

## DC5: Development of advanced microfluidics systems

**Supervisor:** Dr. Alexander McMillan, [alex.mcmillan@elvesys.com](mailto:alex.mcmillan@elvesys.com)

**Host institution:** ELVESYS (ELV), Microfluidics Innovation Center, Paris, France



Elvesys is an innovative company of 50 people created by three young PhDs in microfluidics. Their goal is to become the flagship of microfluidics in the world so that all research teams around the world benefit from the potential of microfluidics. DC5 will be hosted in the “Innovation Unit” where collaborative research projects related to microfluidics are conducted.

**Project description:** Develop and test new microfluidic instrumentation and system development for automated autocatalytic droplet generation. Develop a microfluidic flow sensor surpassing the state of the art, which will allow for high stability flow control - critical for controllable and reproducible droplet generation - when coupled in a feedback loop with a high-performance pressure controller. The poor performance of commercially available flow sensors is a key bottleneck in achieving stable microfluidic droplet production. Specifically, DC5 will: (1) Implementation of fluid handling microfluidic circuits, including novel flow sensor, for the delivery of protein and DNA samples in suspension. (2) Microfluidic system for flow-through droplet generation and immobilisation on chips. (3) Optimisation of droplet generation parameters (i.e., flow rate, channel geometry, frequency) for relevant autocatalytic droplet applications.

**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: École Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (ESPCI) | Length: 2 months | Purpose: Testing of new microfluidic system design in real experimental set-up.
- Host: University of Saarland (USAAR) | Length: 2 months | Purpose: Exchange of experimental and analytical expertise.

### Eligibility conditions:

- MSc or equivalent in engineering-related subject (mechanical, mechatronics, engineering physics etc.)
- DC5 will enrol in the [PhD programme of PSL/ESPCI](#). Corresponding admission requirements apply.

### Required Skills:

- Engineering background (mechanical, mechatronics, engineering physics etc.)
- Experience with CFD simulations (COMSOL, Ansys Fluent, etc.)
- Ideally experience in Python
- Ideally experience in 3D CAD
- Fluency in English
- Ideally knowledge of French, but not required.

### Monthly allowances:

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

**Estimated gross salary:** ~39,000.00 €/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](mailto: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**.



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