

Unraveling the mysteries of the natural killer within us

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Scientists have discovered more about the intricacies of the immune system in a breakthrough that may help combat viral infections such as HIV.

Co-led by Professor Jamie Rossjohn of Monash University and Associate Professor Andrew Brooks from University of Melbourne, an international team of scientists have discovered more about the critical role Natural Killer cells play in the body's [innate immune response](#).

The findings were published today in *Nature*.

Natural Killer cells are a unique type of white blood cell important in early immune responses to tumours and viruses. Unlike most cells of the immune system that are activated by molecules found on the pathogen or tumour, Natural Killer cells are shut down by a group of proteins found on healthy cells.

These de-activating proteins, known as Human Leukocyte Antigens or HLA molecules are absent in many tumours and cells infected with viruses, leaving them open to attack by the Natural Killer cells.

Natural Killer cells recognise the HLA molecules using an inbuilt [surveillance system](#) called "Killer cell immunoglobulin-like receptors" (KIR).

Using the Australian Synchrotron, the team determined the three

dimensional shape of one of these key KIR proteins, termed KIR3DL1, which binds to a particular HLA molecule.

This pairing is known to play a role in limiting [viral replication](#) in people with HIV, slowing the progression of the disease to AIDS.

Professor Rossjohn said that better understanding the structure of KIR proteins may help to develop approaches to better utilise Natural [Killer cells](#) to combat viral infection.

"It is only possible to detect proteins, such as KIRs, using extremely high-end equipment. The use of the platform technologies at Monash and the Australian Synchrotron was absolutely essential to this project's success," Professor Rossjohn said.

Professor Brooks said the researchers would use these findings to investigate other KIR molecules.

"Since KIR3DL1 is only a single member of a much larger family of receptors, the study provides key insight into how [Natural Killer cells](#) utilise other members of this important family of receptors to recognise virus-infected cells and tumours." Professor Brooks said.

Provided by Monash University

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