

## **Colostrum and Epstein Barr Virus**

October 15, 2009; By Dr. Anthony Kleinsmith

Dear consumer,

Your inquiry regarding the benefits of colostrum in relation to the Epstein-Barr virus has been forwarded to me. I am a consultant with extensive knowledge regarding the formation of bovine colostrum and its applications in humans and animals.

The Epstein-Barr virus, which is frequently referred to as EBV, is a member of the herpes virus family. It is an extremely common virus that occurs worldwide with most people becoming infected at sometime during their lives. The National Center for Infectious Diseases estimates that as many as 95% of people living in the United States between the ages of 35-40 have been infected. Many children become infected after the maternal antibody protection conveyed in utero disappears, but the disease produces very mild symptoms that are virtually indistinguishable from those of other mild childhood diseases. When infection occurs in adolescence or young adulthood, it causes infectious mononucleosis about 50% of the time. The symptoms of infectious mononucleosis usually disappear in 1-2 months, but the virus is sequestered in the lymphoid tissue of the throat and neck for the rest of the person's life. The virus may be reactivated at a later time, but infection usually occurs without symptoms. There have been some suggestions in the medical community that EBV may be the responsible agent in chronic fatigue syndrome, but this has not been scientifically substantiated at this time. An event later in life for a few carriers of this virus is the emergence of a rare lymphoma and a nasopharyngeal carcinoma, two very rare forms of cancer that are not normally found in the United States. EBV appears to play a role in these malignant diseases, but is not believed to be the sole cause.

In all infectious disease, the best defense is a good offense. Routine daily supplementation of a healthy diet with a high quality first milking bovine colostrum has been shown to be an effective means to support the immune system. Independent scientific studies, in which I have personally participated, have shown that such supplementation makes the immune system more capable of responding more efficiently than normal against an invading pathogenic microorganism. In addition, a protein found in bovine colostrum, lactoferrin, has been shown to have significant antiviral

properties.

In addition, infection with EBV can be very debilitating and usually results in extreme fatigue. Insulin-like growth factor-1 (IGF-1), and its closely related counterpart insulin-like growth factor-2 (IGF-2), are potent hormones that are found in association with almost all cells in the body. IGF-1 is the best described and most potent of this pair. These molecules are produced by all mammals and, in every case, have a very similar chemical structure regardless of the species. IGF-1 is essential for normal cell growth. Scientific knowledge about the IGFs, what they do and how they act on cells in the body has evolved very rapidly during the past few years. It is now known that there are specific receptors on almost all cells in the body capable of interacting with IGF-1 and triggering a series of chemical events within the cell. There are also 6 different proteins present inside the cell and on cell surfaces that control the actions of IGF-1 on the cell after it binds to a receptor. These are called insulin-like growth factor binding proteins (IGFBPs). In addition, there are at least 87 other related proteins either capable of binding to IGF-1, altering its actions, or influencing the effects of the IGFBPs. These are called insulin-like growth factor binding protein-related proteins (IGFBP-rPs). The entire collection of these proteins is referred to as the insulin-like growth factor binding protein (IGFBP) superfamily. The key event that triggers the effects of any of these proteins appears to be the interaction of IGF-1 with its specific cell-surface receptor, an event that some of these proteins regulate.

The multitude of available IGF-1-binding proteins and related proteins available in the cell is indicative of the many potential effects that the binding of IGF-1 to its specific cell-surface receptor can have on cells. To keep these many effects under control, some of the binding proteins act as checks and balances, allowing the secondary chemical switches in a cell to be turned on and then turning them off when it is appropriate. Therefore, IGF-1 is like the captain of a ship. When it binds to its specific receptor, the ship can move forward, but there are all kinds of systems in place to keep it moving at the right speed and in the right direction. The main triggered events include activation of the process by which the cell grows and reproduces itself and maintenance of the metabolic pathways by which the cell converts glucose into glycogen and uses amino acids to create proteins. The actual pathway by which the cell uses glucose and converts it to glycogen is first switched on by the binding of insulin to its specific cell surface receptors. Glycogen is stored in the liver and muscles and is the

main source of readily available energy when the muscles are exercised. The IGFBP superfamily also has a direct role in how the cell uses amino acids to build proteins. As we age, the ability of our body to create an adequate supply of IGF-1 is diminished. Thus, by eating a well-balanced diet and maintaining a constant supply of IGF-1 in our body, we can keep the ship moving at the right speed and in the right direction. In addition, as we age the cells in our body do not reproduce themselves as well and, since IGF-1 is a primary factor in the ability of cells to grow and reproduce, it is highly desirable to have an appropriate level of IGF-1 in the circulation through dietary supplementation.

I hope that the above information answers your inquiry.

To your good health - always.

Sincerely,  
Alfred E. Fox, Ph.D.

Dr. Alfred E. Fox holds a Ph.D. from Rutgers University in Microbiology (Immunochemistry) and has more than 25 years of senior management experience at Carter-Wallace, Baxter Dade Division and Warner-Lambert, where he was responsible for research and development and regulatory affairs. He was also the founder and president of two biotechnology companies focused on agribusiness and environmental monitoring, respectively. For the past 15 years, Dr. Fox has been the President of Fox Associates, a business and technology consulting firm serving small- to mid-size companies in the human and animal healthcare fields. He focuses primarily on marketing and regulatory issues and for the past 10 years has continuously consulted to bovine colostrum manufacturers, where he has gained regulatory approval for their products, been a technical advisor, helped design and develop marketing strategies and served as an expert witness in legal matters.

References:

Brock J; Lactoferrin: a multifunctional immunoregulatory protein, *Immunology Today* 1995; 16(9): 417-19.

Burvin R, LeRoith D, Harel H, Zloczower M, Marbach M, Karnieli E; The effect of acute insulin-like growth factor administration on glucose metabolism in the rat, *Growth Hormone IGF Res* 1998; 8(3): 205-10.

Geffner M; Effects of growth hormone and insulin-like growth factor-1 on T- and B-lymphocytes and immune function, *Acta Paediatr* 1997; 423:76-9.

Hwa V, Oh Y, Rosenfeld RG; The insulin-like growth factor binding protein (IGFBP) superfamily, *Endocrinol Rev* 1999; 20(6): 761-87.

Kelly KM, Oh Y, et al; Insulin-like growth factor-binding proteins (IGFBPs) and their regulatory dynamics, *Int J Biochem Cell Biol* 1996; 28(6): 619-37.

LeRoith D; Insulin-like growth factor receptors and binding proteins, *Clin Endocrinol Metab* 1996; 10(1): 49-73.

Rosenfeld RG, Hwa V, et al; The insulin-like growth factor binding protein superfamily: new perspectives, *Pediatrics* 1999; 104(4): 1018-21.

Solomons NW; Modulation of the immune system and the response against pathogens with bovine colostrum concentrates, *Eur J Clin Nutr* 2002; 56(S3): S24-8.

Yang Y, Guo L, Ma L, Liu X; Expression of growth hormone and insulin-like growth factor in the immune system of children, *Horm Metab Res* 1999; 31(6):380-4.