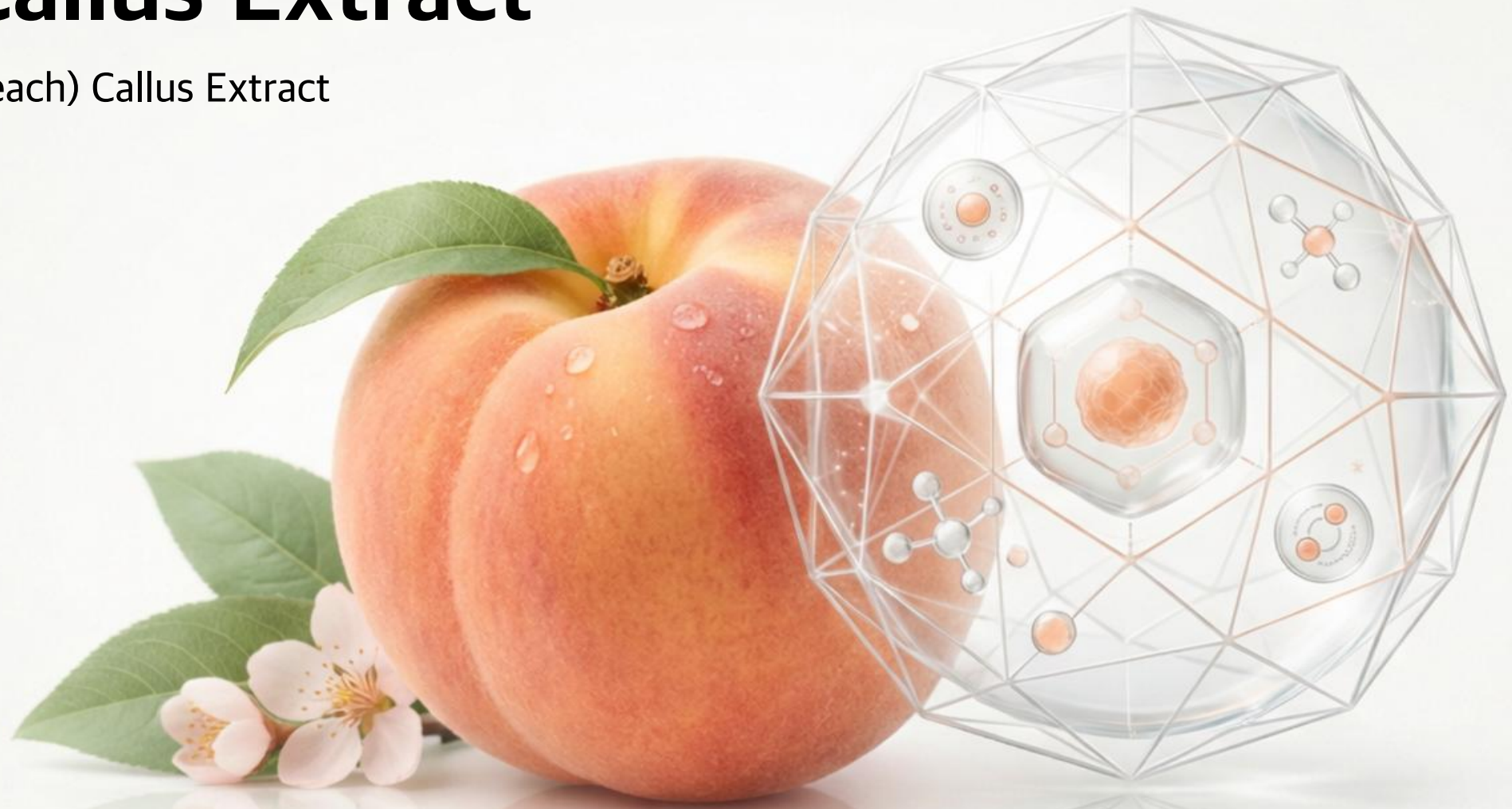
Peach Callus Extract

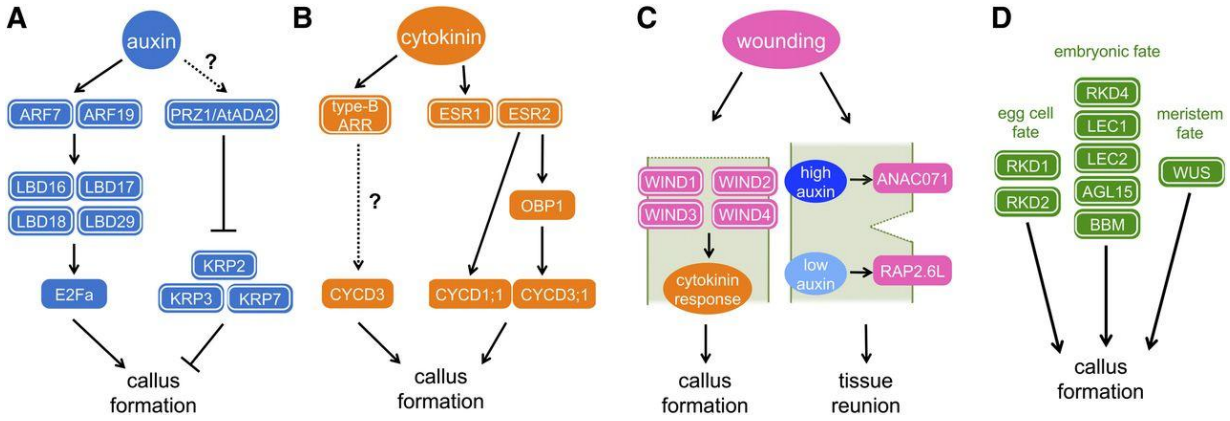
Prunus Persica (Peach) Callus Extract



Plant Callus

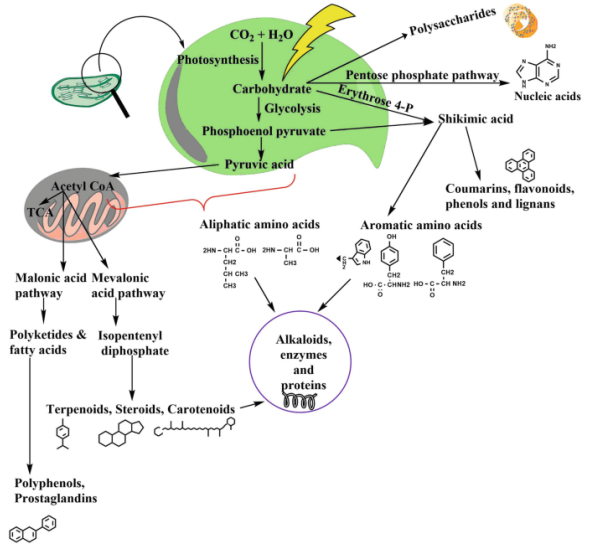
- Callus refers to an undifferentiated mass of plant cells induced through plant cell culture technology.
- Depending on the plant species, callus cells may develop unique shapes and colors, and can proliferate into clusters consisting of tens to millions of cells.
- Plant callus is characterized by totipotency, the ability of a single cell to regenerate into a complete plant, and cell plasticity, which allows cells to differentiate into various cell types.

Mechanism of Callus Formation



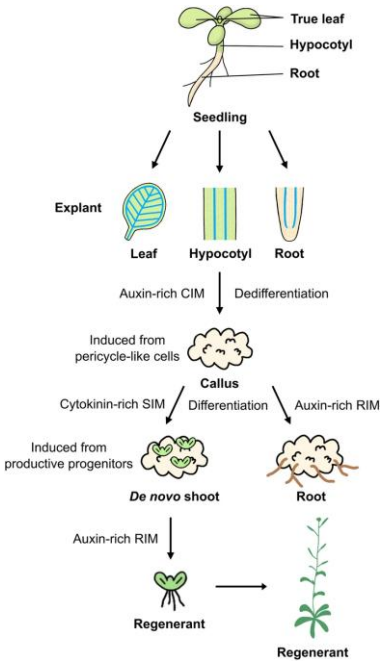
Ref. Momoko Ikeuchi, Keiko Sugimoto, Akira Iwase, Plant Callus: Mechanisms of Induction and Repression, The Plant Cell, Volume 25, Issue 9, September 2013, Pages 3159–3173,

