

## **Simultaneous Milling and Coating Active Pharmaceutical Ingredients (APIs)**

**Xi Han**

PhD candidate

Otto H. York Department of Chemical, Biological and Pharmaceutical Engineering

According to the biopharmaceutics classification system (BCS), both class II and class IV drugs are poorly water soluble, and their bioavailability are limited by their dissolution rate. As a result, increasing the dissolution rate of poorly water soluble drugs becomes an important emerging issue for the current pharmaceutical industry.

According to Noyes–Whitney equation, reducing particle size is a promising way to improve the dissolution rate. Although, reducing particle size is a well recognized method employed to improve the solubility of particles, it causes problem of poor flowability of particles which affects unit operations like blending, tableting and leads to problems like lack of content uniformity resulting in significant loss of revenue.

In this work, a Fluid Energy Mill (FEM) was utilized and a new approach was developed: simultaneously milling and coating active pharmaceutical ingredient (API) particles to improve dissolution rate and flowability at the same time.