

ITI HiFunMat Master Internship Proposal

M 1

M 2

Encapsulation of fragrance molecules in polymeric particles

Internship supervisor

Name, first name	VAUTHIER Madeline
E-mail, Telephone	Madeline.vauthier@ics-cnrs.unistra.fr
Laboratory	Institut Charles Sadron
Collaboration with a HiFunMat member (<i>please indicate their name</i>)	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes : SERRA Christophe

Student profile looked for

Master program (<i>more than one box can be ticked</i>)	<input checked="" type="checkbox"/> Material science and engineering <input type="checkbox"/> Chemistry <input type="checkbox"/> Physics
Other indications if necessary	

Internship description

Micro- and nano-technologies are fast-growing fields, with a wide range of potential applications such as diagnosis and treatment of diseases, cosmetics, electronics, paints, etc.^{1,2} However, the laborious processes of manufacturing particles and the highly transdisciplinary nature of this area, still remain obstacles to a fast development of these technologies in the perfume industry.

In this project, we're looking at polymer particles capable of encapsulating different types of (highly volatile) fragrances thanks to a microfluidic version of a homemade, extremely efficient emulsification device.³⁻⁵ The quantity and chemistry of the encapsulated molecule as well as those of the polymer, and the process operating variables are all parameters influencing the encapsulation and release of those molecules of interest.

During this internship you will learn how to combine physical chemistry, microfluidic processes and polymer science to elaborate fragrance-loaded (nano)particles with controlled release profiles, and more.

References

- 1) Prasad, R. *Fungal Nanotechnology - Springer*. **2017**, 55–75, ISBN: 978-3-319-68424-6.
- 2) Sozer, N. *et coll. Trends in Biotechnology*. **2009**, 27 (2), 82-89.
- 3) Yu, W. *et al. Macromol. React. Eng.* **2017**, 11 (1), 1600024.
- 4) Chang, Z. *et al. Lab on a Chip* **2009**, 9, 3007-3011.
- 5) Abdurahim, J. *et al. J. Drug Del. Sci. Tech.* **2022**, 71, 103358.