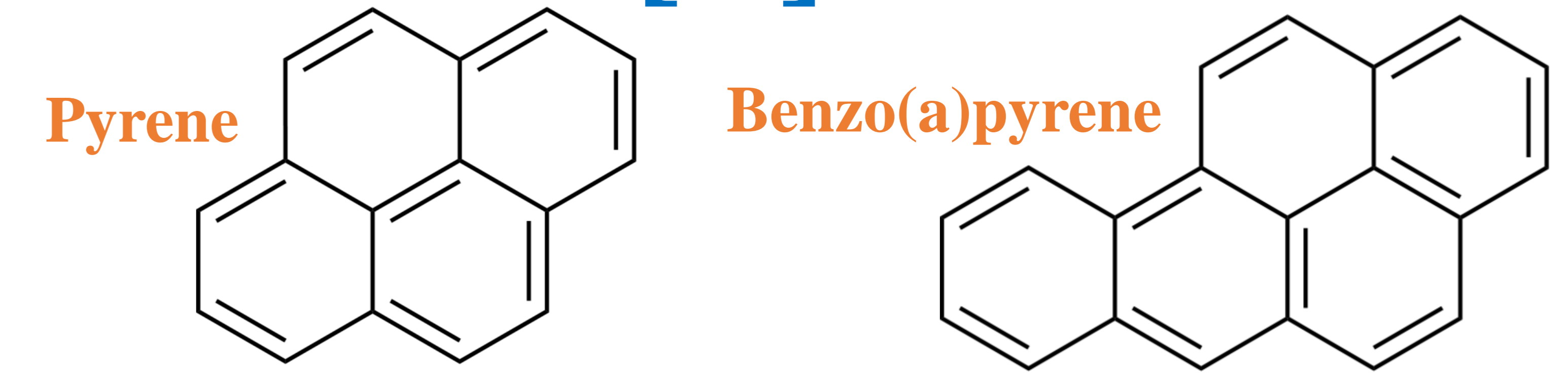


UVA STIMULATED TOXICITY OF PYRENE AND BENZO[A]PYRENE

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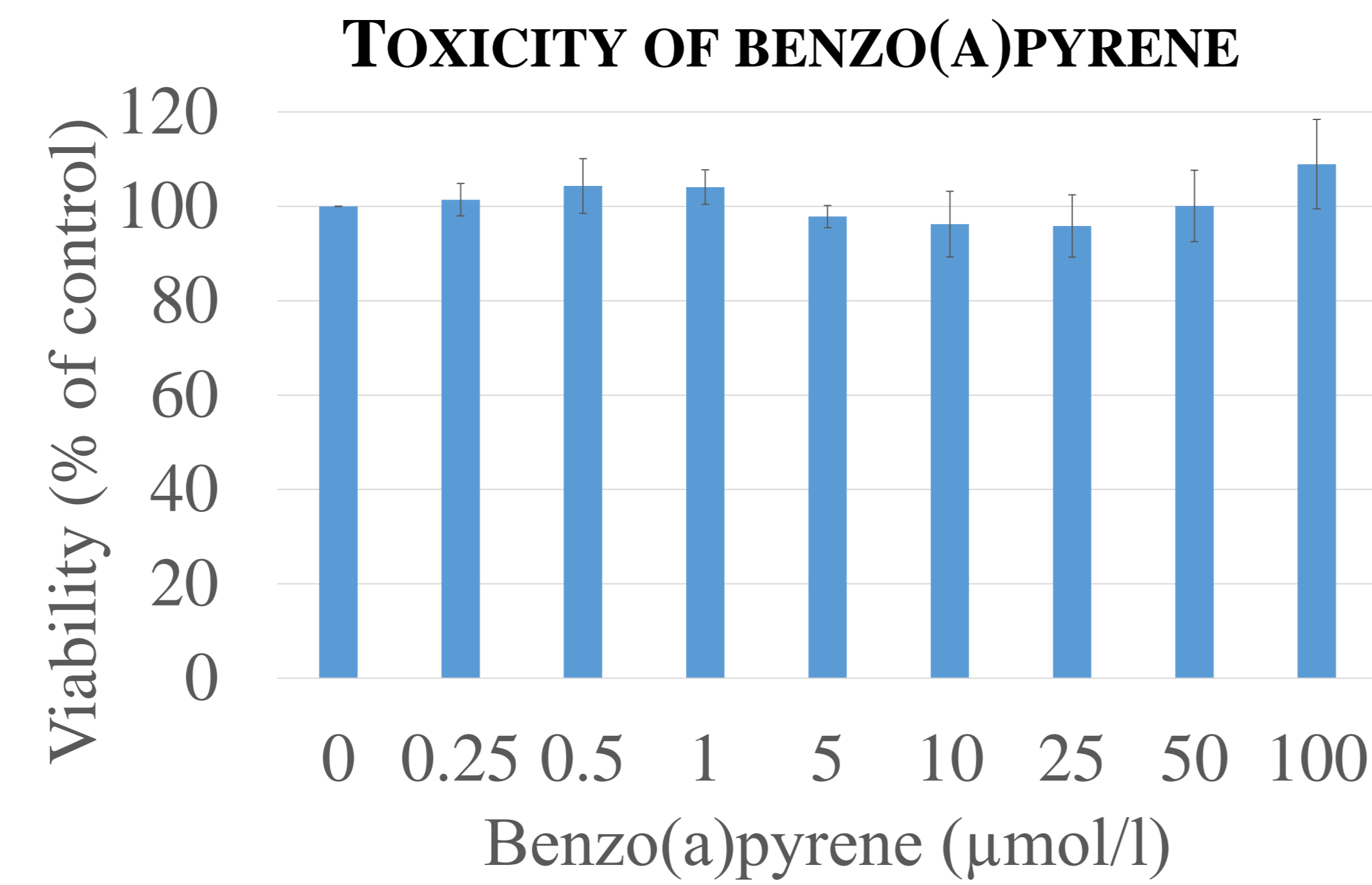
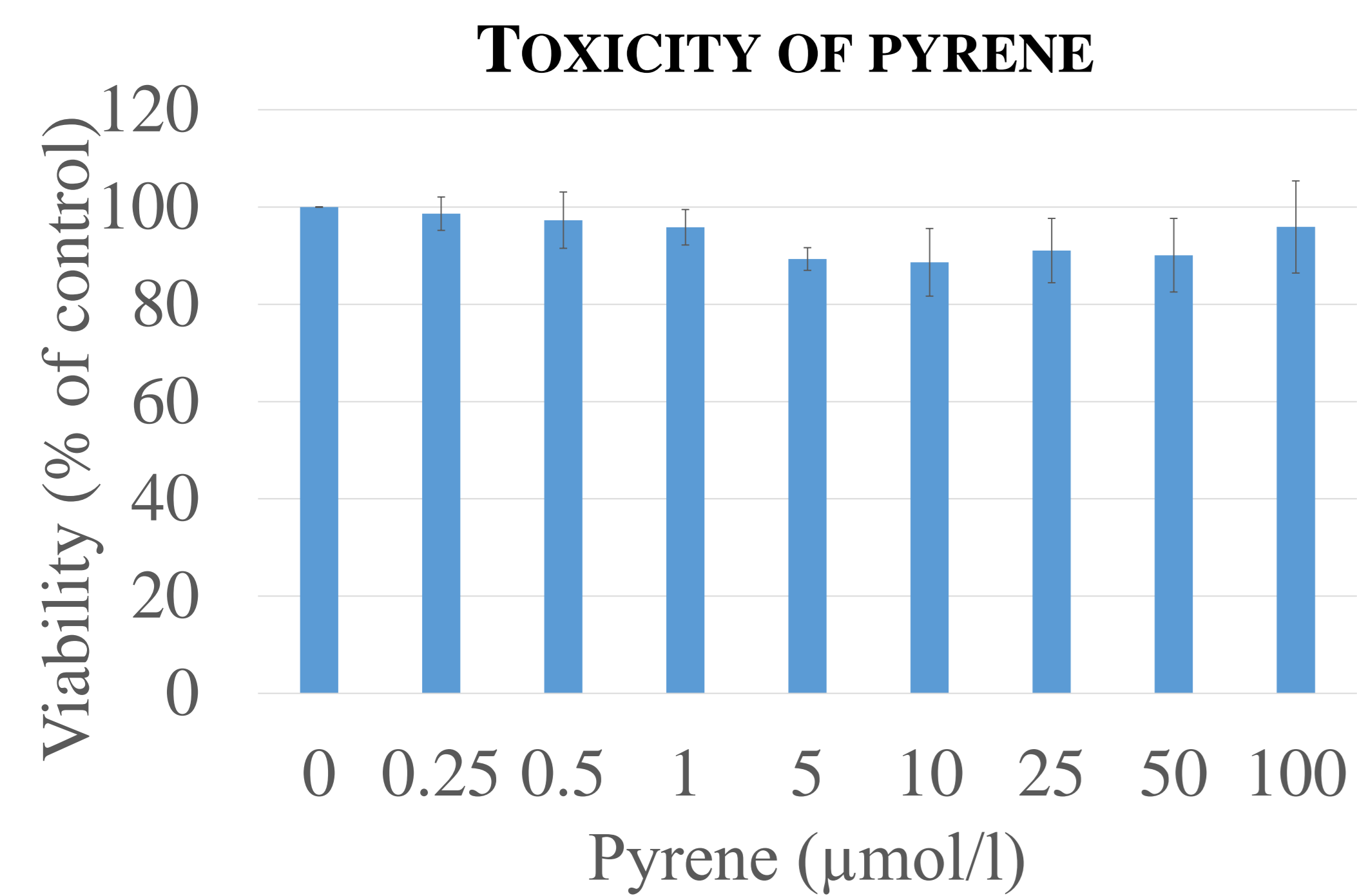
