Research recognized that a highly skilled scientific staff, academically trained in nature’s principles, with research laboratory assets at their disposal, was needed for a new approach to product research and development. This was especially true in areas such as improving methods of nutrient delivery and ensuring product consistency and quality.

**Emulsified Fat-Soluble Nutrients and Botanical Extracts**

After extensive literature searches and review, Biotics Research focused its research resources on developing an improved delivery method for oily nutrients such as vitamins A, D, and E. The result was true oil-in-water emulsions of fat-soluble nutrients. While it was true that other emulsions were available in the market, they were poorly prepared, resulting in little or no advantages in uptake over standard oily preparations. Biotics Research’s emulsions are distinguishable by direct examination under a microscope. The smaller and more uniform particle size in the Biotics Research emulsions are clearly visible under microscopic examination. Particle dispersal is accomplished by non-detergent means. This allows for increased safety and does not increase gut permeability, as is often seen with micellized preparations. Our research on the subject was presented to the American Society for Clinical Nutrition and published in the “American Journal of Clinical Nutrition.”

Our emulsified nutrients represent a more cost-effective means of delivering nutrients than micellized, dry, or oily preparations. Biotics Research also developed a drying process whereby the liquid emulsion can be added to tablets, capsules and powders in a dry form. This process increases stability and convenience, while still delivering increased uptake of fat-soluble nutrients. This was proven by a double-blind, placebo-controlled study that measured the blood uptake of Coenzyme Q10 after ingestion of supplements containing powdered Coenzyme Q10, or the emulsified form (CoQ-Zyme 30™ tablets) at a dose of 30 mg daily. The emulsified CoQ-Zyme 30™ tablets were shown to double blood levels, a feat not accomplished until 88 mg of powdered Coenzyme Q10 was ingested. Again, these results were presented in peer-reviewed scientific publications.

We should note here that Biotics Research introduced Coenzyme Q10 to the North American healthcare market. Our research into this amazing nutrient opened our eyes to its many benefits. We knew we had to make it available; but at the time, Coenzyme Q10 was not available as a raw material. The only way we were going to be able to provide it was to produce it ourselves, which we did! We extracted it from bovine heart muscle, the richest natural source of Coenzyme Q10. It took 4,000 pounds of tissue to yield one kilogram of Coenzyme Q10.

It is important to understand that emulsified nutrients are safely and more completely absorbed by people with gastrointestinal disorders and those with compromised digestion and absorption. As a result, lower doses of emulsified nutrients can be used, resulting in greater compliance and cost-effectiveness.
Emulsified vitamins are absorbed into the lymphatic system, rather than the portal system (as when fat-soluble nutrients are micellized). The lymphatic system normally handles fat absorption, and feeds the immune system directly. Emulsions are naturally found in mother’s milk, nuts and seeds. It is Nature’s way of storing fat and fat-soluble nutrients in our unrefined foodstuffs. Emulsions from Biotics Research are a perfect example of “The Best of Science and Nature.”

Vegetable Culture Product Base

One of the very first steps taken by Biotics Research was the development of our vegetable culture base to replace the usual and customary levels of inert fillers such as sugar, lactose and starch that were commonly used in the manufacture of nutritional supplements. Various plant-culturing techniques were developed, tested, and refined in order to improve the biological activity of potential product bases. After much effort, the vegetable culture base, produced from non-soy legumes, was developed. Harvested at specific stages, our vegetable culture base was found to exhibit ideal characteristics for use in nutritional supplements. The advantages offered by our “Vegetable Culture” base are numerous, and include the following:

• Biologically-active whole food in place of inert ingredients
• Improved and consistent dis-integration, for improved and consistent assimilation

Improved product stability by virtue of the antioxidant activity inherent in the Vegetable Culture

Acceptable by strict vegetarians and vegans

None of the adverse interactions commonly seen with other “fillers” such as lactose

Allows for tablet and capsule production without, or with only minimal use of, lubricants such as silicon dioxide

Proteolytic and Antioxidant Enzymes: Ensuring Stability and Potency

Stability can be a major problem with enzyme products. Upon actual assay, many products labeled to contain proteolytic or antioxidant enzyme activity were found to be sub-potent or completely devoid of activity. From these lessons, we learned to procure enzymes from only the most reputable of sources, and use state of the art in-house quality control to ensure enzyme activity in finished products. Smaller batches are produced on a more frequent basis in order to consistently provide fresh products. Although our approach is more complex, it results in products that are consistently of higher quality and reliability.

