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**Virus-Mimetic DNA Encapsulation Using Novel ABC Triblock Copolymers** RAHUL SHARMA, YOU-YEON WON, School of Chemical Engineering, Purdue University, West Lafayette, IN-47907 — To address the challenge of developing a safe and effective delivery system currently faced in gene therapy technologies, our research explores a novel approach for improving DNA encapsulation and delivery using a novel three-component block copolymer which by design has the self-assembling properties tailored for virus-like encapsulation of DNA. Our approach utilizes an ABC triblock copolymer composed of (A) *hydrophilic* poly(ethylene oxide) (PEO), (B) *hydrophobic* poly(n-butyl acrylate) (PnBA) and (C) *cationic* poly(ethyleneimine) (PEI). With such an ABC sequence of blocks, the C block primarily interacts with the negatively charged phosphates on DNA, and the viral capsid-like morphology of the nanometers-thick membrane can be derived from the A and B blocks at the outer surface of collapsed DNA. In this presentation, we will discuss our recent experiments that establish a proof of concept and processing strategies for achieving the desired virus-mimetic DNA-encapsulating morphology composed of a compact DNA core covered with a layer of protective coating created by the ABC triblock copolymer.

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