Abstract

Research suggests that if angiogenin is fused to NC16A, a domain of BP180 and the target of the body’s B-cells, the angiogenin and NC16A complex would be absorbed by the B-cell as it attacks BP180. Angiogenin, normally playing a crucial role in the formation of new blood vessels, becomes toxic once directly introduced to a cell. The angiogenin, acting as a toxin inside the B-cell, would use its depolymerization mechanism to destroy the B-cell’s RNA. With the B-cell unable to make protein due to the loss of its RNA, apoptosis (cell death) would occur. Any angiogenin-NC16A complex remaining after the apoptosis would neither elicit a negative immune response nor produce any toxic side effects as angiogenin is naturally present in the body. Relief may thus be provided for BP sufferers.

What Is Bullous Pemphigoid?

Bullous pemphigoid (BP) is an autoimmune disease which primarily affects the elderly and is characterized by large, fluid-filled blisters on the surface of the skin. BP currently has no cure. In BP, the body’s immune system produces antibodies to attack collagen XVII, also called BP180, in the skin’s basement membrane. When inflammation cells flock to the distressed membrane, painful blisters result. Traditional treatments for severe cases of BP include immunosuppressant drugs, which suppress the patient’s immune system while treating the blisters, increasing the risk of development of certain cancers and infections. Research centering on angiogenin, a naturally occurring member of the ribonuclease superfamily, has led scientists to believe that a cure for BP may be found in the coupling of angiogenin with a specific region of BP180.

Bullous Byte!

Bullous pemphigoid normally strikes individuals fifty and older. Men and women are equally affected. It is thought that an aging immune system combined with a genetic predisposition may lead to the disease, although an exact cause is currently unknown. Symptoms include itching and burning of the skin, a sensitivity to acidic foods, difficulty eating, and nosebleeds. BP’s characteristic blisters may appear on any surface of the body and within the mouth.

Why Angiogenin?

Naturally occurring in the body, angiogenin destroys the B-cell’s RNA with no toxic side effects to the patient, as would occur in other treatments. The mutated forms of angiogenin, Q117A and Q177G, work faster and more effectively than normal angiogenin in destroying the targeted RNA and therefore are the focus of future BP treatment.

The Double Life of Angiogenin

Along with angiogenin’s promising involvement in treating Bullous Pemphigoid, the protein might also prove useful in treating a variety of human cancers and angiogenesis-dependent diseases, such as endometriosis and diabetes. Angiogenin, primarily circulating in the body’s bloodstream, is vital to those diseases reliant on angiogenesis (the process of new blood-vessel growth) by being a main angiogenic factor. As an angiogenic factor, angiogenin is directly involved in cancer cell proliferation and increased tumor growth. Through manipulation of angiogenin as an angiogenic factor, it is hoped that new treatments derived from angiogenin for certain cancers and other diseases may be developed.