DIPARTIMENTO DI FARMACIA E BIOTECNOLOGIE

AVVISO DI SEMINARIO

Il giorno venerdì **24 Settembre 2021**
alle ore **16:30**

in streaming:

https://teams.microsoft.com/l/meetup-join/19%3aN09c0NIyEssBnF7ObCyDOQwkgDWm1qdd9f7F2nJV9fw1%40thread.tacv2/1631519544944?context=%7b%22Tid%22%3a%22e99647dc-1b08-454a-bf8c-699181b389ab%22%2c%22Oid%22%3a%225a941351-ef41-4aa4-8771-fa50a6d62ca1%22%7d

oppure *in presenza*:

Aula 1, FaBiT, via Belmeloro 6, Bologna (green pass e prenotazione richiesti) *

Prof. Michael J. Maroney, Ph.D.

University of Massachusetts Amherst
Amherst, MA, USA
(ospite Prof. Stefano Ciurli)

terrà un seminario dal titolo:

Maturation of Ni superoxide dismutase: how does the enzyme get its nickel?

Colleghi e studenti sono cordialmente invitati

Commissione Ricerca e Attività Correlate - FaBiT

*** Per la partecipazione in presenza è necessario essere in possesso del green pass e dare comunicazione della propria presenza mediante mail a: stefano.ciurli@unibo.it entro il 24 settembre ore 12:00 in modo da garantire la conformità con la capienza massima dell'aula (66 posti)**

ABSTRACT

In this work, we investigate the maturation of Nickel-dependent Superoxide Dismutase (NiSOD) from *Streptomyces coelicolor*, for which no chaperone has been established, and provide evidence for the role of low molecular weight complexes with L-histidine in the process. NiSOD is the most recently discovered member of superoxide dismutase family of enzymes, which catalyze conversion of superoxide to oxygen and hydrogen peroxide. The assembly and maturation of NiSOD is dependent on the post-translational processing of the N-terminal leader sequence of its precursor, SodN, by the cognate protease, SodX. Using purified proteins overexpressed in *E. coli*, we have characterized *S. coelicolor* SodN and SodX, including their Ni-binding properties. We then show using mass spectrometry, that SodX is capable of processing SodN in vitro in the absence of metal ions and apo-NiSOD can subsequently be nickelated to give active NiSOD. Further, metal ions, including Ni(II), inhibit proteolytic cleavage by SodX. When the proteolytic processing is carried out in the presence of Ni(II) and physiologically relevant L-histidine concentrations, processing and nickel incorporation are rescued. Kinetic studies using pulse-radiolytic generation of superoxide demonstrate the catalytic activity of the NiSOD prepared from SodN. Interestingly, D-histidine, under the same conditions does not rescue SodN processing in the presence of Ni(II), suggesting that a specific ternary complex with L-His is involved.

BIOGRAPHICAL SKETCH

Michael J. Maroney was born in Ames, Iowa, graduated with a B.S. in Chemistry from Iowa State University, and with a Ph.D. in Chemistry from the University of Washington. Following postdoctoral positions at Northwestern University and the University of Minnesota, he joined the faculty at the University of Massachusetts-Amherst in 1985. Prof. Maroney has been an active researcher in the field of metallobiochemistry (bioinorganic chemistry) for 36 years. His research efforts generally combine the characterization of biomolecules that bind transition metals with molecular biological, spectroscopic, and synthetic approaches that are designed to address structure/function relationships. Among the many spectroscopic techniques he employs, he has special expertise in x-ray absorption spectroscopy. He has been particularly interested in the biochemistry of nickel. His current research interests are focused on trafficking proteins involved in the uptake, distribution, regulation, storage, and excretion of nickel, and the metalloenzyme nickel superoxide dismutase. A list of publications may be found at: ORCID: 0000-0002-5598-3038.