

Three Distinguishing Features of NEXGEN

The Innovative idea change leads the new paradigm of cosmetics

Smart phones are categorized as mobile phones but are called smart phone. This is because smart phones, which combine mobile phones and computers, are more than just advanced mobile phones. The smart phone is the innovative communication device that leads the world to a new paradigm. Like this, NEXGEN is categorized into cosmetics; however, biometrics is more appropriate for NEXGEN in that it has the features of medicines. It is highly likely that NEXGEN kicks off a new paradigm in the skin care area.

No Preservative and sterilization processing

Why without artificial preserving and why packing product for a single use?

NEXGEN never uses any kinds of preservatives. This is their first distinguishing virtue compared to other cosmetics. Once you open a lid of container, you usually use it for months and during this time, the contents can be contaminated by microorganisms. To avoid contamination, preservatives are used in cosmetics to inhibit proliferation of microorganisms. In fact, preservatives are toxic substances. When cosmetic preservatives are tested for

toxicity on fish, they kill small fish within 5 seconds. The danger of cosmetics preservatives, however, tends to be ignored while many precautions have been taken against food preservatives regardless of the fact that both the food and the cosmetics preservatives are equally harmful. In this regard, NEXGEN cosmetics have an unparalleled advantage. For the last 30 years, tremendous new materials and formulations have been introduced in the world of cosmetics, but the perfectly sterilized cosmetics without the preservatives were first developed by NEXGEN in 2011.

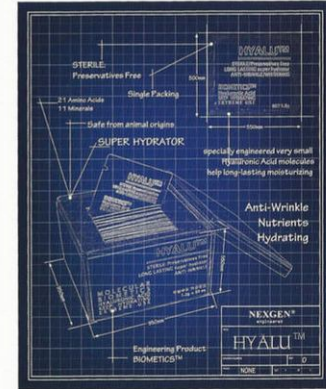
What if the product is perfectly sterilized in the production process but contaminated while

customers are using it? If so, it would become no more than another flawed product. How is NEXGEN preventing this problem? The best and certain way of not using the preservatives in the cosmetics is to use all the product contents in a package at once. NEXGEN thoroughly gets rid of germs that proliferate in the production process and packs the product for a single use. Here, sterilization is the key process of finishing the preservative-free cosmetics.

Is an organic cosmetic better for skin as organic food is better for body? The answer is no. Organic cosmetics use plants that are raised organically without pesticides. Unless we stop using preservatives, using organic ingredients is not enough to be good for skin. Organic cosmetics are made with organic plant extract and plant extracts are basically industrial product, which cannot be distributed without preservatives.

What would happen if spinach soup, whose main ingredient, spinach, is a plant extract, is distributed on a plane? It will spoil soon.

Those who have used cosmetics for long do not know what their true skins are like since they have been under the influence of preservatives



all the time. When they throw away all the cosmetics they have, they will see their genuine skin. NEXGEN's sterilized, preservative-free cosmetics can recover the bad effect of the cosmetics preservatives. The recovery effectiveness of the NEXGEN cosmetics has been guaranteed by customers in the market.

Natural plant extracts 0% Why do the plant engineers reject the plant extracts?



The second outstanding feature of NEXGEN is that they never use natural plant extracts at all. NEXGEN specializes in the plant biotechnology. To illustrate more, Research and Development Company focuses on creating recombinant human proteins from plant protein. NEXGEN is a group of plant engineers. Then, why do those who are well aware of the nature of the plants exclude the plant extracts? The plants are usually perceived as 'mild', 'fresh', 'beautiful', and 'healthy' image. However, the plants might be the most firm organism in the world. Human beings cannot stand still on the spot for even 10 minutes; contrarily, plants stay in the same place for centuries. Because plants are not able to move, they cre-

ate enormous self-defense substances to protect themselves against other living organisms and harsh natural environment. Some of these substances can be beneficial for human beings; however, there are adverse effects (side effects) as well. For instance, bracken is a favored food ingredient in Korea, but actually it is not edible unless it is put in water for some time before cooking due to its toxicity. Plant extracts have potential dangers all the time.

The problem is that we are not able to know the component composition of the cosmetics. Sugar water is made up of sugar and water only and salt water is of salt and water. Unlike sugar water and salt water, the component composition of the aloe extracts is not clear. What kinds of amino acid and how much of it is contained, and what metallic ion concentration is in it. It is not known for anybody and even for the cosmetics manufacturers using the aloe extracts. Spinach soup is spinach extract and seaweed soup is seaweed extract, and of course, we never know what composes them and how its components are organized. This is why NEXGEN refuses to use plant extracts. It is likely that the NEXGEN cosmetics

may be the only cosmetics company that does not include plant extracts in its products. Instead of unreliable plant extracts, NEXGEN chooses materials whose components are clearly known – artificial cell sap, which is the cell where vitamin, amino acid, and mineral are artificially constructed. SunKyo Lee, the CEO of NEXGEN, points out that flowers are beautiful but putting powdered flowers on a face does not make it bloom as beautifully as a flower. Biologically, the beauty is just the means of survival for a flower.

