# Using phase diagrams with microseeding to prepare crystal samples for advanced data collection techniques

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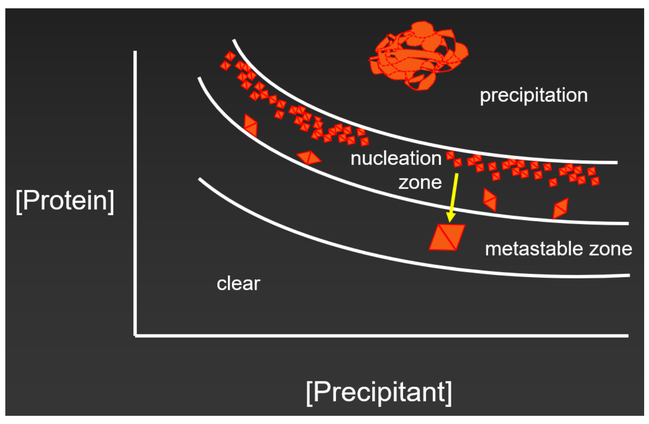
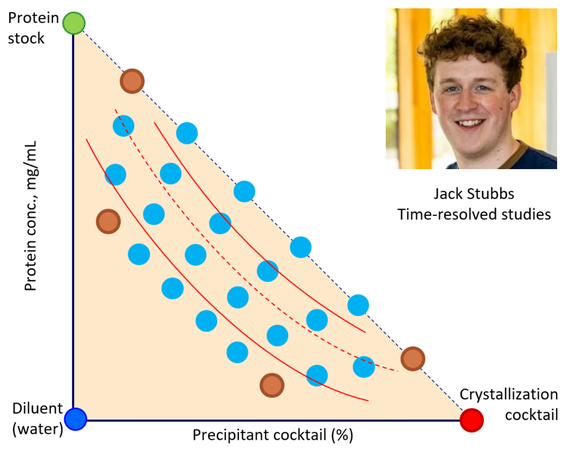
## 1. Automated phase diagram optimization

- Rapidly establish the phase diagram of *your* protein
- Only three solutions are required - protein sample, your crystallization cocktail, and diluent
- No need for stock plates or manual mixing



