



**Yeast Essence
Skin Care Actives**

**Yeast Essence C90
Yeast Essence E100
Yeast Essence N80
Yeast Essence Z20**

Angel Yeast Co., Ltd.

Yeast Essence C90

Proposed INCI name: Sodium carboxymethyl beta-glucan, water

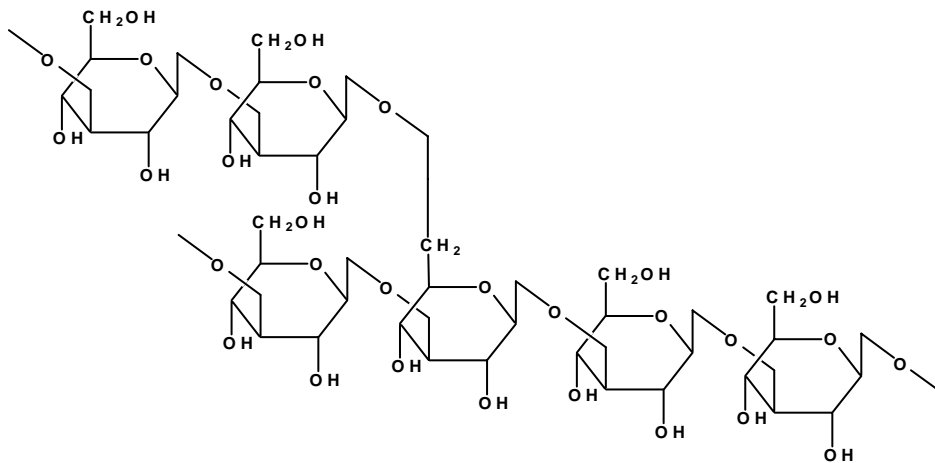
Introduction

Yeast beta-glucan is a **polysaccharide** that exists in the cell wall of yeast, numerous clinical studies have shown that it can stimulate the human immune system by enhancing the activity of macrophages and other immunocompetent cells. Besides, it is able to accelerate tissue repair.

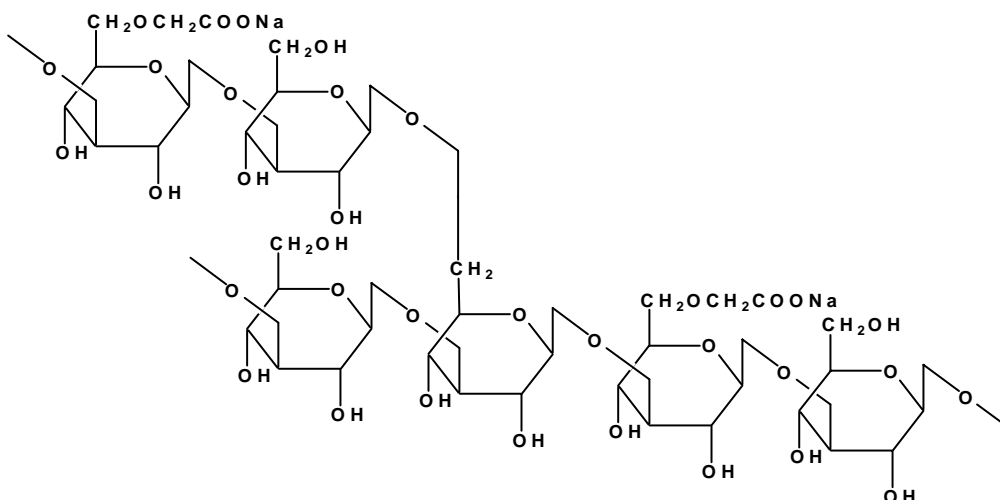
Yeast Essence C90 is partly carboxymethylated yeast beta-glucan, which is water soluble and has the same functions as yeast beta-glucan when used in cosmetics. It can greatly **revitalize the skin's defense system**, enhance the natural repair processes and reduce the sensitivity of the skin.

Immediately below the surface epidermal layer of your skin, you have **Langerhans cells**. These incredible immune cells have the power to stimulate collagen production, increase wound repair, defend against external threats such as sunlight, smoke, environmental assaults, and mitigate the effects of stress, all of these lead to remarkable reductions in the ugly appearance of wrinkles, blemishes, age spots and other skin problems. The miracle of C90 comes from its **unique molecular structure**. When applied to skin, it can quickly penetrate the epidermal layer and come in contact with the Langerhans cells, instantly switching them on.

Molecular Structure



Structure of Yeast Beta-Glucan

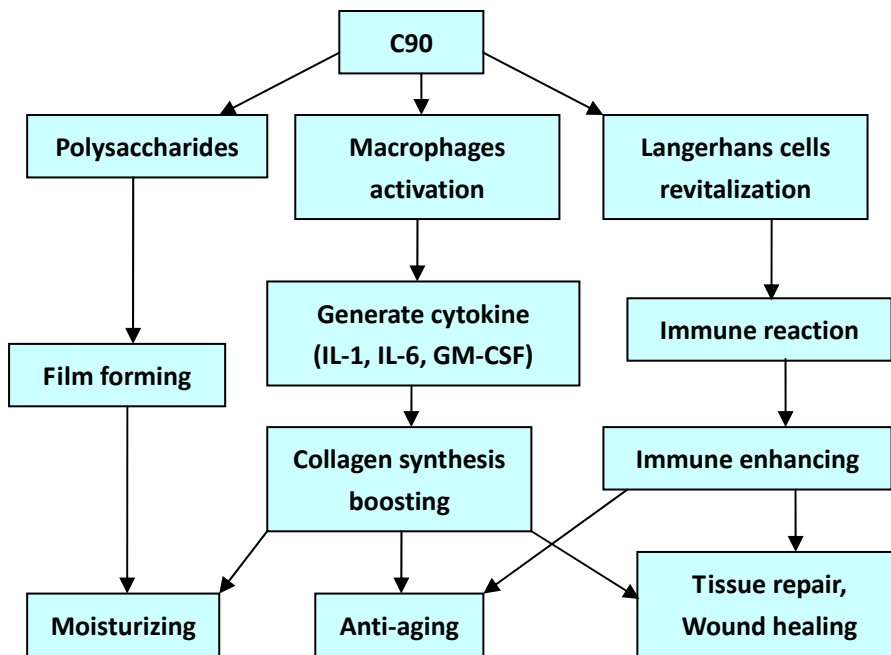


Structure of Sodium Carboxymethyl Beta-Glucan (CMG)

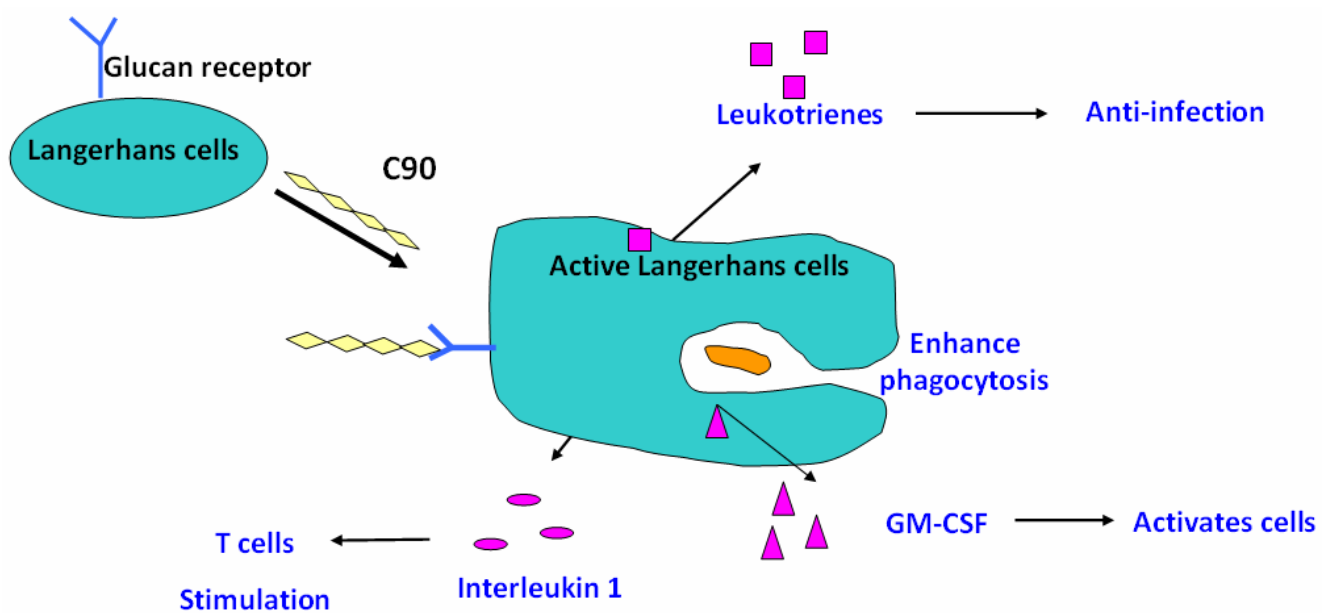
The biological activity of beta-glucan is determined by its molecular structure which depends on its origin (yeast, oat, wheat, fungi). Beta-glucan from yeast was shown to have the **most potent immune-enhancing** capability.

Beta-glucan isolated from yeast is insoluble in water and therefore not suitable for cosmetic use. Thus, Angel developed Sodium Carboxymethyl Beta-Glucan, a **biologically active beta-glucan derivative** which keeps the same biological activity as beta-glucan.

Mechanism



Mechanism of functions



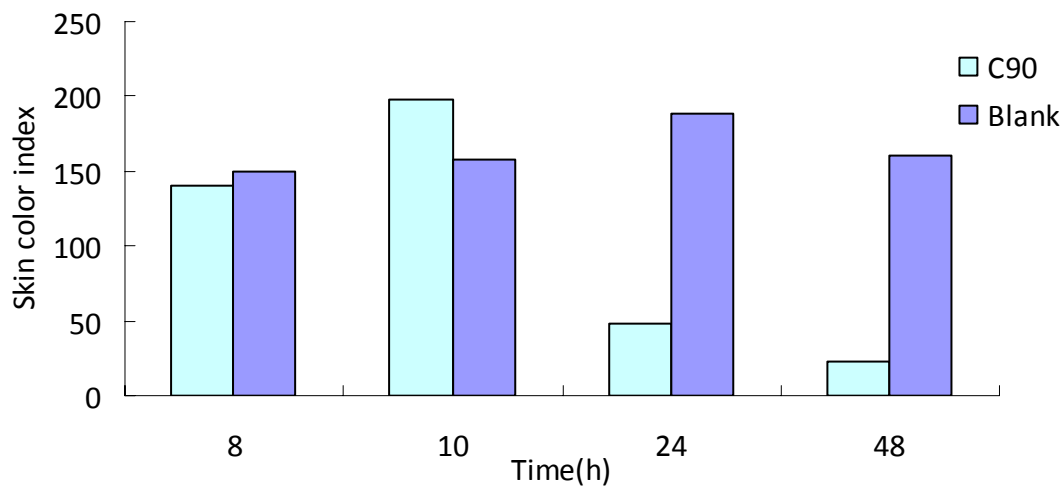
Mechanism of macrophages activation

Langerhans cells activated by C90 can **stimulate the generation of cytokines**, such as leukotriene,

interleukin and colony stimulating factor(CSF), further promote the functions of phagocytosis, anti-infection, cells activation and T- cells proliferation.

Efficacy

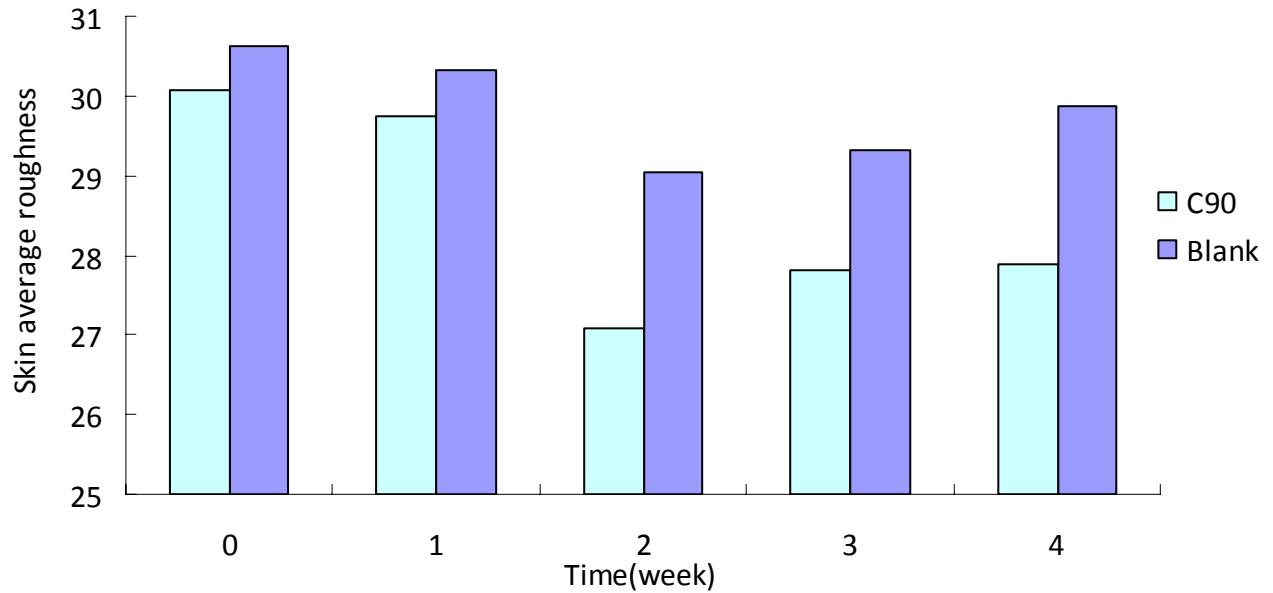
1. Sunburn repair



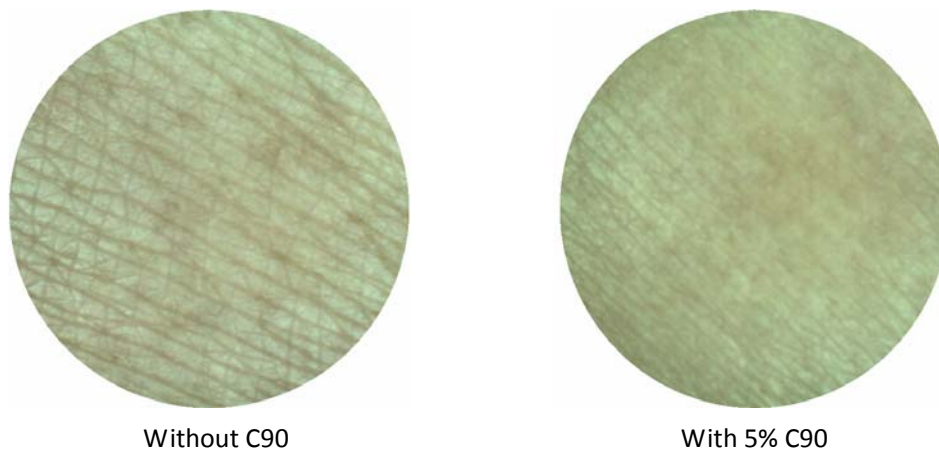
Value change of skin color index during the tests

UV-rays in the sunlight can cause skin erythema and damage, and accelerate skin aging. C90 (5% in formula) can obviously accelerate the skin repair from sunburn, decrease the skin erythema, damage and aging.

2. Anti-aging



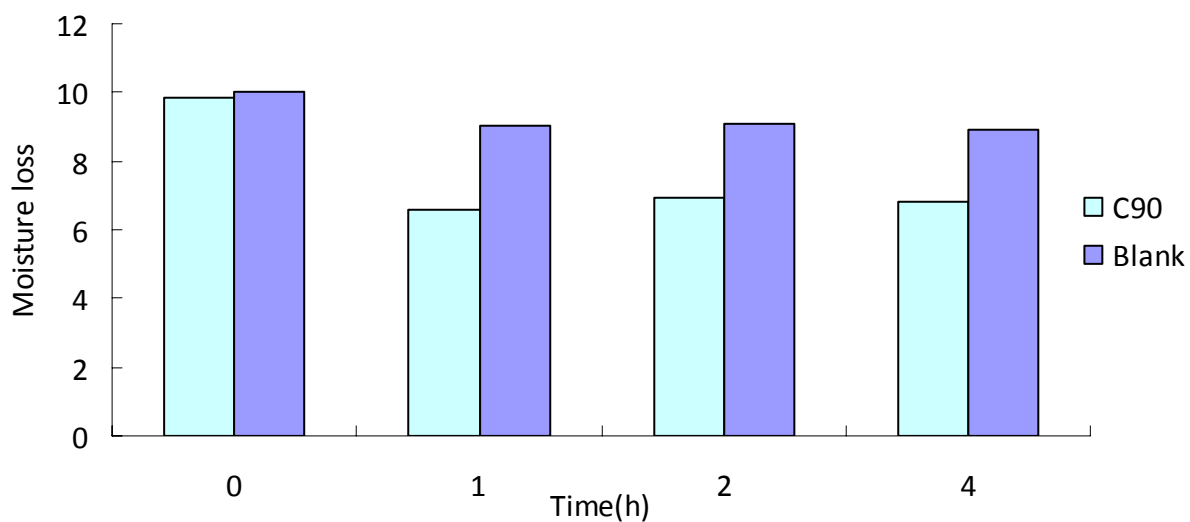
Value of SAR during the tests



Improvement of skin texture after the tests

32 volunteers aged from 35 to 65 took part in the tests. The formulation of C90 at a concentration of 5% was used as a treatment on the volunteers' arms for 4 weeks. Every week the skin was tested to determine the skin average roughness (SAR). The results showed formulation with C90 was effective as an anti-aging agent when compared with the control group.

3. Moisturizing



Value of moisture loss during the tests

30 volunteers of random gender at random age took part in the tests of Transepidermal Water Loss (TEWL). The formulations of C90 at a concentration of 5% were used as pretreatment on the volunteers' arms for evaluation of skin humidity protective effects. The results showed that C90 significantly decreased the skin humidity loss compared with the control groups.

Key Benefits and Claims

- Natural, derived from *Saccharomyces cerevisiae*
- Activates the skin's self-protecting capacity
- Accelerates skin recovery, wound healing
- Restores the skin's moisture barrier
- Repair of sunlight-induced skin damage
- Anti-aging and anti-radiation

Formulating

- Proposed INCI name: **Sodium carboxymethyl beta-glucan, water**
- Recommended use level: 5%- 10%
- Recommended working pH: 4.5-7.5
- Recommended working temperature: ≤ 90 °C

Applications

- Moisturizing and repair products
- Skin care for highly sensitive, damaged skin
- Sun-care products
- Anti-aging and anti-radiation products

Stability and Storage

Yeast Essence C90 can be stored for at least 24 months from the date of manufacture in the unopened original container protected from light in a clean place at a temperature between 4 and 10°C. Keep package tightly closed. Once opened, use contents quickly. In order to avoid secondary microbial contamination, following opening, containers should be handled with special care.

