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EFFECTS OF MATERNAL AU-NP EXPOSURE BY INHALATION ON FETO-PLACENTAL DEVELOPMENT AND PLACENTAL FUNCTION, IN A RABBIT MODEL

Rousseau-Ralliard Delphine^{1,2}, Fessard Valérie³, Boere John⁴, Fokkens Paul⁴, Dahirel Michèle^{1,2}, Richard Christophe^{1,2}, Jouneau Luc¹, Archilla Catherine¹, Gaté Laurent⁵, Huet Sylvie³, Meslier Lisa³, Fournier Natalie⁶, Aubrière Marie-Christine^{1,2}, Gelin Valérie^{1,2}, Marie-Sylvie Lallemand^{1,2}, Aïoun Josiane^{1,2}, Duranthon Véronique¹, Chavatte-Palmer Pascale^{1,2}, Laloë Denis⁷, Jaffrézic Florence⁷, Flemming Cassee⁴, Couturier-Tarrade Anne^{1,2}

1- UMR BDR, INRA, ENVA, Université Paris Saclay, Jouy en Josas, France

2- PremUp Foundation, Paris, France

3- ANSES, Laboratoire de Fougères, BioAgroPolis, Fougères, France

4- National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands

5- INRS, Département Toxicologie et Biométrie, Vandoeuvre, France

6- Hôpital Européen Georges Pompidou (AP-HP), Laboratoire de Biochimie, UF Cardio-Vasculaire, Paris, France.

7- UMR GABI, INRA, Université Paris Saclay, Jouy en Josas, France

Gold nanoparticles (Au-NP) are contained in consumer and medical products leading to an potential of workers being exposed to Au-NP among them pregnant women, but effects of Au-NP on offspring is still unclear. The aim was to evaluate the effects of maternal sub-chronic Au-NP inhalation throughout the gestation on the feto-placental development and placental function in a rabbit model.

11 pregnant females (Au-NP) inhaled uncoated Au-NP (11.5nm) at $132 \pm 38\mu\text{g}/\text{m}^3$ for 5 days/week, from 1-27dpc of gestation. 11 controls were exposed to clean air in the same conditions. Gestation was monitored by ultrasound. At 28dpc, maternal bronchoalveolar fluid, hematology and biochemistry, maternal and fetal biometry were analyzed using a linear models. DNA lesions were evaluated by alkaline comet assay and Au quantified by neutron activation in various maternal and male fetal tissues. Placental gene expression was explored using a customized microarray.

Fetal growth was not affected, although umbilical Doppler resistance was increased at 27dpc in Au-NP. At 28dpc, maternal lymphocytes numbers were increased in bronchoalveolar fluid from Au-NP. Maternal blood mean corpuscular volume was significantly decreased in Au-NP, whereas maternal biometry and biochemistry, fetal biometry remained unchanged. At 28dpc, DNA lesions were detected in maternal bone marrow and in male, but not female, fetal kidneys. Au-NP were strongly detected in maternal lungs, liver and plasma and in the placenta, heart, lungs and kidneys of male fetuses, but not in brain. 3 genes were differentially expressed between groups. Gene Set Enrichment Analysis revealed opposite gene set enrichment profiles in Au-NP males and females compared to C.

Maternal and fetal phenotypes were weakly affected by *in utero* exposure to Au-NP through maternal inhalation but DNA lesions were observed. Moreover, Au-NP were able to reach placental and fetal tissues and to affect placental gene expression in a sex-specific manner.

Guidelines:

- Maximum word count is 300 words.
- The abstract should be structured in the following sections: Objective, Methods, Results and Conclusions.

- The presenting author must be registered before 15th May 2019 for further publication of the abstract in Placenta Journal.
- Abstracts should not be submitted if the content has been accepted for publication AND will be available (on line or in paper) prior to the IFPA meeting in September.