

Effects of Ingested Nanoparticles on Gene Regulation in the Colon

Supporting/Contributing Agency: U.S. EPA (STAR Grant RD83333601)

Dr. Moos's team at the University of Utah tested nanoparticle powders of carbon black, SiO₂, TiO₂, Fe₂O₃, Al₂O₃, and ZnO, which represent commercial chemicals that are currently being produced in high volume as nano-sized powders.

The effect on colon cells was studied because there is evidence suggesting that insoluble particles in the diet can contribute to inflammatory bowel disease. These nanoparticle experiments found that zinc oxide was the most potent of the tested powders. Microarray studies showed that the ZnO changed the level of expression for many genes associated with inflammation and cell survival. Experiments also analyzed the mechanisms by which these particles caused colon cell death.

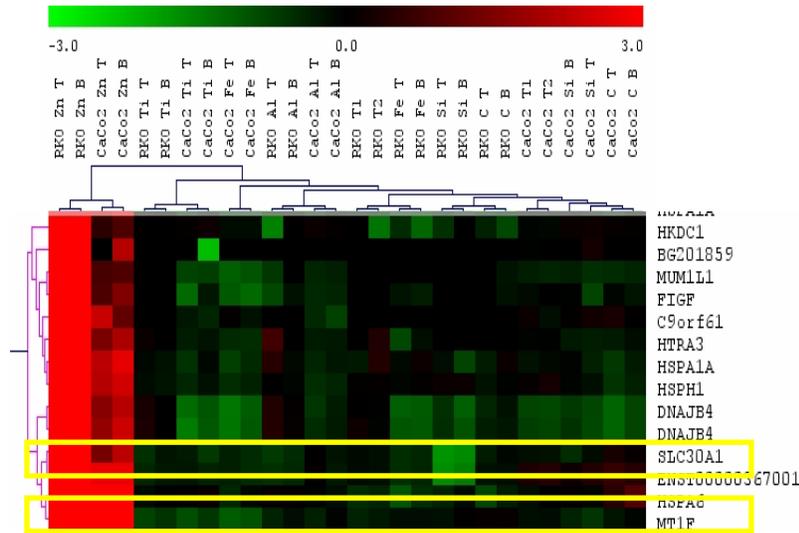


Figure. Caption.

Zinc oxide has long been used in many consumer products, including sunscreens and cosmetics. Nano-sized powders of zinc oxide may have unhealthy effects if ingested in large amounts.

Reference/Publication

Moos, P.J., K. Olszewski, M. Honeggar, D. Woessner, N.S. Cutler, and J.M. Veranth. 2009. Transcriptional responses to ZnO nanoparticles in human colon cancer cells. Manuscript in preparation.