



PATROLS

Advanced Tools for NanoSafety Testing

Cell-based 3D models of the intestine - 3Rs in nanosafety studies

The intestine provides a physical barrier between the human body and the environment. It serves as a point of entrance for engineered nanomaterial (ENM), which has not been carefully considered previously when studying ENM toxicity.

In order to align ENM toxicity studies in the intestine to 3Rs principles (Figure 1), two complex in vitro intestinal models were developed in PATROLS representing various characteristics of the intestine for a realistic and predictive assessment of ENM safety to the intestine (Figure 2).

One cell model developed can mimic healthy and inflamed-like conditions of the intestine and is suitable to study the influence of impaired health on nanomaterial toxicity. The second model contains a specialized cell type applicable for particle uptake and transport studies.

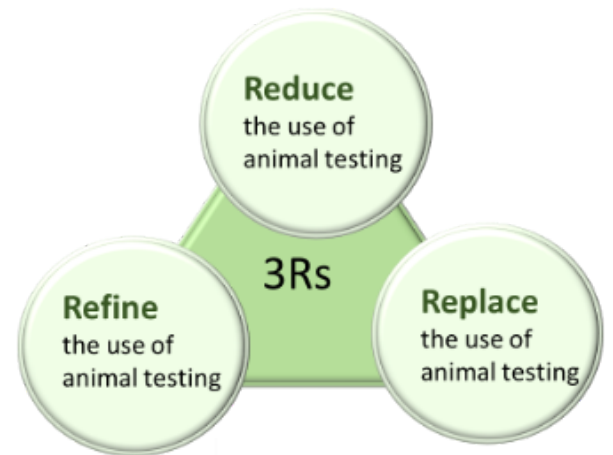


Figure 1: Schematic representation of 3Rs principle in toxicity testing

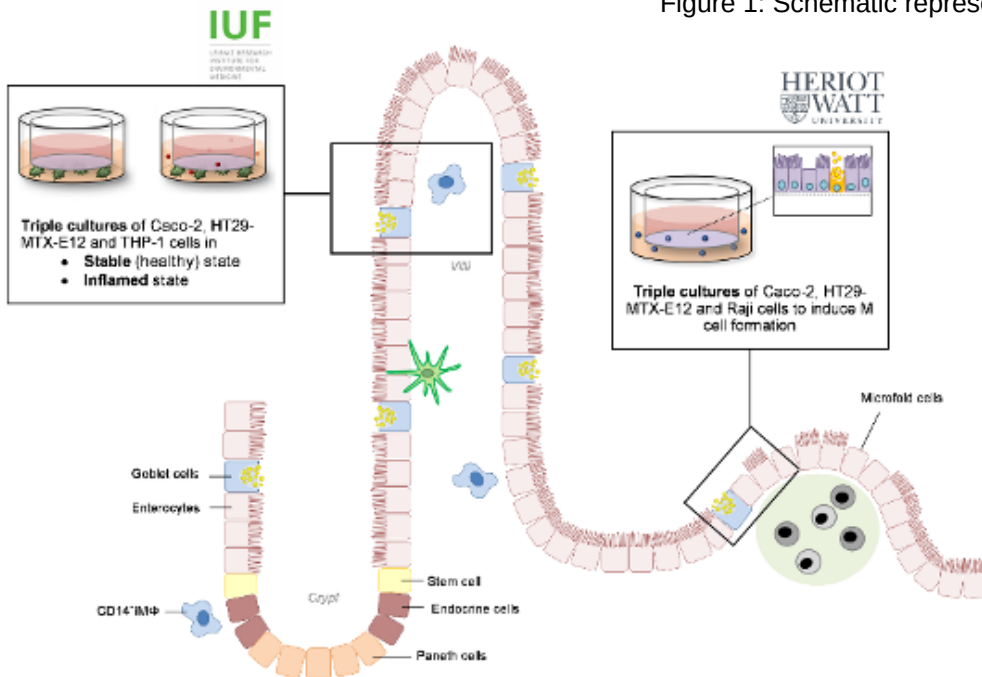


Figure 2. Schematic description of the intestinal in vitro models developed within PATROLS

Both models have demonstrated that the combination of different cell types in one in vitro model can represent in vivo-like characteristics and may be more relevant to study than single cell model. They might prove a promising tool to reduce the need for animal testing

