Baltasar Lucendo Villarin et al., J Cell Sci Ther 2014, 5:4
http://dx.doi.org/10.4172/2157-7013.S1.028

OMICS Group Conferences
Accelerating Scientific Discovery

4th World Congress on
Cell Science & Stem Cell Research
June 24-26, 2014 Valencia Conference Centre, Valencia, Spain

Stabilisation of hepatocyte phenotype using synthetic materials

Baltasar Lucendo Villarin[1], David C Hay[1], Kate Cameron[1], Dagmara Szkolnicka[1], John Iredale[2] and Mark Bardley[2]
[1]University of Edinburgh, UK
[2]MRC Centre for Inflammation, UK

Hepatocytes are the major cell type found in the liver. They perform a myriad of functions that keep the body in balance and therefore are an important resource for the clinic and the laboratory. To date, the gold standard hepatocyte is the freshly isolated from human liver. However, their limited supply, lifespan, variability and cost limit their widespread use. It was proposed that human pluripotent stem cells are a suitable source of hepatocytes for scientific research. Importantly, pluripotent stem cells are capable of self renewal and differentiation to all the cell types of the human body, representing a renewable resource for application. We have developed an efficient, serum free, scalable cell based differentiation procedure to drive human stem cells into active hepatocyte populations. In parallel, we have developed a screening approach to define synthetic materials, which maintain hepatocyte differentiated cell phenotype in culture. A simple polyurethane was identified which improved hepatocyte performance and stability, when compared to biological matrices. Moreover, the synthetic polymer was amenable to scale up and demonstrated batch-to-batch consistency. Importantly, the combination of the serum free differentiation procedure with the synthetic polymer surface has delivered more metabolically active and stable hepatocyte populations.

B.Lucendo-Villarin@sms.ed.ac.uk
davehay@talktalk.net