



HSPH-NIEHS NANOSAFETY CENTER
Member of the NIEHS NHIR Consortium
<http://hsph.harvard.edu/nanosafety/>



Nanolecture Series

Safety Assessment of Graphene-Based Materials: A Graphene Flagship Perspective



Bengt Fadeel

*Professor of Medical Inflammation Research
Karolinska Institutet*

Date: October 18th, 2018

Time: 1:00-2:00 pm

Location: 665 Huntington Ave, Building 1, Room 1302
Boston, MA, 02115

Abstract: The Graphene Flagship Project, along with the Human Brain Project, is the first of the European Commission's Future & Emerging Technology (FET) Flagship Projects, whose mission it is to address major scientific and technological challenges through long-term, multi-disciplinary research and development efforts. Safety assessment is an essential requirement that cannot be dissociated from the development of new technologies. Therefore, the Graphene Flagship has invested considerable efforts in the assessment of the potential impact of graphene-based materials (GBMs) on human health and the environment. The present lecture will provide examples of recent studies conducted in the Flagship on the interactions of endotoxin-free graphene oxide (GO) of differing lateral dimensions with primary human immune cells (macrophages and neutrophils).

Transcriptomics approaches are being increasingly applied to unravel the mechanisms of interactions of nanomaterials with cells and tissues. Using RNA-sequencing coupled with bioinformatics analysis, GO was found to trigger size-dependent transcriptional effects in human lung cells and distinct pathways were activated in lung cells following short-term versus long-term (i.e., several weeks) exposure to GO. These results show that omics approaches can be utilized to provide a deeper understanding of the impact of GO on exposed cells or tissues. Understanding the biological interactions of GO and other GBMs will pave the way towards safe handling and use of these materials

Biographical Sketch: Bengt Fadeel is a Professor of Medical Inflammation Research and Head of the Division of Molecular Toxicology at the Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden. He received his M.D. and Ph.D. degrees from Karolinska Institutet and he was elected as a Fellow of the Academy of Toxicological Sciences in 2012 (recertified in 2018). He served as Vice Chairman of the Institute of Environmental Medicine from 2009-2013 and held a position as Adjunct Professor of Environmental & Occupational Health at the University of Pittsburgh from 2011 to 2016. Dr. Fadeel has been engaged in several EU-funded nanosafety projects, including NANOMMUNE, MARINA, NANOREG, SUN, and NANOSOLUTIONS, and is a member of the EU-funded GRAPHENE Flagship Project, a 10-year project with more than 150 partner institutes, and the EU-funded consortium, BIORIMA ('managing risks of biomaterials'). He is also a partner of the national MISTRA Environmental Nanosafety project and chair of the scientific panel of the national nanosafety platform, SweNanoSafe. He is an editor of *Adverse Effects of Engineered Nanomaterials: Exposure, Toxicology, and Impact on Human Health* (Elsevier) and has organized many conferences including the 7th International Nanotoxicology Congress in Antalya (2014). He has published more than 225 scientific articles. Dr. Fadeel was awarded the national Environmental Medicine Prize (2011) for his research on the opportunities and risks of the emerging nanotechnologies.

Light lunch will be provided

For more information: <https://hsph.me/nanolectures>