Gluathione peroxidase (GSH-Px1-GPX1) a extracellular selenoenzyme expression modulates xenobiotic metabolising enzymes.

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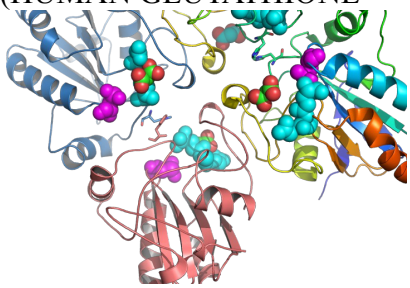
Glutathione peroxidase (EC 1.11.1.9) protects against oxidative damage via the chemoprotective action of nitric-oxide mediated lipid peroxidation and anti oxidative defense by gluathione (GSH-Px1-GPX1) a extracellular selenoenzyme, extracellular glutathione peroxidase (E-GPx) and cellular (C-GPx) detoxifies hydroperoxides. Other antioxidant genes (AOX) as Gpx1, is located in the cytosol and in (mt) mitochondria. Epithelial antioxidative enzymes (AOEs) are activities of GSH-Px1 (gluathione peroxidase), (SOD) superoxide dismutase, and thioredoxine reductase (TXNRD1) by itself or with thioredoxin (Trx) are antioxidant enzymes. Glutaredoxin (Grx) are reduced by the oxidation of glutathione an antioxidant, (The effect of iridoid glucosides such as oleuropein an antioxidant, can often be bound to glucose.) phenolic compound isothiocyanate sulforaphane found in olive leaf, increased cell-lysate NAD(P)H:quinone oxidoreductase (NQO1) phase II activities reduction reactions, catalyzed by such as glutathione-S-transferase (GST) they catalyze the conjugation back to the the thiol group and other GPx mimics (converted into selenocysteine), to the reaction site of glutathione (GSH) and antioxidants, implying (GR) reduction reactions back to glutathione, are an evolutionary relationship between GST and GPx/glutathione system defense in oxidative stress. "Glutathione" peroxidase (Gpx) content, and glutathione reductase (GR) components compose the glutathione (GSH) system, this contains Selenocysteine (Sec), the 21st amino acid at the active GPX site (Homo sapiens chromosome 3, GRCh37 primary reference: rs644261)- TGA => UGA (selenocysteine, which occurs at the active site of glutathione peroxidase GPX1 is coded by UGA, isoform 1 NM_201397.1-variant 1 represents the shorter transcript that encodes the longer isoform 1, as compared to isoform 2-NM_000581.2 variant 2); (rs1050450) is intronless and has a shorter C-terminus. They represent the cDNA as a molecular mechanism (TGA) for down-regulation of mRNA expression and transcriptional code is a regulatory switch at the translational-step delivered to the ribosome in genes similar to Glutathione peroxidase 1 (GP, Gpx1, GSHPX1): locus 3p13-q12 (§, ‡,). GSH-Px is an essential nutrient selenium dependent GPX, by which mRNA translational repression of selenium-binding protein (SBP1) is accomplished when GPX1 increased in human plasma, if selenium-deficient, while independent of Se values in leukocyte (White blood cells) from correspondingly damaged DNA. In fibroblast activity, GPx1 was effective through the prevention or repair of DNA damage. The reductive detoxification of peroxides in cells modulates xenobiotic metabolising enzymes via anticarcinogen supplementation, e.g. selenium-yeast in human plasma. GPX in turn, can lead to carcinogenesis. The heterozygote has an intraerythrocytic environment (red blood cell) with the favorable higher peroxidase activities role in malarial resistance. An in-frame GCG trinucleotide repeat was homozygous for the pseudogene GPX1 Pro197Leu-like two alleles ass with 6 GCG repeats coding for a polyalanine tract. CuZn-SOD (copper/zinc-superoxide dismutase) and other oxidoreductases contribute to the cellular defenses, repair of oxidative damage to DNA. Chronic hyperglycemia (excessive blood sugar) causes oxidative stress, 'Extract silymarin and Berberine-'may' overcome insulin resistance. And for diabetes Astragalus membranaceus can improve the protective effect, an extract from Shidagonglao roots (Mahonia fortunei) or the effects of Berberine from the main alkaloid of Coptis chinensis are agents for preventing sepsis and its lipopolysaccharide (LPS) complications in human microvascular endothelial cells. GPX is down-regulated and peroxiredoxin (PRX) is up-regulated. Both use thioredoxin (Gpx and Prx, suppress Trx, a cysteine-based thioredoxin-specificTxn-GPx expression.) to recharge after reducing hydrogen peroxide (H2O2) along with other cellular molecules. Also found in transcripts in ocular tissues from oxidative anterior damaged cells, GSH-dependent recombinant human lens thioltransferase (RHLT)* being its repair systems. GPX1 could supress staurosporine-induced late generation of ROS, corresponding to reduction in visual loss. Its role in

