

SCIENTIFIC SEMINAR



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Molecular genetic analysis of *Teashirt-1* function in the mammalian nervous system

The mammalian gene *Tshz1*/TSHZ1 encodes a zinc finger homeodomain transcription factor, one of three members of the vertebrate *Teashirt* family. The ancestral gene was likely similar to *tiptop* (*tio*), which is a homologue of *Drosophila* *teashirt* (*tsh*), a homeotic and segment polarity gene essential for fly development. Both *tio* and *tsh* encode proteins with three atypical zinc fingers shared with the vertebrate *Teashirt* homologues. My group has previously generated classical and conditional mutations in all three murine *Tshz* genes. Our analyses have revealed important roles for *Tshz1* in the development, radial migration and maturation of olfactory bulb granule cells and subsets of periglomerular cells and related these deficits to hyposmia in humans carrying heterozygous TSHZ1 mutations. Roles for *Tshz1* in amygdalar development as well as in phrenic and hypoglossal motoneurons were revealed using further conditional mutants. My talk will review the functions of *Tshz1*/TSHZ1 in the mouse and human nervous systems, and then demonstrate, through collation of ChIP-seq data from the ENCODE consortium, that the human TSHZ1 protein binds subsets of genomic alternating purine pyrimidine sequences (aRYs) as well as some other sites that comprise distinct repeat elements. aRY sites bound by TSHZ1 occur in a set of genes implicated in nervous system development and function, including *RBFOX2*, *TSHZ2*, *CDC42EP4*, *ZFH3* and *MEIS2*. Evidence for a gene regulatory network controlled in part by TSHZ1 and aRY elements, whose functions may also encompass switching to a left-handed Z-DNA configuration (flipons), will be discussed.

Tuesday, 21.01.2025, 11:00 a.m.

Hosts: Donna & Thomas Jovin, Jochen Rink



MPI-NAT Fassberg Campus
Seminar Room T5/1st floor

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