CLINICAL TRIAL REPORT

PNK-16811-BC1R

A Clinical study of 'Dewy Fresh' for evaluating improvement of hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution, skin calming effect by temperature

Requested by : Cosmetic International Co., Ltd.

September 09, 2016

P&K 피부임상연구센타
Skin Research Center

Authentication

P&K Skin Research Center Co., Ltd. reports test result of "A Clinical study of 'Dewy Fresh' for evaluating improvement of hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution, skin calming effect by temperature" requested by Cosmetic International Co., Ltd. This clinical test was conducted in accordance with P&K Skin Research Center's SOP.

2016. 09. 09

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Final Report

Title of Study	A Clinical study of 'Dewy Fresh' for evaluating improvement of hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution, skin calming effect by temperature	
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Date of Report Completion	September 09, 2016	
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Contents

Conformation of Reliability Assurance----------5
Summary Report of the Test Result----------7
Research on the Actual Condition of Test Facilities----------12
1. Introduction and the Object of Study----------13
2. Test Product----------13
3. Selection of Subjects----------13
4. Visiting Schedules----------15
5. Test Methods----------15
6. Criteria of Evaluation----------18
7. Statistical Analysis----------19
8. Regulations and Others----------20
9. Results of Study----------21
10. Conclusion----------41
Reference----------43
Appendix 1. Information for Consent form----------44
Appendix 2. Informed Consent form----------47
Appendix 3. Subjects information----------48
Appendix 4. Measurement result of hydration on skin surface----------49
Appendix 5. Measurement result of skin texture----------50
Appendix 6. Measurement result of dead skin cells----------51
Appendix 7. Measurement result of the size of skin pore area----------52
Appendix 8. Measurement result of the number of skin pores----------53
Appendix 9. Measurement result of hydration in deeper skin layer----------54
Appendix 10. Measurement result of TEWL(Trans-Epidermal Water Loss)----------55
Appendix 11. Measurement result of elasticity on skin surface----------56
Appendix 12. Measurement result of elasticity in deeper skin layer----------57
Appendix 13. Measurement result of skin restitution----------58
Appendix 14. Measurement result of skin calming effect----------59
Appendix 15. Result of Global Assessment of Efficacy----------60
Appendix 16. Result of Product preference survey----------62
Appendix 17. Pictures of Skin texture----------64
Appendix 18. Pictures of Dead skin cells----------72
Appendix 19. Pictures of Skin pores----------78
Appendix 20. Pictures of Skin calming effect----------85
Researcher Profile----------91
Accomplishment of Chief Researcher----------99

P&K Skin Research Center

Conformation of Reliability Assurance

No.	PNK-16811-BC1R	Version No.	Ver. 1.0
Study title	A Clinical study of 'Dewy Fresh' for evaluating improvement of hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution, skin calming effect by temperature		
	Duration	August 11, 2016 ~ August 26, 2016	

1. Following basic documentations stored? (Able to check multiple)

■ Study protocol ■ CRF ■ Informed consent ■ Contract

■ Researcher profile ■ Subject ID Number ■ Subject selection record ■ Subject registration record

■ Information for subject informed consent ■ Subject compensation standard

■ Delegation Log ☐ Report of SEA ☐ Blind release

2. Study summary

	Subject number				Content
Planned	20 people				Protocol planned number
Screened	21 people				Screened and selected subject before study initiation
Enrolled/Run-In (Enrolled= Dropped+ Ongoing+Completed)	21 people				Enrolled and participated subject with Subject ID number distribution
Dropped (Total)	1 people				Early dropped subject
Dropped number by reason	Withdrawn	Follow-up fail	AE/SAE	Etc.	Dropped(Total) = Withdrawn+ Follow-up fail + AE/SAE + Etc
	1				
Completed	20 people				Test completed number

3. Did the study processed according to the study protocol?

■Yes ☐ No ☐ N/A

4. Has any documents been changed?

☐ Yes ■ No ☐ N/A

(If 'Yes' :)

5. Did the study processed according to the Standard of operation procedures?

■ Yes ☐ No ☐ N/A

6. Following items of subject information reported in Case Report Form (CRF)?

■ Subject Initial ■ Date of birth ■ Subject identification number

■ Gender ■ Age

7. Did all subjects sign and write date by own in the informed consent form?

■ Yes □ No

8. Any informed consent signed by subject representative?

□ Yes ■ No (If yes _____ times)

* Reason for representative agreement

_____

9. Any copy of informed consent provided to subject or subject representative?

■ Yes □ No

10. Any documents such as data and CRF stored separately?

■ Yes □ No

11. Any adverse event or specified changes occurred?

If yes, please summarize and hand in as Appendix.

□ Yes ■ No

12. Any case of subject complain?

If yes, please summarize and hand in as Appendix.

□ Yes ■ No

<Results>

This clinical test was conducted in accordance with P&K Skin Research Center's SOP.

Also it has been confirmed by the person in quality assurance and submitted to chief researcher.

Date : September 09, 2016

Quality assurance : Jin Hee Shin (sign)

Chief researcher : Beom Joon Kim (sign)

Summary Report of Clinical Study

Subject of Study	A Clinical study of 'Dewy Fresh' for evaluating improvement of hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution, skin calming effect by temperature		
Research Facility	P&K Skin Research Center Co., Ltd	Test Number	PNK-16811-BC1R
Duration of Study	August 11, 2016 ~ August 26, 2016		
Test Product	Dewy Fresh		
Object of Study	This study was conducted to verify the efficacy of Dewy Fresh for evaluating improvement of hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution, skin calming effect by temperature		
Subjects of Study	Females aged 20 to 55 who have included from Selection Criteria of Subjects and excluded from Exclusion Criteria of Subjects		
Number of Subjects	Subjects who participated in this clinical study were total of 21. Since 1 subject was withdrawn, total 20 subjects terminated the study.		
Selection Criteria of Subjects	Selection criteria are as following: 1. Females aged 20 to 55. 2. Subjects who have signed consent form voluntarily after being informed well of object of study and all related contents 3. Subjects who do not have acute or chronic disease including skin ailments 4. Subjects who can be observed and traced for all the experiment period		
Exclusion Criteria of Subjects	Exclusion criteria are any of as following: 1. Subjects who did not want to, or did not fill in Consent form. 2. Subjects who have mental illness. 3. Subjects who have infectious skin diseases. 4. Subjects who have had immuno-suppresive treatment within 3 months. 5. Subjects who have had a steroid treatment or light treatment within 1 month. 6. Subjects who are inappropriate for measurement in the test area.		

	7. Subjects who have atopic dermatitis. 8. Subjects who have systemic allergies or hypersensitivity to cosmetics, to drugs, or to sunlight. 9. Subjects who have had skin scaling or therapy within 3 months. 10. Any Subjects who are considered to be inappropriate to participate in the study by the researcher
Methods of Study	1. Method of Study Subjects, who are satisfied with selection criteria and not satisfied with any of exclusion criteria and agreed with study, apply test product for 2 weeks. Test area was measured before, immediately after and 2 weeks after test product use. As test completed, Global assessment of efficacy and product preference were surveyed from subjects. 2. Evaluation lists 1) Equipment evaluations - Hydration measurement on skin surface : Corneometer - Skin texture measurement : PRIMOS premium - Dead skin cell measurement : Visioscan VC98 - Skin pore measurement(size, number) : Visioface - Hydration measurement in deeper skin layer : Compact D - TEWL(Trans-Epidermal Water Loss) : Vapometer - Elasticity measurement on skin surface : Cutometer - Elasticity measurement in deeper skin layer : Dermal Torque Meter - Skin restitution measurement : Ballisto Meter - Skin calming measurement : Thermo-graphic camera 2) Global Assessment of Efficacy : From subjects 3) Safety evaluation On each visit, researcher evaluates comprehensively taking into consideration the results of visual evaluation and safety questionnaire. 3. Other inquiries 1) Demographic information : Sex, date of birth, age before the clinical study. 2) Vital sign survey : Visual assessment before the clinical study. 3) Medical history : Main symptom, initiation date of disease, test and treatment history. 4) Survey : Product preference was surveyed from subjects.

	4. Visiting schedule : Visiting Twice 1) Visit 1 : Subject consent form, inclusion and exclusion of subjects, skin measurement before and immediately after test product use, test product distribution. 2) Visit 2 : Adverse event check, skin measurement 2 weeks after test product use, surveys.
Primary outcome measures	Evaluation results of hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution, skin calming effect by temperature before and after product use.
Secondary outcome measures	Results of Global Assessment of Efficacy.
Safety Evaluation	Any adverse event occurred after test product use is evaluated.
Results of Study	This clinical study was processed with females who are 20~55 years and satisfied with selection criteria and not satisfied with any of exclusion criteria and agreed with study. Subjects applied test product for 2 weeks. To evaluate skin calming effect of test product, subjects were divided into 2 groups(test, control). Then, skin temperature was measured before, immediately after heating and immediately after test product use. Hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer and skin restitution were measured before and 2 weeks after test product use. Hydration on skin surface, skin texture, dead skin cells and skin pores(size, number) were measured before, immediately after and 2 weeks after test product use. After test completion, all subjects were surveyed about test product. 1) Total 20 subjects who participated in and finished this clinical study were females and the averaged age was 41.30 years. Since 1 subject was withdrawn, total 20 subjects terminated study. Selected subjects did not show any adverse effects nor any medical or drug history that might affect the study. 2) As a result of hydration measurement on skin surface, the value significantly increased($p<0.05$) at immediately after and 2 weeks after test product use.

	3) As a result of skin texture measurement, the value significantly decreased(p<0.025) at immediately after and 2 weeks after test product use. 4) As a result of dead skin cell measurement, the value significantly decreased(p<0.05) at immediately after and 2 weeks after test product use. 5) As a result of skin pore measurement, the size of skin pore area significantly decreased(p<0.025) at immediately after and 2 weeks after test product use. Additionally, the number of skin pore significantly decreased(p<0.025) at immediately after and 2 weeks after test product use. 6) As a result of hydration measurement in deeper skin layer, the value significantly increased(p<0.05) at 2 weeks after test product use. 7) As a result of TEWL measurement, the value did not show significant difference at 2 weeks after test product use. 8) As a result of elasticity measurement on skin surface, the value significantly increased(p<0.05) at 2 weeks after test product use. 9) As a result of elasticity measurement in deeper skin layer, the value significantly increased(p<0.05) at 2 weeks after test product use. 10) As a result of skin restitution measurement, the value significantly increased(p<0.05) at 2 weeks after test product use. 11) As a result of skin calming effect measurement, the value significantly decreased(p<0.05) at immediately after test product use compared to control 12) As a result of Global Assessment of Efficacy, 100% of subjects answered more than ‘Moderate’ about improvement effect about droopy skin pores, skin elasticity of cheek, skin texture, TEWL(trans-epidermal water loss) and skin calming effect, and skin hydration persistency. 95.0% of subjects answered more than ‘Moderate’ about improvement effect about elasticity in deeper skin layer and elasticity on skin

	surface, and dead skin cells. 13) There was no report about adverse effect by subjects during the application period of test product. There was no skin abnormality in physical examination. **Therefore, the test product "Dewy Fresh" is considered to help improving** *** hydration on skin surface, skin texture, dead skin cells and skin pore decrease(size, number) after 2 weeks use including immediate effect** *** hydration in deeper skin layer, elasticity on skin surface, elasticity in deeper skin layer and skin restitution after 2 weeks use** *** skin calming effect by temperature after one application**

Research on the Actual Condition of Test Facilities

Research Center	Name: P&K Skin Research Center Co., Ltd
	Address: (Education Facility Association Building, Yeouido-dong) 4th, National assembly street 62-gil 25, Yeongdeungpo-gu, Seoul, Korea
	President: Jin O Park (sign) 
	Tel :☎ 02-6925-1501~3, (Fax) 02-6925-1504
Object of Establishment	This research center was founded for accomplishing clinical study of cosmetics or quasi-drugs such as safety, moisturizing effect, acne improvement, elimination effect of dead skin cell, whitening effect, wrinkle improvement, and sun protection. Through these scientific evaluations, P&K Skin Research Center provides its clinical study reports and all its related technical information to the requester.
Study Item	Efficacy Evaluation & Study of Cosmetics. Safety Test & Study of Cosmetics. Efficacy Evaluation & Study of Functional Cosmetics. Evaluation & Study of quasi-drugs
Chief Researcher	P&K Skin Research Center Co., Ltd Chung-Ang University Hospital Dermatology Department Beom Joon Kim (sign) 
Researcher	Jin Hee Shin, A Reum Kim, Tae Ji Lee, In Ah Kim, Eun Ji Lim, Yoon Hee Kim, Cho Rong Seo, Min Hye Park, Eun Kyung Lee, Go Eun Gu, Eun Seo Beak, Ji Yoon Han, Su Yeon Kim, So Jin Jeon, Ju Hee Kang
Main facilities and Equipments	Multi Probe-Adaptor MPA5, MPA5 Data recorder, Sebumeter SM815, corneometer probe CM825, Skin-pH meter probe PH905, Skin-Thermometer probe ST500, Mexameter MX18, Sensor for Room Condition RHT100, Delfin VapoMeter, Skin Visiometer SV600, Skin Visiometer VC98, Skin Visiometer VD300, Skin Visiometer data recorder, Visoface Quick, Digital clinical thermometer, Digital Moisture Measurement Instruments,, Chromameter CR400, Multiport Solar Simulator 601-300W, Xenon Lamp Power Supply, Adjustable Multiport Column, Electric Lift, Special Chair, Radio meter PMA2100, UVA Detector PMA2113, SUVDetector PMA2103, Micropipette, Chemical Balance, Timer, Whirl pool system, Folliscope 4.0, Digital Camera, Tripod, Face Fixing Frame Set (A), Face Fixing Frame Set (B), Scopeman, Thermo-hygrostat STHC-MB, Photographing System, Whitening Evaluation Lab, Anti-Wrinkle Evaluation Lab, SPF Evaluation Lab, PFA Evaluation Lab, Moisture Evaluation Lab, Hair Evaluation Lab, Cleansing Room, Waterproof System room, Shower room, Fomex D400(SS-B), Canon EOS 550D, SkinScanner-DUB®

1. Introduction and the Object of study

This clinical study was processed with adult women who are aged 20~55 years and have informed about test and signed the consent form voluntarily to evaluate safety and efficacy of test product. Test product “Dewy Fresh” was provided by the requester, Cosmetic International Co.,Ltd.

Hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution, skin calming effect were measured before and after product use. After study termination, Global Assessment Efficacy and product preference survey were also evaluated.

2. Test product

2-1. Product used in clinical study

<Table 1. Product information>

Product Name	Product No.	Product Type
Dewy Fresh	16811-BC1-S1	A stick type mist spray

2-2. Test product provision

The test product was provided by Cosmetic International Co., Ltd. They were labelled with test number, subject number, product name, manufacturer, and storage method.

2-3. Test product directions to use

- Test product will be used 10 times a day.
- Open the cover and fill it with tap water. Press power button to operate it(20 minutes) with the distance of 5cm from the face.

2-4. Test product storage

The test products are sealed and stored in room temperature.

3. Selection of Subjects

Adults who are satisfied with selection criteria without any of exclusion criteria.

3-1. Inclusion criteria

- Females aged 20 to 55.
- Subjects who have signed consent form voluntarily after being informed well of object of study and all related contents.
- Subjects who do not have acute or chronic disease including skin ailments.
- Subjects who can be observed and traced for all the experiment period.

3-2. Exclusion criteria

- Subjects who did not want to, or did not fill in Consent form.
- Subjects who have mental illness.
- Subjects who have infectious skin diseases.
- Subjects who have had immuno-suppresive treatment within 3 months.
- Subjects who have had a steroid treatment or light treatment within 1 month.
- Subjects who are inappropriate for measurement in the test area.
- Subjects who have atopic dermatitis.
- Subjects who have systemic allergies or hypersensitivity to cosmetics, to drugs, or to sunlight.
- Subjects who have had skin scaling or therapy within 3 months.
- Any individuals who are considered to be inappropriate to participate in the study by the researcher.

3-3. Withdraw criteria

Subjects with any of following cases have withdrawn from the study even after subject agreed to participated.

- Subjects who are willing to discontinue the study.
- Subjects who are with serious adverse effect or who want to discontinue the study because of adverse effect such as erythema.
- Subjects who have hypersensitivity due to the test product.
- Subjects who have to stop using test product due to other disease.
- Other unavoidable circumstances.
- Subjects who do not follow the study processes.
- Subjects who were failed to be traced during study period.

3-4. Number of Subjects

Subjects who participated in this clinical study were total of 21. Since 1 subject was withdrawn, total 20 subjects terminated the study.

4. Visiting schedules

4-1. Visit 1 (Screening, subject selections and skin measurement)

Subjects, who were informed about study and agreed to sign the agreement, had following processes: demographic survey, checking the inclusion/exclusion criteria, checking medical or treatment history, Measurement of hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution, skin calming effect were performed before and immediately after test product use according to test items.

4-2. Visit 2 (Skin measurement and survey)

Any adverse effects or medical history were checked since Visit 1. Measurement of hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution were performed 2 weeks after test product. Global assessment of efficacy, safety evaluation and product preference survey were evaluated at the end.

5. Test methods

5-1. Test area and method

Subjects rested in 20~25℃ and 40~60% humidity area for 30 minutes after washing out the test areas. It was to accommodate in atmosphere before the equipment evaluation and as subjects rest the water intake was limited. Only one researcher measured for objective measurement and measured the same area in each measurement time.

5-2. Hydration measurement on skin surface

Skin hydration level on skin surface was evaluated on cheek using Corneometer CM825 (Courage-Khazaka electronic GmbH, Germany). The Corneometer probe was contacted to skin, measuring through the sensor, 3 times and averaged value was used as skin hydration data. Corneometer measures the capacitance where the probe contacts to measure water content and present excellent result value in dry skin with small water content. It is possible to measure the water content uniformly 30~40 micrometer under corneum layers where effects of cosmetics or medications are small. The unit is A.U. and the value is proportional to skin

hydration amount.

5-3. Skin texture measurement

Skin texture was evaluated as 3D images using PRIMOS Premium (GFMessetechnik GmbH). Skin texture was measured on the same area of cheek, before and after product use. the stored image was analyzed as skin texture parameter Ra(Average roughness). Ra value is disproportional to skin texture improvement.

5-4. Dead skin cell measurement

Dead skin cells are measured from test area using Visioscan VC98 (Courage-Khazaka eletronic GmbH, Germany). Dead skin cells were obtained with special films (Corneofix) first, then image were photographed by Visioscan VC98 to present D.I (Desquamation Index) values for further evaluations.

$$\text{D.I}=\frac{2A+\sum_{n=1}^{5} Tn^{*}(n-1)}{6}$$

D.I : The Desquamation Index (%)

A : The percent area covered by corneocytes

Tn : The percentage of corneocytes in relation to thickness

n : The thickness level (1-5)

5-5. Skin pore measurement

Skin pores were measured in cheek area by Visioface Quick (Courage-Khazaka eletronic GmbH, Germany). The measurement was evaluated based on the photographed pictures and pores counting for further evaluations. From the photographed images, the green marks represent normal sized pores and the red marks represent large sized pores. Therefore, the fewer number and size of red marks mean the number and size reduction of pores.

5-6. Hydration measurement in deeper skin layer

Hydration in deeper skin layer was measured around cheek using MoistureMeter D Compact(Delfin Technologies Ltd, Finland). The evaluation value was measured by laser and the unit is '%'(0~100). The value indicates skin hydration content in topical area and the measured value is proportional to hydration content.

MoistureMeter D Compact generalizes high frequency, low power electromagnetic wave(EM wave). This wave can be penetrated into skin tissue and translated into percentages.

5-7. TEWL(Trans-Epidermal Water Loss) measurement on skin surface

TEWL was measured using Vapometer(Delfin). It was measured once for 10 seconds. TEWL value represents the water loss of skin (g/h.m²) through the skin, which makes it possible to predict skin water retention capacity. The principle is Fick's laws of diffusion. TEWL also can be a index for skin water barrier function. The lower TEWL value means that skin is more healthier.

5-8. Elasticity measurement on skin surface

The skin elasticity was measured by Cutometer CM580(Courage-Khazaka eletronic GmbH, Germany). Skin was measured once and R2 value (skin re-deformation) was evaluated. R2 value is the general elasticity of skin and as close to 1, the skin is more elastic.

5-9. Elasticity measurement in deeper skin layer

The elasticity in deeper skin layer was measured on the same area of cheek around cheek bone area by Dermal Torque meter. Skin was measured in the same area before and after test product use. It was measured 3 times by contact and the averaged value was used as evaluation data. Ue/Ur was evaluated and used for elasticity evaluation in deeper skin layer.

5-10. Skin restitution measurement

Skin restitution was measured using Ballistometer which evaluates the skin flexibility and resilience of skin. The skin restitution was measured on the same area of cheek around cheek bone, before and after product use. It was measured 3 times by contacting Ballistometer probe directly on skin and the average was evaluated for data analysis. Skin restitution is measured as CoR(Coefficient of Restitution) and as the larger CoR value is, the more skin restitution exists.

5-11. Skin temperature measurement

Skin temperature was measured on the face by thermo-graphic camera T-250(FLIR Systems, USA). To maintain stable skin condition, subjects take a rest for 30 minutes. Then, IR was irradiated for 5 minutes in the distance of 30cm from subject’s face. Skin temperature was measured before, immediately after heating and immediately after test product use.

The averaged value of the measured area was used as evaluation data. Thermo-graphic camera (T-250) is high resolution infra-red thermo-graphic camera

with 240x180 pixels and 80mk NETD. It can measure wide range of temperature(-20℃ ~350℃). The unit is ℃. The measured value is proportionate to skin temperature.

5-12. Global Assessment of Efficacy

Subjects had survey about the improvement effect of test product after test product use. It was evaluated in five stages; Very satisfied (4), Satisfied (3), Moderate (2), Dissatisfied (1), Strongly dissatisfied (0). The efficacy of test product was evaluated by percentages of each answers for subject numbers.

5-13. Safety evaluation

The safety of test product was evaluated more than once from all subjects who have used the test product. Any adverse effects after product use and through out the study period were considered together to find the incidence of adverse events and use as safety evaluation data.

5-14. Adverse event evaluation

Any adverse effects were surveyed on each visit. If any events happen before the next visit they were directed to contact the researchers immediately. If the adverse effect has been occurred, the researcher informed the chief researcher. Then the chief researcher evaluated the degree of symptoms and relationship with test products for further appropriate action and participation option.

6. Criteria of Evaluation

6-1. Primary outcome measures

The primary outcome measures was evaluated based on measurement results of hydration on skin surface, skin texture, dead skin cells, skin pores, hydration in deeper skin layer, TEWL, elasticity on skin surface, elasticity in deeper skin layer, skin restitution and skin calming effect by temperature before and after product use. before and after test product use.

6-2. Secondary outcome measures

The second outcome measures were evaluated based on Global Assessment of Efficacy about test product.

7. Statistical Analysis

The statistical analysis package SPSS 19.0 was used to evaluate the efficacy of test products for skin cover persistency, anti-darkening persistency, and skin brightness persistency.

The significance level was set as 5% (ie. p-value < 0.05 is statistically significant).

To evaluate before-immediately after comparison, the parametric test, Paired samples t-test, and the non-parametric test, Wilcoxon signed rank test were used according to the statistical treatment for analysis.

To evaluate data with repeated measures, The parametric test, repeated measures ANOVA(post hoc: Bonferroni correction), and the non-parametric test, Friedman test(post-hoc: Wilcoxon signed rank test with Bonferroni correction), were used to analyze between population comparison.

8. Regulations and Others

8-1. Safety protection of Subjects

This clinical study is based on the Helsinki declaration for human dignity and interests to prevent any of subject disadvantages. The researcher checked subject health to confirm the study participation before the study begins. Also the researcher was well informed about the test product and did best to guarantee subject safety.

8-2. Subject consent and information for consent

The chief researcher and researchers fully explained about all the study processes to the subjects who are satisfied with selection criteria without any exclusion criteria before the study initiation. Also provided enough chances to understand all the predictable results. The subject agreed contents were recorded as documents and the chief researcher confirmed as signing the subject consent form.

8-3. Confidentiality of Identity

All subject names who participated study have maintained confidentially. The consent form which subjects signed have stored by researcher. Also the lists with subject identification code, subject initials, and subject names have administrated specially by researcher or monitor to use as verification data in further recordings or evaluations.

8-4. Other subject protections

P&K Skin research center is equipped with necessary facilities and experts to follow the study protocols and regulations as ensuring subject safety priority. The researcher was well informed about adverse effects and notifications that were stated in study protocol to notice requester after appropriate treatment of any adverse effects during study. When direct or indirect injury occurs due to this study participation, the chief researcher or researchers will do best to treat them. When any adverse effects or side effects of treatment process occur due to test product usage, the requester Cosmetic International Co., Ltd. will compensate all the inquiries. However, subjects will afford any hospital bills, inspection expenses, consultation fees that are unrelated to this clinical study.

9. Result of Study

9-1. Subject information

The total 20 subjects averaged age of who participated in and finished this study was 41.30 years. 2 people was in 20s, 6 people were in 30s, 11 people were in 40s and 1 person was in 50s. All subjects were females.(Table 2).

<Table 2. Subject age (n=20)>

Age	Number	%
20-29	2	10.0
30-39	6	30.0
40-49	11	55.0
50-55	1	5.0

9-2. Withdrawal

Since 1 subject was withdrawn out of 21 subjects, total 20 subjects terminated the study(Table 3).

<Table 3. Subject withdrawal (n=1)>

Subject	16801-S1-09
Reason	Agreement withdrawn
Date	Visit2
Age	48
Gender	Female

9-3. Subject skin types

The 20 subjects' skin types were 9 of dry skin, 8 of dry to normal skin, 2 of normal skin and 1 of normal to oily skin(Table 4).

<Table 4. Subjects skin types (n=20)>

Skin type	Number	%
Dry	9	45.0
Dry to normal	8	40.0
Normal	2	10.0
Normal to oily	1	5.0
Oily	0	0.0

All subjects do not have any skin ailments such as skin disease, itching, sting, erythema, adverse effect on cosmetics, adverse effect on drugs,

hyper-photosensitiveness, atopic dermatitis and etc.

9-4. Primary outcome measures

9-4-1. Hydration measurement result on skin surface

To evaluate skin hydration change on skin surface by test product use, hydration content on skin surface was measured before, immediately after and 2 weeks after test product use.