Vegetable Culture Minerals (Phytochemically Bound)

The next innovation to spring from the Vegetable Culture fountain was Vegetable Culture Trace Minerals. Known amounts of trace minerals molybdenum, vanadium, lithium, rubidium and germanium were first introduced to health care professionals as Biotics Research’s Vegetable Culture Minerals. In addition, chromium and selenium were also completely incorporated into the vegetable culture matrix, resulting in the first yeast-free organic forms of these important trace minerals. Vegetable Culture Minerals combine soluble forms of a particular mineral, with the vegetable culture cells. Again, conditions of environment and growth are carefully regulated, resulting in the uptake and incorporation by the plant cells, just like Mother Nature. Here you have another example of “The Best of Science and Nature.”

The Biotics Research Vegetable Culture Minerals are not to be confused with simply mixing inorganic forms of minerals with a foodstuff and then calling the mix an organic mineral chelate. Our Vegetable Culture Minerals are actually organically chelated or “Phytochemically Bound”. There are laboratory tests to prove this point. The advantages of trace minerals as Vegetable Culture Minerals include:

• Not a yeast source, avoiding potential problems associated with yeast
• Trace minerals are present in forms our bodies are designed to recognize and assimilate
• Organic mineral forms are tolerated better than inorganic forms
• Organic mineral forms are subject to less interaction with other minerals
• Lower doses may be necessary due to better assimilation

Clearly, having our own laboratory facilities and a research scientist on site was essential in the development of our Vegetable Culture processes.

Clinical Laboratory, Genetic Testing & Love Canal

In our early days, Biotics Research operated a clinical laboratory that analyzed blood and urine samples. We were one of the first laboratories to provide mineral analysis via hair. Most healthcare professionals today recognize
the benefit of mineral analysis from hair as a non-invasive test for signs of heavy metal toxicity.

In the late 1970s, Biotics Research operated a licensed clinical testing laboratory for genetic toxicology assessment. From a blood sample, white blood cells were cultured and their chromosomes examined under a high-powered photomicroscope. From the examination of the chromosomes, DNA damage could be measured. While this is a very common procedure in clinical and research labs today, in 1979 very few laboratories in the world were engaged in such tests. Biotics Research was clearly ahead of its time.

Biotics Research was contracted by the US Environmental Protection Agency (EPA) to perform a preliminary study on the residents of Love Canal in upstate New York. The neighborhood was built on a toxic waste site and the residents were having unusually high rates of stillbirths and congenital abnormalities in newborns, as well as other health problems. The residents associated their problems with a toxic waste dump below the community, and we were requested to provide an estimate of genetic damage to the residents in order to determine if extensive studies were necessary.

Serious evidence of genetic damage was identified in a large percentage of residents tested (11 of 36). Unfortunately, this was not the news authorities wanted to hear. Although they tried to refute our findings, ultimately they had to accept the evidence and relocate the residents of Love Canal. Love Canal became a symbol of citizens taking action against toxic chemical pollution, and ultimately led to the establishment of the EPA Superfund to clean up toxic waste sites.

**From Genetic Testing to Interferon**

An outgrowth of our genetic testing resulted in the development, production and sale by Biotics Research, of the first nutritional supplement to supply known, potent levels of interferon.

The ability to culture cells was derived from the genetic toxicology project, and was utilized to raise human fibroblasts (derived from established cell lines, not derived from fetuses). The scientists at Biotics Research believed the use of human cells was essential. In the early 1980s, interferon production was normally accomplished by adding viruses or viral extracts to cell cultures to induce interferon production. Not wanting to handle potentially pathogenic viruses, Biotics Research’s scientists devised a method to induce beta-interferon (now renamed interleukin-6) by adding nutrients that were unheard of at the time. Independent assays established the high level of beta-interferon produced by our cell culture methods.

The concept of oral administration of interferon, which was validated in animal experiments by leading veterinarian researchers, was diametrically opposed to the then-recent attempts by cancer researchers to treat human cancer patients with high doses of purified interferon. They were using doses that were over a million-fold of what the body normally produces. It is important to note, interferon is produced in minute quantities by the body, yet still able to exert powerful effects. Interestingly, excessive doses of interferon may not stimulate the immune system significantly, and may actually cause severe side effects.

Oral administration of Biotics Research’s interferon has been documented to deliver physiological doses to the most common target tissues: epithelial (mucus) membranes. However, a leading interferon researcher of the time petitioned the FDA to make interferon an Investigational New Drug. Though the FDA acknowledged that interferon was a normal bodily component (like proteolytic enzymes), we were forbidden by an injunction from continuing to produce or sell oral interferon.

