

TOXICITY OF SILVER NANOPARTICLES WITH EMPHASIS ON KIDNEY CELLS *IN VITRO* AND *IN VIVO*

FRIDAY

4th NOVEMBER 2016

10:00AM – 11:00AM

ANATOMY SEMINAR ROOM,
L2, MD10, DEPARTMENT OF
ANATOMY, NUS.**MISS CYNTHIA ONG**Graduate Student
Department of Anatomy
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Although silver nanoparticles (AgNPs) are used in various biomedical applications, its toxicological profile remains relatively unknown. *In vitro* experimentation revealed that Fetal Bovine Serum – coated AgNPs (~13nm) induced apoptosis via the extrinsic pathway and genotoxicity to human embryonic kidney HEK 293 cells. In co-cultures of Human Umbilical Vein Endothelial Cells (HUVEC) – HEK 293 cells, where HUVECs were exposed to AgNPs, unexposed HEK 293 cells displayed bystander effects such as differential DNA repair gene expression and oxidative stress. The biological effects of AgNPs were also evaluated in two *in vivo* models. Rats injected with a single dose of 0.2mg/kg body weight AgNPs exhibited renal inflammation, associated with significant up-regulation of miR-128-3p and down-regulation of its target, Agrin. AgNPs also caused a decline in the fecundity of *Drosophila* male flies due to induction of oxidative stress, accompanied by precocious differentiation of germline stem cells and decreased proliferation of spermatogonia.