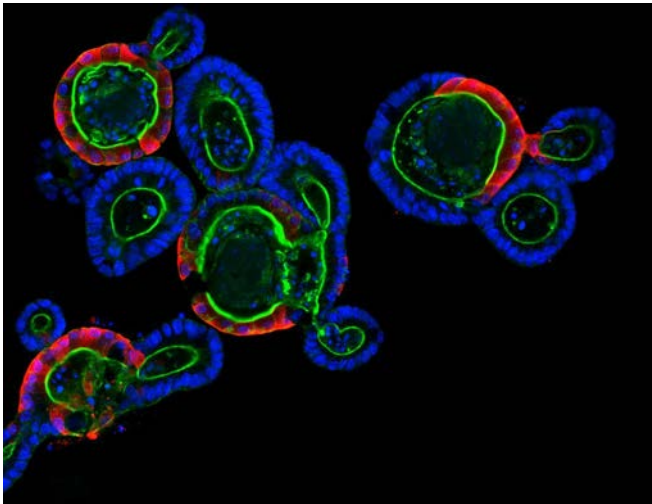


Bio-functional 3-D Hydrogels for culturing organoids



Organoids, mimicking our organs in the lab

Ref. Nr

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Keywords

Intestinal, epithelial, organoids, stiffness, stem cell, hydrogel

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Description

Human-derived stem cell organoids are functional models for identifying and developing novel targeted therapies. They also can provide a unique insight into individual patient diseases which are otherwise difficult to model. Currently available hydrogels provide a microenvironment which lack the mechanical requirements and biochemical complexity required for organoid formation from stem cells.

The present technology deals with developing bio-functional 3D hydrogels and its precursors for culturing adult epithelial cells. The hydrogels offer a fully defined, reproducible and mechanically tunable environment. The method for growing epithelial cells in the hydrogels and for obtaining the organoids from stem cells and tumor cells is also characterized. The technology does not need RGD containing peptides for epithelial organoids culture. Additionally, the invention provides a method for screening pharmacologic compounds for their efficacy in treating intestinal diseases.

Advantages

- Tunable stiffness of the hydrogels
- Adaptable to several organoid types
- No animal derived components
- Characterization of the hydrogels is doable

Applications

- Protocol for generating well-defined matrices for the culture of intestinal stem cells (ISCs) and intestinal organoids
- Scale up in the view of clinical grade materials for tissue regeneration
- Functional screening for therapeutic agents in intestine diseases (inflammation, cancer)