Bioactive Compounds Derived from Plant Callus



Lakshmaiah et al., 2022, Nutraceuticals Production from Plant Cell Factory

Totipotency of Plant Callus



Ref. Adapted from Lakshmaiah et al., 2022

Peach, a Fruit Defense System Against Oxidative Stress

Peach has long been valued as a symbol of health and vitality. In East Asian culture, it has been associated with longevity, protection, and renewal, and is recognized as a fruit rich in nutrients and plant-derived antioxidants. To protect itself while growing under strong sunlight and changing environmental conditions, peach accumulates a variety of antioxidant compounds such as polyphenols and flavonoids. These compounds help defend tissues against reactive oxygen species (ROS) and support the healthy maturation of the fruit.

Skin Environment and Oxidative Stress

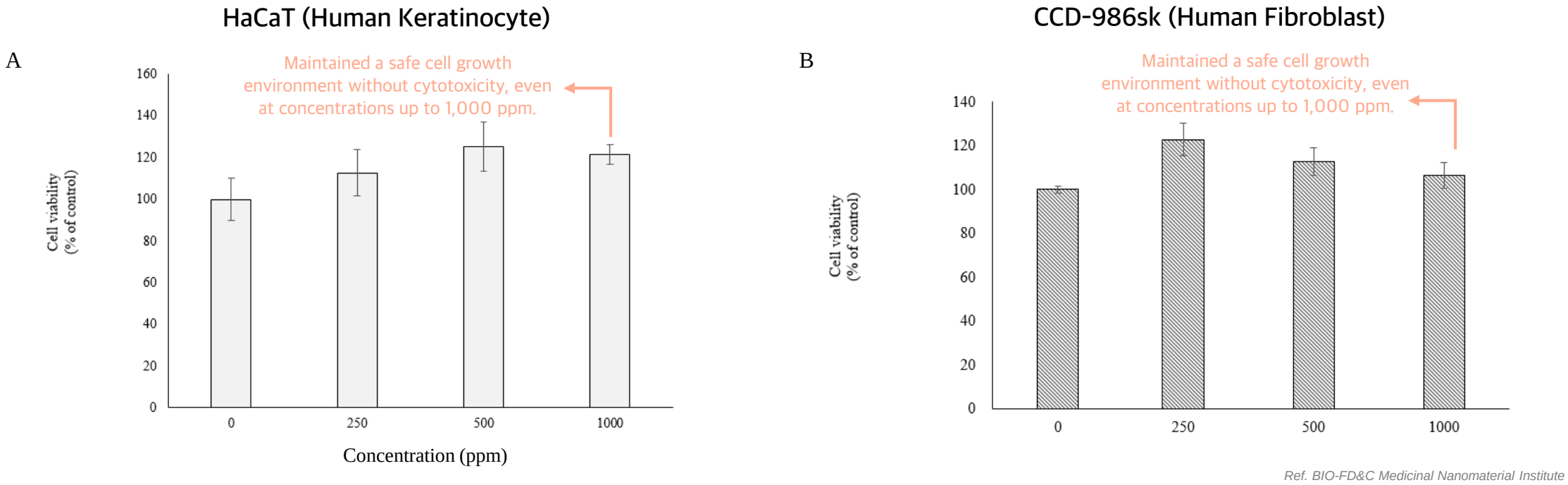
Skin is also exposed daily to UV radiation, environmental pollutants, and external stressors. During this process, reactive oxygen species (ROS) can increase, potentially disturbing skin balance. For this reason, antioxidant care is considered an important factor in modern skincare for maintaining a stable skin environment.

Peach Callus Extract: Inspired by the Plant's Antioxidant Defense Mechanism

Peach Callus Extract is a plant cell-derived ingredient inspired by the environmental stress response capacity and antioxidant defense mechanism of peach plant cells. Based on these characteristics, Peach Callus Extract presents an antioxidant-focused skincare concept for helping maintain a balanced skin environment.

