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Using hepatocytes produced from human ES and iPS cells to model hepatic involvement in serum lipid homeostasis

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Hepatocytes play a central and crucial role for the production and elimination of serum cholesterol and lipid homeostasis and their proper function is of key importance for cardiovascular health. In particular, hepatocytes produce large amounts of endogenously-synthesized cholesterol, which is secreted into circulating blood in the form of apolipoprotein particles. Cholesterol-secreting hepatocytes are also clinically-relevant cells targeted by statin treatment *in vivo*. At present, the study of cholesterol homeostasis is largely restricted to the use of animal models and immortalized cell lines that fail to recapitulate many key aspects of normal human hepatocyte function. Hepatocyte-like cells (HLCs) derived from human embryonic and induced pluripotent stem cells (hESCs and hiPSCs) can potentially provide a cell culture model for the study of cholesterol homeostasis, dyslipidemias, and the action of pharmaceuticals important for cardiovascular health. This seminar will present research showing that differentiated cells resembling hepatocytes can be readily produced from hESCs and hiPSCs. The resulting HLCs exhibit many features of human hepatocytes in vivo, to include acivities related to serum lipid homeostasis. Overall, the research shows that HLCs derived from human pluripotent cells provide a robust cell culture system for the investigation of the hepatic contribution to cholesterol homeostasis at both cellular and molecular levels

Biography

Rasmussen is an Associate Professor in the Department of Pharmaceutical Sciences at the University of Connecticut, and a member of the University of Connecticut Stem Cell Institute. Dr. Rasmussen earned a B.S. degree in at the University of Washington, a Ph.D. the University of Wisconsin in genetics, and completed postdoctoral research at MIT, working on X chromosome inactivation in stem cells. In 2002, Rasmussen founded a stem cell and epigenetics lab at the University of Connecticut. His research is currently focused on stem cell chromatin, reprogramming, and the use of ES cells and iPS cells to model human genetic disorders and mechanisms of toxicology and for the study of human hepatocyte function. Rasmussen also studies chromatin dynamics during preimplantation development, cellular reprogramming, and X chromosome inactivation

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