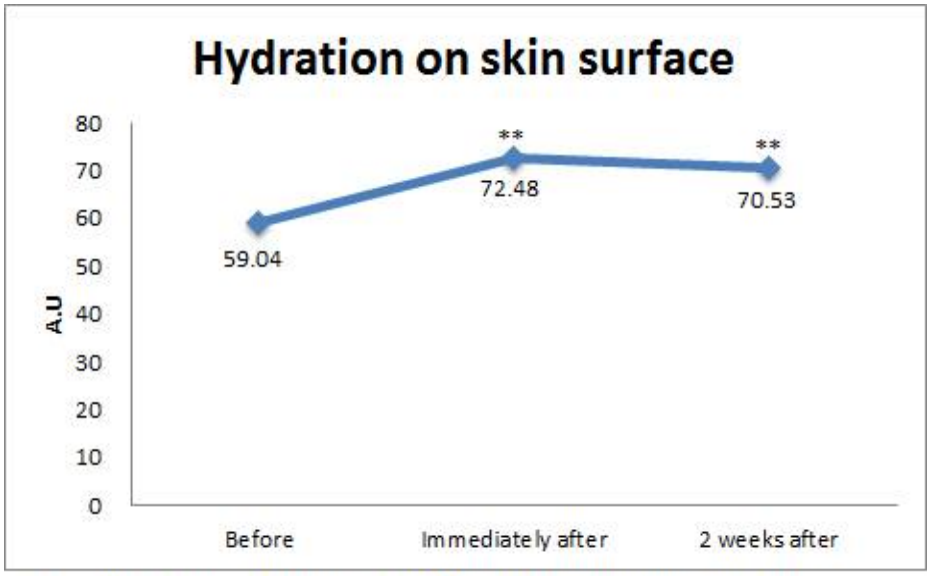
The value was 59.04±11.73 at before, 72.48±9.00 at immediately after and 70.53±9.53 at 2 weeks after test product use.

To evaluate skin hydration change on skin surface in precise and significant way, repeated measures ANOVA(post hoc:Bonferroni correction), which is a parametric test, was used according to the test of normality for test product. There was significant increase with probability $p<0.05$ at immediately after and 2 weeks after test product use(Table 5).

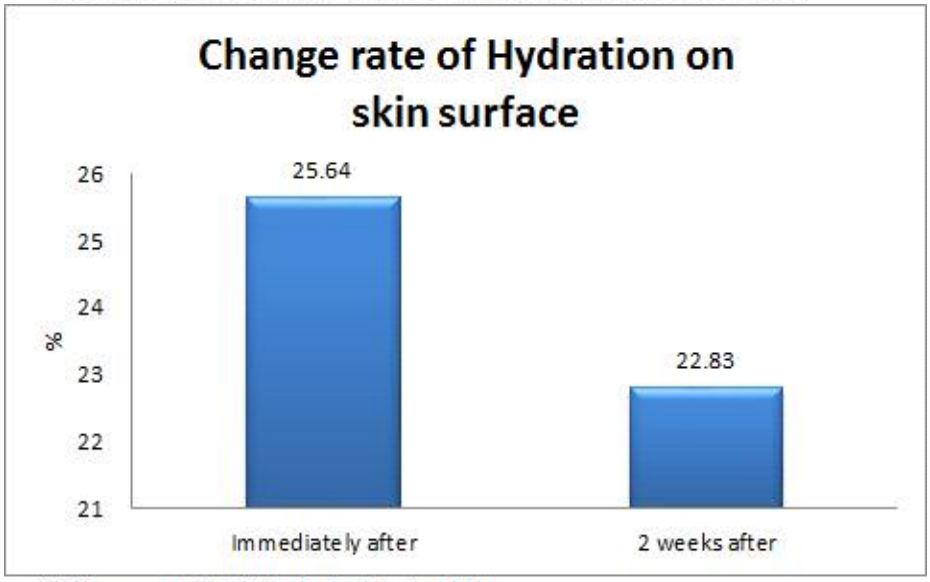
<Table 5. Measurement result of hydration on skin surface, A.U>

				(Mean±SD)
				A.U
			Before	59.04±11.73
			Immediately after	72.48±9.00
			2 weeks after	70.53±9.53
Within population	Probability		Test of within-subject effects	0.000**
		Post-hoc	Before − Immediately after	0.000**
			Before − 2 weeks after	0.001**

** : $p<0.05$ by repeated measures ANOVA, post hoc Bonferroni correction



** : $p<0.05$ by repeated measures ANOVA, post hoc Bonferroni correction



※ Change rate(%)=(after-before)/before*100

9-4-2. Skin texture measurement result

To evaluate skin texture change by test product use, skin roughness was measured before, immediately after and 2 weeks after test product use.

The value was 12.09±2.14 at before, 11.15±2.31 at immediately after and 11.62±2.28 at 2 weeks after test product use.

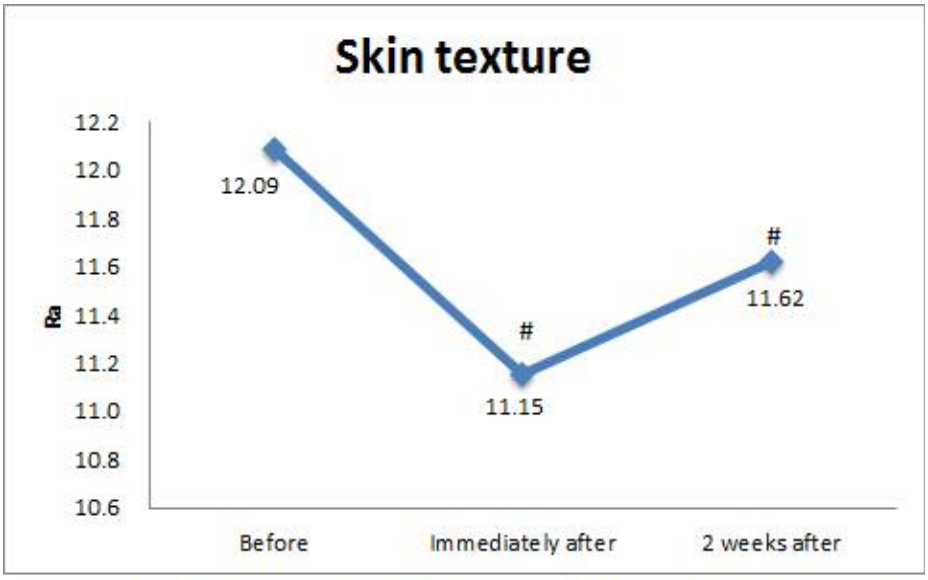
To evaluate skin texture change in precise and significant way, Friedman test(post hoc:Wilcoxon signed rank test with Bonferroni correction), which is a non-parametric test, was used according to the test of normality for test product. There was significant decrease with probability $p<0.025$ at immediately after and 2 weeks after test product use(Table 6).

<Table 6. Measurement result of skin texture, Ra>

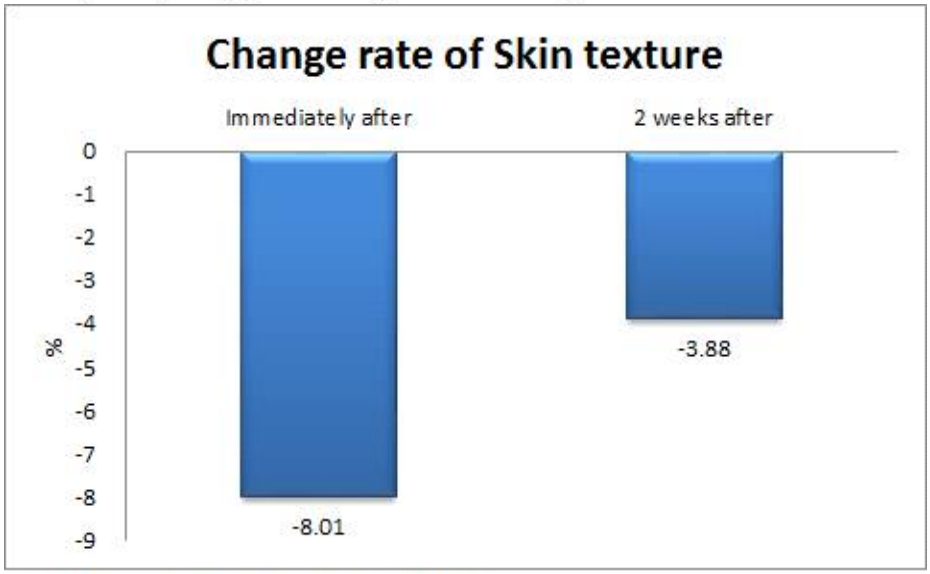
(Mean±SD)

				Ra
			Before	12.09±2.14
			Immediately after	11.15±2.31
			2 weeks after	11.62±2.28
Within population	Probability		Test of within-subject effects	0.000#
		Post-hoc	Before − Immediately after	0.000#
			Before − 2 weeks after	0.009#

: $p<0.025$(=5%/2) by Friedman test, post hoc Wilcoxon singned rank test with Bonferroni correction



: p<0.025(=5%/2) by Friedman test, post hoc Wilcoxon signed rank test with Bonferroni correction



※ Change rate(%)=(after-before)/before*100

9-4-3. Dead skin cell measurement result

To evaluate dead skin cell change by test product use, dead skin cell content was measured before, immediately after and 2 weeks after test product use.

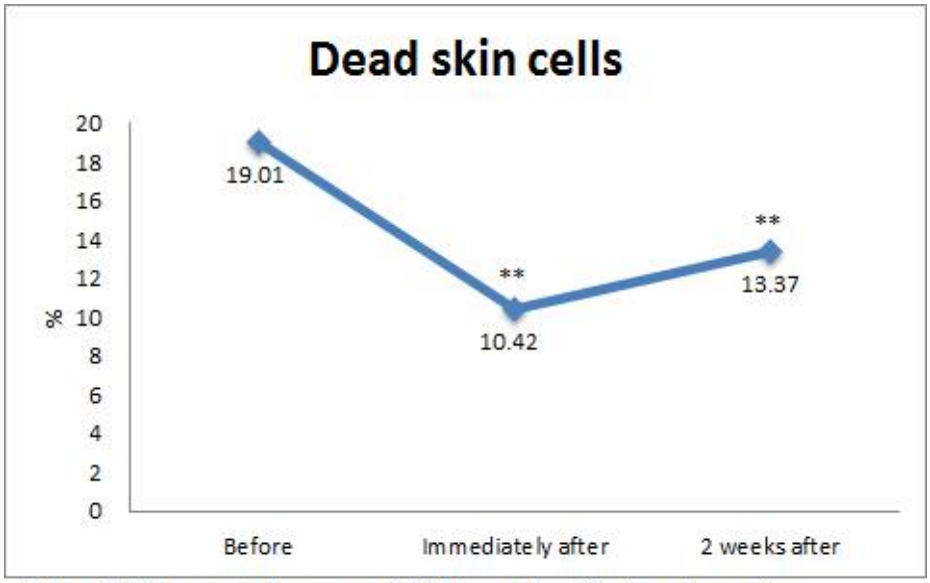
The value was 19.01±4.26 at before, 10.42±2.87 at immediately after and 13.37±3.21 at 2 weeks after test product use.

To evaluate dead skin cell change in precise and significant way, repeated measures ANOVA(post hoc:Bonferroni correction), which is a parametric test, was used according to the test of normality for test product. There was significant decrease with probability $p<0.05$ at immediately after and 2 weeks after test product use(Table 7).

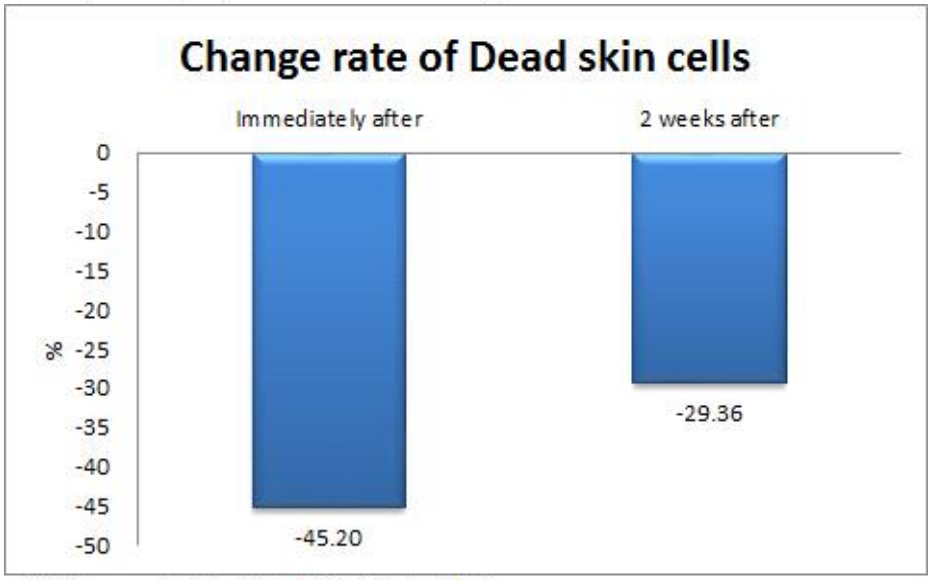
<Table 7. Measurement result of dead skin cell, %>

				(Mean±SD)
				%
			Before	19.01±4.26
			Immediately after	10.42±2.87
			2 weeks after	13.37±3.21
Within population	Probability		Test of within-subject effects	0.000**
		Post-hoc	Before − Immediately after	0.000**
			Before − 2 weeks after	0.000**

** : $p<0.05$ by repeated measures ANOVA, post hoc Bonferroni correction



** : $p<0.05$ by repeated measures ANOVA, post hoc Bonferroni correction



※ Change rate(%)=(after-before)/before*100

9-4-4. Skin pore size measurement result

To evaluate skin pore size change by test product use, the area of skin pore size was measured before, immediately after and 2 weeks after test product use.

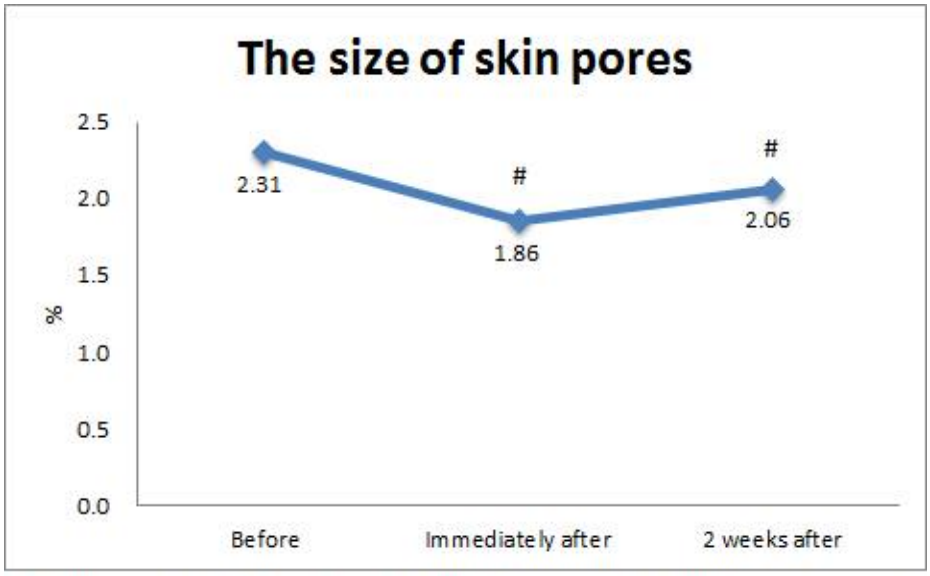
The value was 2.31±2.03 at before, 1.86±1.68 at immediately after and 2.06±1.92 at 2 weeks after test product use.

To evaluate skin pore size change in precise and significant way, Friedman test(post hoc: Wilcoxon signed rank test with Bonferroni correction), which is a non-parametric test, was used according to the test of normality for test product. There was significant decrease with probability $p<0.025$ at immediately after and 2 weeks after test product use(Table 8).

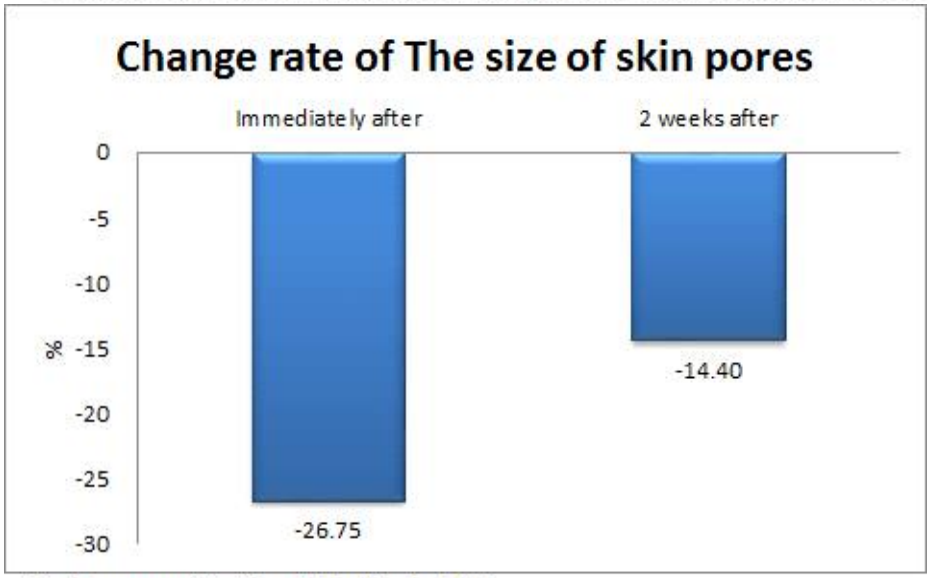
<Table 8. Measurement result of the area of skin pore size, %>

				(Mean±SD)
				%
			Before	2.31±2.03
			Immediately after	1.86±1.68
			2 weeks after	2.06±1.92
Within population	Probability		Test of within-subject effects	0.000#
		Post-hoc	Before − Immediately after	0.000#
			Before − 2 weeks after	0.000#

: $p<0.025(=5\%/2)$ by Friedman test, post hoc Wilcoxon singned rank test with Bonferroni correction



: p<0.025(=5%/2) by Friedman test, post hoc Wilcoxon signed rank test with Bonferroni correction



※ Change rate(%)=(after-before)/before*100

9-4-5. Skin pore number measurement result

To evaluate skin pore number change by test product use, the number of skin pore was measured before, immediately after and 2 weeks after test product use.

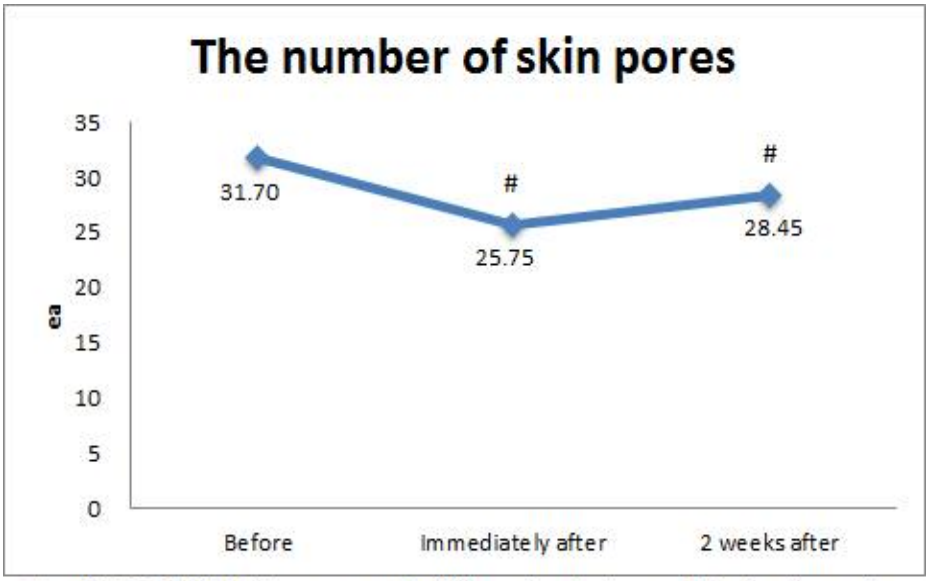
The value was 31.70±28.71 at before, 25.75±23.87 at immediately after and 28.45±26.71 at 2 weeks after test product use.

To evaluate skin pore number change in precise and significant way, Friedman test(post hoc: Wilcoxon signed rank test with Bonferroni correction), which is a non-parametric test, was used according to the test of normality for test product. There was significant decrease with probability $p<0.025$ at immediately after and 2 weeks after test product use(Table 9).

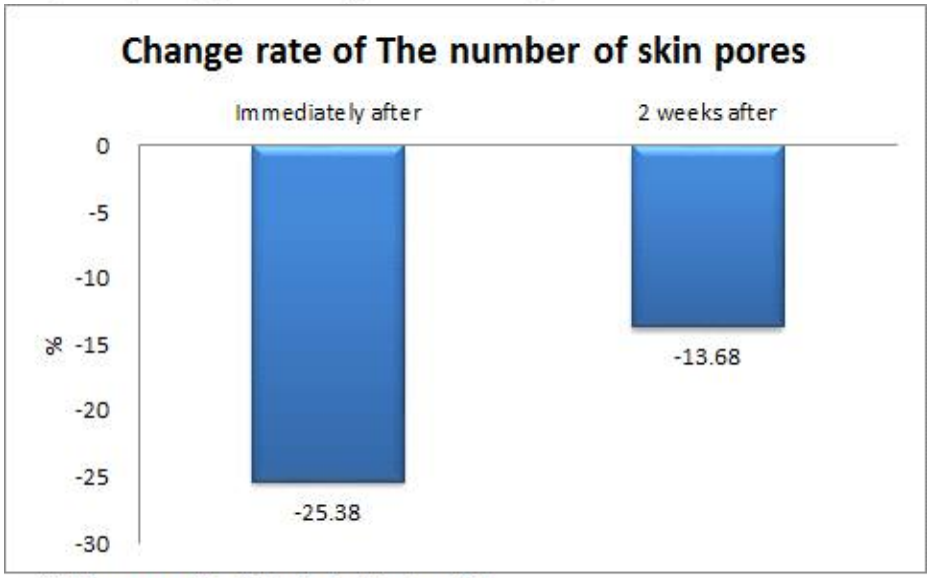
<Table 9. Measurement result of the area of skin pore number, ea>

				(Mean±SD)
				ea
			Before	31.70±28.71
			Immediately after	25.75±23.87
			2 weeks after	28.45±26.71
Within population	Probability	Post-hoc	Test of within-subject effects	0.000#
			Before − Immediately after	0.000#
			Before − 2 weeks after	0.000#

: $p<0.025(=5\%/2)$ by Friedman test, post hoc Wilcoxon singned rank test with Bonferroni correction



: p<0.025(=5%/2) by Friedman test, post hoc Wilcoxon signed rank test with Bonferroni correction



※ Change rate(%)=(after-before)/before*100

9-4-6. Hydration measurement result in deeper skin layer

To evaluate hydration change in deeper skin layer by test product use, hydration content in deeper skin layer was measured before and 2 weeks after test product use.

The value was 54.65±3.99 at before and 56.74±4.11 at 2 weeks after test product use.

To evaluate hydration change in deeper skin layer in precise and significant way, Paired samples t-test, which is a parametric test, was used according to the test of normality for test product. There was significant increase with probability $p<0.05$ at 2 weeks after test product use(Table 10).

<Table 10. Measurement result of hydration in deeper skin layer, %>

			(Mean±SD)
			%
		Before	54.65±3.99
		2 weeks after	56.74±4.11
Within population	Probability	Before - 2 weeks after	0.047*

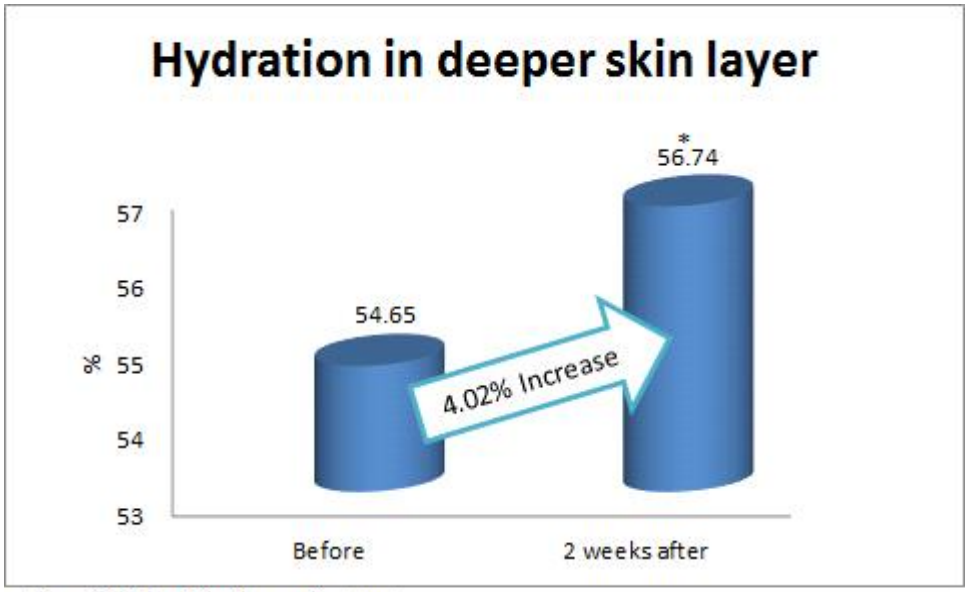
* : $p < 0.05$ by Paired samples t-test

9-4-7. TEWL(Trans-Epidermal Water Loss) measurement result

To evaluate TEWL changer by test product use, TEWL was measured before and 2 weeks after test product use.

The value was 12.65±3.15 at before and 11.39±3.48 at 2 weeks after test product use.

To evaluate TEWL change in precise and significant way, Paired samples t-test, which is a parametric test, was used according to the test of normality for test



* : p<0.05 by Paired samples t-test

⇨ : Change rate(%)=(after-before)/before*100

product. The value decreased at 2 weeks after test product use, however, there was no significant difference(Table 11).

