

Research discoveries uncover secrets of immune system

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A series of discoveries made by scientists at the University of Dundee is helping to uncover the secrets of how chronic inflammatory and autoimmune diseases such as Lupus and rheumatoid arthritis are caused and could lead to new treatments being developed.

The body's [immune system](#) is vital to fight infection by bacteria and viruses, but when it gets out of control is the cause of many [autoimmune diseases](#). Understanding this system is therefore vital to identify ways in which the treatment of these diseases can be improved without compromising the body's ability to fight infection.

Professor Sir Philip Cohen and colleagues in the Medical Research Council Protein Phosphorylation and Ubiquitylation Unit at the University of Dundee have published a series of recent papers uncovering the behaviour of proteins that control the immune system and their role in a range of human auto-immune diseases.

Dundee is among the world's leading centres for research into phosphorylation and ubiquitylation, areas which are becoming increasingly important in determining how abnormalities in [cellular proteins](#) can affect our health.

'In these latest papers we have documented some very intriguing findings about enzymes known as protein kinases and how they control the immune system,' said Professor Cohen.

'For example, we have identified unique roles for two members of the IRAK sub-family of kinases, which suggests they may be suitable targets for the development of drugs to treat chronic inflammatory and autoimmune diseases. These are attractive targets because by switching them off we may be able to suppress autoimmune diseases while only having minor effects on other processes which are critical to fighting infection and for stopping inflammation once it has served its purpose.

'In another piece of work with colleagues at the University of Kentucky we have contributed to the discovery that [mutations](#) in the ABIN1 protein cause a [predisposition](#) to a particular form of Lupus, a serious autoimmune disorder which affects around 3.5 million people worldwide. These findings may lead to the improved diagnosis and treatment of this disease.

'We have also made an unexpected discovery about how the innate immune system is controlled by ubiquitylation, which is likely to become an important area of drug discovery in the future. To prepare for this we have established a significant research grouping in ubiquitylation over the past five years, in addition to our major presence in phosphorylation, as we firmly believe that it is going to be a major frontier in advancing our understanding of human health.

'We are finding that the pharmaceutical industry is paying increasing attention to ubiquitylation research as its potential importance in understanding and treating many diseases becomes increasingly clear.'

Provided by University of Dundee

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