

MPI-NAT SEMINAR SERIES

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Novel RNA regulators of acetylcholine signals

Acetylcholine (ACh) is known as a neurotransmitter for over a century, but how it regulates brain-to-body signaling is still puzzling. Recently, we discovered that small transfer RNA- derived fragments may be causally involved. Short RNA-sequencing revealed altered levels of such short "Cholino-tRFs", that can bind complementary motifs in the 3' untranslated region of mRNA targets and modulate inflammation and stress similarly to microRNAs (miRs). In blood cells from ischemic stroke patients, we identified a 'changing of the guards' process that replaces Cholino-miRs by Cholino-tRFs and may avoid post-stroke infections. In the nucleus accumbens of Alzheimer's disease patients, we found depletion of mitochondrial- originated CholinotRFs that reflects women-specific acceleration of cognitive deterioration; and Parkinson's disease brain, cerebrospinal fluid and blood share consensus motif tRFs whose accumulation is suppressible by deep brain stimulation, precedes disease-related blood protein biomarkers and accompanies the disease-characteristic cholinergic- dopaminergic imbalance. Cholino-tRFs hence merit special attention.

Monday, 09.10.2023, 17:00

Host: Fritz Eckstein & Nils Brose





