Doctoral Landscape Award (DLA) project

Professor Jerry Heng

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Peptide crystallisation

Peptide crystallisation remains difficult to predict and control because of the structural complexity, conformational flexibility and competing intra- and intermolecular interactions that govern nucleation and crystal growth. This project investigates how molecular structure, solution environment, additives and interfaces influence crystallisation behaviour across different peptide systems. Experimental studies will combine systematic crystallisation screening with advanced solid-state and solution characterisation, automated experimentation and data-driven analysis to identify the key factors controlling nucleation kinetics, crystal form, morphology and particle properties. Particular emphasis will be placed on linking molecular-scale interactions with observable crystallisation outcomes and understanding why behaviour changes between closely related peptide molecules and conditions. By developing a more mechanistic and predictive understanding of peptide crystallisation, the project aims to reduce empirical screening and support more robust, efficient and scalable crystallisation processes for peptide purification and manufacture.