UNIVERSITY OF MARYLAND
A. JAMES CLARK SCHOOL OF ENGINEERING
FISCHELL DEPARTMENT OF BIOENGINEERING

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"Harnessing biomaterials to study and control immune function"

Abstract:
Our research combines immunology and biomaterials to understand the interactions between synthetic materials and immune tissues, and to design more selective therapeutic vaccines for cancer and autoimmunity. This presentation will highlight our recent efforts toward these goals combining materials science and bioengineering tools, cell culture, animal models, and samples from human patients. In one example I will discuss new degradable polymer depots that could improve the selectivity of therapies for autoimmune diseases such as multiple sclerosis and diabetes by locally reprogramming the function of lymph nodes – tissues that coordinate immune function. A second area will present the lab's efforts to self-assemble immune signals into modular nanostructures. This rational design approach allows activation of programmable combinations and levels of immune pathways triggered. Modular control over these aspects of immune signaling could help improve the efficacy of vaccines for cancer and infectious disease, and enhance the efficiency of vaccine translation.

Biographical sketch:
Christopher M. Jewell is the Minta Martin Professor of Engineering , Associate Professor, and Associate Chair for Research in the Fischell Department of Bioengineering at the University of Maryland. He is also the Director of the University's BioWorkshop Core Instrument Facility, and a *Fellow* of the American Institute for Medical and Biological Engineering (AIMBE). Dr. Jewell has authored over 90 manuscripts and patents, including papers in *ACS Nano*, *Cell Reports*, *Nature Materials*, *PNAS*, and *Nature*. Some of Dr. Jewell's honors include being honored by the White House as a recipient of the Presidential Early Career Award for Scientists and Engineers (PECASE), selection as a Damon Runyon-Rachleff Innovator, appointment as an Associate Scientific Advisor for *Science Translational Medicine*, receipt of the NSEF Young Investigator Award and Owens Corning Award from the American Institute of Chemical Engineers (AIChE), and selection as the University of Maryland's Graduate Faculty Mentor of the Year. Chris was also honored as the state of Maryland's Outstanding Young Engineer by the Maryland Academy of Science, the state's highest honor for an engineer under 36. Dr. Jewell graduated from Lehigh University in 2003 with high honors, earning dual degrees in Chemical Engineering and Molecular Biology. He received his PhD in 2008 from the University of Wisconsin – Madison, working with Professor David Lynn. Chris then joined the Boston Consulting Group in New York City, where he worked in R&D strategy with global pharmaceutical companies. Dr. Jewell carried out his postdoctoral training as a Ragon Institute Fellow working with Dr. Darrell Irvine at MIT and as a Visiting Scientist at Harvard with Dr. Dan Barouch in the division of Vaccine Research.