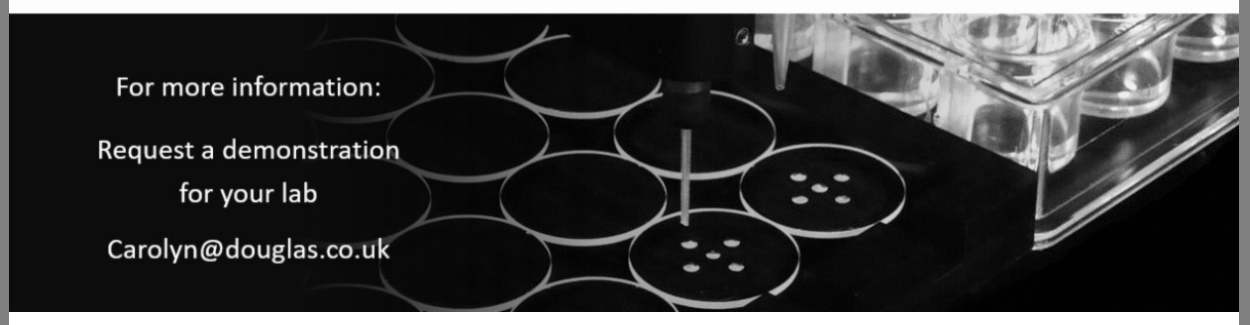
Douglas Instruments

Success in protein crystallization



Dear Crystallographer

Sometimes we need to control the size and number of crystals and the volumes of samples, for instance, if a large number of microcrystals is required for serial crystallography or a single large crystal is required for neutron diffraction. The key points below can help achieve better control of nucleation and crystal growth and help make results easier to interpret for scaling up. They can be included in a typical workflow using the **Oryx range of robots**.

Serial data collection

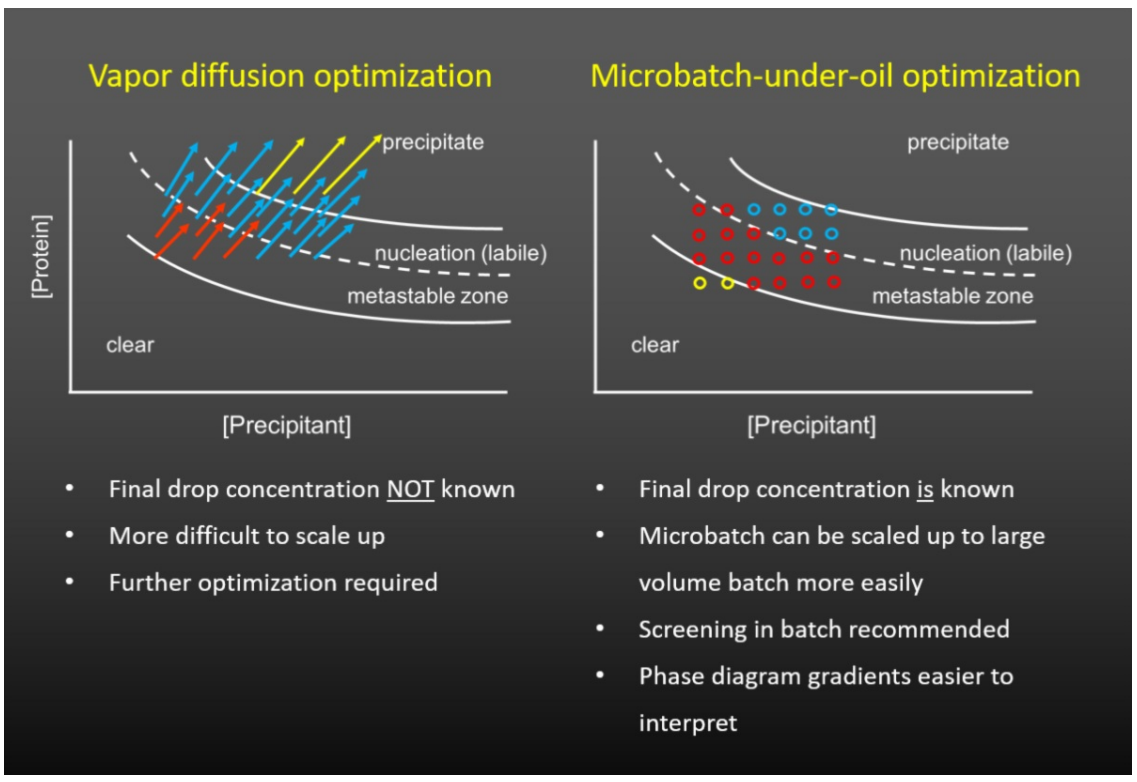
- Use **microbatch-under-oil**: paraffin oil is used to seal the drop, preventing evaporation. Small drops can be scaled up to larger batch experiments because final concentration is known (see phase diagram below)
- Microbatch under oil optimization: establish a phase diagram for your condition
- Microseeding: use a very concentrated seed stock to control the size and number of crystals

MicroED

- **rMMS microseeding**: identify crystals of suitable size and morphology e.g. very thin crystals
- **Microbatch under oil optimization (Youtube link)**: establish a phase diagram for your condition
- Seed stock dilution: use metastable conditions to control the size and number of crystals

Neutron diffraction

- Microbatch-under-oil: paraffin oil is used to seal the drop, preventing evaporation. Small drops can then be scaled up more reproducibly to grow larger crystals
- **Seed stock dilution**: use conditions in the metastable zone to control the size and number of crystals and prevent self-nucleation



Please join us and see our talks at the **ACA** and **ECM** meetings this summer

Douglas Instruments will be presenting its latest scientific publications and projects:

ACA 2022, Portland
Oral session
Tuesday 8th August
2:00 pm- 2:20 pm
General Interest 3 - 4.2.4

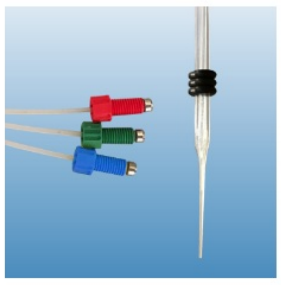
ECM33, Versailles
Oral Session (date not yet fixed)
23 - 27 August 2022

Request more information

Products available from Douglas Instruments

Oryx Robots

Crystallization Plates



Oryx Microtips

Conferences:

Douglas Instruments is attending the following meetings:

ACA Annual Meeting, Portland, USA
30 July - 2 August 2022

ECM33, Versailles, France
23 July - 27 August 2022

Recently published research using Oryx protein crystallization robots:

Protein Frameworks with Thiacalixarene and Zinc

Flood, R.J., Ramberg, K.O., Mengel, D.B., Guagnini, F. and Crowley, P.B., 2022.

Crystal growth & design, *22*(5), pp.3271-3276.

Synthesis and direct assay of large macrocycle diversities by combinatorial late-stage modification at picomole scale

Habeshian, S., Merz, M.L., Sangouard, G., Mothukuri, G.K., Schüttel, M., Bognár, Z., Díaz-Perlas, C., Vesin, J., Bortoli Chapalay, J., Turcatti, G. and Cendron, L., 2022.

Nature communications, *13*(1), pp.1-14.