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Isolation and cultivation of myofibroblasts from rats' liver using explantation method

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Abstract

During liver fibrosis development connective tissue is produced by myofibroblasts that could originate from two hepatic populations: hepatic stellate cells and portal fibroblasts. A marker of myofibroblasts is the expression of α-smooth muscle actin (α-SMA). Distinctive feature of myofibroblasts, derived from hepatic stellate cells, is the preservation of the hepatic stellate cells marker expression - desmin. The processes of activation, proliferation and cells trans-differentiation into myofibroblasts are closely related to the activity of transcription factor NF-kB and its inhibitor IkBα. The aim of our work was to obtain a culture of hepatic myofibrobasts, to study their origin, phenotype, relations between NF-kB and IkBα expression and the processes of activation and cells trans-differentiation into myofibroblasts. For this purpose we isolated heterogeneous population of cells from rat liver by the method of explantation. Almost all the cells had desmin and α-SMA expression. On this basis, we suppose that these myofibroblasts were hepatic stellate cells derivatives, and singular desmin-negative cells originated from portal fibroblasts. Thus, hepatic stellate cells have major potential to activation, growth, proliferation and transdifferentiation into myofibroblasts in comparison to portal fibroblasts. Activated state of the cells was confirmed by stable expression of NF-kB and its inhibitor IkBα in all the cells throughout the whole experiment.

Keywords

α-SMA, Desmin, Hepatic stellate cells, Inhibitor IkBα, Portal fibroblasts, Transcription factor NF-kB