

Industrial & Physical Pharmacy Seminar

IPPH 69600

Monday, April 17, 2023
3:30PM in RHPH 164

“Globular Protein Stability: The Role of Phase Separation”



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First Seminar

Abstract:

Protein formulations are often produced in dried form to enhance stability. However, water removal is thought to be detrimental to the protein structure and biological activity. Therefore, sugars are added to stabilize the protein formulation during dehydration and storage. Sugars are thought to have both thermodynamic and dynamic stabilization effects. Thermodynamically, sugars may be able to form hydrogen bonds with the proteins in place of those previously formed by water. Dynamically, sugars can form glasses below their glass transition temperature, slowing down protein mobility as it becomes coupled to that of the glass matrix. For both these hypotheses, there is one crucial prerequisite: the sugar and the protein have to be miscible. In this seminar, different hypotheses behind the ability of sugars to stabilize biological formulations will be discussed, along with the factors governing miscibility of both components. Understanding the reasons behind phase separation in biological formulations may help in more rapid screening of sugars used in these formulations, along with a better design of the manufacturing process.