

Master's thesis: Flame-made nanoparticles — From physicochemical properties to medical applications

ETH Zurich and Empa SG offer a multidisciplinary master's thesis project whose goal is to identify physicochemical properties (oxidation states, surface charge, etc.) that are relevant for the **antioxidant properties of ceria nanoparticles** synthesized by flame-spray pyrolysis. These properties are important for a broad range of medical treatments, such as wound management. The student will both characterize the nanoparticles and verify the envisaged bioactivity in vitro. He or she then uses the newly gained knowledge to tune the physicochemical properties of the nanoparticles to further improve their antioxidant properties.

A second part of the project is to do an advanced characterization of various nanoparticles that are promising for wound healing and surgical applications. Again, the physicochemical insight will drive further development of the **nanoparticles for their clinical uses**.

Both parts let the student learn and apply a wide spectrum of different characterization techniques and then transfer this knowledge to draw conclusions about medically relevant bioactivity. **Bridging the gap between physicochemical properties and medical applications** is a very important process in today's science research. It is both highly rewarding and demanding, requiring cross-disciplinary knowledge and ability to connect the dots.

Suitable and interested candidates may send a CV and a short motivational statement including research interests to Tino Matter (tino.matter@empa.ch). Housing can be arranged.

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