

Bio21 Collaborative Crystallisation Centre for Rational Design

The Collaborative Crystallisation Centre (C³) provides the infrastructure to advance the process of protein crystallisation and the production of protein crystals required for atomic resolution.

The Centre greatly enhances the capabilities of the Bio21 crystallographic research community by building on the strategic investment in all aspects of biology – including biotechnology and medical research – already made in Victoria and contributing to its successful commercialisation.

C³ will ensure that Victorian research institutions extract maximum value from the Australian Synchrotron when it comes on line in Melbourne in 2007.

Run as a not-for-profit technology platform, the Centre is accessible by all research groups within Victoria – commercial, academic and government.

Operating out of four Melbourne sites, C³ offers the following services:

>> at CSIRO Molecular and Health Technologies

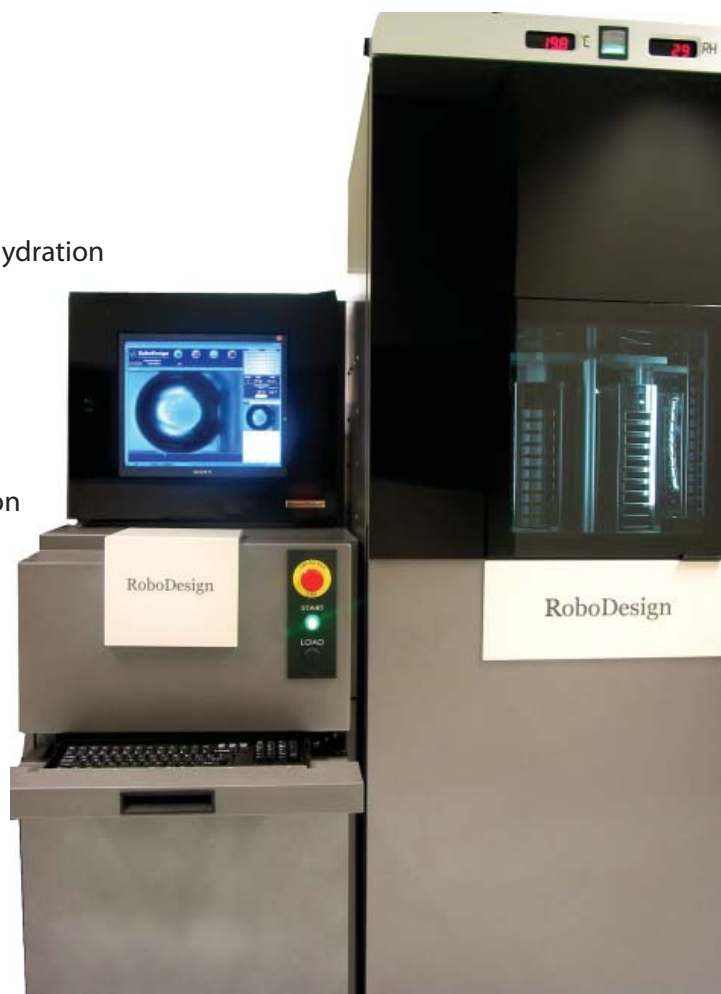
- Robotic crystallisation screening
- Robotic crystallisation refinement
- Storage of protein
- LIMS for experiment management
- Free mounting system/controlled dehydration
- Robotic imaging
- Manual crystallisation inspection

>> at the Walter and Eliza Hall Institute

- Fluidigm FID microfluidic crystallisation

>> at the Burnet Institute and St Vincent's Institute

- Dynamic and static light scattering instruments



:: Robotic crystallisation screening

Are you tired of manually setting up Linbro crystallisation plates? Are you tired of greasing cover slips? Is your wrist aching from all that pipetting of protein? Do you wish that you could screen hundreds of crystallisation conditions rather than just a few at a time? C³ helps you solve these problems using as little as 100 nL of protein per condition.

C³ has a standard screen of about 800 different conditions that can be set up robotically in 96-well sitting drop plates with up to three different proteins per well. These trays will then be stored for you in a temperature-controlled incubator (4°C or 20°C) and digitally imaged at a number of time points during the nucleation and growth phase.

All of these images are then accessible to you and can be stored in a database linked both to your protein and to the crystallisation conditions for each well.

:: Robotic crystallisation refinement

Do you want to try to refine your crystallisation condition as a function of pH and concentration? Do you want to see what happens when you include additives? Experiments of these types can easily be done by setting up the experiment in the Centre's LIMS system and then sending a request to C³.

The same robot will be used to set up the refinement screen as was used for the coarse screen and the refinement tray will be placed in the same incubator system.

:: Storage of protein

If you are a registered user of C³ you can arrange for your protein to be sent and stored at the Centre. All proteins received will be kept at 4°C and will be barcoded for easy identification.

:: LIMS for experiment management

Are you finding it hard to keep track of all the data? Don't you wish to have easily-accessible computer records of all the crystallisation experiments that you have ever done, including well images? Don't you wish that these were all stored in a queryable data base?

C³ offers the CrystalTrak database for managing and setting up all crystallisation experiments. In fact, when you submit a request to C³ for experiments to be done, you simply point the Centre staff to the appropriate place in the database.

:: Robotic imaging

The C³ Minstrel III imaging systems will image all the wells in your tray at the same temperature at which they are stored. Images are taken with a colour five megapixel camera and can be digitally enhanced by the SweetImage software. Imaging typically occurs on a defined schedule with different schedules available for different needs. These images are then available to you on your desktop.

:: Free mounting system/controlled dehydration

C³ offers registered X-ray users access to the Proteros Free Mounting System. This instrument allows the user to see the effect on diffraction quality of hydration/dehydration of crystals in real time. Once optimal hydration conditions are discovered the protein can be cryopreserved for data collection.

:: Manual crystallisation inspection

C³ accepts that digital images of crystals will never completely replace manual inspection. If you wish to examine a tray manually, you can reserve the compound microscope in the room adjoining the incubators at the Centre. C³ staff will retrieve the tray from the incubators for you and return it to the incubators when you have finished.

:: Fluidigm FID microfluidic crystallisation

Still not getting the crystals you want? You can try the C³ Fluidigm free-interface diffusion unit housed at the Walter and Eliza Hall Institute. Note: C³ offers only limited support for this facility.

:: Dynamic and static light scattering instruments

Interested to know about the solution properties of your crystal? C³ has two Malvern Instruments Zetasizers – one situated at St Vincent's Institute and the other at the Burnet Institute. You may book time on either of these instruments.



The **Bio21 Collaborative Crystallisation Centre** operates in partnership with:

Bio21 | CSIRO | Burnet Institute | Victorian College of Pharmacy | St Vincents Institute | Walter and Eliza Hall Institute of Medical Research

www.csiro.au/c3 | c3@csiro.au