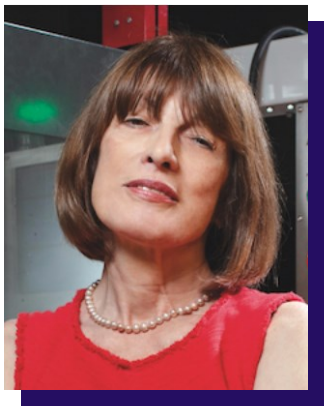
Joint Department of

BIOMEDICAL ENGINEERING

UNC CHAPEL HILL | NC STATE UNIVERSITY

Coulter Seminar Series Presents

"Engineering human tissues for medical impact"



Gordana Vunjak-Novakovic, PhD
University Professor
Mikati Foundation Professor of Biomedical Engineering and Medical Sciences
Columbia University

Gordana Vunjak-Novakovic is a University Professor, the first engineer to receive this highest academic rank at Columbia University. The focus of her lab is on engineering functional human tissues for use in regenerative medicine and patient-specific "organs-on-a-chip" models of diseases, including cancer. She is well published and highly cited, has mentored over 150 trainees, and founded four biotech companies. She is a member of Academia Europaea, Serbian Academy of Arts and Sciences, National Academy of Engineering, National Academy of Medicine, National Academy of Inventors, International Academy of Medical and Biological Engineering, Royal Society – Academy of Science, and the American Academy of Arts and Sciences.

ABSTRACT

The classical paradigm of tissue engineering involves the integrated use of human stem cells, biomaterial scaffolds (providing a structural and logistic template for tissue formation) and bioreactors (providing environmental control, dynamic sequences of molecular and physical signaling, and insights into the structure and function of the forming tissues). This biomimetic approach results in an increasingly successful representation of the environmental milieu of tissue development, regeneration and disease. Living human tissues are now being tailored to the patient and the condition being treated. A reverse paradigm is emerging in recent years, with the development of "organs on a chip" for modeling of integrated human physiology, using micro-tissues derived from human iPS cells and functionally connected by vascular circulation. In all cases, we seek to recapitulate the native tissue environments, using bioengineering tools. To illustrate the state of the art in the field and reflect on the current challenges and opportunities, this talk will discuss: (i) anatomically correct bone regeneration, (ii) bioengineering of the lung, and (iii) "organs on a chip" for patient-specific studies of injury, disease and regeneration.

Friday, September 23rd
12:00 Noon
Presented Virtually
Videoconferenced to: 321 MacNider Hall (UNC) and 4142 Engineering Building III (NC State)