University of Zurich[UZH]

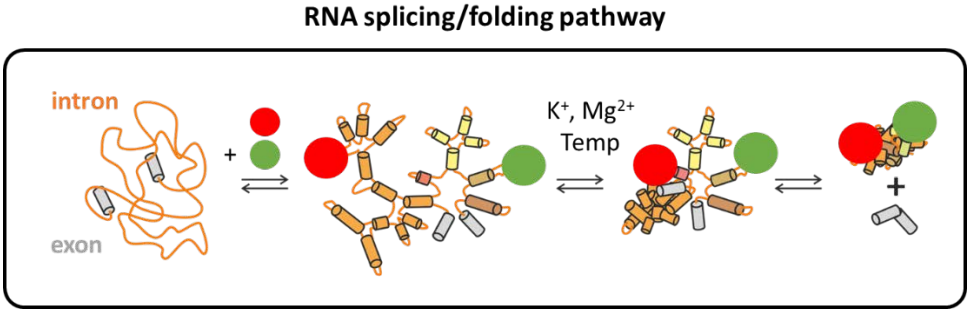
Department of Chemistry

Research project / Master thesis: Ribozymes investigated by single-molecule FRET

The following project is conducted at the laboratory of Prof. Dr. Roland K.O. Sigel at the Department of Chemistry, University of Zurich, and will be supervised by Dr. Susann Zelger-Paulus.

Description

Our focus lies on the visualization of the splicing process of a catalytic RNA that takes place during RNA maturation. The RNA of interest is the group II intron Sc.ai5γ originated from S. cerevisiae. It folds into a defined three-dimensional structure while at the same time actively inducing its self-cleavage from the precursor mRNA. Both processes, splicing, and folding are inextricably linked with each other and highly depend on the environmental conditions, like crowding, salt concentration, and temperature or helper proteins. The project comprises investigations about the chaperone-RNA interaction in a salt- dependent or crowding dependent manner. For that purpose, the RNA is fluorescently labeled and its folding is followed on a single-molecule level by applying single-molecule Förster Resonance Energy Transfer (FRET). Thereby we are applying recently established labeling and immobilization techniques. In this way, we want to understand the transition of an inactive partially folded ribozyme towards its cleavage competent fold on a single-molecule level. Please find more information on our group's website.



Steiner, et al., *Proc Natl Acad Sci USA*, 2008., Bishnu, et al., *Proc Natl Acad Sci USA*, 2018.

We look for

A motivated student who is interested in working in the field of RNA biology combined with biophysics.

We offer

You will work in an international and truly interdisciplinary team of chemists, biochemists and physicists. In addition, you will discover the profound intellectual appeal of single-molecule spectroscopy, which is at the forefront of biophysical research. The starting date will be mutually agreed upon.

Application / Contact Details

If you are interested or have further questions about the project, please contact Dr. Susann Zelger-Paulus: susann.paulus@chem.uzh.ch.

November 2019