

## **Gallium Nitrate a treatment or a cure for Crohn's Disease**

Crohn's disease (CD) is a painful, chronic, often debilitating, inflammatory disease of the intestinal tract. Crohn's disease is a chronic, inflammatory bowel disease which can affect any part of the gastrointestinal tract from the anus to the mouth. CD causes a wide variety of symptoms, including abdominal pain, diarrhea (which may contain mucous and blood), vomiting, weight loss, ulcers and fistulas. CD may also cause complications outside of the gastrointestinal tract such as skin rashes, arthritis and inflammation of the eyes. CD has been considered to be an autoimmune disease, wherein the body's immune system attacks the gastrointestinal tract, causing inflammation. CD tends to present initially in the teens and twenties, with another peak incidence in the fifties to seventies, although the disease can occur at any age.

There has previously been no known pharmaceutical or surgical cure for CD. Treatment options have been restricted to controlling symptoms, maintaining remission and preventing relapse, usually with anti-inflammatory agents.

The Mycobacterium genus includes pathogens known to cause serious diseases in mammals, including tuberculosis and leprosy. Mycobacterium avium subspecies para tuberculosis (MAP) is the likely cause of Crohn's disease (CD) and ulcerative colitis (UC) in humans. Recently, Mycobacterium avium subspecies para-tuberculosis (MAP) has been suggested to be the underlying cause of CD, primarily because MAP has been shown to cause Johne's disease in cattle and sheep, a disease very similar to human CD.<sup>2</sup> MAP has been found in blood samples of sheep, and the optimization techniques used should be useful in determining the presence of MAP in humans with CD. Viable MAP is found in human and cow milk and is not reliably killed by standard pasteurization. MAP is ubiquitous in the environment including in potable water, consequently its disease-causing potential in humans is related to environmental, food quality and immune system integrity. It is common throughout nature and many species can be infected and diseased by it.

MAP, like all Mycobacterium, is an iron-dependent bacterium. Gallium ion

(Ga) is bacteriostatic to all iron dependent bacteria. Ga also has anti-inflammatory properties. Oral use of gallium nitrate (GN), a potent source of Ga, can be beneficial in the treatment of CD, an inflammatory bowel disease. Treatment with diluted (< 1%) oral GN (226 mg elemental Ga) aqueous solutions resulted in complete and immediate elimination of all signs and symptoms of CD. Due to the recurring nature of CD, and the antibiotic and anti-inflammatory nature of Ga, it is unknown at this time as to whether Ga is a treatment or cure for CD. Regardless, oral Ga has been highly beneficial and seen to be immediately effective. Beneficial probiotic intestinal bacteria are not iron dependent, and are not injured by Ga. No side effects were observed at the dosage used.

Gallium Trinitrate produces a concentration-dependent growth inhibition of Mycobacterium tuberculosis strains and Mycobacterium avium complexes grown extra cellularly and within human macrophages. Ga might be beneficial in the treatment of CD especially since bacteria do not develop resistance to it, and because Ga does not harm beneficial (probiotic) intestinal flora. Oral Ga solutions would be beneficial in the treatment of CD since it has both anti-inflammatory properties and is bactericidal to the genus that includes MAP. Use of low-doses of Ga to safely treat CD appears to be a landmark departure from the use of side-effect prone, anti-inflammatory drugs previously used. Perhaps safely killing the bacteria that cause the digestive tract inflammation without side effects is a desired means of treating CD. Clinical trials of oral Ga in treating CD and other diseases, especially inflammatory bowel diseases such as UC and Johne's disease are strongly recommended.

CD increases the risk of cancer in the area of inflammation, and Ga has anti-cancer properties that have been used to treat colon cancer.