

Evaluation of the mucosal retention properties and toxicological profiles of a mucoadhesive polymer gel

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Abstract

Mucoadhesive polymers are delivery systems developed to prolong retention of medication at application sites, such as mucosal tissues. The intimate contact between the mucoadhesive polymer and mucosal tissues require these delivery systems to be non-toxic. Experiments were conducted to evaluate the mucosal retention properties of a proprietary mucoadhesive polymer gel, in comparison to a reference product on human oral mucosal tissues. Toxicological profiles of the proprietary gel was also assessed on the human oral, nasal, and vaginal mucosal tissues. The EpiOral, EpiAirway, and EpiVaginal tissue models (MatTek Corporation) are 3-dimensional models developed to closely resemble the human oral, nasal, and vaginal mucosal tissues, respectively. Mucosal retention properties were evaluated through images of gel retention on the surface of the EpiOral tissue following application and washing, while percent cell viability was determined against a positive and negative control to assess toxicity for all tissue models. Results show that the proprietary gel was retained on the apical surface of the EpiOral tissue for up to 40 min in comparison to 5 min for the reference product. Percent viability of all tissues show that the mucoadhesive polymer gel was non-toxic to the human oral, nasal, and vaginal mucosa. The proprietary gel has demonstrated to be a safe and effective mucoadhesive polymer that can offer increased retention of medication at the site of action without toxicity concerns. Practitioners and compounding pharmacists may then safely utilize this mucoadhesive polymer as a delivery system to increase the contact time between the medication and mucosal tissues.

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Biography

Matt Martin graduated from Morehead State University in 2002 with a BS in Chemistry and then completed his Doctor of Pharmacy at the University of Kentucky in 2006.

He practiced in a compounding pharmacy for 8 years preparing sterile and non-sterile preparations. Currently he serves as a Consultant Pharmacist to the members of the Professional Compounding Centers of America.