

INM-KOLLOQUIUM

“LIVING MICROMACHINES”

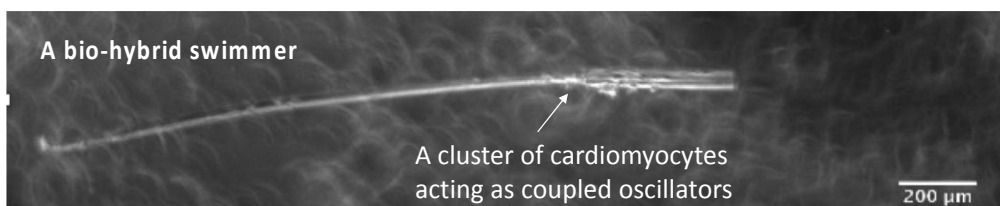
Prof. Dr. Taher Saif

University of Illinois at Urbana-Champaign, Mechanical Science and Engineering

Freitag, 06.07.2018, 11.00 Uhr

INM, Leibniz-Saal, Campus D2 5
Gastgeber: Prof. Dr. Eduard Arzt

Industrial revolution of the 19th century marked the onset of the era of machines that transformed societies. However, all of these machines are non-living, and they do not have inherent intelligence. On the other hand, since the discovery of genes, there is a considerable body of knowledge on engineering living cells. It is thus appropriate to envision biohybrid micro machines that are made from microfabricated scaffolds and living cells. These machines have the potential of unprecedented capabilities, as they would carry the footprints of millions of years of evolution. These machines may emerge from an interaction between the living cells and the micro-nano scaffolds. Thus, they might be the unique products of both the bottom-up and top-down methods. In this talk we will present such an elementary micro machine consisting of a soft slender string and rat cardiomyocytes. The string is made from PDMS by filling a microfabricated channel using capillary draw. Cells are cultured on one region of the string. These cells interact with the string as well as with each other, and beat in synchrony as a single actuator. This living actuator bends the string, and a bending wave propagates from the actuator site towards the end, as a bending of a sperm. This artificial machine thus swims in fluids as the engineered living swimmer. These swimmers might be used in vivo for autonomous intelligent drug delivery.



BIO: Dr Taher Saif received his BS and MS degrees in Civil Engineering from Bangladesh University of Engineering and Technology and Washington State University respectively in 1984 and 1986. He obtained his Ph.D degree in Theoretical and Applied Mechanics from Cornell University in 1993. He worked as a Post Doctoral Associate in Electrical Engineering and the National Nanofabrication Facility at Cornell University during 1993-97. He joined the Department of Mechanical Science and Engineering at the University of Illinois at Urbana-Champaign during 1997. He is currently the Gutgsell Professor in the department. His current research includes tumor micro environment, mechanics of neurons and cardiac cells, development of biological machines, and electro-thermo-mechanical behavior of nano scale metals and semiconductors.

Wir laden 15 Minuten vor Beginn zu einem Get-together mit dem Referenten ein.

KONTAKT

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