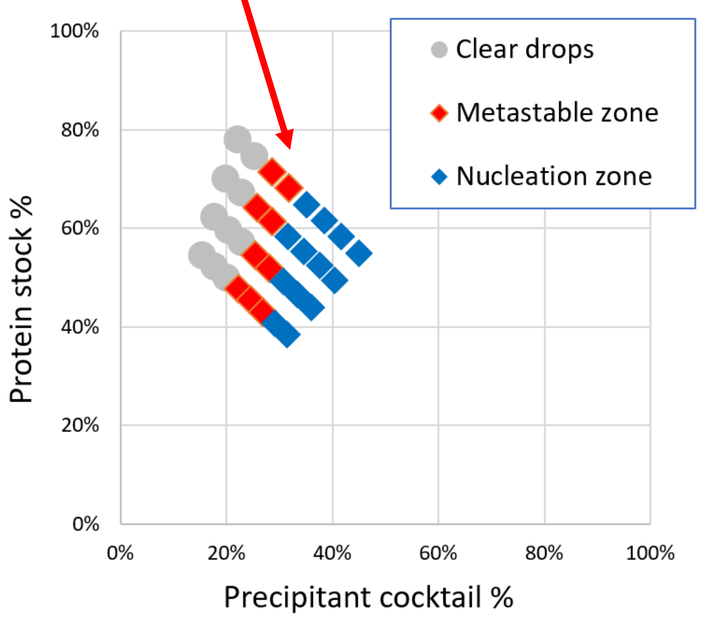



Jack Stubbs
Time-resolved studies

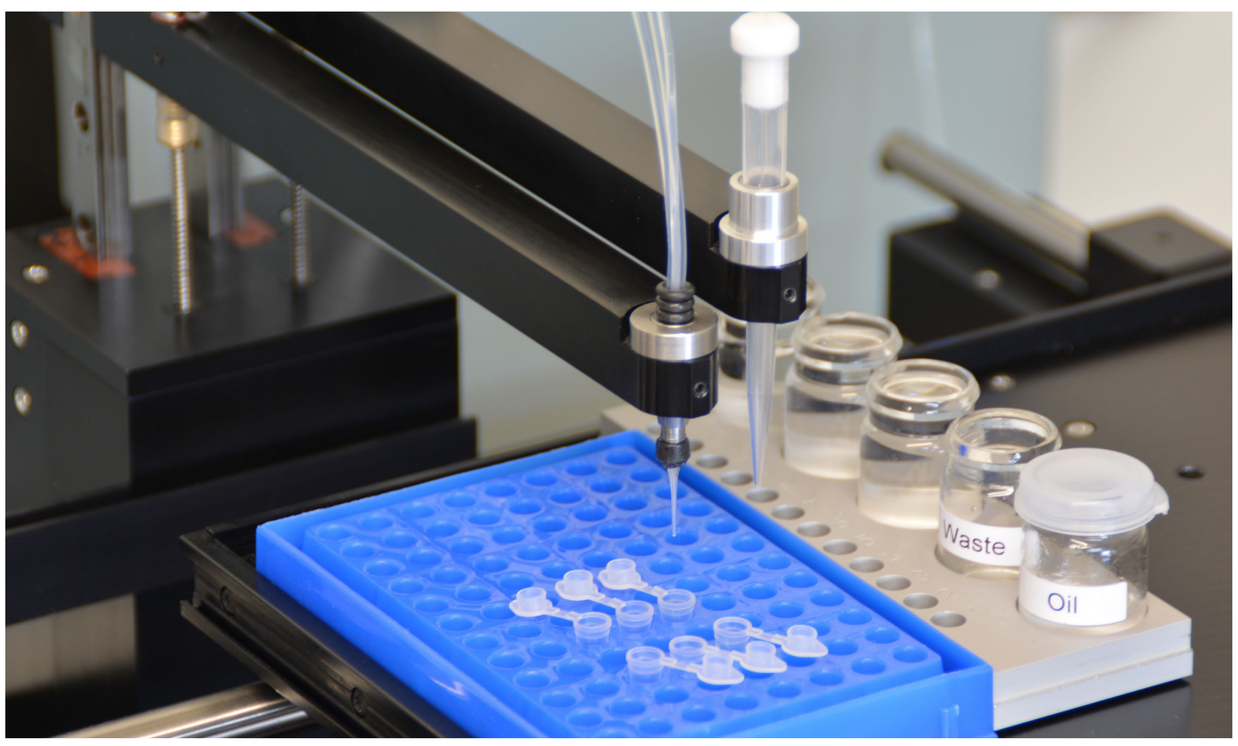
- Universal design can be used for all projects
- A microbatch-under-oil setup provides easily interpreted and meaningful phase diagrams
- Automated oiling improves accuracy and protects drops

