

PRESS CONTACT: Jo Roberts  
JA&K Marketing for Dermazone Solutions  
O: 612-584-4312 • C: 612-799-4817 • [jroberts@jaandk.com](mailto:jroberts@jaandk.com)  
Full press kit at [www.dermazone.com/press](http://www.dermazone.com/press)

**Dermazone Solutions  
Nanotechnology Delivery System  
Lyphazome® Technology Backgrounder**

**Introduction**

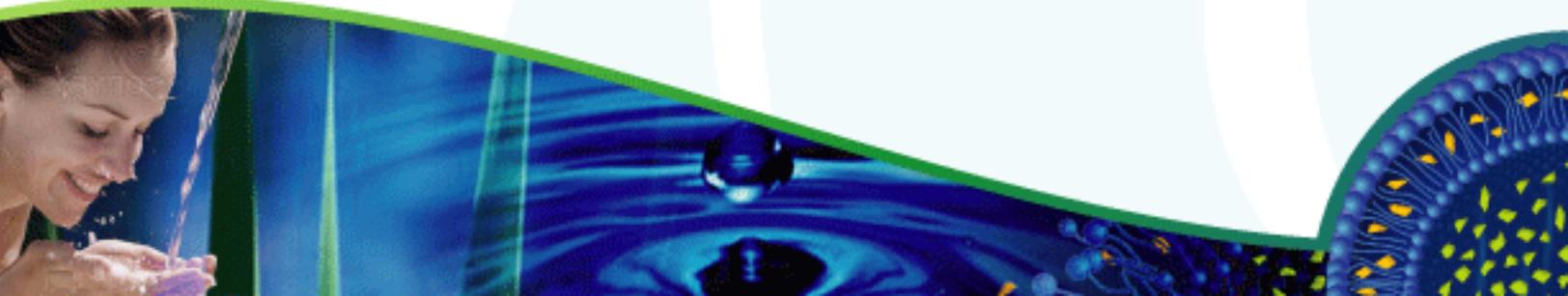
Cosmeceuticals are one of the fastest growing segments of the multi-billion dollar a year skincare market, with some industry forecasters predicting a market value of \$5 billion as early as 2007. With many companies—new and old alike—introducing dozens of new products every year, it is important to distinguish the characteristics that allow Dermazone’s products to stand out in this relatively new and vastly expanding field.

Two key factors differentiating Dermazone from other cosmeceutical manufacturers include the company’s patented nanotechnology encapsulation delivery system known as Lyphazome®, and the use of all-natural, food-grade, pharmaceutical-quality botanicals and bioactives. For 14 years this combination has proven to provide measurable benefits and therapeutic effects, in both clinical trials and real-world applications by medical professionals. For example, the company’s Lyphazome brand Penetrating Moisturizing Lotion demonstrated in a double-blind study to be as effective at improving plantar xerosis and hyperkeratosis (foot conditions often associated with diabetes and other circulatory illnesses) as "Lac-Hydrin," a 12 percent ammonium lactate lotion available by prescription only.

**Ingredient Delivery Systems: Encapsulation Makes a Difference**

The epidermis provides the human body with an extremely efficient protective barrier that keeps out harmful, unwanted substances while preventing significant loss of body fluid. This phenomenon means only the most well designed skincare lines can penetrate through the Stratum Corneum—the outermost layer of skin—to deliver therapeutic agents and natural bioactives to deeper epidermal layers and thus treat the skin in its entirety. Only when delivery systems work with the skin to correct and protect both the exposed surface and subsurface tissues can products provide long-term solutions rather than temporary improvements.

The majority of skincare products use non-encapsulation delivery methods, which rely on coating the outermost layer of the skin’s surface. Products “stick” based upon the chemical properties of individual ingredients and formulas. Though this method can provide effective protection from the elements, products easily wear- or wipe-off, requiring users to reapply frequently in order to maintain ingredient benefits. Ingredients that are able to sink deeper into the skin often provide little added benefit, because they are so small that the body absorbs them before these ingredients make an impact.



In recent years, however, increasing attention has been directed towards delivery systems that encapsulate ingredients within distribution vessels; since 1990 Dr. Michael Fountain, Dermazone's scientific advisor, has been at the forefront of this movement, having focused his research and development efforts on a nanotechnology encapsulation delivery method that time-releases ingredients deep within the epidermis. Only recently have additional companies begun work on creating products featuring various other encapsulation technologies used to release ingredients either on top of the skin or deeper beneath the skin's surface.

Encapsulation works by "packaging" ingredients into delivery vessels small enough to slip between the skin's natural protective barrier and thus provide longer lasting benefits. Depending upon their size, some encapsulators are known as nanospheres because they are measured on the nanometer—one-billionth of a meter—scale. Some encapsulation delivery systems activate ingredients immediately upon penetration, whereas others release over small or large time intervals. In addition, some manufacturers fabricate their encapsulators from synthetic ingredients or add detergents to product formulas; though this often results in a more stable product, synthetics and detergents can irritate the skin, or deteriorate upon entering the body, leaving an internal build-up of these man-made chemicals that can lead to negative long-term side effects. When featured in most products today, nanospheres usually make up a small percentage—less than one to three percent—of the over-all formula, with the remaining product devoted to non-encapsulated ingredients.

