

POST-DOCTORAL SCHOLARSHIP

BIOINSPIRED PASSIVE DISPENSING OF ADHESIVE LIQUID

A 3-year scholarship for a post-doctoral fellow is available at the Microfluidics Lab (University of Liège - ULg), in partnership with the Functional and Evolutionary Morphology Laboratory. It is open in the framework of a 4-year research project funded by the FNRS.



In nature, capillary forces shape the microscopic realm. However their use in microengineering is currently limited by the lack of a robust handling strategy of the tiny volumes of liquid involved. Most insects rely on capillary forces for terrestrial locomotion. Some (incl. beetles) have hairy adhesive pads on their legs that provide fast and reversible attachment on almost any substrate. A femtoliter of liquid is passively dispensed to the tip of each hair, where it forms a bridge with the substrate and provides robust capillary adhesion. Liquid footprints are minimized when the pad detaches.

This post-doctoral project aims at understanding and mimicking the liquid management strategy of these hairy pads. Through a biomimetic approach involving a combination of experiments and modeling, the researcher will ultimately identify a robust bioinspired fluidic design for passive liquid dispensing in microengineering applications.

Person specification

- Master's degree in either biology, engineering, physics, or bio-engineering
- PhD in Science or in Engineering (graduation between 2012 and 2016)
- No more than 12 months in Belgium since Oct. 2013
- Required knowledge: fluid dynamics, basics in cell biology
- Required skills: (electron) microscopy, preparation of biological samples, Matlab programming, physical modeling, English (fluent)
- Appreciated skills: cytochemistry, cryotechniques in microscopy (freeze substitution), animal physiology, image processing, French
- Interest in experimental research, biology and adaptation of living organisms, micro-fabrication

The researcher will be co-advised by Prof. Tristan Gilet (Microfluidics Lab, ULg) and Dr. Philippe Compère (Functional and Evolutionary Morphology Laboratory, ULg). The project will be carried in collaboration with Prof. Pierre Lambert (Université Libre de Bruxelles). The researcher will also join the IAP network microMAST dedicated to the fundamentals and applications of surface tension in engineering.

Interested people should send electronically the following documents to Prof. Gilet & Dr. Compère before July 1st, 2016: cover letter, resume, transcript of grades & ranking, PhD diploma, and any other document that may be useful to support the application (e.g. publications, PhD thesis). They should also ask two recommendation letters from their professors / collaborators (possibly including the PhD advisor). These letters should be signed and sent by email by the professors. Before being hired, the applicant will have to provide a European equivalent of his/her PhD diploma. Short-listed applicants will be interviewed and a final selection will be made by July 31, 2016. The starting date would be October 1, 2016.

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