



# ITE/ΙΕΧΜΗ

## ΒΡΑΒΕΙΟ ΣΤΡΑΤΗΣ ΣΩΤΗΡΧΟΣ 2015 ΒΡΑΒΕΙΟ ΣΤΡΑΤΗΣ ΣΩΤΗΡΧΟΣ 2015

**ΟΜΙΛΗΤΗΣ: Ali Khademhosseini, Ph.D.**

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**ΘΕΜΑ: Nano- and Microfabricated Hydrogels for Regenerative Engineering**

**ΤΟΠΟΣ:** Συνεδριακό και Πολιτιστικό Κέντρο Πανεπιστημίου Πατρών  
Αμφιθέατρο Ι-4

**ΗΜΕΡΟΜΗΝΙΑ: Πέμπτη, 4 Ιουνίου 2015**

**ΩΡΑ: 10:15**

### ΠΕΡΙΛΗΨΗ

Engineered materials that integrate advances in polymer chemistry, nanotechnology, and biological sciences have the potential to create powerful medical therapies. Our group aims to engineer tissue regenerative therapies using water-containing polymer networks, called hydrogels, that can regulate cell behavior. Specifically, we have developed photocrosslinkable hybrid hydrogels that combine natural biomolecules with nanoparticles to regulate the chemical, biological, mechanical and electrical properties of gels. These functional scaffolds induce the differentiation of stem cells to desired cell types and direct the formation of vascularized heart or bone tissues. Since tissue function is highly dependent on architecture, we have also used microfabrication methods, such as microfluidics, photolithography, bioprinting, and molding, to regulate the architecture of



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these materials. We have employed these strategies to generate miniaturized tissues. To create tissue complexity, we have also developed directed assembly techniques to compile small tissue modules into larger constructs. It is anticipated that such approaches will lead to the development of next-generation regenerative therapeutics and biomedical devices.

## SHORT BIO

Ali Khademhosseini is Professor of Medicine at Harvard Medical School and Director of the Biomaterials Innovation Research Center at Brigham and Women's Hospital. He is also a faculty at the Harvard-MIT Division of Health Sciences and Technology as well as an Associate Faculty at the Wyss Institute for Biologically Inspired Engineering and a Junior PI at Japan's World Premier International-Advanced Institute for Materials Research at Tohoku University where he directs a satellite laboratory. He is recognized as a leader in combining micro- and nano-engineering approaches with advanced biomaterials for regenerative medicine applications. In particular, his laboratory has pioneered numerous microfabrication technologies for controlling the architecture and function of engineered vascularized tissues. He has authored over 350 journal papers (H-index = 68, >17500 citations) and 50 books/chapters. In addition, he has delivered 250+ invited/keynote lectures. Dr. Khademhosseini's interdisciplinary research has been recognized by over 30 major national and international awards. He is a recipient of the Presidential Early Career Award for Scientists and Engineers, the highest honor given by the US government for early career investigators. He is also a fellow of the American Institute of Medical and Biological Engineering (AIMBE) and the American Association for the Advancement of Science (AAAS). Currently he serves on the editorial board of numerous leading journals as well as an Associate Editor for ACS Nano (IF: 12) and a permanent member of NIH BTSS study section. He received his Ph.D. in bioengineering from MIT (2005), and MSc (2001) and BSc (1999) degrees from University of Toronto both in chemical engineering. Read more at: <http://www.tissueeng.net/>