Introduction: Pyrene and benzo(a)pyrene are polycyclic aromatic compounds that represent environmental contaminants. They arise during imperfect combustion, but also during grilling and smoking. People mainly inhale them or take them in food or water. They are metabolised by cytochromes P450 and thus carcinogenic metabolites are produced.

Objectives: To determine the toxicity and UVA-stimulated phototoxic effects of pyrene and benzo(a)pyrene on human skin keratinocytes (HaCaT).

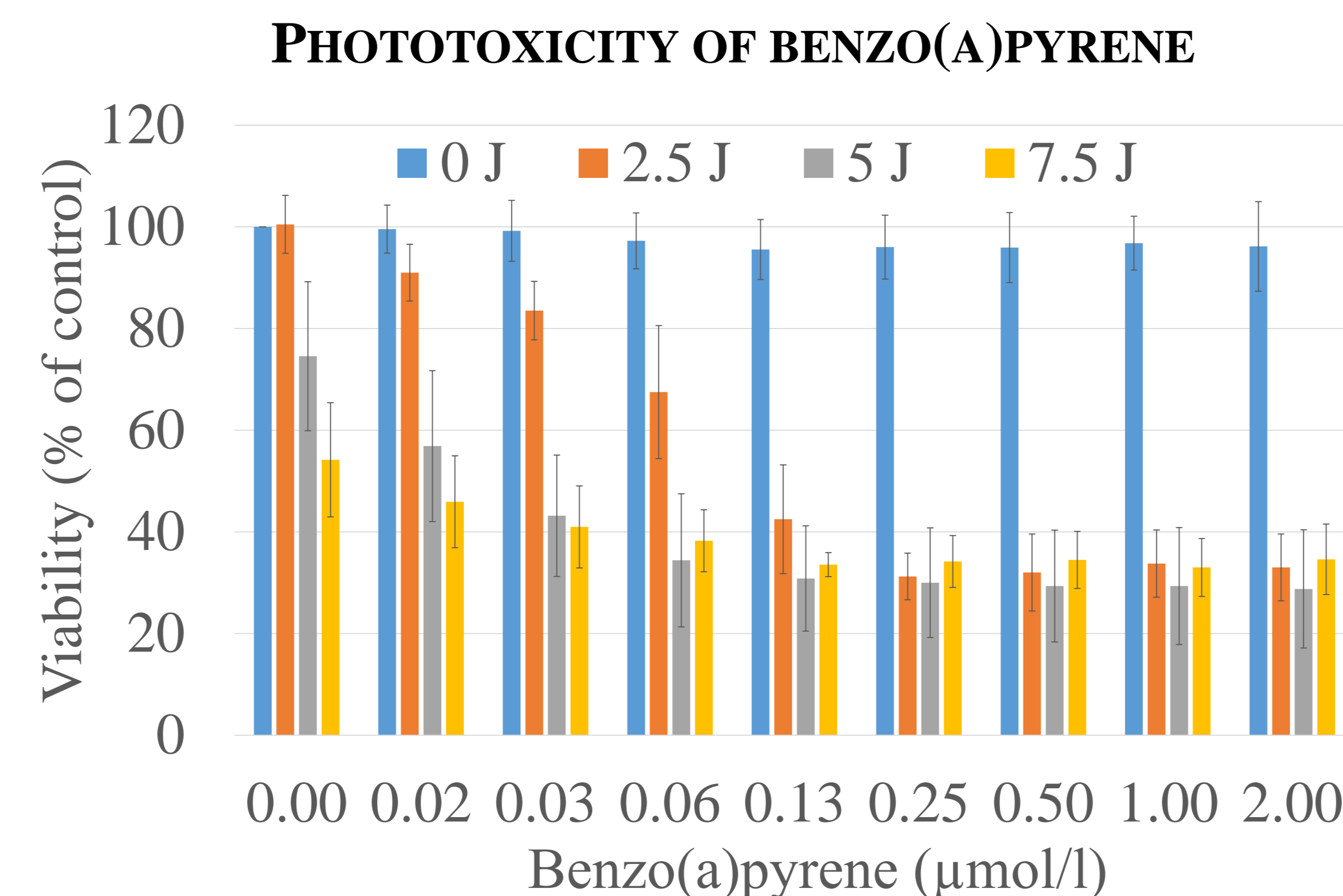
