EpiCor®: Nutrient metabolites keeping humans healthy

By Stephanie Frankenbach, Ph.D.
Poultry Specialist
Diamond V

Many Diamond V customers have asked: “XPC is working to improve the health of my birds. Is a human version of the product available?”

Answer: Yes! EpiCor is produced by Diamond V’s sister company, Embria Health Sciences

What is EpiCor?

EpiCor is a safe, natural combination of metabolites that work together to help strengthen your immune system by balancing immune response. EpiCor has been included as an ingredient in many dietary supplements and functional food products. Its unique mode of action works like a multivitamin for your immune system.*

When taken daily, EpiCor has been shown to be a safe and effective way to help strengthen your immune system for more healthy days throughout the year.* [1]

The EpiCor story

The inspiration behind EpiCor started with a simple observation. In 1998, Diamond V’s employees who manufactured its nutrient metabolite products (XP, now XPC)
noticed that they were not using much sick time. Further investigation with Diamond V’s health insurance provider indicated actual health care claims per person were lower than other companies of similar size in the same region.

Diamond V wanted to know if the improved health of their production workers had something to do with being exposed to the nutrient metabolite product. Diamond V commissioned a pilot study to see if there were measurable beneficial effects on the human immune systems of the factory workers.

The results surprised everyone. The immune systems of the factory workers were indeed stronger. They showed increased Natural Killer cell activity, higher levels of secretory IgA (sIgA) (Figure 1) and lower levels of pro-inflammatory immune complexes compared to office workers that did not come in contact with the nutrient metabolites.

Out of this groundbreaking discovery, Embria Health Sciences was formed to develop a version of this health-promoting ingredient, EpiCor, for people across the world.\[2\]

**EpiCor® cold and flu claim in Canada**

In November, 2012, Health Canada approved a claim for EpiCor after it had evaluated the significant number of quality scientific studies to confirm that EpiCor provides clear benefits without the safety concerns caused by other ingredients currently available.

The approved claim for products containing 500 mg EpiCor says it, “Helps reduce incidence of cold and flu symptoms.”

The significance of this claim is that EpiCor’s research was reviewed using pharmaceutical guidelines and no disclaimers limiting benefits to certain populations are implied. Embria’s flagship ingredient, EpiCor, is an all-natural
product that helps the body balance the immune system and is manufactured using a proprietary technology. EpiCor contains protein, fiber, vitamins, minerals, amino acids, antioxidants and other metabolites that deliver nutritional benefits and support immune health. Clinical studies have found that EpiCor’s immune-balancing properties provide year-round support by helping the body support an immune response as needed. [3]

**Research: How does EpiCor work?**
Understanding the mode of action may provide insight to health benefits you might experience while taking EpiCor.

The following is taken from an Embria publication: [4]

A major portion of Embria’s research on EpiCor has been with double-blind, placebo-controlled human clinical trials, looking at clinical endpoints. These results were aimed at demonstrating statistically significant improvements of the consumer’s health, and have been published in peer-reviewed Medline-indexed journals.

Although reduction in symptoms of upper respiratory track infection (URTI) and allergies were the main thrust of the research, the importance of clinical biomarkers in demonstrating the causes of these beneficial effects was also recognized.

**1. INNATE AND ADAPTIVE IMMUNE SYSTEM:**
- Significantly increases Natural Killer (NK) cell activation *in vivo* (5) and *in vitro* (6)
- Significantly increases NK cell activation in less than 2 hours post-consumption(7)

**PHYSIOLOGY:** NK cells are a type of white blood cell critical to the innate immune system. They provide a rapid immune response to virally infected cells as well as malignant cells. In many cases the NK cells will destroy the infected or malignant cell before the viral infection or malignant tumor can be established. Even if an infection becomes established, NK cells are also known to play a role in the slower acting but more specific adaptive immune response.

- Significantly increases secretory salivary IgA (sIgA) versus placebo (5,8).

**PHYSIOLOGY:** sIgA is the main immunoglobulin (antibody) found in mucous secretions, including tears, saliva, colostrum and secretions from the genitourinary tract, gastrointestinal tract, prostate and respiratory epithelium. It is a major component of the body’s defense against invading pathogens.

- Serum IgG increased over the 5-week consumption period in both groups, with the trend strongest in the EpiCor group (5)

**PHYSIOLOGY:** Serum IgG makes up about 75% of the antibodies found in blood. It is an important part of the immune system’s ability to fight infections of body tissues. It binds many kinds of pathogens — including viruses, bacteria, and fungi
— and protects the body against them using several immune mechanisms.

- Increases B cell activation in vitro (6)
  PHYSIOLOGY: B cells are an essential component of the human adaptive immune system. Their principal function is to make antibodies against antigens.

- Significant increase in Interferon-gamma (IFN-γ) (7)
  PHYSIOLOGY: IFN-γ is a cytokine that is critical for innate and adaptive immunity against viral and intracellular bacterial infections and for tumor control. IFN-γ is now thought to have pleiotropic effects and thus can have both promoting and suppressive roles in autoimmunity.

2. ALLERGY/ASHTMA:
- Strong trend toward reduction of eosinophils in EpiCor group versus placebo (8)
  PHYSIOLOGY: Blood levels of eosinophils are commonly elevated in people with asthma and other allergic diseases.

- Significant decrease in lymphocytes in nasal smears in EpiCor group versus placebo (9).
  PHYSIOLOGY: Increased lymphocytes would be expected in the nasal smears of allergy sufferers.

