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The nanotoxicological influence of nanoparticles on vascular function

Silica nanoparticles (SiNPs) are attractive drug delivery platforms and diagnostic tools, however, recent reports suggest that they may be detrimental to arterial function. We aimed to examine whether SiNPs influence the function of small size arteries, which play an essential role in controlling blood perfusion into tissues. We show that while exposure to SiNPs under static conditions, attenuated dilator responses ex vivo, attenuation was only evident at lower agonist concentrations, when exposed under flow conditions or after intravenous injection, *in vivo*. Pharmacological inhibition studies suggest that SiNPs may interfere with the endothelial dependent hyperpolarizing factor (EDHF) vasodilator pathway. The dosage dependent influence of SiNPs on arterial function, demonstrated in our study, will help identify strategies for their safe clinical administration in the future.

Biography

May Azzawi is a Reader in Vascular Physiology at the Healthcare Science Research Institute, Faculty of Science and Engineering, Manchester Metropolitan University, United Kingdom. She received her PhD from the University of London (National Heart and Lung Institute, Royal Brompton Hospital, London) and has held Post-doctoral and Fellowship positions at the University of Manchester. She has over 20 years' research experience in multidisciplinary fields, including vascular physiology and nanomedicine, and has published widely (>3,000 citations to date). She leads a 'Nanovascular' research group investigating the influence of nanoparticles on cellular and vascular function using ex vivo and 3D *in vitro* models. Her group focuses on strategies (Nutraceutical and Nanotechnology) for the preservation and restoration of vascular function. She has authored over 50 publications, including peer reviewed articles and book chapters, and has secured over half a £million in research funding (Innovate UK, Erasmus Mundus, EPSRC). She is Co-editor of the journal 'Regenerative Nanomedicine'; Editorial Board Member of 'Applied Nanostructured Materials'; Co-chaired the 3rd international conference on nanotechnology in medicine and acts as Referee for a number of international journals in the fields of nanomedicine and vascular science.

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