# European Respiratory Society
# Annual Congress 2013

**Abstract Number:** 3239

**Publication Number:** P4253

**Abstract Group:** 6.2. Occupational and Environmental Health

**Keyword 1:** Animal models **Keyword 2:** Inflammation **Keyword 3:** Occupation

**Title:** Biodistribution of engineered hematite nanoparticles in healthy and asthmatic mice

Ms. Åsa 19414 Gustafsson asa.gustafsson@foi.se [1,2], Dr. Ulrika 19415 Bergström ulrika.bergstrom@foi.se [1,3], Mrs. Lina 19416 Ågren lina.agren@foi.se [1], Prof. Lars 19417 Österlund lars.osterlund@angstrom.uu.se [1,4] and Prof. Anders 19418 Bucht anders.bucht@foi.se [1,2]. [1] Swedish Defence Research Agency, Div of CBRN Defence and Security, Umeå, Sweden ; [2] Dept of Public Health and Clinical Medicine, Umeå University Hospital, Umeå, Sweden ; [3] Dept of Organismal Biology, Uppsala University, Uppsala, Sweden and [4] Dept of Engineering Sciences, Uppsala University, Uppsala, Sweden .

**Body:** Background: Iron oxide nanomaterials are used in a wide range of green nanotechnology applications, such as solar hydrogen production, solid waste decontamination, and waste water cleaning. During manufacturing there is a risk of inhalation exposure. To date there are few studies of biodistribution following inhalation of hematite nanoparticles (NP) and no such studies are published on sensitive individuals. Aim: The present work aimed to study if biodistribution of hematite NP differs between healthy mice and mice with an allergic airway inflammation. Method: Radioactive [$^{55/59}$Fe]-hematite NP (primary diameter 20nm) was given by intratracheal lung instillation to healthy mice and mice with an allergic airway inflammation induced by the experimental allergen ovalbumin. Biodistribution was monitored with liquid scintillation and whole-body autoradiography (WBA) at 1, 7 and 14 days after exposure, respectively. Results: Our data demonstrate translocation towards lymphoid organs; draining mediastinal lymph nodes, thymus, spleen and other organs such as bone marrow, liver, and brain. Tissue levels were fairly stable or decreased over time. However, within the brain the levels were observed to increase over time, and WBA indicates a regional distribution within the brain. Our preliminary data do not indicate major differences in biodistribution between healthy mice and mice with an ongoing airway inflammation. Conclusions: These data demonstrate that exposure to hematite NP via inhalation is a route of entry to secondary organs and highlight a need for further delineation of their biodistribution after inhalation of hematite NP and assessment of detrimental health effects including neurological effects.