

PROCEEDINGS**iHUMAN: Syngeneic, Vascularised, Innervated, Standard Live Human Platform for Science and Industry**

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ABSTRACT

Government authorities, academies, research institutes and industries are presently hindered by a lack of functional, healthy and standardized human platforms of cells, tissues, and organs, predominantly using costly live animal models and cells of low human relevance. Existing models of live animals or immortalized cell lines of either animal or human origin, often poorly reflect human physiology. Primary human cell cultures are difficult to procure in sufficient quantity and can be prone to much inter-batch variability, depending on the cell source. By contrast, self-renewable, genetically healthy and single-sourced human pluripotent stem cells (PSCs) exhibit enhanced biological relevance and stable predictability over their more expansive counterparts. As genuine pluripotent stem cells, human PSCs serve as an unlimited source potentially to develop into all cell types of the human body. Hence, global pioneers and governments like the EU and UK have endeavoured to develop a technically simple, cost-effective and replicable system of human PSCs-derived live platforms since 2008.

Unlimited, syngeneic, standard, living, functional tissues and organs with vascularization and innervation from single human PSC are currently being explored. Accordingly, a new area of 'iHuman' [1], i.e. 'in-vitro and in vivo live human platforms', has been established. The cells, tissues, and organs of iHuman offer not only the ideal in-stock donors for translations and grafts but also the ideal in-vitro and in vivo 'clinical' platform of no-risk trials/tests for the studies and applications of all human health-related sciences, including fundamental health studies. Moreover, the iHuman platform will be widely adopted in many more areas beyond medicine, pharmaceuticals, and cosmetics in all industries relating to human health. As much more cost-effective and safer platforms, iHuman will replace animals and human subjects for human health R&D in the near future [2]. The cells, tissues and organs of iHuman will be ethically and gradually adopted at a reasonable and practical pace, non-clinically, pre-clinically and clinically in medicine and all human health-related industries, academies and authorities [3].

This fast development is revolutionizing health sciences from animal-based platforms to much more accurate human-based platforms. The revolution will bring a new burgeoning industry of iHuman platforms of live cells, tissues, organs, and systems in the next decades.

KEYWORDS

iHuman; syngeneic organ; stem cell

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