pathogenesis of (inflammatory disorders of blood antioxidant enzyme system) as an autoimmune disease background, appears to be the hydroperoxide metabolism in diverse pathogens*, an enzyme by single administration streptozotocin (60 mg/kg) of negative implication, oxidative damage or antioxidant status when examined in contrast as metabolic syndrome through the GPX down-regulation are comparable, with reduced-enzyme-activity to the T allele of the GPx-1 genetic leucine/proline polymorphism at codon 198 approximately 70% for pro197 and 30% for leu197 named Pro198Leu (rs1050450). The leucine-containing allele was less responsive to GPx-1 enzyme activity. Thioltransferase (TTase) with GPx the dethiolating enzyme, thiol* catalysis glutaredoxin thioltransferase (Grx) content and activity to the thiol status produced by the oxidation of glutathione: a seleno-organic compound ebselen (2-phenyl-1,2-benzisoselenazol-3(2H)-one) catalyzed in vitro, has been reported to '« mimic » development of small-molecule selenium compounds' ('synthetic antioxidant' GPX) required for, a diphenyl diselenide PhSe group 'in the catalytic activities' is introduced by reaction (a monocyte-derived soluble protein (M-DSP/Gpx1) with 5-LO, (5-lipoxygenase) activity this 'recovered (M-DSP)-GPx inactivation'. In which Serum Malondialdehyde (MDA) a marker (oxidative activity) generated from, reactive oxygen species (ROS) is thought to cause DNA damage with various antioxidants usually homeostatically controlled by endogenous superoxide dismutase (SOD), as a by-product and the oxygen-sensor neuroglobin (Nb), GSHPx reactive neurons or in brief neuronal damage (apoptosis) after ischemia. Antioxidant enzymes such as Cu/Zn-superoxide dismutase (SOD) and a 21-kD protein (involved in neuroprotection) GPx1 both in the free radical chain, protects neurons and Microglial cells. Microglial cells are, sensitive to small changes from Reactive oxygen species (ROS), free radical scavenging enzymes-mediated apoptosis. Neuronal loss and deteriorating CNS function: is linked to the pentose phosphate shunt, the (PPP) pentose phosphate pathway, has a relatively low content of enzymatic antioxidants, in a higher cellular ROS level to oxidative stress. A candidate (SePP1) selenoprotein (P-plasma) or genetic variations homologous to GPX1. Microsomal (reconstituted fraction) glutathione transferase-1 (hGSTP1) decreased cytotoxicity (cartilage degradation and regeneration [Leucas aspera] to mitochondria damage, directed to citrulline-containing proteins) by effects of hydrogen peroxide 'H(2)O(2), which causes lipid peroxidation (LPO) in the (ER) endoplasmic reticulum. In which LPO product Malondialdehyde and other Thiobarbituric acid reactive substances - TBARS - are formed as a byproduct, when the effects of GPX1 (glutathione peroxidase 1)' is measured, the effects of Centella asiatica extract detoxifies. Antioxidants and detoxication agents as antigenotoxic* agents (isoflavones via dietary intake) were also observed as cytogenetic end-points* of carcinogenesis. Over-expression could drain the reduced glutathione (hepatic and GSH dependent enzymes), cellular glutathione (GSH) levels, GSH acts as a feedback rate-limiting inhibitor of its synthesizing enzyme GCL (gamma-glutamyl-cysteine synthetase) activity, Diosgenin is a useful Marker degradation-compound of Low-density lipoprotein (LDL) and high-density lipoprotein (HDL) against oxidation. The compound buthionine sulfoximine (BSO) inhibits the first step of glutathione synthesis, concerning the mechanism of GSH depletion. Gpx suppresses (thioredoxin) Trx - expression, which augments Anti-clastogenic (mutagenic agents), potential DNA-binding (heritable multigenerational/evolutionary tolerance), in a cDNA open reading frame (ORF) GPx1 is a small pericentric inversion, incorporating the co-translational selenocysteine which may be unique to the insertion sequence elements.

Biological Assembly GPx-1 tetrameric structure with an altered carcinogen metabolism and reduce oxygen tension to explain the anti-carcinogenic effects, the redox donor status (Figure 2) of one oxygen atom limited to only two regions may carry missense variant (rasmol_php_C and _D) a reaction incorporated into the overall tetrameric structures instability potentially in humans through modulation of biosynthetic and genetically modified GSH enzymes binding the selenocysteine insertion sequence elements. The specific activity of the enzyme Sec suggest how the molecular pathway might work, as the glutathione pathway may influence the enzyme Sec reaction site incorporation sequence in the 3'-untranslated region UTR of glutathione (GSH) may further reveal a signaling pathway that is activated. The differing and interacting roles of GPX1 and (Sec.) Selenocysteine Synthase [doi: 10.2210/rcsb_pdb/mom_2008_8] both vectorstogether with glutathione (HUMAN GLUTATHIONE TRANSFERASE (HGST) PDB ID: 1LJR ligand component GSH: C10 H17 N3 O6 S, molecules colored: aquamarine) did; activates two multiple signaling pathways in one of the Gpx1 variants 1 or 2 nucleotide, the nonsense codon, UGA has both, related to the antioxidative pathway vectors together PDB ID: 1gp1 (2-AMINO-3-SELENINO-PROPIONIC ACID: ALANINE molecule colored: purple), is located near the selenocysteine insertion sequence element PDB ID: 2F8A (rainbow colored: ribbons) mutant of GPX1.



Interrogation of data based on experimentally determined models are limited but revealed network structures that dynamically conveyed information from the antioxidant enzymes that share a common pathway considered most important in the selenocysteine synthesis pathway from the information suggested, and they implicate at least one selenoprotein (GPx-1) in the process.