LOW DENSITY LIPOPROTEIN INDUCED GROWTH OF U 937 CELLS

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Low density lipoproteins (LDL) play an important role in the development of coronary atherosclerosis. In this study the growth of the cell line U937 in the presence of increasing concentrations of LDL has been studied.

Serum samples from 80 males with varying serum LDL concentrations were used. The mean serum cholesterol concentration was 6.86 (SD 0.84) mmol/l. The mean LDL concentration was 4.74 (SD 0.80) mmol/l. LDL was added in increasing concentrations (5μg/ml. 10 μg/ml, 20 μg/ml) to a fixed concentration of U937 cells (0.5×10^5). The cells were suspended in 10% lipid-deficient serum and culture medium (KPMI 1640-Gibco) and incubated at 37°C. After 48 hours. 2.5-diphenyl tetrazolium bromide was added to arrest cell growth. Cell growth was estimated by measuring the optical densities. The results are shown in Table 1.

Table 1. Dose dependent LDL induced growth of U937 cells

LDL concentration (mmol/1)	Number of Patients	Optical density of cell suspensions Means (SD) with varying LDL Concentrations			
		5μg/ml	10μg/ml	20μg/ml	Blank
Less than 3.9	12	0.07(0.02)	0.14(0.04)	0.31(0.07)	0.06(0.01)
4-4.9	39	0.07(0.02)	0.15(0.03)	0.30(0.05)	0.04(0.04)
5-5.9	21	0.07(0.02)	0.14(0.03)	0.30(0.06)	0.03(0.01)
Over 6	7	0.07(0.01)	0.13(0.02)	0.29(0.03)	0.03(0.01)

Addition of LDL to U937 cells resulted in a dose dependent increase in cell number over a 48-hour period indicating a direct relationship between LDL uptake and increase in cell number. The uptake of LDL is mediated by apo B and as a consequence, the rate of proliferation of U937 cells in a given concentration will depend on the functional properties and concentration of apo B. These findings suggest that determination of U937 cell growth in the presence of LDL may be an easy and reliable assay for determination of functional defects of apo B.