

School of Pharmacy PhD Project 2017 / 2018

Mechanochemical Preparation of Multi-Component Pharmaceutical Materials for Enhanced Physicochemical Properties

Various strategies have been widely investigated to enhance the bioavailability of poorly absorbed drugs in order to increase their clinical efficacy when administered orally. The production of novel multi-component forms provides a way to modify the physicochemical properties (e.g. solubility, stability) without changing the biological efficacy of the active pharmaceutical ingredient (API) compound. Tuning of physical properties such as melting point may even be feasible if an isostructural series of API forms can be generated.

This project will involve synthesis and characterisations of a number of multi-component pharmaceutical materials (MPMs), that are composed of at least one pharmaceutical active ingredient (API), via advanced and innovative preparations. Of particular interest are APIs that exhibit suboptimal physicochemical properties such as poor aqueous solubility, low permeability, and/or thermal instability, and those that possess problematic polymorphisms. In a second strand, the project will also involve formulation of such novel MPMs through continuous manufacturing. In so doing, the researcher will attempt to exploit the spectrum of interactions involved in forming the supramolecular synthons. The outcome of this project will also be used to aid the fundamental comprehension of the feasibility and criteria for both the engineering and formulation of MPMs via innovative manufacturing techniques.

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How to Apply

Postgraduate applications should be made using Queen's University [Direct Applications Portal](#). Please note that there are two application processes: one for admission to the university and another for postgraduate awards.

Further Information

Additional information for prospective postgraduate students can be found on the [School of Pharmacy website](#) and the [Queen's Postgraduate website](#).