1145-92-1151 **Cassandra L Williams*** (`williamc18@hawkmail.newpaltz.edu`), 6 Hollyberry Drive, Hopewell Junction, NY 12533, and **Anca Radulescu** and **Annalisa Scimemi**. *Revising estimates of glutamate transporter density in astrocytes: a geometric computation.*

Glutamate is the main excitatory neurotransmitter released in the brain. Its removal from the extracellular space is important to terminate synaptic transmission between neurons, and prevent build-up of neurotoxicity. The removal process is intermediated by non-neuronal cells called astrocytes. These take in the excess extracellular glutamate via prism-shaped cross-membrane transporters densely expressed in the wall of the cell membrane. To understand their impact on neurotransmission efficiency, one needs to estimate the density of transporters for an average astrocyte. All existing computations are based on simplifying assumptions of spherical shape for a typical astrocyte. However, the actual, 3-dimensional fractal geometry of an astrocyte may drastically reduce this number, since cross-membrane transporters cannot collide. We use a geometric modeling argument, based on the known crystal structure of the transporter, to study how the structural complexity of astrocytic processes influences the surface density of transporters. We then use Monte Carlo reaction-diffusion simulations to determine whether these theoretical estimates challenge our knowledge of how glutamate transporters shape efficiency of synaptic transmission. (Received September 19, 2018)