

Immunocytochemical demonstration of a lipid droplet-specific capsule in cultured leydig cells of the golden hamsters

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摘要

Abstract

In this report, we provide direct evidence for the presence of a lipid droplet-associated capsule in hamster steroidogenic Leydig cells by using a monoclonal antibody A2. Leydig cells are characterized by containing many lipid droplets and having 3 beta-hydroxysteroid dehydrogenase activity. Immunofluorescence staining with this antibody demonstrated a rim or capsule surrounding the lipid droplets in Leydig cells, a pattern not seen with anti-vimentin antibody. Immunogold labelling confirmed ultrastructurally that antibody binding was distributed on the lipid droplet surface. In order to investigate the possible function of the capsule, we examined the morphological changes induced in the capsule following stimulation with LH or dibutyryl cAMP; the fluorescent intensity of the capsule was seen to gradually decrease, accompanied by a decrease in number and size of lipid droplets, and the response to both reagents was time- and concentration-dependent. We thus conclude that hormonal stimulation resulting in the detachment of certain capsular proteins from the surface of lipid droplets is mediated via the cAMP signaling pathway and may allow cholesterol ester hydrolytic enzyme direct access to its substrate in the lipid droplet.