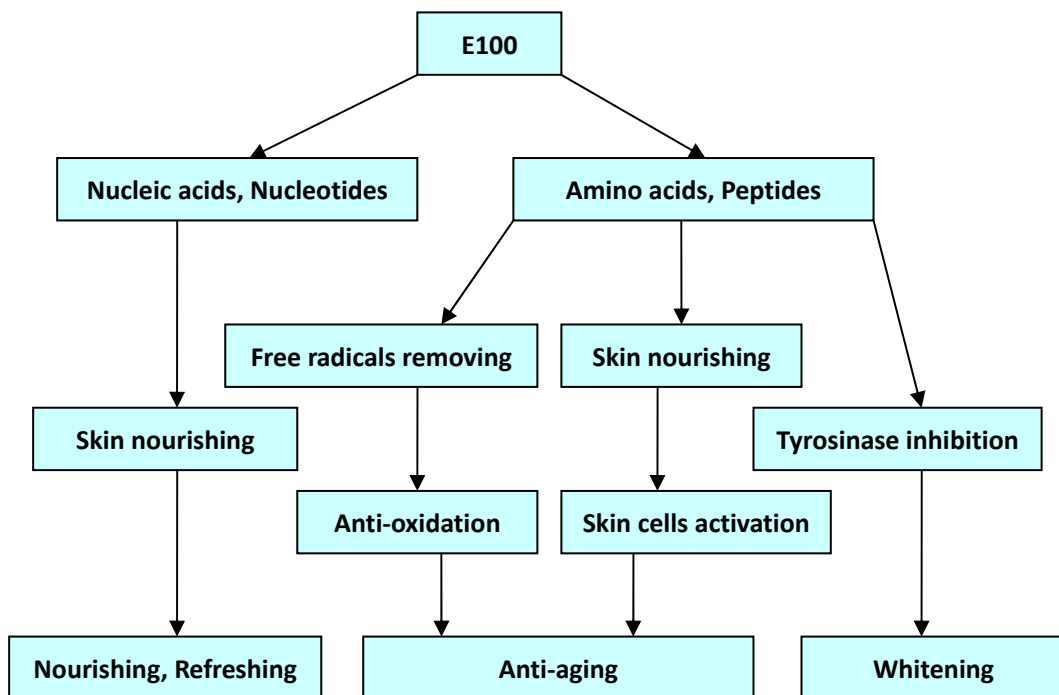
Yeast Essence E100

Proposed INCI name: Saccharomyces Ferment Filtrate, water

Introduction

Yeast Essence E100, derived from *Saccharomyces cerevisiae*, is full of **amino acids, nucleic acids, peptides, minerals and vitamins** that work together to allow the skin's natural surface rejuvenation process to function at its best. On dry basis, E100 contains at least 30% amino acids, 15% nucleic acids and 30% peptides, all of which are the main ingredients of the NMF (natural moisturizing factors). **Amino acids and peptides** can be easily absorbed by skin to promote collagen synthesis and nourish the skin cells. **Nucleic acids** are essential for skin cells metabolism, can deeply revitalize and soften skin.

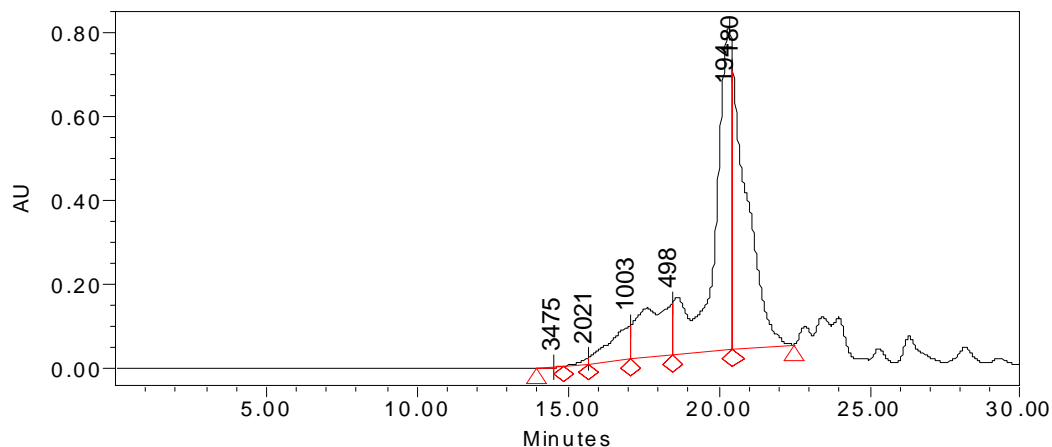
Mechanism



Mechanism of functions

Property

Small molecular weight (Mw) of Yeast Essence E100



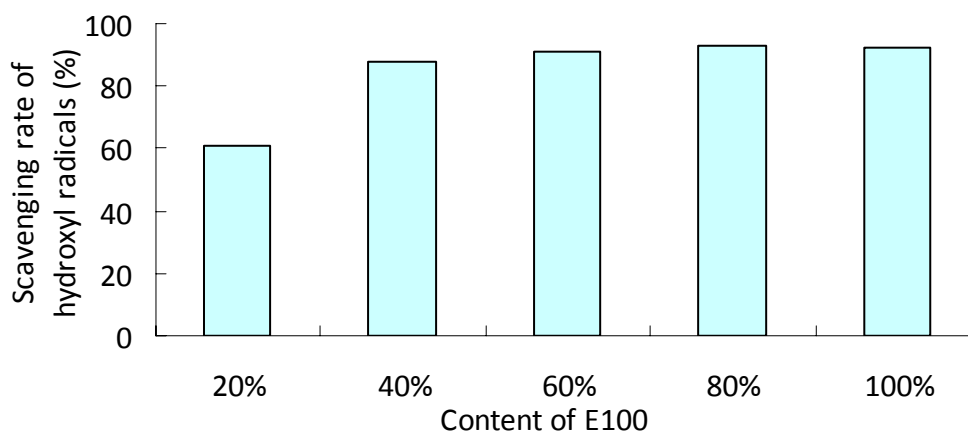
	Scope of the Mw	Content, %	Mw
1	>3000	0.10	3649
2	3000~2000	0.30	2237
3	2000~1000	5.73	1321
4	1000~500	13.35	712
5	500~180	47.35	251
6	<180	33.17	146

