

The importance of glutathione in human disease.

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Reduced glutathione (GSH) is the most prevalent non-protein thiol in animal cells. Its de novo and salvage synthesis serves to maintain a reduced cellular environment and the tripeptide is a co-factor for many cytoplasmic enzymes and may also act as an important post-translational modification in a number of cellular proteins. The cysteine thiol acts as a nucleophile in reactions with both exogenous and endogenous electrophilic species. As a consequence, reactive oxygen species (ROS) are frequently targeted by GSH in both spontaneous and catalytic reactions. Since ROS have defined roles in cell signaling events as well as in human disease pathologies, an imbalance in expression of GSH and associated enzymes has been implicated in a variety of circumstances. Cause and effect links between GSH metabolism and diseases such as cancer, neurodegenerative diseases, cystic fibrosis (CF), HIV, and aging have been shown. Polymorphic expression of enzymes involved in GSH homeostasis influences susceptibility and progression of these conditions. This review provides an overview of the biological importance of GSH at the level of the cell and organism.

