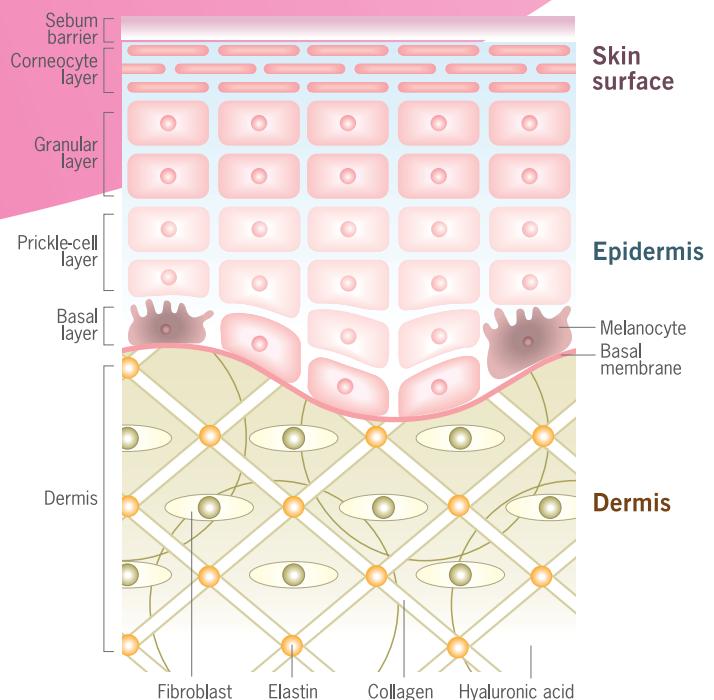


Astaxanthin and Skin Health

- Enhance your skin beauty with astaxanthin.
- Improve skin smoothness and oil control.
- Treat and control age spots.
- Reduce wrinkles and protect skin cells from within.

Human skin is mainly composed of epidermis and dermis which form the largest organ in a body. In addition to the function of protecting the body from environmental changes, human skin also has multiple esthetic values. Aging causes the skin to lose its suppleness and elasticity; however, UV-induced radical oxygen is more harmful to the skin because it accelerates the aging process. Astaxanthin can inhibit the activity of radical oxygen with its potent antioxidative power by acting rapidly against it on the skin surface, epidermis and dermis, thus maintaining healthy and beautiful skin.



Astaxanthin Inhibits Melanogenesis

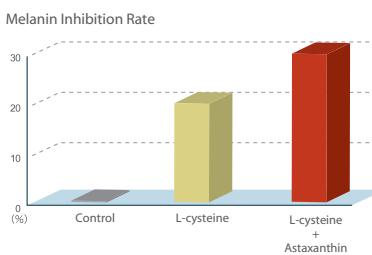
Astaxanthin inhibited melanogenesis in cultured human epidermis models.



<Study Method>
Astaxanthin's inhibition of melanogenesis in cultured human epidermis models was measured.¹

Astaxanthin Inhibits Melanin Production - 1

Astaxanthin and L-cysteine's inhibition of melanin production was evaluated in a cultured human epidermis model.¹ *by Labcyte MELANO-MODEL (Japan Tissue Engineering Co., Ltd.)

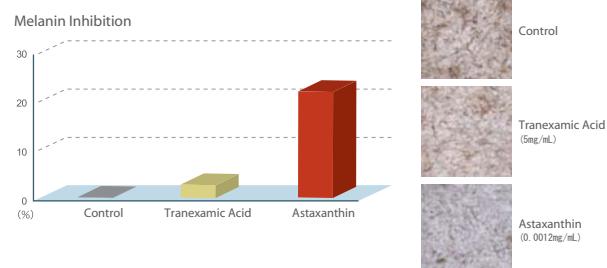


Combined use of astaxanthin and an agent acting independently of astaxanthin (e.g. L-cysteine) inhibited melanin production more strongly than single application of the agent did.

Astaxanthin Inhibits Melanin Production - 2

A cultured human epidermis model* was transiently treated with astaxanthin or tranexamic acid in advance of the study. Inhibition of melanin production was evaluated in the models exclusive of extracellular astaxanthin or tranexamic acid.

* by Labcyte MELANO-MODEL (Japan Tissue Engineering Co., Ltd.)



Age Spot Treatment

The age spot area visibly reduced after 8 weeks treatment.

