Title: Characterization of cholesterol transport proteins in osteocytes in response to differentiation and inflammatory cytokines.

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Hypercholesterolemia is associated with osteoporosis and cardiovascular disease. Lipoprotein particles serve to transport cholesterol, fatty acids and fat-soluble vitamins to bone cells. Failure of reverse cholesterol transport in skeletal tissue may contribute to osteoporosis and atherosclerosis. We previously reported on the diminution of cholesterol efflux by tumor necrosis factor alpha (TNFα) in the MLO-Y4 osteocyte cell line. This cytokine resulted in repression of ABCA1, a cholesterol efflux protein. To further define the roles of scavenger receptors in skeletal tissue, protein levels and mRNA levels of scavenger receptors ATP-binding cassette-1 (ABCA1), scavenger receptor class B-1 (SRB1), cluster of differentiation 36 (CD36), and lectin-type oxidized LDL receptor 1 (LOX-1) will be assayed before and after the addition of lysophosphatidic acid (LPA) which induces dendrite growth in osteocytes. MLO-Y4 cells will be incubated to determine the effect of TNF α and interleukin 1 beta (IL-1β) on scavenger receptors, mRNA, and transcriptional activity. We hypothesize that inflammatory cytokines modulate cholesterol transport proteins in osteocytes. The medical student will perform cell culture, qualitative microscopy, western and northern blotting, transfections, RNA isolation and quantitation with real-time polymerase chain reaction. This work is supported by a UF College of Medicine Deans’ Grant.


