

# Introduction to **Digital Array Dispersion** and **Double Emulsion Technology** from **Elsom Research** Innovative Biotechnologies

Digital Array Dispersion (**DAD**) and Double Emulsion Technology (**DET**) are just two of the state-of-the-art innovations in skincare developed by Elsom Research and incorporated in our products. This document will give some basic information about how these technological advances help us create scientifically sound products designed to operate with your bodies natural processes to support and improve the health of your skin.

**Part I**      **What is Digital Array Dispersion?**  
(begins on page 2)

**Part II**     **What is Double Emulsion Technology?**  
(begins on page 4)

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## What is Digital Array Dispersion (DAD) Technology?

DAD technology utilizes an ultra-fast, deep-penetrating vehicle to deliver beneficial ingredients into the skin by topical application. The ingredients which are mobilized by DAD reach their end target in a formation which is readily available for efficient processing.

### Why is DAD Technology beneficial to skin?

DAD technology utilizes our state-of-the-art proprietary technology to create ultra-small emulsion particles. These particles facilitate penetration and absorption into the skin of beneficial ingredients. The individual particles of DAD which flow into the skin are grouped into an array of individual units. The array formation increases the concentration of beneficial ingredients at the desired location on the skin but does not clog skin pores. Since DAD ensures that no continuous greasy coating is formed on the skin, beneficial properties of essential oils and oil soluble ingredients become available without the common drawbacks associated with oil-based skin treatments.

### More Details?

#### The Structure of DAD Units

The basic DAD unit is a vehicle which is comprised of smaller sub-units joined together to form a ball shape. The basic DAD vehicle unit is very small. Vehicle size can reach the size of a Nanosome™, about 20 nanometers or smaller. The basic DAD unit comprises a single digit within the multitude of units comprising the digital array.

**The following illustration provides a general description of the basic DAD vehicle unit.**

### Digital Array Dispersion (DAD) Technology

The Basic DAD unit



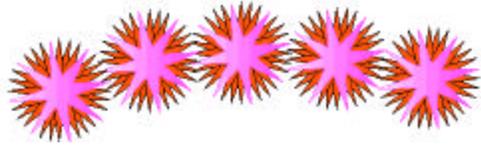
The basic DAD unit/digit is illustrated as a star-like ball. The rays within the star represent sub-units comprising the vehicle.

The basic DAD units can cling lightly to each other without actually merging with each other. A multitude of units clinging together comprises an array of such units. The clinging process is reversible and each unit maintains its individual characteristics even when clinging to other units. Since units cling and dissociate continuously, array groupings of several tens of units to several hundreds of units are always present in the formulations. Each unit is

thus a single and individual digit within the digital array. A digital array facilitates concentration of beneficial ingredients carried by the vehicles to their end target: the skin.

**The following illustration provides a general description of a digital array.**

### Digital Array Dispersion (DAD) Technology

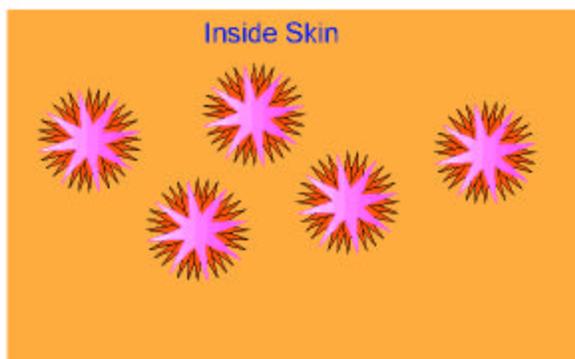


The basic DAD units/digits cling to each other to form a digital array of vehicles. Note that the digital array does not create a continuous layer of oil; instead, there is ample space between vehicles for air to pass through and healthy skin processes to continue undisturbed.

After entering the skin, the vehicles are exposed to a physiological environment which can trigger them to release each other, ending their clinging as a digital array. By releasing each other after having been arranged as a digital array at first contact with the skin, the vehicles in the skin can achieve a more even distribution of beneficial ingredients throughout the target area.

**The following illustration provides a general description of the DAD vehicles after entering the skin.**

### Digital Array Dispersion (DAD) Technology



The environment inside the skin allows the array of units/digits to dissociate and be distributed evenly at its target location.

## What is Double Emulsion Technology (DET)?

DET synergizes two of our other powerful skincare technologies, DAD and Nanosomes™, into an unbeatable combination.

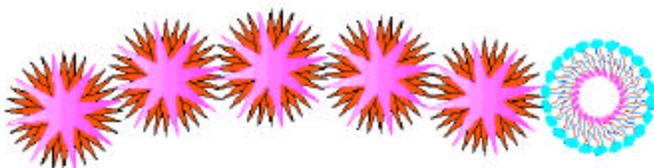
## How does Double Emulsion Technology (DET) relate to Digital Array Dispersion (DAD) and Nanosomes™?

DAD and Nanosomes™ are both effective means of carrying nutrients to the skin. When performance of DAD vehicles is compared with that of Nanosomes™, DAD vehicles have excellent penetration into the skin, while Nanosomes™ are particularly good at passing through oil and water barriers. DAD vehicles can carry larger loads of oil-soluble materials than water-soluble materials. Though both Nanosomes™ and DAD vehicles can deliver materials to and remove material from their inside skin targets, their mechanisms of delivery and removal are different from each other. Formulating both Nanosomes™ and DAD vehicles in a special preparation provides the most advanced and powerful delivery system for topical applications: **Double Emulsion Technology (DET)**.

Since Nanosomes™ too, can reversibly cling to DAD vehicles, Nanosomes™ can act as path-finders or as “locomotives”, facilitating penetration of cargo carried by DAD vehicles as described in the following illustration.

### DET Technology

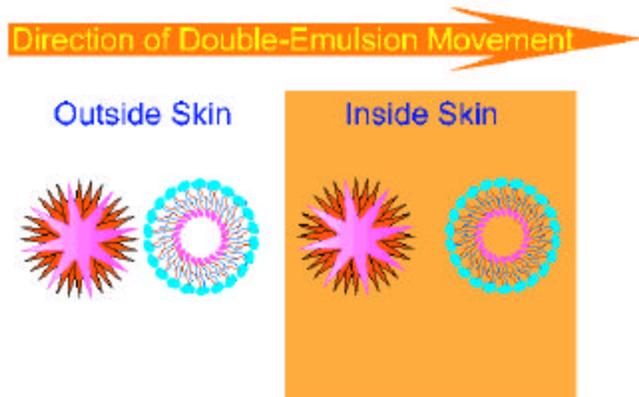
#### Interactions Between Nanosomes and DAD



The Nanosomes™ act as locomotives or path-finders; synergistically, Nanosomes™ and DAD vehicles facilitate their respective properties in penetration into the skin, and carrying and concentrating beneficial ingredients in the skin.

As in DAD technology, in the skin, Nanosomes™ and DAD vehicles combined with DET can release each other for consistent discharge and distribution of beneficial ingredients, as can be viewed in the following illustration.

## Double-Emulsion Technology (DET)



This illustration describes the DET movement that distributes DAD vehicles and Nanosomes™. The illustration compares movement of DAD vehicles and Nanosomes™ toward the skin and after entering the skin where they can release each other.

## Conclusion

This has been an introduction to just a few of the important breakthroughs in skincare developed by Elsom Research. We hope you find it informative, and that you will enjoy using our products.

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