

Abstract Submitted
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The Effect of Graphene Oxide/Reduced Graphene Oxide Functionalized with Metal Nanoparticles on Dermal, Bacterial, and Cancerous/Non-Cancerous Epithelial Cells¹ ARTHUR CHEN, MIRIAM RAFAILOVICH, MARCIA SIMON, State Univ of NY- Stony Brook, REBECCA ISSEROFF, Lawrence Public High School, STEPHEN WALKER, State Univ of NY- Stony Brook, JAE HEE CHO, Boston University, JOHN JEROME, Suffolk University — Graphene and metal nanoparticles are permeating health products but their effects individually and combined on human skin are uncertain. This project studied the effect of graphene oxide (GO) and reduced graphene oxide (rGO) functionalized with Ag or Pt nanoparticles (Ag/PtNPs) on bacterial, dermal (DFBC's), and cancerous (SCC13's) and non-cancerous (DO33's) epidermal cells. GO was functionalized with AgNPs or PtNPs, forming metallized-GO; then reduced with NaBH₄. FTIR and SEM confirmed the synthesis and composition. Confocal and SEM showed that Ag-rGO, depending on nanoparticle size, killed either *S. Aureus* or *K. Pneumoniae*, while Pt-rGO and rGO had no effect. Rhodamine staining revealed that Ag-rGO was very toxic to SCC13's, but only slightly toxic to DO33's. Pt-rGO and rGO had little effect on SCC13's and DO33's. At high concentrations all GO solutions inhibited cell growth but were not cytotoxic. Optical microscopy displayed that every GO/rGO solution adhered to DFBC's and influenced their direction of growth, making GO/rGO potentially applicable for wound healing.

¹Garcia MRSEC Polymers at Engineered Interfaces

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