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In vitro and *Ex vivo* toxicology of antimicrobial conjugated electrolytes: Interactions with mammalian cells

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Abstract

Certain cationic phenylene ethynylene (CPE)-based polymers (PPEs) and oligomers (OPEs) exhibit dark- and light-activated antimicrobial activity. Until recently, it was unknown if they would also exhibit similar biocidal activity toward mammalian cells. Based on their biocidal activity and diversity of repeat unit number and functional groups, a variety of CPEs, PPEs, and OPEs were selected for these studies, and were examined for their toxicity toward mammalian cells at three levels: cytoxicity testing of cell monolayers, skin irritation testing of tissues, and intracellular co-localization. As expected, concentration plays the largest role in determining viability. The lack of skin irritation for all substances alleviates initial safety concerns for products based on these CPEs and OPEs. In all cases, the addition of light changed the effects of the compounds on the mammalian cells. The modes of action of these compounds appear to be governed primarily by length.

Biography

Heather Canavan is an associate professor in the Dept. of Chemical and Nuclear Engineering and the Center for Biomedical Engineering at the University of New Mexico. She received her PhD in Physical Chemistry from George Washington University in 2002, after which she held a postdoctoral fellowship in the Chemical and Bioengineering Departments at the University of Washington. The focus of her research is the biocompatibility of bioactive polymers, including the plasma polymerization of biomaterials as novel cell culture substrates for biosensor and tissue engineering applications. She publishes in journals such as *Langmuir*, *Plasma Processes and Polymers*, and *Biomaterials.*