



THE SELECTED ABSTRACTS

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Session: Mini symposium I: Nanomaterials and Health

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309 Monitoring and modeling of exposure to manufactured nano objects, agglomerates & aggregates (NOAA) for epidemiologic studies

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Abstract

Introduction

A major challenge for setting up human field studies is the identification of sufficiently large number of workers with exposure to NOAAs. Pooling of data is necessary but requires harmonization of methods. A multi-metric exposure approach is proposed, which may be better correlated to health effects, however, an appropriate exposure estimate has not been developed yet. Currently, workers' activities/ tasks related to NOAA are time wise highly variable resulting in considerable within-worker, between-day variances. No validated models exist to predict exposure to NOAA, however, the concepts of such a source-receptor model have been presented, and for specific activities (i.e. powder handling or spraying) more detailed models are being developed. Meanwhile larger datasets on (mostly task-based) occupational (estimates of) exposure to NOAA are available, e.g. the NANOSH study, or will be built. Database structures are actively developed, e.g. the PEROSH -NECID database, and harmonized workplace exposure studies generating data will populate the NECID database in near future.

Methods and results

The challenges for exposure assessment for epidemiologic studies can be addressed by developing task-based exposure matrices profiles covering scenario's across the product chain of NOAA. Building blocks for such task-based exposure matrices will be existing models and those that are under development, e.g. Stoffenmanager nano, NanoSafer, further analysis of existing datasets to demonstrate task-specific exposures and tailored task-based measurements. Combined with worker specific information on type of NOAA, and frequency, duration etc. of activities/tasks per job title, estimates for exposure can be derived. In addition, co-exposures from process or combustion derived ultrafine particles will be taken into account. A multi-pathway approach is used, however, the focus will be on the inhalation route. Currently, the feasibility of such an approach is explored in a pilot study, which is supported by an extensive measurement campaign in the facility.