MS082.O02

Enhancing the success of crystallization: strategies and techniques

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The past 15 years have seen remarkable advances in the miniaturisation, automation and analysis of crystallisation experiments. However, production of high quality crystals persistently remains a major hurdle to structure determination; it is often the case that no crystals are formed at all or that clusters of useless crystals are obtained.

There is no 'magic bullet' that will guarantee the yield of useful crystals, hence rational approaches leading to the development of new and improved technologies for attaining high quality crystals are of crucial importance to progress.

The talk will present strategies for increasing the chances of success and highlight practical methods that have led to successful crystallization when standard techniques had failed. These methods involve active control of the crystallization environment which has resulted in obtaining crystal hits during screening, as well as producing high quality crystals at the optimisation stage [e.g. 1-3]. A new approach of designing smart materials for automated high-throughput crystallization experiments http://www.imperialinnovations.co.uk/CRMIP will also be presented. Several of the techniques have been patented and commercialised.

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Keywords: Protein crystallisation, nucleation, nanomaterials