POLITECNICO DI MILANO

PhD in FISICA / PHYSICS - 40th cycle

THEMATIC Research Field: ORGANIC BIOSENSORS

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	Cell-based biosensors constitute a fundamental tool in biotechnology, and their relevance has greatly increased in recent years as a result of a surging demand for reduced animal testing and for high-throughput and cost-effective in vitro screening platforms dedicated to environmental and biomedical diagnostics, drug development and toxicology. In this context, electrochemical/electronic cell-based biosensors represent a promising class of devices that enable long-term and real-time monitoring of cell physiology in a non-invasive and label-free fashion,with a remarkable potential for process automation and parallelization. The PhD in this field is aimed at exploiting the potential of organic based electronic devices for advanced tools in electrophysiology, exploiting the latest advancements in the recording of action potentials of electrogenic cells (e.g., cardiomyocytes) enabled by organic transistors.
Methods and techniques that will be developed and used to carry out the research	The study will be performed within the "Printed and Molecular Electronics" group, led by Mario Caironi in the Center for Nano Science and Technology, of the Istituto Italiano di Tecnologia. The study will require the fabrication of high-performance electronic sensors, mainly based on electrolyte gated transistors and employing them for the electrophysiological study of electrogenic cells, such as cardiomyocytes and neurons.
Educational objectives	A solid knowledge of organic electronic biosensors, and development of competences in solution-based fabrication techniques (i.e. printing) for the patterning of functional

	materials.
Job opportunities	Bioelectronics is a worldwide expanding field, with several growing opportunities worldwide, particularly in EU and also in Italy. Careers in academia, in industry, industrial R&D and consulting are possible.
Composition of the research group	1 Full Professors 0 Associated Professors 11 Assistant Professors 9 PhD Students
Name of the research directors	Mario Caironi, Adrica Kyndiah

Contacts

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https://www.iit.it/it/web/printed-and-molecular-electronics

Additional support - Financial aid per PhD student per year (gross amount)

	1st year	2nd year	3rd year
Housing - Foreign Students	1000.0 € per student	1000.0 € per student	1000.0 € per student
	max number of financial aid available: 1, given in order of merit (only for students with scholarship)..		
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 activities: Educational activities (purchase of study books and material, funding for participation to courses, summer schools, workshops and conferences). Financial aid per PhD student per 3 years: max 5707,20 euros per student.

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: individual or shared use computer and desk