



Joint guest lecture of the  
Philipps-Universität Marburg and  
Max-Planck-Institute for Heart & Lung Research

24<sup>th</sup> of November 2016

Guests are welcome

**BENJAMIN PODBILEWICZ**  
Technion – Israel Institute of Technology

## “Neuronal fusion and regeneration during aging”

In developed countries, aging is the single biggest risk factor for ischemic stroke and neurodegenerative disorders. Aging neurons change their morphology and show a decline in regenerative potential. Unlike axons, the fate of dendritic trees during aging has not been studied in detail in any organism. We use the complex dendritic trees of polymodal mechanosensory PVD and FLP neurons of *C. elegans* as a paradigm to study morphological and functional alterations of dendrites during aging. We found that young larvae and 1-day adults have organized dendritic trees, but 5-day old adults have disorganized and hyperbranched structures. EFF-1 in the PVD simplifies the architecture of dendritic trees independently of the insulin/IGF-1 pathway. While young animals could regenerate their dendritic trees via auto-fusion, there was a progressive age-dependent loss of regenerative potential. We found that AFF-1, a paralog of EFF-1, mediates regeneration of severed dendrites in a cell non-autonomous mechanism. Thus, ectopic expression of EFF-1 and AFF-1 fusion proteins in aging neurons could differentially rejuvenate their dendritic trees: EFF-1 maintained dendrites young-looking, whereas AFF-1 promoted their ability to fuse and reconnect following injury. Our findings could have implications for treatment of stroke, spinal cord and brain injuries.

5:00 pm  
Fachbereich 17  
Großer Hörsaal



Max-Planck-Institut  
für Herz- und Lungenforschung  
W.G. Kerckhoff-Institut

