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Comparing *ex vivo* and *in vitro* Translocation of Silver Nanoparticles and Ions through Human Nasal Epithelium

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Abstract

Silver nanomaterials are widely used in clinically approved devices, consumer goods, devices and over-the-counter nutraceutical products. Despite the increase in silver nanomaterial research, few investigations have specifically distinguished the biological effects resulting from silver nanoparticles (AgNPs) versus silver ions released from AgNPs. This is in part, due to the complex analytical methods required to characterize silver ion release from AgNPs in biological media. This study sought to analyze silver ion release from AgNPs in biological media, compare silver transport from soluble AgNO₃ and AgNPs through *ex vivo* full thickness sinus human tissue explants human nasal epithelium and determine fractional AgNP internalization by human nasal epithelial cells. Rapid silver ion release is observed from AgNPs in human nasal epithelial cell medium over 3 hours (9.6% of total silver mass). Significantly

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