

## PhD in BIOINGEGNERIA / BIOENGINEERING - 40th cycle

## THEMATIC Research Field: 3D PRINTED MODELS FOR THE STUDY OF DISEASED AND HEALTHY CARTILAGE TISSUE

Monthly net income of PhDscholarship (max 36 months)

€ 1400.0

In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity	
Motivation and objectives of the research in this field	The aim is the development of 3D models for the study of diseased and healthy cartilage tissue. To this aim, additive manufacturing and molding techniques will be used to mimic the tissue architecture and custom-inks (also including ceramic nanoparticles) will be developed based on the expertise of the proponent group. These will be capable of recapitulating the compositional and mechanical properties of the native tissue. To characterize the mechanical and biological behavior of the models, cells behavior inside the inks will be studied by in vitro characterizations and by spectroscopy, with a specific reference to FT-IR and EDS.
Methods and techniques that will be developed and used to carry out the research	For the design and the development of the research topic, biomaterial science background, knowledge on additive manufacturing and biological investigation will be used and implemented where necessary to match the final aim of the research.
Educational objectives	During the PhD program, the PhD student will improve her/his skills, working group interactions, know-how in biomaterials and their possible modification for improving the mimicking of biological tissues, advanced technological processing, chemical-physical investigation techniques, in vitro biological studies



Job opportunities	Post-doc in high-level universities (Italian and European) Researchers in start-up or spin-off developing new ideas in the bioengineering field Consultancy in engineering industries
Composition of the research group	3 Full Professors 4 Associated Professors 8 Assistant Professors 6 PhD Students
Name of the research directors	PROF SILVIA FARE' - PROF. GABRIELA GRAZIANI

Contacts

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Additional support - Financial aid per PhD student per year (gross amount)		
Housing - Foreign Students		
Housing - Out-of-town residents (more than 80Km out of Milano)		

Scholarship Increase for a period abroad		
Amount monthly	700.0 €	
By number of months	6	

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Educational activity: The student will be encouraged to attend to courses at POLIMI or abroad 2 / 3 in International Schools.

Teaching assistantship: There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.

Computer and desk availability: no personal computer is available, but there are computers connected to the different instruments the PhD student will work on during her/his PhD. A desk for the PhD student will be available