

Media Backgrounder

SOCS1 and the human immune system

What is SOCS1?

Suppressor of Cytokine Signaling 1, or SOCS1, is a protein found in most cells in our body. It was discovered by scientists at Melbourne's Walter and Eliza Hall Institute 10 years ago. SOCS1 plays a role in managing disease by inhibiting the action of cytokines in cells. Different cytokines play different roles in the body's immune response. The MIMR study showed that SOCS1 inhibited an important cytokine called interferon.

What is interferon?

Interferon regulates cell proliferation and fights infection. Once foreign objects are detected in the body, interferons are produced which trigger anti-viral proteins to fight the infection. SOCS1 tells the body when to 'switch off' the immune response. If the response is not switched off, an inflammatory disease can develop.

What happens between SOCS1 and interferon?

When a virus infects a cell, interferon is produced in large amounts. The interferon is then sent outside the cell to interact with interferon receptors on neighbouring cells. Then, the cell 'switches on' anti-viral proteins to protect itself from the viral infection. SOCS1 is another protein that is switched on by this interaction. Once enough interferon has been activated, SOCS1 switches off, blocking any further interferon from entering the cell and reducing the risk of inflammatory disease.

What are the implications of this study?

This current study showed how SOCS1 regulates susceptibility to viral infection and inflammatory disease in mice. Significantly, the study identified that SOCS1 can be manipulated to allow a path for interferon signal to travel through the cell to deliver the immune response message. This could mean future drugs could fight infectious diseases and cancer by triggering SOCS1 to switch on and off.

Current cancer and hepatitis treatments are interferon-based, but as interferons are highly toxic, only small dosages can be administered. Future treatments manipulating SOCS1 instead of interferons could lead to patients needing much smaller amounts of interferon-based medication, thus improving its efficacy and reducing side effects.

An abstract of the research paper is available online: www.nature.com/nj/journal/v7/n1/abs/ni1287.html

