Departmental Colloquium

Thursday, April 19, 2018, 12:30 pm
Refreshments: 12:15 pm
SSL 150
SSC Auditorium next to the library

Professor Barbara Imperiali

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The Chemistry and Biology of Asparagine-Linked Protein Glycosylation

Abstract:

Complex multistep biosynthetic pathways that afford asparagine-linked (N-linked) glycoproteins occur in all domains of life. The extremely varied and critical functions of N-linked glycosylation in mammalian biology makes this process of significant interest and importance in human health and disease and also of great relevance in medicine and biotechnology as protein therapeutics have become important elements in the modern pharmacopoeia. N-linked glycosylation also occurs in prokaryotes, and although many important details remain to be explored, it is now evident that there are key differences between the pathways and the glycoprotein functions relative to the intensely studied eukaryotic processes. For example, prokaryotic N-linked glycoproteins integrate a tremendous diversity of carbohydrate building blocks, which are not observed in eukaryotic biology, and there is considerable interest in understanding this phenomenon. In this context, bacterial glycoproteins produced through membrane-associated pathways are implicated in host-pathogen interactions and are displayed on bacterial cell surfaces as virulence factors. Additionally, while all of the multistep N-linked protein glycosylation pathways observed to date feature glycan assembly at the bilayer interface on linear polyprenol phosphates, prior to the *en bloc* transfer of glycans to acceptor asparagine residues, there are intriguing differences in both the identities of the polyprenols and even the nature of glycan activation for the central amide glycosylation reaction.

This presentation will discuss themes reflected in our current research on N-linked protein glycosylation. I will compare and contrast the structures and functions of key enzymes in the N-glycosylation pathways across domains of life and highlight enzymatic steps in Gram-negative pathogens that are critical for virulence and pathogenicity in human hosts.

Hosted by Professor Matthew Pratt

The scientific community is invited

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