleep.