Kübrah Keskin et al., J Genet Mol Biol 2019, Volume 3

VASCULARIZATION OF A BONE MARROW MODEL

Kübrah Keskin, Sieber S, Marx U, Lauster R and **Rosowski M**
Technische Universität Berlin, Germany

The bone marrow is, as a harbour of the endosteal and perivascular niche of haematopoietic stem and progenitor cells (HSPCs), an important organ of the human body and has a tremendous role in regenerative medicine. Sieber et al. (2017) mimicked the endosteal niche by developing a dynamic bone marrow model harbouring HSPCs in co-culture with Mesenchymal Stromal Cells (MSCs) for up to eight weeks in a hydroxyapatite coated zirconium oxide-based ceramic. The cultivation of the 3D construct is realized within the "Multi-organ-chip" (MOC) developed at our chair. The MOC is a microfluidic device consisting of a circular channel system which connects two wells to cultivate organoids. To additionally mimic the perivascular niche, vascular structures must be added to the model. HUVECs, in co-culture with MSCs, elongate and form a primitive network. Since HSPCs must be cultivated in serum-free medium to prevent uncontrolled differentiation, tri-cultures were performed in which MSCs, HSPCs and HUVECs were cultivated in serum-free medium for 1 week. It could be shown that HUVECs survive in the serum-free medium and maintain primitive vascular structures. Moreover, it is planned to connect this tissue engineered vascularized dynamic 3D model with the endothelialized channel system of the MOC, to set up a closed *in vitro* system of a vascularized bone marrow model. This will give the opportunity for basic research als well as for diagnostics in regenerative medicine more efficiently without animal testing.

BIOGRAPHY

Kübrah Keskin is a Graduate of Biotechnology and is currently doing her PhD in the Department of Medical Biotechnology at the Technical University Berlin.

k-keskin@tu-berlin.de

Note: