European membrane expertise to focus on new treatments for human diseases

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A new 15 million Euro project led by the University of Leeds aims to find novel treatments for many human diseases by bringing together the leading European experts in membrane proteins.

The project – the European Drug Initiative for Channels and Transporters (EDICT) – will target about 80 proteins, which play an important role in human diseases as varied as diabetes, heart disease, neuropsychiatric disorders like epilepsy and depression, osteoporosis, stomach ulcers and cataracts.

Membrane proteins are key to every process in the human body, channelling ions or transporting chemicals and so are ideal targets for new treatments. Infections by pathogenic bacteria, yeasts and parasites also involve their own membrane proteins, which can be specific targets for development of new drugs and antibiotics.

The research is mainly funded by the European Commission, involves twenty-seven partners from twelve countries – including two Nobel Laureates - and is set to last four years.

Coordinating the project is Peter Henderson, Professor of Biochemistry and Molecular Biology from Leeds' Faculty of Biological Sciences.

"Membrane proteins are seen by many as the next potential source of drug development, and so the EC is keen to fund research in this area," he said. "However, they are difficult to study and are poorly understood,

though the recent sequencing of the human and other genomes show they make up about one third of all proteins in all organisms, including humans."

"At the moment, few groups of membrane proteins are being seriously investigated by the pharmaceutical industry, so this project will help to fill that gap. By bringing together the best scientists in this challenging field from all over Europe, we hope to make a real advance towards new treatments for key diseases."

Industry has also seen the benefit of bringing such expertise together under one umbrella and working with the academics will be pharmaceutical giant AstraZeneca and a smaller company, Xention, which specialises in the discovery and development of novel and selective ion channel drugs.

The researchers include biologists, structural biologists, chemists and experts in the three key technologies: x-ray crystallography, nuclear magnetic resonance, and electron microscopy.

The team aims to map out the structure of the proteins, so they can identify compounds that could be developed as a treatment for these diseases. Where they have already mapped some structures, the team will have a head start and hope to make real advances towards new treatments.

Other researchers joining the project from Leeds include Professors Steve Baldwin and Carola Hunte from the Faculty of Biological Sciences and Professor Peter Johnson and Dr Colin Fishwick from the School of Chemistry. All are members of Leeds' Astbury Centre, the leading interdisciplinary research centre in the UK studying how life works at an atomic level.

The two Nobel Laureates involved in the research are Director of the Medical Research Council's Dunn Human Nutrition Unit in Cambridge, Professor Sir John Walker, who also holds an honorary doctorate from the University of Leeds, and Director of the Max Planck Institute for Biophysics in Frankfurt, Germany, Professor Hartmut Michel.

Source: University of Leeds