Magnetic Solutions for Collective Manipulation in Biomedical Applications

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Abstract

In this talk, we first introduce the general framework of our activities and some recent results on collective cell manipulation for drug screening and medical applications at large. Then, we illustrate how magnetic forces can help in targeted therapy with details about our solution for making magnetic nano-particle based therapies safe and acceptable.

Biography

Arianna Menciassi is Full Professor of Biomedical Robotics at Scuola Superiore Sant'Anna (SSSA, Pisa, Italy) and team leader of the "Surgical Robotics & Allied Technologies" Area at The BioRobotics Institute. She obtained the Master Degree in Physics (summa cum laude, 1995) at the Pisa University and the PhD in Bioengineering at SSSA (1999). She was Visiting Professor at the Ecole Nationale Superieure de Mecaniques et des Microtechniques of Besancon (France), and at the ISIR Institute at the Université Pierre et Marie Curie, in Paris. She has a substantial devotion to training and education, both at SSSA and at the University of Pisa, having served as preceptor to 15 postdoctoral associates, 25 PhD students and ~ 60 graduate degree recipients.

Her main research interests involve surgical robotics, biomedical robotics, smart solutions for biomedical devices, biomechatronic artificial organs, microsystem technology and micromechatronics, with a special attention to the synergy between robot-assisted therapy and micro-nano-biotechnology-related solutions. She also focuses on magnetically-driven microrobots and microdevices, as well as on biomedical integrated platforms for magnetic navigation and ultrasound-based treatments.

She carries on an important activity of scientific management of several projects, European and extra-European, thus implying many collaborations abroad and an intense research activity. She is the co-author of more than 400 scientific publications and 7 book chapters on biomedical robots/devices and microtechnology. She is a co-Editor of a book on piezoelectric nanomaterials for biomedical applications. Arianna Menciassi is co-inventor of 81 patents (national and international): 24 patents have been granted in Italy since the year 2004; 27 patents have been granted also abroad. She served until August 2013 in the Editorial Board of the IEEE-ASME Trans. on Mechatronics. She is Member of the Editorial Board for Soft Robotics (since 2012); she is Topic Editor of the International Journal of Advanced Robotic Systems (since 2013); she is Member of the Editorial Board for the Journal of Medical Robotics Research (since 2015); she has been recently appointed as Editor of APL Bioengineering and member of the Editorial Board of Scientific Reports.

She is Co-Chair of the IEEE Technical Committee on Surgical Robotics, she is in the Steering Committee of the Society for Medical Innovation and Technology and in the Steering Committee of the IEEE Transactions on Nanobioscience. In the year 2007, she received the Well-tech Award (Milan, Italy) for her researches on endoscopic capsules, and she was awarded by the Tuscany Region with the Gonfalone D'Argento, as one of the best 10 young talents of the region.