

Comparative effects of superoxide anion and hydrogen peroxide on microsomal and cytosolic glutathione S-transferase activities of rat liver

Letelier, María Eugenia

Molina-Berríos, Alfredo

Cortés-Troncoso, Juan

Jara-Sandoval, José A.

Müller, Andrea

Aracena-Parks, Paula

Glutathione S-transferases (GSTs) are isoenzymes occurring in the cytoplasm and as integral membrane proteins. In addition to their role in drug metabolism by conjugating electrophilic and lipophilic compounds with glutathione (GSH), these enzymes display multiple functions in cells, including antioxidant action. It has been generalized that reactive oxygen species (ROS) inhibit cytosolic GSTs and activate microsomal GSTs; some evidence shows, however, that different ROS-generating systems can inhibit microsomal GST activity. We therefore tested the effect of Fe³⁺/ascorbate, another ROS-generating system, on cytosolic and microsomal GST activities from rat liver cytosol and microsomes, respectively, and compared it to that of hydrogen peroxide (H₂O₂). We found that, while both agents displayed similar inhibitory effects on cytosolic GST activity, they promoted opposite effects on microsomal GST activity. Using specific antioxidant enzymes, we corroborated that the effect of Fe³⁺/ascor