

Rotation projects available

Alzheimer's disease and traumatic brain injury

We are testing how circular RNAs from the microtubule associated protein tau locus are generated, by determining cis and trans factors for their generation (cis: Alu elements, sequences with complementarities; trans: cellular stress, kinases, RNA editing enzymes). This work is applied in a zebrafish model for traumatic brain injury.

Techniques involved: **Gibson cloning, RT-PCR, cell culture, Riboseq, cell/brain fractionation.**

Welden JR, van Doorn J, Nelson PT, Stamm S. The human MAPT locus generates circular RNAs. *Biochim Biophys Acta Mol Basis Dis.* 2018;2753-60. PubMed PMID: 29729314.

The project is funded by the Department of Defense and NIH until 2023 and suitable for a Ph.D project.

Prader-Willi syndrome: Obesity and Hyperphagia

The lab studies the molecular basics of the Prader-Willi Syndrome, to most frequent genetic form of hyperphagia and obesity. It is now clear that the loss of small nucleolar RNAs located in the PWS critical region on Chromosome 15 is the cause of the disease. We showed that these RNAs function in pre- mRNA processing and discovered a new class of non-coding RNAs.

The rotation project will identify new target genes for these snoRNAs, determine their processing and analyze their composition. In addition, we test an oligonucleotide for its ability to stop mice from eating using wild-type and hyperphagic mice. **Techniques include RNase protection analyses, RT-PCR, cell culture, transfection, mouse work and bioinformatics approaches.**

The project is funded by the Binational Science Foundation until 2022 and is suitable for a Ph.D. project.

References:

Kishore, S., and Stamm, S. (2006). The snoRNA HBII-52 regulates alternative splicing of the serotonin receptor 2C. *Science* 311, 230-232.

REVIEW: Falaleeva M, Stamm S. Processing of snoRNAs as a new source of regulatory non-coding RNAs: snoRNA fragments form a new class of functional RNAs. *Bioessays.* 2013 Jan;35(1):46-54

Falaleeva M, Pages A, Matuszek Z, Hidmi S, Agranat-Tamir L, Korotkov K, Nevo Y, Eyras E, Sperling R, Stamm S. Dual function of C/D box snoRNAs in rRNA modification and alternative pre-mRNA splicing *Proc Natl Acad Sci U S A.* 2016;113(12):E1625-34. PubMed PMID: 26957605.

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