rate of occurrence and mortality, three oral squamous carcinoma cells (Fadu, OEC-M1, and OC3) treated by sodium arsenite (NaAsO2) and dimethylarsenic acid (DMA) were investigated to determine whether the arsenic compounds could be the anti-cancer agents. Results show that cells appeared rounded up and became membrane blebbing after treatments with NaAsO2 (1 μM) and DMA (1 mM) for 24 hr in OEC-M1 and OC3 cell lines, and NaAsO2 (10 μM) and DMA (5 mM) for 24 hr in Fadu cell line, respectively. These morphological changes revealed characteristics of apoptosis. In cell viability test, the surviving percentage of all three cell lines significantly decreased as the dosage of arsenic compounds increased (10 to 100 μM NaAsO2 and 1 to 100 mM DMA). The impact of arsenic compounds on cell cycle regulation was detected by flow cytometry. Results showed that the percentage of subG1 and G2/M phase cells among three cell lines increased in both NaAsO2 and DMA treatments. In addition, activation of the caspases, such as caspase-8, -9, and -3, and cleavage of poly ADP-ribose polymerase (PARP) were examined by western blot, and results showed that NaAsO2 and DMA activated caspase-8, -9, and -3 cleavages. Moreover, both arsenic compounds could activate JNK, ERK1/2, and p38 phosphorylation among these cell lines. Taken together, NaAsO2 and DMA could induce cell apoptosis through extrinsic and intrinsic apoptotic pathways and cause the activation of MAPK pathway in Fadu, OEC-M1, and OC3 oral cancer cell lines.

P20-02
Association between perfluoroalkyl substances in cord blood and birth weight in Belgian population

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Introduction: Perfluoroalkyl substances (PFAS) are man-made chemicals used in numerous industrial processes and characterized by very long half-lives in the environment. We highlighted PFAS contamination in cord blood samples collected in Belgium. In this population, we also found a negative correlation between PFNA concentration in cord blood and TSH level measured 3 days after delivery [1]. Beside the TSH level, birth weight is also an important health parameter, since low birth weight (<2500 g) is related to several health adverse outcomes. Many studies explored the potential association between PFAS contamination in newborn and birth weight but the results are still inconsistent and the situation was never assessed in Belgium. The objective of the present work is thus to assess the potential correlation between PFAS levels measured in cord blood and birth weight in Belgium.

Materials and methods: Cord blood samples (n = 281) were collected at the university hospital of Liege (Belgium) between August 2013 and March 2016. Levels of perfluoroalkyl substances were determined using LC-MS. Birth weight and additional data about newborns and their mothers (gestational age, mother age, pre-pregnancy BMI, tobacco habits, parity, and sex of the newborn) were collected using the medical records. Multivariate analyses were performed using R software to assess the association between birth weight and PFAS levels.

Results and discussion: No significant correlation was highlighted between birth weight and PFAS contamination in our population. Nevertheless, the concentration measured in our population is low (median PFOA concentration: 0.68 ng/mL and median PFOS concentration: 0.73 ng/mL) compared to populations where significant negative correlations were highlighted (e.g. in English newborns, median PFOA concentration: 3.7 ng/mL and median PFOS concentration: 19.6 ng/mL [2]).

Conclusion: Contrary to the results of some other studies, in our population, birth weight and PFAS levels were not significantly associated. This discrepancy may be due to the lower contamination of Belgian newborns.

References

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P20-03
Aryl hydrocarbon Receptor (AhR) signaling in human primary trophoblast cells

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Introduction: The aryl hydrocarbon receptor (AhR) is a ligand-activated transcription factor that controls a wide variety of developmental and physiological events. AhR is highly expressed in placenta and it upregulates the most important xenobiotic metabolizing enzyme of the placenta, cytochrome P450 1A1 (CYP1A1). Chemicals including pharmaceuticals and environmental contaminants binding to AhR in the placenta, may contribute to adverse effects on the fetal development, as well as fetal metabolism and reproductive system.

Methods: Human primary trophoblast cells were isolated from full term placenta after delivery. The trophoblasts were exposed to 25 μM of AhR agonist β-naphthoflavone (BNF) for 72 h and gene expression profiling was done by using Illumina Human HT-12 expression beadchips. Differential expression of selected genes was confirmed with RT-qPCR. Ingenuity pathway analysis (IPA) was performed to identify BNF induced biological functions and downstream signaling pathways within the gene expression data.

Results: In response to BNF treatment, 68 genes were up regulated and 294 genes were down regulated as compared to control cells. The majority of the top upregulated genes were genes related to inflammatory response, polycyclic aromatic hydrocarbons (PAHs) and dioxin-related response, fatty acid, steroid and xenobiotic metabolism. Whereas, the majority of the top downregulated genes play a role in placental growth and development, regulating pregnancy-related hormones and metabolism, and modulating the activity and function of immune cells.

Conclusions: Our study indicates that AhR signaling in placenta is involved in regulation of various physiological processes beyond xenobiotic metabolism. Therefore, any disturbances of AhR signaling can have significant consequences on maintenance of pregnancy.