Soukaina Bahsoun et al., Biomed Res, Volume 30
DOI: 10.4066/biomedicalresearch-C1-026

The role of dissolved oxygen level on human mesenchymal stem cells culture and its implication on the cryopreservation process

Soukaina Bahsoun, K Coopman and **E Akam**
Loughborough University, UK

Human mesenchymal stem cells (hMSCs) are viewed by many as strong candidates for cell therapy. The translation from bench to bed side requires an expansion process with no compromise on the cells' safety, viability, purity and potency. hMSCs culture conditions have been the subject of vast research and a debate still exists on how to describe hMSCs "best performance". Culturing hMSCs in low oxygen (hypoxia) has become a popular option aiming to improve yield and functionality. A review of the literature was conducted by (Bahsoun et al. 2018) to gather evidence on how hypoxia affects hMSCs attributes including marker expression, differentiation potential, growth, attachment, migration, genomic stability and paracrine activity. Despite the disparities noticed across the literature in the terminology and the equipment used, it was concluded that hypoxia improves most of the attributes assessed.

Cryopreserved human bone marrow mesenchymal stem cells (hBM-MSCs) are one of the most common types of cells used in clinical trials. Whether autologous or allogeneic, cryopreservation is an integral part of cell therapy manufacturing. While using cryopreserved cells is sometimes taken for granted, developing optimal cryopreservation processes is still a challenge. Using hypoxia pre-conditioning to improve hBM-MSCs recovery after cryopreservation is a novel approach. Preliminary data shows hypoxia pre-conditioning improves the post-thaw osteogenic potential of hBM-MSCs.

Speaker Biography

Soukaina Bahsoun has completed a three-year degree in biology. She moved to the University of Victoria in Canada and studied five high-level molecular biology modules, two of which are directed studies completed under the supervision of professor David Levin and professor Francis Choy. After moving to UK, she joined the Open University and completed Bachelor of Science (with honours) first class degree. Her motivation for graduate studies and research allowed her to secure a position on the postragduate training programme in regenerative medicine at Loughborough University, UK.

e: S.bahsoun@lboro.ac.uk

Notes: