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(51) Int.Cl.⁶ A61K 7/48, A61K 31/685, A61K 7/40, A61K 31/13

(30) 1999/06/03 (1999-26753) KR

(54) **COMPOSITIONS POUR LE SOIN DE LA PEAU ET LEUR
UTILISATION POUR GUERIR LA PEAU ENDOMMAGEE**

(54) **SKIN CARE COMPOSITIONS AND THEIR USE IN HEALING
INJURED SKIN**

(57) Disclosed are skin care compositions and their use in healing injured skin. The compositions are identical in lipid constituents and structural property to epidermal membranes. They comprise the major constituents for membranes of the stratum corneum, including ceramides, cholesterol and fatty acids, the major constituents for endodermal membranes, including lecithin and triglyceride, and physiological active substances, including phytosphingosine and its derivatives. Without causing side effects, the skin care compositions are far superior in skin penetration and water-retention capacity. With the same composition and structural properties as in epidermal membranes, the compositions fortify the intercellular, lamellar bilayer sheets of the stratum corneum to function as the epidermal barrier, resulting in a great reduction of transcutaneous water loss and in showing an excellent hydration and emolliation effect on the epidermis. Also, the skin care compositions are of good compatibility with therapeutic active ingredients whether hydrophobic or hydrophilic, as well as of excellent drug delivery. So, they are very effective for healing injured skin and acne.

ABSTRACT

Disclosed are skin care compositions and their use in healing injured skin. The compositions are identical in lipid constituents and structural property to epidermal membranes. They comprise the major constituents for membranes of the stratum corneum, including ceramides, cholesterol and fatty acids, the major constituents for endodermal membranes, including lecithin and triglyceride, and physiological active substances, including phytosphingosine and its derivatives. Without causing side effects, the skin care compositions are far superior in skin penetration and water-retention capacity. With the same composition and structural properties as in epidermal membranes, the compositions fortify the intercellular, lamellar bilayer sheets of the stratum corneum to function as the epidermal barrier, resulting in a great reduction of transcutaneous water loss and in showing an excellent hydration and emolliation effect on the epidermis. Also, the skin care compositions are of good compatibility with therapeutic active ingredients whether hydrophobic or hydrophilic, as well as of excellent drug delivery. So, they are very effective for healing injured skin and acne.

SKIN CARE COMPOSITIONS AND THEIR USE IN HEALING INJURED
SKIN

BACKGROUND OF THE INVENTION

5

1. Field of the invention

10 The present invention relates, in general, to skin care compositions which are identical in lipid constituent and structural property to epidermal membranes and, more particularly, to skin care compositions which are superior in skin penetration and water-retention capacity, thereby exhibiting excellent therapeutic activity on injured skin. Also, the present invention is concerned with the use of such skin care compositions in healing injured skin.

15

2. Description of the Prior Art

20 Deeply understanding the structure of the skin and the membrane composition and physical properties of dermal cells is indispensable for and helpful in developing skin applications for maintaining the health of the skin.

25 The architecture of the skin is composed of the dermis and the epidermis which are classified according to the differentiation of keratinocyte cells from a basal layer. Particularly, the anucleate, conified, outermost layers of the epidermis are collectively known as the stratum corneum.

As a rule, the stratum corneum, is responsible for

primarily protecting the skin from external physical and chemical environments as well as functions as a skin barrier against excessive transcutaneous water loss to the environment. Dysfunction of this epidermal barrier may
5 cause skin dryness, which can be manifested in a variety of cutaneous lesions and skin diseases. Thus, skin care is fundamentally to moisturize the skin.

The skin is exposed to numerous bacteria. In fact, under the normal conditions the skin has bacteria thereon,
10 thereby protecting harmful bacteria from causing cutaneous lesions or diseases. In other words, when the bacterial flora on the skin are imbalanced, some skin diseases occur. In this regard, some stratum corneum lipids are responsible for maintaining normal bacterial flora on the skin
15 (Tannock, G.W., in "Normal Microflora" (Eds. Champman & Hall), pp 3-8, 1995).

During the past decade, extensive and intensive research has been directed to the intercellular lipid compositions of the stratum corneum and their
20 physicochemical properties and biological functions. Dermal cellular membranes are of lipid lamellar bilayer structures and different in lipid type and composition from one dermal layer to another.

Phospholipids, one of the major kinds of membrane
25 lipids, becomes scarce in the membranes which are nearer the outermost layers of stratum corneum whereas ceramides are more abundant therein. The membrane lipids of the

stratum corneum are known to comprise about 40 % of ceramides, about 25 % of cholesterol, about 25 % of fatty acids, and about 10 % of cholesterol sulfate.

It is generally accepted that ceramides play a particularly important role in preventing the water loss through the stratum corneum and restoring damaged dermal layers. Recent reports have revealed that phytosphingosine, a ceramide precursor, has an activity against microbes, functioning to maintain normal bacterial flora on the skin although its content in the stratum corneum is low (Bibel, D.J. et al., "Topical sphingolipids in antiseptis and antifungal therapy: Clinical and Experimental Dermatology" 1995:20, pp 395-400; Babel, D.J., et al., "Antimicrobial Activity of Stratum Corneum Lipids from Normal and Essential Fatty Acid-Deficient Mice", J. Invest. Dermatol. 92:632-638, 1989; Bibel, D.J., et al., "Antimicrobial Activity of Sphingosines: J. Invest. Dermatol., 98:269-273, 1992).

Research results disclosing that various skin diseases, including atopic dermatitis, are attributed to abnormal changes in the membrane lipid composition of the stratum corneum, lead dermatology and cosmetology to pay new attention to the main membrane lipids of the stratum corneum, ceramides, cholesterol and fatty acids (Mao-Qiang, M., Feingold, K.R., Thornfeldt C.R., and Elias, P.M., "Optimization of Physiological Lipid Mixtures for Barrier Repair", J. Invest. Dermatol., 106:1096-1101, 1996).

For these reasons, extensive research is concentrated on the development of skin care products taking advantage of stratum corneum lipids and phytosphingosine. In order to exhibit sufficient physiological activity, these substances must penetrate through the stratum corneum to the epidermal membranes which phospholipids compose. To this end, the lipid lamellar products developed must have similar structures to those of the membrane lipids of the stratum corneum.

Conventional skin care compositions, however, suffer from a disadvantage of being limited in their application amounts because ceramides and phytosphingosine are of low solubility and high feasibility to form crystals owing to hydrophobicity. In addition, they cause side effects and show poor trans-epidermal penetration on account of the use of solutions and additives unsuitable to the skin, such as propylene glycol/ethanol, etc (De Paepe K., Vandamme P., Roseeuw D., and Rogiers V., "Ceramides/Cholesterol/Free Fatty Acids Containing Cosmetics: The Effect on the Barrier Function. S?W-Journal 122:199-204, 1996; de Groot A.C., Weyland J.W., Nater J.P. "Unwanted Effects Cosmetics and Drugs Used in Dermatology. In; de Groot A.C., Weyland J.W., Nater J.P. (Eds.), Elsevier, Amsterdam, 1994, 3rd. ed, pp 770).

In order to solve the above-mentioned problems, attempts were made to develop pseudo-ceramide comprising products which are of high solubility and facile utility.

However, the pseudo-ceramide products are disadvantageous in that they are easily accumulated in the skin in addition to being not biodegradable.

5

SUMMARY OF THE INVENTION

Knowledge of the membrane lipids of dermal cells and their architectural properties allows modification and adaptation leading to the present invention.

10

Therefore, it is an object of the present invention to overcome the above problems encountered in prior arts and to provide a skin care composition which comprises certain of epidermal lipid species and endodermal lipid species or their structurally similar precursors, analogs or isomers.

15

It is another object of the present invention to provide a skin care composition which is superior in dermatoplicity.

20

It is a further object of the present invention to provide a skin care composition which is useful as a moisturizer for emolliation and hydration of the epidermis and as an enhancer for the therapeutic activity of known pharmaceutical agents.

25

Based on the present invention, the above objects could be accomplished by a provision of a skin care composition comprising ceramides, cholesterol, fatty acids, lecithin, triglycerides, and phytosphingosine or its derivatives. Lecithin and triglycerides are the key

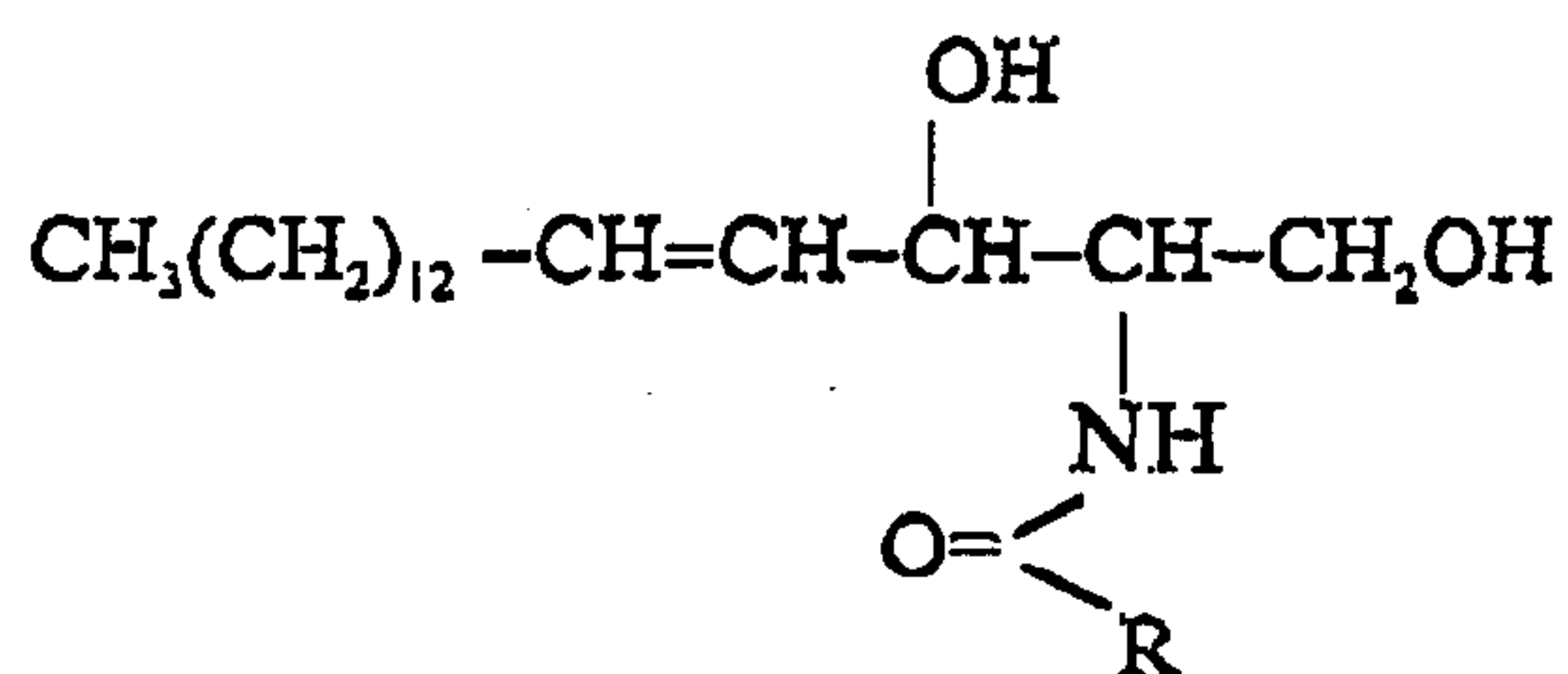
constituents for the membranes of the endodermis. Phytosphingosine or its derivatives play a role in maintaining a normal microflora state on the skin.

The skin care compositions of the present invention
 5 comprise natural materials which compose dermal membranes, but not solvents, such as propylene glycol/ethanol, nor synthetic surfactants, so the compositions are highly compatible with the skin without causing side effects.

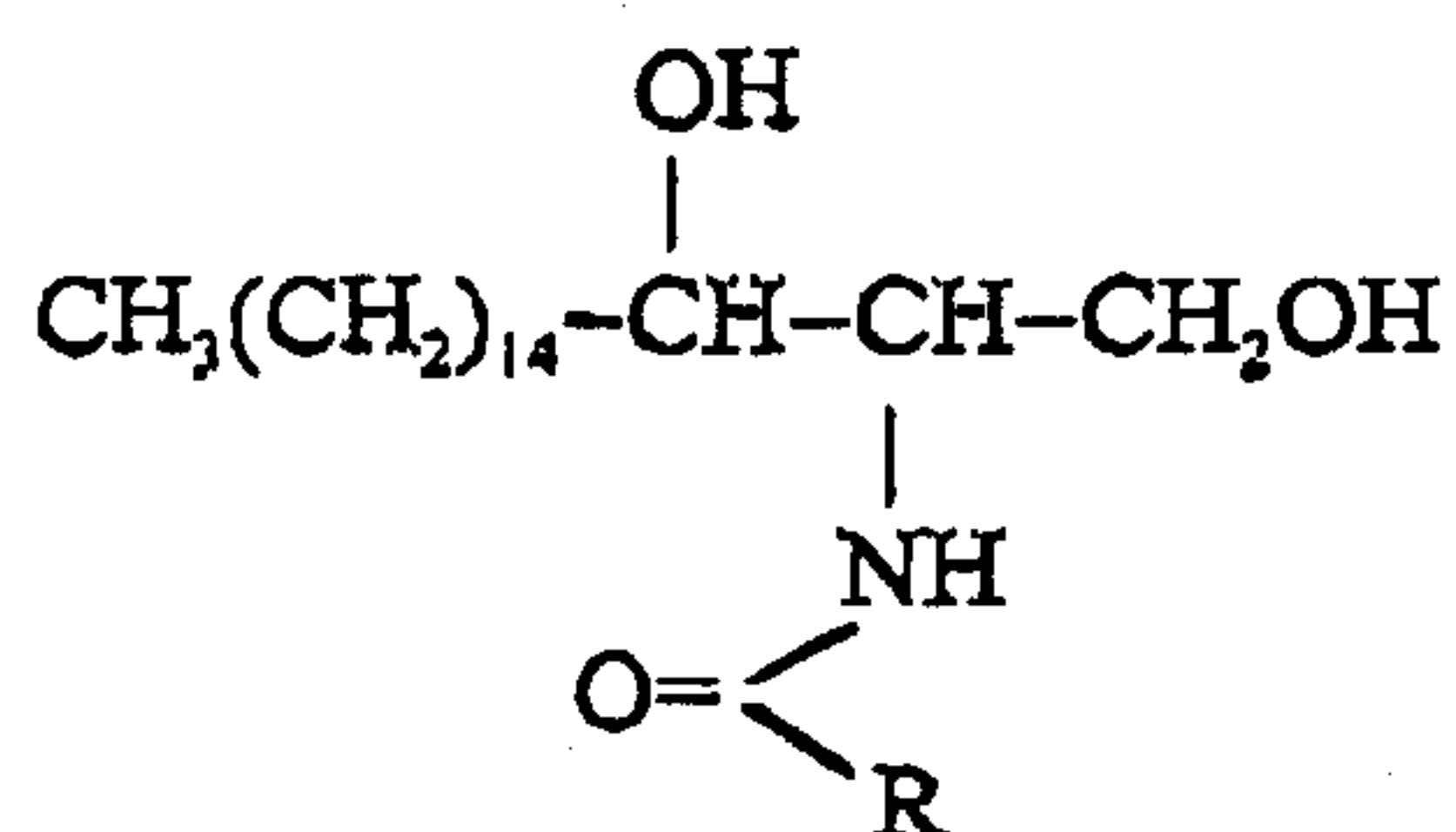
The ceramides useful in the present comprise
 10 derivatives of sphingosine, sphinganine and phytosphingosine, and mixtures thereof. Ceramide groups 1, 2, 3, 4, 5, 6I and 6II may be used.

Following are the structural formulas of the ceramide derivatives used in the present invention.

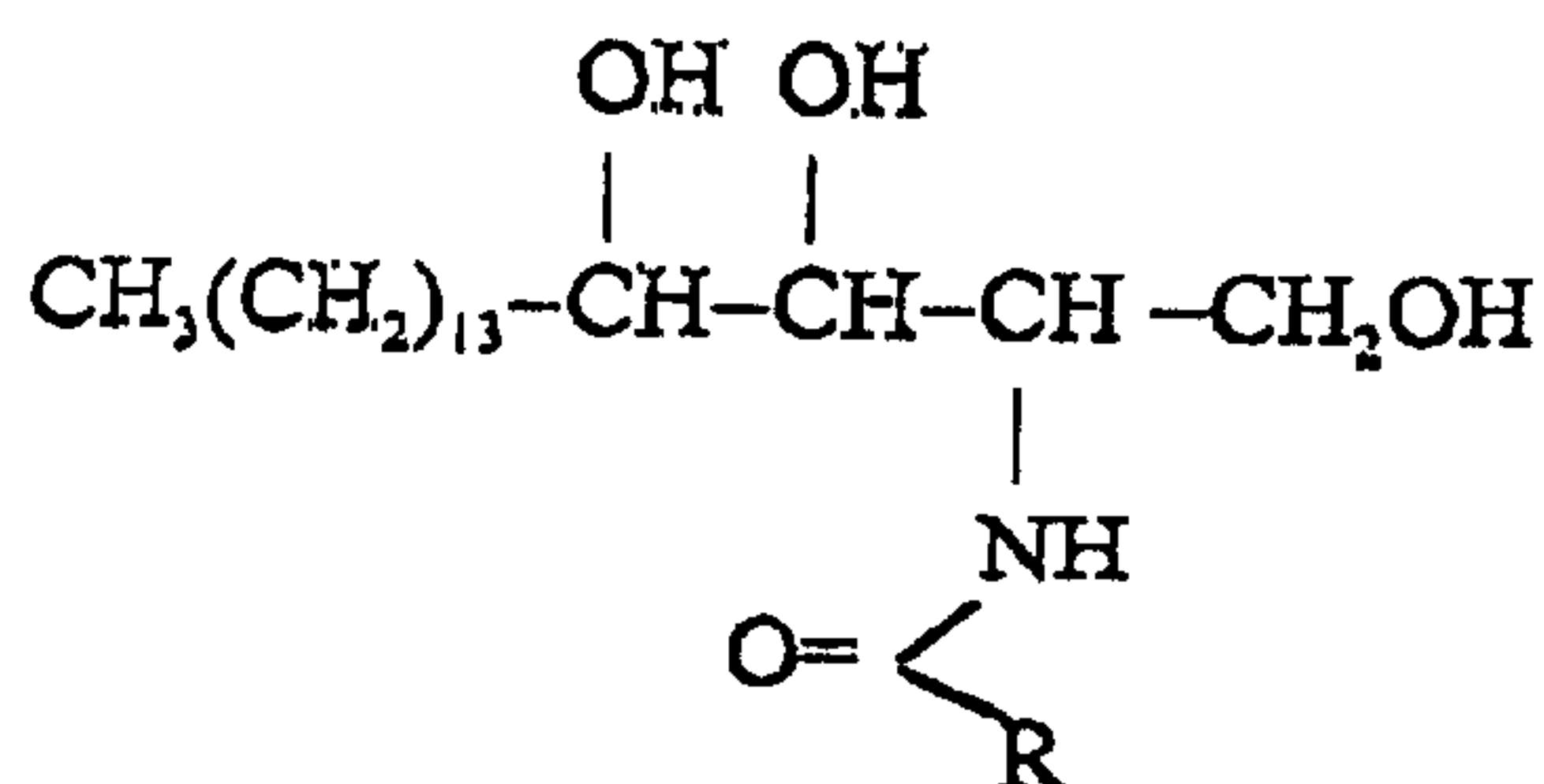
15 1. Sphingosine Derivatives



25 2. Sphinganine Derivatives



3. Phytosphingosine Derivatives



wherein R is a C₆₋₂₅ unsaturated fatty acid which has one or two double bonds or a C₆₋₂₅ saturated fatty acid which has hydroxy group at the α or β position.

Available in the present invention is phytosphingosine itself. Polar derivatives are, however, preferred in terms of emulsification and solubility, which can be obtained the following modification of phytosphingosine.

1. Organic salt

Using organic acids, there are prepared organic salts of phytosphingosine which are neutral in pH. Available organic acids are exemplified by hydrogen chloride, lactic acid, α-, or β-hydroxy acid, and salicylic acid.

2. Cations

A methyl group is introduced to the amine group of phytosphingosine to synthesize N,N,N-trimethyl phytosphingosine.

3. Tetraacetylphytosphingosine (TAPS)

This compound is synthesized from phytosphingosine.

As for cholesterol and its derivatives, they are helpful in the liquid lamellar crystallization of ceramides which have the same structure as that of the membranes of

dermal cells, stabilizing the liquid crystals. Useful in the present invention are cholesterol, cholesterol sulfate and cholesterol hemisuccinate.

5 As the fatty acids in the skin care composition of the present invention, saturated or unsaturated fatty acids containing 6~25 carbon atoms or combinations thereof are used.

10 Functioning as a skin penetration enhancer and a softener, the phospholipid used in the present invention is preferably hydrogenated or hydroxylated when considering the stability of the composition.

15 As compared with the compositions comprising the ceramides which are different in structure from the membranes of dermal cells, the compositions of the present invention cause almost no side effects and exhibit very superb skin penetration and moisturization. In addition, the skin care compositions of the present invention are compatible with therapeutic active ingredients whether hydrophobic or hydrophilic. Together with this
20 characteristic, their excellent drug delivery allows the skin care compositions of the present invention to be used as pre-formulations of therapeutic products for damaged skin.

25 DETAILED DESCRIPTION OF THE INVENTION

The present invention contemplates a skin care

composition which is comprised of the same components as in the membranes of dermal cells, thereby effecting the sufficient dermal efficacy of ceramides and phytosphingosine and its derivatives. The present invention also pertains to the use of such a skin care composition in healing injured skin.

The skin care composition of the present invention comprises the major constituents for membranes of the stratum corneum, including ceramides, cholesterol and fatty acids, the major constituents for endodermal membranes, including lecithin and triglyceride, and physiological active substances, including phytosphingosine and its derivatives.

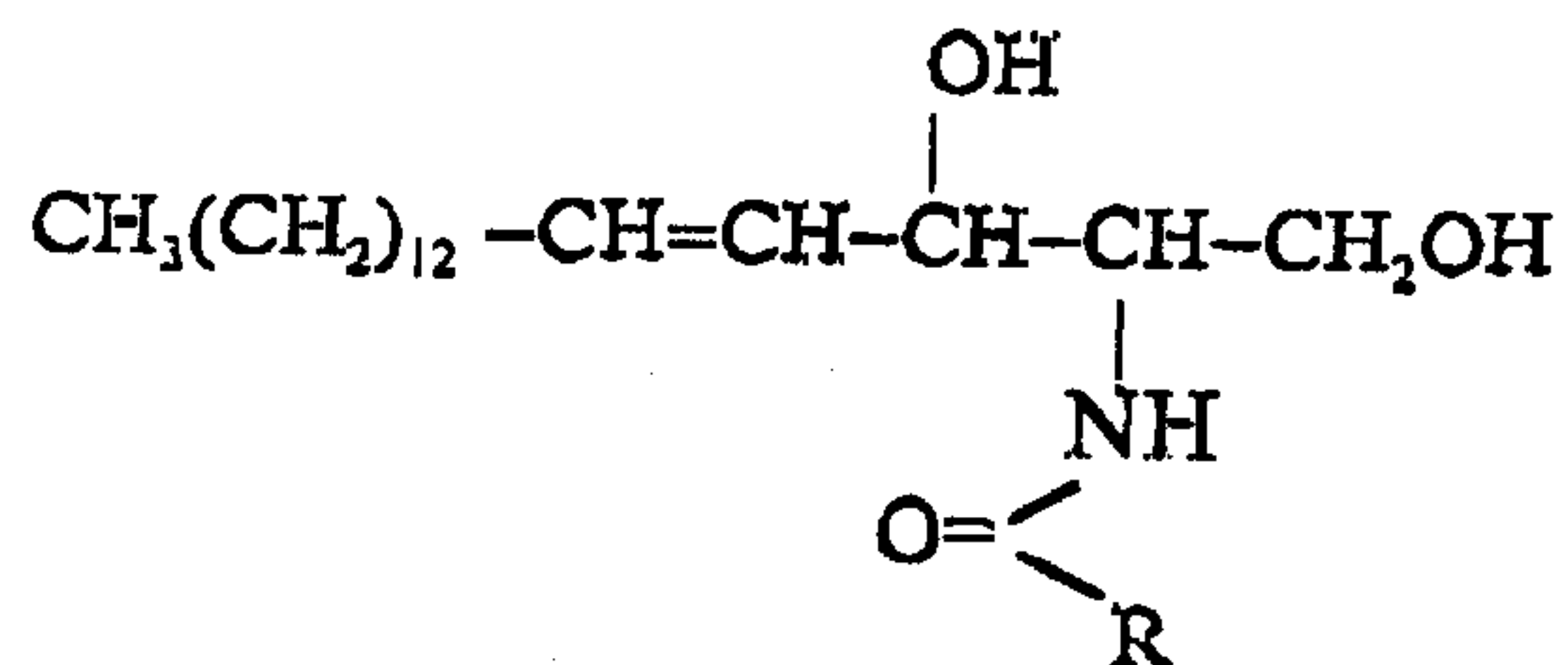
After the reports revealing that the constituents for membranes of the stratum corneum are concerned with various disorders of the skin, active research has been directed to the restoration of damaged skin by provision of the main constituents for the membrane of the stratum corneum, that is, ceramides, cholesterol, and fatty acids. In this regard, these membrane lipids are combined in appropriate amounts to give liposomes, a kind of lipid droplets, which can be used for a drug delivery system for the skin.

However, ceramides, known to play the most pivotal role in the restoration of damaged skin among the constituents for the membranes of the stratum corneum, are hydrophobic and do not undergo liquid lamella crystallization, making it very difficult to develop the

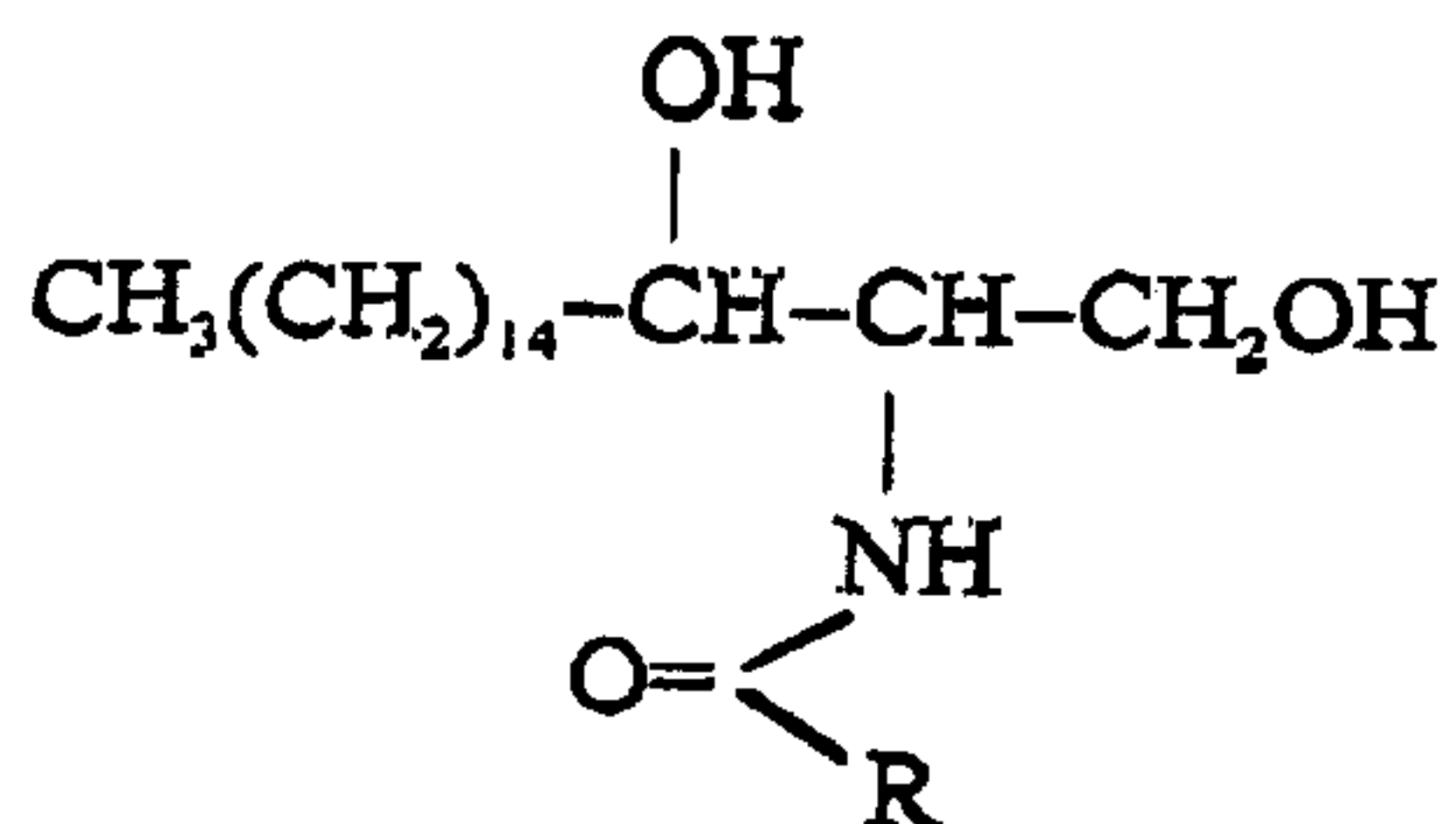
products which meet stability, utility and penetration conditions at once. In the present invention, this problem is overcome with oil-in-water type skin care compositions which contain only the natural materials found in membranes of dermal cells, but neither synthetic surfactants nor solvents, and are superior in dermatoplicity.

The ceramides used in the present invention are amide derivatives in which fatty acids are grafted to the amine groups of sphingosine, phytosphingosine, and sphinganine, exemplified by the following structural formulas:

