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## ENZYMOMOLOGY AND MOLECULAR BIOLOGY

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**Claudio Santi***University of Perugia, Italy***New drugs and catalysts inspired by glutathione peroxidase**

Glutathione peroxidase (GPx) among the currently known selenoenzymes is the best characterized in terms of chemical structure and reaction mechanism. The catalytic center of this enzyme is a selenocysteine and more specifically, a selenium atom that is stabilized by a catalytic triad in the form of nucleophilic selenate. In this form, the selenium is reactive toward peroxides determining their reduction into the non-harmful alcohol or water. The selenol by reaction with the peroxide is transformed into the corresponding selenenic acid which is rapidly reduced by two molecules of glutathione affording a molecule of oxidized glutathione and the native selenate which is ready to start a second cycle. Glutathione peroxidase have a crucial role in the control and prevents the damage produced by the reactive oxygen species (ROS) in living system and from one side it is important to maintain a healthy status from the other it is necessary to reinforce it during a number of pathologic situation. During the last decades, several small molecules containing selenium as well as some artificial selenoenzymes were developed and tested as antioxidants but also as pro-oxidants as enzyme inhibitors, hormetic agents, antiviral, anticancer, antimicrobial agents. In this talk, the author will report the state of art of the research on this field focusing some new prospective that is currently ongoing in our laboratory: Discovery of new biologically active organoselenium compounds and determination of their reaction mechanism in living systems. Besides that the bio inspiration is an excellent strategy for the development of new efficient and eco sustainable catalyst for application in Green Chemistry, some recent examples of these results will be presented and discussed.

**Biography**

Claudio Santi received his PhD in Chemical Sciences from the University of Perugia under the supervision of Professor Marcello Tiecco. Currently, he is a Professor of Organic Chemistry and leads the Group of Catalysis and Organic Green Chemistry in the Department of Pharmaceutical Sciences. His research interests range from the application of selenium reagents in green chemistry to the development of new organoselenium containing drugs. He is author of more than 130 publications including review articles and book chapters.

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