



# IFPRI Project Abstract

## Feasibility/Collaboration Proposal: Model calibration as a Tool for Material Characterisation

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Project Start Date: 02 December, 2022

Abstract Date: 12 May 2023

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### ***Project Objective:***

Validating of and improving confidence in the coupled granule disintegration model using a flow cell with optical microscope and a state-of-the-art optical coherence tomography (OCT) system. This enables qualitative and quantitative assessment of liquid penetration and swelling of granules.

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### ***Approach:***

This study employed two methods to study liquid uptake and swelling in pharmaceutical raw materials and granules prepared using high shear wet granulation. The methods involved a custom flow cell connected to either a microscope or an optical coherence tomography system. These methods allowed for real-time monitoring of individual particles and granules during contact with liquid.

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### ***Recent Results:***

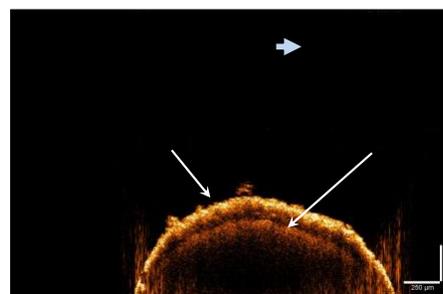
This study successfully utilised microscope-based monitoring to identify surface erosion and crack propagation in single particles and granules over time. Additionally, optical coherence tomography enabled simultaneous detection of the liquid penetration front and granule swelling (Figure 1), providing further insights into granule disintegration. These techniques offer essential data for validating performance models of granules.

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### ***Next Steps:***

Next steps will involve further analysis of images to extract quantitative data on liquid uptake and swelling. The obtained data will then be used to develop and validate models for predicting the liquid uptake and swelling behavior of granules.

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*Figure 1: Monitoring swelling and liquid uptake of a single granule using optical coherence tomography coupled to a flow cell.*