<Table 11. Measurement result of TEWL, g/m^{2}h>

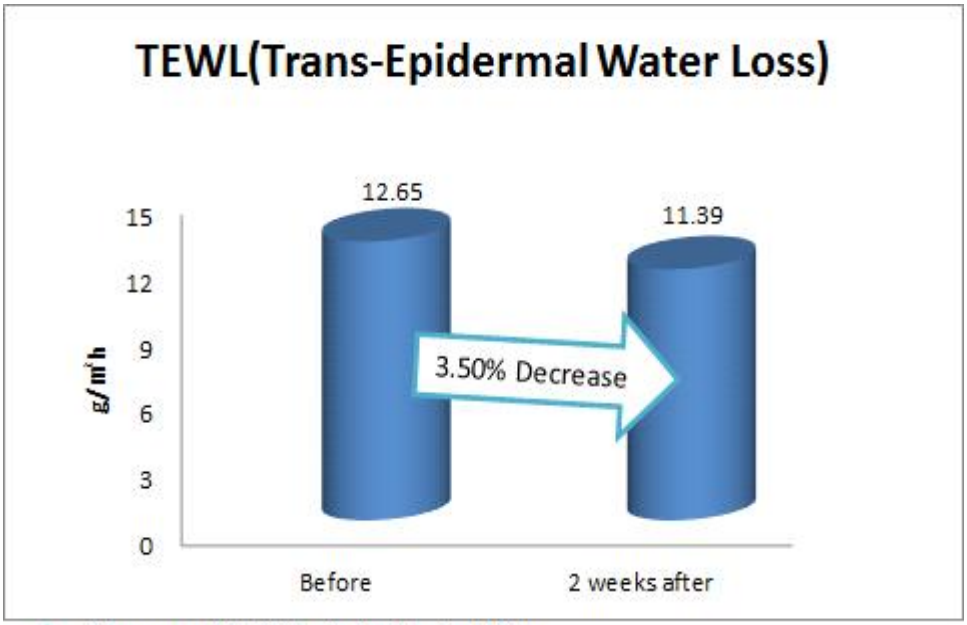
			(Mean±SD)
			g/m^{2}h
		Before	12.65±3.15
		2 weeks after	11.39±3.48
Within population	Probability	Before − 2 weeks after	0.235

9-4-8. Elasticity measurement result on skin surface

To evaluate elasticity change on skin surface by test product use, skin elasticity value R2 was measured before and 2 weeks after test product use.

The value was 0.6036±0.0833 at before and 0.6423±0.0758 at 2 weeks after test product use.

To evaluate elasticity change on skin surface in precise and significant way,



⇨ : Change rate(%)=(after-before)/before*100

Paired samples t-test, which is a parametric test, was used according to the test of normality for test product. There was significant increase with probability $p<0.05$ at 2 weeks after test product use(Table 12).

<Table 12. Measurement result of elasticity on skin surface, R2>

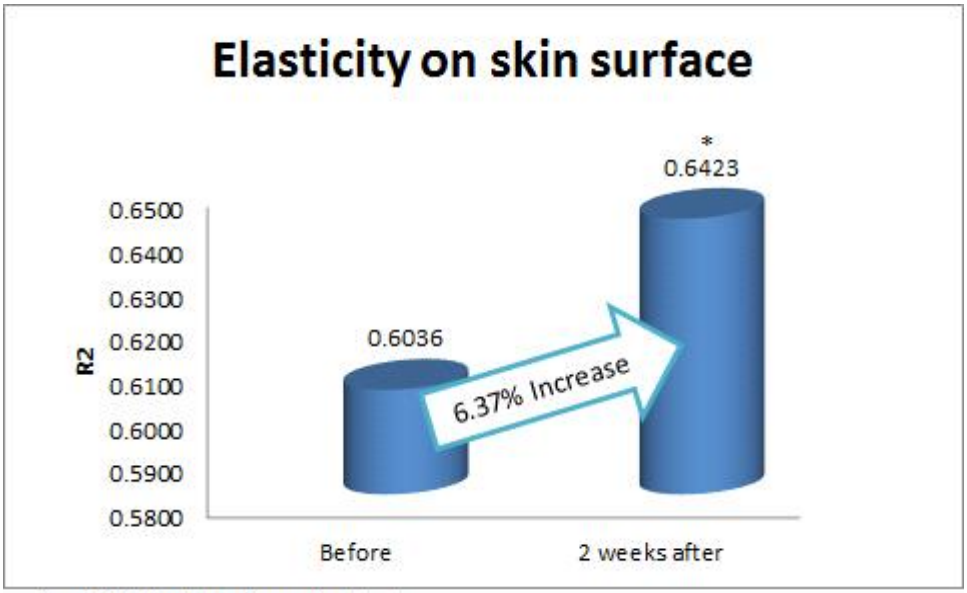
			(Mean±SD)
			R2
		Before	0.6036±0.0833
		2 weeks after	0.6423±0.0758
Within population	Probability	Before – 2 weeks after	0.020*

* : $p<0.05$ by Paired samples t-test

9-4-9. Elasticity measurement result in deeper skin layer

To evaluate elasticity change in deeper skin layer by test product use, skin elasticity value Ur/Ue was measured before and 2 weeks after test product use.

The value was 0.61±0.08 at before and 0.66±0.08 at 2 weeks after test product use.



* : p<0.05 by Paired samples t-test

⇨ : Change rate(%)=(after-before)/before*100

To evaluate elasticity change in deeper skin layer in precise and significant way, Wilcoxon signed rank test, which is a non-parametric test, was used according to the test of normality for test product. There was significant increase with probability p<0.05 at 2 weeks after test product use(Table 13).

<Table 13. Measurement result of elasticity in deeper skin layer, Ur/Ue>

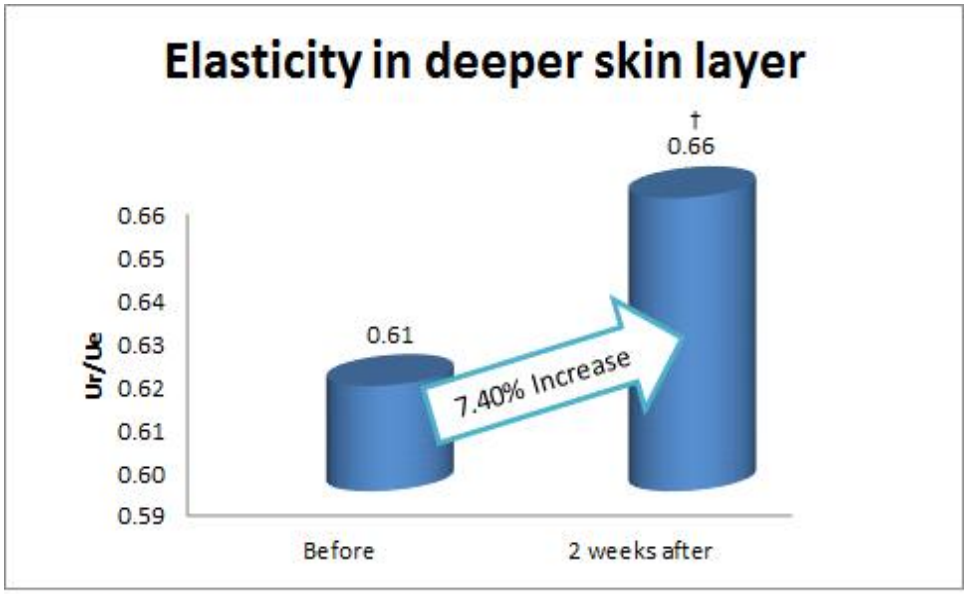
			(Mean±SD)
			Ur/Ue
		Before	0.61±0.08
		2 weeks after	0.66±0.08
Within population	Probability	Before − 2 weeks after	0.000†

†: p<0.05 by Wilcoxon signed rank test

9-4-10. Skin restitution measurement result

To evaluate skin restitution change by test product use, skin restitution value CoR was measured before and 2 weeks after test product use.

The value was 0.54±0.03 at before and 0.57±0.03 at 2 weeks after test product



† : p<0.05 by Wilcoxon signed rank test

⇨ : Change rate(%)=(after-before)/before*100

use.

To evaluate skin restitution change in precise and significant way, Wilcoxon signed rank test, which is a non-parametric test, was used according to the test of normality for test product. There was significant increase with probability p<0.05 at 2 weeks after test product use(Table 14).

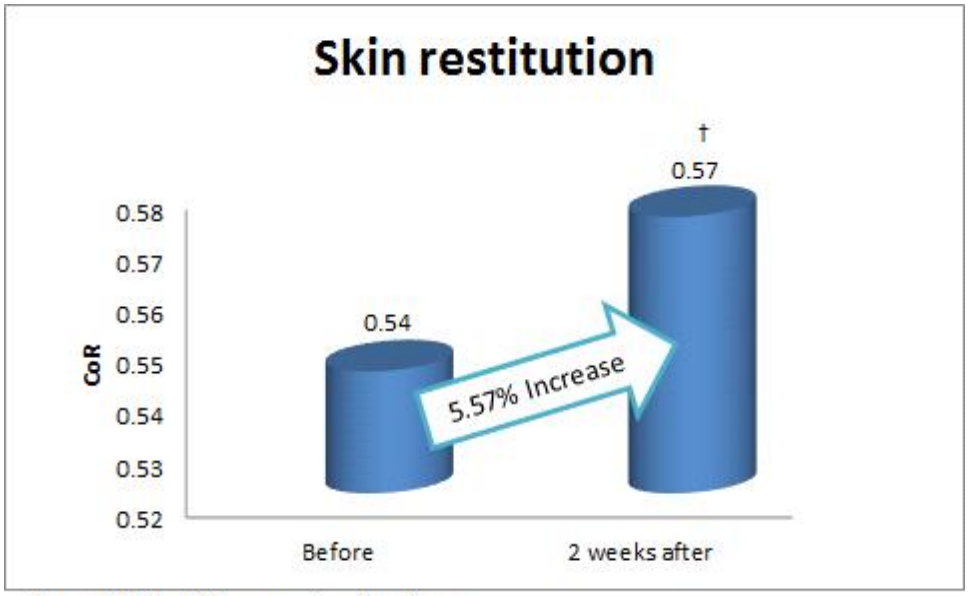
<Table 14. Measurement result of skin restitution, CoR>

		(Mean±SD)
		CoR
	Before	0.54±0.03
	2 weeks after	0.57±0.03
Within population	Probability	Before − 2 weeks after	0.000†

†:p<0.05 by Wilcoxon signed rank test

9-4-11. Skin calming effect measurement result

To evaluate skin calming effect by test product use, skin temperature was measured before heating, immediately after heating and immediately after test



† : p<0.05 by Wilcoxon signed rank test

⇨ : Change rate(%)=(after-before)/before*100

product use.

In control group, the value was 32.80±0.84 at before heating, 38.48±0.74 at immediately after heating and 36.42±0.39 at immediately after test product use.

In test group, the value was 32.88±0.86 at before heating, 38.39±0.62 at immediately after heating and 33.15±0.67 at immediately after test product use.

To evaluate skin calming effect in precise and significant way, Paired samples t-test, which is a parametric test, and Wilcoxon signed rank test, which is a non-parametric test, were used according to the test of normality for test product. There was significant decrease with probability p<0.05 at immediately after test product use compared to control group(Table 15).

<Table 15. Measurement result of skin temperature, ℃>

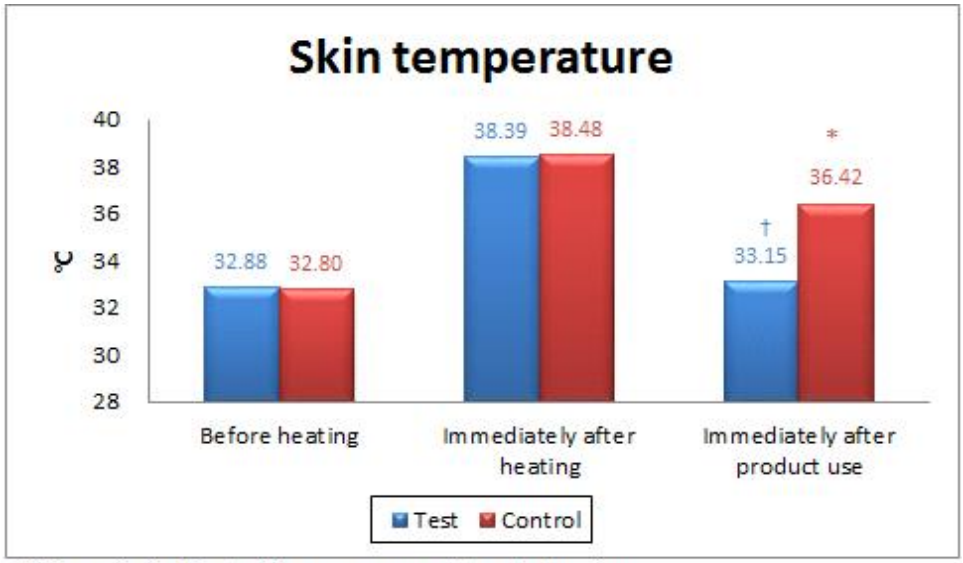
(Mean±SD)

			Control (Un-applied)	Test
		Before heating	32.80±0.84	32.88±0.86
		Immediately after heating	38.48±0.74	38.39±0.62
		Immediately after product use	36.42±0.39	33.15±0.67
Within populati	Proba bility	After heating - After product use	0.000*	0.000†

on			
Between populations	Probability	After heating - After product use	0.000*

*: $p < 0.05$ by Paired sample's T-test

†: $p < 0.05$ by Wilcoxon signed rank test



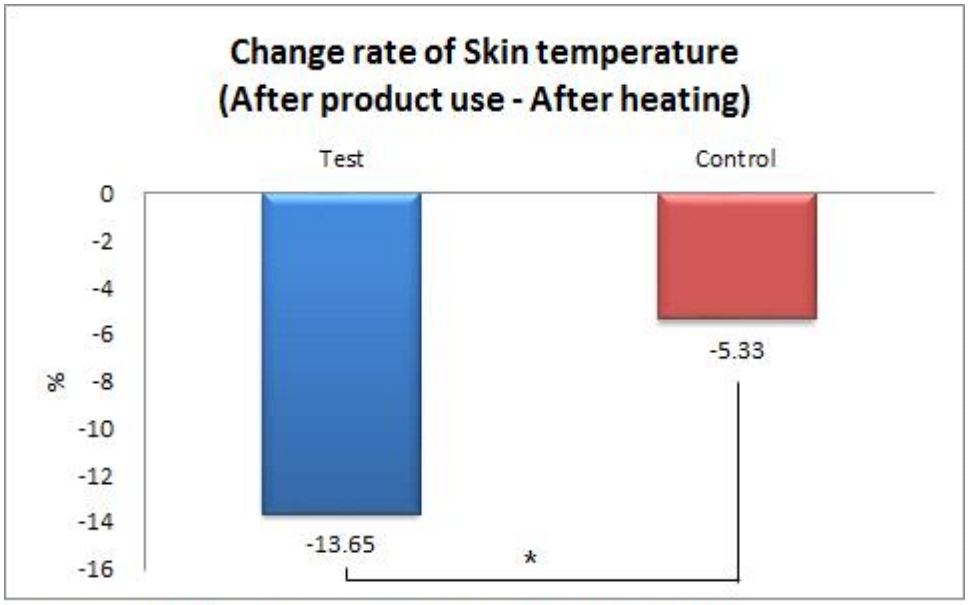
※ There is significant difference compared to after heating

* : $p<0.05$ by Paired samples t-test

† : $p<0.05$ by Wilcoxon signedrank test

9-5. Secondary outcome measures

9-5-1. Global Assessment of Efficacy



* : There is significant difference.(p<0.05 by Paired samples t-test)

The efficacy of test products was surveyed about improvement effect on droopy skin pores, elasticity in deeper skin layer, elasticity on skin surface, skin elasticity of cheek, dead skin cell, skin texture, TEWL(trans-epidermal water loss) and skin calming effect, and skin hydration persistency. Based on the subject survey, result values were calculated as percentages.(Table 16).

<Table 16. Result of Global Assessment of Efficacy>

Improvement	Number of subjects (Percentage, %)					Average	Standard deviation
	4*	3*	2*	1*	0*		
Droopy skin pores	0	9 (45.0)	11 (55.0)	0	0	2.45	0.51
Elasticity in deeper skin layer, and elasticity on skin surface	2 (10.0)	9 (45.0)	8 (40.0)	1 (5.0)	0	2.60	0.75
Skin elasticity of cheek	0	13 (65.0)	7 (35.0)	0	0	2.65	0.49
Dead skin cell	2 (10.0)	13 (65.0)	4 (20.0)	1 (5.0)	0	2.80	0.70
Skin texture	3 (15.0)	11 (55.0)	6 (30.0)	0	0	2.85	0.67
TEWL(trans-epidermal water loss) and skin calming effect	2 (10.0)	13 (65.0)	5 (25.0)	0	0	2.85	0.59
Skin hydration persistency	4 (20.0)	11 (55.0)	5 (25.0)	0	0	2.95	0.69

*4: Very satisfied, 3: Satisfied, 2: Moderate, 1: Dissatisfied, 0: Strongly dissatisfied

As a result, 100% of subjects answered more than ‘Moderate’ about improvement effect about droopy skin pores, skin elasticity of cheek, skin texture, TEWL(trans-epidermal water loss) and skin calming effect, and skin hydration persistency. 95.0% of subjects answered more than ‘Moderate’ about improvement effect about elasticity in deeper skin layer and elasticity on skin surface, and dead skin cells.

9-5-2. Result of product preference survey

The test product preference such as immediate skin moisturizing, smooth skin texture and skin glossiness, absorptiveness, hydration, mobility and overall usability were surveyed. The results of each items were indicated as percentages.(Table 17).

<Table 17. Result of Product preference>

	Number of subjects (Percentage, %)					Average	Standard deviation
	4*	3*	2*	1*	0*		
Immediate skin moisturizing	5 (25.0)	13 (65.0)	2 (10.0)	0	0	3.15	0.59
Smooth skin texture and skin glossiness	4 (20.0)	11 (55.0)	5 (25.0)	0	0	2.95	0.69
Absorptiveness	1 (5.0)	14 (70.0)	5 (25.0)	0	0	2.80	0.52
Hydration	5 (25.0)	12 (60.0)	3 (15.0)	0	0	3.10	0.64
Mobility	6 (30.0)	9 (45.0)	5 (25.0)	0	0	3.05	0.76
Overall usability	2 (10.0)	15 (75.0)	3 (15.0)	0	0	2.95	0.51

*4: Very satisfied, 3: Satisfied, 2: Moderate, 1: Dissatisfied, 0: Strongly dissatisfied

As a result, 100.0% of subjects answered more than ‘Moderate’ about all items of immediate skin moisturizing, smooth skin texture and skin glossiness, absorptiveness, hydration, mobility and overall usability.

10. Conclusion

This clinical study was processed with females who are 20~55 years and satisfied with selection criteria and not satisfied with any of exclusion criteria and agreed with study. Subjects applied test product for 2 weeks.

To evaluate skin calming effect of test product, subjects were divided into 2 groups(test, control). Then, skin temperature was measured before, immediately after heating and immediately after test product use. Hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer and skin restitution were measured before and 2 weeks after test product use. Hydration on skin surface, skin texture, dead skin cells and skin pores(size, number) were measured before, immediately after and 2 weeks after test product use.

After test completion, all subjects were surveyed about test product.

1) Total 20 subjects who participated in and finished this clinical study were females and the averaged age was 41.30 years. Since 1 subject was withdrawn, total 20 subjects terminated study. Selected subjects did not show any adverse effects nor any medical or drug history that might affect the study.

2) As a result of hydration measurement on skin surface, the value significantly increased($p<0.05$) at immediately after and 2 weeks after test product use.

3) As a result of skin texture measurement, the value significantly decreased($p<0.025$) at immediately after and 2 weeks after test product use.

4) As a result of dead skin cell measurement, the value significantly decreased($p<0.05$) at immediately after and 2 weeks after test product use.

5) As a result of skin pore measurement, the size of skin pore area significantly decreased($p<0.025$) at immediately after and 2 weeks after test product use. Additionally, the number of skin pore significantly decreased($p<0.025$) at immediately after and 2 weeks after test product use.

6) As a result of hydration measurement in deeper skin layer, the value significantly increased($p<0.05$) at 2 weeks after test product use.

7) As a result of TEWL measurement, the value did not show significant difference

at 2 weeks after test product use.

8) As a result of elasticity measurement on skin surface, the value significantly increased(p<0.05) at 2 weeks after test product use.

9) As a result of elasticity measurement in deeper skin layer, the value significantly increased(p<0.05) at 2 weeks after test product use.

10) As a result of skin restitution measurement, the value significantly increased(p<0.05) at 2 weeks after test product use.

11) As a result of skin calming effect measurement, the value significantly decreased(p<0.05) at immediately after test product use compared to control

12) As a result of Global Assessment of Efficacy, 100% of subjects answered more than 'Moderate' about improvement effect about droopy skin pores, skin elasticity of cheek, skin texture, TEWL(trans-epidermal water loss) and skin calming effect, and skin hydration persistency. 95.0% of subjects answered more than 'Moderate' about improvement effect about elasticity in deeper skin layer and elasticity on skin surface, and dead skin cells.

13) There was no report about adverse effect by subjects during the application period of test product. There was no skin abnormality in physical examination.

Therefore, the test product "Dewy Fresh" is considered to help improving
*** hydration on skin surface, skin texture, dead skin cells and skin pore decrease(size, number) after 2 weeks use including immediate effect**
*** hydration in deeper skin layer, elasticity on skin surface, elasticity in deeper skin layer and skin restitution after 2 weeks use**
*** skin calming effect by temperature after one application**

Reference

1. Kang HH. Anti-aging in cosmetics. J. Soc. Cos. Sci. Kor. 1997 ; 23 : 57-61.
2. Doris EB, Cosmetics for elderly people. Cosmetics and Toiletories. 2006 ; 111 : 31-37.
3. Garrel C, Fontecave M. Nitric Oxide. Chemistry and biology analysis of free radicals in biological systems. 1995 ; 21-35.
4. Hogg N. Pro-oxidant and antioxidant effects of nitric oxide. Analysis of Free Radicals in Biological Systems. 1995 ; 37-49.
5. Rice Evans CA. Formation of free radicals and mechanisms of action in normal biochemical processes and pathological states. in Free Radical Damage and Its Control, Elsevier. 1994 ; 131-153.
6. Gilchrest BA. Skin aging and photoaging: an overview. J. Am. Acad. Derm. 1989 ; 21 : 610-613
7. Daly CH and Odland GH. Age-related changes in the mechanical of human skin. J Invest Dermatol, 73:85-87, 1979.
8. Bjarnason B. Flosadottir E and Fischer T. Objective non-invasive assessment of patch tests with the laser Doppler perfusion scanning technique. Contact Dermatitis, 40: 251-260, 1999.
9. Bornmyr S. Svensson H. Lilja B. and Sundkvist G. Skin temperature changes and changes in skin blood flow monitored with laser Doppler flowmetry and imaging: a methodological study in normal humans. Clinical Physiology, 17: 71-81, 1997.

Appendix 1. Information for Subject Consent form

A Clinical study of 'Dewy Fresh' for evaluating improvement of hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution, skin calming effect by temperature

We request you to participate in this clinical study. However, it is important that you understand why this study should be done and what procedure would be performed, before deciding participation in this clinical study. We have prepared information for agreement about your role when you participate in this study. Please read this information for subject's agreement carefully and discuss about this with your family and other people. If you have any question, please ask to chief researcher or other researchers.

1. Purpose of Clinical study

P&K Skin Research Center is going to perform the Clinical study of 'A Clinical study of 'Dewy Fresh' for evaluating improvement of hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution, skin calming effect by temperature' requested by Cosmetic International Co., Ltd.

① This clinical study is conducted to healthy females aged 20 to 55, evaluating the effect of testing product.

② The test product is applied for 2 weeks.

③ The study is performed to evaluate improvement of hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution, skin calming effect before, immediately after and 2 weeks after test product use.

2. Method of clinical study

① **Number of subjects and period of study**

Number of subjects that we require is over 20 people. If you are appropriate to participate in clinical study and you or your representative sign on agreement, you will participate in this clinical study for 2 weeks according to study process.

② **Selection of subject**

This study targets females ranging in age from 20 to 55. You can participate in this study if you satisfy all the inclusion criteria and do not have any exclusion criteria.

③ **Test product**

- Test product will be used 10 times a day.
- Open the cover and fill it with tap water. Press power button to operate it(20 minutes) with the distance of 5cm from the face.

④ **Visiting schedule**

If you participate this study it will be 2 visits and it may require about 1 hour and 30 minutes.

3. Forecasted allergy and side effect

We expect that allergy or other side effects are not occurred, because the samples are made with cosmetic materials accordance of KFDA. However, in subjects who have sensitive skin, severe itching, rash, sting and eruption may occur. Therefore, we will inform you any new information about safety during the clinical study.

4. Appropriate contraception method for female

If you are pregnant or are doing breast-feeding or have a plan to be pregnant or do not agree with following suggested appropriate contraception method, you cannot participate in this study.

① Hormonal contraception : Oral contraceptive drug etc.

② Intrauterine Device : Loop etc.

③ Barrier method : Femidom, Spermicide etc.

5. Benefits in respect of participation of clinical study

All the testing product and required processes are provided. If you finish the appointed study, some transportation expenses will be provided.

6. Compensation and treatment in case of any side effects

During study period, researcher will perform the study with taking subject's safety as the highest priority. When side effects are occurred by using the test product, you can receive needed examination and treatment. And we will do a follow-up until the side effects resolved. If you have any side effect by using the clinical test product, Cosmetic International Co., Ltd. will take charge for all the following treatment cost.

7. Withdrawal of participation after agreement

Participating in this study depends on your voluntary intention. Even if you agreed to participate in this study, you can discontinue the participation at any time. Even though you discontinue the study, you can receive treatment for side effects related with the study and you will not have any disadvantages. If you want to discontinue the study, please contact to the person in charge of the P&K Skin Research Center.

8. Confidentiality of Identity

Your personal data which has gained during the progress of study, is protected not to be opened to others. Even though the results of study are published, your personal information is kept in secret. In addition, photographs taken in study could be used to article, book, periodical publication, report and the broad cast media.

9. Duty of Subject

You should follow the below list to protect yourself and to perform study correctly.

① You should keep using the test product and follow examination schedule.

② If any adverse effects are presented, contact the researcher immediately and follow the instruction. If you are said to be required the extra examination please do so.

③ Please specifically report to chief researcher or person in charge in case of using other product or medicines.

④ Please do not use any other cosmetics of products which have similar efficacy to test

product.

⑤ Please avoid heavy drinking or exercise before each visit.

10. Signature

If you want to participate in this study after informed about this study, please sign on participation agreement sheet.

11. Inquiry

If you want to know more about this study or have any side effects related to this study or need to contact to the chief research and other researchers for medical consultation, you can contact any time to following contact number and consult the person in charge.

	Name	Belongs to	Tel.
Chief Researcher	Beom Joon Kim	Chung-Ang University Hospital Dermatology Department	+82-2-6925-1501
Researcher	Jin Hee Shin A Reum Kim Tae Ji Lee In Ah Kim Eun Ji Lim Yoon Hee Kim Cho Rong Seo Min Hye Park Eun Kyung Lee Go Eun Gu Eun Seo Beak Ji Yoon Han Su Yeon Kim So Jin Jeon Ju Hee Kang	P&K Skin Research Center Co., Ltd.	+82-2-6925-1502 +82-2-6925-1503

P&K Skin Research Center Co., Ltd.

Appendix 2.

