Indian Institute of Science
Centre for BioSystems Science and Engineering

BSSE Seminar

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Leveraging physiological dynamics towards drug discovery and development

Speaker: **Dr. Madhuresh Sumit,**
Senior Scientist, Pfizer Inc, USA

ABSTRACT:

Drug discovery and development have often been challenging owing to the underlying temporal dynamics in physiological systems and heterogeneity of responses it imparts. However, these varied temporal patterns also provide biological systems an additional dimension that can be leveraged to filter meaningful information leading to specificity of responses. In this research seminar, we shall take two examples illustrating how we can utilize temporal information to dissect biochemical pathways towards drug discovery and development. The first example deals with a G-protein linked signaling pathway involved in Type 2 diabetes (doctoral work). The second example deals with N-linked glycosylation, a post-translational modification crucial in defining immunogenicity and pharmacokinetics in biotherapeutics (postdoctoral work). While the two examples widely differed in scales (nanoliter versus kiloliter), fluid mechanics involved (Newtonian versus non-Newtonian), therapeutic type (small molecule versus large biomolecules) and scope (discovery versus development), a combined computational and experimental approach successfully addressed both.