Therapeutic Probiotics for the treatment of gastrointestinal disorders

Description of the Technology

The Microbial Genetics Group of the Rowett Research Institute have isolated and identified bacteria that convert lactic acid to butyric acid in the human large intestine. The bacteria are responsible for preventing the accumulation of lactic acid in the normal healthy gut. Lactic acid can accumulate where the microbial balance of the gut is disturbed, is associated with inflammation and disease, and can lead to toxicity. This is particularly noticeable in Ulcerative Colitis sufferers and those recovering from major abdominal surgery. There are believed to be associations also with Inflammatory Bowel Disease (IBD) and a possible link to Irritable Bowel Syndrome (IBS). Butyric acid in contrast is required to maintain colonic epithelial cell health and has been shown to reduce risk of colorectal cancer and prevent/reverse colitis.

The bacteria could have significant therapeutic benefits for the treatment of human inflammatory bowel conditions and for the healthy re-population of gut microflora in patients who have undergone a major microbial challenge such as surgery or radio/chemotherapies.

Requirements of anti-inflammatory technology

In the developed world Ulcerative Colitis affects around 1 in 600 whist for Inflammatory Bowel Disease the figure is higher at around 1 in 400. Both are conditions that appear to be on the increase particularly in younger populations and some ethnic groups. Both give rise to severe symptoms and there is strong evidence that IBD may lead to colorectal cancer.

Current treatments rely on the use of anti inflammatories such as corticosteroids, aminosalicylates and immunosuppressants. In some cases these may be coupled with the use of wide range antibiotics. These are typically ineffective with patients presenting either as unresponsive or with significant secondary effects.

There are significant opportunities to develop probiotic therapies that draw upon the body's natural mechanisms for maintaining immune status and which through the mechanism of action of selected bacteria strains address specific microbiological challenges.

Highlights of Technology

Potential probiotic pharmaceutical therapy.
Therapy based on naturally occurring inhabitant of healthy gut.
Potential to reduce or remove risk of side effects associated with current therapies.

Development Status

The activity of a number of lactate utilising, butyrate-producing bacteria from the human colon has been demonstrated *in vitro*. Studies are planned to further examine the ability of each to consume lactate when co-cultured with lactate producing strains such as *Bifidobacterium* and *Lactobacillus*. Initial data has shown complete utilisation when co cultured. Further work is planned to correlate the target bacteria with their deficiencies in UC and IBD patients and as a route to developing therapeutic products to evaluate performance using animal models.

Industry sectors

Therapeutics
Biotechnology
Food
Agriculture
R&D

Therapeutic Targets

Ulcerative Colitis
Inflammatory Bowel Disease
Microbiologically compromised (for example following major surgery, and chemo/radiotherapy)

The technology has the potential to be developed for other probiotic therapeutics targeting specific microbial/physiological interactions.

Patent Status

A Patent Application has been filed (UKPA 0307026.5) and will be subject to international filings under the Patent Co-operation Treaty. Relevant strains have been deposited, in line with the Budapest Convention with NCIMB Ltd.

Relevant Publications

The bacterial strains, their isolation, characterisation and the technology underpinning the patent has been detailed in the following publication:

Duncan, S.H., Louis, P. and Flint, H.J. Bacteria from human faeces that convert D-, or D-and L-, lactate and acetate into butyrate. (Manuscript in preparation).

Relationships Sought

Strategic alliances and/or joint ventures are sought to realise the full potential of the technology in chronic indications.

Licenses are available to the technology covered in the Patent Application and to the associated Rowett know-how.

An initial feasibility study can be undertaken to validate the technology for specific applications.

Contact Details

To discuss this technology opportunity and for further details please contact:

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