

Development of an olfactory prosthesis for people suffering from anosmia

Master/Semester project or lab immersion

(Section: Microengineering – Physics – Electric Engineering – Life Science)

Sensory deficits are a major source of handicap in people's lives. Scientists have already developed prostheses and implants for hearing impairments and are developing those for vision. Partial and total loss of smell (hyposmia / anosmia) impacts 20% of the world-wide population with deleterious effects on quality of life. However, we have yet to develop such devices to restore the sense of smell, primarily because scientific knowledge linking artificial systems to human biological olfaction is still lacking. The ROSE project is composed of a European consortium working together to push the limit of artificial olfactory sensations. The project will be held in close collaboration with the European partners and may include travels to meet with them.

At the LMIS1, we are currently investigating new ways of generating sensations in the nasal cavity using different methodologies, such as electrical stimulation. The project is evolving quickly and is highly multidisciplinary, involving aspects of physiology electronics, cleanroom microfabrication and materials science: the focus can be adjusted depending on the student's preferential interests, best knowledge, previous experience and motivation.

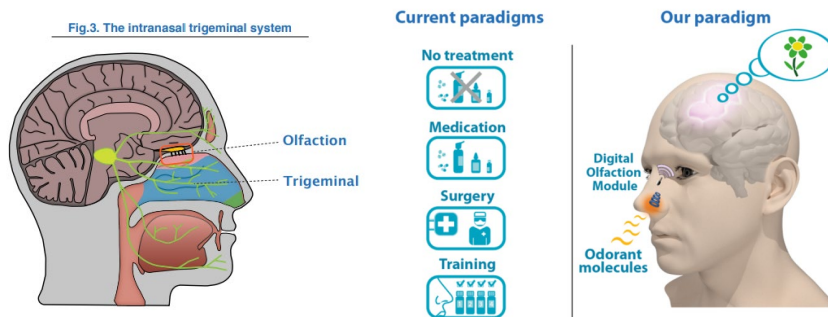


Figure 1 : (a) schematic showing the olfactory system (b) Paradigm of the ROSE project for the restauration of olfaction in anosmic people

Possible tasks:

- Cleanroom work
- Microfluidics
- Electronics design
- Experimental characterization
- 3D printing

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