

Induction of Oral Tolerance in Ulcerative Colitis and Crohn's Disease

Background

Ulcerative colitis is an inflammatory bowel disease caused by the inflammation and sores in the lining of large intestine. It is estimated that about 5% of patients suffering from ulcerative colitis are at risk of developing colon cancer. Annually, about 2 million Americans are afflicted with either ulcerative colitis or Crohn's disease with roughly 1 million patients suffering from each disease. Sera of patients with ulcerative colitis reveal autoantibodies to colonic autoantigens. This disease is hard to diagnose because of similarity in the symptoms with another inflammatory bowel disease called Crohn's disease.

Crohn's disease, unlike ulcerative colitis, is caused by inflammation deep in the intestinal walls. Although the small intestine is largely affected, Crohn's disease can affect any region of the gastrointestinal tract, including the mouth.

Currently, there is no cure or effective treatment for both diseases. The treatment strategies currently in clinical use relieve the symptoms by suppressing the inflammatory cascade that damages the colon. Thus, there is a need for effective treatment strategies for both ulcerative colitis and Crohn's disease. The following is a brief description of a treatment strategy that can be used to effectively treat and control the inflammatory process that damages the colon.

Description of the Technology

A colon specific antigen termed, colon epithelial cellular protein (CEP), has been shown to induce tolerance in rats suffering from experimentally induced form of ulcerative colitis. CEP reduced inflammation in rats challenged with trinitrobenzene-sulfonic acid (TNBS) compared with control rats. Further, CEP, human colon tumor cell extract, normal colon epithelial cell extract or transfer of T lymphocytes from mice fed with colonic antigen extract were all equally effective in the reducing inflammation. Administering normal small intestine or human fibroblast cellular extract did not offer protection from inflammation indicating that the protective effect is organ specific. These results were bolstered by the finding of increased anti-inflammatory TGF β and decreased pro-inflammatory IFN γ levels in the serum of rats fed with CEP. Taken together these studies reveal that oral tolerance can be induced by feeding the colon specific protein CEP to patients suffering from ulcerative colitis and Crohn's disease.

Advantages

Ulcerative colitis is currently treated with 5-ASA agents, which is a combination of sulfonamide, sulfapyridine, and salicylate to control the inflammation. These drugs cause sever side effects such as nausea, vomiting, heartburn, diarrhea and headache. Corticosteroids such as Prednisone and hydrocortisone are also used to treat inflammation. These too cause undesirable side effects such as hypertension, facial hair, acne and weight gain. In severe cases of ulcerative colitis surgery is recommended. Thus, an alternative treatment that overcomes the limitations of current treatment strategies would be beneficial.

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Applications

For the induction of oral tolerance in inflammatory bowel diseases such as ulcerative colitis and Crohn's disease by the administering orally, subcutaneously, by parenteral injection, intranasally, rectally etc., any of the following:

- CEP;
- a human colon tumor cell extract;
- normal colon epithelial cell extract;
- T lymphocytes obtained from individuals fed with colonic antigen extract.

Patent Status

- United States patent application filed.
- Application was published on February 12, 2004 (Publication Number US-2004-0029786-A1)

Licensing Opportunity

- This technology is available for non-exclusive or exclusive license.

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