

DC4: Feedback of compartmentalisation on reactions

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Host institution: University of Saarland, Center of Human and Molecular Biology, Saarbrücken, Germany

The Tang lab is an interdisciplinary lab, focused on unravelling the chemical and physical principles of living systems. They do this using bottom-up synthetic biology and biophysical approaches for the construction and characterization of synthetic cellular systems. The lab applies the system to questions in origin of life and modern biology including “how does compartmentalisation tune biochemistry in time and space?” and “what are the minimal number of components to generate a living system”.

Project description: The project main aims to study how molecular heterogeneity will impact the emergent, macroscopic properties of coacervate droplets and how these parameters affect encapsulated chemical reactions. Imparting rational chemical level changes to the system, obtaining (bio)physical measurements which provide descriptions of droplet viscosity for correlating these cross-scale effects on incorporated reaction kinetics. Provide absolute quantification of the reaction kinetics and its associate parameters to fully understand how compartments can provide a physical feedback mechanism on reaction kinetics.

Specifically, DC4 will: (1) Characterise coacervate phase diagrams. (2) Quantify the biophysical properties of coacervate droplets. (3) Determine the reaction kinetics within coacervates depending on chemical environments and (bio)physical properties.

Secondments: This project is carried out in strong collaboration with the following groups, and visits to their laboratories are expected during the project. A willingness to travel and spend time abroad is therefore essential:

- Host: ELVESYS (ELV) | Length: 1 months | Purpose: Explore new microfluidics
- Host: University of Groningen (RUG) | Length: 2 months | Purpose: Exchange experimental and theoretical approaches to quantify reactions in coacervates.
- Host: Spectrometry Vision BV (MSV) | Length: 3 months | Purpose: Develop and apply advanced mass spectrometric techniques for the characterisation of coacervates.

Eligibility conditions:

- MSc degree or equivalent in chemistry, physics or an engineering-related subject.

Required Skills:

- Ability to work with quantitative approaches and excellent technical aptitude
- Work independently and communicate effectively within a team
- Excellent conceptual, writing and presentation skills and excellent command of the English language

Monthly allowances:

- Living allowance: €3400*
- Mobility allowance: €600
- Family allowance, if applicable: €660

Estimated gross salary: ~40,000 €/year

* The living allowance is adjusted by a [country correction coefficient](#), depending on the country where the host institution is located. The exact net salary is dependent on local tax and social and health insurance regulations and will be confirmed upon appointment.

Enquiries

For general information about the DarChemDN visit the [project website](#) or send an email to info@darchem-dn.eu.



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How to apply

To complete your online application, visit the [DarChemDN recruitment web page](#).

Required documents:

- Cover Letter
- Curriculum Vitae (including contact information of two referees)
- Copy of Transcripts
- Copy of Diplomas (if available at the time of application – otherwise please provide a confirmation with the expected graduation date)

Only shortlisted applicants will be contacted. Interviews are expected to be online in November/December 2023.

Application deadline: To receive full consideration, applications must be submitted before **31 October 2023**.

