DISTRIBUTION OF 7S SOY GLOBULIN IN HEPG2 CELLS BY CAPILLARY ELECTROPHORESIS AND LDL RECEPTOR UP-REGULATION

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In HepG2 cells, the a+a' subunits from 7S soy globulin were shown to be more active in LDL receptor up-regulation than either the whole 7S or the b subunit. Purpose of this work was to develop a rapid and reliable capillary electrophoresis (CE) method to monitor intracellular distribution of 7S soy globulin in order to investigate its relative abundance in the different cellular compartments. HepG2 cells were incubated for 24 hours in MEM plus 5% LPDS containing 0.5 mg/ml of fluorescein isothiocyanate tagged 7S (FITC-7S), a concentration at which an up-regulation of LDL receptors was previously reported. Cells were harvested and nuclei were separated from the cytosolic fraction. FICT-7S, total cell lysate, nuclear and cytosolic fractions were analyzed by standard electrophoretic techniques and laser induced fluorescence-zonal CE (LIF-CE). The results obtained by LIF-CE indicated a main FITC tagged component in total lysate and in the cytosolic fraction, not present in the nuclear compartment, with a different retention time from native FITC-7S, indicating an intracellular degradation of 7S. In non denaturing gradient gel electrophoresis the main FITC band present in the cytosol migrated with a molecular size higher than native 7S indicating a possible interaction with proteomic component/s. Moreover, in a separate experiment we found that the up-regulation of LDL receptors induced by a' subunit alone was similar to that found in HepG2 cells after exposure to both a+a'. These results, while confirming our previous data on the different digestion pattern of the 7S, suggest the validity of CE method to identify the intracellular component involved in the soy peptide interaction and the possible correlation with the specific biological effect, such as the observed up-regulation of LDL receptors. The keyl role of a' subunit in the cell cholesterol homeostasis has also been proposed.