Regardless of great scientific developments, the skin care area is still approached with the old paradigm, emotion. NEXGEN insists that the paradigm should change from science to smart science.

Self-production of growth factor protein

How NEXGEN can use enough growth factor protein for the effectiveness?

The third feature is that NEXGEN develops and produces recombinant proteins such as growth factor proteins, which have recently been recognized as the next generation's new

materials for cosmetics.

Three years ago, retinol was the only new material for cosmetics. At that time, NEXGEN, the company developing and producing proteins for medical purposes, commercialized 20 kinds of growth factor proteins and by doing so, entered into the cosmetics market.

The growth factor protein, which improves skin elasticity and triggers cell division, is traded with a highly expensive price. In cases of EGF (Epidermal Growth Factor) and IGF (Insulin like Growth Factor), which are favored for high-functional cosmetics, cost \$40,000 and \$90,000 per 1g respectively. The price of growth factor proteins can be a burden for makeup companies to use in practice. In other words, the cosmetics companies cannot afford the sufficient amount of growth factor proteins. NEXGEN, however, can use growth factor proteins at cost with the advantage of self-production. This means that NEXGEN meets the qualification to put the growth factor proteins into practical use, which will result in high effectiveness. 🌸

For medical Care, not only for skin care!

'Innovation', this key word has presented with functional cosmetics in Skin care market by NEXGEN Biotech where has developed 20 kinds of growth factor protein(EGF). The company has vision which the cosmetic will be a one of medicine with the high concentration of antiaging function.

This article will show the potential for medical care with latest resilient material will soon be showcasing a spider fiber protein, stable EGF and new material which is planning and development.

60 kinds of Special care product in cosmetic

NEXGEN Biotech is the company which looks quite far away from cosmetic industry. After established in 1999, the company has concentrated R&D of recombinant protein which is contained in medicine. Especially, NEXGEN Biotech has global reputation about 'Plant Molecular Farming' which can makes human protein.

NEXGEN Biotech has launched cosmetic business when the company supply 'Growth factor protein' to cosmetic large company 4years ago. In 2009, cosmetic development and manufacturing have started and they joined cosmetic industry. Today, NEXGEN

Biotech has produced 60 kinds of special care for improvement of extremely dry skin, anti-wrinkle, obesity, hair care and skin trouble. These are specially made for skin care shop.

A Preservative-free, sterilized product, natural plant extracts 0% and self-production of growth factor protein are NEXGEN Biotech's unique features and benefits of the product and it provides high performed cosmetics.

Spider fiber protein of latest resilient material

There are more than 20 kinds of cosmetics which has contained 'Growth factor pro-



tein' of new material by NEXGEN biotech. Among the most important one is EGF : Cell regeneration and Anti-aging (Epidermal Growth Factor) and IGF : Cell regeneration, Anti-aging and Hair growth (Insulin-like Growth Factor).

There are completed proteins for R&D. One is the 'Spider Fiber' which is artificial spider silk. A new resilient material had not developed while the collagen and elastin that is used as a long elastic material.

For this reason, NEXGEN Biotech has been

to develop a spider fiber protein which can be used for a new resilient material instead of the collagen and elastin. It is unlikely that the mass gathering spider fiber, one would instead develop an artificial spider fiber.

Two kinds of EGF which improve stability has developed and is finished to the registration of parent. EGF looks great effect on cell regeneration and elasticity is restored newly-developed because there was less reliable with circulation period at room temperature. Current Spider Fiber protein and

improved stable EGF and Spider Venom protein which can be alternative to Botox, Green fluorescent protein(GFP) derived from jellyfish and EGF production in plants has developed.

The cosmetic can be an applying medicine.

‘Innovation’ is the key word for NEXGEN Biotech which has launched skin care industry with functional products. Hopefully, cosmetic industry platform will be changed by NEXGEN Biotech.

The ultimate goal is aging management that ‘To keep the young state for a long time through an applying cosmetic’. They are looking for ways to maintain a youthful with development of new materials and are focused on aging management.

Although NEXGEN Biotech designed skin care project for cosmetic, they expect it will be reached to medical care. They assume that cosmetic will be consistent with medicinal materials and it will be alternative applying medicine.

Excellent functional cosmetics may have

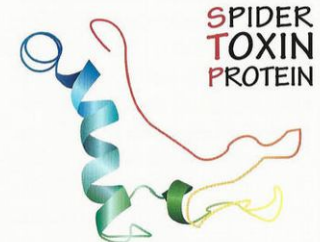
perhaps already climbed to the rank of medicines. Some cosmetics which is all easily accessible will be able to use for medicine when people goes to the hospital difficult, suffering and costly process. 🍄



