

# Development and application of an immunocompetent human induced pluripotent stem cell-derived intestinal epithelial cell model for hazard assessment of the oral exposure route

Meike van der Zande<sup>1</sup>, Loes PM Duivenvoorde<sup>1</sup>, Wendy Jansen Holleboom<sup>1</sup>, Benedetta Fabrizi<sup>1</sup>, A Paul Vos<sup>2</sup>, Shanna Bastiaan-Net<sup>2</sup>, Monic MM Tomassen<sup>2</sup>, Aafke WF Janssen<sup>1</sup>

<sup>1</sup>Wageningen Food Safety Research, Wageningen, The Netherlands, <sup>2</sup>Wageningen Food & Biobased Research, Wageningen, The Netherlands

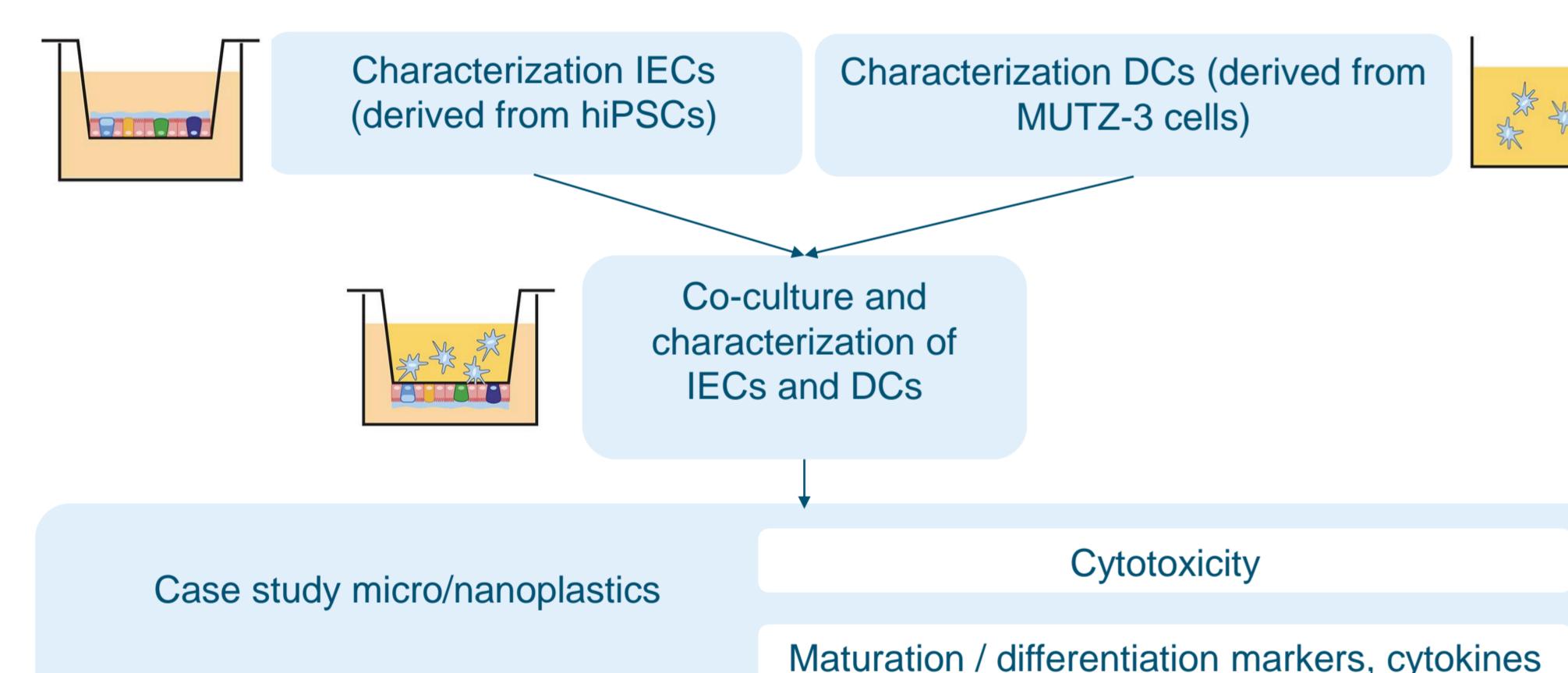
## Background

Human induced pluripotent stem cell (hiPSC)-derived intestinal epithelial cell (IEC) layers have the potential to provide an increasingly improved alternative to cell lines as they differentiate into multiple intestinal cell types that are also present *in vivo*. However, these models currently lack immunocompetence, as they do not contain immune cells like for instance dendritic cells (DCs) that play an important role in intestinal immune responses.