Informed Consent form

A Clinical study of 'Dewy Fresh' for evaluating improvement of hydration on skin surface, skin texture, dead skin cells, skin pore decrease(size, number), hydration in deeper skin layer, TEWL(Trans-Epidermal Water Loss), elasticity on skin surface, elasticity in deeper skin layer, skin restitution, skin calming effect by temperature

I received a satisfactory explanations about study purpose, method, expected effects and side effects, benefits of participation, progress of the study. I received explanations about compensation and treatment when physical, psychological, social and economical damages occur. I also received explanations about collecting personal information by research center from chief researcher or person in charge of the study.

Agreement for collection and use of personal information

Personal Information	Purpose	Duration
Name, Date of birth, Contact number, Address, Photographs with portrait rights	Participation in clinical study, Article, Book, Periodical publication, Report, Broad cast media	5 years from agreement

You have a right to refuse agreement for collection and use of personal information. However, if you disagree with the agreement, you can not be participated in this clinical study.

Subject:_____ (signature)

I received an explanation that it does not become a problem that I disagree to participate in the study, and I can discontinue at any time even though I agreed to participate the study. I do not have any disadvantage after withdrawal of agreement and personal imformation will be offered to the third party. All data related to the study will be kept in secret.

Agreement for providing personal information to the third party

Third party	Personal Information	Purpose	Duration
Cosmetic International Co., Ltd.	Name, Date of birth, Contact number, Address, Photographs with portrait rights	Article, Book, Periodical publication, Report, Broad cast media	5 years from agreement

You have a right to refuse agreement for collection and use of personal information. However, if you disagree with the agreement, you can not be participated in this clinical study.

Subject:_____ (signature)

So, I agree to participate in this clinical study with my own free will.

1. Subject/Representative

Subject:_____ (sign)_____ (Date)_____,_____,_____

Representative:_____ (sign)_____ (Date)_____,_____,_____(Relationship)____

Date of birth: _____year _____month _____date (age) Tel:_____

Address:_____

I explained fully about the outline of clinical study and, effectiveness and side effects of products. I answered to questions sincerely. I have a duty to manage this clinical study as a dermatologist, and I also have a duty to discontinue the study immediately if the progress of clinical study adversely affects the health of subject.

2. Researcher/Person in charge of the study

Name:_____ (signature)_____ (Date)_____,_____,_____

P&K Skin Research Center Co., Ltd.

Appendix 3. Subject information

Subject ID No.	Name	Date of birth	Age	Skin type	Gender
16811-BC1-01	KYR	1971-01-08	45	Normal	F
16811-BC1-02	BSJ	1978-01-05	38	Dry	F
16811-BC1-03	KBY	1967-12-03	48	Dry to normal	F
16811-BC1-04	KKS	1969-01-20	47	Dry	F
16811-BC1-05	SHJ	1971-11-03	44	Dry to normal	F
16811-BC1-06	LMH	1977-11-29	38	Dry	F
16811-BC1-07	USA	1970-08-24	45	Dry	F
16811-BC1-08	KOS	1976-12-15	39	Dry	F
16811-BC1-09	SKS	1967-08-26	48	Normal	F
16811-BC1-10	KYM	1977-03-19	39	Dry	F
16811-BC1-11	KJR	1976-02-20	40	Dry to normal	F
16811-BC1-12	KMJ	1968-07-22	48	Dry to normal	F
16811-BC1-13	LJH	1976-09-16	39	Dry to normal	F
16811-BC1-14	OAY	1970-03-30	46	Dry	F
16811-BC1-15	SIY	1969-02-28	47	Dry	F
16811-BC1-16	CJE	1982-01-03	34	Dry to normal	F
16811-BC1-17	YMK	1967-02-18	49	Dry to normal	F
16811-BC1-18	HSM	1965-09-16	50	Normal	F
16811-BC1-19	HSY	1989-11-09	26	Normal to oily	F
16811-BC1-20	KJY	1992-12-30	23	Dry to normal	F
16811-BC1-21	LHK	1975-04-25	41	Dry	F

Appendix 4. Measurement result of hydration on skin surface (A.U)

Subject ID No.	Before	Immediately after	2 weeks after
16811-BC1-01	69.27	82.27	77.43
16811-BC1-02	79.50	80.70	74.93
16811-BC1-03	64.20	80.33	69.80
16811-BC1-04	41.20	72.47	64.50
16811-BC1-05	42.53	64.80	71.47
16811-BC1-06	52.73	69.97	84.30
16811-BC1-07	62.93	66.57	71.43
16811-BC1-08	51.90	72.43	70.80
16811-BC1-09	69.23	75.10	N.A
16811-BC1-10	44.53	68.80	64.47
16811-BC1-11	70.00	85.13	83.90
16811-BC1-12	54.70	55.43	53.70
16811-BC1-13	45.27	50.83	48.47
16811-BC1-14	60.30	77.53	76.73
16811-BC1-15	66.70	81.27	59.73
16811-BC1-16	76.70	79.40	77.50
16811-BC1-17	43.53	67.47	64.23
16811-BC1-18	57.47	67.17	76.43
16811-BC1-19	59.97	70.03	74.70
16811-BC1-20	65.07	77.67	81.33
16811-BC1-21	72.33	79.23	64.77

Appendix 5. Measurement result of skin texture (Ra)

Subject ID No.	Before	Immediately after	2 weeks after
16811-BC1-01	11.01	10.39	9.65
16811-BC1-02	11.06	9.60	13.04
16811-BC1-03	12.56	11.89	11.92
16811-BC1-04	12.40	11.97	11.57
16811-BC1-05	11.94	10.02	10.54
16811-BC1-06	11.35	10.50	10.92
16811-BC1-07	10.00	9.52	10.06
16811-BC1-08	10.58	8.57	9.59
16811-BC1-09	11.94	10.64	N.A
16811-BC1-10	14.80	13.87	13.72
16811-BC1-11	12.19	11.03	11.24
16811-BC1-12	14.37	13.74	14.19
16811-BC1-13	11.75	11.14	11.36
16811-BC1-14	9.94	8.85	10.30
16811-BC1-15	11.37	10.27	11.11
16811-BC1-16	12.11	11.99	11.42
16811-BC1-17	11.45	9.17	10.76
16811-BC1-18	11.26	11.07	11.82
16811-BC1-19	19.57	18.81	19.39
16811-BC1-20	11.52	11.07	11.44
16811-BC1-21	10.52	9.62	8.38

Appendix 6. Measurement result of dead skin cells (%)

Subject ID No.	Before	Immediately after	2 weeks after
16811-BC1-01	11.14	6.52	9.18
16811-BC1-02	14.76	9.10	11.50
16811-BC1-03	18.30	9.68	12.57
16811-BC1-04	11.51	4.76	7.84
16811-BC1-05	19.61	12.96	15.13
16811-BC1-06	24.03	10.54	14.89
16811-BC1-07	13.03	8.00	9.20
16811-BC1-08	24.62	13.26	16.69
16811-BC1-09	19.82	8.60	N.A
16811-BC1-10	15.35	9.71	10.90
16811-BC1-11	22.22	12.52	16.57
16811-BC1-12	24.47	15.54	18.38
16811-BC1-13	21.30	11.97	14.31
16811-BC1-14	16.22	9.44	11.49
16811-BC1-15	17.67	4.77	8.68
16811-BC1-16	21.26	12.24	17.96
16811-BC1-17	17.88	10.01	12.23
16811-BC1-18	21.06	13.30	15.22
16811-BC1-19	24.01	12.96	16.82
16811-BC1-20	22.33	11.48	12.59
16811-BC1-21	19.34	9.61	15.22

Appendix 7. Measurement result of the size of skin pore area (%)

Subject ID No.	Before	Immediately after	2 weeks after
16811-BC1-01	3.66	3.06	3.58
16811-BC1-02	3.36	3.34	3.16
16811-BC1-03	2.01	1.31	1.32
16811-BC1-04	2.62	1.84	2.04
16811-BC1-05	0.77	0.57	0.66
16811-BC1-06	0.82	0.36	0.51
16811-BC1-07	1.48	1.08	1.2
16811-BC1-08	0.26	0.12	0.24
16811-BC1-09	3.69	3.22	N.A
16811-BC1-10	2.49	2.39	2.36
16811-BC1-11	1.14	0.88	1.02
16811-BC1-12	7.95	5.69	7.1
16811-BC1-13	0.42	0.28	0.41
16811-BC1-14	0.93	0.56	0.81
16811-BC1-15	0.66	0.25	0.42
16811-BC1-16	0.62	0.64	0.43
16811-BC1-17	5.67	4.86	5.65
16811-BC1-18	3.98	3.45	3.62
16811-BC1-19	3.24	2.79	2.9
16811-BC1-20	0.29	0.13	0.26
16811-BC1-21	3.78	3.53	3.56

Appendix 8. Measurement result of the number of skin pores (ea)

Subject ID No.	Before	Immediately after	2 weeks after
16811-BC1-01	51	43	50
16811-BC1-02	43	43	42
16811-BC1-03	25	16	17
16811-BC1-04	35	25	28
16811-BC1-05	9	7	8
16811-BC1-06	9	4	6
16811-BC1-07	19	15	16
16811-BC1-08	4	2	3
16811-BC1-09	44	41	N.A
16811-BC1-10	32	29	30
16811-BC1-11	18	15	17
16811-BC1-12	112	84	100
16811-BC1-13	6	4	6
16811-BC1-14	16	10	14
16811-BC1-15	10	4	6
16811-BC1-16	10	10	7
16811-BC1-17	86	71	79
16811-BC1-18	48	43	45
16811-BC1-19	41	37	38
16811-BC1-20	4	2	4
16811-BC1-21	56	51	53

Appendix 9. Measurement result of hydration in deeper skin layer (%)

Subject ID No.	Before	2 weeks after
16811-BC1-01	55	63
16811-BC1-02	54	63
16811-BC1-03	52	54
16811-BC1-04	55	53
16811-BC1-05	55	55
16811-BC1-06	52	56
16811-BC1-07	57	56
16811-BC1-08	52	50
16811-BC1-09	55	N.A
16811-BC1-10	65	61
16811-BC1-11	54	55
16811-BC1-12	63	55
16811-BC1-13	51	53
16811-BC1-14	47	51
16811-BC1-15	53	53
16811-BC1-16	53	59
16811-BC1-17	58	62
16811-BC1-18	52	56
16811-BC1-19	55	60
16811-BC1-20	56	63
16811-BC1-21	54	55

Appendix 10. Measurement result of TEWL(Trans-Epidermal Water Loss) (g/m^2h)

Subject ID No.	Before	2 weeks after
16811-BC1-01	11.2	10.4
16811-BC1-02	15.4	14.6
16811-BC1-03	9.7	15.2
16811-BC1-04	8.8	14.7
16811-BC1-05	12.3	10.1
16811-BC1-06	9.1	10.7
16811-BC1-07	10.5	6.7
16811-BC1-08	10.5	8.9
16811-BC1-09	14.3	N.A
16811-BC1-10	12.0	6.0
16811-BC1-11	12.8	10.1
16811-BC1-12	14.7	12.5
16811-BC1-13	18.0	10.8
16811-BC1-14	13.0	20.6
16811-BC1-15	11.1	8.2
16811-BC1-16	14.0	14.5
16811-BC1-17	8.7	10.1
16811-BC1-18	14.6	13.3
16811-BC1-19	14.6	7.1
16811-BC1-20	11.0	11.9
16811-BC1-21	21.0	12.9

Appendix 11. Measurement result of elasticity on skin surface (R2)

Subject ID No.	Before	2 weeks after
16811-BC1-01	0.6667	0.6381
16811-BC1-02	0.7197	0.6654
16811-BC1-03	0.5845	0.6987
16811-BC1-04	0.6448	0.6561
16811-BC1-05	0.6099	0.6699
16811-BC1-06	0.7088	0.6532
16811-BC1-07	0.6000	0.6438
16811-BC1-08	0.7117	0.7330
16811-BC1-09	0.6587	N.A
16811-BC1-10	0.6373	0.7417
16811-BC1-11	0.6516	0.6727
16811-BC1-12	0.4047	0.5714
16811-BC1-13	0.5519	0.5885
16811-BC1-14	0.5017	0.4758
16811-BC1-15	0.5872	0.5966
16811-BC1-16	0.6747	0.7430
16811-BC1-17	0.5096	0.5635
16811-BC1-18	0.5751	0.5333
16811-BC1-19	0.5492	0.6299
16811-BC1-20	0.6788	0.7285
16811-BC1-21	0.5049	0.5305

Appendix 12. Measurement result of elasticity in deeper skin layer (Ur/Ue)

Subject ID No.	Before	2 weeks after
16811-BC1-01	0.50	0.57
16811-BC1-02	0.57	0.62
16811-BC1-03	0.68	0.71
16811-BC1-04	0.66	0.68
16811-BC1-05	0.68	0.70
16811-BC1-06	0.45	0.47
16811-BC1-07	0.54	0.69
16811-BC1-08	0.78	0.81
16811-BC1-09	0.58	N.A
16811-BC1-10	0.70	0.80
16811-BC1-11	0.59	0.65
16811-BC1-12	0.55	0.58
16811-BC1-13	0.60	0.65
16811-BC1-14	0.68	0.69
16811-BC1-15	0.59	0.68
16811-BC1-16	0.60	0.67
16811-BC1-17	0.60	0.62
16811-BC1-18	0.63	0.62
16811-BC1-19	0.58	0.60
16811-BC1-20	0.62	0.64
16811-BC1-21	0.68	0.69

Appendix 13. Measurement result of skin restitution (CoR)

Subject ID No.	Before	2 weeks after
16811-BC1-01	0.52	0.55
16811-BC1-02	0.55	0.58
16811-BC1-03	0.54	0.55
16811-BC1-04	0.53	0.53
16811-BC1-05	0.55	0.60
16811-BC1-06	0.52	0.54
16811-BC1-07	0.55	0.56
16811-BC1-08	0.58	0.59
16811-BC1-09	0.52	N.A
16811-BC1-10	0.49	0.52
16811-BC1-11	0.54	0.57
16811-BC1-12	0.49	0.50
16811-BC1-13	0.57	0.59
16811-BC1-14	0.52	0.59
16811-BC1-15	0.53	0.58
16811-BC1-16	0.60	0.64
16811-BC1-17	0.57	0.59
16811-BC1-18	0.56	0.58
16811-BC1-19	0.53	0.61
16811-BC1-20	0.60	0.62
16811-BC1-21	0.55	0.57

Appendix 14. Measurement result of skin calming effect (℃)

Subject ID No.	Before heating		Immediately after heating		Immediately after product use	
	Control (Un-applied)	Test	Control (Un-applied)	Test	Control (Un-applied)	Test
16811-BC1-01	32.4	32.4	39.1	38.3	37.0	34.0
16811-BC1-02	33.3	33.7	38.9	38.7	37.1	34.3
16811-BC1-03	32.7	33.0	38.7	38.2	36.7	33.4
16811-BC1-04	34.7	34.9	38.5	38.8	36.3	33.7
16811-BC1-05	33.1	32.7	39.2	37.6	36.6	32.3
16811-BC1-06	32.4	32.4	38.3	38.1	36.1	32.4
16811-BC1-07	32.1	32.3	37.3	37.6	36.6	33.2
16811-BC1-08	32.4	32.7	38.0	37.9	36.3	33.3
16811-BC1-09	N.A	N.A	N.A	N.A	N.A	N.A
16811-BC1-10	32.9	32.6	37.1	38.1	35.9	33.5
16811-BC1-11	33.2	32.9	38.0	38.2	36.7	33.1
16811-BC1-12	32.3	32.8	39.2	39.3	36.0	32.6
16811-BC1-13	32.8	32.3	38.0	38.3	35.9	31.9
16811-BC1-14	31.0	30.9	38.2	37.9	35.9	32.1
16811-BC1-15	32.4	32.9	37.5	37.5	36.1	32.9
16811-BC1-16	33.0	33.4	38.0	38.4	36.6	34.0
16811-BC1-17	31.9	31.7	39.5	39.6	36.3	32.9
16811-BC1-18	32.8	32.9	38.7	38.1	36.2	32.7
16811-BC1-19	33.6	33.3	38.6	38.8	37.2	33.9
16811-BC1-20	32.4	33.4	38.7	38.8	36.4	33.6
16811-BC1-21	34.5	34.3	40.0	39.6	36.4	33.1

Appendix 15. Result of Global Assessment of Efficacy

Subject ID No.	Droopy skin pore	Elasticity in deeper skin area/on skin surface	Skin elasticity of cheek	Dead skin cells
16811-BC1-01	2	2	3	3
16811-BC1-02	2	2	2	3
16811-BC1-03	3	3	3	3
16811-BC1-04	2	3	3	2
16811-BC1-05	2	4	3	3
16811-BC1-06	3	2	2	3
16811-BC1-07	3	3	3	3
16811-BC1-08	3	4	3	4
16811-BC1-09	N.A	N.A	N.A	N.A
16811-BC1-10	2	3	3	3
16811-BC1-11	2	3	3	2
16811-BC1-12	2	2	2	2
16811-BC1-13	2	3	3	3
16811-BC1-14	3	2	3	3
16811-BC1-15	3	3	3	4
16811-BC1-16	3	2	2	3
16811-BC1-17	3	3	3	3
16811-BC1-18	3	3	3	2
16811-BC1-19	2	2	2	3
16811-BC1-20	2	2	2	3
16811-BC1-21	2	1	2	1

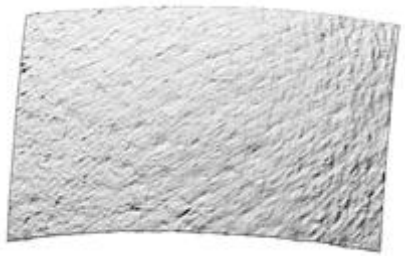
Subject ID No.	Skin texture	TEWL and Skin calming effect	Skin hydration persistency
16811-BC1-01	2	3	2
16811-BC1-02	3	3	3
16811-BC1-03	4	3	4
16811-BC1-04	3	3	3
16811-BC1-05	3	2	3
16811-BC1-06	3	3	3
16811-BC1-07	3	3	3
16811-BC1-08	4	4	4
16811-BC1-09	N.A	N.A	N.A
16811-BC1-10	3	3	3
16811-BC1-11	3	3	2
16811-BC1-12	2	2	2
16811-BC1-13	3	2	2
16811-BC1-14	3	3	3
16811-BC1-15	3	4	4
16811-BC1-16	3	3	3
16811-BC1-17	4	3	4
16811-BC1-18	2	3	3
16811-BC1-19	2	2	3
16811-BC1-20	2	3	3
16811-BC1-21	2	2	2

Appendix 16. Result of Product preference survey

Subject ID No.	Immediate skin moisturizing	Smooth skin texture and skin glossiness	Absorptiveness
16811-BC1-01	2	2	2
16811-BC1-02	4	2	3
16811-BC1-03	4	4	3
16811-BC1-04	3	3	3
16811-BC1-05	3	4	3
16811-BC1-06	3	3	3
16811-BC1-07	4	3	3
16811-BC1-08	4	3	3
16811-BC1-09	N.A	N.A	N.A
16811-BC1-10	3	3	2
16811-BC1-11	3	3	3
16811-BC1-12	3	3	3
16811-BC1-13	3	3	3
16811-BC1-14	3	3	3
16811-BC1-15	3	2	3
16811-BC1-16	3	3	3
16811-BC1-17	3	4	4
16811-BC1-18	3	3	2
16811-BC1-19	3	4	3
16811-BC1-20	4	2	2
16811-BC1-21	2	2	2

Subject ID No.	Hydration	Mobility	Overall usability
16811-BC1-01	3	2	2
16811-BC1-02	3	3	3
16811-BC1-03	4	3	3
16811-BC1-04	3	3	3
16811-BC1-05	4	4	3
16811-BC1-06	3	3	3
16811-BC1-07	3	4	4
16811-BC1-08	4	4	4
16811-BC1-09	N.A	N.A	N.A
16811-BC1-10	3	2	3
16811-BC1-11	2	2	3
16811-BC1-12	3	2	2
16811-BC1-13	3	3	3
16811-BC1-14	3	2	3
16811-BC1-15	4	4	3
16811-BC1-16	3	3	3
16811-BC1-17	4	3	3
16811-BC1-18	2	4	3
16811-BC1-19	3	3	3
16811-BC1-20	3	4	3
16811-BC1-21	2	3	2

Appendix 17. Pictures of Skin texture (PRIMOS Premium)

	Before	Immediately after	2 weeks after
16811 -BC1 -01			
16811 -BC1 -02			
16811 -BC1 -03			

	Before	Immediately after	2 weeks after
16811 -BC1 -04			
16811 -BC1 -05			
16811 -BC1 -06			

	Before	Immediately after	2 weeks after
16811 -BC1 -07			
16811 -BC1 -08			
16811 -BC1 -09			N.A

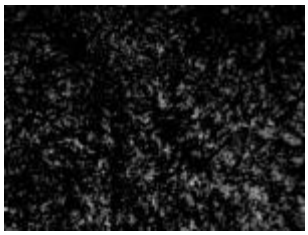
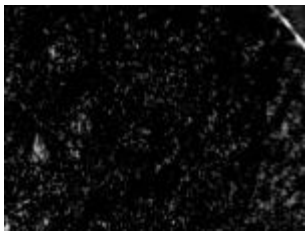
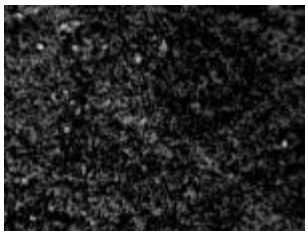
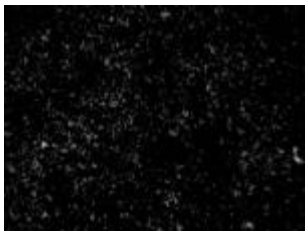
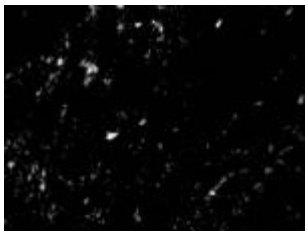
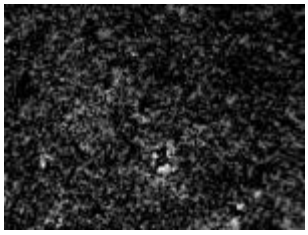
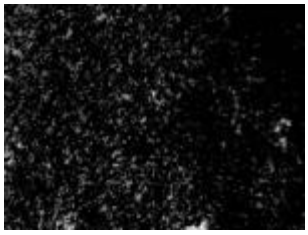
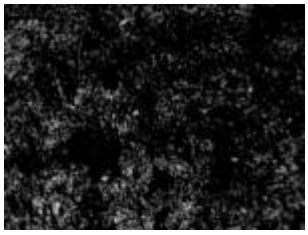
	Before	Immediately after	2 weeks after
16811 -BC1 -10			
16811 -BC1 -11			
16811 -BC1 -12			

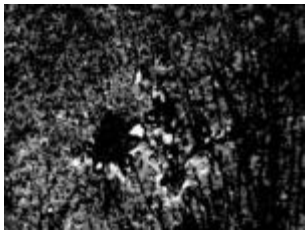
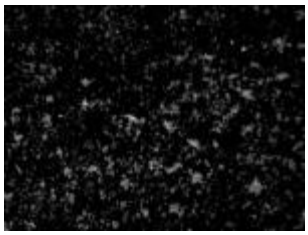
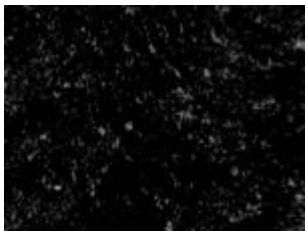
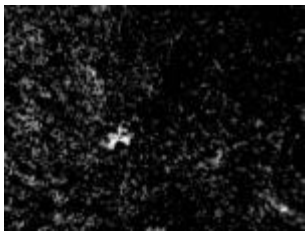
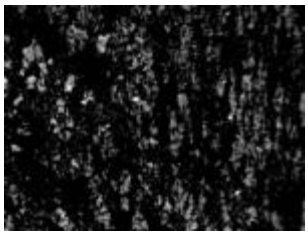
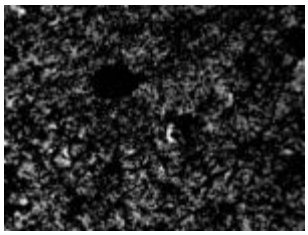
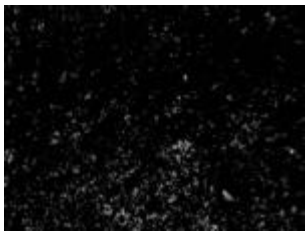
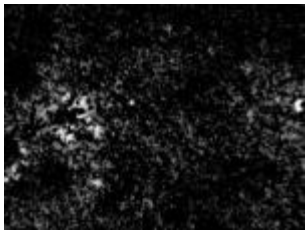
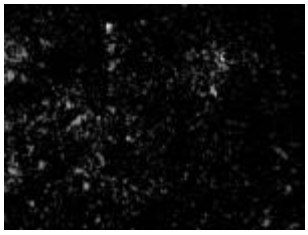
	Before	Immediately after	2 weeks after
16811 -BC1 -13			
16811 -BC1 -14			
16811 -BC1 -15			

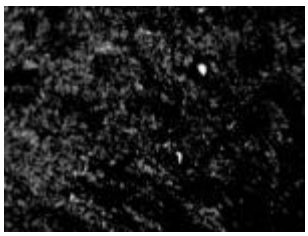
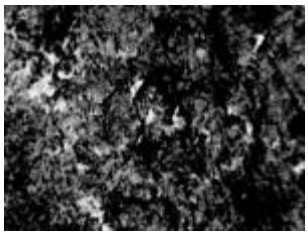
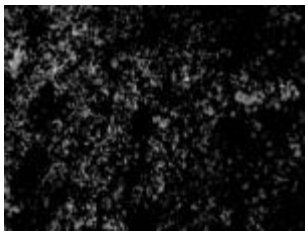
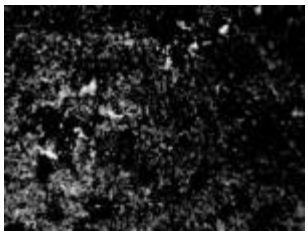
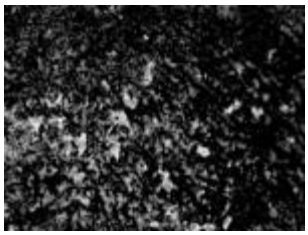
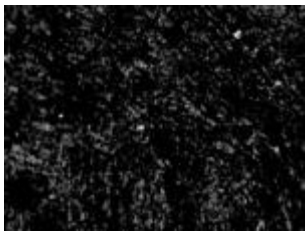
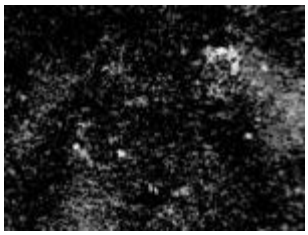
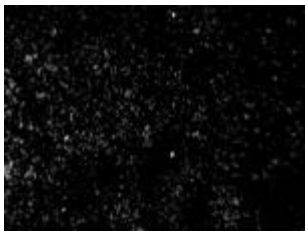
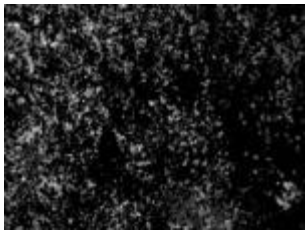
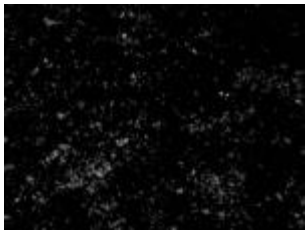
	Before	Immediately after	2 weeks after
16811 -BC1 -16			
16811 -BC1 -17			
16811 -BC1 -18			

