Effects of adipocyte-secreted factors on cell cycle progression in HT29 cells.

BACKGROUND: Obesity is a chronic sub-inflammatory condition which is a risk factor for several cancer diseases, e.g. colon cancer. Adipose tissue secretes biologically active factors like leptin with a known pro-inflammatory or mitogenic activity. Both, chronic inflammation and an increased cell proliferation are considered to play an important role in colon carcinogenesis. Diverse phytochemicals were shown to have cell growth inhibiting effects.

AIM OF THE STUDY: The aim was to investigate whether adipocytes could mediate a proliferative capacity to HT29, a human colon adenocarcinoma cell line, and whether phytochemicals could modulate this effect. METHODS: Infranatants of adipocyte cultures from different donors were prepared and the effects of those conditioned adipocyte media (CAM) on HT29 cell growth were measured. Additionally, cell cycle progression was analyzed by flow cytometry after CAM treatment and ERK 1/2 phosphorylation was analyzed. RESULTS: CAM from a subgroup of adipose tissue donors stimulated HT29 cell growth, whereas others did not. This effect seems to be mediated via the ERK 1/2 pathway. Furthermore, CAM caused changes in cell cycle distribution with a shift of HT29 cells from G1- into the S-phase. This effect could be mimicked by leptin (1 nM). Co-incubation of CAM-treated HT29 cultures with beta-carotene or EGCG did not have a significant impact on cell cycle progression, whereas genistein (30
microM) tended to inhibit the CAM-stimulated transition of cells into the S-phase. CONCLUSION: This study confirmed the mitogenic activity of leptin in HT29 cells, although leptin secretion from adipocytes is not likely to be responsible for CAM-stimulated cell growth in our test system. The investigated phytochemicals seem to have only a minor influence on CAM-mediated cell cycle progression.