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

Lisa McDonnell, Tasha Johnson and Daniel G Peterson
Animal Science, California Polytechnic State University, San Luis Obispo, CA

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.