

***In vitro* anti mitogenic and apoptotic effects by using plasma jets**

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Since approximately ten years now, numerous studies have been investigated on the very important potentialities of non thermal plasmas for biomedical applications. Ionised and excited gases are produced at atmospheric pressure and many developed systems are thus conceived to form gaseous reactive mediums at mean temperature closed to the physiological temperatures of living organisms. Therapeutic medical applications are observed for blood coagulation, cicatrisation of wound healing and cancerology [1-4].

But what about the interaction mechanisms between the numerous species formed in such plasma devices and living organisms? ROS and RNS are produced in gaseous plasma phases as well as electrical charges, photons, electric local fields, thermal low variations, and all these energies levels may individually or synergetically interact with living cells. Although plasma was recently shown to induce cell apoptosis and cell cycle arrest in malignant cells [5], little is known about the effect of plasma exposure on non malignant, connective cells. Here, we tested the effect of plasma jets on periodontal ligament cells (PDLC), that have been shown to be mesenchymal-like progenitors cells, involved in periodontal healing and homeostasis. Our results showed that plasma jets induce cell apoptosis, cell cycle disturbances and inhibition of osteogenic differentiation, effects largely dependent on time exposure and distance from the plasma source. Interestingly, the use of foetal bovine serum partially rescue the apoptotic and anti proliferative effects plasma-induced. These results clearly showed that plasma jet may interfere with connective tissue wound healing.

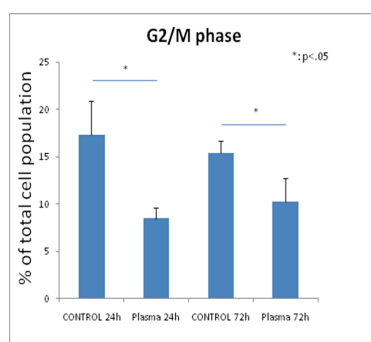


Figure 1: Decrease of PDLC percentage in G2/M stage 24 hrs and 72 hours after 30s plasma jet exposure

References

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