



$$\frac{\partial}{\partial t} p(\mathbf{r}, t) = \nabla D(\mathbf{r}) [\nabla p(\mathbf{r}, t) + \beta p(\mathbf{r}, t) \nabla U(\mathbf{r}, t)]$$

We are hiring **PostDocs** and **Research Assistents**

for the **ERC-funded project**

**'Barcoding gene expression dynamics at single-molecule resolution'**

Gene expression is a stochastic process. Random expression bursts cause tremendous cell-to-cell variations in mRNA and protein levels. The consequences are beneficial in some instances, e.g., in cell differentiation, and harmful in others, e.g., in bacterial drug tolerance. A key interest in biology is therefore to decipher the kinetics behind this noise. What is the distribution of transcription rates in a cell population? Are gene expression dynamics heritable? Do gene networks communicate via the 'Morse code' of expression burst? Detailed answers to these questions are pending due to insufficient methods to temporally resolve gene expression noise at single-molecule resolution.

**DYNOME is our answer to this challenge.**

DYNOME combines super-resolution particle tracking, multi-color barcoding, lineage tracking, and lab-on-a-chip bioreactors in one innovative bio-dynamics platform to monitor gene expression at the single-molecule level for many genes in single cells over many generations. Decrypting cell-individuality with kinetic models will be a breakthrough both in basic and in applied sciences with impacts on the development of drugs against bacterial invasions, the design of new and useful functionalities in cells, and on our understanding of how biological variability arises from the laws of statistical physics.

**You want to break limits by creating the 'transparent cell'?**

Contact us.

### **What we expect:**

A degree in Physics, Engineering, Computer Science, or Physical Chemistry  
Knowledge in optical microscopy, nanofabrication, or stochastic reaction systems  
Programming skills in C++, R, Matlab, or Mathematica  
Very good command in English  
Team skills, motivation, initiative, and willingness to perform

### **What we offer:**

Research projects at the interface between Physics and Systems Biology  
State-of-the-art research environment/equipment  
Work in a highly interdisciplinary team  
An inspiring and vibrant research campus

It is important to the Weizmann Institute of Science that you will be able to reconcile your academic career and family life. We therefore have a daycare center that is close to the institute.

Please send your application to Dr. Hagen Hofmann (Group Leader).

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