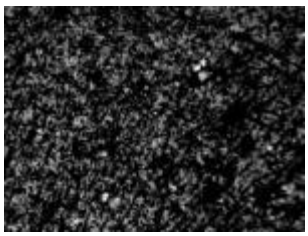
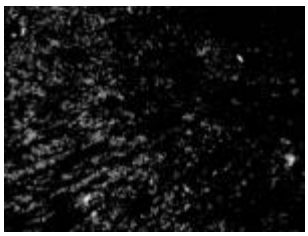
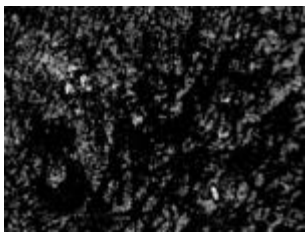
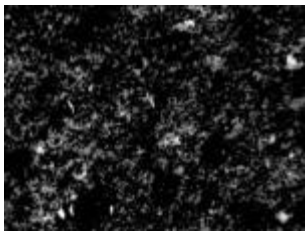
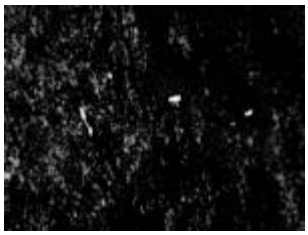
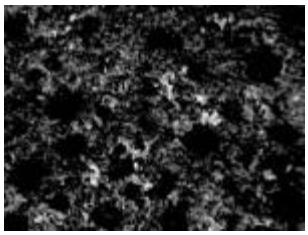
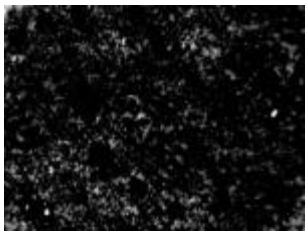
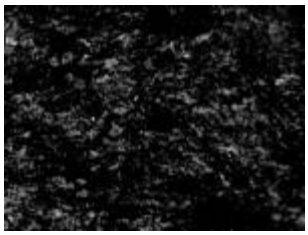
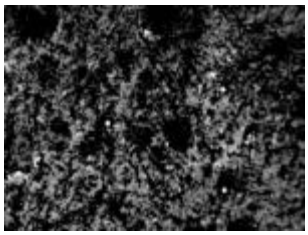
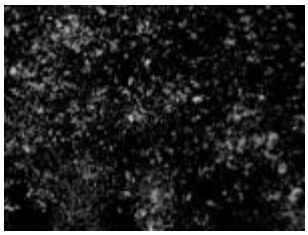
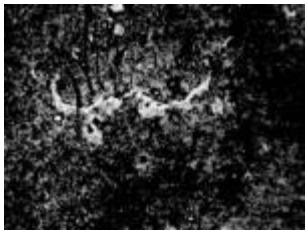
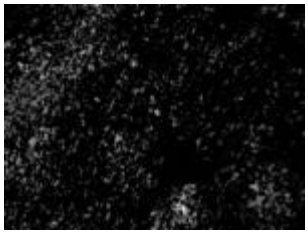
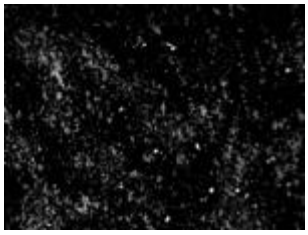
	Before	Immediately after	2 weeks after
16811 -BC1 -19			
16811 -BC1 -20			
16811 -BC1 -21			

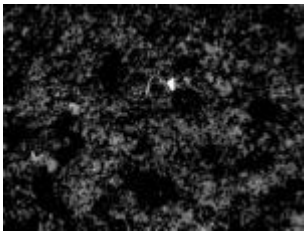
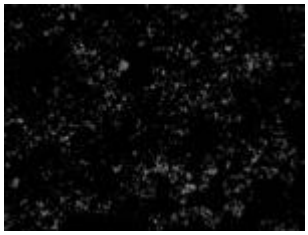
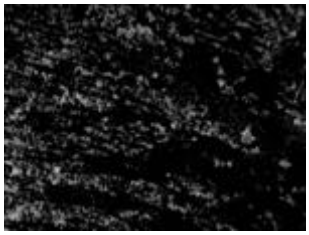
Appendix 18. Pictures of Dead skin cells (Visioscan VC98)

	Before	Immediately after	2 weeks after
16811-BC1-01			
16811-BC1-02			
16811-BC1-03			
16811-BC1-04			
16811-BC1-05			

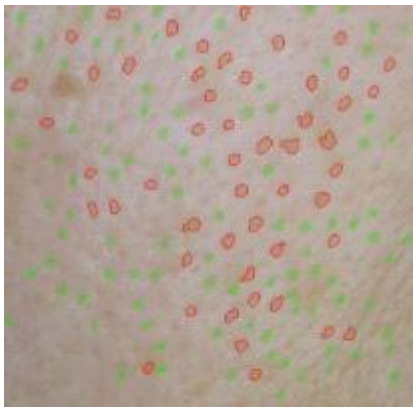
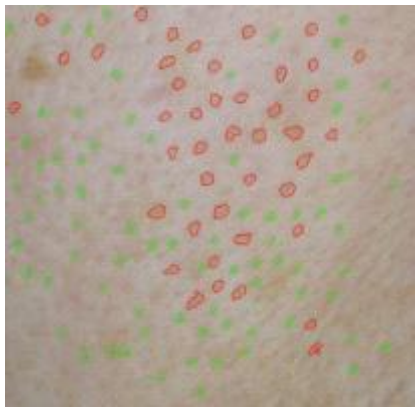
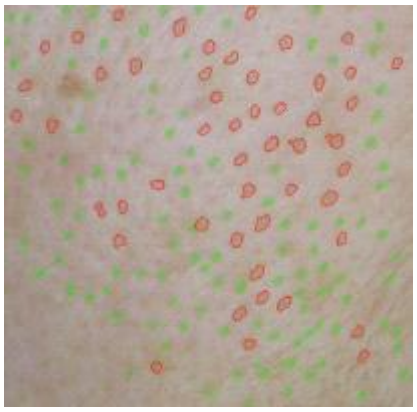
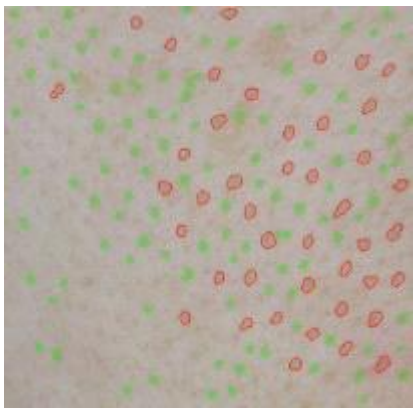
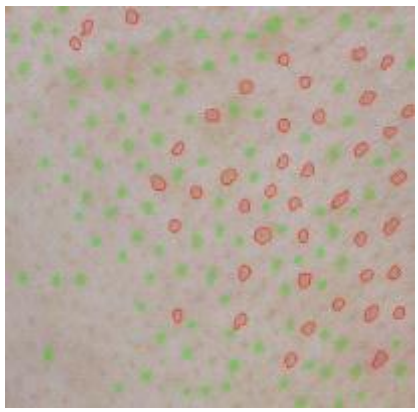
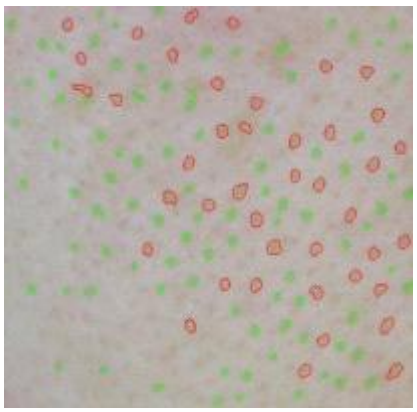
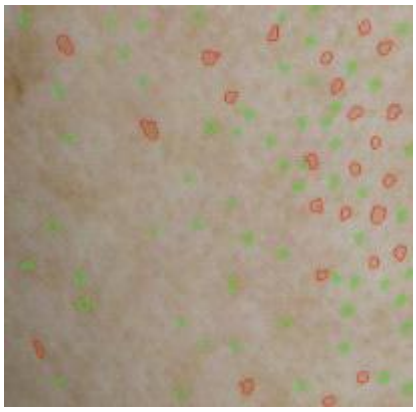
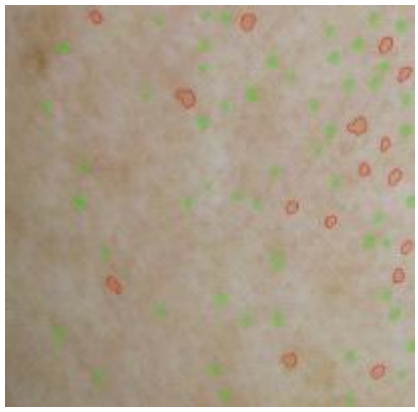
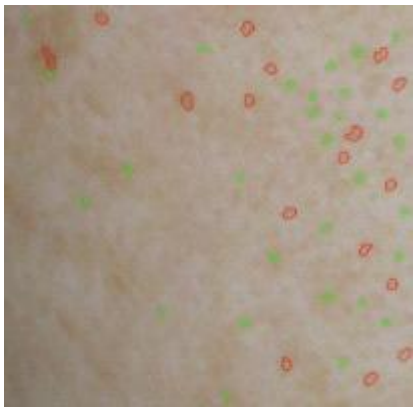
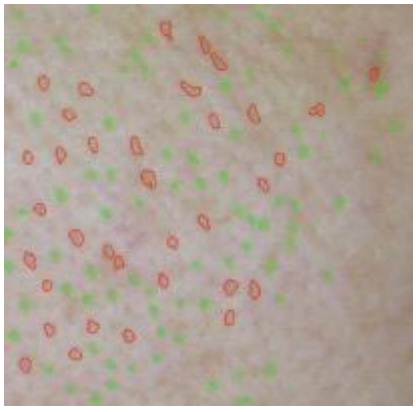
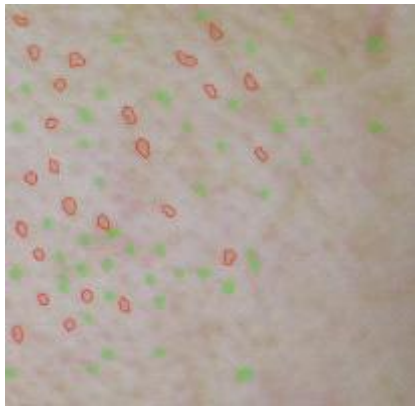
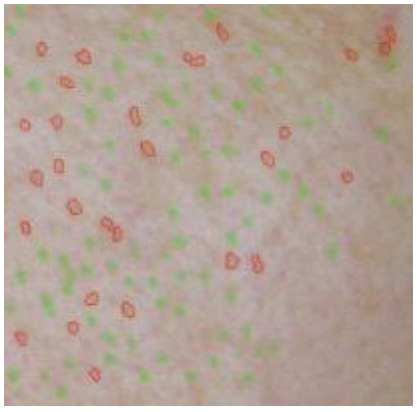
	Before	Immediately after	2 weeks after
16811-BC1-06			
16811-BC1-07			
16811-BC1-08			
16811-BC1-09			N.A
16811-BC1-10			

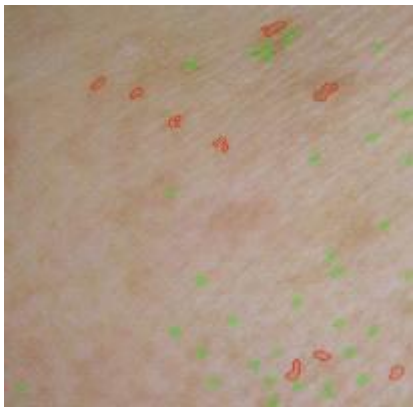
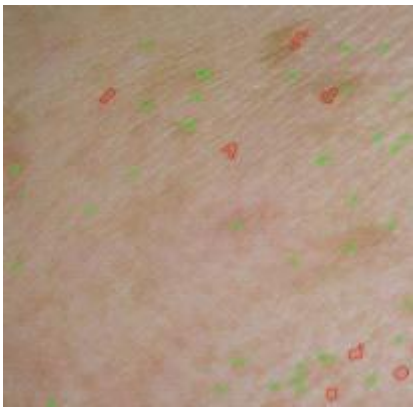
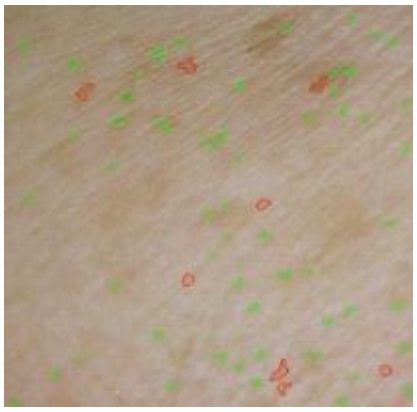
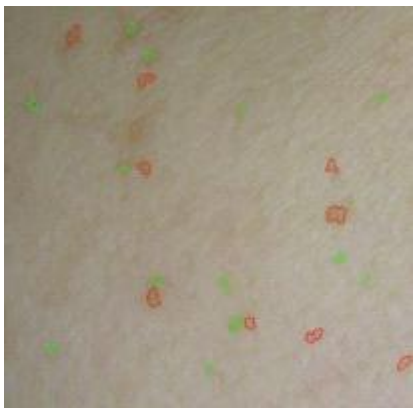
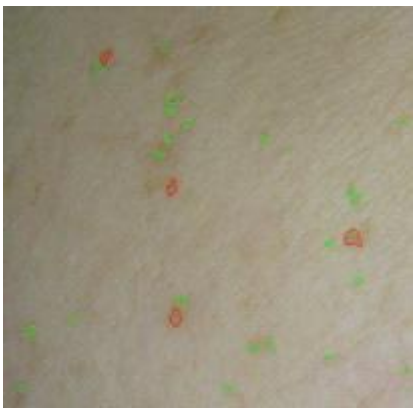
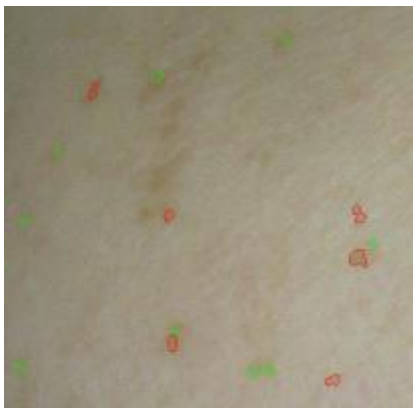
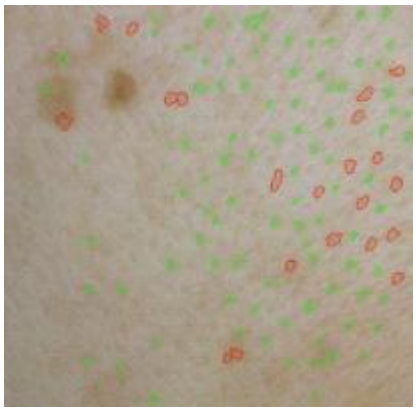
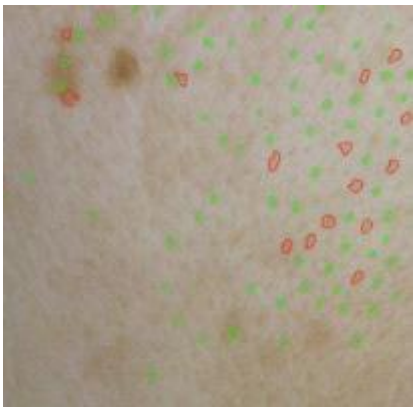
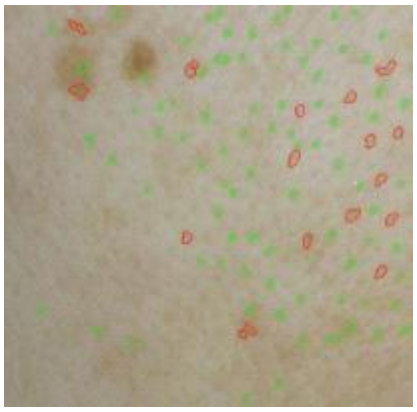
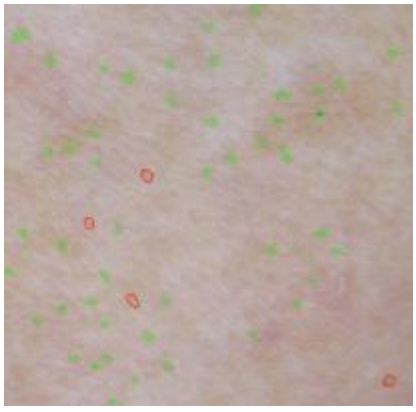
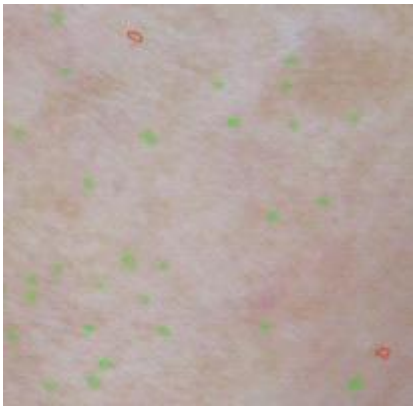
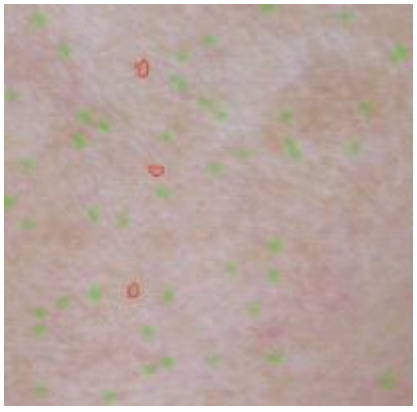
	Before	Immediately after	2 weeks after
16811-BC1-11			
16811-BC1-12			
16811-BC1-13			
16811-BC1-14			
16811-BC1-15			

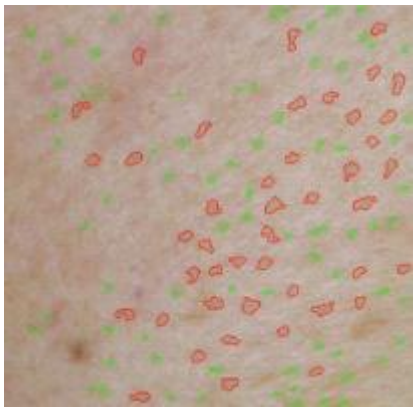
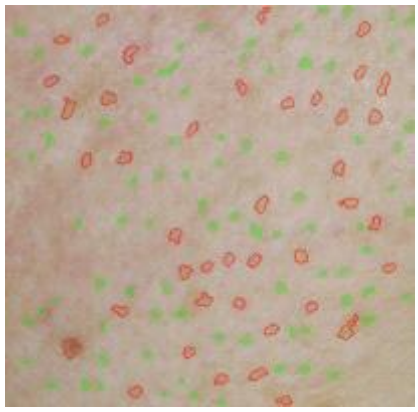
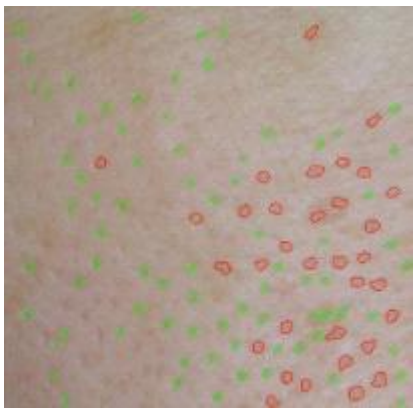
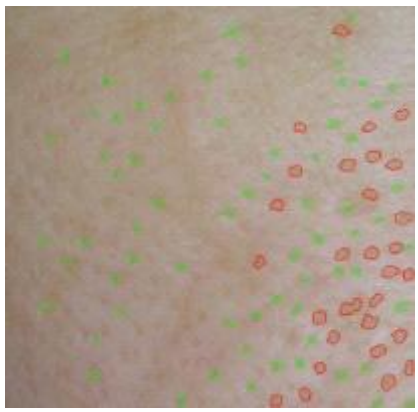
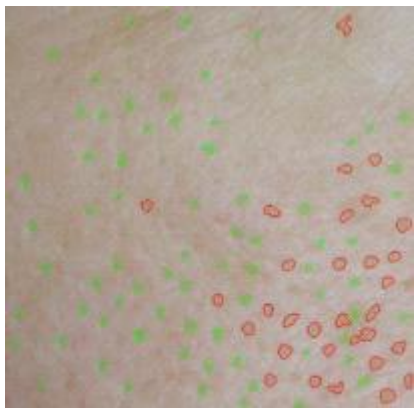
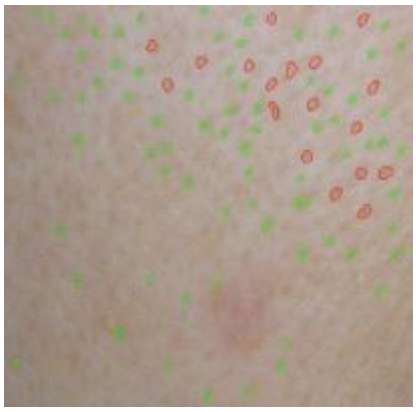
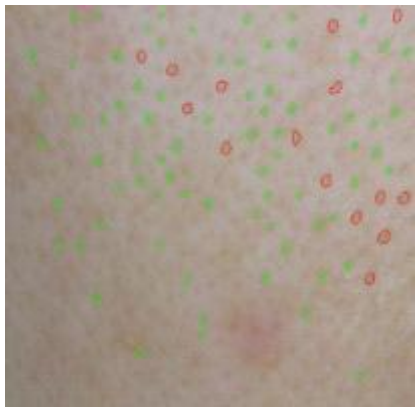
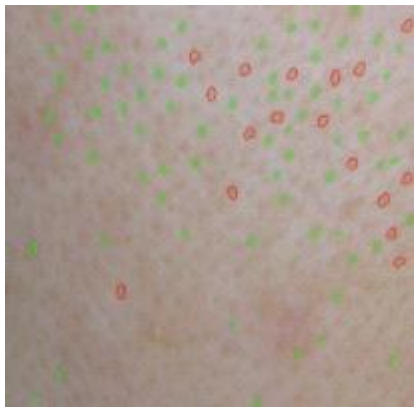
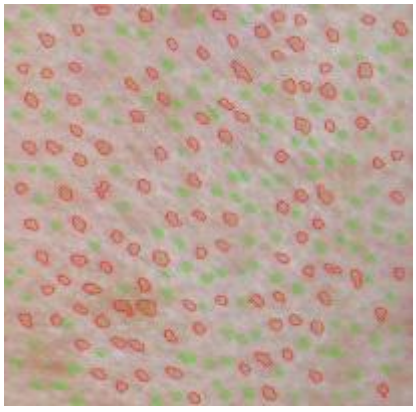
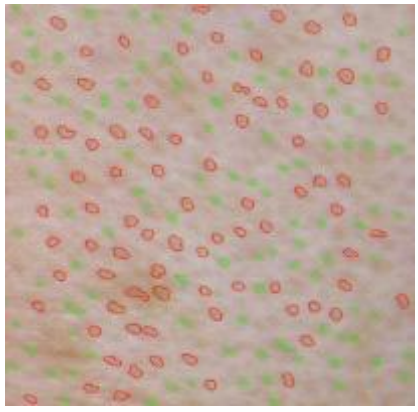
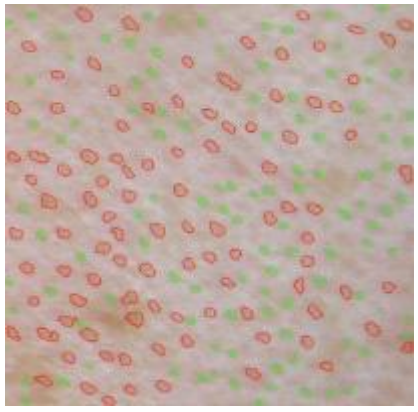
	Before	Immediately after	2 weeks after
16811-BC1-16			
16811-BC1-17			
16811-BC1-18			
16811-BC1-19			
16811-BC1-20			