- A stable ingredient produced through plant cell culture technology
- Contains peach-derived antioxidant components
- Helps maintain skin condition by supporting protection against oxidative stress
- Contributes to creating a protective skin environment against external aggressors

Cell Viability Test in Human Skin Cells



Ref. BIO-FD&C Medicinal Nanomaterial Institute

Fig 1. Effect of Prunus Persica (Peach) Callus Extract on cell viability. A: Cell viability of human keratinocyte(HaCaT), B: Cell viability of Human Dermal Fibroblast(CCD-986sk)

Peach Callus Extract showed no cytotoxicity and maintained **stable cell viability** at all tested concentrations in both **HaCaT (human keratinocytes)** and **CCD-986sk (human fibroblasts)**. Compared with the control group, cell proliferation was observed at all concentrations, indicating its **positive potential for supporting skin cell activity and improving skin health**.

Scalp & Hair Care Application Potential - HFDPC Cell Viability Test

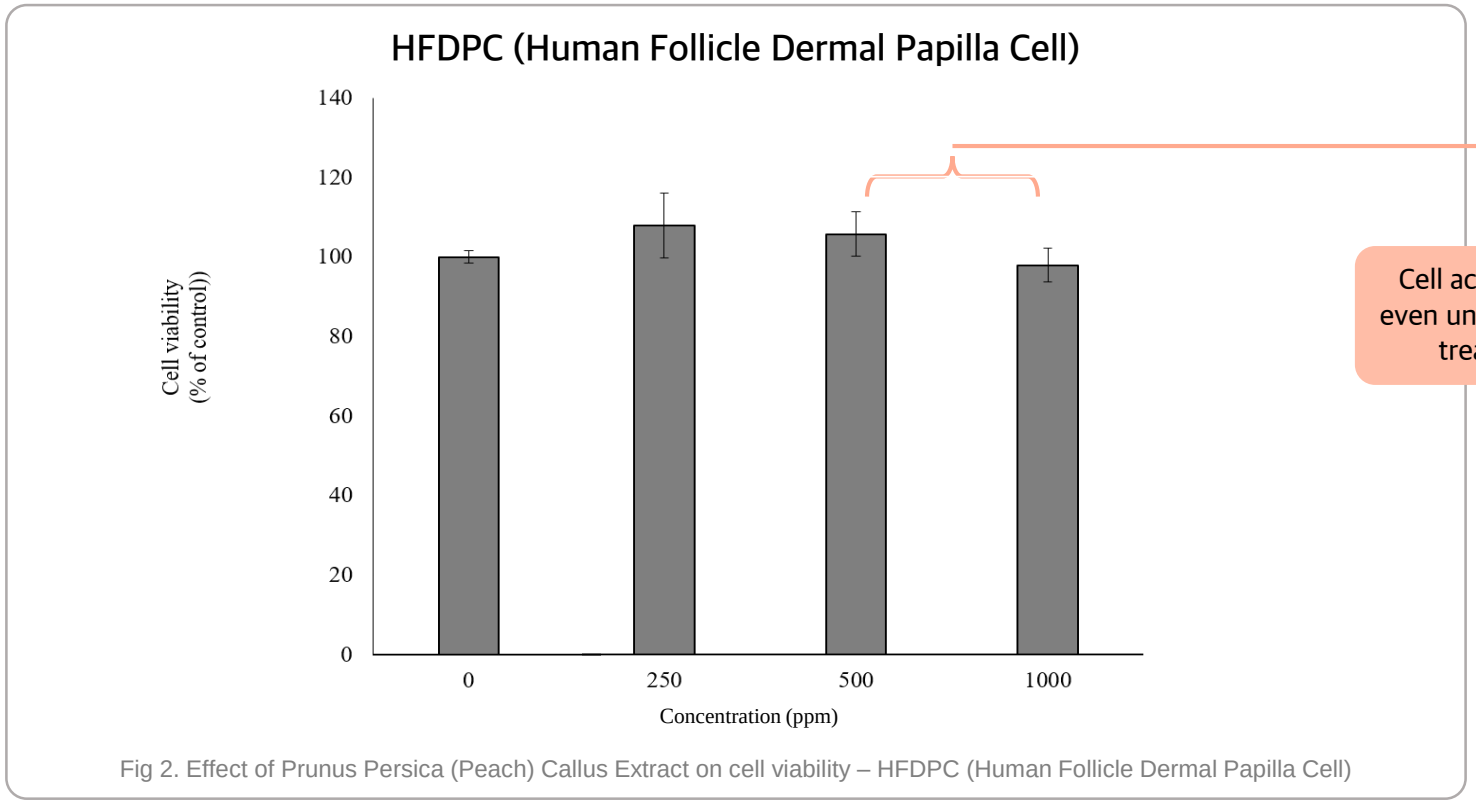
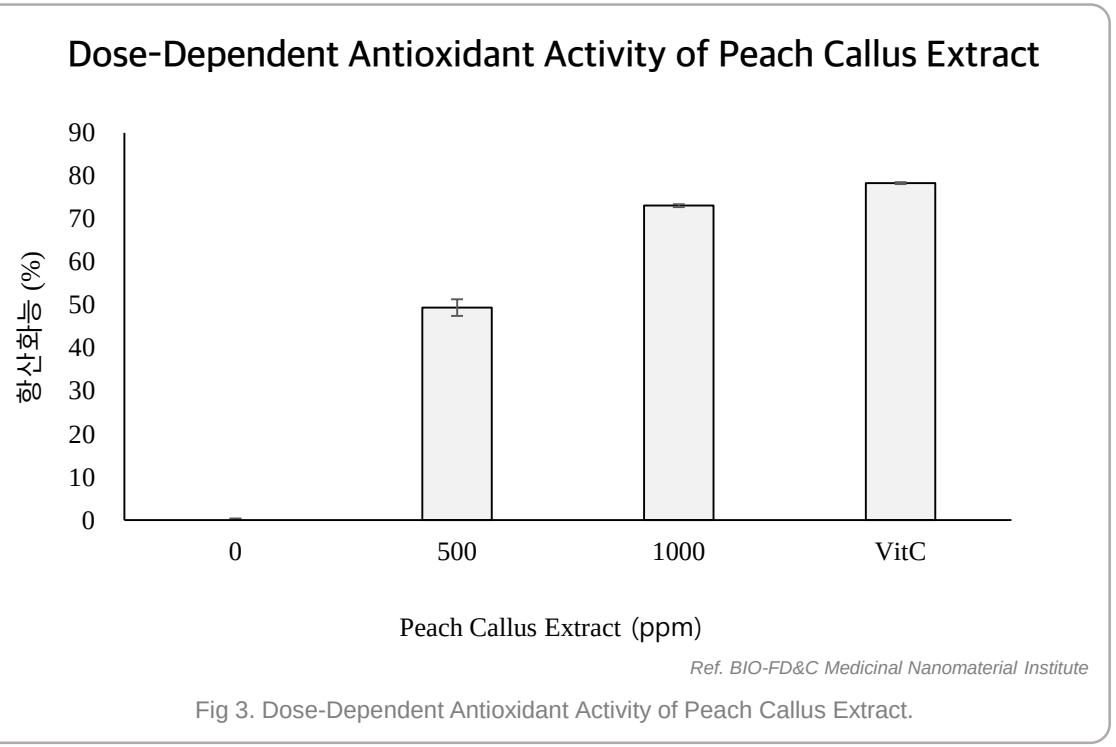