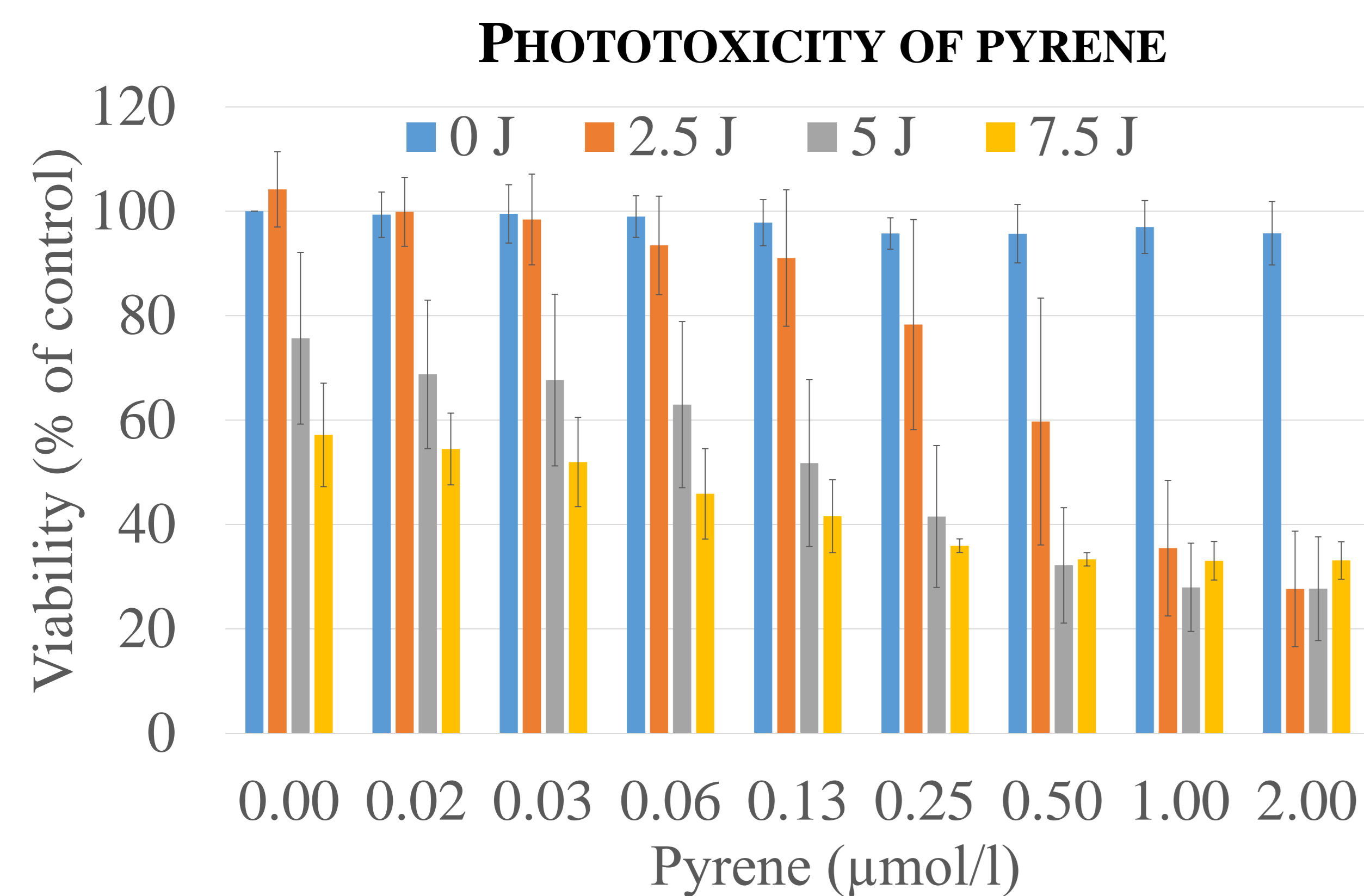
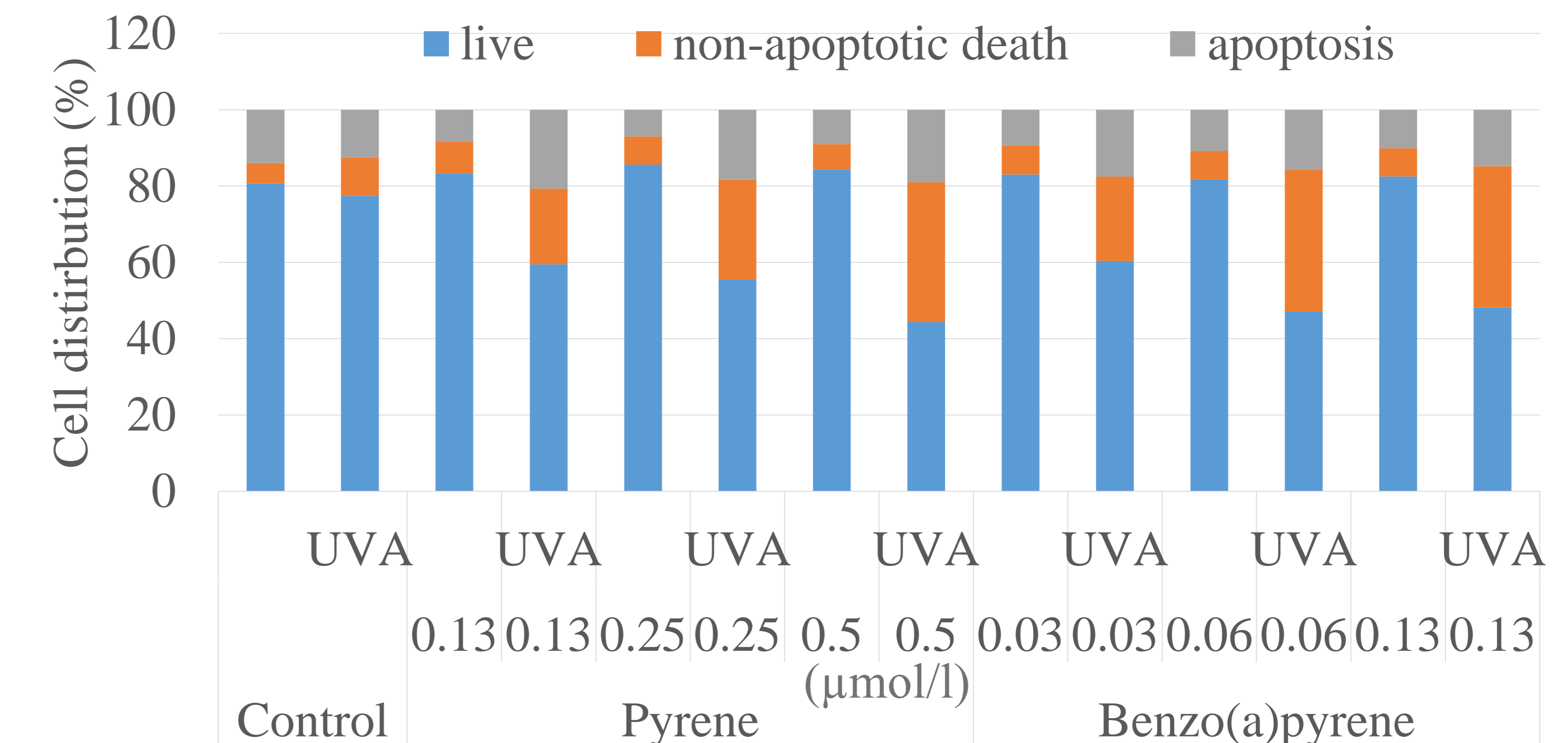
Methodology: Toxicity of P and BAP (0.25-100 μM) was evaluated after 24 treatment. Assessment of phototoxic effect included pre-treatment of cells with non-toxic concentration of P/BAP (1 h), wash-step and exposure to UVA radiation (2.5; 5.0 and 7.5 J/cm^2). Cell viability was measured by the accumulation of neutral red (NR) in the cells. The effect of pyrene/benzo(a)pyrene in combination with UVA radiation (2.5 J/cm^2) on type of cell death was studied by a commercial kit. The level of pro-inflammatory cytokine interleukin 6 (IL-6) was measured by the ELISA method. The level of reactive oxygen species was measured by using prefluorescent probe (dihydrofluoresceine diacetate) and fluorescence microscopy.

