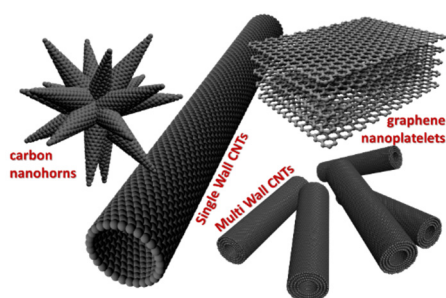


Title	Nano-carbon hybrid materials for biomedical applications
PI	MENNA Enzo
Research Group	Carbon Nanostructures, Soft Materials and Plasma Chemistry – DiSC
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Project description:

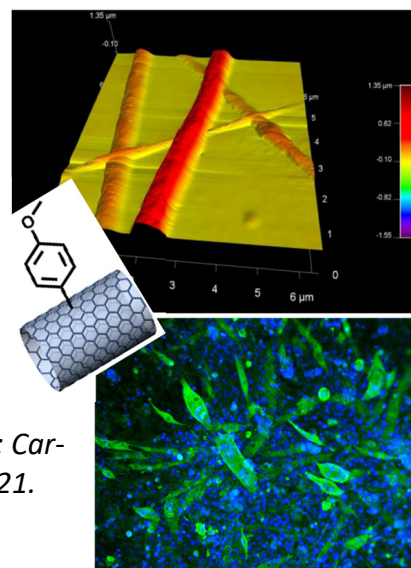
The use of carbon nanostructures (CNSs) for regenerative medicine applications attracts large attention for different scopes. Chemical modification of Carbon Nanostructures (CNS) such as Carbon Nanotubes and Graphene materials will be studied and optimized to obtain hybrid and composite materials, based on biocompatible polymers or hydrogels as matrices, to be used in regenerative medicine. Our previous research has demonstrated a beneficial effect of CNS derivatives on cell cultures. Mechanical and electrical properties of CNS will be now used to

tailor the behaviour of the resulting biomimetic scaffolds in order to mimic natural tissues. The ability of scaffolds to promote the growth and differentiation of cells and the restoring of damaged tissues like peripheral nerves will be evaluated. The project will investigate how chemical modification of CNSs affects materials properties and how in turn they influence the response of cells and tissues. Organic and Materials Chemistry, including preparation and characterization, will be complemented by advanced processing like electrospinning and plasma treatments, in vitro and in vivo tests through secondments.

Advanced instrumentation for chemistry and materials is available at DiSC, while access to complementary facilities (biological, medical, physical ...) is offered by secondments and other collaborations.

Relevant publications:

J. Sci. Adv. Mater. Devices, **2024**, 9, 100762; *ACS Appl. Mater. Interfaces* **2024**, 16, 3093-3105; *Nanomaterials* **2021**, 11, 404; *Nanomaterials* **2020**, 10, 415; *Mater. Chem. Phys.*, **2018**, 214, 265; *Nanomedicine* **2016**, 11, 1929.; *Eur. J. Org. Chem.* **2016**, 1071; *Carbon* **2015**, 95, 725; *Nanomed.-Nanotechnol. Biol. Med.* **2015**, 11, 621.

**Hosting groups for a possible period abroad:**

- Prof. Patrick Van Rijn - University of Groningen/University Medical Center Groningen (The Netherlands) - Department of BioMedical Engineering
- Prof. Matteo D'Este - AO Research Institute - Davos (Switzerland)
- Prof. Michael Monaghan – Trinity College Dublin - (Ireland) - Trinity Biomedical Sciences Institute
- Prof. Claudia Merlini - University of Florianopolis Santa Catarina (Brazil) - Dept. of Chemistry