



# Office of Technology Management

## *Use of a Parasite-derived Novel Protein as an Anti-inflammatory and Immunomodulatory Agent*

### Technology Reference

CP11

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### Field

Antibody development

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### License Status

Seeking Licensing Partner

### Patent Status

US patent 6372219

### Overview

A protein with anti-inflammatory, and immunomodulatory functions was identified and isolated from the excretory/secretions of a human parasite *Schistosoma mansoni*. This protein, designated herein as Sm 16.8, is released by schistosomes upon entry into human skin. Under in vitro conditions Sm 16.8 is shown to stimulate the production of anti-inflammatory cytokine Interleukin-1 receptor antagonist (IL-1ra) in human keratinocytes and transcriptionally down regulate the production of proinflammatory cytokines IL-1 .alpha. and IL-1 .beta..

### Technical Summary

Inflammation is a critical and complex process associated with the pathophysiology of many diseases. The treatment of such diseases often requires suppression of inflammation, so effective anti-inflammatory agents with minimal side-effects are of great interest to the medical, pharmaceutical, and bio-tech communities. The patented molecule Sm 16 shows tremendous potential for the treatment and control of chronic inflammatory disease of the skin. Injection of the gene for Sm 16 into the skin results in localized production of the protein, which appears to be non-antigenic.

The novel protein Sm 16 was isolated and cloned from the secretions of the human parasite, *Schistosoma mansoni*. The larval stages of the parasite have the unique ability to penetrate intact, unabrased human skin to gain entry into the human body and spend 72 hours migrating through layers of the epidermis and dermis without eliciting any inflammatory tissue response. Analysis of *Schistosoma mansoni*'s excretory secretions revealed the presence of a 16.8 KDa protein with an anti-inflammatory activity. This protein was designated Sm 16.

### Benefits

- Antibody development efforts target many important diseases such as cancer, infection, inflammation, and autoimmune disease.
- The development of disease-modifying antirheumatic drugs will have a dramatic impact on the rheumatoid arthritis drug market.

### Areas of Application

- Development of vaccines for diseases such as schistosomiasis, a water-borne tropical disease that infects more than 200M people worldwide and is caused by the parasite *Schistosoma mansoni*.
- The parasite *Schistosoma mansoni*, may be using the Sm 16 protein to gain entry into the human body, it is possible that neutralizing the protein's effect could prevent the infection in humans.

### Stage of Development

- Under in vitro conditions, Sm 16.8 is shown to stimulate production of an anti-inflammatory cytokine (IL-1ra) and to transcriptionally down regulate production of proinflammatory cytokines (IL-1 .alpha. and IL-1 .beta.).