

The effect of natural hairy decellularized plant derived cellulose scaffolds on changing the fate of liver cancer cells

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Abstract

BACKGROUND: Hepatocellular carcinoma (HCC) is now becoming one of the leading causes of cancer mortality around the world. Unraveling the mechanism of its progression and interactions in cells' microenvironment can shed light on the way to finding efficient diagnosis and treatment. Exploiting natural scaffolds for studying the effects of cell niche on the morphology characteristic and expression of tumor markers have recently been reported.

AIMS: Present works aimed to evaluate the suppressive effect of 3D natural cellulosic herbal derived scaffold on growth rates of hepatocellular carcinoma cells.

Methods: First hairy leaves were thoroughly decellularized and assessed for surface roughness, hydrophilicity, mechanical properties, and porous constructions. The correlation between the HCC cell's interaction with hairy cellulosic scaffolds such as changes in secretion of growth factors and decline progression, and the tumor growth and blood vessel recruitment were investigated in vitro.

Results: Data presented here has revealed that plant-based hairy plant-derived scaffolds have a remarkable ability to mimic the tumor behavior and niche. Amongst them, tomato and nettle leave exhibited unique construction for cancer studies mainly due to their pores and topographical properties.

Conclusions: Proposed 3D structure of culturing HCC, which can more closely mimic the tumor microenvironment, can serve as an ideal model for the study and application of novel anticancer drugs against HCC.

Keywords: Cellulosic scaffolds, Hairy plant leave, tumor microenvironment, hepatocellular carcinoma in vitro model, drug screening

References

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