Advanced Control in Powder Processing (Through Modelling and Continuous Processing) to Deliver Novel Formulations

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A research facility for processing powders across the scales relevant to the formulation industries has been delivered as a joint project between CPI and a number of adademic and industrial partners (including AstraZeneca, GSK and the Universities of Edinburgh and Sheffield). This state-of-the-art facility hosts a number of different powder processing capabilities and includes the applicaiton of multi-scale models to enable industrialists and academics to develop, prove, prototype and scale-up the next generation of products and optimise their processes. The facility as a whole allows a deep understanding of powder processes from gram to tonne scales utilising a range of process analytical technology (PAT) such as Raman, Near IR and particle size and shape analysis.

This PAT in combination with mechanistic models and Advanced Process Control (APC) accelerates and de-risks the translation of laboratory innovations into new products and processes for commercial companies of all sizes, as well as significantly reducing the cost of scaling up. The hardware control and data fusion software (Perceptive Engineering) allow us to implement an advanced process control model for real-time prediction of formulation properties; by monitoring process parameters.

We will present results detailing the practical implementation of PAT tools into continuous pharmaceutical processing for wet granulation along with the use of mechanistic models in this work. Further powder processing capability will be described detailing how to implement the use of PAT sensors to enable understanding and control in powder formulation.