Molecular weight of E100

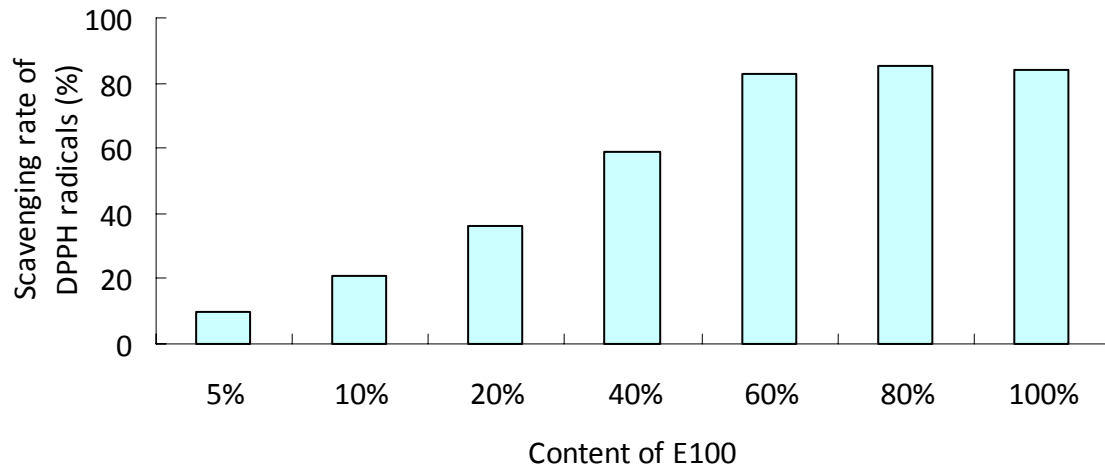
The Mw of E100 was determined using volume exclusion chromatography. The results showed that the main components of E100 were amino acids, nucleic acids and peptides. The Mw of E100 was small (mostly under 1000D) so that it can be easily absorbed by skin cells.

Efficacy

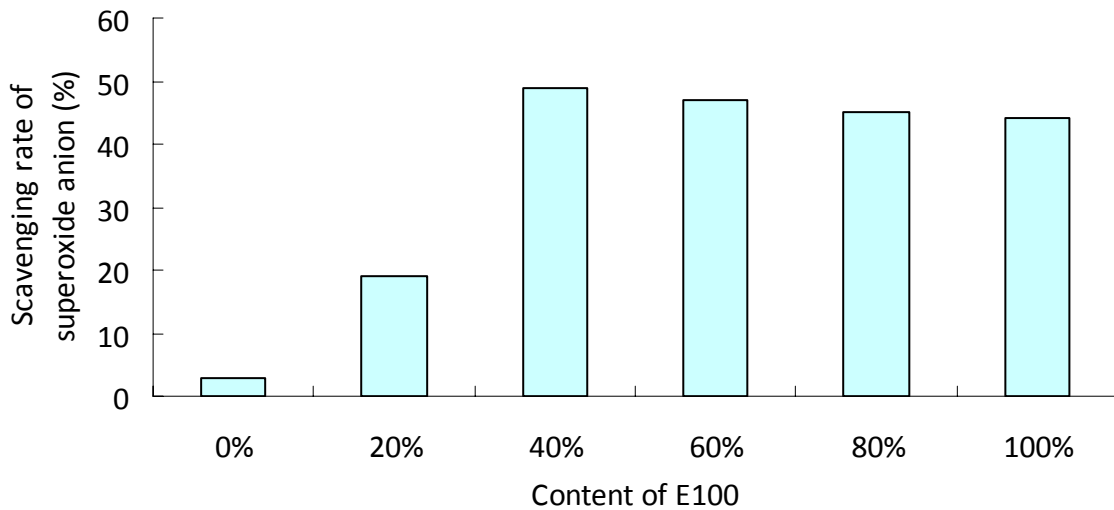
1. Anti-aging -- Free radicals scavenging



Scavenging rate of hydroxyl radicals



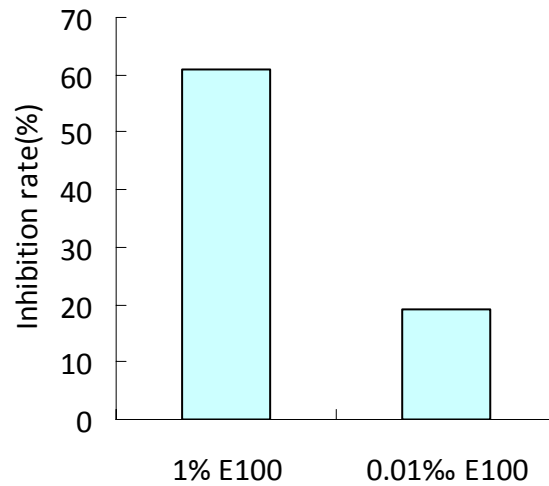
Scavenging rate of DPPH radicals



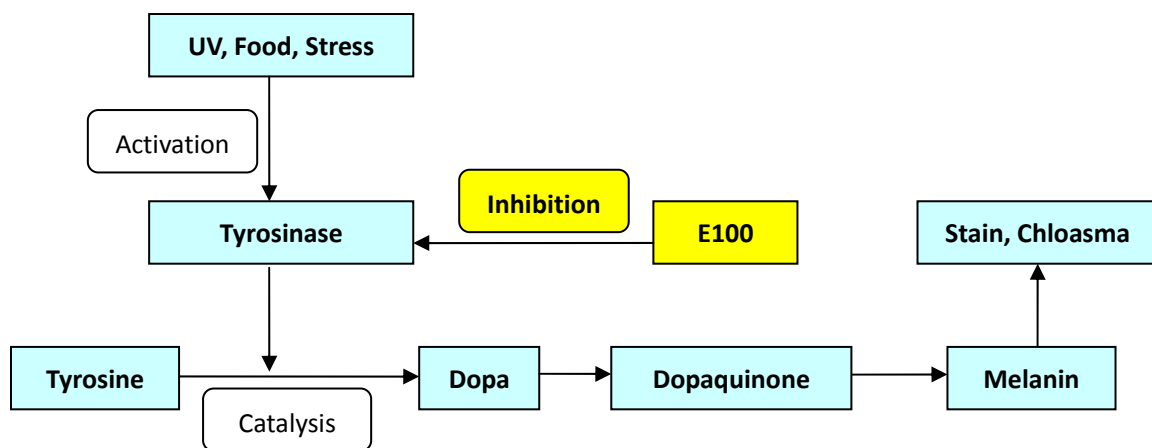
Scavenging rate of superoxide anion

Free radicals, which are harmful compounds generated during the oxidation reaction in human body, can damage the skin tissues and cells, which cause aging effects. The results of the efficacy tests showed that E100 were effective in the scavenging of hydroxyl radicals, DPPH radicals and superoxide anion.

2. Whitening -- Inhibition of tyrosinase



Inhibition rate of the formation of melanin



Mechanism of the inhibition of tyrosinase

Inhibition ability of E100 on tyrosinase was strong. E100 acted as an inhibitor, and the peptides it contained can react and compete with tyrosinase, blocking the tyrosinase-catalyzed reaction of dopa to dopaquinone, thus blocking the intracellular formation of melanin.

