

Natural killers help fight human disease

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Professor Carola Vinuesa at The John Curtin School of Medical Research.

(Medical Xpress) -- Researchers from The Australian National University have discovered a new type of cell which boosts the human body's ability to fight off infections and life-threatening diseases.

Professor Carola Vinuesa from The John Curtin School of Medical Research has found a type of cell which recognises lipid antigens, or foreign molecules, which sit on infectious bacteria which invade the body. Once recognising the lipids, the cell, called Natural killer T follicular helper (NKTfh), generates antibody responses in B [cells](#) – which are the body's natural defence against invasion by viruses and bacteria.

Professor Vinuesa said that the cell represents a non-chemical based and natural way for the [human body](#) to fight-off bacteria and infection.

“Natural killer T cells, unlike other T cells, recognise molecules known as lipids instead of just recognising proteins expressed by infectious bacteria. These types of bacteria can cause life-threatening infections, including meningitis and pneumonia. NKT cells don’t just recognise lipids – they can be naturally activated by them,” she said.

“Not surprisingly, NKT cells have been shown to play important roles in combating infection and in other immune processes including allergy, cancer and autoimmunity.

“What we have found is a subset of NKT cells, the NKTfh, which are specialised in generating antibody responses in B cells that recognise lipid-containing antigens. NKTfh cells also induce specialised structures called germinal centres, similar to those which have previously been shown to generate high affinity antibody responses to protein antigens. Both these qualities provide a natural boost to B cells, subsequently strengthening the human immune system and its ability to stave off infection.”

Professor Vinuesa also discovered that the NKTfh cells provide this boost over a very short and sharp period of time without generating long-lived antibody-producing cells.

“The discovery of the NKTfh will help us understand how to elicit immune protection against lipid-containing microbes and which natural antibody responses can best fight each type of infection,” she said.

“For example, the ability of NKTfh cells to promote faster [antibody responses](#) than conventional helper T cells may be important for protection against life-threatening infections, whereas their inability to induce long-lived antibody producing cells may be key to the prevention of autoimmune diseases.”

Professor Vinuesa's recent discoveries have been published in two separate papers in the journals *Nature Immunology* and *Immunity*.

Provided by Australian National University

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