



**DZHK**  
DEUTSCHES ZENTRUM FÜR  
HERZ-KREISLAUF-FORSCHUNG E.V.

UniversitätsKlinikum Heidelberg

## External Seminar Speaker

**Prof. Robert Passier**

Leiden University

Professor of Anatomy and Embryology, stem cell biology



**Place: Analysezentrum 3, 2. OG, Room 02.332**

**Date: Wednesday, December 12<sup>th</sup>**

**Time: 11.00 am**

### **Human pluripotent stem cells derived cardiac cells for disease modelling and regenerative medicine - Towards heart-on-chip and 3D heart models**

Cardiovascular disease is the leading cause of death globally, representing approximately 30 percent of all death. Although in the last decades researchers have focused on the treatment of heart disease, there is currently no cure for this disease. In addition to genetic and environmental factors, which are considered to be key determinants of cardiac disease, impaired cardiac function may be exhibited by unexpected drug-induced side effects, called cardiotoxicity. Besides the safety concerns, unpredicted cardiotoxic side effects leading to late-stage drug attrition or withdrawal of drugs from the market is a financial catastrophe for the pharmaceutical industry. One major problem is the limited ability to accurately mimic human heart disease and to predict the effects of potential heart drugs on patients using the current in vitro assays and experimental animal models. Human pluripotent stem cell (hPSC)-derived cardiac cells can be used to set up human-relevant, patient-specific cell-based assays for biomedical and pharmacological research. Here, I will discuss the application of hPSC-derived cardiomyocytes to more accurately mimic human heart function in vitro and their potential for tissue engineering and regenerative medicine. Moreover, the use of patient-derived cells will allow personalized medicine (also called precision medicine), enabling accurate assessment of the disease phenotype and underlying mechanisms, drug discovery and drug toxicity testing, leading to better and safer drugs.

**Host: Prof. Dr. med. Johannes Backs**

Director of the Department Molecular Cardiology and Epigenetics

Department of Internal Medicine VIII

University of Heidelberg