SPP 1757

Molecular mechanisms and functional implications of heterogeneity in myelin structure

Speaker:

Professor Dr. Mikael Jakob Simons
Technische Universität München
Institut für Zellbiologie des Nervensystems

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Project description:

Heterogeneity of oligodendrocyte morphology was already described by Del Rio Hortega in 1928. However, it has so far not been able to refine the concept of oligodendrocyte heterogeneity and to associate these various oligodendroglial subtypes with different functions. In this proposal we plan to analyze whether subtypes of oligodendrocytes generate myelin with different structural and functional properties. We propose that there are fundamental differences of how the uncompacted areas containing - cytoplasmic channels - are organized in myelin of axons with different calibres. Our central hypothesis is that these cytoplasmic channels provide tracks for molecular transport and therefore determine whether myelin is able to actively support axons. The molecular organization and the mechanism underlying the biogenesis of the channels will be addressed. In addition, the ultrastructure of the cytoplasmic channels will be analyzed after myelin damage and subsequent remyelination. Overall, we plan to use an integrative approach by combining advanced electron microscopy, genetics and cell biology to gain insight into how heterogeneity is generated in a complex membrane architecture. If successful the project may also provide new data relevant for our understanding of the pathogenesis of progressive multiple sclerosis.

Quelle:
https://gepris.dfg.de/gepris/projekt/254848210