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Pressemitteilung

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ERC Consolidator Grant awarded to Professor Robert Fledrich for his research on nerve disorders

Robert Fledrich, neuroscientist and professor at the Institute of Anatomy at Leipzig University's Faculty of Medicine, has been awarded an ERC Consolidator Grant by the European Research Council (ERC) for his scientific work on the regeneration of the peripheral nervous system. This highly endowed grant of around 2 million euros is one of the most prestigious awards for researchers in Europe.

Professor Fledrich's research focuses on diseases of the peripheral nervous system. In addition to acute nerve damage, such as that caused by cuts or accidents, he also investigates chronic nerve diseases that occur as a result of metabolic diseases such as diabetes. Curative treatment options for these so-called neuropathies are not available, mainly because the underlying disease mechanisms are still poorly understood. However, unlike the brain and spinal cord, peripheral nerves have considerable regenerative potential, which may hold promise for new therapies.

The NervAdapt project, now funded by the European Research Council, is investigating the conditions required for successful nerve regeneration. "Complete repair is only possible when damaged nerve tissue is broken down and rebuilt by the cells involved. Glial cells play a crucial role, as they must overcome significant metabolic challenges to coordinate the regeneration process," says Professor Fledrich.

Recent studies by Fledrich's research group show that glial cells have to specifically adapt their metabolism after injury and ramp up energy production in their mitochondria. To make this metabolic adjustment, glial cells communicate with a variety of other cell types, including macrophages and cells from the surrounding adipose tissue. "The observation that signals from neighbouring cell types can influence the energy balance of glial cells has far-reaching implications. Firstly, it paves the way for exploiting the energy balance of glial cells as a new therapeutic target for acute nerve damage. However, receptivity to metabolic signals also shows that faulty signals, such as those generated in metabolic diseases, could become a problem for glial cells. In fact, obesity or diabetes is associated with a significant change in the circulation of metabolic signalling molecules such as leptin or insulin in the bloodstream. It is possible that continuous stimulation of glial cells may not be tolerated in the long term and may be the cause of slowly progressive nerve dysfunction. In fact, half of all people with diabetes develop neuropathy during the course of the disease. It is not yet curable," says Professor Fledrich.

The NervAdapt project therefore aims to investigate the relationship between the regeneration potential of damaged nerves, the communication of the cell types involved and their metabolic dynamics in a conceptually novel way. By targeting cellular metabolism and communication pathways using genetic manipulation in mice, Professor Fledrich hopes to find new therapeutic approaches for neurological diseases that are currently virtually untreatable. The ERC funding now provides this important research project with the necessary resources to answer fundamental questions about the regeneration of the peripheral nervous system.

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About Professor Fledrich: Robert Fledrich studied biology in Göttingen, Germany, where he completed his doctorate in neuroscience at the Max Planck Institute for Experimental Medicine in 2014 and subsequently worked as a postdoctoral researcher. In 2018, Robert Fledrich moved to Leipzig University with a prestigious Emmy Noether fellowship from the German Research Foundation, where he has since led a research group at the Institute of Anatomy in the Faculty of Medicine. In 2023, he was appointed Professor of Neuroanatomy at the Leipzig Institute of Anatomy.

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