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Comparison of the effects of growth hormone on MAC-T cells and primary mammary cells

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ABSTRACT

The ability of growth hormone (GH) to increase milk yield through somatomedins is well characterized, however recent studies utilizing mammary epithelial cell (MEC) lines have indicated a possible direct effect on MEC. In the mammary alveolar cell-T (MAC-T) line, relative abundance of mRNA for two milk protein genes, α -lactalbumin and α _{S1}-casein, and GH receptor was increased by GH. MAC-T cells were compared to bovine mammary tissue explants and primary MEC isolated from raw milk through culture in classical lactation medium (dexamethasone, insulin, prolactin) with 0 or 10 ng/mL GH. Explant and primary cell mRNA abundance showed a similar pattern to MAC-T indicating that the effects observed in cell lines may be relevant *in vivo*. To begin to understand the nature of the effects of GH in MEC, global protein expression in MAC-T cells was analyzed by 2-D gel electrophoresis, finding the abundance of 40 proteins altered by inclusion of 10ng/mL GH. Proteins were identified using MALDI-TOF with tandem MS and include enzymes involved in glycolysis, lipogenesis, protein processing and transport. Research funded by California State University Agricultural Research Initiative award #07-3-011.