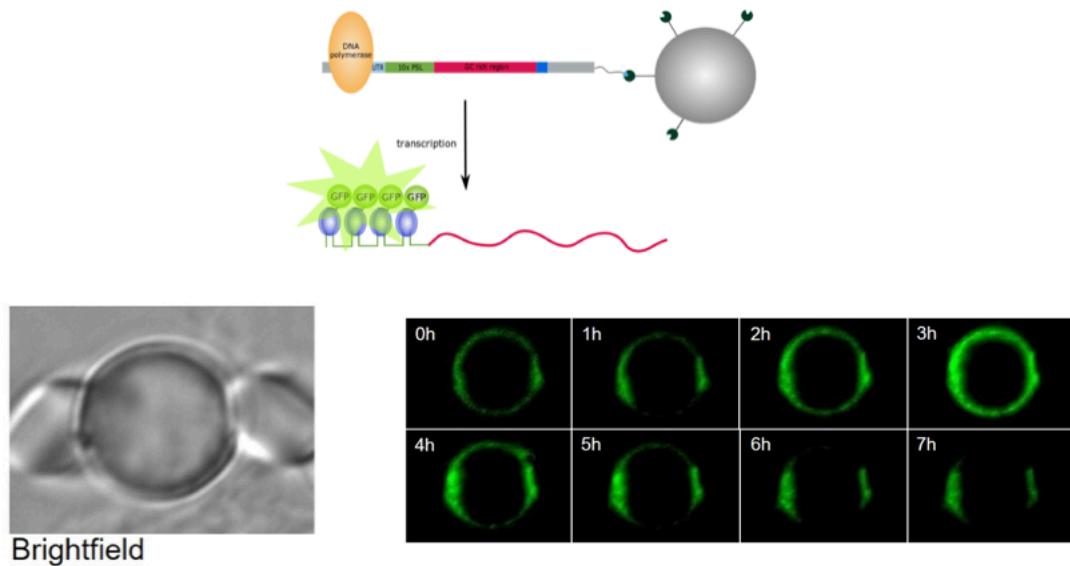


Visualizing transcriptional events at the single molecule level

Where ? Bioinspired Communications Systems, TU Darmstadt, Germany
<http://www.bcs.tu-darmstadt.de/>



Project : Monitoring single transcription events have been achieved previously in our lab by using the well-known PP7/MS2 system for dual color imaging of mRNA transcript [1]. After having gathered transcriptional event data in single yeast cells, our next aim is to generate transcriptional traces in a cell-free system environment. The student involved in the project will produce various *E. coli* cell extracts containing the necessary molecules for the mRNA labeling visualization. The extracts will be tested in different conditions; either in a microfluidics chips trapping DNA-carrying beads (See Fig), or on DNA curtains coated chips to monitor the transcriptional elongation in real time. Various DNA strands will be used, such as transcriptional regulators sequences used in collaborative projects.

Skills used : Molecular Biology, Microfluidics, Microscopy, Data Analysis

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1. Hocine S, Raymond P, Zenklusen D, Chao JA, Singer RH. Single-molecule analysis of gene expression using two-color RNA labeling in live yeast. *Nature methods*. 2013;10(2):119-121. doi:10.1038/nmeth.2305.

2. High-Throughput Universal DNA Curtain Arrays for Single-Molecule Fluorescence Imaging
Ignacio F. Gallardo, Praveenkumar Pasupathy, Maxwell Brown, Carol M. Manhart, Dean P. Neikirk, Eric Alani, and Ilya J. Finkelstein
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