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INM COLLOQUIUM

"CIRCADIAN CONTROL OF THE SECRETORY PATHWAY IS A CENTRAL MECHANISM IN ECM HOMEOSTASIS"

Prof. Dr. Karl E. Kadler
The University of Manchester, UK

Tuesday, January 29, 2019, 11.00 Uhr

INM, Campus D2 5, Leibniz-Saal
Host: Prof. Dr. Aránzazu del Campo

Extracellular matrix (ECM) fibrils containing collagen-I provide essential life-long support and protection for cells but the cellular and molecular mechanism for their maintenance is unknown. Here we show 24-hour rhythms in collagen-I synthesis and degradation, fibril network remodeling, and tissue biomechanics that are essential for ECM maintenance. Timed-series transcriptomics showed circadian clock regulation of genes encoding endoplasmic reticulum (ER) and Golgi proteins. Unsupervised principle component analysis of timed-series proteomics identified clustering at dawn and dusk. Sec61a2 (translation), Tango1 and Pde4d (Golgi transport), Vps33b (post-Golgi transport), and Ctsk (collagen degradation) are sequentially rhythmic. An ODE model of the secretory pathway predicted collagen accumulation with an arrhythmic secretory pathway, which were subsequently confirmed in mice and cultured fibroblasts in which the circadian clock had been genetically disabled. Our studies suggest that a rhythmic secretory pathway is a central mechanism in collagen homeostasis.

You are invited to have coffee with the speaker 15 minutes before the talk starts.

KONTAKT

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