## 2.Dilute seed stock

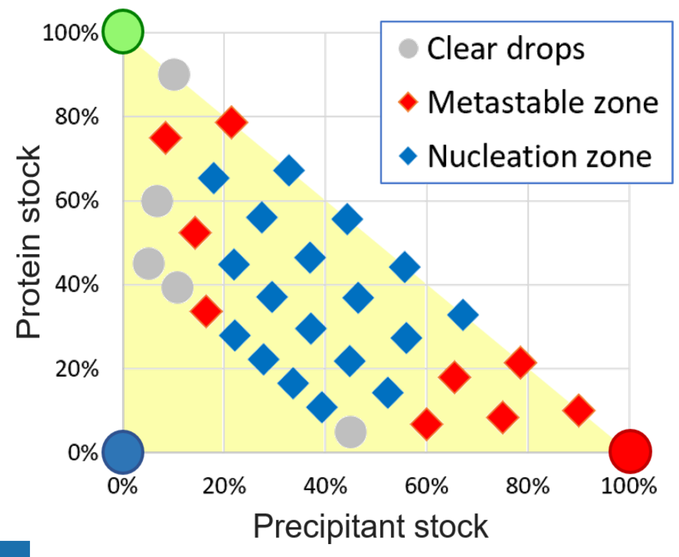

## 3. "Zoom in" on one region



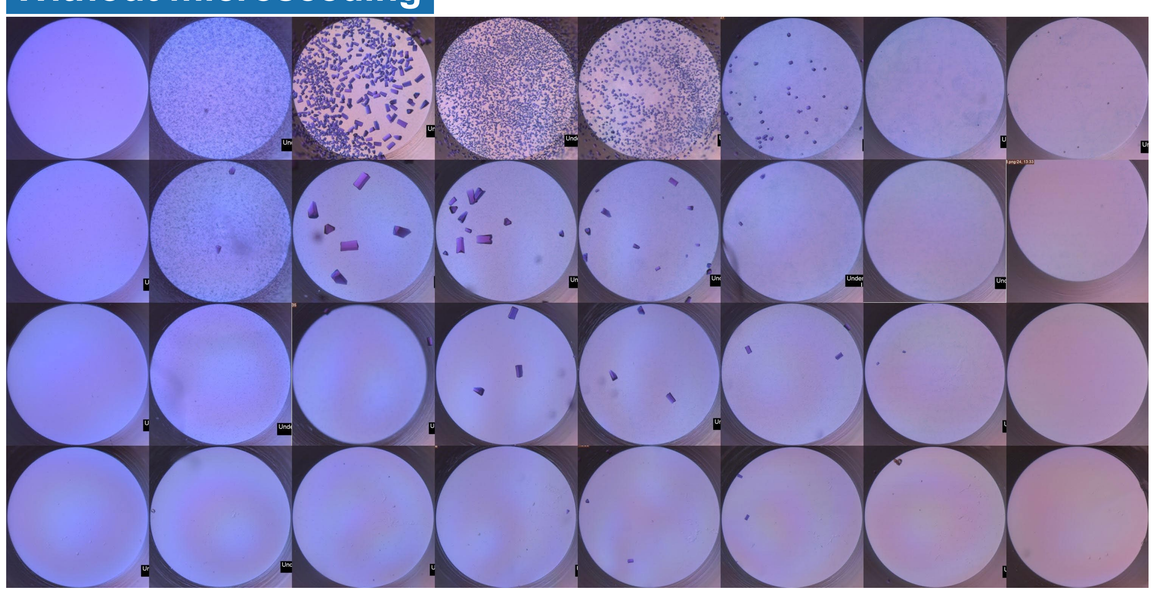

## 4. Scale up >10 uL in PCR tubes



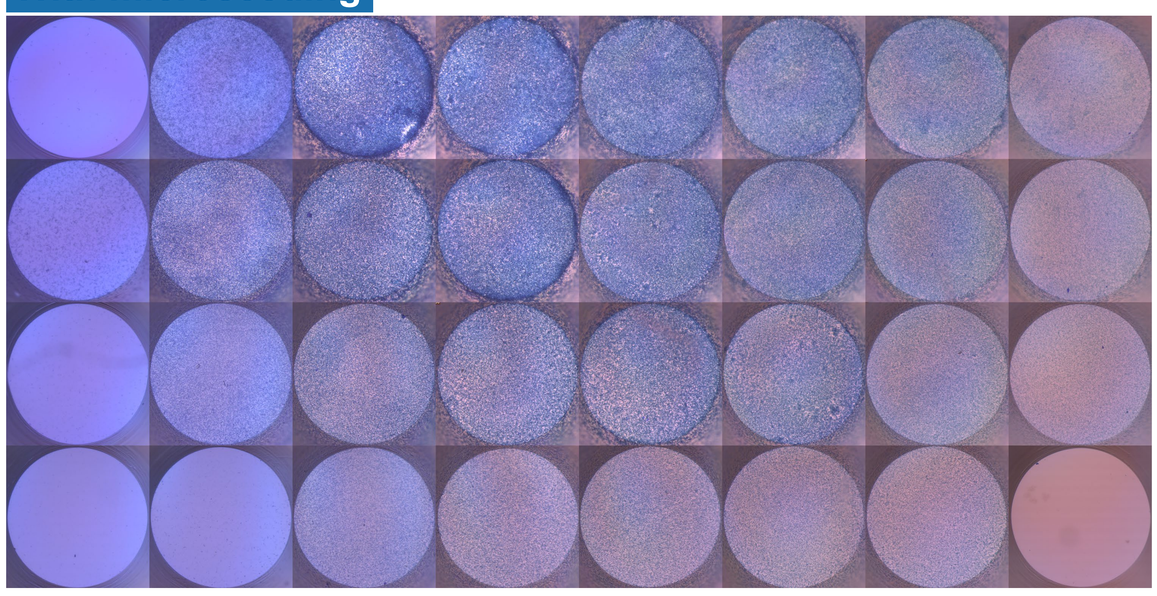

## Case study: phycocyanin phase diagram



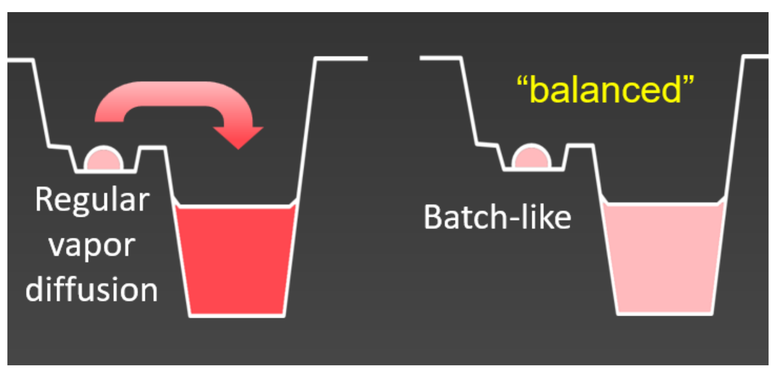

### Without microseeding

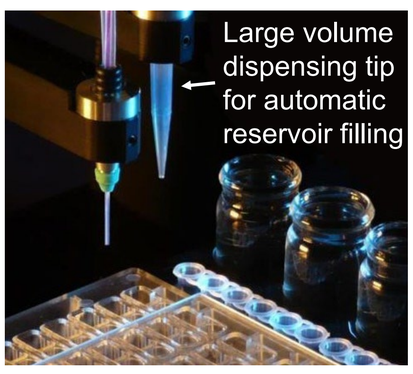


### With microseeding



## Alternative vapor diffusion plate setup




## Notes

1. We recommend the microbatch method (with stirring) to sample each point. Microbatch avoids equilibration of the drop.
2. By mixing protein (green spot), precipitant cocktail (red spot), and a diluent (blue spot), any point in the yellow triangle can be reached. Each experiment took less than 10 minutes and used less than 26 µL of each ingredient.
3. By repeating the experiment with and without a seedstock the metastable zone (red diamonds) can be identified.
4. Microbatch conditions can easily be scaled up using the robot to batch (eg 50 µL) in PCR tubes.
5. Microbatch conditions can easily be converted to vapor diffusion by setting up the same conditions in the drops and placing an almost identical solution in the reservoir where protein is replaced with protein buffer.

Webinars

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