DIFFERENCES IN *all-trans* BETA-CAROTENE (BC) UPTAKE AND ECCENTRIC CLEAVAGE BY HUMAN ENDOTHELIAL AND NEOPLASTIC CELL LINES. EFFECT ON GENE EXPRESSION IN MICROARRAY ANALYSIS

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This study was aimed at investigation of the ability of the different human cell lines to uptake and catabolise beta-carotene (BC) and to assess associated changes in the gene expression patterns. BC was supplemented alone or in combination with arachidonic acid (AA) to normal human cell line (human umbilical vein endothelial cells; HUVECs) and human neoplastic cell lines: leukemia (HL-60, U-937,TF-1); prostate (PC-3, LNCaP); and melanoma (A375, WM35). HPLC data revealed that BC was differentially absorbed and catabolised. Cells characterized by low BC uptake (HUVECs and hematological malignancy cells) had higher BC catabolism in comparison to the high-uptake group which included the cell lines derived from solid tumors. A significant inverse correlation between BC uptake (area under kinetic curve of BC uptake, AUC BC) and epoxide/BC ratio as well as apocarotenals/BC ratios was observed. The number of genes significantly linked to cellular BC response assessed in microarray, correlated with BC uptake and BC catabolism by the eccentric cleavage and oxidation. Gene expression profile representing two pathways: xenobiotic metabolism (XM) and vesicle-mediated transport (VMTR) and some others related to the lipid-raft and/or clathrin dependent endocytic pathways differentiate the mechanisms of cellular BC uptake and metabolism in normal and neoplastic cells.