Dermazone's Lyphazome nanosphere encapsulators are composed of all-natural ingredients and carry the U.S. Food and Drug Administration's GRAS (Generally Regarded as Safe) designation. Dermazone products feature at least an 80 percent Lyphazome nanosphere concentration, at least a 75 times greater encapsulation concentration than comparable cosmeceutical products. This means that 80 percent of the ingredients contained in these products time-release deep within the epidermis, providing immediate *and* long-lasting benefits.

### **History: The Creation of Lyphazome Technology**

Dermazone Solutions' (formerly Fountain Pharmaceuticals) initial research on the treatment of deep scarring among burn victims yielded a need for a deep-penetrating delivery system with a consistent, sustained release of healing agents. The company focused its research on the topical application and improved delivery of encapsulated agents to the skin, with a particular emphasis on burn victims. The resulting outcome was Dermazone's patented Lyphazome nanotechnology delivery system. Lyphazome nanospheres, a fraction of the size of traditional liposomes, are small enough to penetrate into the inner epidermal layers, yet are large enough to neither be counterproductively absorbed by the body nor provide a risk of nanoparticle toxicity, a concern often associated with biochemical nanotechnology.

### **Technology in Action: Lyphazome Nanospheres**

The primary key to the effectiveness of any nanotechnology skincare system lies in the size of the product's nanosphere delivery vessels. To create Lyphazome nanospheres, Dermazone begins with a precursor material, nanosphere "building blocks" made of all-natural, plant-based phospholipids. These "building blocks" begin at 20 to 30 nanometers in size, or less than 100 billionths of a meter. Next, Dermazone loads these nanosphere "building blocks" with the appropriate all-natural, food-grade, pharmaceutical-quality bioactives and active ingredients required for a given product formula, as well as water for a sustained dose of hydration. These final, fully loaded nanospheres are 125 to 150 nanometers in radius, or

1/50<sup>th</sup> the size of a human skin cell. The resulting Lyphazome nanospheres are small enough to easily penetrate the skin's natural surface barrier, yet large enough to not be counterproductively absorbed by the body. Fourteen years of research and development determined this "perfect" nanosphere size, and Dermazone's continues research and development for new patent applications.

Dermazone products time release an 80 percent concentration of Lyphazomes deep into the epidermis, not just onto the skin's surface. Lyphazome nanospheres build up a reservoir within the stratum granulosum where they remain poised, much like "smart bombs," ready to penetrate deeper into the skin as needed over time—over eight hours or more. As they migrate through the deeper epidermis layers and further disperse, the nanospheres time-release their encapsulated ingredients, replenishing nutrients and sustaining moisture within the skin as they are naturally lost throughout the day. Once a Lyphazome® nanosphere releases its ingredients, the phospholipids that make up the nanosphere's structure form a matrix with cells to strengthen the skin's natural surface barrier. The remaining 20 percent non-encapsulated ingredients provide immediate surface benefits, acting like "breakfast for the skin," whereas time-released nanosphere-delivered ingredients provide nutrition throughout the day.

Lyphazome nanospheres therefore provide an advantage over competing encapsulation technologies based upon size, concentration, composition and performance.

- Size: Lyphazome nanospheres are 125 to 150 nanometers in radius—or 1/50<sup>th</sup> the size of a human skin cell—small enough to penetrate deep into the epidermis yet large enough to not be counterproductively absorbed by the body
- Concentration: Dermazone products feature at least an 80 percent concentration of Lyphazomes
- Composition: Dermazone uses only all-natural, food-grade, pharmaceutical-quality ingredients to create and load its Lyphazomes
- Performance: Once Lyphazome nanospheres penetrate the skin's outer layer, they create a repository of actives and moisture that release over time—eight hours or more—when and where the skin needs them, and once all ingredients are released, nanosphere "building blocks" form a matrix with cells to fortify the skin's natural protective barrier

### **Conclusion**

Through the combination of cutting-edge nanotechnology research and proven healing aids found in nature, Dermazone Solutions has produced a patented nanosphere delivery system—Lyphazome—unlike any other on the market today. Dermazone's Lyphazome nanosphere-infused products feature the "perfect size" nanosphere encapsulators, small enough to penetrate deep beneath the skin's surface while large enough to not be counterproductively absorbed by the body prior to full effectiveness. Lyphazome nanotechnology's superior ability to time-release potent all-natural, food-grade, pharmaceutical-quality bioactives and moisture within the epidermis differentiates the company's Lyphazome and Celazome® skincare lines from competing cosmeceutical products by not only treating surface conditions, but improving and strengthening the structure of the skin over time.