

Influence of process parameters in the generation of reactive oxygen and nitrogen species in cell culture media by atmospheric pressure plasma jet

**Cristina Canal^{1,2}, Marjolaine Humbert¹, Jordi Guillem-Martí^{1,2},
Maria-Pau Ginebra^{1,2}**

¹ Biomaterials, Biomechanics and Tissue Engineering Group, Dpt. Materials Science and Metallurgy, Technical University of Catalonia (UPC), Escola d'Enginyeria Barcelona Est (EEBE), c/ Eduard Maristany 10-14, 08019 Barcelona, Spain

² Research Centre in NanoEngineering (CrNE), UPC, Spain

Cold plasmas generated at atmospheric pressure have already demonstrated selective anti-tumor action in a number of carcinomas and in more relatively rare brain tumors. However, its effects on bone cancer are still unknown, and could represent an alternative therapy to current therapies for bone cancers are difficult to implement and unfortunately not completely effective.

Preliminary results of our group revealed that cytotoxicity following direct interaction of APPJ with cells is comparable to indirect interaction when only liquid medium is treated and subsequently added to the cells, especially on the long-term. The high efficiency of the indirect treatment indicates that an important role is played by the liquid medium in contact with the plasma and the cells.

Therefore, the reactive oxygen species (ROS) and reactive nitrogen species (RNS) in the gaseous plasma stage and then transmitted to the liquid phase, might overall lead to lethal and selective action towards osteosarcoma cells.

In the present work we evaluated the generation and evolution of various species species generated by APPJ on different cell culture media. Different parameters were evaluated, and different diagnostic methods are employed and discussed here.

Acknowledgements

Authors acknowledge the financial support of MAT2015-65601-R project (MINECO/FEDER, EU) and from the ERC under the EU's Horizon 2020 research and innovation programme (grant agreement No 714793).