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## Functions of antigen presenting cells can be altered by gold nanoparticles exposure

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Gold nanoparticles (AuNP) are increasingly used for therapeutic and diagnostic applications. Due to their small size (<200 nm), NP can increase the diffusion and effectiveness of drugs while facilitating modes of administration. Nevertheless, the potential risks for human health associated to NP exposure remain poorly documented especially about their effects on the immune system. Antigen presenting cells (APC), such as macrophages and dendritic cells, participate in the maintenance of body integrity, engulfing foreign pathogens and delivering signals to other components of the immune system. In this study, we investigated whether these functions could be altered by NP exposures. Using the macrophage cell line J774 and primary bone marrow derived dendritic cells, we have demonstrated that AuNP highly accumulate in APC. Notably, this accumulation did not alter phagocytosis capacity of macrophages. Then, analyzing expression of surface markers CD-86 and MHC-II, we established that NP exposure did not activate bone marrow derived DC. Moreover, further activation of these cells by known activators such as bacterial lipopolysaccharide (LPS) was not impaired by NP. However, in this case, the cytokine response was altered, showing reduced inflammatory cytokine production such as IL-6, IL-12 and IL-23. In a model of antigen presentation *in vitro*, this cytokine profile resulted into an altered development of specific immune responses. AuNP exposure led to an increase in T cell specific cytokines: IL-13 and IL-4 (indicating a shift of classical Th1/Th2 balance towards Th2) and IL-17 (standing for an alteration of T-cell fate towards Th17). All together, these results demonstrated that NP did not alter phagocytosis and DC activation. However, these NP changed cytokine responses after such activation, leading specific T cell fate towards Th2 and Th17 phenotypes. These modifications could impair the immune system physiology and contribute to chronic diseases or autoimmunity.

### Biography

Alexis Gonon is a 3rd year PhD student at Institute of Advanced Biosciences (IAB) of Grenoble, France. After a Bachelor degree in Biology at University Joseph Fourier, he completed his Master's degree in Animal Genetics at Paris Diderot University. He has expertise in Mouse Experimentation at Pasteur Institute, France. He is involved in partnerships between IAB and several French and international companies of nanomedicine to test immune safety of these new innovative drugs.

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