Results

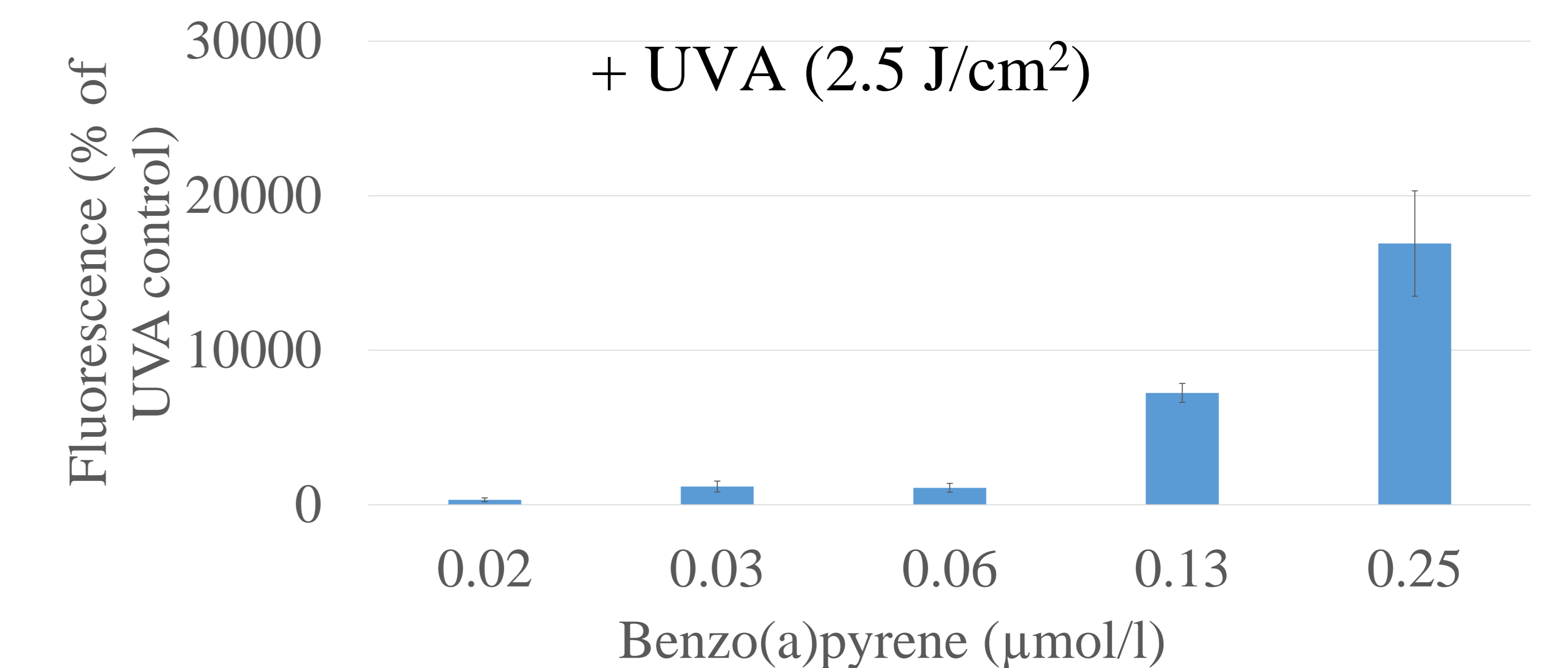
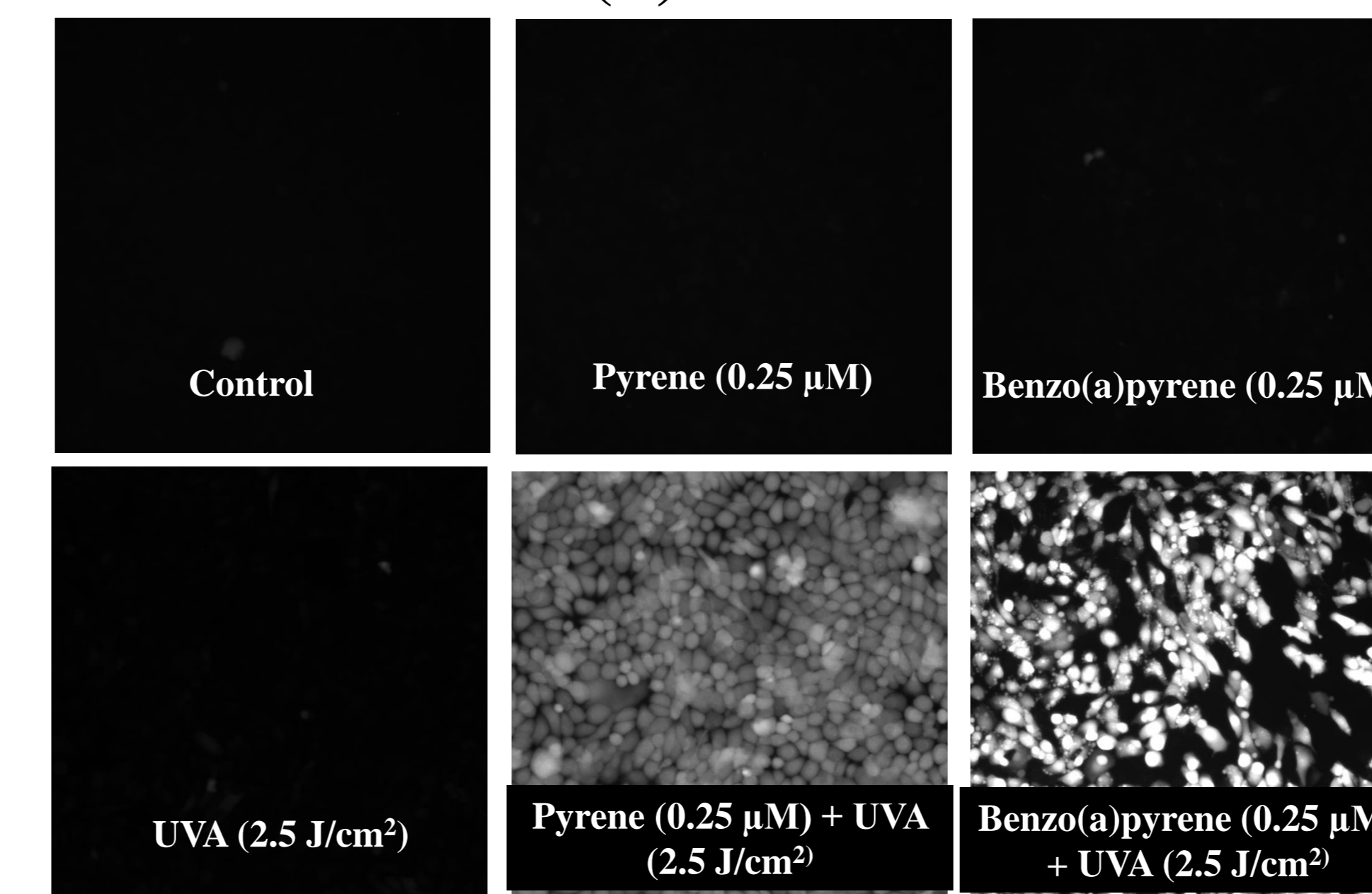
- Both compounds were non-toxic up to the maximal concentration tested (100 μM , 24 h).
- Non-toxic dose of UVA radiation (2.5 J/cm^2) accelerated toxicity of pyrene and benzo(a)pyrene.
- Benzo(a)pyrene was more phototoxic than pyrene.
- Non-apoptotic cell death was induced by benzo(a)pyrene and pyrene in combination with UVA.
- No effect of both compounds on IL-6 level was found (data are not presented).
- Phototoxicity of both studied compounds is accompanied with production of ROS.



EFFECT OF PYRENE AND BENZO(A)PYRENE IN COMBINATION WITH UVA (2.5 J/cm^2) ON CELL DEATH



EFFECT OF BENZO(A)PYRENE IN COMBINATION WITH UVA (2.5 J/cm^2) ON PRODUCTION OF REACTIVE OXYGEN SPECIES



Conclusion: The results of the pilot study shows that both pollutants have strong phototoxic potential. This model will be used in the following study focused on description and better understating of pollutants (photo)toxicity mechanism.