DIPARTIMENTO DI FARMACIA E BIOTECNOLOGIE

AVVISO DI SEMINARIO

Il giorno mercoledì **19 ottobre 2022**
alle ore **16:30**

in presenza:

Aula A (ex Farmacologia) – FaBiT, via Irnerio 48, Bologna BO

oppure *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

Prof. Raymond J. Turner

Department of Biological Sciences, Faculty of Science, University of Calgary, Alberta, Canada
(ospite Prof.ssa Martina Cappelletti)

terrà un seminario dal titolo:

EXPLORATIONS TO UNDERSTAND STRUCTURE/FUNCTION OF EMRE: A BACTERIAL SMALL MULTIDRUG RESISTANCE EFFLUX PUMP

Colleghi e studenti sono cordialmente invitati

Commissione Ricerca e Attività Correlate - FaBiT

ABSTRACT

There are a number of superfamilies of multidrug resistance efflux pumps (MDREPs). The group of interest is the small multidrug resistance (SMR) family of proteins, reflect their name given these proteins comprise of ~110 amino acids cytoplasmic membrane protein comprising of 4 transmembrane helices. SMRs are found on the chromosomes or mobile genetic elements in most all bacteria. EmrE, is the archetype of the family and it confers host resistance to a wide variety of quaternary cation compounds (QCCs) driven by the proton motive force. Our group have used biochemical and biophysical studies to explore the multimeric state and ligand binding in membrane mimetics. A key question we investigated is how such a small protein transports such diverse substrates. To answer this, we use bioinformatics combined with mutagenesis leading to discovery of accessory amino acids important for the resistance to different molecular groups of QCCs. The question we have recently recognized is that it is unlikely that SMRs have evolved to be resistant to QCC's; so what is the natural substrate? Other groups have found that one sub-family of SMR MDREPs are guanidinium exporters. We discovered that EmrE may be involved in transporting osmo-protectants such as betaine. The final question that we addressed; what other proteins do EmrE couple with to complete the efflux of the substrate completely out of the cell? From this enquiry we identified other outer-membrane proteins participating with EmrE for its activity in *Escherichia coli.*

BIOGRAPHICAL SKETCH

Raymond J. Turner is a multi-ethnic multi-generational Canadian. Academic career began with a B.Sc. in Biochemistry / Chemistry followed by a Ph.D. (1990) in Biophysical Chemistry. Post-Doctoral training was obtained in Clinical Microbiology and Molecular Biochemistry. In 1998, was recruited to the University of Calgary and is presently appointed as Faculty Professor of Science.

Has held the post as Department Head and Graduate program director and chair of various research cluster units. He has also served on Dean's and vice-presidents' advisory committees.

Research funding from the Canadian funding councils of NSERC, CIHR, Genome Canada, and MITACS as well as a number of industrial partners. He has received awards of excellence in research and excellence in graduate student supervision from the University of Calgary. Awarded the Western Universities Speaker Lectureship from the Canadian society of Chemistry in 2015. Recent service activity is participating in a cross Canada MOOC for new professors to learn how to be better supervisors. He is also a lecturer for an international course on OneHealth approaches to AMR.

Research interests are multidisciplinary from metal ion interactions with bacteria, to biofilm physiology and biochemistry, to protein transporters and translocases This knowledge is applied to biotechnology approaches for bioremediation, nanomaterials and antimicrobials.