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Polyaromatic hydrocarbons accentuate malignant phenotype of the PC3 prostate cancer cell line

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Prostate cancer risk factors are mainly associated to an increase of oxidative stress (OS) related with ageing, genetics, recurrent inflammation, life style or carcinogens exposure as polycyclic aromatic hydrocarbons (PAHs). These last one are ubiquitous environmental contaminants resultant from the incomplete combustion of carbon-containing fuels such as tobacco, wood, diesel, or charbroiled [1,2].

Although numerous studies have related polycyclic aromatic hydrocarbons (PAHs) to tumour formation, few investigations have addressed PAHs effects on prostate cancer progression. Here we investigated the effect of four PAHs namely, pyrene, benzo(a)pyrene, chrysene and benzo(k)fluoranthene on cell growth and cell cycle progression, viability, mitochondria membrane potential, reactive oxygen species (ROS) production, vascular endothelial growth factor (VEGF) and hypoxia inducible factor (HIF) expression in the prostate cancer cell line, PC3, derived from bone metastasis.

Our data demonstrated that PAHs can stimulate cell growth, in line with an increase of the S-phase of the cell cycle, and mitochondria membrane potential. These results are also concomitant with an increase in VEGF and HIF expression and ROS levels, usually implicated in cancer progression, suggesting that PAHs can contribute to a more aggressive prostate cancer phenotype.

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