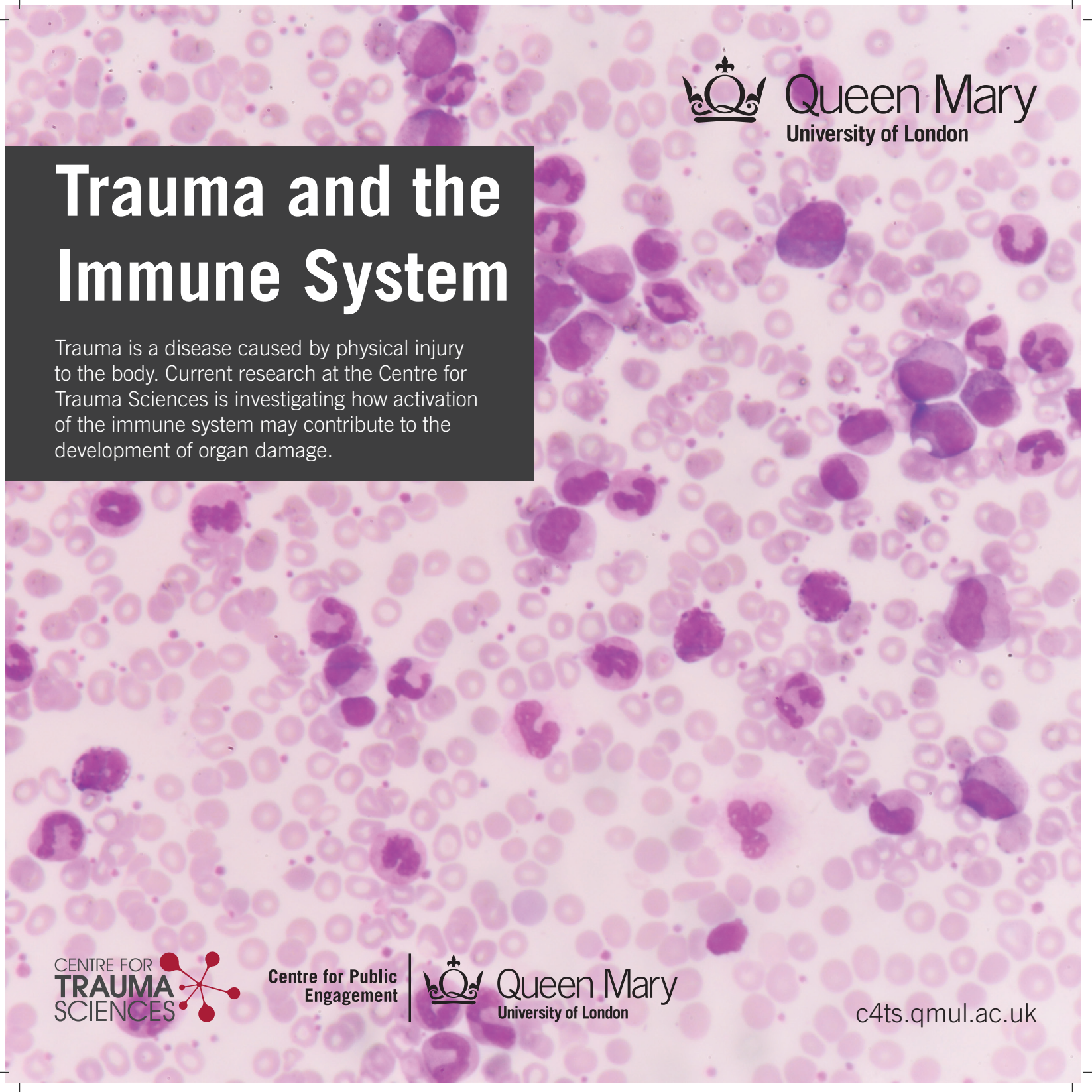

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Trauma and the Immune System

Trauma is a disease caused by physical injury to the body. Current research at the Centre for Trauma Sciences is investigating how activation of the immune system may contribute to the development of organ damage.

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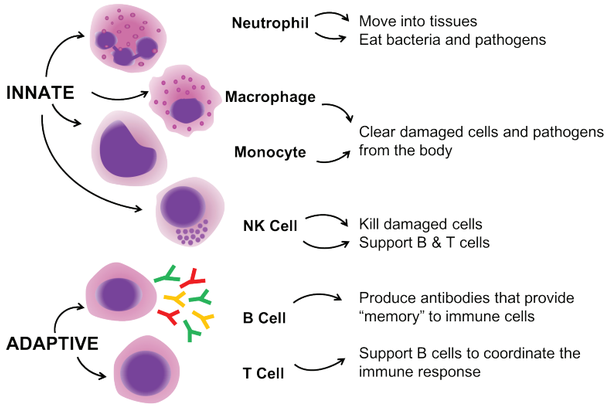
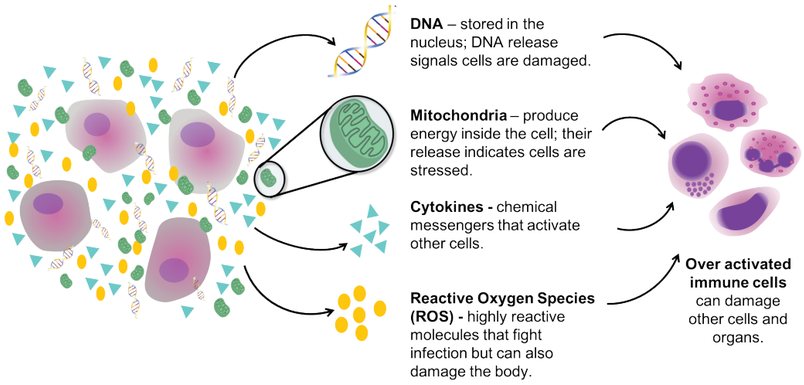
The healthy immune system

The immune system plays a vital role in protecting the body from dangerous microorganisms.

