

## **Autonomous Pharmaceutical Crystallisation** DataFactory

Sahil Sandeep Salekar, Chantal Mustoe, Alastair Florence, CMAC Future Research Hub, The University of Strathclyde

## **Overview**

- Crystallisation is widely used in pharmaceutical lacksquaremanufacturing
- Developing the crystallisation process can be resource intensive, limiting the scope, consistency of data acquired
- Automation offers high-throughput data collection and lacksquareopportunity for model-driven experimental design to improve prediction and optimisation
- Robotic solid-liquid dosing saves researcher time from manual repetitive tasks
- Robotic transfer allows for increased throughput and 24/7 operability
- Aim is to develop a comprehensive Crystallisation Parameter database as the foundation of a predictive Crystallisation Classification System to enable Quality by Digital Design (QbDD).

## **DataFactory Architecture**



- QR printer and QR reader will be added in the process for sample tracking
- Increasing number of Crystallines for more data collection
- Involving different types of robots to automate the experiments for each instruments
- Implementing open standard communication like SILA2 (Standardisation in Lab Automation) and ROS2 (Robotic

Operating System) to standardise the communication interface between instruments Adding optimiser to determine the next best experiment

## Conclusions

- Delivering autonomous, self-driving DataFactory for Crystallisation screening will enable comprehensive screening of crystallisation responses for multiple APIs
- These insights will deliver a unique process data asset to inform improved prediction and optimisation tools
- The result from this project will make a faster translation from pharmaceutical process development research to manufacturing



