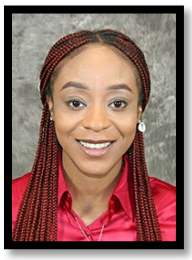
PURDUE UNIVERSITY | Department of Industrial and Molecular Pharmaceutics

Industrial & Molecular Pharmaceutics Seminar

IMPH 69600

Monday, April 15, 2024
4:30 PM in RHPH 164

"Exploring the Failure Mechanisms of High Drug Load Amorphous Solid Dispersions"



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First Seminar

Poor solubility is a major challenge in oral drug delivery, and amorphous solid dispersions (ASDs) have proven to be an efficient technique for enhancing the solubility of these drugs. ASD formulations are often limited by the drug load required for adequate drug release to ensure a therapeutic effect. High drug load ASDs are typically preferred in order to reduce the amount of polymer required in ASD formulations which in turn will help reduce pill burden and improve patient compliance. However, they often show poor release behavior compared to low drug-load ASD formulations. More specifically, copovidone (PVPVA)-based ASDs display an abrupt drop in release beyond a threshold drug loading called the limit of congruence (LOC). This irrational release behavior has been referred to as the 'falling-off-the-cliff' effect. Furthermore, this LOC varies widely for various drug-PVPVA systems, some systems having an LOC as high as 40% and others having an LOC as low as 5%. Although the exact mechanisms involved in these behaviors are still poorly understood, literature has shown that hydrogen bond interactions between the drug and polymer could have a negative impact on PVPVA-based ASD release and explain some of these variations. In this seminar, we hope to shed more light on these observations by using three model compounds with varying hydrogen bond interaction strengths with PVPVA to investigate the impact of hydrogen bond as a failure mechanism of high drug load PVPVA-based ASDs.