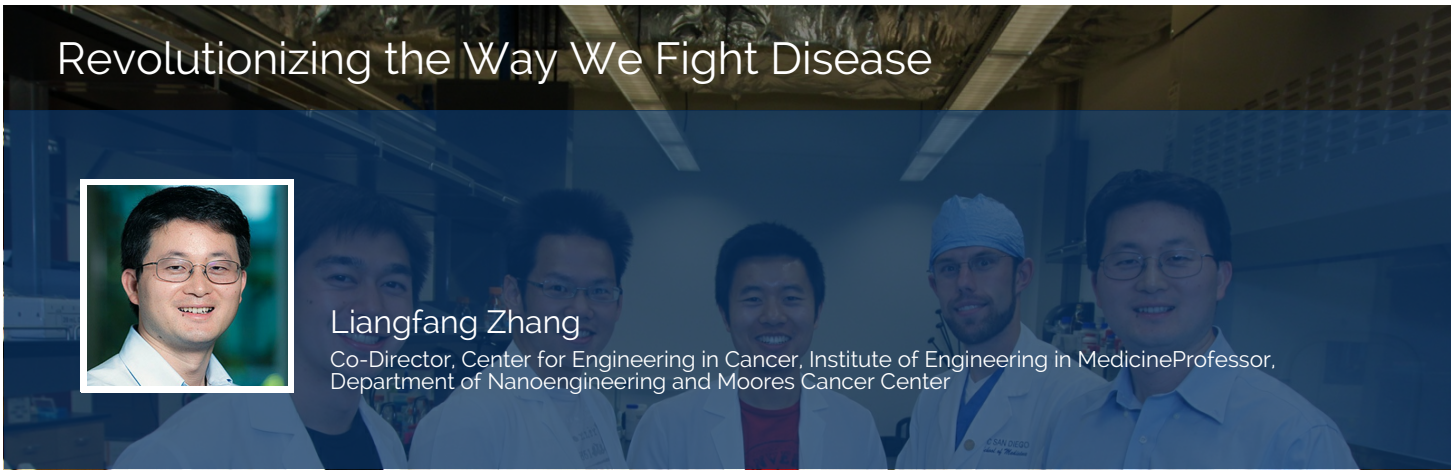
Revolutionizing the Way We Fight Disease



Liangfang Zhang

Co-Director, Center for Engineering in Cancer, Institute of Engineering in MedicineProfessor, Department of Nanoengineering and Moores Cancer Center

CURRENT RESEARCH

Using the body as camouflage against itself for more effective therapies

Dr. Liangfang Zhang, Professor in the Department of Nanoengineering and the Moores Cancer Center at the University of California, San Diego is creating cutting-edge biomimetic nanotechnologies, nanostructures that mimic the properties and functions of live cells and organisms, and exploiting them to study and solve complex biological problems. This technology wraps man-made nanoparticles with natural biological material taken directly from the cells and organisms. In 2011, Dr. Zhang was the first to invent cell membrane-coated nanoparticle technology, which has now evolved as an emerging research field. Specifically, he developed an entirely new red blood cell (RBC) membrane camouflaging technique to disguise synthetic drug delivery nanoparticles as natural RBCs. By cloaking nanoparticles with cellular membranes derived directly from natural RBCs, these nanoparticles are naturally equipped with all of the immune-related proteins presented on RBC membranes, and can therefore evade the body's immune system for prolonged and more effective drug delivery. This work represents the first attempt to combine natural cellular membranes with synthetic nanomaterials to develop novel biomimetic drug delivery systems. It opens a whole new set of opportunities for the society of nanotechnology and materials science. We are urgently looking for new treatments to some of life's most pressing medical conditions, particularly cancers and antibiotic-resistant bacterial infections, and Dr. Zhang is revolutionizing the way we fight these diseases with his technology. These are critical, unmet medical challenges that threaten the public health and demand bold and innovative solutions.

Dr. Liangfang Zhang, Principal Investigator of...

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AFFILIATION

University of California, San Diego

EDUCATION

- Postdoc in Chemical Engineering 2008 ,Massachusetts Institute of Technology
- Ph.D. in Chemical & Biomolecular Engineering 2006 ,University of Illinois at Urbana-Champaign
- M.S. in Chemical Engineering 2002, Tsinghua University
- B.E. in Chemical Engineering 2000, Tsinghua University

AWARDS

- Elected Fellow, American Institute of Medical and Biological Engineering, 2015
- Allan P. Colburn Award, American Institute of Chemical Engineers, 2014
- TR35 Innovator Award, MIT Technology Review, 2013
- Unilever Award, American Chemical Society, 2012
- Mentorship Award, UCSD Clinical and Translational Research Institute, 2012

RESEARCH AREAS

Health & Wellness, Wellness, Aging Research

FUNDING REQUEST

Your contributions will enable Dr. Zhang to continue to develop his revolutionary cell membrane coating method and identify and refine applications for this technology. Continuous support is needed to further develop these technologies toward clinical trials, which enables them to be tested in actual human subjects. Dr. Zhang's methods are innovative and exciting, and their full potential has yet to be realized.