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MPI-NAT SEMINAR SERIES

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The search for cell-intrinsic mechanisms of developmental tempo

Understanding the rules that determine how cells and organisms can precisely initiate and terminate processes at specified times and how do they modulate the rate at which they tick will help us explain when processes go awry, for example in tissue overgrowth or deficits. Moreover, differences in timing (heterochronies) are a major driver for evolutionary change. Although cellular and molecular mechanisms controlling developmental processes are often evolutionarily conserved, the speed at which these operate can vary substantially between species.

Work in the lab aims to identify the molecular mechanisms that determine the pace of biological processes. Previously, we developed equivalent stem cell differentiation models to spinal cord motor neurons and showed that differences in tempo between species can be recapitulated *in vitro*. We provided evidence that this is not due to differences in signalling, nor the sequence of genes or their regulatory elements. Instead, we find an approximately two-fold increase in protein stability in human cells compared to mouse and this can account for the slower pace of human development (Rayon et al., *Science* 2020). We are now taking these findings forward to establish a causal link between protein stability and developmental timing. In addition, we are using mouse diapause as a physiological system to investigate modulation of developmental rate.

Thursday, 18.04.2024, 13:00

Host: Melina Schuh / Jochen Rink



Large seminar room
Fassberg Campus

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