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Introducing the Bio21-WEHI Crystallisation Facility

R. P. Smith[1], M. A. Gorman[1], J. V. Nguyen[2], C. Lou[2], Y-H. Tan[1], D.W. Keizer[1]

[1]Bio21 Institute, University of Melbourne, 30 Flemington Road, Parkville 3010, Australia [2]WEHI, 1G Royal Parade, Parkville VIC 3052, Australia Communicating author: roxanne.smith@unimelb.edu.au

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Protein crystallisation is a highly specialised and valued technique in the field of structural biology, despite the large expansions into Cryo-Electron Microscopy and its ever-growing popularity. Here in Melbourne, Australia, crystallising proteins to determine their molecular structures is widely used for projects with a structural biology element, especially those with a structure-based drug design focus. Since 2021 access to protein crystallisation equipment and services in the Parkville Biomedical Precinct for researchers has been limited.

To address this shortage of local resources, the Bio21-WEHI Crystallisation Facility has been established. This facility is a joint venture between WEHI and the Bio21 Institute, University of Melbourne, with support from the ACRF Facility for Innovative Cancer Drug Discovery. The facility hosts equipment for drop setting, screen building, plate storage and imaging. Services offered include initial crystallisation screening in a sitting drop, 96 well format with the choice from approximately 30 commercial crystallisation screens, lipidic cubic phase crystallisation of membrane proteins, optimisation of hit conditions, and even a “bring your own screen” option. All services provide regular imaging of your experiments with visible light to allow tracking of crystal growth, plus additional imaging under UV to assist in determining if your crystals consist mainly of protein or salt. The facility will also offer plate compatibility for in-plate data collection at the Australian Synchrotron.

The Bio21-WEHI Crystallisation Facility is a recent addition to the Structural Biology infrastructure located in the Parkville precinct, especially within the Bio21 Institute. This new edition compliments the existing platforms at the Bio21 Institute, including the Ian Holmes Imaging Centre, Melbourne Mass Spectrometry and Proteomics, Metabolomics Australia, and Melbourne Magnetic Resonance which form a comprehensive structural biology and drug discovery pipeline. The Bio21-WEHI Crystallisation Facility is situated in the Melbourne Protein Characterisation, which is a comprehensive technology platform that encompasses other well-known protein techniques including: peptide synthesis, mammalian and insect protein expression, protein interaction techniques such as analytical ultracentrifugation, CD, ITC & mass photometry and X-ray diffraction[#]. This allows users to access a single platform to carry out all experiments from peptide and protein production, protein purification, biochemical characterisation including determining secondary structure, oligomeric state, and binding interactions; through to protein crystallisation and X-ray data collection to solve protein structure at atomic resolution.

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[#]For further information see: https://www.bio21.unimelb.edu.au/proteins/