Using an Industrial Partnership Award (IPA) from BBSRC, researchers at The University of Manchester and GlaxoSmithKline (GSK) discovered the mechanism by which the body’s internal clock controls inflammation in the lungs. As a result of this project and its success, the researchers have formed a pioneering three-way collaboration between academics, the NHS and industry to find new treatments for inflammatory conditions such as asthma and rheumatoid arthritis.

“The IPA enabled the University and GSK to explore a novel and rapidly developing area of biology in the best environment for the experimental work needed, but with the industry link bringing insight into potential therapeutic outputs,” says Professor Stuart Farrow, Director of the Respiratory Therapy Area at GSK, who is currently on secondment to The University of Manchester.

It is known that inflammatory diseases like asthma vary depending on the time of day, but the reasons for this were unclear. Using their IPA, the researchers discovered key molecules linking the body’s circadian clock – which controls our daily patterns of sleeping and waking – to the occurrence of inflammation. The IPA enabled the University and GSK to explore a novel and rapidly developing area of biology in the best environment for the experimental work needed, but with the industry link bringing insight into potential therapeutic outputs,” says Professor Stuart Farrow, Director of the Respiratory Therapy Area at GSK, who is currently on secondment to The University of Manchester.

The researchers are using this information in a collaborative drug discovery programme to find new treatments for inflammation. Because they now know the molecules involved in the regulation of the body’s inflammatory response by the circadian clock, the researchers can seek anti-inflammatory drugs that target these molecules.

Knowing how the circadian clock affects inflammation in the body, it may also be possible to determine the optimum time of day to take medication for it to have maximum effect. For example, GPs may be able to advise patients with asthma on the most appropriate time of day to use their inhaler. This line of research is also now being explored by the scientists.

The success of the project led to the creation of the Manchester Centre for Nuclear Hormone Research in Disease. This centre is highly unusual in that it brings together academics, the NHS and industry to collaborate in a three-way approach to finding new therapies for inflammatory conditions like asthma, chronic obstructive lung disease (COPD), and rheumatoid arthritis. The centre is jointly managed by Professors Andrew Loudon, David Ray and Stuart Farrow who led the IPA project.

Asthma affects one in 12 adults and one in 11 children in the UK, and kills on average three people in the UK every day. COPD is a life-threatening lung disease primarily

IMPACT SUMMARY

The Manchester Centre for Nuclear Hormone Research in Disease, a collaboration between academics, the NHS and industry aimed at finding new therapies for inflammatory diseases, has been created as a consequence of this IPA project.

The results of the IPA project are being used in a collaborative drug discovery programme to find new treatments for inflammation.

BBSRC’s Industrial Partnership Award (IPA) scheme

BBSRC’s Industrial Partnership Award (IPA) scheme supports collaborative research with industry.

It is a means of encouraging scientists to consider and seek industrial partnership in their research grant proposals, and to ensure that an avenue for knowledge exchange exists for BBSRC-supported research.

The IPA scheme provides funding for science-led grants where an industrial partner makes a minimum 10% cash contribution to the cost of the project.

The scheme fosters strong partnerships between academic institutions and companies, allowing high-quality science to be plugged directly into UK industry. This provides a route for research to generate economic and societal benefits, as well as opening up opportunities for further funding and providing career development for the researchers involved.
caused by smoking. A survey in 2001 estimated that 13.3% of people in the UK over 35 suffered from COPD, and the World Health Organisation predicts COPD to be the world’s third biggest killer by 2030.

The award of the IPA allowed GSK to engage in a basic bioscience research project which, at the start of the project, was not certain to lead to an application. GSK would generally consider such research too high-risk to fund on its own. The IPA also gave the company the opportunity to conduct high quality research with leading experts in the field.

“The IPA was an invaluable opportunity to initiate collaborative work in a field at an early stage of development,” says Farrow, “and generated exciting data to support progress to translational activities.”

Following the completion of the IPA, the links between the University of Manchester and GSK have continued to flourish, to the extent that Farrow, a senior member of GSK staff, has been seconded to the University of Manchester to work full-time on a programme on biological clocks and disease.

The project also resulted in a highly-cited paper in the leading scientific journal Proceedings of the National Academy of Sciences. For the postdoctoral researchers working on the project, the experience has helped them obtain funding to further their research careers.

“It’s been a great success,” says Professor Andrew Loudon from the University of Manchester, who led the project. “We have had continuous interactions with GSK staff from those early embryonic days and the collaboration has grown and grown.”

“We have now developed close links, with the award of four career development research fellowships at the University of Manchester [BBSRC David Phillips, MRC clinical, MRC basic science and Asthma Research UK clinical fellowship], four current CASE studentships with GSK as partner, and three new research grants collaborative with GSK [BBSRC IPA award and two MRC grants with GSK support under the MICA scheme]."

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