

Homeostatic responses of thyroid hormone calorogenesis in the liver: Association with oxidative stress

Videla, Luis A.

Thyroid hormone (L-3,3',5-triiodothyronine, T₃) exerts calorogenic effects by accelerating mitochondrial O₂ consumption through transcriptional activation of respiratory genes, with consequent increased reactive oxygen species (ROS) production. In the liver, ROS generation occurs at different sites of hepatocytes and in the respiratory burst of Kupffer cells, triggering the activation of the transcription factors nuclear factor- κ B, signal transducer and activator of transcription 3, and activating protein 1. Under these conditions, the redox upregulation of Kupffer cell-dependent expression of cytokines [tumor necrosis factor- α , interleukin (IL)-1, and IL-6] is achieved, which upon interaction with specific receptors in hepatocytes trigger the expression of antioxidant enzymes (manganese superoxide dismutase, inducible nitric oxide synthase), antiapoptotic proteins (Bcl-2), and acute-phase proteins (haptoglobin, α -fibrinogen). These responses and the promotion of hepatocyte and Kupffer