

Case study
2020
University of
Birmingham



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High-resolution research

The University of Birmingham has an impressive stable of high-resolution spectrometers, built up over the last 15 years. The University is the first in the UK to have the Eclipse, the latest in the Orbitrap range of mass spectrometers. Birmingham also boasts a 7 Tesla Fourier-transform ion cyclotron resonance (FTICR) mass spectrometer, a very high mass resolution instrument.

Of course, the instrument proposed under The Franklin's Biological Mass Spectrometry (BMS) theme, is at another level yet again. But according to Professor Tim Softley, Pro-Vice-Chancellor for Research and Knowledge Transfer and member representative for the University, that is exactly why Birmingham became part of the Institute.

"Our strategy is to provide world class, cutting-edge infrastructure for our researchers, and we are doing this through a combination of investment in facilities on campus and enabling access to unique national facilities such as those planned for The Franklin," he said.

Helen Cooper, Professor of Mass Spectrometry and EPSRC Fellow, agrees.

"The whole ethos of The Franklin is that it will house instruments that no one institution alone could achieve," she says. "These instruments will be unique in the UK and a fantastic resource for the scientific community and especially The Franklin's member universities."

Professor Cooper has been helping to develop the BMS theme, the area where, given Birmingham's expertise and existing infrastructure, the University has been most closely engaged with The Franklin. The involvement has mainly involved two work packages.

One is developing the new BMS instrument for protein imaging, as Professor Cooper's own research focuses on in-situ analysis of proteins from tissue or other biological substrates. The other is data analysis workflows, a field in which her colleague from the School of Computer Science, Dr Iain Styles, has particular expertise and which cuts across many of the other themes. Dr Styles is developing a number of proposals with The Franklin and other partners focusing on high-performance computing for machine learning and molecular dynamics.

Although the new instrument may take several years development to reach its full potential, each iteration will increase the both the imaging resolution and mass resolution achieved, which Professor Cooper finds an exciting prospect.

"In the future, our vision is that we will be able to go to The Franklin to use this instrument and – in my case at least – study proteins in fabulous detail. We hope there will be lots of interaction and people moving between Birmingham and Harwell," she says.

Professor Softley also sees the relationship offering an exciting future. "Our University's membership of The Franklin supports one of our strategic objectives, which is to use our multidisciplinary breadth in the life sciences to deliver collaborative research across the spectrum, from discovery to translation, and ultimately to have impact on human health."



*Professor Tim Softley,
Pro-Vice-Chancellor for
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