

# Programme and Abstract Book

1<sup>st</sup> WORKSHOP ON HUMAN BIOMONITORING  
IN PORTUGAL (1<sup>st</sup> HBM-PT)

“Bridging Chemical Exposure to Human Health”

11 May 2018 | Lisboa, Portugal

Instituto Nacional de Saúde Doutor Ricardo Jorge (INSA)

**P6 - Firefighters' biomonitoring: impact of fire  
combat on levels of urinary monohydroxyl  
metabolites of polycyclic aromatic hydrocarbons**

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## **P6 - Firefighters' biomonitoring: impact of fire combat on levels of urinary monohydroxyl metabolites of polycyclic aromatic hydrocarbons**

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Firefighters, one of the most hazardous occupations, are regularly exposed to complex mixtures of pollutants during fire combat. Polycyclic aromatic hydrocarbons (PAHs) are distributed between the gaseous and particulate phases of air: they are one of the most health-relevant pollutants released during fires because of their genotoxic, mutagenic, and carcinogenic properties [1]. This work aims to assess the impact of firefighting activities on firefighters' total exposure to PAHs.

Spot urine samples were collected in healthy and non-smoking firefighters before and after fire combat activities. Six urinary PAH metabolites (1-hydroxynaphthalene (1OHNaph), 1-hydroxyacenaphthene (1OHAce), 2-hydroxyfluorene (2OHFlu), 1-hydroxyphenanthrene (1OHPhen), 1-hydroxypyrene (1OHPy), and 3-hydroxybenzo[a]pyrene (3OHB[a]P)) were quantified by liquid chromatography with fluorescence detection [2-3].

Urinary 1OHNaph and 1OHAce were the predominant biomarkers of exposure in both non-exposed and exposed firefighters, accounting with 63-98% of total levels of PAH biomarkers ( $\Sigma$ OH-PAHs). 2OHFlu, 1OHPhen, and 1OHPy contributed with 1-17%, 1-13%, and 0.3-10% of  $\Sigma$ OH-PAHs, respectively. The PAH biomarker of carcinogenicity (3OHB[a]P) was not detected. Overall exposed firefighters presented levels of  $\Sigma$ OH-PAHs that were 2-35% higher than for non-exposed subjects. Urinary 2OHFlu seems to be the compound with the most pronounced increments in exposed firefighters. Urinary 1OHPy levels were always lower than the benchmark of 0.5  $\mu$ mol/mol creatinine proposed by the American Conference of Governmental Industrial Hygienists. More studies assessing PAH biomarkers of exposure but also biomarkers of effect and susceptibility are needed to evaluate the impact of fire emissions on the health of firefighters.

This work was financially supported by European (FEDER funds through COMPETE) and National funds through Fundação para a Ciência e Tecnologia project UID/QUI/50006/2013 and fellowship SFRH/BPD/105100/2014, and also in the scope of the P2020 Partnership Agreement Project POCL-01-0145-FEDER-006939 (Laboratory for Process Engineering, Environment, Biotechnology and Energy—LEPABE) funded by FEDER funds through COMPETE2020—Programa Operacional Competitividade e Internacionalização (POCI). Authors are thankful to all firefighters from the district of Bragança that participated in this study.

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