Request for support for the 2024-2028 CCP4 grant application for funding through the BBSRC

Dear colleague,

We are writing to ask for your support for the scientific proposal we are about to submit to the BBSRC on behalf of CCP4 this month, that will deliver methodology to advance macromolecular crystallography. Collaboration partners in this proposal are the Universities of Liverpool, Newcastle, Southampton, York, the LMB Cambridge, STFC laboratories at RAL, and the Diamond Light Source. The core scientific support by BBSRC grants has been central to the success of CCP4 and has underpinned our ability to raise additional funds through commercial licences that support maintenance and distribution of the software and the user community.

Over the past year, CCP4 has collated ideas to define the current scientific challenges we need to address. The CCP4 Executive selected the strongest proposals, sharing and discussing them with the community at the Working Group 1 meeting at the CCP4 study weekend earlier this year. Important new trends accelerate and enrich structural biology. The new-generation of machine learning computational models have a major impact – allowing us to use these models in our science and to solve new structures. The exponential growth of EM depositions complements macromolecular crystallography, providing many structures of membrane proteins and macromolecular complexes.

Your support underlines the central role that macromolecular crystallography continues to play in basic and translational bioscience, delivering the throughput and resolution needed for drug discovery and chemical probes, experimentally validating and improving computational models, and ideally complementing the strength of cryo-EM. The scientific objectives in the proposed work packages (WPs) build on the outputs of previous grants to deliver novel science and tools to transform the utility, throughput and accuracy of macromolecular crystal structure:

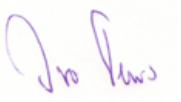
- to develop a theoretical framework to support the multi data - multi model nature of modern structural studies and enable joint refinement and description of the dynamic behaviour of macromolecules (WP1/WP2 - Diamond Source, the LMB Cambridge, and the Universities of Southampton and York);
- to generate novel tools for exploiting electron diffraction from macromolecular crystals (WP3 - STFC laboratories at RAL);
- to integrate exciting developments in AI to apply deep learning based predictions of contacts and distances, in particular for complexes and RNA targets (WP4 - Liverpool University).

We ask you to endorse our application by signing up on a form at https://forms.office.com/e/Abkb8fkHJx your email, your affiliation, and your position (PI, Technical staff, PDRA, PhD, undergraduate, or other). We will use the information to generate statistics that will be included with this application to the BBSRC (and no other purpose).

If you are a PI, we additionally ask you to send a letter of support directly to the CCP4 Chair (ivo.tews@soton.ac.uk). Letters of support must be received by the 17th of April.

With many thanks in advance for your time and support.

Ivo Tews
CCP4, Chair



The Collaborative Computing Project 4 was established in 1979 and continues to underpin world class macromolecular structural science in the UK. Effective use of data collected at synchrotron, XFEL and electron microscopy facilities is at the heart of the project's mission. User communities benefiting from such research include academics as well as industrial users. At the interface of the two, CCP4 enables discoveries that underlie vaccine and therapy discovery (including, e.g., SARS-CoV-2) and may equally be applied to tackle modern challenges such as adaptation to climate change, biotechnology, or public health.