Fig 2. Effect of Prunus Persica (Peach) Callus Extract on cell viability – HFDPC (Human Follicle Dermal Papilla Cell)

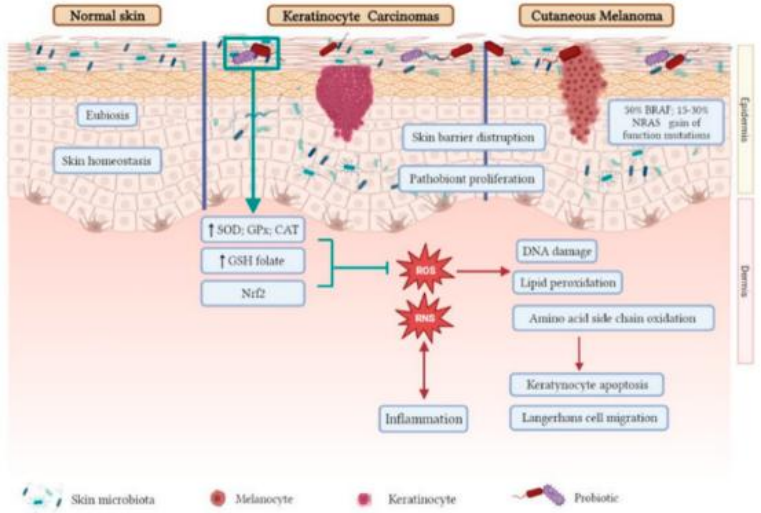
Peach Callus Extract maintained **stable cell viability** without cytotoxicity at all tested concentrations in **HFDPC (human follicle dermal papilla cells)**. In addition, cell proliferation was observed at all concentrations compared with the control group, suggesting its **positive potential for supporting hair follicle cell activity**.

