Hepatic stellate cells (HSCs) are retinol-storing pericytes of liver sinusoids. They are of medical importance, not only in chronic liver damage which leads to cirrhosis, but they also seem to be keyplayers in acute liver failure [1]. The latter is a severe insult especially in the course of sepsis. The functional difference of quiescent and activated stellate cells is of outstanding significance. Triggers of HSC activation and accompanying complex molecular biological and biochemical changes are only incompletely understood. Raman spectroscopy is a powerful technique to investigate and image biological cells and tissues, both chemically fixed and alive [2-3]. The adoption of this label-free method to study biochemical changes on single cell level in complex tissue surrounding would offer new insights into cell behaviour. To uncover the HSC Raman fingerprint we combine Raman spectroscopic mapping and the specificity of antibody based immunofluorescence labelling. Within Raman maps of rat liver tissue slices we identify cell nuclei via application of advanced chemometrical methods. In the next step, corresponding cells are assigned to HSCs, hepatocytes and macrophages by immunofluorescence imaging. In addition, we study Raman spectroscopic characteristics of quiescent and activated primary HSCs from rat *in vitro*. Here, we especially recognize two different species of lipid droplets in quiescent HSCs. The identification of Raman spectroscopic specialities of HSCs would facilitate future studies on their behaviour and its imaging *in vivo*. Further *in vitro* studies are needed to gain knowledge on biochemical changes and lipid droplet remodelling in the course of HSC activation in advance.

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References: