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## Viewing life under the microscope

A founding partner in the Rosalind Franklin Institute, University College London has been closely involved in shaping all the themes around which the new institute is organised.

The research synergies with the Franklin has seen UCL appoint researchers to lead the University's work on each theme: Professor Konstantino Thalassinios for Biological Mass Spectrometry, Professor Althea Tabor for Next Generation Chemistry, Professor Finn Werner for Structural Biology and Professor Paul Beard for Imaging with Sound and Light.

One of the earliest programmes to get off the mark, however, has been within the Correlated Imaging theme, that aims to design and build a new kind of electron microscope able to image liquid samples in their natural state, without fixing or freezing them. This would enable the structure of the liquid and its dynamic changes to be captured with sub-nanometer resolution. Key to success is devising a way of encapsulating the liquid using materials that are just a few nanometers thick. This will enable the samples to be 'visible' to the electrons, but not in contact with the vacuum of the microscope where it would just evaporate, and it's here that UCL is already playing a key part.

Professor Giuseppe Battaglia is the Franklin's member representative at UCL. He explains: "At UCL we've been working on several imaging techniques including optical and electron microscopy for a number of years so our expertise makes us a natural partner for the work going on at the Franklin."

One of the materials used for containing the liquid samples is graphene and the UCL team is also looking forward to working with Franklin partners in Manchester where there is established world-class expertise in working with this novel material. A joint post, funded by the Franklin, with research time at both Manchester and UCL has been created to progress this research.

The next five years will see significant changes as UCL plans to extend its activity on the Harwell Campus – a move that will enable deeper engagement with research groups at the Franklin, as well as with the Institute's newest member, the Diamond Light Source.

"Engaging more with the Structural Biology team will be a natural next step for us and we are a partner in the Cambridge-led project to build a cheaper, more accessible liquid phase EM microscope," says Professor Battaglia. "Beyond that, I'm very excited to see how the different themes will evolve and the relationships develop further. It would be fascinating, too, to see projects developing in physical biology, or in biomaterials. These are areas where the Franklin could also make significant contributions."

As well as providing opportunities to take part in research programmes with clinical and commercial potential, UCL academics are excited about the opportunities for exploring 'blue sky' research.

"Often funding is allocated on the basis of a potential application and that can make the research less adventurous," says Professor Battaglia. "Having a facility where taking a few more risks is encouraged will be beneficial for all of us. Where will we be in five years' time? In some ways we just don't know – and that's pretty cool."



Professor Giuseppe Battaglia with Dr Lorena Ruiz Perez, the UCL liquid TEM centre manager