

# Breakthrough is achieved by thinking out of the box

## ● Nanocapsule Technology

In general, a spherical formulation with a particle size of several tens of nanometers (1 nm: 1 billionth of a meter) is called a nanocapsule. DDS (Drug Delivery System) technology aims at sustained release of drugs and tissue targeting by covering the phase containing drugs with synthetic polymer or natural polymer film. The nanoencapsulation technology Nanoegg developed adopts the inorganic coat called carbonate for the first time in history. The difference in drug encapsulation technology from other encapsulation technologies is that the drug inclusion concentration is extremely high at 99%, and it excels in solubility in vivo. In addition, there is the ease of production. We have already realized nanoencapsulation of retinoic acid (a physiologically active substance of vitamin A), which is known as a therapeutic drug component of skin regeneration, and other drugs for skin, too.



### Cases used to treat melasma

(Clinical studies at University of Tokyo Plastic Surgery Department, Professor Yoshimura's Group)

When NANOEGG® is used



Before use

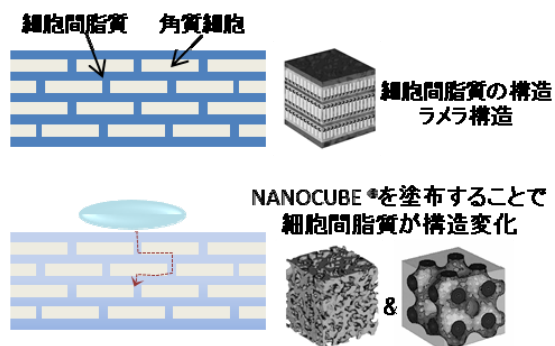
4 weeks later

8 weeks later

## ● Liquid Crystal

The outermost stratum corneum of the epidermis plays a barrier of protecting the skin and the body from physical and chemical influences. It is mainly composed of corneocytes and intercellular lipids. Intercellular lipids form a sandwich like layer where water and lipid alternate and this thin surface structure is lamellar structure in the skin.

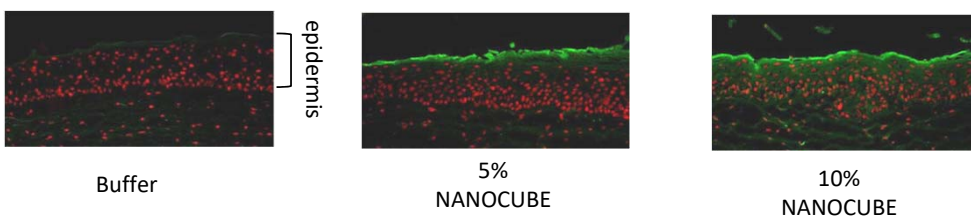
We focused on the specific structure of intercellular lipids and developed an external base that aims at improving skin regeneration and percutaneous absorption. This nanotechnology was also developed by us for the first time in history. By applying such DDS technology, we are pursuing research into next-generation medical treatment, such as replacing medication therapy that is being done by injection or dialysis with external medication so that treatment is less burdensome for the patients.



### Transdermal Delivery

Fluorescent labeled dextran was exposed to 3Dskin and its absorption state was observed.

Drug was absorbed by the stratum corneum by NANOCUBE, and concentration dependency of NANOCUBE was also confirmed.



Buffer

5%  
NANOCUBE

10%  
NANOCUBE