





H2020 MSCA - ITN - 2017 - 766007

“MAMI”

Magnetics and Microhydrodynamics: from guided transport to delivery

ESR 3 Actuated Liquid Cilia to achieve locally driven flow

Research project	Ferrofluids are fascinating magnetic fluids that are used in high demanding vacuum applications, and everyday objects such as loudspeakers. When a strong magnet is held close to such a ferrofluid, Rosensweig instabilities are induced, resulting in stunning hedgehog-like patterns. We propose to manipulate these instabilities with oscillating magnetic fields to induce local flows, much like natural cilia. The latter consist of extended tube-like structures that beat rhythmically to displace fluids, for example inside the brain. By optimizing the density and surface tension of the ferrofluid versus that of the fluid to be moved, we can influence the critical field where Rosensweig instabilities appear, as well as their wavelength. Our devices have only liquid-liquid interfaces, with expected low fouling properties. Achieving both locally-driven flow and non-fouling would create exiting new possibilities in microfluidics.
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Host Institution	University of Strasbourg CNRS   Institut de Science et d'Ingénierie Supramoléculaires 8 allée Gaspard Monge, 67000 Strasbourg France http://isis.unistra.fr
Required profile	The candidate should hold a MS degree in Physics or Chemistry, with a strong background in Condensed Matter, Magnetism, or Physical Chemistry. Interest for interdisciplinary research is welcome. Research stays are planned in Latvia, Spain, and France. The candidate should not have stayed in France in the last 12 months.