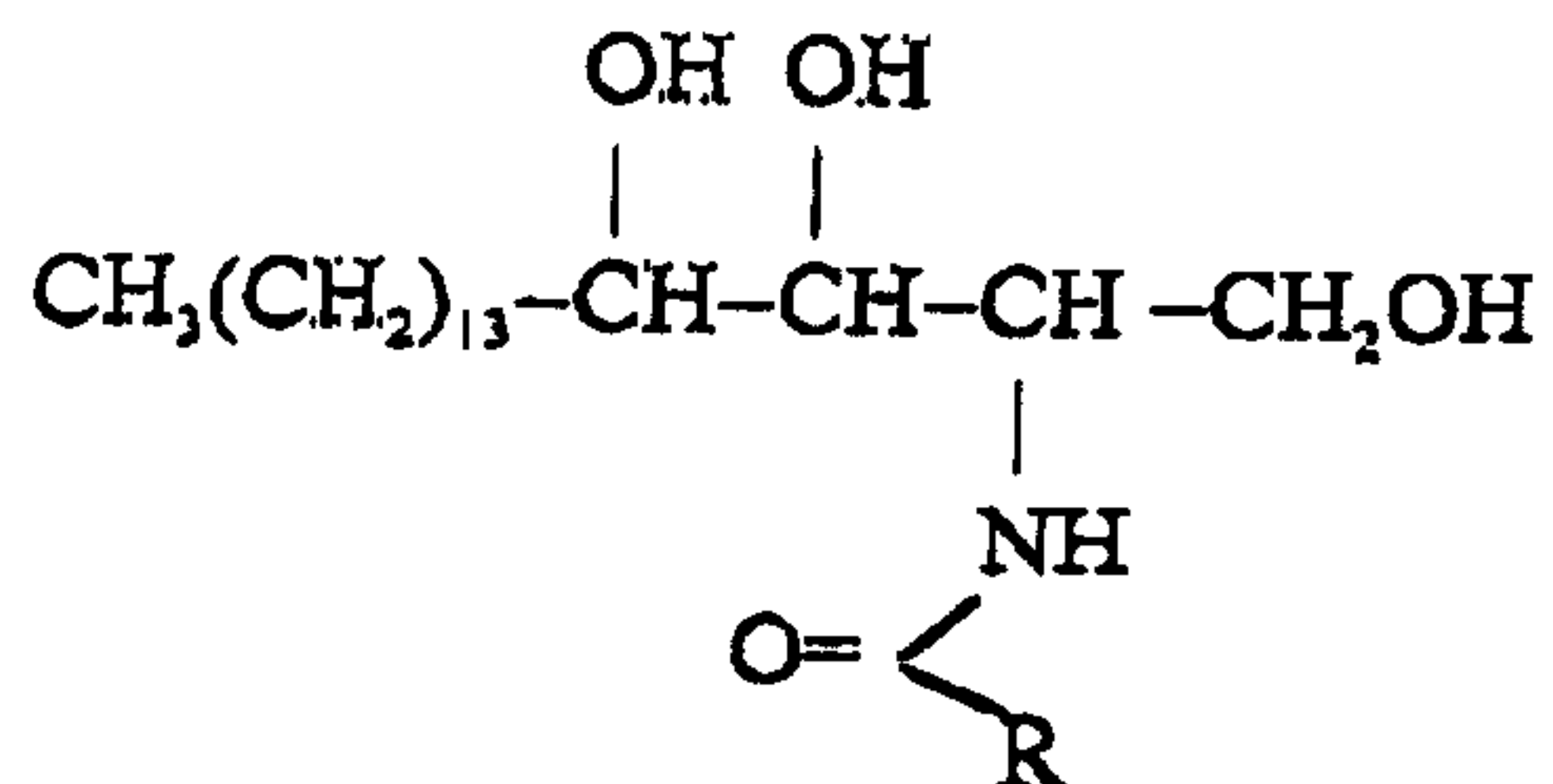
1. Sphingosine Derivatives



2. Sphinganine Derivatives



3. Phytosphingosine Derivatives



wherein R is a C₆₋₂₅ unsaturated fatty acid which has one or two double bonds or a C₆₋₂₅ saturated fatty acid which has hydroxy group at the α or β position.

Preferably, the ceramide derivatives are used at an amount of 1~10 wt% based on the total weight of the composition. For example, an amount without the range causes poor formation of emulsion. Available amounts for triglyceride and lecithin are within the range of 1 to 10 wt% based on the weight of the composition.

The cholesterol used in the present invention is selected from the group consisting of cholesterol, cholesterol sulfate, cholesterol hemisuccinate and mixtures thereof. The presence of cholesterol is helpful in the liquid lamellar crystallization of ceramides, stabilizing the liquid crystals formed. Cholesterol is preferably used at an amount of 1~10 wt% based on the weight of the composition and most preferably at an amount of 40~50 wt% based on the weight of the ceramides used.

Useful in the present invention are saturated fatty acids containing 6~25 carbon atoms, unsaturated fatty acids containing 6~25 carbon atoms with one or two double bonds, or combinations thereof. They are used at an amount of 1~10 wt% based on the weight of the composition and most preferably, 40~50 wt% based on the weight of the ceramides used.

In accordance with the present invention, best therapeutic and moisturizing effects can be brought about

in the compositions when the lipid constituents for the membranes of the stratum corneum are used at a weight ratio of ceramides:cholesterol:fatty acids of 2:1:1 with maintenance of liquid lamella crystallization. The topical application of the skin care composition in this weight ratio to an injured site of the skin results in a most efficient restoration effect on the injured skin.

Phytosphingosine, as it is, may be used in the present invention. Alternatively, it may be converted into a polar derivative in the form of organic salts, N,N,N-trimethylphytosphingosine, or tetraacetylphytosphingosine (TAPS), in order to improve emulsification and solubility. The allowable amount of phytosphingosine in the composition of the present invention is within the range of 1 to 10 wt% based on the weight of the composition.

The phytosphingosine derivatives can be obtained through the following modification of phytosphingosine.

1. Organic salt

Using organic acids, organic salts of phytosphingosine, neutral in pH, are prepared. Available organic acids are exemplified by hydrogen chloride, lactic acid, α -, or β -hydroxy acid, and salicylic acid. Owing to their high acidity, these acids, although known as activating dermal cells, are difficult to apply for skin care products. In the present invention, however, they can be freely used by virtue of the neutralization of phytosphingosine.

2. Cations

A methyl group is introduced to the amine group of phytosphingosine to synthesize N,N,N-trimethyl phytosphingosine.

3. Tetraacetylphytosphingosine (TAPS)

This compound is synthesized from phytosphingosine.

Even if present at an amount of as low as 1 wt% in the membranes of the stratum corneum, phytosphingosine is very important because of its antimicrobial activity. Therefore, it gives a contribution to the maintenance of normal bacterial flora on the skin. In addition, phytosphingosine is a precursor for ceramide, serving as a physiological active material. It was found to show good therapeutic efficacy as measured in patients suffering from acne.

