object. As a result, they have obtained the following findings. Specifically, the present inventors have found that ingestion and/or action of a certain type of lactic acid bacteria enhances the gene expression of retinal dehydrogenase that is an indicator of the immune function, and thereby promoting the production of retinoic acid that is also an indicator of the immune function, which can solve the above-mentioned problem. Lactic acid bacteria used as an active ingredient in the present invention have been eaten for a long period of time in the form of, e.g., fermented food. Therefore, the agent for producing retinoic acid and the agent for enhancing immune function are highly safe and have low risks of side effects.

The agent for producing retinoic acid or the agent for enhancing immune function of the present invention is ingested by and/or acts on a subject, thereby more strongly inducing retinoic acid from retinal with retinal dehydrogenase in the body, and thus immune function is enhanced. According to the present invention, for example, preventive and/or therapeutic effects on infectious diseases caused by opportunistic bacteria, infectious diseases caused by pathogenic bacteria or fungi, infection with *Helicobacter pylori*, infectious diseases caused by viruses, bacterial translocation, prolonged intestinal mucosal inflammation, changes in the intestinal flora balance (e.g., disruption of intestinal flora balance), diseases induced by the aforementioned inflammations, inflammatory bowel disease, such as Crohn's disease and ulcerative colitis, excessive inflammation, and allergic symptoms can be expected. In addition, promotion of retinoic acid production by lactic acid bacteria according to the present invention, can be expected to lead to a decrease of infection risk, suppression of inflammation, and anti-allergic effects in infants and children having immature immune function, elderly persons with lowered immune function, and patients with various diseases. According to the present invention, such effects can be expected, particularly for elderly persons or aged mammals.

Specifically, the present invention includes the followings. In one aspect, the present invention refers to the use of lactic acid bacteria in the manufacture of an agent for increasing production of retinoic acid in a mammal for preventing, treating or ameliorating allergic symptoms, wherein the lactic acid bacteria are *Lactobacillus delbrueckii* subsp. *bulgaricus*. In another aspect, the present invention refers to the use of lactic acid bacteria in the manufacture of an agent for increasing production of retinoic acid in a mammal to whiten skin as a preventive or therapeutic treatment of skin conditions such as stains, wherein the lactic acid bacteria are *Lactobacillus delbrueckii* subsp.

*bulgaricus*. In still another aspect, the present invention refers to a cosmetic method of increasing production of retinoic acid in a mammal to whiten skin, comprising parenteral administration of an agent for increasing production of retinoic acid comprising lactic acid bacteria to skin, wherein the lactic acid bacteria are *Lactobacillus delbrueckii* subsp. *bulgaricus*. Also, described herein is the following:

[1] An agent for producing retinoic acid comprising, as an active ingredient, lactic acid bacteria. [2] The agent for producing retinoic acid according to [1], wherein the lactic acid bacteria are the genus *Lactobacillus* bacteria.

Claims

1. Use of lactic acid bacteria in the manufacture of an agent for increasing production of retinoic acid in a mammal for preventing, treating or ameliorating allergic symptoms, wherein the lactic acid bacteria are *Lactobacillus delbrueckii* subsp. *bulgaricus*.

2. Use of lactic acid bacteria in the manufacture of an agent for increasing production of retinoic acid in a mammal to whiten skin as a preventive or therapeutic treatment of skin conditions such as stains, wherein the lactic acid bacteria are *Lactobacillus delbrueckii* subsp. *bulgaricus*.

3. The use according to claim 1 or 2, wherein the lactic acid bacteria are of *Lactobacillus delbrueckii* subsp. *bulgaricus* strain OLL1073R-1 (Accession Number FERM BP-10741).

4. The use according to any one of claims 1 to 3, wherein the lactic acid bacteria are present at 100,000,000 or more cells per unit package.

5. A cosmetic method of increasing production of retinoic acid in a mammal to whiten skin, comprising parenteral administration of an agent for increasing production of retinoic acid comprising lactic acid bacteria to skin, wherein the lactic acid bacteria are *Lactobacillus delbrueckii* subsp. *bulgaricus*.

6. The cosmetic method according to claim 5, wherein the lactic acid bacteria are of *Lactobacillus delbrueckii* subsp. *bulgaricus* strain OLL1073R-1 (Accession Number FERM BP-10741).

7. The cosmetic method according to claim 5 or 6, wherein the lactic acid bacteria are present at 100,000,000 or more cells per unit package in the agent for increasing production of retinoic acid.