

Postdoctoral Research Fellow in Process Optimisation for Drug Manufacturing

Salary: up to point 6 on the Level 2A Research Ireland New Post Doctoral Researcher June 2026 -- €53,925 (plus employer PRSI and pension contributions)

Start date: September 1st 2026

Duration: **Specific Purpose Contract** (estimated duration 18 months)

Where: School of Computer Science and Statistics and School of Pharmacy and Pharmaceutical Sciences, Trinity College Dublin (TCD), Ireland.

Post Summary

The successful applicant will collaborate within a skilled and motivated team of scientists dedicated to the development of Artificial Intelligence (AI) methods for process optimisation of manufacturing parameters in pharmaceutical manufacturing.

Roller compaction is a dry granulation process widely used in pharmaceutical manufacturing to improve powder flowability, bulk density, and content uniformity while avoiding the use of solvents and drying steps. In this process, a powder blend is continuously fed between two counter-rotating rollers, where it is compressed into a dense ribbon or sheet. The compacted ribbon is subsequently milled to produce granules with desired size and flow characteristics for downstream processing such as tableting or capsule filling. The project aims to optimise the roller compactor process parameters for different material property inputs in order to achieve the desired ribbon quality metrics using AI-based optimisation.

The postdoc will conduct research that contributes to three of the following streams of work 1) define “user needs, goals, procedures” for AI-based process optimisation (in particular focusing on Bayesian Optimisation (BO)) of the roller compactor process parameters; 2) implement BO-based strategies and software tools to be able to apply these methods to the process optimisation of the the roller compactor process parameters (using GPytorch, BOtorch); 3) test and evaluate the solution on a real manufacturing process.

The position will be under the direction of Assoc. Prof. Alessio Benavoli, Prof. Anne Marie Healy and Assoc. Prof. Deirdre D’Arcy from TCD and a pharmaceutical industry partner. For informal inquiries please contact alessio.benavoli@tcd.ie

Required Qualifications

The successful candidate must have a PhD in Computer Engineering/Science, Statistics, Biostatistics or a related field. The post is applicable to both new and experienced PhD holders, and salary will be commensurate with experience and achievements.

Essential Knowledge & Experience (1) Expertise in machine learning and AI; (2) Knowledge of Bayesian Optimisation; (3) Good programming skills; (4) Established track record of publication in leading journals/conferences, on relevant topics; (5) Excellent written and oral communication skills, the ability to work well in a group, strong self-motivation and willingness to learn.

Desirable Knowledge & Experience: Experience in one or more of the following areas, is considered is preferable: (1) Knowledge and understanding of pharmaceutical solid dosage form manufacture; (2) Development of AI-based surrogate models for digital-twin; (3) Industry collaboration.

How to apply: Applicants should submit a cover letter and a full Curriculum Vitae, including the names and contact details of two referees (with email addresses) **as soon as possible and no later than the 30th June 2026**, via email (subject “Postdoctoral Research Fellow in Process Optimisation for Drug Manufacturing”) to: alessio.benavoli@tcd.ie