

[Immunobiology](#)

[Volume 228, Issue 6](#), November 2023, 152762



Impact of gold nanoparticles (AuNPs) on eosinophils isolated from male and female individuals

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Abstract

It is well established that some differences exist between the male and female immune systems. Despite this, a sex-based analysis is not frequently performed in most scientific published reports. Knowing that inflammation is a common undesired effect observed resulting from [nanoparticle](#) (NP) exposure, we investigate here how in vitro [treatment](#) of [gold NPs](#) with a primary size of 20 and 70 nm (AuNP<sub>20</sub> and AuNP<sub>70</sub>, respectively) will alter the biology of human [eosinophils](#) isolated from men and women blood. We found that [treatment](#) of AuNP<sub>70</sub>, but not AuNP<sub>20</sub>, significantly delay [apoptosis](#) only in [eosinophils](#) isolated from women. AuNPs were found to decrease eosinophil [phagocytosis](#), however, significance was only observed in AuNP<sub>20</sub>-induced eosinophils isolated from women. The production of IL-8 was significantly increased in response to both AuNPs but only in eosinophils isolated from men and the production of IL-1 $\beta$  was increased in AuNPs-induced eosinophils, although significance was observed only in AuNP<sub>70</sub>-induced eosinophils isolated from women. We conclude that future studies investigating the toxicity of AuNPs (or other NPs) should include a sex-based analysis, especially if the tested NPs have potential medical applications knowing the increased interest in the development of personalized precision medicine.