

School of Biomedical Engineering

Research Day 2021

DISTINGUISHED ACADEMIC LECTURE



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Professor, Department of Chemistry; Department of Chemical and Biochemical Engineering and School of Biomedical Engineering, Western University.

“Functional Polymers for Biomedical Applications”

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Biography: Elizabeth Gillies is Professor in the Department of Chemistry, Department of Chemical and Biochemical Engineering, and School of Biomedical Engineering at Western University, and former Canada Research Chair in Polymeric Biomaterials. She obtained her B.Sc. degree in Chemistry from Queen's University, Kingston, Canada in 2000. She then moved to the University of California, Berkeley where she completed her Ph.D. degree in 2004 working under the guidance of Jean Fréchet. After postdoctoral work at the University of Bordeaux with Ivan Huc, she joined Western in 2006. Her research interests are in the development of biodegradable polymers, stimuli-responsive polymers, phosphorus-containing polymers, and polymer assemblies. Her team is applying these polymers via multidisciplinary collaborations to a range of applications including drug delivery, tissue engineering, and agriculture. Dr. Gillies is currently the Director of the Centre for Advanced Materials and Biomaterials Research at Western. She has received a number of awards including Tier 1 and 2 Canada Research Chairs, E. W. R. Steacie Memorial Fellowship, Early Researcher Award (Ontario), and Fallona Interdisciplinary Science Award (Western).

Abstract: Over the past couple of decades, transformative advancements in polymer chemistry have enabled the widespread preparation of well-defined polymers with specifically tailored functionalities, degradation properties, and molecular architectures. These advancements are enabling new applications of polymers in a range of fields and in particular biomedical areas,

where polymer structure and function are key for the development of drug delivery vehicles, tissue engineering scaffolds, and a wide range of other functional biomedical devices. This presentation will describe recent work from our group in two main areas. First, a class of polymers, termed “self-immolative polymers” (SIPs), which are designed to depolymerize end-to-end upon the cleavage of stimuli-responsive end-caps from the polymer termini will be presented. The development of these polymers, as well as their application in drug delivery nanoparticles and in coatings will be described. In addition, recent work on phosphonium polymers will also be presented. The use of phosphonium polymers as soluble and surface-active antibacterials will be presented.