

# Thiol homeostasis and supplements in physical exercise

## Thiol homeostasis and supplements in physical exercise

Sen CK, Packer L.

Departments of Surgery and Molecular & Cellular Biochemistry, The Ohio State University Medical Center, Columbus, OH 43210-1252, USA.  
sen-1@medctr.osu.edu

### Abstract

Thiols are a class of organic sulfur derivatives (mercaptans) characterized by the presence of sulfhydryl residues. In biological systems, thiols have numerous functions, including a central role in coordinating the antioxidant defense network. Physical exercise may induce oxidative stress. In humans, a consistent marker of exercise-induced oxidative stress is blood glutathione oxidation. Physical training programs have specific effects on tissue glutathione metabolism that depend on the work program and the type of tissue. Experimental studies show that glutathione metabolism in several tissues sensitively responds to an exhaustive bout of exercise. Study of glutathione-deficient animals clearly indicates the central importance of having adequate tissue glutathione to protect against exercise-induced oxidative stress. Among the various thiol supplements studied, N-acetyl-L-cysteine and alpha-lipoic acid hold the most promise. These agents may have antioxidant effects at the biochemical level but are also known to influence redox-sensitive cell signaling.