

## Master Thesis

### Hydroxyapatite deposition onto carbon micro tubes with 3D porous structure (Aerographite) via an electrophoretic method

**Background:** Aerographite (AG) is a novel carbon based material that consists of a 3D network of seamlessly interconnected carbon fibers and ribbons creating pores of different dimensions in the macro (30–1000  $\mu\text{m}$ ) and micro (10–30  $\mu\text{m}$ ) regime. These features render AG an interesting candidate to create an artificial cellular matrix for tissue engineering and further biomedical applications. Coating AG with a thin layer (100-200 nm) of HA provides bioactive sites on the surface without impairing aerographite 3D architecture.

**Objective:** Using electrophoretic (EPD) method to coat AG with hydroxyapatite nanoparticles, the homogeneity of coating onto AG and bone ingrowth into the coated AG has to be quantified. Thereto AG with different structure and hydroxyapatite nanoparticles with specific parameters will be used. Homogenous coatings obtains by EPD parameter optimization, and surface modification of AG and HA nanoparticles. The optimum coating will be evaluated from experiments and the biological responses will be quantified and compared with standard bioactive samples.

**Your Qualification:** Student of Materials Science and Engineering (Master)

**Duration:** 6 months

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