UNIVERSITY OF LIMERICK OLLSCOIL LUIMNIGH | Technology Transfer Office

LicensingOpportunity

Protease Enzyme with activity against proinflammatory mediators

Overview

Immune dysregulation is identified in a broad variety of significant syndromes and disorders including those of the skin, e.g. eczema, the lungs, e.g. asthma, and the gut, e.g. Inflammatory Bowel Disease. The predominant strategies employed to target immune dysregulation and associated disorders are the use of recombinant monoclonal antibodies (MCAb) and the use of antagonists to receptors of pro-inflammatory mediators.

One drawback of a strategy utilizing MCAb to tackle immune dysregulation is that the production of MCAb is expensive, and large quantities have to be administered. Furthermore, both MCAb and receptor antagonists are generally administered intravenously in a healthcare setting. This systemic route leads to significant adverse side effects.

There is a need to provide a treatment strategy targeting immune dysregulation which overcomes the disadvantageous associated with current methods. The UL technology can solve this problem, as the novel protease exhibits activity against a multitude of pro-inflammatory mediators.

Technology

Our technology relates to a protease enzyme, named Prtl, and its use to treat immune dysregulation disorders. This enzyme, expressed by Lactobacillus can catalyze the destruction of thousands of pro-inflammatory mediators and allows the use of lower quantities of therapeutic medicaments in the treatment of immune dysregulation diseases.

Benefits

The isolated protease is capable of enzymatic destruction of a broad range of pro-inflammatory mediators.

Applications

This technology provides a method of treating or preventing an immune dysregulation disorder by administering a therapeutically effective amount of the protease to a patient in need. The medicine can be administrate orally or parenterally. It can be used to treat the conditions listed in Table 1 by inactivating the relevant immune mediator.

Family of mediator	Members	Examples of target diseases
Anaphylotoxin	C3a, C4a, C5a	Sepsis, skin diseases, transplant rejection, Lyme disease
CXCL cytokine	IL-8, IP10	Ulcerative Colitis, cancer, gingivitis, psoriasis

Class-2 cytokine	IL-10	Leishmaniasis
IL-17 cytokine	IL-17	Psoriasis, autoimmune disorders, allergy response, asthma, eczema
IL-1 cytokine	IL-1β	Autoimmune disease
TNF cytokine superfamily	TNF-α	Rheumatoid arthritis, ankylosing spondylitis, Alzheimer's, cancer, psoriasis, IBD
Common β receptor-signaling cytokines	IL-3	Allergic inflammation

Commercial Opportunity

The University of Limerick is interested in seeking partners to exploit the commercial potential of this pharmaceutical excipient by entering into licensing agreements.

Target Market for Innovation: Pharmaceutical sector

☐Development partner

☐Commercial partner

☒Licensing

☐University spin-out

☐Seeking investment

1.

Patent Title: Protease enzyme with polyvalent activity against proinflammatory mediators

Type: Regional

Country: EPO

Status: Filed

Priority Date: 23-Oct-2018

Application number: EP2019078944

2.

Patent Title: PrtI-a protease enzyme with polyvalent activity against proinflammatory mediators

Type: Regional

Country: USA

Status: Filed

Priority Date: 23-Oct-2018

Application number: 17/287992

3.

Patent Title: Protease enzyme with polyvalent activity against proinflammatory mediators

Type: PCT

Country: EPO

Status: Filed

Priority Date: 23-Oct-2018

Application number: PCT/EP2019/078944; WO 2020/084014

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Figures

In Figure 1 the Prtl enzyme has activities against the following pro-inflammatory mediators (Fig. 1B):

IL-8, C3a, TNF-α, human C5a (hC5a), IP-10, IL-17, IL-1β, mouse C3a (mC3a) and IL-3. Furthermore, PrtI also cleaves the immune signalling molecule IL-10 (Fig. 1B).

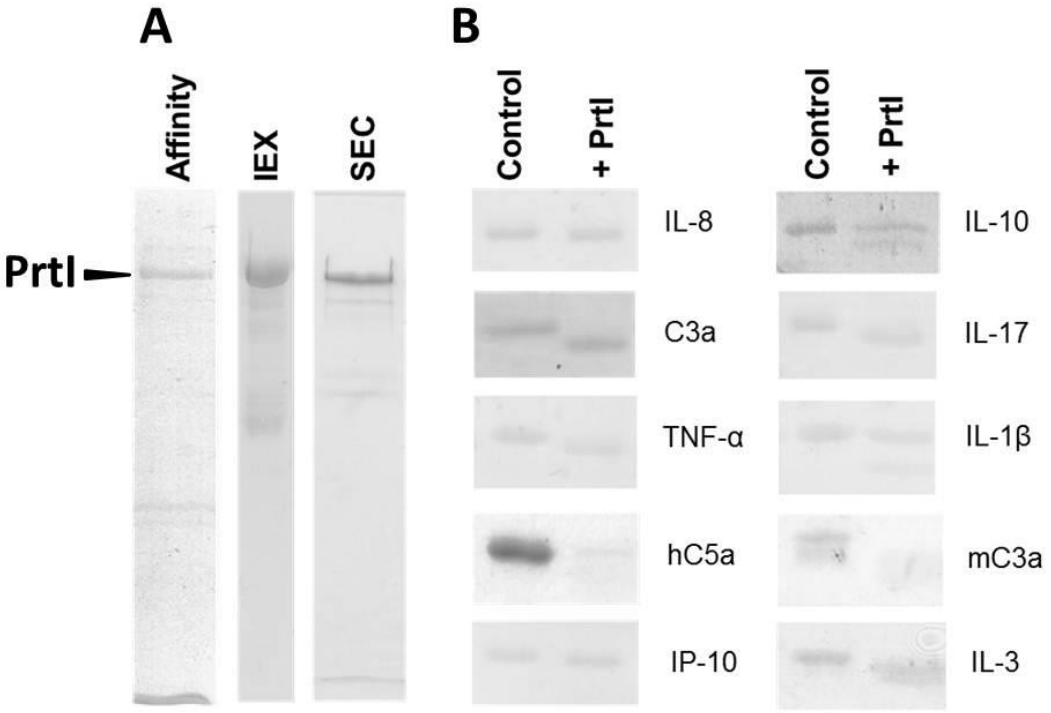

Figure 1: **Preliminary results demonstrating activity of PrtI.** A. Purification regime for recombinant PrtI. B. Activity of PrtI (+ PrtI) against a range of mediators as indicated in panel B.