**Neonatal Glandulars**

Biotics Research realized the importance of neonatal calf serum went beyond the culturing of lymphocytes. From our genetic toxicology work, we knew that neonatal tissues contained fetal growth factors that could keep normal adult cells alive in culture form. We also knew that European doctors, in efforts to restore health in humans, used “live cell therapy”, utilizing injections of fetal (almost neonatal) tissues from animals. We knew that glandular products were becoming increasingly popular with some Healthcare Professionals in the United States. Histological analysis of neonatal and adult glandular tissues documented the cleanliness and vibrant growth state of neonatal glandular tissues compared to normal, healthy adult gland tissue. Clearly, glandular products from neonatal bovine tissues represented a distinct improvement in quality, as compared with other products available.

The process of cryosolvation was developed at Biotics Research to preserve the attributes of neonatal glands and organs, resulting in materials suitable for solid dose production.
Because neonatal glands were relatively fat-free, harsh defatting procedures used by others in our industry were not necessary. Instead, a modest amount of a mild organic solvent found in our bodies is used to remove fats that could later oxidize, resulting in short shelf-life. Our method does not remove important biological compounds, like phospholipids. Additionally, low temperature drying preserves enzyme activities and conformation of the numerous metabolic intermediate compounds found in neonatal glands. The results are stable materials suitable for delivery in solid dose form, which preserves the essential qualities of neonatal glands.

**Chondro-Protection**

Another first from Biotics Research was the concept of Chondro-Protection via supplementation. In the early 1980s, at the request of a cutting-edge chiropractic physician, Biotics Research began researching glycosaminoglycans (GAGs). We soon focused on Chondroitin sulfates (CS), large, heterogeneous biological polymers used by the body to maintain proper elastic integrity within tissues. The chief GAG of cartilage is CS, a repeating disaccharide, specifically glucuronic acid and sulfated N-acetylg glucosamine.

Biotics Research learned that the benefits of CS were enormous. During the repair of injured connective tissue, CS synthesis precedes collagen synthesis and is essential for proper healing. Additionally, CS are structural components of vascular intima, giving strength and elasticity to blood vessels. The normal synthesis of CS can be inhibited by nutritional deficiencies, and by the use of anti-inflammatory drugs such as corticosteroids, salicylates, gold salts, ibuprofen, phenylbutazone and other NSAIDs. The benefits of chondroitin sulfate for patients with osteoarthritis has been well documented, as have the cardioprotective benefits.

Upon determining that high-quality chondroitin sulfates could be readily absorbed, Biotics Research determined to make Purified Chondroitin Sulfates available to its professional clientele as a dietary supplement. But again, the raw material was not commercially available at that time. As was the case with CoQ10, we would have to produce it ourselves, which we did. Today, chondro-protective products containing chondroitin sulfates and glucosamine are among the most commonly prescribed products in the industry. But, beware: all chondro-protective products are not created equal. Recent research suggests that a large percentage of glucosamine and chondroitin products available in the market today are not as potent as they claim. Biotics Research is the only professional company that has purified chondroitin sulfate as a raw material and has done clinical studies with chondroitin sulfate. Biotics Research uses only purified chondroitin sulfate from commercial sources that meet or exceed NIH standards of purity. With in-house laboratory capabilities, chondroprotective agents can be tested and released for manufacturing at Biotics Research. Many suppliers of chondroitin sulfate provide materials that assay at 30% purity compared to 100% purity. The result is that many products on the market do not meet label claim. Using standardized chondroprotective agents provides for repeatable clinical outcomes. At Biotics Research, our testing and manufacturing processes ensure safe and effective products of the highest quality and consistency.

**Phytochemistry and Quality Assurance Laboratory: An On-Site Advantage at Biotics Research**

Biotics Research is unique in the health product industry in that we have an on-site laboratory facility for phytochemistry research as well as a quality assurance program already in place to meet the upcoming changes in FDA regulations. In the phytochemistry lab, we analyze incoming botanicals for quality, purity, contamination, and potency; products which do not meet our standards are rejected and returned to the supplier, where they are often resold to other product manufacturers. Having laboratory facilities on-site allows us to constantly analyze and ensure the quality of the products that we make, thus ensuring our doctors and their patients of safety and potency.

Quality control and quality assurance programs are part of the corporate culture at Biotics Research. While many companies invest heavily into slick marketing, they often ignore the product. In the near future, many of these companies will face regulatory extinction because of their failure to invest in in-house quality control, research and development, and faculty development.

---

For additional information please contact us at:
Biotics Research Corporation
6801 Biotics Research Drive
Rosenberg TX 77471
(800) 231 - 5777
Email: biotics@bioticsresearch.com

Biotics Research Corporation
“The Best of Science and Nature”
www.bioticsresearch.com