Various proteins that are used in high-performance cosmetics

Growth Factor	
hEGF	Synthetic Human Epidermal Growth Factor
KGF	Synthetic Human Keratinocyte Growth Factor
aFGF	Synthetic Human Acidic Fibroblast Growth Factor
bFGF	Synthetic Human Basic Fibroblast Growth Factor
IGF-1	Synthetic Human Insulin Like Growth Factor 1
IGF-2	Synthetic Human Insulin Like Growth Factor 2
bNGF	Synthetic Human Nerve Growth Factor-beta
CTGF	Synthetic Human Connective Tissue Growth Factor
GD11	Synthetic Human Growth/Differentiation factor 11
GH	Synthetic Human Growth Hormone
IL-2	Synthetic Human Interleukin-2
NOC	Synthetic Human Noggin
PDGF-BB	Synthetic Human Platelet-Derived Growth Factor BB
VEGF121	Synthetic Human Vascular Endothelial Cell Growth Factor
TGF-alpha	Synthetic Human Transforming Growth Factor alpha
TGF-beta	Synthetic Human Transforming Growth Factor beta
SCF	Synthetic Human Stem Cell Factor
THY-b4	Synthetic Human Thymosin Beta-4
PRX1	Synthetic Human Peroxiredoxin 1
PRX2	Synthetic Human Peroxiredoxin 2
SOD	Synthetic Human Superoxide Dismutase
TRX	Synthetic Human Thioredoxin

Skin Care	
SV	Recombinant Spider Toxin Protein
SFP	Spider Fiber Protein
GS	GH-SFP Hybrid Protein
ES	EGF-SFP Hybrid Protein
SE	SFP-EGF Hybrid Protein
HAS3	Hyaluronic Acid Synthase 3
Hag Fiber	Recombinant Hagfish Fiber
GFP	Jellyfish Green Fluorescent Protein
EGFGFP	EGF-GFP Hybrid Protein
GFPEGF	GFP-EGF Hybrid Protein
EG	EGF-GH Hybrid Protein
GE	GH-EGF Hybrid Protein
LIN	Synthetic Human LIN protein



Molecular Biometrics

The basic function of the cosmetics is moisturizing and nutrition. To give functionality such as anti-wrinkle, whitening, and UV block, the functional ingredients are added additionally. Generally, in addition to a functional single ingredient, numerous types of plant extracts are also used for the functionality.

The plants have a natural, environment-friendly, and safe meaning; however, plants actually cannot move from birth to death. Therefore, they produce many types of agonists to protect themselves from the temperature change or pathogens and insects. Mostly, these materials are to inhibit the other organisms, which threaten their own life. The identity of these materials is not known completely, and it may act as a toxic material to the human cell.

Also, when the plant extracts are used in the cosmetics, we might not know the types and contents of each ingredient included in the extracts, except that some volumes of certain plant extracts are used. The ingredient is a minimum unit using function, and since numerous ingredients are included in the plant extracts such as nutrients like proteins, amino

acids, minerals and the second metabolite like alkaloid materials, it is not proper that the plant extracts of the complex state are considered as an ingredient. If we don't know what kinds of the ingredients are contained, it is difficult to figure out the cause when the side effect occurs or the desired effect is not working. Therefore, high price cosmetic product which is hundreds of thousands of won per one cosmetic item could cause systemic problem of unidentified amount and ingredient through use of plant extracts.

Biometrics, NEXGEN Cosmetics

The NEXGEN cosmetic minimizes the stimulation of the skin cell, and at the same time, it maximizes the nutrition balance, using the artificial cellular liquid, adjusted with $\text{pH}7\pm 0.5$ of the neutral and 300 ± 20 mOsmol/Kg of the

osmotic pressure like the blood, and building similarly with the human cell such as 21 different amino acids, 12 different vitamins and 14 different minerals. Also it minimizes the side effect since the uncertain effect of extracts cannot be shown and exact amount of single ingredient of desired effect (e.g., whitening, Anti-wrinkle, moisturizing etc.) is used. The ingredient that function is not known is prohibited. If the existing cosmetic product is an analog product, of which the ingredients are not known, the NEXGEN product, quantifying right amount of only single ingredient, can be considered as a digital product.

NEXGEN cosmetics are mostly preservative-free, sterilized product which is non-existent case in the world. But complying special purpose of some product, there is least side effect preservative contained products. However, to maximize the effect of the active ingredient by compensating the reverse function of the preservative, it is designed to contain a very sufficient amount of the active ingredient. As the organic product was an alternative for the safe and environment-friendly agricultural product, the preservative-free, sterilized cosmetic can be used as an alternative as a real

organic cosmetic as a safe and environmental friendly product in the cosmetic industry. However, even if the ingredients of the existing organic cosmetic were produced with the pure organic substance, as the preservative for sterilization is added to the final products, it is difficult to call it an organic cosmetic. As there is an agricultural organic product, on which the agricultural pesticide has never been used, preservative-free, sterilization products of NEXGEN, on which the preservative have never been used, can be called real organic cosmetics. Like this, as NEXGEN cosmetic is an engineering product like the most advanced electronic product, well designed and engineered, the using of the plant extracts, which the ingredient, content and function are not known exactly, is excluded, any ingredient from the animal is not included, and it is safe from the transmission of the potential pathogen from the animal. Therefore, molecular cosmetics which all ingredients are known as single ingredient with quantitative calculation in molecular level, that is BIOMETICS which is differentiated from the existed concept of simple mixture COSMETICS. 🌱