Benefits and Claims

- Natural , derived from *Saccharomyces cerevisiae*
- Inhibits the activity of tyrosinase
- Reduces formation of melanin
- Nourishes skin cells with essential nutrients
- Skin anti-aging and whitening
- Skin brightening, moisturizing and skin cells activation

Formulating

- Proposed INCI name: **Saccharomyces Ferment Filtrate, water**
- Recommended use level: 3%- 5%
- Recommended working pH: 4.5-5.5
- Recommended working temperature: ≤ 45 °C

Application

- Skin care for anti-aging
- Skin nourishing and activation products
- Whitening and refreshing products
- Repair and moisturizing products

Stability and Storage

Yeast Essence E100 can be stored for at least 24 months from the date of manufacture in the unopened original container protected from light in a clean place at a temperature between 4 and 10°C. Keep package tightly closed. Once opened, use contents quickly. In order to avoid secondary microbial contamination, following opening, containers should be handled with special care.

Yeast Essence N80

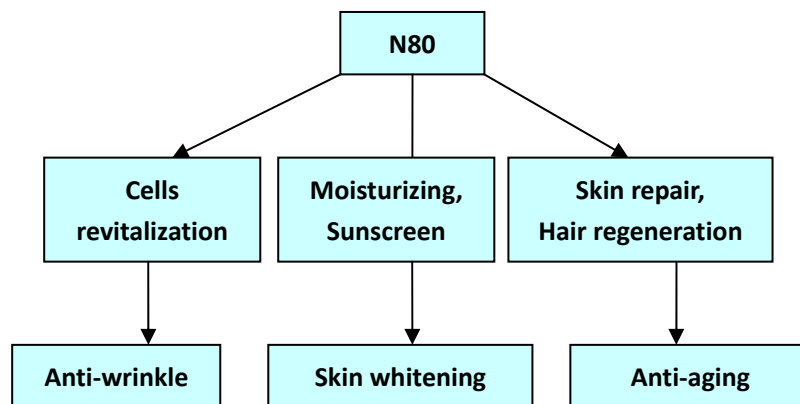
Proposed INCI name: Adenosine, guanosine, thymidine, uridine; water

Introduction

During the growth of cells, the metabolism is slowing down due to the **nucleic acids deficiency**, which leads to the acceleration of skin aging. Supplying with nucleic acids can enhance the metabolism of the cells, make the cells in a great vitality, accelerate the renewal of the cells, and promote the synthesis of collagen tissue in the skin, all of these actions lead to the reduction of skin wrinkles and the improvement of the skin elasticity. Therefore, nucleic acids win the reputation of “**revitalizing agent of the skin cells**”.

Yeast Essence N80 is obtained from yeast nucleic acids by biological enzymolysis. The active ingredients in N80 can be absorbed rapidly by skin and supply the skin nucleotides to eliminate wrinkles and revitalize the skin quickly.

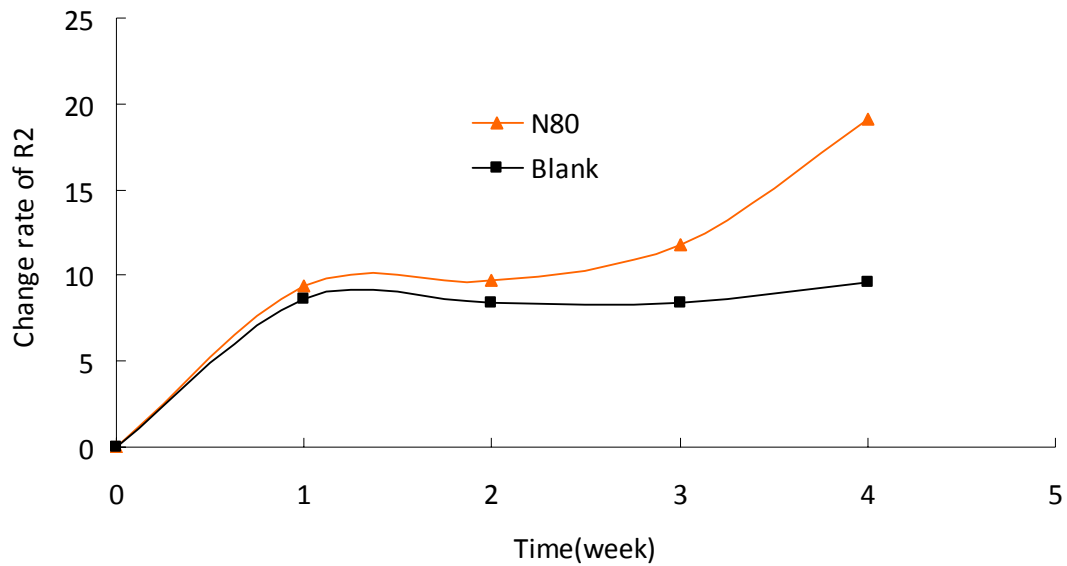
Mechanism



Mechanism of functions

Efficacy

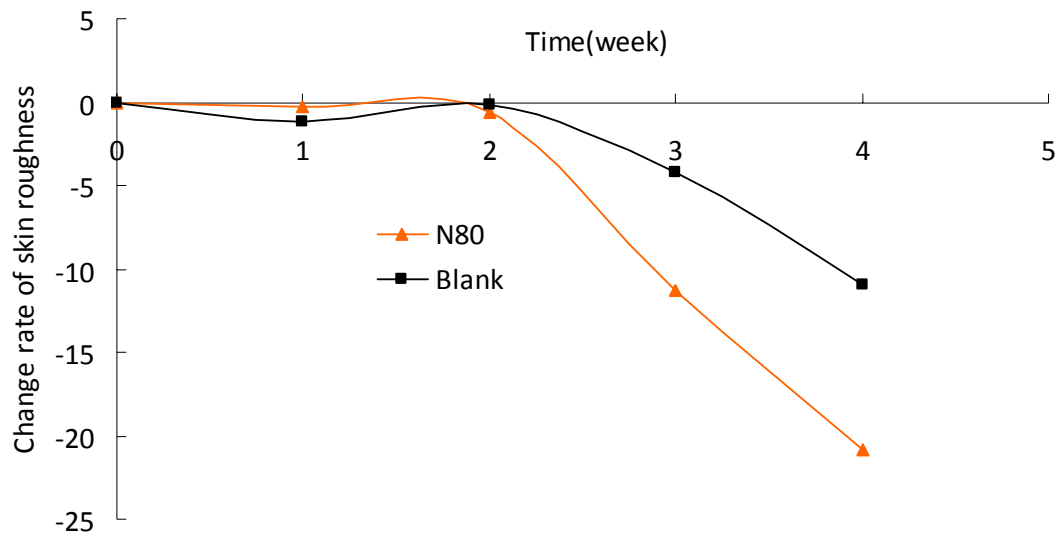
1. Anti-wrinkle -- Skin elasticity improvement



