Banking and Characterisation of Human Induced Pluripotent Stem Cells for Drug Discovery Applications

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Induced pluripotent stem cell models of human disease are rapidly becoming an integral part of drug discovery, disease stratification and basic research. The consistent derivation and banking of iPSC from healthy donors or patients with disease causing genome mutations is an important step to fully utilise the potential of this technology. Robust characterisation of iPSCs as a population and at the single cell level is integral to ensuring a defined starting material for subsequent research. Knowledge of individual iPSC line behaviour and potency will guide their use to produce iPSC derived material such as mature differentiated cell populations.

The EBiSC consortium consists of twenty six partners, distributed across nine separate European nations and includes seven universities, six pharmaceutical companies, five biotechnology companies, four government run agencies and a single charity (the Wellcome Trust). The goal is to establish in Europe a centralized, not-for-profit iPSC line banking, testing and distribution activity, providing all qualified users with access to scalable, cost-efficient and customized cell line products and associated services. Based on this provision, the centralised facility is projected to become self-sustaining by 2019. A central pillar of the EBiSC vision is to support applications in disease modelling and patient stratification based on cellular phenotyping.

In drug discovery more predictive preclinical cellular disease models are required to assess and rank the efficacy of compounds in a cost-effective manner. iPSC –derived models including neuronal, cardiomyocyte, pancreatic, and hepatocyte cell types display the genetics and cellular function of primary human cells. They therefore offer an improved mechanism to improve the efficiency and economics of drug development.

This poster describes the process of large scale banking and use of imaging tools to characterise iPSC lines at the population and single cell level which will ultimately guide the quality control and release of lines to the general scientific community.