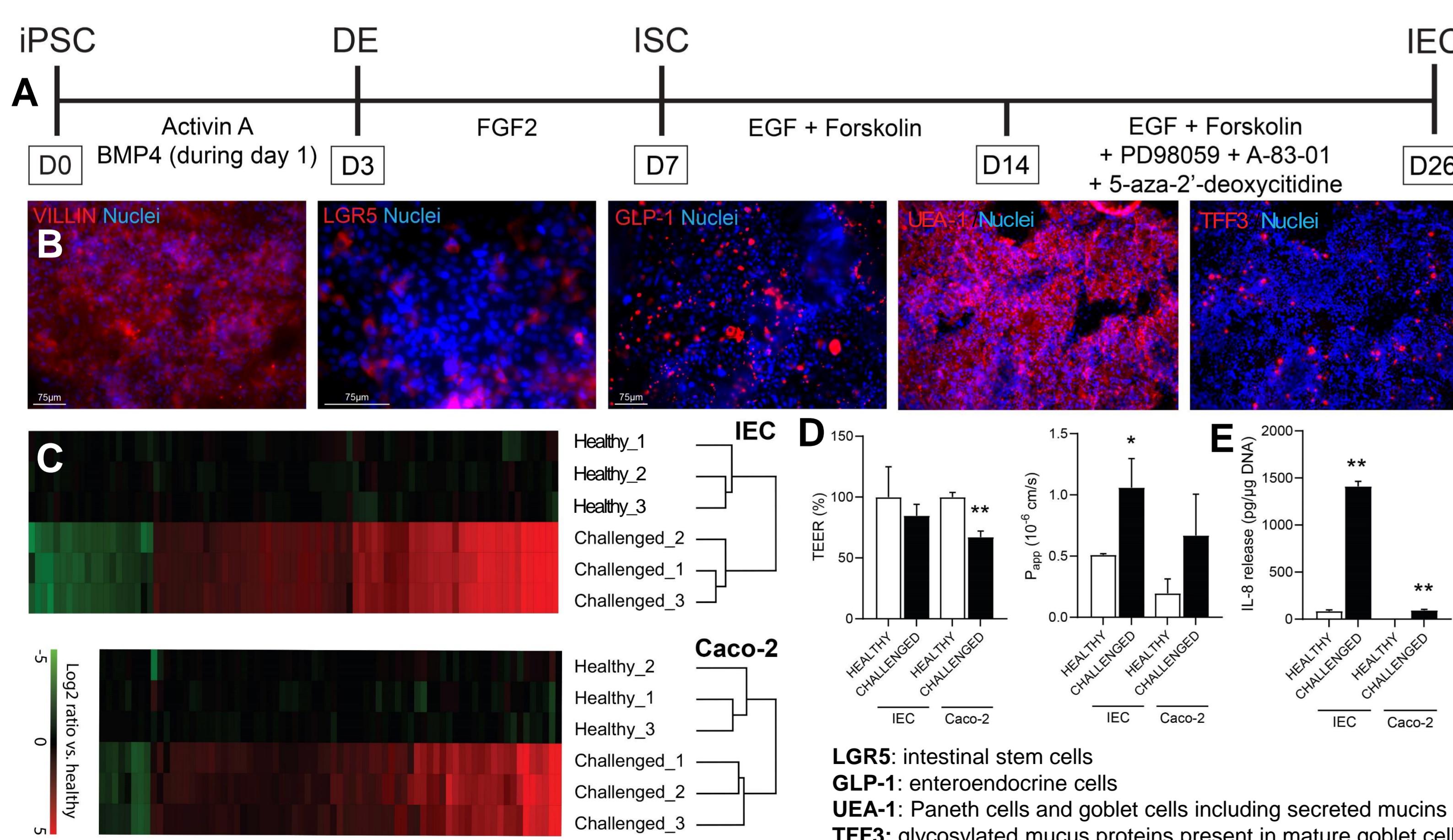
## Objective

To develop and characterize an immunocompetent hiPSC-derived IEC model, by co-culturing IEC layers with MUTZ-3 derived DCs.

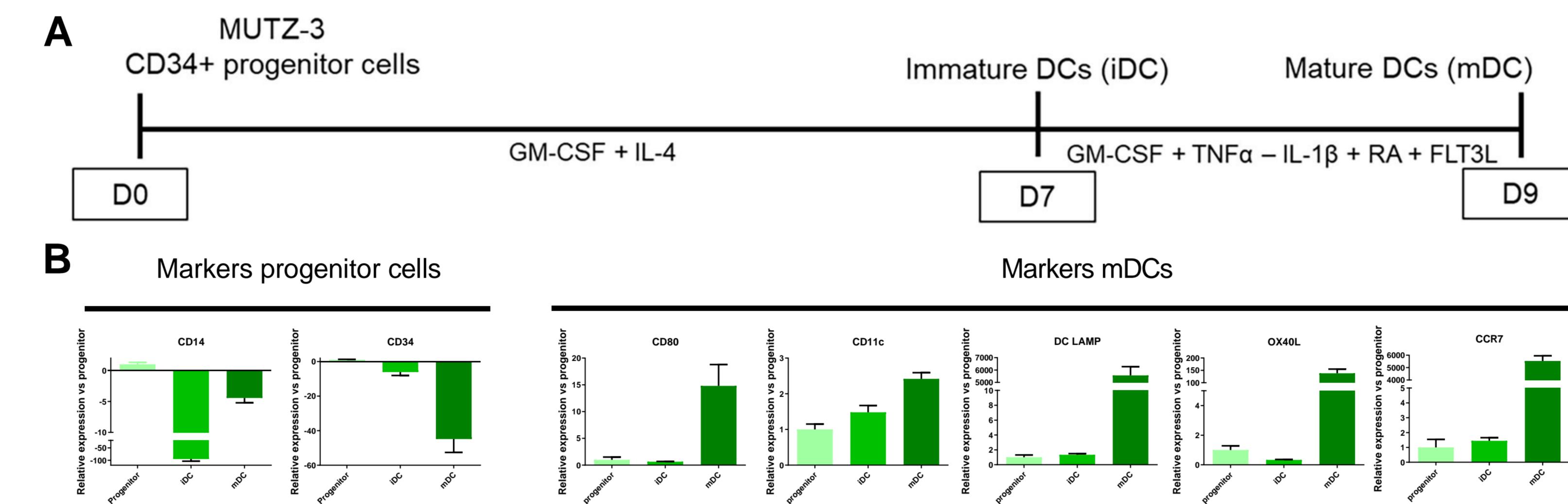
## Study design



## Results: characterization hiPSC-derived IECs



## Results: characterization MUTZ-3 dendritic cells



**Figure 2.** A) Differentiation protocol of MUTZ-3-derived DCs B) Gene expression of markers for progenitor cells and mature DCs (mDCs) measured at D0, D7 and D9. Expression is relative to the progenitor cells which were set at 1. Expression of progenitor markers decreased whereas expression of mDCs increased in time.

## Results: characterization co-culture model

