PhD topic: Process Engineering of an Innovative Pharmaceutical Production Process

This PhD project aims at developing mechanistic process models for an innovative pharmaceutical production process (continuous pharmaceutical production process of tablets). The research will be conducted in close cooperation with 4 companies (**Janssen Pharmaceutica, GSK, UCB and Pfizer**). Research results will be published in important scientific journals.

Pharmaceutical companies can only release drug products (e.g., tablets, capsules, …) when the product quality is guaranteed. Since the publication of the Process Analytical Technology guidance by the FDA (2004), product quality should be built into the drugs already during production process design. During manufacturing, several pharmaceutical raw materials (i.e., active drug compounds and excipients) are processed by several consecutive process steps or process phases, leading to a final product formulation with the predefined quality. Currently, pharmaceutical production processes are developed by empirically testing how the process and input material variables affect the product quality parameters. Herewith, end product quality is mainly determined off-line and after processing.

However, there is a huge need within pharmaceutical industries to implement in-line and real-time quality control systems and to obtain detailed knowledge on how raw materials behave during processing. Therefore, theoretical/physical/phenomenological modeling of the production processes is required and have already proven to enable increase of process knowledge. In this project focus is on twin-screw wet granulation and fluid bed drying and further improvement of previously developed models. Objectives are further improvement of models to make them more generic and developing better experimental design techniques. Moreover, scale-up and scale-down is of interest.

The project is very much driven by industry needs and is close to the application and practice. It is conducted by a team of PhDs embedded in the research groups mentioned below.

Profile: master's degree in **bio-engineering, chemical engineering, physics, chemistry**. Candidates must have strong interest in mechanistic modeling and pharmaceutical engineering. Experience in Python and/or Matlab is an asset.

Duration: 4 years, tentative starting 1/10/2018 (earlier possible!)

Statute: PhD scholarship

Application by August 15, 2018

Please send letter of interest and CV to both email-addresses below

Contact and further information:

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