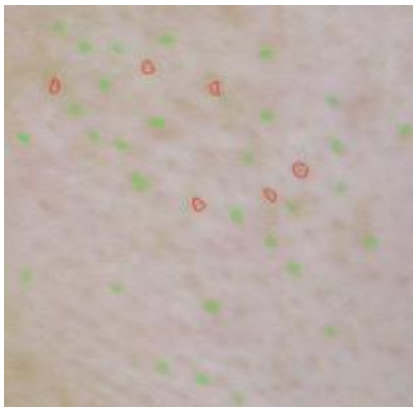
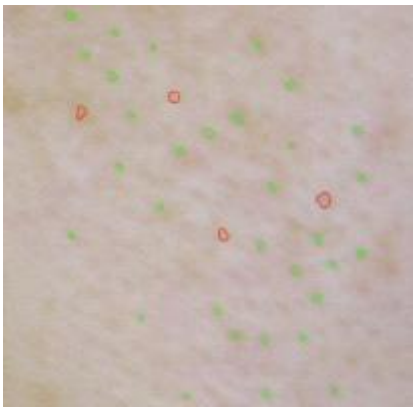
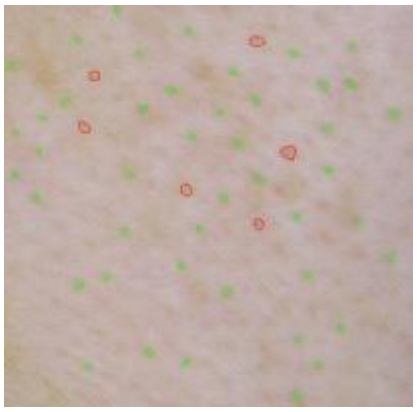
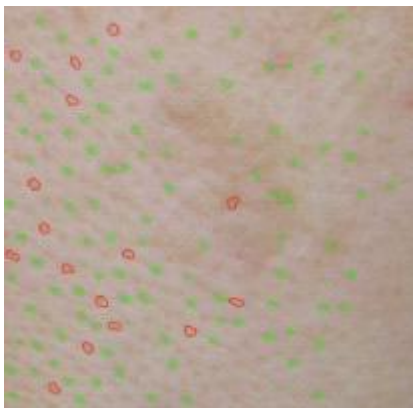
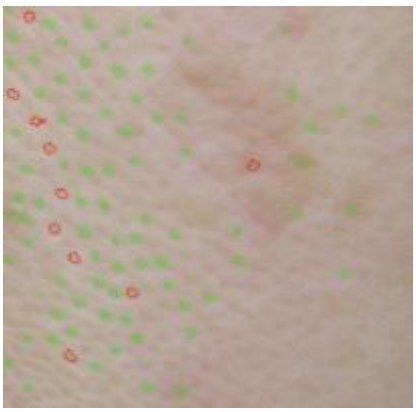
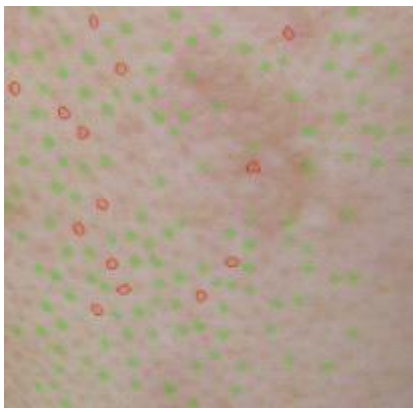
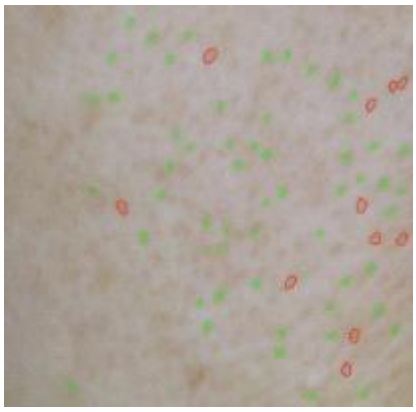
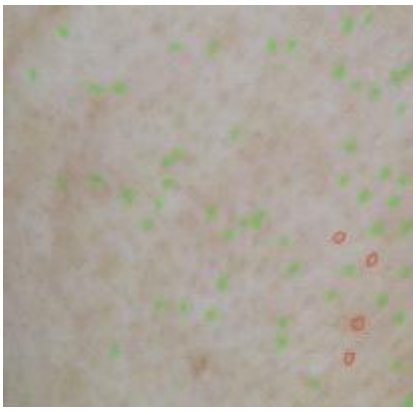
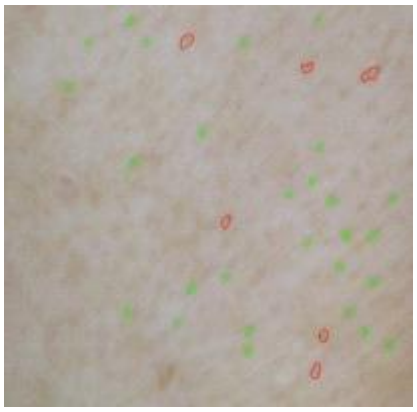
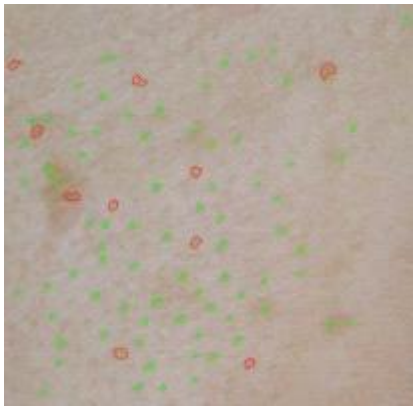
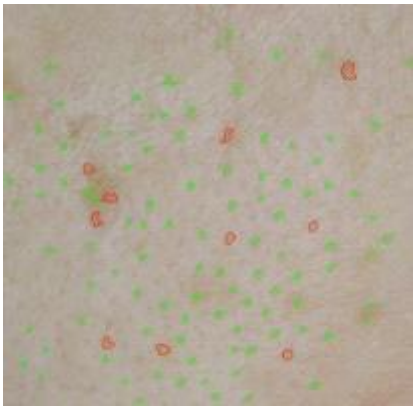
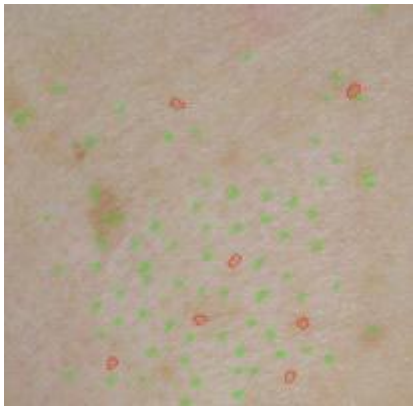
	Before	Immediately after	2 weeks after
16811-BC1-21			

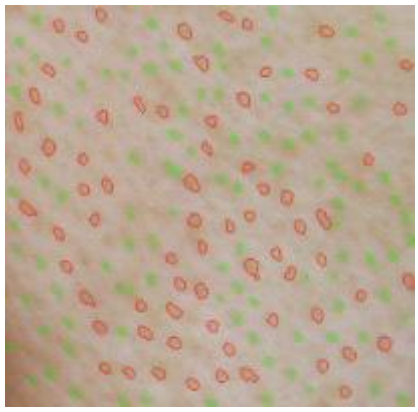
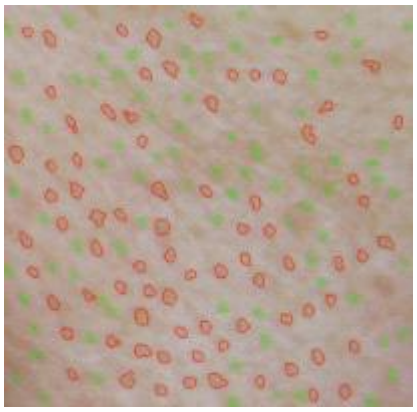
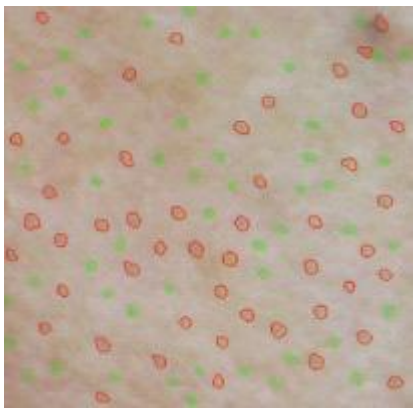
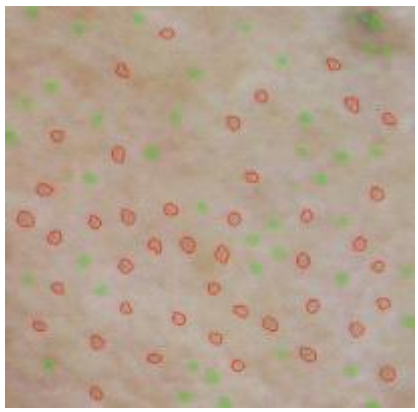
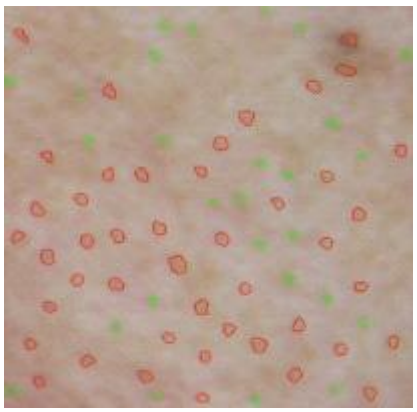
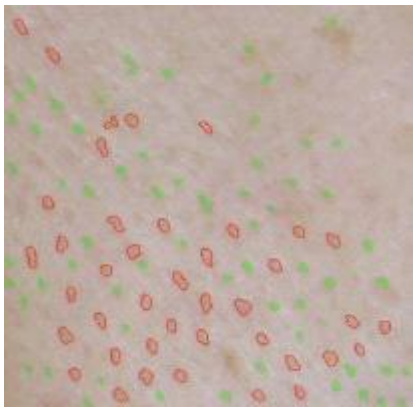
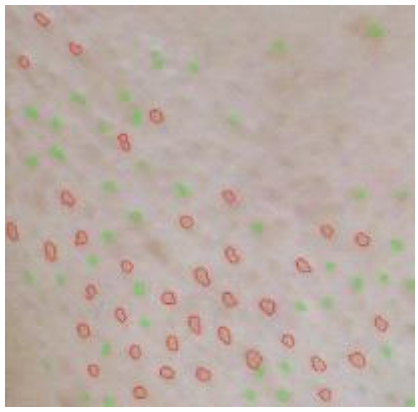
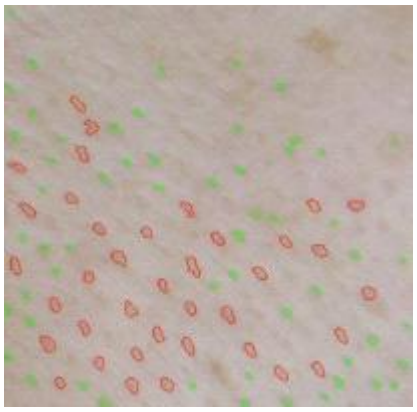
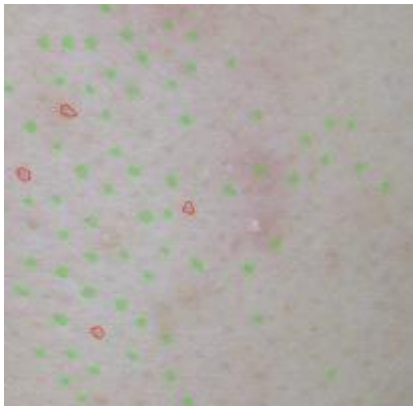
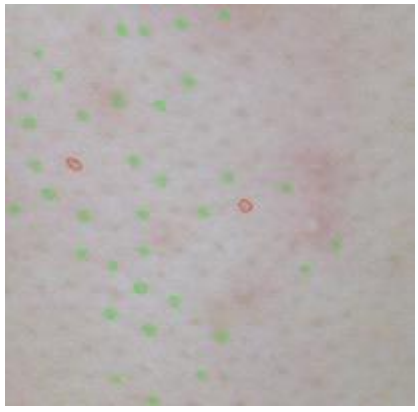
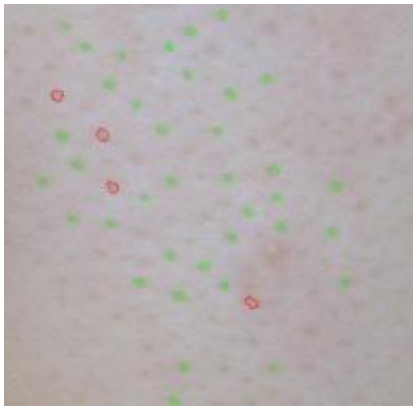
Appendix 19. Pictures of Skin pores (Visioface)

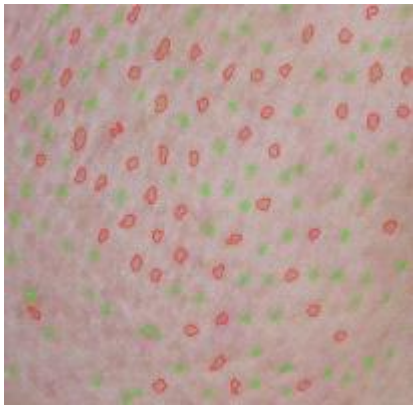
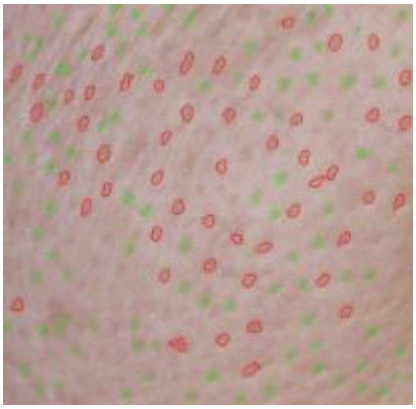
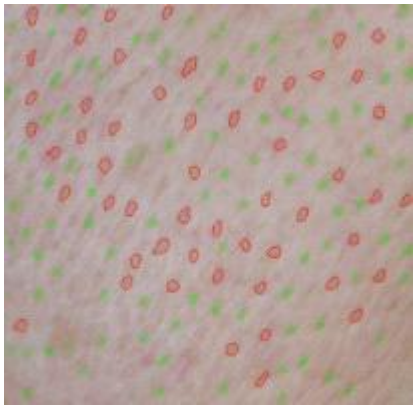
	Before	Immediately after	2 weeks after
16811 -BC1 -01			
16811 -BC1 -02			
16811 -BC1 -03			
16811 -BC1 -04			

	Before	Immediately after	2 weeks after
16811 -BC1 -05			
16811 -BC1 -06			
16811 -BC1 -07			
16811 -BC1 -08			

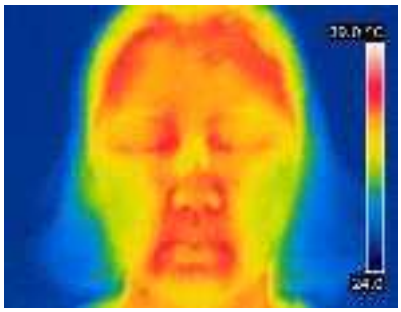
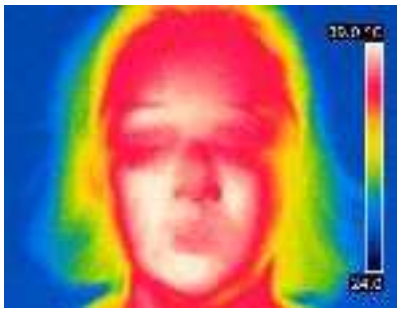
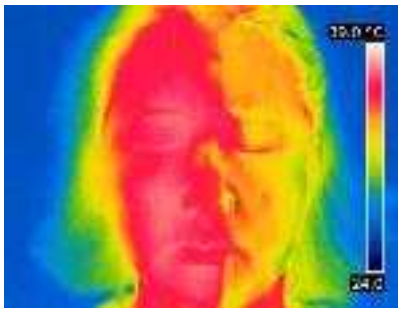
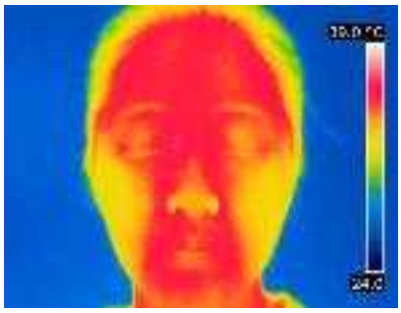
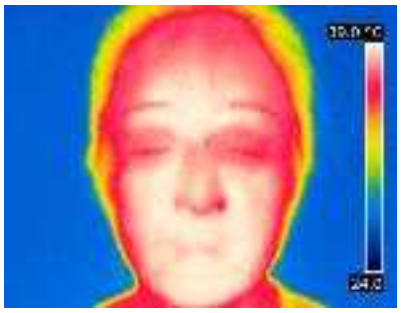
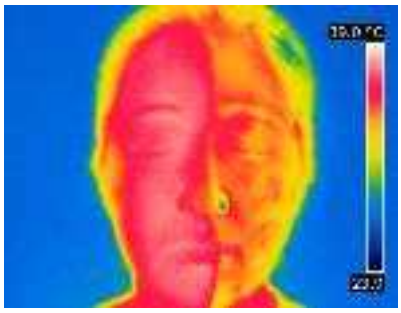
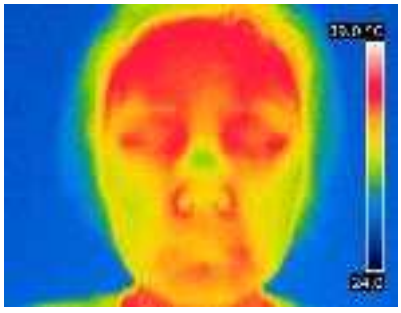
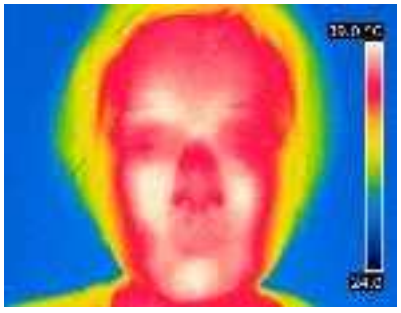
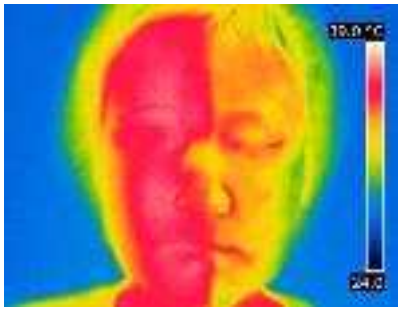
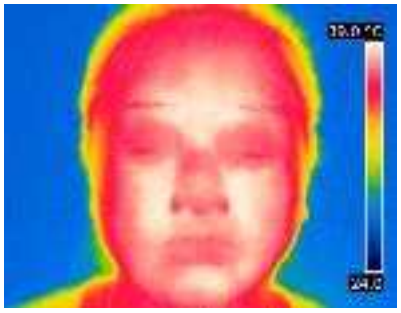
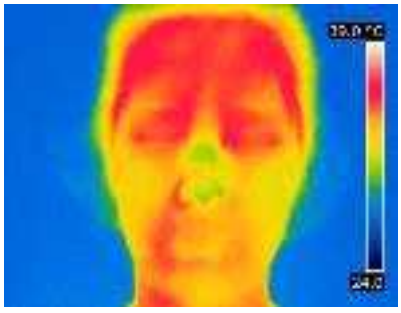
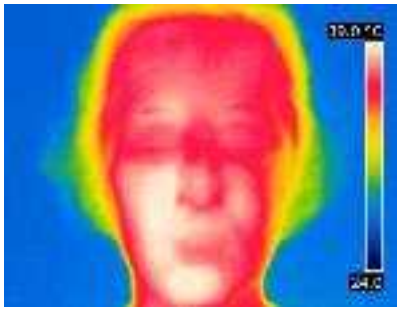
	Before	Immediately after	2 weeks after
16811 -BC1 -09			N.A
16811 -BC1 -10			
16811 -BC1 -11			
16811 -BC1 -12			

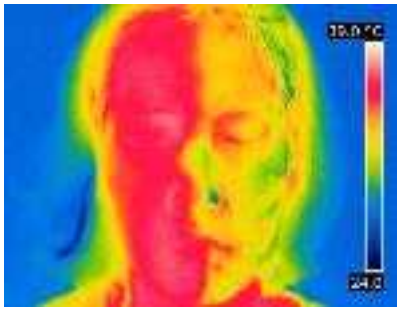
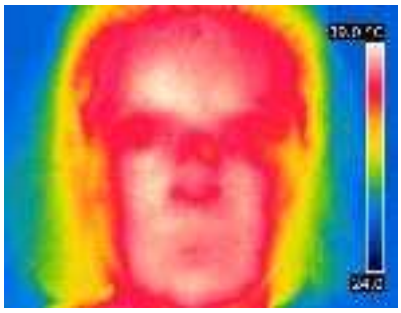
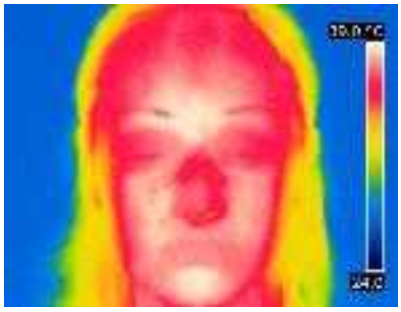
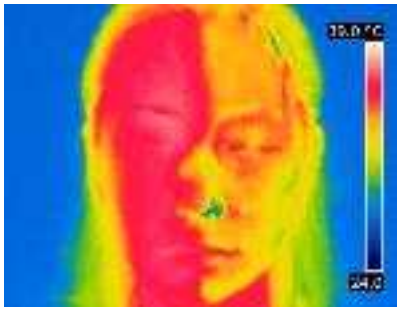
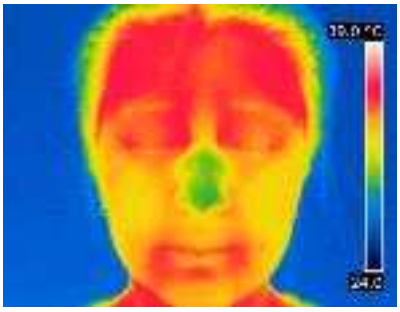
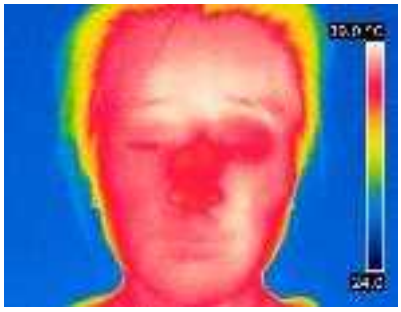
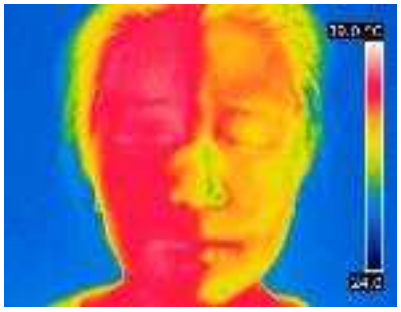
	Before	Immediately after	2 weeks after
16811-BC1-13			
16811-BC1-14			
16811-BC1-15			
16811-BC1-16			

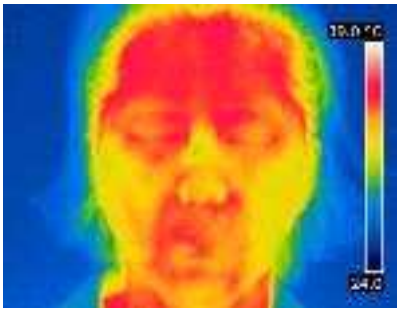
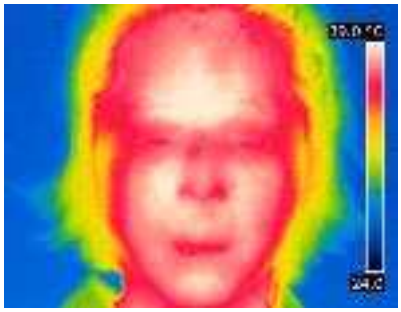
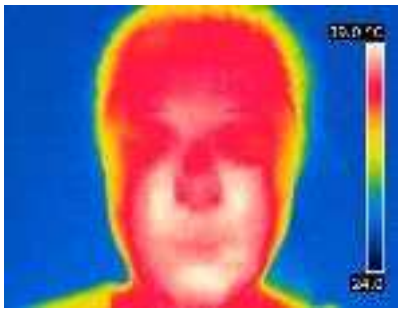
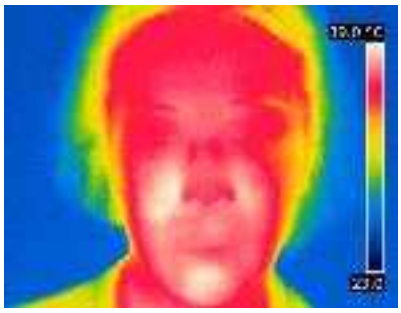
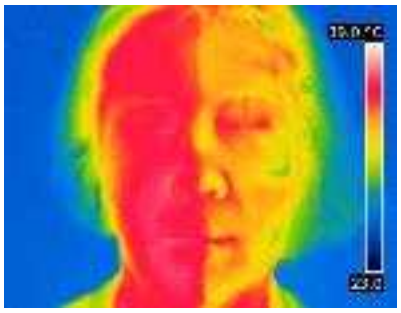
	Before	Immediately after	2 weeks after
16811-BC1-17			
16811-BC1-18			
16811-BC1-19			
16811-BC1-20			

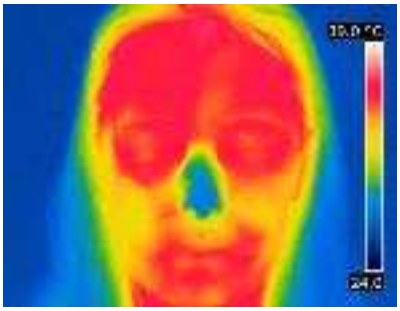
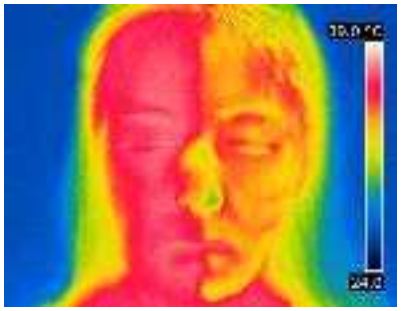
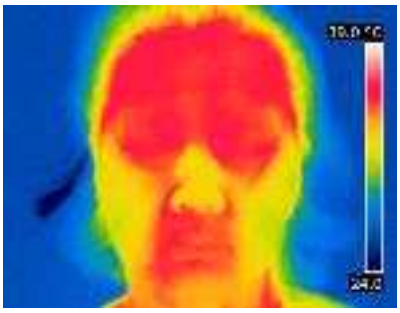
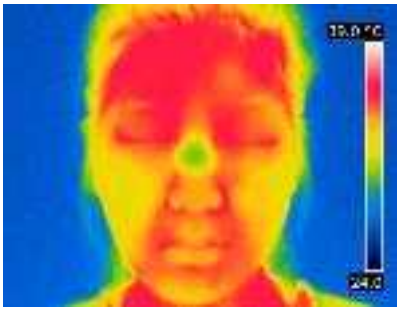
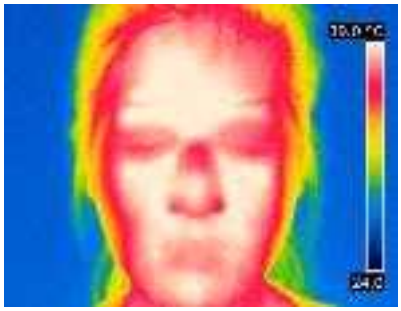
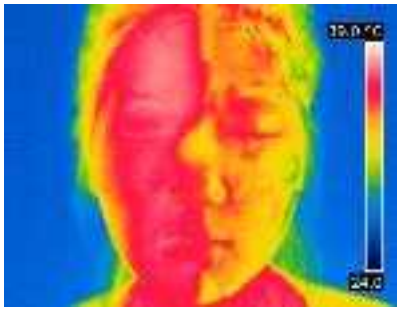
	Before	Immediately after	2 weeks after
16811 -BC1 -21			

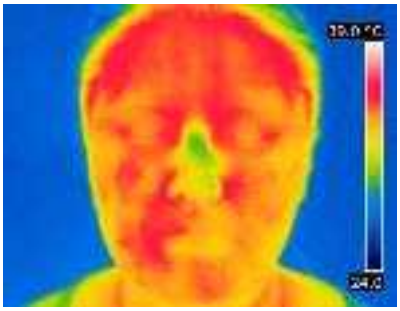
Appendix 20. Pictures of Skin calming effect (Thermo-graphic camera)

