



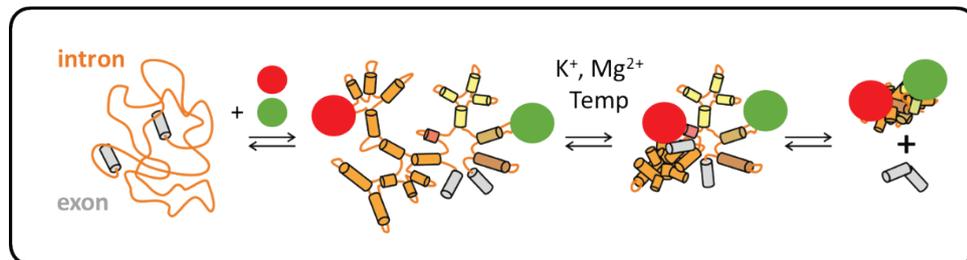
## Magnesium-dependent RNA folding investigated by single-molecule FRET

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### 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 salt concentration, type of salt and temperature. The project comprises investigations about the salt- and temperature dependent folding pathway of a group II intron derivative. 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.

### RNA splicing/folding pathway



Steiner, et al., *Proc Natl Acad Sci USA*, 2008., Fiorini, et al., *Chimia*, 2015.

### Details

In more detail, part of the project comprises the preparation of the RNA, which includes *in vitro* transcription, RNA purification and labeling the RNA fluorescently. The focus lies on investigating the RNA folding depending on the type of salt, salt concentration and temperature by smFRET. This requires the preparation of the sample and microscopic chamber, recoding smFRET trajectories and data analysis. We are looking for a motivated student in the field of biochemistry or any related discipline who is interested in an interdisciplinary Forschungsprojekt, which can be extended to a master thesis.

### Keywords

Forschungsprojekt or Master thesis, period to be decided, supervisor Susann Zelger-Paulus (Postdoc)

### Contact Details

Are you interested or do you have more questions about the project? Please contact Susann Zelger-Paulus ([susann.paulus@chem.uzh.ch](mailto:susann.paulus@chem.uzh.ch)) or visit our homepage <http://www.chem.uzh.ch/en/sigel/research.html>