Il giorno 7 ottobre alle ore 15.30 presso l'Aula Magna del dipartimento di Fisica e Chimica in viale delle scienze ed.18 il Prof. Dimitri E. Khoshtariya, direttore del "Institute for Biophysics and Bionanosciences" della I. Javakhishvili Tbilisi State University, Georgia terrà un seminario dal titolo:

"Combined studies of the stability, flexibility and performing issues for redox-active proteins through the extended method of interfacial voltammetry."

ABSTRACT: Redox-active proteins can be readily functionalized at diversely modified conducting platforms (electrodes) by using alkanethiol-based self-assembled monolayer films (SAMs) or other carbon-based nanostructures (including graphene, variety of nanotubes, etc.). Application of the modern, temperature- and high-pressure assisted voltammetry techniques furnished by variation of the SAM thickness, SAM terminal group composition and solution composition, allows not only for the identification of electron transfer (exchange) mechanism (e.g., tunneling vs. dynamically controlled regimes), but also for drawing conclusions about the degree of protein's interfacial confinement and its further stabilization/destabilization by the solution additives [1-5]. Several cases of the environs' remarkable impact will be discussed: (A) Combined effect of the surface confinement and medium's vitrification on azurin, latter caused by the high concentration of organic salt, choline dihidrogen phosphate. We disclosed essential structural stabilization of azurin, along with the dynamically controlled ET mechanism combined with a remarkable nonergodic aspect [1,2]. (B) Essential impact of a strength of the protein-SAM interaction (free diffusion vs. nonflexible docking) on the structural stability and intrinsic ET mechanism for the Fe(III/II)H2O form of myoglobin. In this case, change of protein's stability and conformational flexibility was found to be correlated with a degree of the inner-sphere reorganization of a Fe-coordinated water, hence with the rate of electron transfer [3,4]. (C) Impact of "direct wiring" on the quasi-simultaneous proton-coupled two-electron transfer for a FAD cofactor of the glucose oxidase, latter pierced by the carbon nanotube-polymer hybrids [5]. (D) The nonergodic/nonlinear impact on the electron transfer pattern of a glass-forming milieu within biomimetic devices made of gold-deposited L-cysteine SAMs, capable of capturing redox-active copper(II) ions [6] (considered as a model system for azurin-containing nanodevices [1,2]), will also be discussed.

References:

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