



- **Athletes Use Muscles!**
- **Muscles Need Oxygen!**
- **Use of Oxygen Creates “Free Radicals”!**
- **Free Radicals are Toxins (Poisons)!**
- **Toxins and Free Radicals Have to be Eliminated!**
- **Glutathione Eliminates Free Radicals and Toxins!**
- **Immunocal is Proven to Optimize Glutathione in the Cells and Increase Muscle Performance!**
- **Using Immunocal daily gives you, the Athlete, a Natural Competitive Edge!**

### **What Everyone Should Know About Sports Physiology!**

To replicate in sufficient numbers the T-cells need GLUTATHIONE (GSH). The body manufactures Glutathione to feed the immune system. When working out, training or competing athletically the immune system is often overwhelmed. It cannot get rid of free radicals fast enough to prevent fatigue, muscle pains, soreness, muscle damage, stress, etc. In one clinical study it says: “After prolonged intense exercise the number of lymphocytes in the blood is reduced, and the function of natural killer cells is suppressed; furthermore secretory immunity is impaired. During this time of immunodepression, often referred to as ‘the open window’, the host may be more susceptible to micro-organisms (viruses, bacteria, etc.) bypassing the first line of defense.” **This is of interest to top athletes who perform frequent severe exercise.**

**Free radicals have been implicated in the development of diverse diseases** such as cancer, diabetes, cataracts and many more.

Recent epidemiological data suggests an inverse relationship between antioxidant intake and cardiovascular disease risk. The data also suggests that antioxidants may delay aging.

**Vitamin E, Beta-Carotene and Vitamin C have shown promise as protective antioxidants.** Other ingestible products with antioxidant properties include Selenium and Coenzyme Q10.

But these all come from the outside – they are not manufactured by the body – while **Glutathione** is probably the most effective antioxidant manufactured by the body itself.

To accomplish an increase in **Glutathione** levels a precursor, or building block, is required. Such a super-antioxidant is now available to all athletes. Developed in Canada – after 18 years of research – this product is available as a food supplement via a

network of independent distributors. It is called **Immunocal®** in the United States and **HMS 90** (Human Milk Serum – 90% Protein) in Canada.

Extensive clinical research and more research that is currently ongoing in University Hospitals throughout the world support it. It holds 5 pharmaceutical patents, all of them for “Method of Use” (very difficult to obtain) with more patents pending!

**Immunocal®** helps to optimize the **Glutathione** level in all your cells. It enables – if **Glutathione** is available in sufficient quantities – your T-cells to fight off infections before you even notice them. It eliminates free radicals before they become a problem. It optimizes your immune system and the antioxidant defense mechanism of your body.

In recent **performance tests** with **Immunocal®**, athletes reported an increase of **13%**. If you are not an athlete you will say, “**13%? So what? Big Deal!**” **But if you consider, for example, that the difference in a 100-yard dash between 1st and 6th place is 1 to 2%, you may just start to think.**

The expression I used when I heard of this was “Wow!” And you may be similarly impressed.

This product is easy to take. One pouch of this powder (10 grams) is sufficient for normal maintenance of your immune system. The use of two or three pouches may be needed when strenuous exercise is required. **You do not want to succumb to and infection of a fever on the eve of an important competition or an Olympic event.**

There is much more information available if you, your coach, or your trainer are interested. Refer to Dr. Larry Lands of Montreal General Hospital, **Muscle Performance Study**, now entered into a peer review Publication “**Journal of Applied Physiology.**” (Volume 87 / 1381 – 1385, 1999).

**For further information, get back to the person who informed you of this special report**

## Muscular Performance Study by Larry Lands, MD Montreal General Hospital

### **The Effect of Supplementation with a Cysteine Donor on Muscular Performance**

Lands LC , Grey VL , Smountas AA, McGill University Health Centre – Montreal General Hospital, Montreal Canada.

#### **Double- blind study:**

Oxidative stress contributes to muscular fatigue. Glutathione (GSH) is the major intracellular antioxidant, whose biosynthesis is dependent upon cysteine availability. We hypothesized that supplementation with a whey-based cysteine donor (IMMUNOCAL) designed to augment intracellular GSH would enhance performance.

Twenty healthy young adults (10 men) were studied pre and 3 months post - supplementation with either Immunocal or casein placebo. Muscular performance was assessed by whole leg isokinetic cycle testing, measuring Peak Power and 30second Work Capacity. Lymphocyte GSH was used as a marker of tissue GSH. One placebo subject dropped out, and one Immunocal subject's follow up results were technically unacceptable. There were no baseline differences (age, ht, wt, % ideal wt, Peak Power, 30 sec. Work Capacity).

Both Peak Power (mean rise: 13.0% plus or minus 3.5%,  $p < 0.02$ ) and 30 sec Work Capacity (13.0% plus or minus 3.7%,  $p < 0.03$ ) increased significantly in the Immunocal group, with no change (2.0% plus or minus 9% and 1.0 plus or minus 9.3%) in the placebo group. Lymphocyte GSH also increased significantly in the Immunocal group, (37.8% plus or minus 12.47%,  $p < 0.03$ ) with no change in the placebo group (0.9% plus or minus 9.6%).

Our results support the use of a well-tolerated whey-based cysteine donor (Immunocal) to augment muscular performance. We speculate that supplementation may have even more benefit in situations of ongoing oxidative stress, such as chronic obstructive lung disease and cystic fibrosis.

*Supported by the Canadian Cystic Fibrosis Foundation and Immunotec Research Ltd.*

*Presented October 1-2, 1998 at the "Lung Association" in Quebec City, Canada*

*Presented at the American Lung Association International Symposium in San Diego, California March 1999 as one of 30 out of over 5,000 papers submitted to be presented at this significant conference.*