



PhD in BIOINGEGNERIA / BIOENGINEERING - 38th cycle

THEMATIC Research Field: A NOVEL TURBINE-BASED INSUFFLATOR FOR PERSONALIZING MINIMALLY-INVASIVE SURGERY

Monthly net income of PhDscholarship (max 36 months)

€ 1325.0

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

Minimal access surgery is a growing field, with more than 10 million procedures performed globally each year. However, current insufflation devices can cause postoperative pain, difficult management of mechanical ventilation during anaesthesia, and prolonged hospital stay. The development of a turbine-based insufflator addresses these challenges and has the potential to reduce overall healthcare costs. Erasmus MC and Politecnico di Milano have established a collaboration to develop a turbine-based insufflator that improves surgical performance and outcome by improving ventilation, personalizing insufflation pressure, and efficiently removing smoke created by electrosurgery.

Methods and techniques that will be developed and used to carry out the research

The aim is to develop the turbine-based insufflator by further investigating and developing the features that most benefit patients and surgical outcome. In this project a clinical prototype will be clinically evaluated to test safety and efficacy in the first trial in humans. Additionally, an advanced biomechanical in-vitro model will be developed to design, build, and test insufflation systems. Erasmus MC and Politecnico di Milano, together with Spatium Medical and IDE Group, have established a public-private partnership. Health-Holland, a subsidiary of the Dutch ministry of Economics, supports this collaboration and has provided funding for this research project. Link to project page from a previous project: <https://www.health-holland.com/project/2022/2018/effects-muscle-paralysis->



	holland.com/project/2022/2018/effects-muscle-paralysis-laparoscopic-workspace-needed-minimally-invasive-surgery
Educational objectives	The supervisor and his research group support the research development. Seminars and courses encourage an interdisciplinary approach. Laboratory activity completes the research path. Students are also encouraged to spend a period of study abroad (with availability of an additional financial support).
Job opportunities	Job opportunities include research both in academic and private institutions in Italy and abroad, and in industry. Spin-off and startups from research results are encouraged. Employment in this field offers various interesting opportunities.
Composition of the research group	1 Full Professors 1 Associated Professors 5 Assistant Professors 3 PhD Students
Name of the research directors	PROF. RAFFAELE DELLACA'

Contacts
Prof. Raffaele Dellacà raffaele.dellaca@polimi.it

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	662.5 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
The PhD student will attend specific PhD courses at Politecnico di Milano according to his/her personal study plan; He/she will be able to attend summer schools and will have the opportunity to disseminate his/her research results in international conferences; The PhD student will assist in teaching by giving practical and lab lessons and by tutoring of BSc and MSc students developing



their thesis work. The PhD student will have personal desk in the Politecnico and will be equipped with a personal computer, in addition he/she will have access to the Lab facilities and instrumentation.