

# Challenges, Opportunities, and New Directions in Conventional and Silicone Hydrogel Contact Lens Polymers

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**Introduction:** Bio-mimicry is a concept that has been applied to the design of biomaterials; namely that polymers having chemical structures similar to structures that occur naturally in the body are perceived to be more compatible with body tissue. Omafilcon A, a soft hydrogel contact lens polymer developed by Biocompatibles International, Inc. reflects an early attempt, in an ongoing effort, to achieve a more biocompatible “implant” material. In addition to hydroxyethyl methacrylate (HEMA), this polymer contains a phosphorylcholine group-containing monomer. The material is claimed to resist desiccation compared to other conventional hydrogels by mimicking corneal chemistry. While this represents one consideration, far more has occurred to help make the contact lens biocompatible.

**Results/Discussion:** This presentation will review the latest in materials surface and bulk-chemistry innovation, along with clinical response, to the easiest medical implant site imagined - the ocular surface. Issues such as compatibility, protein and lipid fouling, lens comfort, visual acuity, etc., will be discussed in regard to daily and extended wear platforms. Challenges, opportunities, and new directions will be highlighted for daily and extended wear lenses.

**Conclusions:** Recent progress in biomaterial science is leading to contact lens medical devices with enhanced biocompatibility. Control of surface chemistry as well as bulk-chemistry has produced a number of lenses that are better tolerated and more comfortable.