

## Ingredients Supported by Patents and Clinical Studies Make Better Products

For many years, Albion International, the holding company of Albion Laboratories, has clearly been the leading holder of patents in the field of mineral amino acid chelate nutrition and technology. Albion International currently owns about 70 patents. This is strong evidence to the fact that Albion is heavily committed to advancing the art and science of mineral nutrition. The thirty-four scientific articles that have been launched through Albion Laboratories resources in the last two years alone further evidence this fact. Some of the patents have been co-invented along with Albion's customer companies and associates. Albion tries to assist its business partners in many ways, and this type of cooperation is one that helps everyone grow the science and art of mineral nutrition. In addition, by providing Albion customer companies with mineral ingredients that are supported by patents and published studies, Albion helps its customer companies build more effective and desirable products - products that can stand out from the competition.

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### Patents Connected to Enhanced Performance

One of Albion's most recent patents is entitled "Bioavailable Chelates of Creatine and Essential Metals" (U.S. Patent #6,114,379). This is the basis for our Creatine Magna Power™, which is a magnesium creatine chelate. The patent states that the production of this molecule provides for the protection of the creatine from cyclization (providing more active creatine) and the increased absorption of magnesium. Early studies have shown this molecule to out perform creatine and combination regimens of creatine and magnesium supplements in the generation and maintenance of energy. While significant, this is far from the first Albion held patent to deal with the area of performance physiology and nutritional biochemistry. The ability of Albion mineral amino acid chelates

to have a positive impact on many areas of performance can be seen in several other recent patents that are jointly owned by Albion International and Albion Laboratories' customers as shown below:

*US Patent # 5,888,553 • Non-Steroidal Anabolic Composition*

This patent deals with the use of two chelate forms from Albion that make up a non-steroidal anabolic nutrient formulation. This nutrient formulation enables the body to generate and maintain skeletal muscle at a mass and in a manner optimally suited to the genetic makeup of that person. The actual formulation is made up of effective amounts of chromium (salt complex, or chelate), and the Albion manufactured magnesium

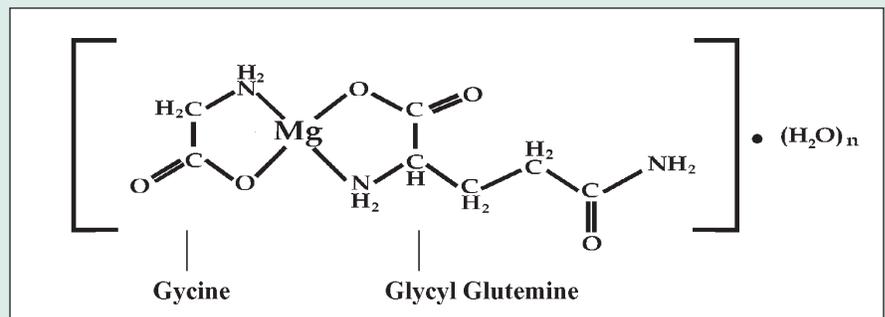


Figure 1

glycyl glutamine chelate (MGG). The patent also describes other optional nutrients that can be added to this anabolic nutrient mixture. The patent specifically states that the magnesium glycyl glutamine is a chelate in which the ligand to magnesium mole ratio be at least 2:1, with one mole being glycine and the other mole glutamine. Most typically this chelate has the following formula (see Figure 1):

In a chelate of this structure, the molecule contains approximately 10% magnesium, 60% glutamine, and

## NOTE

It is important to take note of the fact that only the Albion material, which is specified in the writings of these patents, can be used when these patents are being referred to in conjunction with a nutritional product. Each of these mineral amino acid chelates is made to meet the very specifications of the amino acid chelates mentioned in the patent. It is the unique chemical nature of these particular amino acid chelates that allows them to perform and conform with the patent.

The actual patents are very long and detailed, thus placing anything in a newsletter, outside of the abstract versions presented would be impractical. However, the actual patents are quite detailed in their claims and the support of these claims, and can make for some informative reading.

30% glycine by weight. The actual ingredient, as marketed by Albion, is 8.5% elemental magnesium. The magnesium, glycine, glutamine, and chromium are all involved in the anabolic effect of the formulation. The ability to have them all in bioavailable form (through Albion's patented processes) is the key to the anabolic effectiveness of this mixture. For the detail on the physiology behind this, please refer to the listed patent.

*U.S. Patent # 5,270,297 • Endurance And Rehydration Composition*

This patent speaks to providing rehydration and endurance to a person showing signs of physiological stress through the use of a nutritional formulation made up of simple sugars and more complex carbohydrates, and at least magnesium (in the form of an amino acid chelate). Other ingredients are listed as optional. The patent states that when administered, the blend of carbohydrates and the magnesium amino acid chelate facilitate rehydration and the delivery of nutrients and calories to appropriate sites within the body for efficient utilization. The patent details the ligand:magnesium molar ratios of the chelate, as well as its molecular weight. It is important to note that the patent states that this form of magnesium (Albion Magnesium Chelazome™) is required because it does not result in the common side effects of intestinal irritability, loose stools, or diarrhea that typically accompany the ingestion of high levels of magnesium.

