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# A crucial link in immune development and regulation unearthed

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An Australian team of scientists has uncovered a quality control mechanism that must take place for our immune system to subsequently effectively destroy harmful viruses and bacteria.

The findings were published today in the prestigious international journal *Nature*.

The team solved a 15-year puzzle by working out the structure and function of a protein called pre T alpha that is essential in guiding the correct expression of various receptors expressed by T lymphocytes, white blood cells of the immune system.

These receptors, known as T cell receptors, recognise unique components of microbial pathogens.

Joint team leader, ARC Federation Fellow Professor Jamie Rossjohn, from Monash University's School of Biomedical Sciences, said that understanding the structure of pre-T alpha explains a fundamental step in T cell development and anti-microbial immunity.

"We showed that the pre-T alpha molecule not only assists in the expression of functional T cell receptors but it also allows two molecules to bind together, which alerts the T cell that this receptor is constructed properly, allowing the T cell to move to the next step in its development," Professor Rossjohn said.

Co-leader of the project Professor Jim McCluskey from the University of Melbourne said without T cell receptors we would be profoundly immunodeficient and therefore pre-T alpha plays an essential role in ensuring proper immunity.

"Additionally, there is some evidence that pre-T alpha may also be involved in some childhood leukaemias, so this new knowledge of how it functions may be important in diagnosis and treatment of acute lymphoblastic leukaemia," Professor McCluskey said.

Provided by Monash University