ABTS Assay - Verification of Potent Antioxidant Activity



Ref. BIO-FD&C Medicinal Nanomaterial Institute

Fig 3. Dose-Dependent Antioxidant Activity of Peach Callus Extract.



[Oxidative stress on skin]

ROS are reactive species generated through UV exposure and normal metabolic processes such as respiration. They induce oxidative stress in skin cells, causing damage to cells and tissues and serving as a major factor in skin aging symptoms such as wrinkles, loss of elasticity, and hyperpigmentation.

Peach Callus Extract showed a tendency for **antioxidant activity to increase significantly** in a dose-dependent manner. In addition, **it demonstrated an antioxidant effect comparable to vitamin C**, confirming its potential as an excellent natural antioxidant ingredient.

Distinctive Features of BIO-FD&C Plant Cells

Sustainable Ingredient

Non-GMO Ingredient

Aseptic Production System

Activation of Bioactive Components

- BIO-FD&C's plant cell technology enables reproducible production of plant materials, making it sustainable with a low environmental burden.
- BIO-FD&C's plant cell technology does not use GMO plants during the cultivation process.
- BIO-FD&C plant cells are cultured in a controlled sterile environment, ensuring safety from contamination or infection caused by external factors.
- BIO-FD&C plant cells utilize proprietary in-house R&D technology, resulting in a high expression level of bioactive compounds.

BIO-FD&C Plant Cell Manufacturing Process

Seed Germination

After selecting the target plant, the seeds are germinated on a culture plate.

Plant Callus Induction

Using appropriate cultivation technology, callus is induced from the germinated seeds.

Solid Culture (Plate)

The induced callus is cultured and grown under solid culture conditions.

Suspension Culture (Bioreactor)

Once sufficient growth is achieved, the callus is transferred to a bioreactor for large-scale mass culture.

Harvesting & Freeze-Drying

The mass-cultured callus is harvested and then freeze-dried.

Extraction / Formulation

Only the active components are extracted and formulated according to customer specifications.

Quality Control / Shipment

After quality inspection, the final product is released for shipment.

Summary

Trade Name	Peach Callus Extract
INCI Name	Prunus Persica (Peach) Callus Extract
Source	Prunus Persica (Peach) Callus
Product type	Solution
Effect	Anti-Oxidant
Storage	Keep it in a cool temperature (4℃ ~ 15℃) and avoid direct sunlight.

- Peach Callus Extract is a plant callus-based ingredient inspired by the peach-derived antioxidant system. It may help protect the skin from ROS and contribute to maintaining a stable skin environment.
- Experimental results showed that Peach Callus Extract exhibited overall high cell viability in HaCaT, CCD-986sk, and HFDPC cells without cytotoxicity, indicating its suitability as a safe cosmetic ingredient.
- In particular, increased cellular activity was observed within certain concentration ranges, suggesting its potential to support the functions of skin and hair follicle-related cells.
- In the ABTS assay, Peach Callus Extract demonstrated antioxidant activity comparable to vitamin C, supporting its potential application in both skincare and scalp & hair care formulations.

BIO-FD&C provides bio-based ingredients through a research-driven approach and development grounded in scientific evidence.
The efficacy and safety of our ingredients are validated by scientific data and managed under consistent standards throughout the entire process, from planning and research to manufacturing and quality control.
Based on the latest research and validated data on skin and human application technologies, we continue to strengthen our technological competitiveness.
With accumulated expertise and a responsible research system, we strive to be a reliable partner our customers can trust.

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