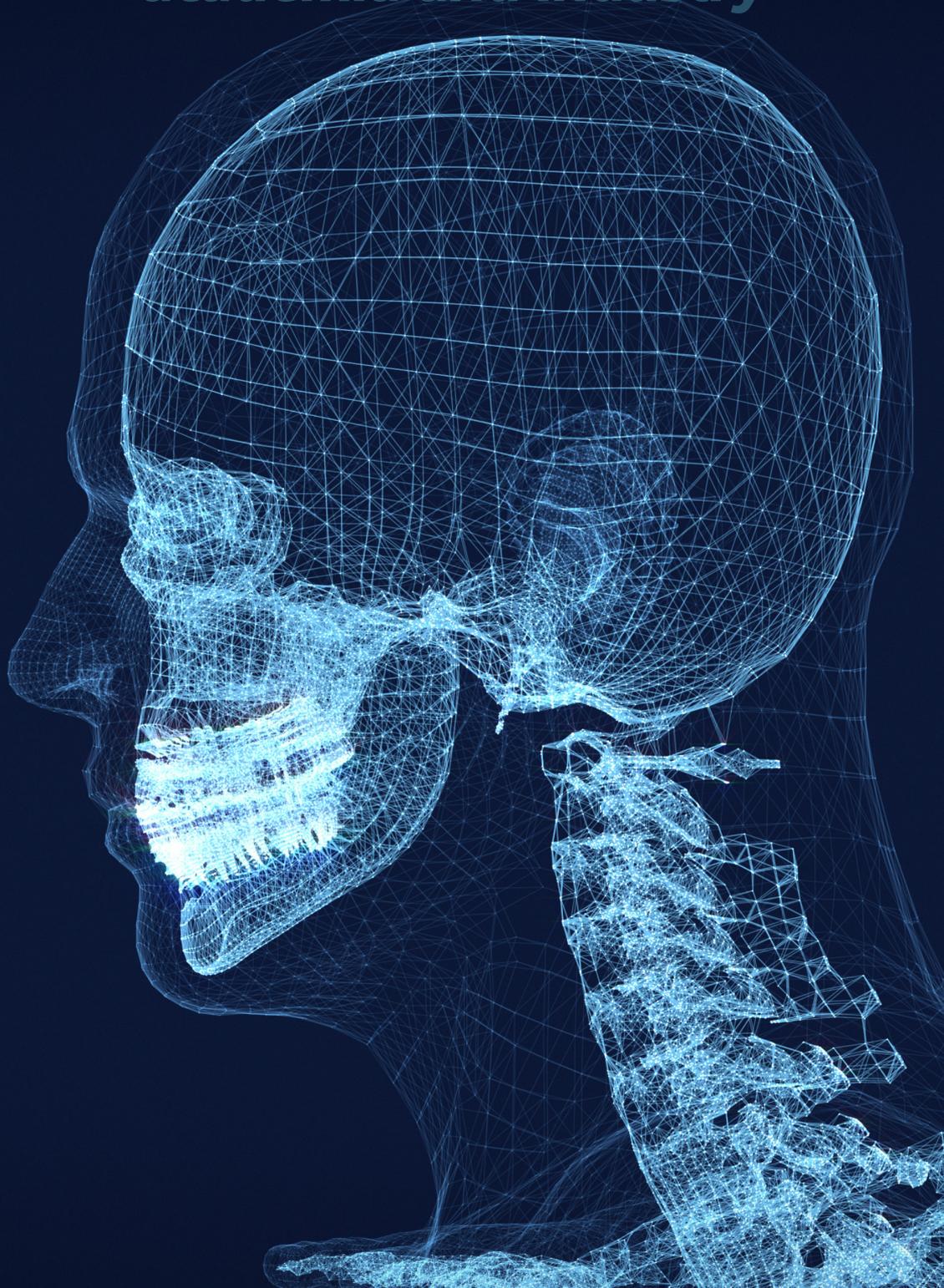


“ *Over the next five years, we hope to start to see these new technologies being developed and transferred to both academia and industry* ”

Case study
2020
Diamond Light
Source



A 'new' partnership with a long history

Diamond Light Source may be The Franklin's newest member, officially joining in September 2019, but its involvement in the Institute dates back to The Franklin's inception. Access to the UK's national synchrotron and world-class imaging facilities was a major factor in the decision to site The Franklin alongside Diamond on the Harwell Campus.

Diamond already has involvement with many of The Franklin's member universities, working in areas which also fall within The Franklin's themes. It has been a natural progression for this work to continue under the auspices of the new Institute, and likewise for Diamond itself to become a Franklin member.

Diamond CEO and Franklin member representative, Professor Andrew Harrison, explains: "Diamond is a world-leading scientific facility with over 14,000 users from both academia and industry. Excellence and innovation are key values that propel our technological developments. The Franklin drives research and development for the life sciences, and together we will develop new technologies which can benefit the user community. We are glad that now we sit at the table with other members to develop The Franklin's strategy."



Professor Andrew Harrison, Diamond CEO

Diamond's Electron Bio-Imaging Centre (eBIC) is also a key resource for The Franklin, and Diamond researchers are partners on The Franklin's collaborative project with Thermo Fisher Scientific to develop more advanced cryo-electron tomography (cryo-ET). This complements a grant to Diamond with generous funding from the Wellcome Trust, which pioneers the use of machine learning to interpret the large volume of data that will be generated through the cryo-ET. This has been developed by former senior software scientist at Diamond, Dr Mark Basham, now working as Head of Artificial Intelligence at The Franklin.

Additionally, Diamond's VMXm beamline is embracing the joint use of X-rays and electrons to probe microcrystals, with Diamond Research Fellow Gwyndaf Evans overseeing this work. He is also working on theoretical aspects of the cryo-ET project, looking at how electrons will interact with the biological samples to optimise the experimental design.

Diamond is also working with The Franklin and TTP Labtech to develop new protocols for the company's Chameleon robot, which prepares samples for cryo-electron microscopy. The aim is to ensure more efficient, reproducible sample preparation.

Diamond's Director of Life Sciences, Professor Dave Stuart, says: "Being part of The Franklin brings enormous benefits for Diamond, because the Institute is able to conduct research that is outside our remit. We envisage that this will feed back into Diamond to improve the equipment and techniques we use, ensuring we stay at the cutting edge, and that the entire user community can thereby benefit from the technological developments this partnership will provide."

All of The Franklin's themes offer opportunities to link with expertise and technology at Diamond, believes Professor Stuart. For the Next Generation Chemistry theme, researchers can draw on Diamond's high-throughput XChem pipeline, which enables the screening of chemical fragments to find binding sites on their targets. Protein production, part of the Structural Biology theme, links to areas Diamond is already working on; theme leader and Franklin Director, Professor James Naismith, is a member of Diamond's Membrane Protein Laboratory. The Franklin's theme leader for Correlated Imaging, Professor Angus Kirkland, is also Science Director for ePSIC, the physical sciences imaging centre based at Diamond Light Source.

"I recently attended the first meeting of member representatives and found it inspiring," says Professor Harrison. "Over the next five years, we hope to start to see these new technologies being developed and transferred to both academia and industry. The R&D that The Franklin is seeking to achieve is challenging but incredibly exciting and we're looking forward to working together."