- Trend toward relative decrease serum IgE versus placebo (5,8)
  PHYSIOLOGY: Pollen binds to IgE antibodies present on the mast cells of allergy sufferers. The mast cells, and similar cells like basophils activate to release chemicals, including histamine, into the blood vessels and tissues. The binding of histamine to histamine receptors produces the effects of inflammation to surrounding tissues and causes nerve stimulation, leading to symptoms of itchy, watery eyes, sneezing, runny nose, and itching of the nose and throat.

- Significant decrease in PGE2 levels by 31% (9)
  PHYSIOLOGY: Prostaglandins, including PGE2, are also produced in large amounts during allergen exposure, and some conventional medicines reduce PGE2 levels as part of their mechanisms of action.

- Significant decrease in NGF by 22% (9)
  PHYSIOLOGY: Excessive production of NGF was found in past studies of allergic rhinitis patients.

- Trend toward lower serum basophil percentages (8)
  PHYSIOLOGY: The mast cells and similar cells like basophils activate to release chemicals, including histamine, into the blood vessels and tissues, which leads to allergy symptoms.

- Dose dependent inhibition of LPS-induced nitric oxide (NO) with EpiCor, while
positive control increased NO \((in vitro \ bioassay)\) \(^{(10)}\)

**PHYSIOLOGY:** In medicine, exhaled nitric oxide can be measured in a breath test to diagnose or monitor asthma or other conditions characterized by airway inflammation.

- Total white blood cell count remained constant in the EpiCor group, whereas there was a mild trend towards an increase in white blood cells in the placebo group \(^{(5)}\)

**PHYSIOLOGY:** While blood cells tend to proliferate in people due to the onset of seasonal allergies.

3. **ANTIOXIDANT**
- Significant increase in serum antioxidant protection seen 2 hours post consumption\(^{(7)}\)

4. **GUT HEALTH AND RELATIONSHIP BETWEEN GUT HEALTH AND IMMUNITY**
- EpiCor modulates the gut microflora, increasing the proportion bifidobacteria and lactobacilli (B&L)

**PHYSIOLOGY:** B&L are lactic acid-producing bacteria constituting a major part of the intestinal microflora in humans and other mammals. The most important role of the microflora, from the point of view of the host, is probably to act in colonization resistance against exogenous, potentially pathogenic, microorganisms \(^{(11)}\).

- Increases production of butyrate

**PHYSIOLOGY:** Butyrate is the major energy source for the intestinal epithelial cells, is considered to have anti-inflammatory effects, and has been studied for its role in nourishing the colonic mucosa and in the prevention of cancer of the colon \(^{(12)}\).

- Decreases production of proinflammatory cytokines

**PHYSIOLOGY:** The change in composition of the microbial community of the gut caused a reduction in the production of inflammatory cytokines IL-8 and IL-1b in a model of the gut lining \(^{(13)}\).

- Individual IL-10 levels were increased after EpiCor consumption, while they remained unchanged in the placebo group \(^{(5)}\)

**PHYSIOLOGY:** Knockout studies in mice suggested the function of this cytokine as an essential immunoregulator in the intestinal tract.

- Significantly increases secretory salivary IgA (sIgA) versus placebo \(^{(5,8)}\).

**PHYSIOLOGY:** In a healthy person, sIgA inhibits the colonization of pathogenic bacteria in the gut, as well as the mucosal penetration of pathogenic antigens. At least 80% of all the body's plasma cells, the source of sIgA, are located in the intestinal lamina propria throughout the length of the small intestine \(^{(14)}\).
5. INFLAMMATION

- EpiCor treated mice had significantly lower arthritis scores versus placebo (9).
- Arthritic mice showed significant increase in IFN-γ levels in control mice versus mice fed EpiCor (9).

PHYSIOLOGY: IFN-γ is one of the primary endogenous mediators of inflammation and immunity. IFN-γ has been considered an autoimmune disease promoting or pro-inflammatory cytokine, as also suggested from the collagen-induced arthritis model. IFN-γ is now thought to have pleiotropic effects and thus can have both promoting and suppressive roles in autoimmunity.

- Arthritic mice showed significant increase in levels of immune complexes in control mice versus mice fed EpiCor.

PHYSIOLOGY: Increased levels of immune complexes are associated with autoimmune diseases.

- Significant decrease in NGF by 22% (9).

PHYSIOLOGY: Increases in NGF are associated with discomfort and pain with inflammatory responses because it impacts mast cells and afferent neurons. NGF is such a profound primary mediator of chronic pain that even vaccine research has been initiated in this area of medicine.

- Rat paw edema severity and PGE2 levels were significantly reduced by approximately 50% and 31% respectively by consumption of EpiCor (9).

PHYSIOLOGY: A major mediator of the localized inflammatory response in this model is the proinflammatory prostaglandin PGE2, which has a role in other medical conditions as well. For example, in autoimmune diseases such as rheumatoid arthritis, PGE2 has a pro-inflammatory function.

- Individual IL-10 levels were increased after EpiCor consumption, while they remained unchanged in the placebo group (5).

PHYSIOLOGY: IL-10, also known as human cytokine synthesis inhibitory factor (CSIF), is an anti-inflammatory cytokine.
Please contact your Diamond V representative or visit http://www.embriahealth.com/ for more information about EpiCor.

*These statements have not been evaluated by the Food & Drug Administration. This product is not intended to diagnose, treat, cure, or prevent disease.

References