Lecithin, an important constituent for cellular membranes, is extensively studied for drug delivery systems owing to the tendency to form lipid bilayer structures and liposomes in water. In addition, lecithin, representative of phospholipids, plays a role as a skin penetration enhancer and a skin softener. Preferable in the present invention is the lecithin which is hydrogenated or hydroxylated with an iodine value of around 20.

The skin care compositions of the present invention form vehicles which can entrap the materials beneficial to the skin, so that the skin care compositions can be used as

pre-formulations of skin care products where therapeutic reagents are utilized.

A better understanding of the present invention may be obtained in light of the following examples which are set forth to illustrate, but are not to be construed to limit the present invention.

PREPARATION EXAMPLE I

Preparation of Organic Salts of Phytosphingosine

In ethanol was dissolved phytosphingosine which was then added with an equal equivalent of organic solvents. After being stirred at room temperature for 30 min, the solution was deprived of ethanol under a reduced pressure and added with acetone to precipitates. The precipitates were filtered and dried (Yield: 98 %).

PREPARATION EXAMPLE II

Preparation of N,N,N-Trimethyl Phytosphingosine

In chloroform was dissolved phytosphingosine which was added with five equivalents of sodium carbonate and five equivalents of methyl iodide, followed by refluxing for 7 hours with stirring. The precipitates were filtered off and discarded. The solvent was removed from the filtrate, after which the residue was added with acetone. The precipitates thus formed were filtered and dried to give

the title compound (Yield 70 %).

PREPARATION EXAMPLE III

Preparation of Tetraacetylphytosphingosine (TAPS)

5

In anhydrous chloroform was dissolved phytosphingosine which was then added with five equivalents of triethyl amine and cooled to room temperature. Five equivalents of acetyl anhydride were added for 30 min to the solution
10 which was then refluxed for 4 hours with stirring. After being cooled to room temperature, the solution was added with an equal volume of water to separate an organic layer. This organic separation procedure was repeated three times. After the organic solvent was removed from the organic
15 layer through evaporation, the residue was recrystallized in hexane. The precipitate thus formed was filtered and dried to give the desired compound (Yield 95 %).

EXAMPLE I

20

Some components of the skin care composition according to the present invention were made in a lipid phase while others were made in an aqueous phase.

For the lipid phase, 1.5 g of stearic acid were added
25 to 5 g of triglyceride and the mixture was heated up to 80 °C. After the mixture was completely dissolved, the solution was added with 3 g of cholesterol and 5 g of

ceramide and stirred until they were dissolved completely. Subsequently, 2 g of lecithin was added and dissolved, followed by adding 1.5 g of oleic acid.

5 For the aqueous phase, 79.2 g of distilled water were heated up to 80 °C to which 2 g of phytosphingosine and 0.8 g of lactic acid were added, followed by stirring to complete dissolution.

10 The aqueous phase was slowly added in the lipid phase and the resulting solution was stirred at 80 °C for 30 min and then, slowly cooled to room temperature to afford a creamy composition.

EXAMPLE II

15 For a lipid phase, 2 g of stearic acid were added to 5 g of triglyceride and the mixture was heated up to 80 °C. After the mixture was completely dissolved, the solution was added with 3 g of cholesterol and 5 g of ceramide and stirred to complete dissolution.

20 For an aqueous phase, 82.3 g of distilled water were heated up to 80 °C to which 2 g of phytosphingosine and 0.7 g of lactic acid were added, followed by stirring to complete dissolution.

25 The aqueous phase was slowly added in the lipid phase and the resulting solution was stirred at 80 °C for 30 min and then, slowly cooled to room temperature to afford a creamy composition.

EXAMPLE III

For a lipid phase, 1 g of stearic acid was added to 3 g of triglyceride and the mixture was heated up to 80 °C. After the mixture was completely dissolved, the solution was added with 3 g of cholesterol, 2 g of TAPS and 5 g of ceramide and stirred until they were dissolved completely. Subsequently, 2 g of lecithin were added and dissolved, followed by slowly adding 1.5 g of oleic acid and 1 g of linoleic acid, in order, with stirring.

For an aqueous phase, 80 g of distilled water were heated up to 80 °C to which 2 g of a phytosphingosine salt (phytosphingosine-HCl) were added, followed by stirring to complete dissolution.

The aqueous phase was slowly added in the lipid phase and the resulting solution was stirred at 80 °C for 30 min and then, slowly cooled to room temperature to afford a creamy composition.

The skin care compositions of the present can be topically applied to the human skin. Particularly, when the skin is in a xerosis state or damaged, the topical application of the compositions to the damaged site prevents water loss from the skin site and restores the membranes of dermal cells around the skin site. The skin care compositions of the present invention were assayed for dermal efficacy in the following test examples.

TEST EXAMPLE I

Therapeutic Activity Against Acne Diseases and
Moisturizing Effect

5 Tested were fifteen young men who had at least ten
comedones on one cheek. The skin care composition obtained
in Example I was applied to their faces three times a day,
for example, in the morning, at noon time, and just before
retiring. Their eczematous sites were observed to be
10 cleaned at 6~12 weeks after application. The curing
periods of time were different individually.

 Skin conductance was measured prior to application,
and again at 3 weeks after application with the aid of a
skin surface hydrometer, such as that manufactured by Ibs
15 Inc., Japan, identified as "Skicon-200". The mean values
are given in Table 1, below.

TABLE 1
Results of Electric Conductance of Skin

Skin Conductance	
Before Application	After Application
51.2±6.6	200.5±9.7

25 In addition, the rate of trans-epidermal water loss
was measured prior to application and at 3 weeks after
application by use of an evaporimeter, such as that
manufactured by Servo Med, Sweden, identified as "Epi". The
mean values are given in Table 2, below.

TABLE 2
Trans-Epidermal Water Loss

5	Trans-Epidermal Water Loss	
	Before Application	After Application
	50.5±2.5	10.1±3.2

10 As apparent from the data of Tables 1 and 2, the skin care composition according to the present invention is effective to cure acne disease and ameliorates the trans-epidermal water loss. This demonstrates that the skin care compositions of the present invention are very useful as a moisturizer for emolliation and hydration of the epidermis by virtue of its effect on epidermal barrier function.

15

TEST EXAMPLE II

Curing Efficacy on Injured Skin

Curing Efficacy on Stab

20 The tension strength of the composition on a pierced wound was a measure of the healing efficacy on the wound. Measurement of the tension strength followed a modified Schute and Domenjoz method.