	Before heating	Immediately after heating	Immediately after product use	
			Control	Test
16811 -BC1 -01				
16811 -BC1 -02				
16811 -BC1 -03				
16811 -BC1 -04				
16811 -BC1 -05				

	Before heating	Immediately after heating	Immediately after product use	
			Control	Test
16811 -BC1 -06				
16811 -BC1 -07				
16811 -BC1 -08				
16811 -BC1 -09				
16811 -BC1 -10				

	Before heating	Immediately after heating	Immediately after product use	
			Control	Test
16811 -BC1 -11				
16811 -BC1 -12				
16811 -BC1 -13				
16811 -BC1 -14				
16811 -BC1 -15				

	Before heating	Immediately after heating	Immediately after product use	
			Control	Test
16811 -BC1 -16				
16811 -BC1 -17				
16811 -BC1 -18				
16811 -BC1 -19				
16811 -BC1 -20				

	Before heating	Immediately after heating	Immediately after product use	
			Control	Test
16811 -BC1 -21				

Researcher Profile

1. Researcher in charge

[Personal data]

Name : Beomjoon Kim, M.D. PhD. and Dermatologist
Present : Head of Professor & Chairman, Department of Dermatology, Chung-Ang University College of Medicine, Seoul, Korea

Tel : +82-2-6299-1525

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License number : 71628

[Education]

2000	Graduated College of Medicine, Chung-Ang University, Korea
2000-2001	Internship, Chung-Ang University Hospital, Korea
2001-2005	Resident, Chung-Ang University Hospital, Korea
2003	Master of Science, Graduate school of Chung-Ang University, Korea
2007	Doctorate of Philosophy, Dermatology, Chung-Ang University, Korea

[Professional Career]

2005-2015	-Invited reviewer of 'British Journal of Dermatology'
	-Reviewer of 'Journal of American Academy of Dermatology'
	-Reviewer of 'International Journal of Dermatology
2007-2015	-Invited reviewer, Clinical and experimental dermatology, Dermatologic Surgery, Pediatric dermatology
2007-present	-Editorial board, Chung-Ang Journal of Medicine
2010-present	-Editorial board, Asian Aesthetic Guide
2011-2014	-Clinical specialist of medical equipment, National Institute of Food and Drug Safety Evaluation
2011-present	-Committee member of Medical Equipment Board, Ministry of Food and Drug Safety
2012	-Vice president, Aesthetics Asia 2012
2012-present	-Editorial board, Journal of Cosmetics, Dermatological Sciences and Applications
	-Editorial board, Annals of Dermatology
2013-2015	-Committee member of Self-regulatory Boards, Ministry of food and drug safety
2013-present	-Professor, Department of Dermatology, Chung-Ang University Hospital, Korea
	-Editorial board, Dermatology Aspects

-Committee member of Korea Institute of Planning & Evaluation for Technology in Food, Agriculture Forestry and Fisheries

-Project Manager board member, Ministry of food and drug safety

2014 -Organizing committee member for 3rd Eastern Asia Dermatology Congress

2014-present -The chief instructor of Dermatology, Chung-Ang University Hospital, Korea

-Educational board, The Korean Academy of Asthma, Allergy and Clinical Immunology

-Editorial board, Plastic and Aesthetic Research

-Editorial board, Allergy Asthma & Respiratory Disease

-Editorial board, International Journal of Dermatology Research and Therapy

-Expert, Central Pharmaceutical Advisory Committee, Ministry of food and drug safety

-Advisory panel, National Institute of Food and Drug Safety Evaluation

2015-present -Editorial board, Investigative Dermatology and Venereology Research

-Editorial board, Journal of Cosmetology & Trichology

-Editorial board, Journal of Procedural Dermatology

-Specialized examination commissioner, National Court Administration

2016-present -Editorial board, World Journal of Methodology

-Director of Biomedical Research Institute, Chung-Ang University Hospital, Korea

-Professional advisor of Korean Industrial Standards, Ministry of food and drug safety

-Review board of medical device adverse event, Medical Device Information and Technology Assistance center

-Editorial board, Journal of Dermatology and Plastic Surgery

-Editorial board, Source Journal of Investigative Dermatology

-Editorial board, Journal of the Society of Cosmetic Scientists of Korea

-Editorial board, Current Updates in Dermatology Research

-Editorial board, Journal of Case Reports & Imaging

-Committee member of Policy Advisory Board, Ministry of food and drug safety

-Committee member of Communication Advisory Board, Ministry of food and drug safety

[Awards]

2003 -Scholarship, The Korean Society for Investigative Dermatology

-Novartis award, Korean Society for Medical Mycology

2006 -Best Paper, Symposium of Korea Information Processing Society

2007 -Dr. Paul Janssen Award, Korean Dermatological Association

-International Health Professional of the Year 2007, International Biographical Center, Cambridge, England

-Best Poster, Symposium of Korean Dermatological Association

2008 -Scholarship, The American Academy of Dermatology, USA

2009 -Academy award, Chung-Ang University, Korea

2010	-Outstanding book, ‘Aesthetic Dermatology’, Ministry of Culture, Sports and Tourism, Korea
2011	-Chungsan Academic Award, Korean Academy of Asthma, Allergy and Clinical Immunology
	-Excellent assessor of R&D projects, National Research Foundation of Korea, Ministry of Educational Science and Technology, Korea
2012	- Dong-Ah academy award, Korean Dermatological Association
	-Excellent professor of Industrial Academic Cooperation Foundation, Chung-Ang University Industrial Academic Cooperation Foundation, Korea
2013	-Academic Contribution Award, Chung-Ang University Hospital, Korea
	-Citation of Textbook Compliation Committee of Dermatology 6th edition, Korean Dermatological Association
	-BRIC “Korea’s Honorable People ” Records
2014	-Citation of President, Science and Technology Promotion Merit
2015	-Excellent Author of Science and Technology Journal, Korean Federation of Science and Technology Societies

[Societies]

Korean Medical Association, Committee of Public Information (2000 - present)

Korean Dermatological Association (2001 - present)

Committee member of The Korean Society for Investigative Dermatology (2001 - present)

Committee member of The American academy of dermatology (2006 – present)

Committee member of Education, Korean Dermatological Association(2007-2011)

Committee member of Korean Society for Medical Mycology (2009-present)

Reviewer, Annals of Dermatology (2009-present)

Reviewer, Korean journal of Dermatological Association (2009-present)

Committee member of Text compilation, Korean Dermatological Association (2011-2013)

Committee member of Publication, Korean Dermatological Association (2011-present)

Director of the Korean Society of Pigment Cell Research (2011-present)

Committee member of Korean Society Hair Restoration Treatment (2012-present)

Director of the Korean Society for Aesthetic and Dermatologic Surgery (2013-2014)

Committee member of the Korean Atopic Dermatitis Association (2013-present)

Director of the Korean Hair Research Society (2014-present)

Review Board, Division of Basic research of Medical and Pharmaceutical Sciences, National Research Foundation of Korea (2014-present)

Committee member of External Relations, Korean Dermatological Association (2014-present)

Assistant administrator, Committee of Finance, Korean Dermatological Association (2014-present)

Committee member of Information and Communications, Korean Dermatological Association (2014-present)

Director of planning, Korean Society for Anti-Aging Dermatology (2015-present)

Committee member of Legislation Department, Korean Academy of Asthma, Allergy and Clinical Immunology (2015-present)

2. Quality assurance

[Personal data]

Name : Jin Hee Shin

Gender : Female

Date of birth : January 03rd, 1977

[Education]

1995.03 ~ 1999.02 Bachelor's degree in Genetic Engineering, Kyung Hee University, Korea

2003.03 ~ 2008.02 Master's degree in Neurology, Graduate school of Medicine, A Jou University, Korea

[Career]

2007. ~ 2012. Senior Researcher/Project manager, Central research institute, GNT pharma Co., Ltd.

2012. ~ 2015. Chief researcher/Researcher professor, Samsung Advanced Institute for Health Sciences & Technology, Samsung Seoul Hospital

2015. ~ 2015. Research instructor, Microbiology class, Graduate school of A Jou University, Korea

2016. ~ Present Chief researcher, P&K Skin Research Center

3. Researcher

[Personal data]

Name : A Reum Kim

Gender : Female

Date of birth : January 22nd, 1988

[Education]

2006.03 ~ 2011.02 Bachelor's degree in Cosmetic pharmacology, Daegu Haany University

2011.03 ~ 2013.02 Master's degree in Fine Chemistry, Graduate School of Industry, Seoul national university of science and technology

[Career]

2013.04 ~ Present : Researcher, P&K Skin Research center

[Personal data]

Name : Tae Ji Lee

Gender : Female

Date of birth : July 24th, 1987

[Education]

2009.03 ~ 2012.02 Bachelor's degree in Life science, Korea University

[Career]

2013.10 ~ Present : Researcher, P&K Skin Research center

[Personal data]

Name : In Ah Kim

Gender : Female

Date of birth : April 14th, 1988

[Education]

2007.03 ~ 2012.02 Bachelor's degree in Life science, Sungshin women's University

[Career]

2013.10 ~ Present : Researcher, P&K Skin Research center

[Personal data]

Name : Eun Ji Lim

Gender : Female

Date of birth : December 17, 1989

[Education]

2008.03 ~ 2011.08 Bachelor's degree in Department of Food&nutrition, Yeungnam University

2011.09 ~ 2013.02 Master's degree in Clinical nutrition, Department of Food&nutrition Yeungnam University

[Career]

2014. ~ 2016. : Researcher, The Clinical Trial Center for Bio-industry at Semyung University

2016. ~ Present : Researcher, P&K Skin Research center

[Personal data]

Name : Yun Hee Kim

Gender : Female

Date of birth : February 23rd, 1989

[Education]

2007.03 ~ 2013.08 Bachelor's degree in Applied Mathematics, Dankook University

[Career]

2014.03 ~ Present : Researcher, P&K Skin Research center

[Personal data]

Name : Cho Rong Seo

Gender : Female

Date of birth : December 15th, 1988

[Education]

2010.03 ~ 2012.08 Bachelor's degree in Food and biotechnology, Sungkyunkwan University

2012.09 ~ 2014.08 Master's degree in Biotechnology, Kyunghee University

[Career]

2015.05 ~ Present : Researcher, P&K Skin Research center

[Personal data]

Name : Min Hye park

Gender : Female

Date of birth : January 25, 1992

[Education]

2011.03 ~ 2016.02 Bachelor's degree in Bio Technology, Suwon University, Prospective graduate

[Career]

2015. ~ Present : Researcher, P&K Skin Research center

[Personal data]

Name : Eun Kyung Lee

Gender : Female

Date of birth : April 21, 1993

[Education]

2012.03 ~ 2016.02 Bachelor's degree in Life science, Dongkook University, Prospective graduate

[Career]

2015. ~ Present : Researcher, P&K Skin Research center

[Personal data]

Name : Go Eun Gu

Gender : Female

Date of birth : June 01, 1991

[Education]

2010.03 ~ 2014.02 Bachelor's degree in Microbiology, Gyeongsang University

2014.03 ~ 2016.02 Master's degree in Biochemistry, Graduate School of medicine, Chungang university

[Career]

2016. ~ Present : Researcher, P&K Skin Research center

[Personal data]

Name : Eun Seo Baek

Gender : Female

Date of birth : July 06, 1993

[Education]

2012.03 ~ 2016.02 Bachelor's degree in applied biochemistry, Konkuk University

[Career]

2016. ~ Present : Researcher, P&K Skin Research center

[Personal data]

Name : Ji Yoon Han

Gender : Female

Date of birth : February 27, 1990

[Education]

2009.03 ~ 2015.02 Bachelor's degree in applied Chemistry, Sejong University

[Career]

2016. ~ Present : Researcher, P&K Skin Research center

[Personal data]

Name : So Jin Jeon

Gender : Female

Date of birth : September 23, 1990

[Education]

2012.03 ~ 2015.08 Bachelor's degree in Chemistry, Sungkyunkwan University

[Career]

2016. ~ Present : Researcher, P&K Skin Research center

[Personal data]

Name : Su Yeon Kim

Gender : Female

Date of birth : February 01, 1991

[Education]

2012.03 ~ 2016.02 Bachelor's degree in Chemistry, Soonchunhyang University

[Career]

2016. ~ Present : Researcher, P&K Skin Research center

4. Research Assistant

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[Career]

2015. ~ Present : Researcher, P&K Skin Research center

Accomplishment of Chief Researcher

	Title	Journal
1	Ethnical characteristics of the eyelashes : a comparative analysis in Asian and Caucasian females	Br J Dermatol 2006;155(6):1170-6
2	Alopecia areata associated with basal cell carcinoma developing within a naevus sebaceus	Br J Dermatol 2006;155(5):1090-1
3	Cutaneous Schwannoma treated by tumescent suction technique	Int J Dermatol 2006;45(10):1267-8
4	Clinical observation of cellular phone dermatitis in Korea	Kor J Dermatol 2006; 44(1):35-9
5	A case of congenital cutis laxa with growth retardation	Kor J Dermatol 2006;44(3):387-9
6	Dermatosis in human immunodeficiency virus infected patients in Korea	Kor J Dermatol 2006;44(4):420-4
7	A case of nail-patella syndrome	Kor J Dermatol 2006;44(4):492-4
8	Incontinentia pigmenti in a male infant	Kor J Dermatol 2006;44(5):624-6
9	A clinical analysis of 29 cases of centipede bite	Kor J Dermatol 2006;44(9):1037-43
10	Hair cuticle differences between Asian and Caucasian	Int J Dermatol 2006;45(12):1435-7
11	Non invasive evaluation of hair interior morphology by X-ray microscope	J Dermatol 2006;33(11):759-64
12	Androgenetic alopecia in adolecents: A report of 43 cases	J Dermatol 2006;33(10):696-9
13	Study of causative organisms in pitted keratolysis	Kor J Med Mycol 2006; 11(4):172-6
14	Two cases of green nail syndrome	Kor J Med Mycol 2006; 11(3):163-5
15	A clinical analysis of 133 cases of pitted keratolysis	Kor J Dermatol 2006;44(10):1165-70
16	Photoepilation:a potential threat to wound healing in a mouse	J Cosmet Dermatol 2006;5(2):115-20
17	Incontinentia pigmenti:clinical observation of 40 Korean cases	J Korean Med Sci 2006;21(3):474-7
18	Eosinophilic pustular folliculitis : successful treatment with topical pimecrolimus	Clin Exp Dermatol 2006;32(1):108-9
19	A case of black hairy tongue following the use of psychotropic agents	Korean J Dermatol 2007;45(1):107-9
20	The analysis of the expression of TGF-β in human hair follicles in vivo	Korean J Dermatol 2007;45(4):321-6
21	In vitro phototoxicity test using artificial skin with melanocytes	Photodermatol Photoimmunol Photomed

		2007;23(2-3):73-80
22	The long term efficacy and relapse rate of itraconazole pulse therapy versus terbinafine continuous therapy for toenail onychomycosis - a 96-week follow-up study -	Kor J Med Mycol 2007;12(3):139-47
23	Clinical observation of sarcoidosis	Korean J Dermatol 2007;45(9):87-83
24	Two cases of pellagra in alcoholics	Korean J Dermatol 2007;45(9):956-8
25	Clinical analysis of Ramsay Hunt syndrome	Korean J Dermatol 2007;45(11):112-6
26	The effects of Physiogel®cream on the allergic contact dermatitis	Korean J Dermatol 2007;45(11):1139-43
27	A case of anal erosion treated with chamomile and myrrh extracts	Korean J Dermatol 2007;45(11):1170-72
28	A case of reactivation of herpes simplex virus in foot dorsum followed by friction by sandals' trap	Korean J Dermatol 2007;45(11):1119-201
29	Two cases of onychomycosis treated with electric nail grinder and nail lacquer	Kor J Med Mycol 2007; 12(4):198-202
30	Clinical effects of shark cartilage extracts on erythematotelangiectatic rosacea patients	Korean J Dermatol 2007;45(12):1253-7
31	A case of graphite foreign body misdiagnosed as blue nevus	Ann Dermatol 2007;19(4):166-9
32	A case of tufted hair folliculitis	Ann Dermatol 2007;19(4):189-92
33	Treatment of lipomasassisted with tumescent liposuction	J Eur Acad Dermatol Venereol 2007;21(2):243-6
34	Infantile perianal pyramidal protrusion treated by topical steroid application	J Eur Acad Dermatol Venereol 2007;21(2):263-4
35	An efficient method of preparing dressing materials for laser procedure	J Cosmet Dermatol 2007;6(4):272-4
36	Development of open comedones: a rare complication of surgery for axillary hyperhidrosis and osmidrosis	J Eur Acad Dermatol Venereol 2008;22(3):401-2
37	Dermal fibrosis in male pattern hair loss : a suggestive implication of mast cells	Arch Dermatol Res 2008;300(3):147-52
38	The efficacy of electric nail grinding with nail lacquer in the treatment of onychomycosis	Korean J Dermatol 2008;46(1):77-82
39	Fractional photothermolysis for the treatment of striae distensae in Asian skin	Am J Clin Dermatol 2008;9(1):33-7
40	A corynebacterial triad: Prevalence of erythrasma and trichomycosis axillaris in soldiers with pitted keratolysis	J Am Acad Dermatol 2008;58(2 Suppl):S57-8

41	Comparative study of 20% aluminum chloride solution and botulinum toxin A injection in the treatment of patients with primary palmar hyperhidrosis	Korean J Dermatol 2008;46(3):334-40
42	Development of a non-invasive measure system to the thickness of the subcutaneous adipose tissue layer	Exp Dermatol 2008;17(6):537-41
43	Expression of neuropeptides and their receptors in melasma	Korean J Dermatol 2008;46(5):627-32
44	A case of milia en plaque induced by physical stress	Korean J Dermatol 2008;46(5):707-9
45	A clinical study of androgenetic alopecia (VI)	Korean J Dermatol 2008;46(6):729-35
46	A case of actinic cheilitis treated by topical photodynamic Therapy with methyl aminolevulinate	Korean J Dermatol 2008;46(6):835-8
47	Two cases of basal cell carcinomas Treated by topical photodynamic therapy with methyl aminolevulinate	Korean J Dermatol 2008;46(6):796-9
48	Combination therapy of cyclosporine and methylprednisolone on severe alopecia areata	J Dermatolog Treat 2008;19(4):216-20
49	Topical immunomodulators are effective for treatment of vitiligo	J Dermatol 2008;35(8):503-7
50	A case of cutaneous Hodgkin's disease presented with a maculopapular rash	Korean J Dermatol 2008;46(9):1262-5
51	A case of plaque-type blue nevus on the scalp	Korean J Dermatol 2008;46(9):1299-301
52	A case of pseudolymphoma on the left ear lobe after ear piercing	Korean J Dermatol 2008;46(10):1424-6
53	Multicenter survey of the efficacy and compliance with using topical pimecrolimus by patients with atopic dermatitis	Korean J Dermatol 2008;46(10):1357-61
54	An epidemiologic study on patch test positivities for patients with allergic contact dermatitis	Korean J Dermatol 2008;46(10):1362-8
55	Keratitis-ichthyosis-deafness syndrome with unusual hypopigmentation	J Dermatol 2008;35(12):798-800
56	Two cases of doughnut-shaped warts following cryosurgery	Korean J Dermatol 2008;46(12):1651-3
57	The use of dynamic ultrasonography for the confirmation of lower leg muscle herniation	Ann Dermatol 2008;20(4):190-2
58	The clinical study of linea nigra in pregnancy	Korean J Obstet Gynecol 2008;51(3):290-6
59	Prevention of thyroidectomy scar using a new 1,550-nm fractional erbium-glass laser	Dermatol Surg 2009;35(8):1199-205
60	Pilot study on photodynamic therapy for acne using indocyanine green and diode laser	J Dermatol 2009;36(1):17-21
61	Angioimmunoblastic T cell lymphomas: frequent cutaneous skin	Ann Dermatol

	lesions and absence of human herpes viruses	2009;21(1):1-5
62	A case of diffuse neurofibroma of scalp	Ann Dermatol 2009;21(1):46-8
63	Case of congenital esophageal stricture by ganglioneuroma and acro-flexural pigmentation: A coincidence?	J Dermatol 2009;36(3):159-62
64	Clinical efficacies of topical agents for the treatment of seborrheic dermatitis of the scalp : A comparative study	J Dermatol 2009;36(3):131-7
65	Herpes zoster duplex bilateralis in a patient with breast cancer	Cancer Res Treat 2009;41(1):50-2
66	A case of generalized fixed drug eruption due to a piroxicam plaster	Clin Exp Dermatol 2009;35(2):204-5
67	Differential display analysis of 2,3,7,8-tetrachlorodibenzo-p-dioxin identified induction of ras-related nuclear protein binding protein2 (RanBP2) gene	Toxicol Res 2009;25(1):35-40
68	Development of an imaging system for use in diagnosing dermatologic diseases	Korean J Dermatol 2009;47(3):303-8
69	A case of atopic dermatitis treated by phototherapy with full spectrum light	Korean J Asthma Allergy Clin Immunol 2009;29(1):60-3
70	Optimal culture condition for antifungal susceptibility tests of Malassezia globosa	Kor J MedMycol 2009;14(4):182-9
71	Skin care for atopic dermatitis	Korean J Dermatol 2009;47(5):531-8
72	Parvovirus B19 infection associated with acute hepatitis in infant	Pediatr Infect Dis J 2009;28(7):667
73	Potent inhibition of human cytochrome P450 1B1 by tetramethoxystilbene	Toxicol Lett 2009;189(1):84-9
74	Treatment of striae distensae with fractional photothermolysis	Dermatol Surg 2009;35(8):1215-20
75	A clinical study of androgenic alopecia (VII)	Korean J Dermatol 200947(7):765-771
76	Muire-Torre syndrome: A case of sebaceous epithelioma with thyroid cancer	Korean J Med 2009;77:S179-82
77	Clinical and histopathologic review on 28 cases of nodular fasciitis	Korean J Dermatol 2009;47(6):649-57
78	Efficacy of high-energy copper bromide laser (511 and 578with for deep infantile haemangioma	Clin Exp Dermatol 2009;34(7):e451-2
79	Clinical efficacy for 1% zinc pyrithione shampoo for the treatment of dandruff	Korean J Dermatol 2009;47(8):875-83
80	Successful treatment of depressed scars of the forehead secondary to herpes zoster using subdermal minimal surgery technology	Dermatol Surg 2009;35(9):1439-40

81	A case of drug eruption induced by various cephalosporin antibiotics	Korean J Asthma Allergy Clin Immunol 2009;29(3):212-6
82	A case of faun tail naevus treated by intense pulsed light	Ann Dermatol 2009;21(2):147-9
83	A case of pilar sheath acanthomas on the both cheeks	Korean J Dermatol 2009;47(9):1077-9
84	Enhanced efficacy of photodynamic therapy with methyl 5-aminolevulinic acid in recalcitrant periungual warts after ablative carbon dioxide fractional laser: a pilot study	Dermatol Surg 2009;35(12):1927-32
85	Laser lipolysis with pulsed 1064 nm Nd:YAG laser for the treatment of gynecomastia	Int J Dermatol 2009;48(12):1353-9
86	Increased expression of nerve growth factor receptor and neural endopeptidase in the lesional skin of melasma	Dermatol Surg 2009;35(8):1244-50
87	Potent inhibition of human cytochrome P450 1B1 by tetramethoxystilbene	Toxicology letters 2009;189(1):84-9
88	Effects of vitamin C vs. multivitamin on melanogenesis: comparative study in vitro and in vivo	Int J Dermatol 2010;49(2):218-26
89	Photodynamic therapy: new treatment for recalcitrant malassezia folliculitis	Lasers Surg Med 2010;42(2):192-6
90	A study on the quality of life and the economic burden of Korean patients with viral warts	Korean J Dermatol 2010;48(1):33-8
91	The effect of the extracts of Taraxacum platycarpum (AF-343) in atopic dermatitis	Korean J Asthma Allergy Clin Immunol 2010;30(1):36-42
92	A study onthe antimicrobial effect of bamboo (Phyllosrachys bambusoides) essential oil on Malassezia	Kor J Med Mycol 2010; 15(1): 1-11
93	The effect of full spectrum light phototherapy for patients with tinea pedis	Kor J Med Mycol 2010; 15(1):12-7
94	Photodynamictherapy with methyl 5-aminolevulinate acid might be ineffective in recalcitrant alopecia totalis regardless of using a microneedle roller to increase skin penetration	Dermatol Surg 2010;36(5):618-22
95	Synthesis of benzoxazole amides as novel antifungal agents against Malassezia Furfur	Bull Korean Chem Soc 201031(5):1270-4
96	Photodynamic therapy with methyl 5-aminolevulinate acid combined with microneedle treatment in patients with extensive alopecia areata	Clin Exp Dermatol 2010;35(5):548-9
97	Anti-inflammatory and anti-oxidant Effects of Sophora flavescens root extraction in lipopolysaccharide-activated raw 264.7 cells	Kor J Med Mycol 2010;15(2):39-50

