

**DR. MICHAEL R. KING** is the J. Lawrence Wilson Professor and Department Chair of Biomedical Engineering at Vanderbilt University. Previously he was the Daljit S. and Elaine Sarkaria Professor at Cornell University. He completed a PhD in chemical engineering at the University of Notre Dame and postdoctoral training in bioengineering at the University of Pennsylvania. He has written textbooks on the subjects of statistical methods and microchannel flows, and has received several awards including the NSF CAREER Award, Outstanding Research Awards from the American Society of Mechanical Engineers and the American Society of Clinical Chemistry, and was a James D. Watson Investigator of New York State. King is a Fellow of the American Institute for Medical the Biological Engineering, the Biomedical Engineering Society, the American Association for the Advancement of Science and the International Academy of Medical and Biological Engineering. He served as founding Vice President of the International Society of Bionic Engineering. He is the Editor-in-Chief of Cellular and Molecular Bioengineering, an official journal of the Biomedical Engineering Society, and served as the Chair of the Biomedical Engineering Council of Chairs.



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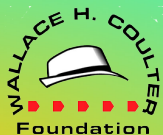
**J. Lawrence Wilson Professor and Department Chair**  
Vanderbilt University

**FRIDAY, APRIL 15, 2022 | 9:00 AM | EC 2300**

### **DRIVERS WANTED: CELLULAR DELIVERY OF ANTI-CANCER THERAPEUTICS IN THE CIRCULATION**

**ABSTRACT:** Metastasis contributes to over 90% of cancer-related deaths. Many types of cancer metastasize via the bloodstream, where circulating tumor cells (CTCs) originating from the primary tumor can travel through the circulation or lymphatic system and engraft in distant organs. In an effort to neutralize CTCs with the potential to form new tumors, a new therapeutic approach has been developed in which circulating blood cells are functionalized with TRAIL protein that will induce cancer cell death upon contact. The TRAIL-coated leukocytes, presenting therapeutic protein on their surface, have been found to effectively eliminate cancer cells from the bloodstream and lymph nodes in mice, and in cancer patient

blood samples subjected to fluid flow. I will share exciting new results showing effective prevention of distant metastasis via treatment before and after surgical resection of breast tumors in immunocompetent mice, and tests of the efficacy of TRAIL liposomes in treating cancer patient blood samples under flow conditions. Finally, I will show a new platform technology for the delivery of therapeutics that exploits the natural process of DNA netosis, where cellular DNA is rapidly exteriorized by neutrophils in response to cytokine stimuli. We have engineered supercharged proteins which immobilize on the DNA nets and successfully neutralize metastatic cells.



Through the generous support of the Wallace H. Coulter Foundation, the Department of Biomedical Engineering facilitates weekly lectures each year during academic terms. Experts in all areas of Biomedical Engineering are invited to provide a research seminar and to meet with faculty and students to discuss the latest developments and research in Biomedical Engineering.

**Friday, April 15, 2022**  
**9:00 AM | <https://bme.fiu.edu/seminars>**