

Next-Generation Home-Lab Systems for the Changing Structural Biology Landscape

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Recent hardware developments which increase performance while greatly reducing operational requirements enable home-lab systems to be valuable analytical tools for any research department. In addition, a home-lab system can provide a great teaching resource both on graduate and undergraduate levels to advance structural biology expertise. The Bruker D8 VENTURE utilizes two novel technologies that extend the capabilities of diffraction hardware while minimizing the expense. The new air-cooled I μ S DIAMOND microfocus sealed tube source uses a unique anode technology, diamond hybrid, to produce intensities similar to modern rotating anodes. The anode consists of a diamond substrate coated with copper. Properties of diamond such as high thermal conductivity, low thermal expansion and extreme hardness make it an ideal substrate allowing not only higher power loading but greater long-term stability of the source. The PHOTON III is a new CPAD (charge-integrating pixel array detector) which utilizes a mixed-mode approach for data collection. The weak reflections are measured in photon-counting mode and the strong reflections are measured in the proven integrating mode. This allows the PHOTON III to have the ultra-sensitivity to collect very weak reflections while not suffering from charge sharing or nonlinearity effects common to other photon-counting detectors. The hardware advances along with experimental data will be discussed.