This thesis incorporates the results of investigations carried out on the synthesis and secretion of apoB, the obligate protein component of very low density lipoproteins (VLDL) and low density lipoproteins (LDL) by primary cultures of rat hepatocytes. Plasma lipoproteins are heterogeneous macromolecular complexes of lipids and proteins (apoproteins). Their major function is to transport essentially insoluble hydrophobic lipids of dietary or endogenous origin in the hydrophilic environment of plasma to various tissues. Even though the pathways of metabolism of lipoproteins are known in outline, the regulation of lipoprotein assembly and secretion at molecular level is poorly understood particularly that of VLDL. VLDL transports endogenously synthesised triacylglycerol from liver to other tissues. By virtue of its precursor relationship to LDL it also plays an important role in cholesterol homeostasis. A brief review of literature available on the metabolism of lipoproteins is given in the introductory chapter. Understanding the mechanism of regulation of lipoprotein metabolism is essential, since in many pathological conditions including atherosclerosis, there is derangement of the metabolism of lipoproteins. Hence studies were carried out in this respect using rat hepatocytes maintained in primary culture, as liver is the major site of synthesis of VLDL.

The synthesis and secretion of apoB in the presence of various exogenous factors like fatty acids, cholesterol, lipoproteins, glycosaminoglycans in the rat hepatocytes have been studied. The modulation of apoB synthesis and secretion by hormones such as dexamethasone, cortisone, β-estradiol, thyroxine, insulin, glucagon, epinephrine and dibutyryl cyclic AMP were also studied. The results of these investigations have been discussed in the thesis.