

S19-1 **Functions of Selenoproteins**

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The role of selenium has been largely attributed to its presence in selenoproteins as the 21st amino acid, selenocysteine (Sec). Sec is encoded by UGA. Selenoproteins like glutathione peroxidases (GPx), thioredoxin reductases or iodothyronine deiodinases are involved in redox reactions. GPx catalyzes the reduction of hydrogen peroxide and lipid hydroperoxide by glutathione. GPx exists in several forms that differ in their primary structure and localization. We have shown that selenoprotein P (SeP) exhibits a GPx -like activity. To understand the physiological significance of the diversity among these enzymes, a comparative study on the peroxide substrate specificity of three types of ubiquitous GPx (cGPx, PHGPx, eGPx) and of SeP was done. The specific activities and kinetic parameters against two hydroperoxides (hydrogen peroxide and PCOOH) were determined. These four enzymes exhibit different peroxide and thiol specificities, and collaborate to protect biological molecules from oxidative stress both inside and outside the cells. SeP and eGPx cooperatively catalyze the reduction of the PCOOH and CEOOH associated with oxidized LDL. These results suggest that these selenoenzymes prevent oxidized LDL progression and foam cell formation in atherosclerotic lesions. The other functions of SeP such as a Se transporter will be also presented.