The importance of measuring dissolved molecular oxygen during plasma jet treatment of cells cultured *in vitro*

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There is rapidly growing interest in the application of cold atmospheric plasma (CAP) jets in biology and medicine. The strong interest is fueled by the potential of CAP jets to significantly aid in the treatment of life-threatening indications such as non-healing chronic wounds and cancers. The action of CAP jets in biology and medicine is mainly attributed to reactive oxygen and nitrogen species (RONS). The delivery of RONS into solution by CAP jets and the potential link between CAP jet-generated RONS to cellular signaling processes, which ultimately drive the biological or medical outcome, has mainly been investigated through *in vitro* assays. Using UV-Vis spectroscopy it has been shown that inert plasma jets not only deliver RONS but concomitantly de-oxygenate water [1]. De-oxygenation is due to the inert gas from the partially ionized plasma jet, purging dissolved oxygen out of the water. Potentially, de-oxygenation of biological solutions could produce adverse effects such as undesirable hypoxia and also increase the resistance of cancer cells to CAP jet therapy. It will be discussed in this presentation how combined dynamic changes in the concentrations of RONS and dissolved oxygen in the biological fluid can significantly impact cell viability *in vitro* during and after CAP jet treatment [2]. Monitoring the dissolved oxygen concentration is relatively straightforward and could help in the interpretation of *in vitro* studies and therefore in the development of more effective strategies in the application of cold atmospheric plasma in biology and medicine.

References

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