Beitrag ID: **15** Typ: **talk**

Tissue Interactions During Sensory Neurite Remodeling

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Neurite pruning and regrowth are conserved developmental processes in which neuronal networks undergo refined changes in connectivity and morphology, which are required for the formation of the adult nervous system. We use Drosophila Class 4 dendritic arborization (C4da) neurons to investigate neuronal remodeling, since they eliminate their dendrites by specific degradation (pruning) in early pupal stages and subsequently regrow new adult specific dendritic arbors. But which permissive and/or instructive signals lead to the start of the C4da dendrite regrowth program? C4da neurons extend their dendrites underneath the epidermal layer of the body wall, with epidermal cells undergoing remodeling in a similar timeframe, including the apoptosis of larval epidermal cells (LECs) while adult epidermal cells start proliferating and replace the larval epidermis, leading to massive changes in the tissue environment. Here, we investigate whether epidermis remodeling needs to be finished before C4da dendrite regrowth can actively start, by establishing a live imaging method in which neuronal and epidermal remodeling processes could be visualized simultaneously in a high temporal manner. We also investigate whether impaired epidermal remodeling has an impact on C4da dendrite regrowth by inhibition of larval epidermal cell (LEC) apoptosis. Moreover, we use tissue specific RNAi knockdown of promising candidate genes to identify involved factors in the mechanism activating the dendrite regrowth program. Preliminary results show that active regrowth of C4da neuron dendrites starts after epidermis remodeling is finished and the tissue becomes static again, meaning that tissue movements have mostly subsided, suggesting that these tissue mechanics could inhibit dendrite regrowth. While the inhibition of epidermis remodeling by prevention of LEC apoptosis seems to have negative effects on C4da dendrite regrowth we could also show that the transmembrane receptor Ret might be a key player involved in the dendritic regrowth process.

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