Postdoctoral Position

Dynamic Artificial Cells with Dissipative Elements

Key words: Artificial Cells, Dissipative Self-Assembly, DNA Nanoscience

The Walther Lab at the University of Mainz (Germany) is searching for an outstanding postdoctoral researcher to work on the merger of dynamic DNA Nanoscience (reaction networks) and DNA-based artificial cells. The group has recently pioneered pH-feedback systems and ATP-driven DNA nanosystems, as well as a unique approach for DNA-based artificial cells. The present postdoc position aims to increase behavioral complexity, reach dynamic structures, target applications in intelligent matter - if desired at the interface to cells.

As an ideal candidate, you have a background in artificial cells, dissipative self-assemblies, chemical reaction networks or DNA Nanoscience or complex molecular systems in general.

Team. We are an ambitious team, and this position is embedded in an ERC Consolidator Grant project! We provide you with an inspiring and collaborative team atmosphere in a multinational and multidisciplinary environment, and ample opportunities to develop. Brand new, cutting-edge synthetic and analytical infrastructure and facilities are available due to generous support by the University of Mainz and the Gutenberg Research College. We run our own fully equipped cell lab. Prof. Walther (h-index 63, age 42) is a Gutenberg Research Professor, a Max Planck Fellow and a 2 x ERC Awardee. More information on the group can be found here: www.walther-group.com

EXPECTED CANDIDATE PROFILE

As an ideal candidate you are creative, highly self-motivated, ambitious, and communicative to excel in scientific challenges. You hold a PhD in Chemistry, Physics or similar and have a background in soft matter. Previous exposure to artificial cell research, systems chemistry or DNA nanoscience is a plus. We are willing to train you in complementary skills.

Selected references on life-like DNA systems and DNA-based artificial cells in the past:

1. Dissipative Organization of DNA Oligomers for Transient Catalytic Function *Angew. Chem. Int. Ed.* e202113477 **(2022)**.
2. Autonomous DNA nanostructures instructed by hierarchically concatenated chemical reaction networks *Nat. Commun.* 14, 5132 (**2021**).
3. Signal-processing and adaptive prototissue formation in metabolic DNA protocells, *Nat. Commun. 13*, 1 **(2022)**.
4. DNA protocells via signal processing prompted by artificial metalloenzymes *Nat. Nanotechnol.* 15, 914 (**2020**).
5. Programmable Dynamic Steady States in ATP-Driven Non-Equilibrium DNA Systems *Sci. Adv.,* 5, eaaw0590, **(2019)**.
6. Programmable ATP-Fueled DNA Coacervates by Transient Liquid-Liquid Phase Separation *Chem* 6, 3329 (**2020**).
7. Modular Design of Programmable Mechanofluorescent DNA Hydrogels *Nature Commun.* 10, 529 (**2019**).
8. ATP-Responsive and ATP-Fueled Self-Assembling Systems and Materials" *Adv. Mater.* 32, 2002629 (**2020**). Review
9. Deng, J., Walther, A. ATP-Powered Molecular Recognition to Engineer Transient Multivalency and Self-Sorting 4D Hierarchical Systems *Nat. Commun.* 11, 3658 (**2020**).
10. Multiple Light Control Mechanisms in ATP-fueled Non-Equilibrium DNA Systems *Angew. Chem. Int. Ed.* 59, 12084 **(2020)**.

The position is according to the German salary scale with full social benefits. The position is available from Spring 2023 and has a duration of 2 years.

Application Deadline is January 31st 2023.

Please send your full application as a **single** PDF file containing

- letter of motivation including a summary of your past research experience, in particular a meaningful summary of your PhD and master thesis; transcript of records of your Master program.
- Detail in your letter why you believe you are the right person and what you expect from us
- curriculum vitae and list of publications
- Two contacts for reference letters

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