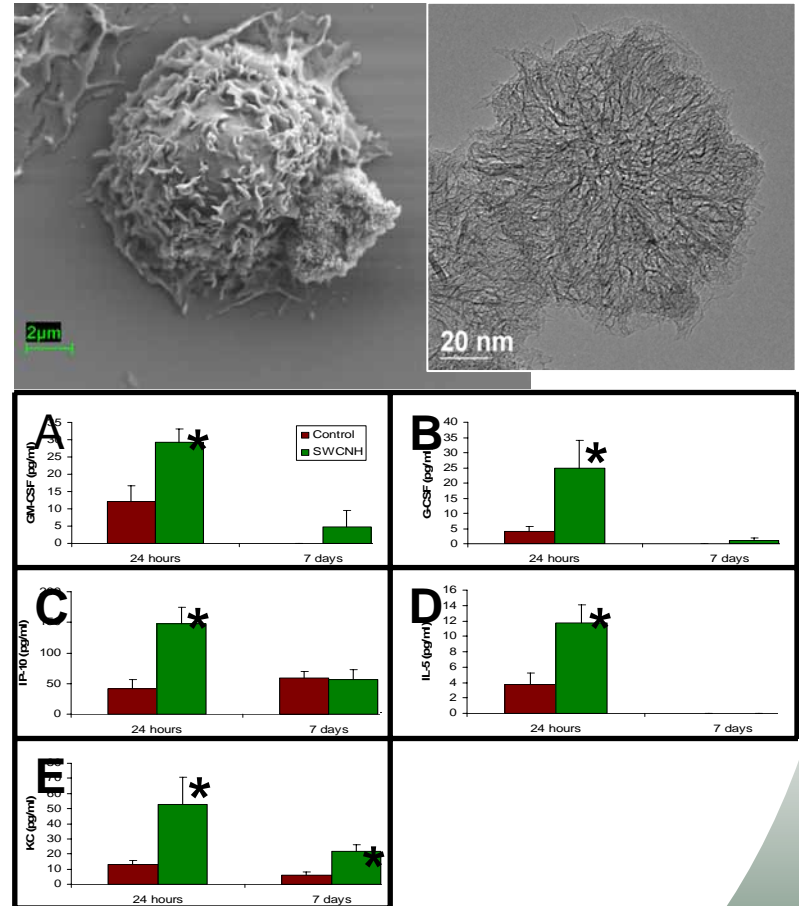# Assessing Pulmonary Toxicity of Nanomaterials

Contact: Meng-Dawn Cheng, *chengmd@ornl.gov*, 865-241-5918
ORNL/Laboratory Directed Research and Development Program

- First in-vivo investigation of the pulmonary toxicity of single-walled carbon nanohorns using C57BL6/J mice.

- Only 5 out of 22 cytokines and chemokines measured in BAL fluid indicated early (24 hours post-exposure) and none showed sustained (7 days) inflammatory responses.

- Histological analysis found no signs of granulomas or early fibrosis suggesting non-detectable pulmonary structural changes from the exposure to SWNHs.

OAK RIDGE National Laboratory

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Previous studies have suggested that single-walled carbon nanotubes (SWCNTs) may pose a pulmonary hazard. We investigated the pulmonary toxicity of single-walled carbon nanohorns (SWCNHs), a relatively new carbon-based nanomaterial that is structurally similar to SWCNTs. Mice were exposed to 30 µg of surfactant-suspended SWCNHs or an equal volume of vehicle control by pharyngeal aspiration and sacrificed 24 hours or 7 days post-exposure. Total and differential cell counts and cytokine analysis of bronchoalveolar lavage fluid demonstrated a mild inflammatory response which was mitigated by day 7 post-exposure. Whole lung microarray analysis demonstrated that SWCNH-exposure did not lead to robust changes in gene expression. Finally, histological analysis showed no evidence of granuloma formation or fibrosis following SWCNH aspiration. These combined results suggest that SWCNH is a relatively innocuous nanomaterial when delivered to mice in vivo using aspiration as a delivery mechanism.

Assessing the pulmonary toxicity of single-walled carbon nanohorns (2007)
Rachel M. Lynch, Brynn H. Voy, Dana F. Glass, Shannon M. Mahurin, Arnold M. Saxton, Robert L. Donnell, & Meng-dawn Cheng, *Nanotoxicology* (in press)

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