98	The development and evaluation of multiplex PCR technique for identification of Malassezia yeast	Kor J Med Mycol 2010;15(2):51-60
99	Effect of anti-inflammation and skin hydration of AF-343 on macrophage raw 264.7 cells and NC/Nga mice with atopic dermatitis	Kor J Med Mycol 2010;15(2): 61-76
100	Expression of neuropeptides and their degrading enzymes in ACD	Clin Exp Dermatol 2010;35(3):318-23
101	Clinicopathologic efficacy of copper bromide plus/yellow laser (578 nm with 511 nm) for treatment of melasma in Asian patients	Dermatol Surg 2010;36(6):885-93
102	Treatment of acne scars using subdermal minimal surgery technology	Dermatol Surg 2010;36(8):1281-7
103	Evaluation of free oxygen radical and antioxidant capacity in alopecia areata	J Dermatol 2010;37(8):762-4
104	Treatment of alopecia areata with fractional photothermolysis laser	Int J Dermatol 2010;49(7):845-7
105	Treatment of two cases of acne vulgaris with Rubus coreanus miquel extract	Kor J Med Mycol 2010;15(3):140-5
106	The stability of the disk-type microneedle in Skh-hairless-1 (Albino) mice	Korean J Asthma Allergy Clin Immunol 2010;30(3):222-7
107	Objective measurements using the skin prick test in allergic rhinitis	Arch Otolaryngol Head Neck Surg 2010;136(11):1104-6
108	Effects of alcohol intake on the skin physiology	Korean J Dermatol 201048(11):948-54
109	KAAACI work group report on the treatment of severe/recalcitrant atopic dermatitis	Korean J Asthma Allergy Clin Immunol 2010;30(4):255-70
110	Role of CD4+CD25high+FOXP3+ regulatory T Cells in psoriasis	Ann Dermatol 2010;22(4):397-403
111	Treatment of periorbital wrinkles using a 2,790-nm Yttrium Scandium Gallium Garnet laser	Dermatol Surg 2010;36(9):1382-9
112	Objective evaluation of photoepilation by phototrichogram	J Dermatol 2010;37(12):1019-24
113	Cloning and Expression in Pichia pastoris of a New Cytochrome P450 Gene from a Dandruff-causing Malassezia globosa	Toxicol Res 2010;26(1):47-52
114	The effect of calcipotriol on the expression of human β defensin-2 and LL-37 in cultured human keratinocytes	Clin Dev Immunol 2010 Feb 22
115	Fractional photothermolysis laser treatment of male pattern hair loss	Dermatol Surg 2011;37(1):41-51
116	A novel function of Siglec-9 A391C polymorphism on T cell receptor	Int Arch Allergy Immunol

	signaling	2011;154(2):111-8
117	Sorafenib(Nexavar, BAY 43-9006)-induced hand-foot skin reaction with facial erythema	Ann dermatol 2011;23(1):119-22
118	The measurement of optimal power distance in LEDs	Korean J Dermatol 2011;49(2):125-30
119	A study of potential application of Rubus coreanus miquel extract for seborrheic dermatitis treatment	Kor J Med Mycol 2011;16(1):1-8
120	A case of ingrown toenail associated with tinea unguium treated with K-D® wire	Kor J Med Mycol 2011;16(1):31-4
121	Topical photodynamic therapy with methyl aminolevulinate may be an alternative therapeutic option for the recalcitrant Malassezia folliculitis	Int J Dermatol 2011;50(4):488-90
122	Efficacy of hydrogel mask with 2% arbutin for melasma	Korean J Dermatol 2011;49(3):210-6
123	Study on tests of skin safety and inhibition of atopic dermatitis using a StoneTouchⓇnfrared scanner in a mouse model	Korean J Dermatol 2011;49(3):217-26
124	Amlodipine-associated bullous pemphigoid with erythema multiforme-like clinical features	Int J Dermatol 2011;50(5):628-39
125	Primary cutaneous mucinous carcinoma on the abdomen	Korean J Dermatol 2011;49(4):348-52
126	Full-spectrum light phototherapy for atopic dermatitis	Int J Dermatol 2011;50(1):94-101
127	Distribution of Malassezia species on the scalp in Korean seborrheic dermatitis patients	Ann dermatol 2011;23(2):156-61
128	The efficacy of autologous platelet rich plasma combined with ablative carbon dioxide fractional resurfaction for acne scars: A simultaneous split-face trial	Dermatol Surg 2011;37(7):931-8
129	Functional expression and characterization of CYP51 from dandruff-causing Malassezia globosa	FEMS Yeast Res 2011;11(1):80-7
130	Antimicrobial and anti-inflammatory effects of Cecropin A(1-8)–Magainin2(1-12) hybrid peptide analog P5 against Malassezia furfur infection in human keratinocytes	J Invest Dermatol 2011;131(8):1677-83
131	Skin hydration, tansepidermal water loss and relation with tinea pedis in the patients with primary hyperhidrosis	Kor J Med Mycol 2011;16(4):178-85
132	A pilot study of Q-switched 1064-nm Nd:YAG laser treatment in the keratosis pilaris	Ann dermatol 2011;23(3):293-8
133	Efficacy of 694-nm Q-switched ruby fractional laser treatment of melasma in female Korean patients	Dermatol Surg 2011;37(8):1133-40
134	Detection and typing of human papillomavirus in cutaneous common warts by multiplex polymerase chain reaction	Journal of Life Science 2011;21(7):947-52

135	Subdermal minimal surgery with hyaluronic acid as an effectivefor neck wrinkles	Dermatol Surg 2011;37(9):1291-1296
136	Therapeutic Effects of Light Emitting Diode on Atopic Dermatitis-Like Lesions in NC/Nga Mice	Korean J Asthma Allergy Clin Immunol 2011;31(3):207-214
137	Anti-inflammatory and Anti-pruritic Effects of Portulaca oleracea L. Extract Using In Vitro and In Vivo Inflammation Model: LPS-treated Raw264.7 Cells, Keratinocytes, NC/Nga Mice and Hairless SKH-1 Mice	Korean J Asthma Allergy Clin Immunol 2011;31(3):199-206
138	Treatment of Verrucous Carcinoma of the Lower Lip with Topical Imiquimod(Aldara®) and Debulking Therapy	Ann dermatol 2011;23(1):68-71
139	Localized Penile Involvement Presenting as a Sole Manifestation of Syphilid	Korean J Dermatol 2011;49(9):859-61
140	Identification of a novel mutation in the ectodysplasin A gene in a Korean family with X-linked hypohidrotic ectodermal dysplasia	Int J Dermatol 2011;50(11):1437-9
141	Skin Hydration and Collagen Synthesis of AF-343 in HS68 Cell Line and NC/Nga Mice by Filaggrin Expression and Suppression of Matrix Metallopreteinase	Toxicol Res 2011;27(4):225-229
142	In Vitro Evaluation Method Monitoring Pathogenic Condition of Acne Vulgaris by Culturing Keratinocyte with Sebocyte	Korean J Dermatol 2011;49(12):1057-63
143	Generalized erythroderma as a manifestation of Sezary syndrome	Korean J Dermatol 2011;49(12):1131-4
144	Early congenital syphilis presenting with skin eruption alone: a case report	Korean J Pediatr 2011;54(12):512-514
145	Clinical trial design of filler	J Cosmet Dermatol 2011;8(1):23-7
146	Efficacy of intradermal radio-frequency combined with autologous platelet rich plasma for striae distensae: a pilot study	Int J Dermatol 2012;33(33):8579-90
147	A case of alopecia universalis with agminated lentiginosis and multiple cafe´-au-lait macules: a synchronous coincidence?	Int J Dermatol 2012;51(1):115-24
148	Multiple Pass Ultrasound Tightening of Skin Laxity of the Lower Face and Neck	Dermatol Surg 2012;38(1):20-7
149	Inhibitory effect of vitamin U (S-Methylmethionine Sulfonium Chloride) on differentiation in 3T3-L1 pre-adipocyte cell lines	Ann Dermatol 2012;24(1):39-44
150	Selective sebaceous gland electrothermolysis as a treatment for acne a prospective pilot study	Int J Dermatol 2012;51(3):339-44
151	Oral Lichen Planus for Whom Dermoscopy Was Used as an Adjuvant	Korean J Dermatol

	Diagnostic Tool	2012;50(2):167~70
152	Anti-Inflammatory Effect of Houttuynia Cordata Thunb in Activated Raw 264.7 Cells Activated with Lipopolysaccharide and Interferon Gamma	Korean J Asthma Allergy Clin Immunol 2012;32(1):43-50
153	The Effect of the Mixed Herbal Extract Lotion for Korean Patient with Atopic Dermatitis: A Pilot Study	Korean J Asthma Allergy Clin Immunol 2012;32(1):26-33
154	Photodynamic therapy: new treatment for refractory lymphocytic infiltration of the skin	Clin Exp Dermatol 2012;37(3):235-7
155	The safety evaluation of a potent angiogenic activator, synthetic peptide(SFKLRY-NH2) for the skin application	Toxicol Res 2012;28(1):51-6
156	Multiple Digital Mucinous Cysts	Korean J Dermatol 2012;50(5):485-6
157	Functional expression and characterization of recombinant NADPH-P450 reductase from Malassezia globosa	J Microbiol Biotechnol 2012;22(1):141-6
158	Characterization of the fungal microbiota (Mycobiome) in healthy and dandruff-afflicted human scalps	Plos One 2012;7(2):e32847
159	A pilot study of silver-loaded cellulose fabric with incorporated seaweed for the treatment of atopic dermatitis	Clin Exp Dermatol 2012;37(5):512-5
160	Treatment of atopic dermatitis associated with Mallasezia sympodialis by green tea extracts bath therapy: a pilot study	Mycobiology 2012;40(2):124-8
161	Transdermal drug delivery using disk microneedle rollers in hairless rat model	Int J Dermatol 2012;51(7):859-63
162	Anti-inflammatory Effect of Green Tea Cell Water in Activated Raw 264.7 Cells with Lipopolysaccharide	Korean J Asthma Allergy Clin Immunol 2012;32(2):115-21
163	A new method for evaluating postacne scarring	Skin Res Technol 2012;18(3), 384-5
164	A comparison of neuropeptide expression in skin with allergic contact dermatitis in human and mouse	Int J Dermatol 2012;51(8):939-46
165	Successful treatement of alopecia areata with topical calcipotriol	Ann Dermatol 2012;24(3):341-4
166	The microneedle roller is an effective device for enhancing transdermal drug delivery	Int J Dermatol 2012;51(9):1137-9
167	Melanonychia caused by Candida parapsilosis	Kor J Med Mycol 2012;17(2):1-5
168	Autologous fat grafting and platelet-rich plasma for treatment of facial contour defects	Dermatol surg 2012;38(9):1572-4
169	Efficacy of intradermal radiofrequency combined with autologous platelet rich plasma for striae distensae: a pilot study	Int J Dermatol 2012;51(10):1253-8

170	Papular elastorrhexis confined to dorsal aspect of the hand and foot	Korean J Dermatol 2012;50(7):618-20
171	A case of syphilid with nail dystrophy	Korean J Dermatol 2012;50(7):628-31
172	Increased expression of type I collagen in AF-343 treated human skin fibroblasts	Yakhak Hoeji 2012;56(1):9-13
173	Folluculitis decalvans of the scalp: improvement with intralesional injection of triamcinolone acetonide and oral isotretinoin	Korean J Dermaol 2012;50(9):837-9
174	Adult onset of nevus unius lateris	Ann Dermatol 2012;24(4):480-1
175	The treatment of keloids with pneumatic technology: a pilot study	Int J Dermatol 2012;51(12):1502-7
176	Autologous fat grafting and platelet-rich plasma for treatment of facial contour defects	Dermatol surg 2012;38(9):1572-4
177	Platelet-rich plasma for treating male pattern baldness	Dermatol Surg 2012;38(12):2042-4
178	Human skin safety test of green tea cell extracts in condition of allergic contact dermatitis	Toxicol Res 2012;28(2):113-6
179	The evaluation of skin safety and skin cell toxicity for Scutellaria baicalensis georgi extract according to extraction conditions	Korean J Dermatol 2012;50(11):859-68
180	Treatment of striae distensae using needling therapy: a pilot study	Dermatol Surg 2012;38(11):1823-8
181	Facial skin barrier function recovery after microneedle transdermal delivery treatment	Dermatol Surg 2012;38(11):1816-22
182	A randomized trial of Lactobacillus plantarum CJLP133 for the treatment of atopic dermatitis	Pediatr Allergy Immunol 2012;23(7):667-73
183	A pilot study of special drug delivering fabric's effect on cellulite reduction	Korean J Obes 2012;21(4):213-9
184	Clinical study of StoneTouch® far-infrared device on atopic dermatitis	Korean J Dermatol 2012;50(10):874-9
185	The efficacy of oral low molecular weight collagen peptide for skin recovery after fractional photothermolysis laser treatment	J Soc Cosmet Scientists Korea 2012;38(4):321-6:t.
186	A case of small plaque psoriasis treated with combination of 578-nm copper bromide laser with light-emitting diode (LED)	J Korean Soc Psoriasis 2012;9(1):49-51
187	The effect of epidermal growth factor (EGF) conjugated with low-molecular-weight protamine (LMWP) on wound healing of the skin	Biomaterials 2012;33(33):8579-90
188	Efficacy and safety of a novel botulinum toxin type A product for the treatment of moderate to severe glabellar lines: a randomized, double -blind, active-controlled multicenter study	Dermatol Surg 2013;39(1pt2):171-8

189	Combination therapy with cyclosporine and psolaren plus ultraviolet A in the patients with severe alopecia areata: a retrospective study with a self-controlled design	Ann Dermatol 2013;25(1):12-6
190	Safety evaluation of stamp type digital microneedle devices in hairless mice	Ann Dermatol 2013;25(1):46-53
191	Rare manifestation of giant molluscum contagiosum on the scalp in old age	Ann Dermatol 2013;25(1):109-10
192	A case of zosteriform lichen planus on the right scapular area	Korean J Dermatol 2013;51(1):75-6
193	Fine scratches on the spectacle frame might be provocation factor of allergic contact dermatitis	Ann Dermatol 2013;25(2):152-5
194	The effects of 830 nm light-emitting diode (LED) therapy on acute herpes zoster opthalmicus: a pilot study	Ann Dermatol 2013;25(2):163-7
195	The annual changes of clinical manifestation of androgenetic alopecia clinic in Korean males and a females: outpatient-based study	Ann Dermatol 2013;25(2):181-8
196	Inhibitory effects of Saururi chinensis extracts on melanin biosynthesis in B16F10 melanoma cells	Biol Pharm Bull 2013;36(5):772–9
197	Safety evaluation of topical valproate application	Toxicol Res 2013;29(2):87-90
198	The efficacy of cleansing device with a rotating brush on the skin	J Soc Cosmet Scientists Korea 2013;39(2):97-103
199	Sun Protection Factor (SPF) assessment of the sunscreen composed of natural substances	J Soc Cosmet Scientists Korea 2013;39(2):141-8
200	Anti-immunogobulin E in theof refractory atopic dermatitis	Clin Exp Dermatol 2013;38(5):496-500
201	Efficacy of light-emitting diode photomodulation in reducing erythema after fractional carbon dioxide laser resurfacing: a pilot study	Dermatol Surg 2013;39(8):1171-6
202	Linear macular amyloidosis along the lines of Blaschko	Korean J Dermatol 2013;51(7):536-8
203	A case of steatocystoma multiplex developed on the labium major	Korean J Dermatol 2013;51(7):572-573
204	Treatment of refractory venous stasis ulcers with autologous platelet-rich plasma and light emitting diodes: a pilot study	J Dermatolog Treat 2013;24(5):332-325
205	The efficacy of shampoo containing ginseng radix on preventing hair loss and promotion hair growth	J Soc Cosmet Scientists Korea 2013;39(3):187-194
206	Treatment of facial paraffinoma with a bipolar radiofrequency device	J Dermatol 2013;40(9):762-763

207	Oceanobacillus chungangensis sp. nov., isolated from a sand dune	Int J Syst Evol Microbiol 2013;63(Pt10):3666-3671
208	Inhibitory effect of tianeptine on catagen induction in alopecia areata-like lesions induced by ultrasonic wave stress in mice	Clin Exp Dermatol 2013;38(7):758-67
209	Electrophysiological study for comparing the effect of biological activity between type A botulinum toxins in rat gatrocnemius muscle	Hum Exp Toxicol 2013 32(9):914-20
210	A study on the effect of lymph drainage massage using natural cosmetics on moisture, sebum and pores of facial skin	J Soc Cosmet Scientists Korea 2013:19(6):1112-9
211	Phosphatidylcholine and bipolar radiofrequency for treatment of localized fat deposits	J Dermatolog Treat 2014;25(4):308-9
212	Efficacy of adenosylcobalamin in relieving xerotic pruritus symptoms of atopic dermatitis	J Eur Acad Dermatol Venereol 2014;28(2):254-255
213	Characterization of two kinds of filler for the formulation	Korean J Dermatol 2014;52(1):7-12
214	Formulation characteristics of three kinds of Elravie®fillers	Korean J Dermatol 2014;52(2):100-105
215	An adverse effect following illegal medical procedure by unlicensed non-medical personnel	Korean J Dermatol 2014;52(3):205-6
216	Fixed drug eruption caused by levocetirizine	Korean J Dermatol 2014;52(5):364-5
217	Flame figures in histology associated with allergic contact dermatitis from henna tattoo	Int J Dermatol 2014;53(4):e305-307
218	A case of androgenetic alopecia treated with valproic acid	Int J Dermatol 2014;53(3):e214-215
219	A combination trial of intradermal radiofrequency and hyaluronic acid filler for the treatment of nasolabial fold wrinkles : a pilot study	J Cosmetic & laser ther 2014;16(1):37-42
220	Combined treatment with 578-/511-nm copper bromide laser and light-emitting diodes for post-laser pigmentation: a report of two cases	Dermatol Ther 2014;27(2):121-125
221	Potential relationship between the canonical Wnt signaling pathway and expression of the vitamin D receptor in alopecia	Clin Exp Dermatol 2014;39(3):368-375
222	Reduction in facial hyperpigmentation after treatment with a combination of topical niacinamide and tranexamic acid: a randomized, double-blind, vehicle-controlled trial	Skin Res Technol 2014;20(2):208-212
223	Skin texture aging trend analysis using dermoscopy images	Skin Res Technol 2014;20(4):486-97

224	Comparative study of hyaluronic acid fillers by in vitro and in vivo testing	J Eur Acad Dermatol Venereol 2014;28(5):565-568
225	Pilot study of the efficacy of 578 nm copper bromide laser combined with intralesional corticosteroid injection for treatment of keloids and hypertrophic scars: a pilot study	Ann Dermatol 2014;26(2):156-161
226	Facial scar treated with an intra-dermal radiofrequency device	J Cosmet Laser Ther 2014;16(3):151-152
227	Effects of collagen tripeptide supplement on skin properties: a prospective, randomized, controlled study	J Cosmet Laser Ther 2014;16(3):132-137
228	Treatment of hypertrophic burn scars by combination laser-excision and pinhole method using a carbon dioxide laser	Lasers Surg Med 2014;46(5):380-384
229	Comparison of efficacy and diffusion of three formulations of botulinum toxin type A in two patients with forehead hyperhidrosis	Clin Exp Dermatol 2014;39(5):673-675
230	Investigation of the degradation-retarding effect caused by the low swelling capacity of a novel hyaluronic acid filler developed by solid-phase cross linking technology	Ann Dermatol 2014;26(3):357-362
231	Depressed facial scar successfully treated with autologous platelet rich plasma and light-emitting diode phototherapy at 830nm	Ann Dermatol 2014;26(3):417-418
232	Leucine-rich glioma inactivated 3 is a melanogenic cytokine in human skin	Exp Dermaol 2014;23(8):600-2
233	The efficacy, longevity and safety of combined radiofrequency treatment and hyaluronic acid filler for skin rejuvenation	Ann Dermatol 2014;26(4):447-56
234	Picrasma Quassioides inhibits LPS-and IFN-ɣ-stimulated nitric oxide production and inflammatory response in RAW264.7 macrophage cells	Biotechnol Bioprocess Eng 2014;19(3):404-10
235	Mycophenolate Antagonizes IFN-ɣ-induced catagen-like changes via beta-catenin activation in human dermal papilla cells and hair follicles	Int J Mol Sci 2014;15(9):16800-15
236	Therapeutic effects of full spectrum light on the development of atopic dermatitis-like lesions in NC/Nga mice	Photochem Photobiol 2014;90(5):1160-9
237	A tip of intralesional triamcinolone acetonide injection in acne	J Am Acad Dermatol 2014;71(4):e127-8
238	Topical EGF for the improvement of acne lesions: A randomized, double-blinded, placebo-controlled, split-face trial	Int J Dermatol 2014;53:1031-6
239	Proliferating trichilemmal tumor with primary essential cutis verticis gyrata	Korean J Dermatol 201452(7):515-7

240	Recombinant growth factor mixtures induce cell cycle progression and the upregulation of type I collagen in human skin fibroblasts, resulting in the acceleration of wound healing processes	Int J Mol Med 2014;33(5):1147-52
241	Inhibitory and anti-inflammatory effects of Helicobacter pylori-derived antimicrobial peptide HPA3NT3 against Propionibacterium acnes in the skin	Br J Dermatol 2014;171(6):1358-67
242	Observation of in vivo morphologic changes after carbon dioxide ablative fractional laser in a mouse model using noninvasive imaging modalities and comparison with histologic examination	Photochem photobiol 2014:90(6):1423-6
243	Surface modification of silk fibroin nanofibrous mat with dextran for wound dressing	Fibers and Polymers 2014;15(6):1137-45
244	Double-blind, randomized non-inferiority trial of a novel botulinum toxin A processed from the strain CBFC26, compared with onabotulinum toxin A in the treatment of glabellar lines	J Eur Acad Dermatol Venereol 2014;28(12):1761-7
245	Effect of dutasteride 0.5 mg/d in men with androgenetic alopecia recalcitrant to finasteride	Int J Dermatol 2014;53(11):1351-7
246	Scar sarcoidosis on a hypertrophic scar	Clin Exp Dermatol 2014;39(8):945-7
247	Effect of high advanced-collagen tripeptide on wound healing and skin recovery after fractional photothermolysis treatment	Clin Exp Dermatol 2014;39(8):874-80
248	Superoxide dismutase 1 inhibits α-MSH- and UVB-induced melanogenesis in murine skin	Ann Dermatol 2014;26(6):681-7
249	The effect of evening primrose oil for the prevention of xerotic cheilitis in acne patients treating with isotretinoin: a pilot study	Ann Dermatol 2014;26(6):706-12
250	Radiation-induced alopecia treated with botulinum toxin type A injection	Plast Reconstr Surg Glob Open 2014;2(10):e226
251	Infrared camera-proven water-damaged homes are associated with the severity of atopic dermatitis in children	Ann Allergy Asthma Immunol 2014;113(5):549-55
252	Analysis of the distribution of pores and factors affecting facial pores	Korean J Dermatol 2014;52(12):851-857
253	A multicenter, randomized, double-blind clinical study to evaluate the efficacy and safety of PP-501-B in correction of nasolabial folds	Dermatol Surg 2015;41(1):113-20
254	Comparative trial of a novel botulinum neurotoxin type A versus onabotulinum toxin A in the treatment of glabellar lines: A multi-center, randomized, double-blind, active-controlled study	Int J Dermatol 2015;54(2):227-34

255	Efficacy and safety of topical glycopyrrolate in patients with facial hyperhidrosis: a randomized multi-center, double-blinded, placebo-controlled, split-face study	J Eur Acad Dermatol Venereol 2015;29(2):278-82
256	The novel treatment of neck wrinkle with an intradermal radiofrequency device	Ann Dermatol 2015;27(1):79-81
257	Efficacy and safety of injection with Poly-L-lacitc acid compared with hyaluronic acid for correction of nasolabial fold: a randomized, evalulator-blinded, comparative study	Clin Exp Dermatol 2015;40(2):129-35
258	Acne-like eruption induced by pseudoxanthoma elasticum	J Korean Soc Acne Res 2015;3(1):25-6
259	Chronic inflammatory reactions after thread lifting: a delayed and unusual complication of the use of non-absorbable threads	Dermatol Surg 2015;41(4):510-3
260	Facial paraffinoma treated with a bipolar radiofrequency device	Int J Dermatol 2015;54(1):89-91
261	Efficacy of Cistanche Tubulosa and Laminaria Japonica extracts (MK-R7) supplement in preventing patterned hair loss and promoting scalp health	Clin Nutr Res 2015;4(2):124-31
262	Efficacy of combination light-emitting diode (635 and 830 nm) therapy on local injection site reactions after filler	Clin Exp Dermatol 2015;40(3):333-5
263	Improvement in skin wrinkles with use of a preparation containing human growth factors and hyaluronic acid serum	J Cosmet Laser Ther 2015;17(1):20-3
264	Correction of midface volume deficiency using hyaluronic acid filler and intradermal radiofrequency	J Cosmet Laser Ther 2015;17(1):46-48
265	Resveratrol exerts growth inhibitory effects on SZ95 human sebocytes through the inactivation of PI3-k/ Akt pathway	Int J Mol Med 2015;35(4):1042-50
266	Berberine regulate melanin synthesis by activating PI3K/AKT, ERK, and GSK3βin B16F10 Melanoma cells	Int J Mol Med 2015;35(4):1011-6
267	Botulinum toxin for the treatment of refractory erythema and flushing of rosacea	Dermatology 2015;230(4):299-301
268	Epidermal growth factor improves the migration and contractility of aged fibroblasts cultured on 3D collagen matrices	Int J Mol Med 2015;35(4):1017-25
269	Improved methods for selective cryolipolysis results in subcutaneous fat layer reduction in a porcine model	Skin Res Technol 2015;21(2):192-200
270	Synergistic inhibition of tumor necrosis factor-alpha-stimulated pro-inflammatory cytokine expression in HaCaT Cells by a combination of rapamycin and mycophenolic acid	Ann Dermatol 2015;27(1):32-9

271	Novel treatment using intradermal radiofrequency and hyaluronic acid filler to correct marionette lines	Ann Dermatol 2015;27(3):351-2
272	A rapid effect in childhood granulomatous periorificial dermatitis with oral metronidazole and topical tacrolimus	Korean J Dermatol 2015;53(5):405-6
273	Squamous cell carcinoma and multiple Bowen's disease in a patient with a history of consumption of traditional Chinese herbal balls	Case Reports in Dermatology 2015;7(2):151-155
274	Use of cream containing mucus secreted by snails has an anti-aging effect on skin	Korean J Dermatol 2015;53(6):430-436
275	A hair growth-enhancing component of hydrolysate of human placenta: In vitro and in vivo assessment	J Clin Investigat Dermatol 2015;3(1):1-5
276	Potential synergistic effects of human placental extract and minoxidil on hair growth promoting activity in C57BL/6J mice	Clin Exp Dermatol 2015;40(6):672-81
277	Long term (24 months) safety evaluation of poly-DL-lactic acid filler injection for nasolabial fold: a multi-center, open, randomized, evaluator blind, active-controlled	Plast Reconstr Surg 2015;135(6):1074-5
278	The alpha-melanocyte-stimulating hormone suppresses TLR2-mediated functional responses through IRAK-M in normal human keratinocytes	PLoS One 2015;10(8):e0136887
279	Effects of topical moisturizers on the skin of healthy full-term infants and toddlers	J Soc Cosmet Sci Korea 2015;41(1):63-71
280	Efficacy of silicone gel sheets with 595-nm pulse dye laser in patients with post-cesarean section scar: a pilot study	J Clin Invest Dermatol 2015;3(2):1-4
281	A case of drug eruption similar to erythema multiforme induced by sorafenib	Korean J Dermatol 2015;53(7):542-5
282	A novel adamantyl benzylbenzamide derivative, AP736, inhibits melanogenesis in B16F10 mouse melanoma cells via glycogen synthase kinase 3β phosphorylation	Int J Mol Med 2015;36(5):1353-60
283	Combined treatment with botulinum toxin and 595-nm pulsed dye laser for traumatic scarring	Ann Dermatol 2015;27(6):756-8
284	Comparison of high-dose corticosteroid pulse therapy and combination therapy using oral cyclosporine with low-dose corticosteroid in severe alopecia areata	Ann Dermatol 2015;27(6):676-81
285	A randomized clinical trial to evaluate the efficacy and safety of lidocaine-containing monophasic hyaluronic acid filler for nasolabial folds	Plast Reconstr Surg 2016;137(3):799-808