



ISTITUTO ITALIANO
DI TECNOLOGIA

Istituto Italiano di Tecnologia
Center for Micro-BioRobotics@SSSA
Viale R. Piaggio 34, Pontedera, Italy

Workshop

Medical micro-robots | potential, challenges, strategies and dreams

March 7, 2011

- 09:15 - 09:30** **Welcome**
- 09:30 - 10:15** **P. Dario - Scuola Superiore Sant'Anna and Istituto Italiano di Tecnologia, Center for Micro-BioRobotics@SSSA, Pisa (Italy)**
Converging technologies: from mini- to nano-robots for medical applications
- 10:15 - 11:00** **J.-O. Park - Chonnam National University, Robot Research Initiative, Gwangju (Korea)**
Intravascular therapeutic micro-robot for chronic total occlusion in coronary artery
- 11:00 - 11:15** **Coffee break**
- 11:15 - 12:00** **S. Martel - École Polytechnique de Montréal, Montréal (Canada)**
Synthetic and bacterial micro-robots that navigate in the blood vessels prior to release therapeutics as far as deep inside tumors
- 12:00 - 12:45** **F. Arai - Nagoya University, Nagoya (Japan)**
On-chip robotics: micro-/nano-robots in microfluidic chip for biomedical innovations
- 12:45 - 14:00** **Free time for lunch**
- 14:00 - 14:45** **K. Morishima - Tokyo University of Agriculture and Technology, Tokyo (Japan)**
Emergent functionality of regenerative biomechanical systems powered by muscle cells toward wet nano-robotics
- 14:45 - 15:30** **A. Ferreira - École Nationale Supérieure d'Ingénieurs de Bourges, Bourges (France)**
Current modeling and control challenges in medical nano-robotics
- 15:30 - 16:15** **M. Sitti - Carnegie Mellon University, Pittsburgh, PA (USA)**
Chemotactic bacteria propelled swimming micro-robots as potential future medical micro-robots
- 16:15 - 16:30** **Coffee break**
- 16:30 - 17:15** **T. Fukuda - Nagoya University, Nagoya (Japan)**
Medical micro surgery robot and simulator
- 17:15 - 18:15** **Round table - All Speakers**
Medical micro-robots: potential, challenges, strategies and dreams
- 18:15** **End of Workshop**

The workshop focuses on micro-robots for medical applications, discussing both state-of-art solutions/strategies and expected trends. The chosen topic is presented through a wide-view, multi-faceted perspective encompassing both theoretical and experimental issues, on both artificial and bio-hybrid micro-systems. Eight speakers will animate the WS: they are world-renowned major players in the micro-robotic field; coming from six Countries (Italy, France, USA, Canada, Korea, Japan), they will provide a worldwide perspective. Besides individually giving a talk, the speakers will join in a final roundtable, debating on the potential of micro-robotic solutions for medical applications, on present challenges and difficulties to be overcome for their effective implementation/exploitation, up to dreamed scenarios. The considered roundtable expressly aims at shaping the vision in the field. Targeted audience primarily includes researchers in the micro-robotic field at several levels (from PhD students up to senior scientists), yet the addressed, multidisciplinary topic is credited to be of interest for roboticists at large, as well as for scientists from other disciplines (e.g. chemistry, biology, physics, engineering).

Local Organizers: Paolo Dario, Edoardo Sinibaldi (contact: edoardo.sinibaldi@iit.it)