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**Selective pruning of mushroom spines in the ventrolateral thalamic relay nucleus of the female mouse during adolescence**

Adolescent synaptic pruning is critical for proper neurodevelopment and is mediated by α4βδ GABAA receptors (GABAAR) in the hippocampus. The thalamic relay nuclei express high levels of α4βδ GABAARs but synaptic pruning has not yet been investigated in this CNS region. Therefore, I investigated whether synaptic pruning occurs in the ventrolateral (VL) relay nucleus of the female mouse thalamus during adolescence. Our lab was interested in looking at the VL nucleus since it projects to layer 5 of the primary motor cortex (M1) where we have shown α4βδ GABAAR-mediated synaptic pruning, which was selective for mushroom spines on the proximal dendrites of female mice. Male mice did not exhibit this selective pruning. Golgi staining was used to assess spine density/types in each group from z-stack projection (0.3 μm) photomicrographs taken with a Nikon DS-U3 camera mounted on a Nikon Eclipse Ci-L microscope using a 100x oil objective. Spine density across the dendrites of multi-polar excitatory neurons in the VL relay nucleus of the thalamus (proximal and distal segments) was compared using pubertal and post-pubertal (~P35, assessed by vaginal opening, vs. P56) female mice. In the multi-polar excitatory neurons of the VL relay nucleus of the thalamus, no general synaptic pruning was observed (P35=0.324±0.022 spines per 10 μm, P56=0.359±0.022, P>0.05), and in the proximal region, there was a significant increase of spine density (P35=0.092±0.01 spines per 10 μm, P56=0.137±0.012, P<0.05). However, in the distal region of the dendrite, there was selective mushroom spine pruning (P35=0.098±0.012 spines per 10 μm, P56=0.064 ±0.0091, P<0.05). These results indicate that selective pruning of mushroom spines occurs in VL thalamus of the female mouse during adolescence. Thus, the next step would be characterizing whether or not this pruning occurs in α4 knock-out mice to determine whether α4βδ GABAARs mediate this event as shown in other CNS areas.