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Three dimensional (3D) dynamic culture and metabolomic analysis of hESC

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Conventional two-dimensional (2D) culture methods for the differentiation of human embryonic stem cells (hESCs) and human induced pluripotent stem cells (hIPS) utilize tissue culture flasks/dishes which is cumbersome, multi-stage, requiring passaging of cells resulting in inefficient differentiation and undesired heterogeneous population. Controlling hESCs differentiation pathways(s) for specific lineage production remains a challenge. The most efficient protocols require multi-step process that lasts for approximately one month rendering such protocols difficult to scale-up. Advance culture methods on *in vitro* 3D culture model application provide a better culture condition by mimicking specific aspects of *in vivo* cell behaviour in order to enable the accurate prediction of cellular differentiation and tissue development. Metabolomics (metabolic profiling) highlights subtle differences that are useful for the optimization of stem cell bioprocessing. Characterizing metabolic alterations from pluripotent stem cells towards the final differentiation stage facilitate understanding of the proliferation and differentiation mechanisms. By focusing on the metabolic influence during culture process, herein, we present our current approach on hESCs metabolic profiling of the core metabolism, using GC-MS metabolomics, which has revealed some interesting differences between 2D and 3D cultures.

Biography

Iliana Fauzi has completed her PhD from Imperial College London, UK and currently continuing her Postdoctoral studies at BSEL, Imperial College London, UK. She is holding a position as an Assistant Professor in one of Malaysia's top university in Department of Bioengineering. She is taking part actively in publishing, reviewing and presenting papers in reputed journals and prestigious international conferences. She is a member of the Tissue Engineering & Regenerative Medicine International Society (TERMIS 2008), International Society of Experimental Hematology (ISEH 2009) and the American Society of Hematology (ASH 2010).

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