Colloquium

Institute for Regenerative Medicine (IREM) in collaboration with Wyss Translational Center Zurich (Wyss Zurich), Regenerative Medicine Technologies Platform

Interdisciplinary Colloquium Regenerative Medicine I

Tuesday, May 30, 2017 at 12:30 – 1:30 pm,
Kleiner Hörsaal OST,
University Hospital Zurich

Prof. Roberto Speck

Department of Infectious Diseases and Hospital Epidemiology, USZ

Gene Engineering an HIV Resistant Immune System

We have a major effort in the laboratory to gene engineer an HIV resistant immune system. This work is done in collaboration with Prof. Karl-Heinz Krause (UNIGE, Geneva, CH) and Prof. Michael Pepper (University of Pretoria, South Africa).

For generating HIV resistant CD4+ T-cells, we have developed an optimized microRNA for down-regulating the HIV co-receptor CCR5. Using this microRNA we have gotten first-proof-of pre-clinical concept data that gene engineering HIV resistant CD4+ T-cells constrains HIV replication in vivo using humanized mice (functional cure). Briefly, we introduced the microRNA to CCR5 via lentiviral-based transduction into CD34+ cells and transplanted these gene-engineered CD34+ cells into the liver of new-born mice. 12 weeks later the humanized mice were infected with replication competent HIV.

We found that humanized mice expressing >50% of gene engineered CD4+ had HIV RNA copy numbers less than 5.000/µl – HIV-infected patients with such a low number of HIV RNA have a very protracted course of their HIV disease and in fact do not need any combined anti-retroviral treatment.

We are now working for identifying a 2nd anti-HIV target and getting all procedures/lab manipulations ready for a phase I clinical trial.

Organiser: Prof. Dr. Dr. Simon P. Hoerstrup
Execution/Chair: Dr. Steffen M. Zeisberger
IREM & Wyss Zurich, Univ. of Zurich and ETH Zurich