25 Male Sprague-Dawley rats with a certain level of body weight were adapted to new raising conditions of a temperature of 22 ± 2 °C and a humidity of 50 ± 5 % for one week or longer and used for testing when they showed no abnormal symptoms. During the pre-raising term and test period, the rats were allowed to eat feedstock and water freely.

During the test period, each of the rats was raised in an individual cage.

The rats were grouped in three panels of five each. The five rats in a blank group were applied with no substances. For a control group, an ointment base which is commonly used in hospitals and pharmacies was used.

After having the hairs on the back cut by means of a clipper, the rats were etherized and the exposed skin sites were sterilized with 70% alcohol. The skin on the back was incised from a point 3 cm apart from the neckline to a point 2 cm further apart along the central line with the aid of a surgical knife and the incised site was sutured at regular intervals of 0.5 cm. To prevent infection, an antibiotic was injected intramuscularly once a day for four days. Test formulations were applied to the sutured sites at a certain dosage once a day from the day of the operation. At 5 days after the operation, the sutures were removed and on the 7th day after the operation, an area comprising the cut site was excised from the rat and measured for tension strength by using a tensiometer (C.K., Kim, et al., Kor. Pharm. Sci., vol. 27, No. 2, 139-143, 1997; R. Schulte and R. Domenjoz, Mde. Pharmacol. Exp., 16, 453-468, 1967).

The results are given in Table 3, below.

TABLE 3
Tension Strength Results

	Test Groups	Tension Strength
5	Blank	100
	Control Ointment	125
	Inventive	150

10 From the data of Table 3, it is apparent that the skin care composition of the present invention has a remarkable healing effect on damaged skin. The higher tension strength in the control group than in the blank group is believed to be attributed to the moisturizing effect of the ointment base.

15 TEST EXAMPLE III

Measurement of Injury-Healing Effect by Wound Area Method

20 The injury-healing effect of the present invention was tested by measuring the restoration of the dermal site which was wounded by excising a circular dermal area 6 mm in diameter. The measurement followed a modified Wakita method(H. Wakita, et al., J. Invest. Dermatol. 110:253-258, 1998).

25 Sprague-Dawley rats with a certain level of body weight were adapted to new raising conditions of a temperature of 22 ± 2 °C and a humidity of 50 ± 5 % for one week or longer and used for testing when they showed no abnormal symptoms. During the pre-raising term and test period, the rats were allowed to eat feedstock and water freely.

During the test period, each of the rats was raised in an individual cage.

After having the hairs on the back cut by means of a clipper and completely removed with a razor, the rats were etherized and the exposed skin sites were sterilized with 70% alcohol. An area 6 mm in diameter was incised from the skin on the back at a site point 3 cm apart from the neckline along the central line with the aid of a biopsy punch, to form a trauma. To prevent infection, an antibiotic was administered through intramuscular injection once a day for four days. Test formulations were applied to the traumatized sites at a certain dosage once a day from the day of the operation. At 4, 7 and 10 days after the operation, transparent films were brought into close contact with the traumas and the shapes of the traumas were precisely traced on the films. Measurement of the areas of the traumas was conducted by using 400% magnified copies of the traced films. Healing rate was calculated according to the following formula:

$$\text{Healing Rate(\%)} = 1 - \frac{\text{Area Weight on the day of Measurement}}{\text{Area Weight on 1st day}}$$

The rats were grouped in three panels of five each. The five rats in a blank group were applied with no substances. For a control group, an ointment base which is commonly used in hospitals and pharmacies was used.

The results are given in Table 4, below.

TABLE 4
Injury-Healing Effect Measured by Wound Area Method

Test Groups	Healing Rate(%)		
	4 days	7 days	10 days
Blank	15.2	43.4	80.2
Control Ointment	16.6	52.7	92.5
Inventive	22.5	61.0	96.2

Without causing side effects, as described hereinbefore, the skin care composition of the present invention is far superior in skin penetration and water-retention capacity to conventional compositions which comprises ceramide and components in different types from those of epidermal membranes. With the same composition and structural properties as in epidermal membranes, the skin care composition of the present invention fortifies the intercellular, lamellar bilayer sheets of the stratum corneum to function as the epidermal barrier, resulting in a great reduction of transcutaneous water loss and in showing an excellent hydration and emolliation effect on the epidermis. In addition, the skin care composition is of good compatibility with therapeutic active ingredients whether hydrophobic or hydrophilic, as well as of excellent drug delivery. Thus, it is very effective for healing injured skin and acne.

The present invention has been described in an illustrative manner, and it is to be understood that the terminology used is intended to be in the nature of description rather than of limitation. Many modifications

and variations of the present invention are possible in light of the above teachings. Therefore, it is to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

5

What is claimed is:

1. A skin care composition, comprising ceramide, cholesterol, fatty acids, triglyceride, lecithin, and phytosphingosine or its derivatives.
2. A skin care composition as set forth in claim 1, wherein the ceramide is used at an amount of 1~10 wt% based on the weight of the composition
3. A skin care composition as set forth in claim 1, wherein the cholesterol and the fatty acids are used at an amount of 4~50 wt% based on the weight of the ceramide used.
4. A skin care composition as set forth in claim 1, wherein the lecithin and the phytosphingosine or derivatives thereof are each used at an amount of 1~5 wt% based on the weight of the composition.
5. A skin care composition as set forth in claim 1, wherein the ceramide is an amide derivative in which a fatty acid is grafted to the amine group of sphingosine, phytosphingosine, or sphinganine.
6. A skin care composition as set forth in claim 4, wherein the fatty acid is a saturated or unsaturated fatty acid containing 6~25 carbon atoms.
7. A skin care composition as set forth in claim 1, wherein the cholesterol is selected from the group consisting of cholesterol, cholesterol sulfonate and cholesterol hemisuccinate.

8. A skin care composition as set forth in claim 1, wherein the cholesterol is used at an amount of 1~10 wt% based on the weight of the composition.

9. A skin care composition as set forth in claim 1, wherein the phytosphingosine derivatives are in the form of organic salts, N,N,N-trimethylphytosphingosine, or Tetraacetylphytosphingosine.

10. Use of the skin care composition of claim 1 in healing injured skin.

11. Use of the skin care composition as set forth in claim 10, wherein the injured skin results from cutting, a burn, inflammation, and acne.

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