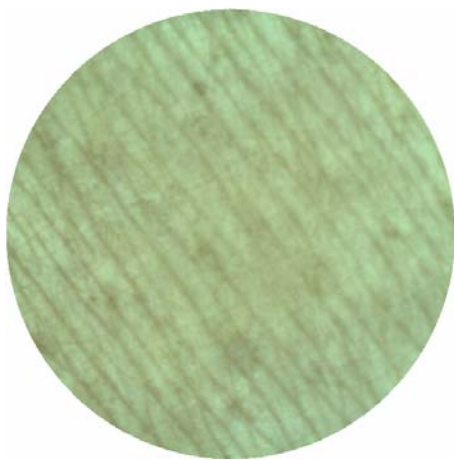
Change rate of R2 during the tests

Skins below the eyes of 32 subjects were selected as the test areas, the skin elasticity before and after the tests (samples: 5% N80; control groups: placebo without N80) were measured using skin elasticity tester. R2 value is the ratio of the skin springback value without pressure to the skin maximum value of stretch with pressure. During the test of 4 weeks, the R2 value of the samples was increasing, and the R2 change rate of the samples was significantly higher than the control groups.

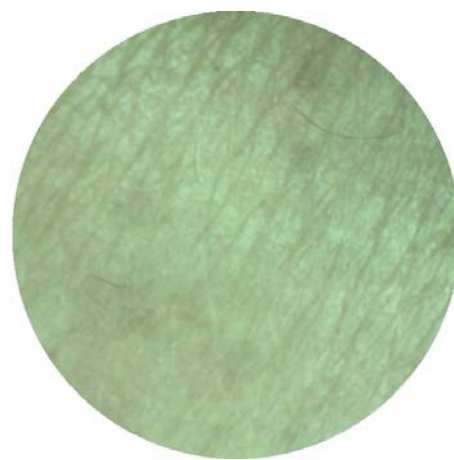
2. Anti-wrinkle -- Eye wrinkle repair



Change rate of skin roughness during the tests



Without N80



With 5% N80

Improvement of skin texture after 4 weeks tests

Skins below the eyes of 32 subjects were selected as the test areas, the skin texture degree before and after the tests (samples: 5% N80; control groups: placebo without N80) were measured. During 4 weeks of testing, the skin roughness of the samples was decreasing after using 2 weeks of 5% N80, and the change rate of the samples was significantly higher than the control groups.

Benefits and Claims

- Natural, derived from *Saccharomyces cerevisiae*
- Skin anti-wrinkle
- Improve skin elasticity
- Skin revitalizing and refreshing
- Improve metabolism of skin cells

Formulating

- Proposed INCI name: **Adenosine, guanosine, thymidine, uridine; water**
- Recommended use level: 3%- 10%
- Recommended working pH: 4.0-7.5
- Recommended working temperature: ≤ 45 °C

Application

- Eye cream products
- Anti-wrinkle products
- Skin nourishing and refreshing products
- Anti-aging and whitening products

Stability and Storage

Yeast Essence N80 can be stored for at least 24 months from the date of manufacture in the unopened original container protected from light in a clean place at a temperature between 4 and 10°C. Keep package tightly closed. Once opened, use contents quickly. In order to avoid secondary microbial contamination, following opening, containers should be handled with special care.

Yeast Essence Z20

Proposed INCI name: Saccharomyces/Zinc ferment, water

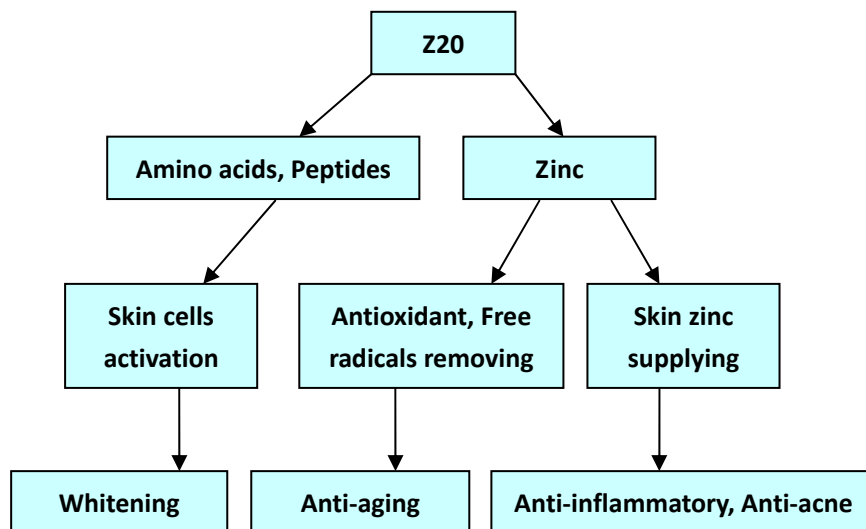
Introduction

Yeast Essence Z20 is extracted from zinc-enriched yeast by biological enzymolysis. In addition to containing a large number of skin-rejuvenating amino acids, peptides, nucleic acids and other biologically active substances, Z20 also contains the **active zinc** for skin metabolism. The chelated form of zinc reduces the skin irritation caused by zinc, which makes it good at anti-inflammatory and anti-acne.

Zinc is important and necessary to healthy skin. Zinc is extremely important to the proliferation of fibroblasts and the synthesis of collagen fiber. According to the studies, the serum level of zinc in patients suffering from psoriasis, seborrheic dermatitis and acne vulgaris were lower than the level of healthy objects.

Using patented raw materials and advanced biotechnology, refined with a series of patented technology of fermentation, enzymolysis and membrane separation, Z20 has a variety of skin-beneficial effects, such as anti-inflammatory, anti-acne and anti-aging.

Mechanism



Mechanism of functions

Efficacy

1. Z20 for skin oil-control (In 5% formula)

Face skin of 30 subjects was selected as the test area, the skin oil content of the forehead and cheek were tested by Skin Oil Tester (Sebumeter SM815, Germany CK Company).