*US Patent # 5,882,685 • Food Energy Utilization From Carbohydrates In Animals*

The primary function of carbohydrates in the body is to provide a source of fuel. Carbohydrates are degraded to carbon dioxide and lower sugars, and in that process they release energy. They also function as starting material for the synthesis of fatty acids and certain amino acids, as well as playing a role in the structure of glycolipids, glycoprotein, nucleic acids, etc. From this, it can be seen that the digestion and metabolism of carbohydrates is of great consideration. This patent deals with a method for facilitating the digestion of carbohydrates into simple sugars in warm-blooded animals, which includes man, by maintaining and enhancing the natural disaccharidase enzymatic activity in the mucosal cells of the small intestines. The disaccharidases are located on the brush border of the mucosal cells of the intestine. They not only digest the disaccharides into monosaccharides, but they also facilitate the transfer of the sugars across the membrane, and in so doing are integral to the absorption of the carbohydrates. Iron is an essential mineral and other minerals selected from a group made up of copper, zinc, manganese, as well as magnesium and chromium (all as amino acid chelates) have demonstrated ability to improve disaccharidase activity, as may potassium. The chelates must be of proper ligand:mineral ratio, and have a molecular weight of no more than 1500 daltons, but preferably less than 1000 daltons. In the amino acid chelate form, these minerals are taken into the mucosal cells lining the small intestine where they are utilized to facilitate a significant increase in the production and

activity of disaccharidase enzymes, such as maltase, sucrase and lactase. These enzymes promote the hydrolysis of disaccharides resulting from the degradation of more complex carbohydrates or of sucrose and lactose into simple sugars or monosaccharides. Making them ready for absorption. The patent reviews data showing the degree of increased enzyme activity associated with these mineral chelates.

*U.S. Patent # 5,292,538 • Improved Sustained Energy And Anabolic Composition And Method of Making*

This patent describes the use of a nutrient formulation consisting of a mix of sugars, complex carbohydrates, and partially hydrolyzed protein combined with at least magnesium amino acid chelate, which will provide sustained energy and support an anabolic physiological state in humans. Other ingredients, including lipids, bioavailable minerals in the form of amino acid chelates, anabolic nutrients, vitamins, antioxidants, and lipotropics may be added as desired to obtain optimal effect. This specific anabolic nutrient mixture enhances the utilization of insulin, carbohydrates, protein, and lipid. In addition, this mix of mineral amino acid chelates and carbohydrate substances has the net effect of maintaining a positive metabolic energy balance, both immediately and over a sustained period. The patent delineates the mole ratio of ligand to mineral (magnesium and others) required of the mineral chelates used in the formula.

## Five Patents Pointing to Enhanced Performance

In the patents mentioned in this newsletter, a variety of Albion's patented mineral amino acid chelates are listed as keys to the patents issued. They were:

Creatine Magna Power™ to enhance bioavailability of the creatine and the magnesium.

Magnesium Glycyl Glutamine (MGG) and Chromium Chelavite® for non-steroidal anabolic effect.

Magnesium Amino Acid Chelate (Chelazome® form) to enhance endurance and rehydration.

Ferrochel™ (Iron AAC) plus other mineral chelates for enhancing the energy derived from carbohydrate intake.

Magnesium Amino Acid Chelate (Chelazome® form) for improved sustained energy and anabolic effect.

So there are several Albion patented mineral amino acid chelates that are keys to performance enhancement. They can be used in products that are geared for physical activities requiring strength and power, quick energy and endurance, rehydration and recovery. There are many ways to combine these patented uses into unique and effective sports nutrition products. In reviewing these patent claims, it is very encouraging to note that there are some very natural and healthy ways to help improve the anabolic state by using some of the mineral chelates listed, in the fashion mentioned in their patents. It would seem that this would be a wiser way to improve ones muscularity than the use steroids, or their chemical relatives.

## More Ingredients for Performance

The list of Albion ingredients that can be used in dietary supplements aimed at performance enhancement does not stop with those listed earlier. In the March 1999 issue of Albion Research Notes (Vol. 8, No.1), there was an extensive review of the mechanisms for the anabolic effects of both zinc and the amino acid arginine. Albion Laboratories produces a patented neutralized zinc arginine chelate. This unique mineral amino acid chelate has many positive biological effects, outside of sports performance (immune system, wound healing, growth), but the combined effects zinc and arginine in the area of enhancing growth hormone and

nitrogen balance is a definite plus, when trying to formulate a product to assist in muscle building.

In the January 1997 issue of Albion Research Notes (Vol.6, No. 1), the role of magnesium in energy production was reviewed. Magnesium is involved in virtually every energy system of the human body. It is literally the cornerstone of energy metabolism. In that issue, there was mention of some research done on two other Albion mineral ingredients that had positive effects on endurance performance: Magnesium and Potassium Aspartate. In the study mentioned there, Albion's

chelated Magnesium Aspartate and complexed Potassium Aspartate increased endurance performance 151% over that seen with magnesium and potassium aspartate salt forms.

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## Conclusion

Now that the usefulness of many patented Albion mineral amino acid chelates and complexes have been pointed out in the area of performance nutrition, shouldn't you think about Albion the next time you want the best natural way to improve the products you are taking or

formulating? Albion has key mineral ingredients that have patented and clinically proven uses in the area of sports nutrition that are outstanding. This is in addition to the fact that Albion's totally reacted, nutritionally functional mineral chelates have:

**Higher bioavailability**

**Superior tolerability**

**Enhanced physiological benefits**

**Better absorption dynamics**

**Greater Safety**

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