TECHNISCHE UNIVERSITÄT DARMSTADT

Using Fluorescent *in Situ* Hybridization (RNA-FISH) to quantify mRNAs in individual *Saccharomyces cerevisiae*

Fachbereich 18
Elektrotechnik und Informationstechnik
Bioinspirierte Kommunikationssysteme

Department 18
Electrical Engineering and Information Technology
Bioinspired Communication Systems

Prof. Dr. Heinz Koeppl
Head of lab

Motivation

RNA plays an important role in both the transcription and translation processes. Unlike bacteria, in eukaryotes, RNA will be transported, localized, and locally translated. Therefore, it is meaningful to detect the localization and quantify the RNA. RNA-FISH is one of the most popular methods to quantify and localize RNA in fixed cells. For this reason, we would like to establish the RNA detection in *Saccharomyces cerevisiae* using fluorescence *in situ* hybridization (FISH).

Goals

This master thesis focuses on establishing the RNA detection in Saccharomyces cerevisiae using fluorescence in situ hybridization. It will be a challenge to explore the localization and quantify the RNA during the data analyse and further compare it with in vivo data.

Prerequisites:

- Experience with cell biological working techniques, ideally experience in imaging
- Independent working ability
- Fluent English language skills in both reading and writing, German language skills beneficial.

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Reference

[1] Huber D, Voith von Voithenberg L, Kaigala G V. Fluorescence in situ hybridization (FISH): History, limitations and what to expect from micro-scale FISH Micro Nano Eng. 2018;1:15-24.

[2] Trcek T, Chao JA, Larson DR, Park HY, Zenklusen D, Shenoy SM, Singer RH. Single-mRNA counting using fluorescent in situ hybridization in budding yeast. Nat Protoc. 2012 Feb 2;7(2):408-19.

[3] Sanderson MJ, Smith I, Parker I, Bootman MD. Fluorescence microscopy. Cold Spring Harb Protoc. 2014;2014(10)

Applications (including CV) should be sent in electronic form only, summarised in a single overall pdf document. For further information, please contact Yujie Zhong.