

Crystallization Platform Integrating Screening & a Novel Optimization Strategy

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Obtaining diffraction quality crystals is a common bottleneck in macromolecular crystallography. With the number of projects increasing exponentially, searching for the right crystallization conditions is a time consuming effort. We have now setup a medium-throughput crystallization platform at the main laboratory in Heidelberg in order to centralize resources, cut costs, and provide efficient and rapid service to EMBL-Heidelberg research groups using X-rays.

The platform is based on use of a nanoliter dispensing robot, standardized crystallization screens with a total of 1800 different conditions, and a database linked to an imaging system for data archiving. The advantages of the service are multiple. It significantly reduces crystallization setup costs by using fewer crystallization solutions and fewer samples. It also saves valuable time. What started as a medium throughput crystallization platform has rapidly grown and 300,000 crystallization drops have already been set up.

As a standard and simple approach for crystal optimization, we are now using the prefilled Nextal Opti-Salts crystallization microplates. This tool allows us to rapidly generate our own new subset of conditions expanded around the hits obtained at initial screening. It works using a combinatorial optimization approach. We will present three projects where the Opti-Salts generate a significant improvement with minimum efforts and investment.

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