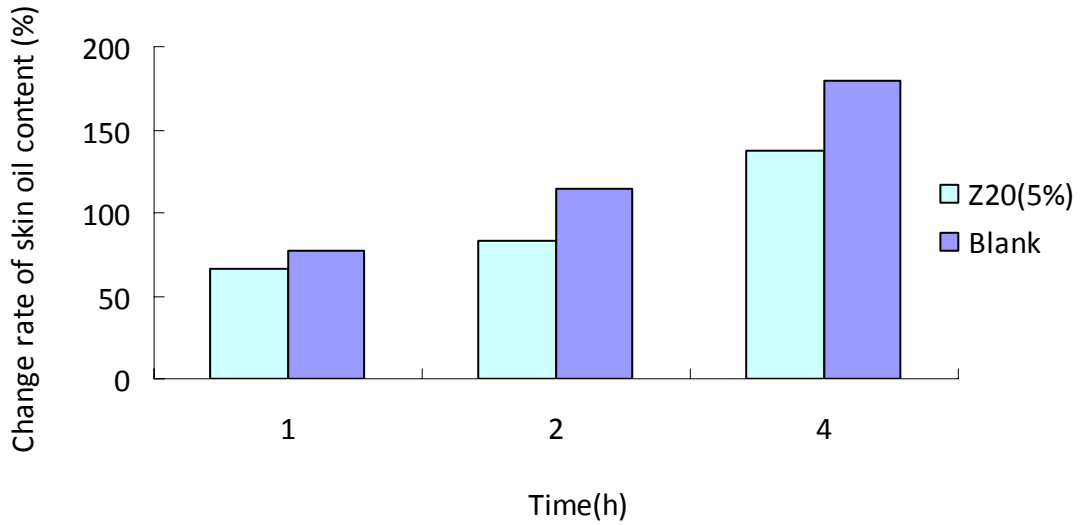


Figure 1 Change rate of the skin oil content during the tests



Before the test

After the test of 4 hours

Improvement of skin after 4 hours tests

During the test period of 4 hours, the skin oil content of the forehead and cheek were increasing, but the skin oil content of the 5% Z20 groups was lower than the blank groups, showing that Z20 was efficient in skin oil-control, and it was most efficient after 4 hours.

2. Z20 for skin oil-control (100% original Z20)

Face skin of 30 subjects was selected as the test area, the skin oil content of the forehead and cheek were tested by Skin Oil Tester (Sebumeter SM815, Germany CK Company).

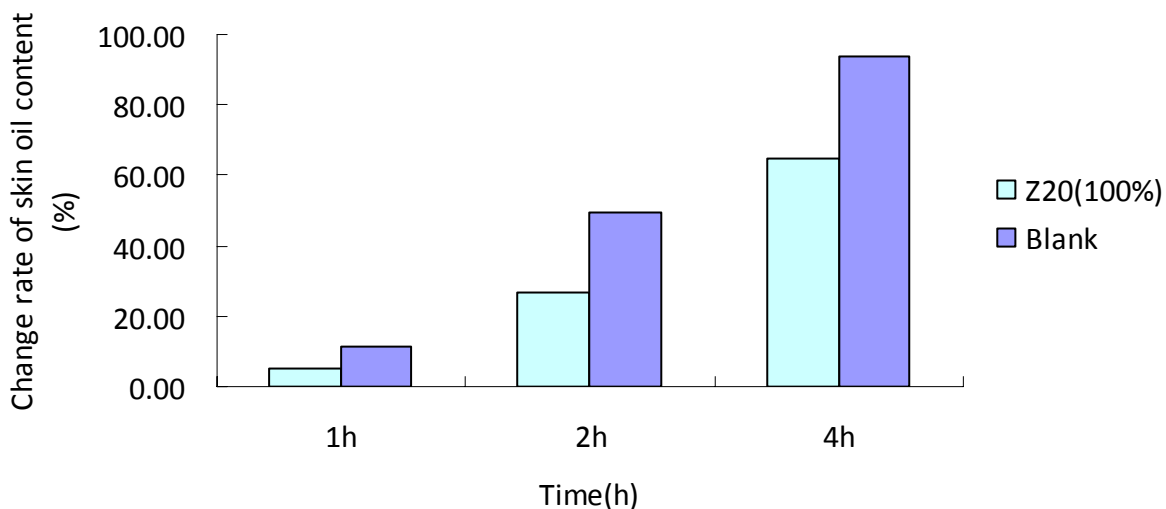


Figure 2 Change rate of the skin oil content during the tests

Figure 2 shows that, during the test period of 4 hours, the change rate of skin oil content were increasing after using of the samples, but the change rate were lower than the control groups in hour 1, hour2 and hour 4, showing that the skin oil content of the sample groups was lower than the control groups.

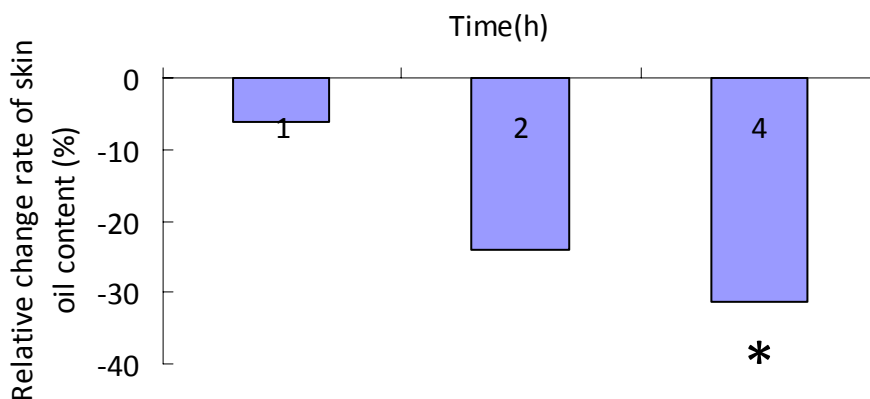


Figure 3 Relative change rate of the skin oil content during the tests (* $p < 0.05$)

Figure 3 shows that, during the test period of 4 hours, the relative change rate of the skin oil content were negative in hour 1, hour2 and hour 4, showing that the skin oil content of the sample groups was lower than the control groups, and there was significant difference ($p < 0.05$) in hour 4, showing that Z20 was efficient in skin oil-control.

Benefits and Claims

- Natural , derived from *Saccharomyces cerevisiae*
- Skin anti-acne
- Skin revitalizing and refreshing
- Nourishes skin cells with essential nutrients
- Improve metabolism of skin cells

Formulating

- Proposed INCI name: **Saccharomyces/Zinc ferment, water**
- Recommended use level: 5%- 15%
- Recommended working pH: 3.5-5.0
- Recommended working temperature: ≤ 45 °C

Application

- Anti-acne products
- Skin nourishing and refreshing products
- Anti-aging and whitening products

Stability and Storage

Yeast Essence Z20 can be stored for at least 24 months from the date of manufacture in the unopened original container protected from light in a clean place at a temperature between 4 and 10°C. Keep package tightly closed. Once opened, use contents quickly. In order to avoid secondary microbial contamination, following opening, containers should be handled with special care.