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Media Release

Swiss Aerosol Award 2015

This year's Swiss Aerosol Award goes to Mr. Yaobo Ding from the Institute for Work and Health (IST) at the University of Lausanne. The young researcher developed in his thesis an effective system for nanopowder aerosolization and deagglomeration of airborne nanoparticles.

Studies have shown that workers at nanotechnology workplaces can be exposed to engineered nanomaterials (ENMs) aerosolized from dry nanopowders. Not only the site ENMs deposit in the lungs but also their biological interactions with the human body strongly depend on the ENM size, which in turn are determined by particle agglomeration and deagglomeration behaviors in the air. How these processes take place during various transport and exposure routes (e.g., inhalation) is yet to be understood. First, a reliable aerosolization system is needed to generate nanoparticle aerosols with stable size distribution and number concentration for subsequent characterizations. Afterwards, an efficient method is needed to determine the mechanical stability (deagglomeration potential) of aerosolized nanoparticle agglomerates.

This year's winner of the Swiss Aerosol Awards, Mr. Yaobo Ding, has studied during his doctoral dissertation at the Institute for Work and Health at the University of Lausanne the stability of airborne nanoparticle agglomerates under aerodynamic shear.* The experiments were conducted with reference nanomaterials provided by the Joint Research Center (JRC) of European Commission under the EU's FP7 project MARINA. The results demonstrated the possibility of airborne nanoparticles to deagglomerate under certain level of aerodynamic shear force. The work also documented the suitability of the developed system for routine characterizations of powder-generated nanoparticles.

The established method for ranking the deagglomeration potentials of airborne ENMs is an important contribution to human exposure and risk assessments in work environment. As the author of the study, Mr. Yaobo Ding is therefore awarded by the Swiss Lung Foundation with CHF 10'000 as the Swiss Aerosol Award 2015.

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* Yaobo Ding and Michael Riediker. A system to assess the stability of airborne nanoparticle agglomerates under aerodynamic shear. Journal of Aerosol Science, 88(0): 98-108 (2015)