The immune system is made up of many cells – termed white blood cells. These cells are made up of two groups – innate and adaptive immune cells. Innate immune cells respond quickly and produce the same response every time they are activated. The adaptive immune system is slightly slower to respond; it is directed by signals from cells of the innate system and creates a 'memory' for the immune system by producing antibodies.



The immune response to injured tissue



Severe injury leads to large areas of damaged tissue. This rapidly stimulates the body's immune cells.

Research at the Centre for Trauma Sciences has shown that severe injury can lead to multiple organ failure. This means that organs like the heart, lungs and kidneys stop working properly due to cell damage.

What we are learning from our patients

By taking blood samples from trauma patients we can study how the immune cells react to traumatic injury.

- We count and label cells to detect changes in their function.
- We can also look at the information stored in the cell's DNA and genes.

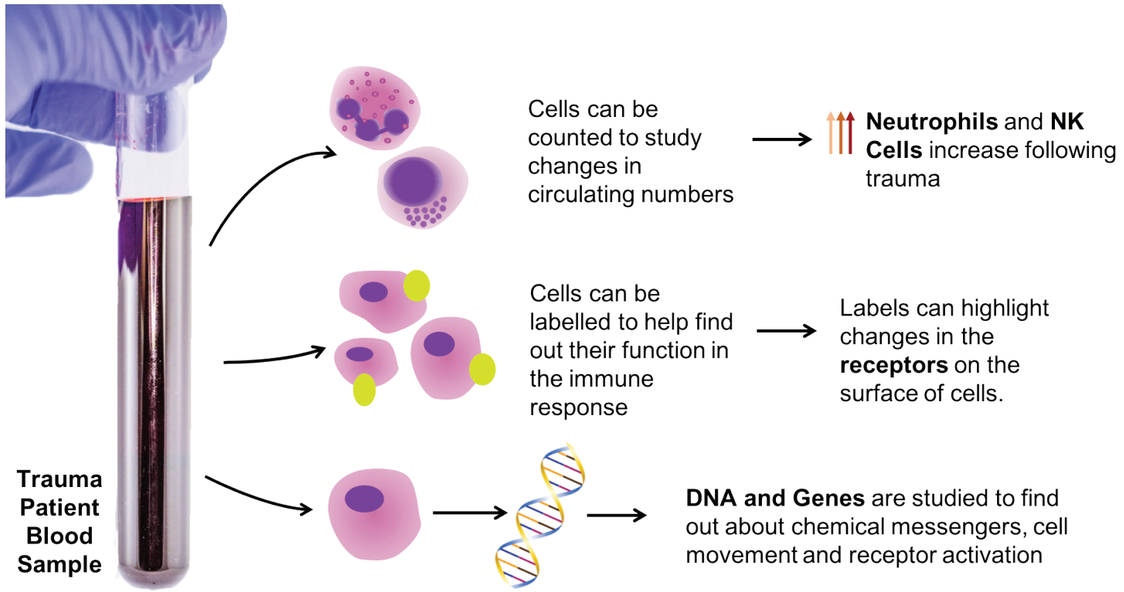
By studying these samples, we have seen:

- Traumatic injury rapidly increases the number circulating innate white blood cells
- A day after injury immune cell numbers decrease, some to far below normal levels
- Receptors present on the surface of immune cells are changed

By looking at the genes of immune cells we can investigate what they are doing.

We have seen that some innate immune cells become strongly activated. This may explain:

- How immune cells damage the body's organs
- Why immune cells may eventually become switched off

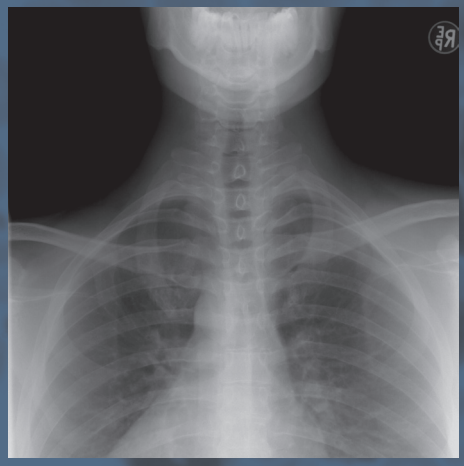


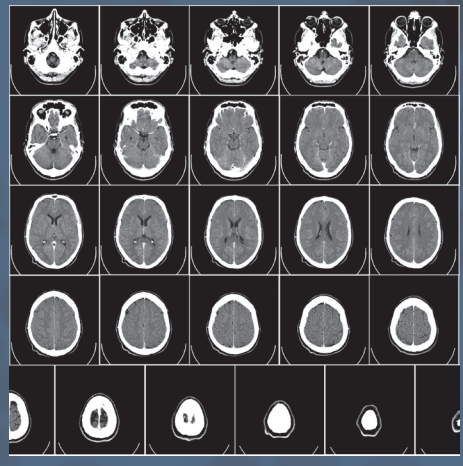
Protecting future patients against multiple organ failure

A better understanding of how the immune system responds to trauma will help us to develop new treatments to protect patients from developing multiple organ failure.

Some of our recent and current clinical trials aim to understand more about how the immune system is involved in organ failure after trauma.

Check out ACITII, ORDIT, MODET and TOP-ART on our website to find out more:
c4ts.qmul.ac.uk/research





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