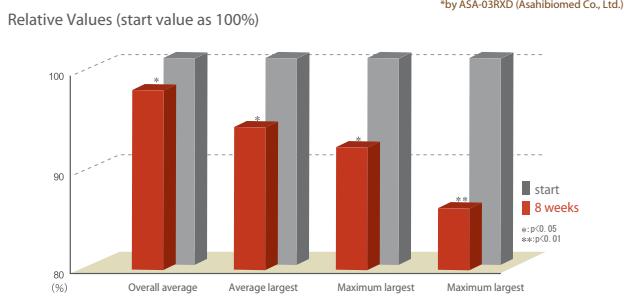


<Study Method>

29 healthy female subjects took 6mg of astaxanthin supplement and applied astaxanthin topical product for 8 weeks. Comparison of age spots between 0 and 8 weeks were determined by image analysis.¹

Astaxanthin Repairs Wrinkles (By Analysis Methods with Replicas)

Wrinkle topography of the subject's crow's feet was evaluated with replica by image analysis* before and after the treatment.



Study showed that astaxanthin worked effectively in wrinkle analysis parameters.¹

Astaxanthin Cell Protection

Astaxanthin protected fibroblasts from damage by singlet oxygen.

Cell viability



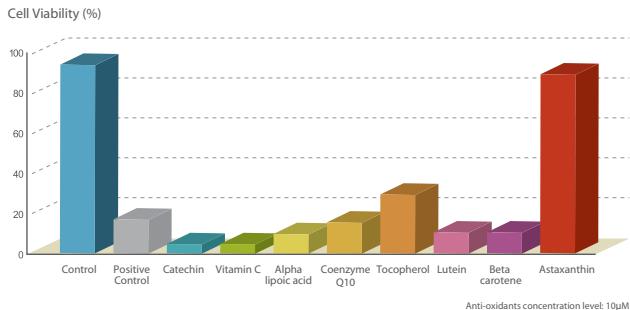
<Study Method>

Human fibroblasts were pre-incubated with astaxanthin and then exposed to singlet oxygen. Protection was evaluated by cell viability by MTT method.²

*Fibroblasts: Cells that constitute dermis and produce collagen and hyaluronic acid.

Cell Protection Comparison with Other Anti-oxidants

Astaxanthin's cell protection ability was compared with other anti-oxidants.



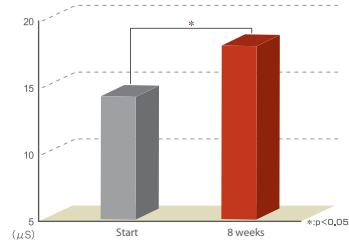
Study showed that astaxanthin had the highest ability to protect cells.²

Improvement of Corneum Water Volume

10 female subjects with dry skin took 6mg of astaxanthin supplement and applied astaxanthin topical product (manufactured by Fuji Chemical) for 8 weeks. Corneum water volume in the subjects' cheek was evaluated* before and after the study.

*by ASA-M2 (Asahibiomed Co., Ltd)

Corneum Water Volume



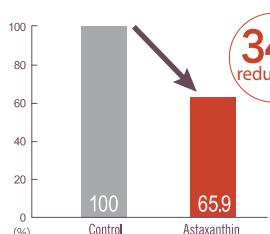
Study showed that astaxanthin improved corneum water volume of dry skin.

Study conducted by Fuji Chemical Industry Co., Ltd.

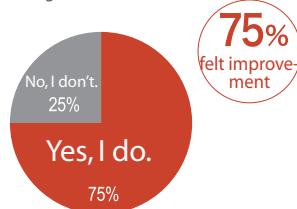
Improvement of Oil Control

Astaxanthin reduced the sebum secretion on the skin surface.

Sebum oil reference value after 6 weeks



Do you feel better about your skin oil balance after taking astaxanthin?



<Study Method>

37 healthy male subjects were divided into two groups: (1) 6mg of astaxanthin supplement and astaxanthin topical product (manufactured by Fuji Chemical) and (2) control group. Each group took supplement and the topical product for 6 weeks. Sebum secretion on the subject's nasal zone was evaluated before and after the study. A questionnaire survey was conducted simultaneously.

Study conducted by Fuji Chemical Industry Co., Ltd.

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A Subsidiary of Fuji Chemical Industry Co., Ltd.

3 Terri Lane, Unit 12
Burlington, NJ 08016
Tel: 609-386-3030 Fax: 609-386-3033
www.fujihealthscience.com contact@fujihealthscience.com