

Functional Liver from Stem Cells

In a breakthrough discovery, scientists in Japan have generated functional human liver tissue from induced pluripotent stem cells (iPSCs). The finding was reported in Nature online (Nature 2013, doi:10.1038/nature12271). Takanori Takebe, Hideki Taniguchi and colleagues of Yokohama City University, Japan triggered human iPSCs which were originally generated from donated adult tissue to form liver buds (rudimentary liver). Liver bud is an early structure that is seen when liver forms. Under normal circumstances, liver buds are made inside 3- or 4-week-old embryos and grow into mature livers as the embryo develops.

The liver buds on transplantation into experimental mice, developed a vascular system connected to the host within 48 hours of transplantation and matured into tissue resembling the adult liver. The iPSC-derived liver tissue also performed liver-specific functions such as protein production and human-specific drug metabolism. The transplants started producing high levels of albumin within days, and demonstrated gene expression profiles characteristic of mature liver tissue.

The research offers great hope in bringing the prospect of growing organs in the laboratory for transplantation into human patients and in drug testing.

Source and for more information

<http://www.pharma-mag.com/scientists-grow-functional-liver-from-stem-cells/>

<http://www.sciencemediacentre.co.nz/2013/07/04/human-liver-tissue-grown-in-mice-experts-respond/>

<http://www.asianscientist.com/in-the-lab/building-liver-induced-pluripotent-stem-cells-2013/>