

# Roundworm could provide new treatment for sepsis

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Research by the University of Liverpool has found that systemic inflammation caused by sepsis can be suppressed by a protein which occurs naturally in a type of roundworm.

Sepsis is a serious inflammatory condition, caused by the body over-reacting to infection. The body becomes overwhelmed by bacteria, setting off a series of reactions that lead to inflammation and clotting. It affects around 20 million people worldwide each year, and accounts for a large proportion of [intensive care unit](#) admissions.

For the past 30 years, sepsis has largely been treated by antibiotics and maintenance of blood flow. Despite these treatments - often complicated by antibiotic-induced liver injury or the presence of multi drug-resistant bacteria - mortality rates for those with severe illness who go into multi-organ damage and [septic shock](#), remain as high as 50%. New treatments for septic shock are of high clinical need.

Findings by an international team, led by Professor Alirio Melendez, based at the University's Medical Research Council Centre for Drug Safety Science in the Institute of Translational Medicine, show that inflammation triggered by bacterial endotoxins in immune cells from patients with sepsis is suppressed by a protein called ES-62 which is secreted by a type of roundworm called *Acanthocheilonema viteae*.

Roundworms can infect the human digestive tract, lymphatic vessels, skin and muscle. They are extremely common - particularly in parts of

the world with poor sanitation - and it is estimated that nearly a quarter of the world's population are currently infected. Roundworm can live in the human body for decades without adverse effects or triggering the immune system.

Scientists already know that the protein secreted by roundworm is capable of suppressing inflammation and people infected with worms usually benefit from reduced inflammation if they suffer from conditions such as allergies and [autoimmune diseases](#).

Professor Melendez explained: "The protein secreted by the roundworm stimulates a process called autophagy, a process of 'self-eating' that is essential to clear damage to cellular proteins or organelles and promote cell survival and function during stress situations.

"Autophagy reduces inflammation but at the same time permits the clearance of microbial infection. The findings suggest that ES-62 could be used to induce autophagy and reduce the overwhelming inflammation that is responsible for the massive tissue damage seen in sepsis."

He added: "ES-62 has the therapeutic ability to enhance recovery in septic shock by suppressing and limiting catastrophic inflammatory responses while allowing for bacterial clearance to occur. Administration of ES-62, or a synthetic small molecule derivative, alone or in combination with antibiotics could potentially be used treatment of septic shock as well as other inflammatory diseases."

**More information:** The research is published in *Nature Immunology*.

Provided by University of Liverpool

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