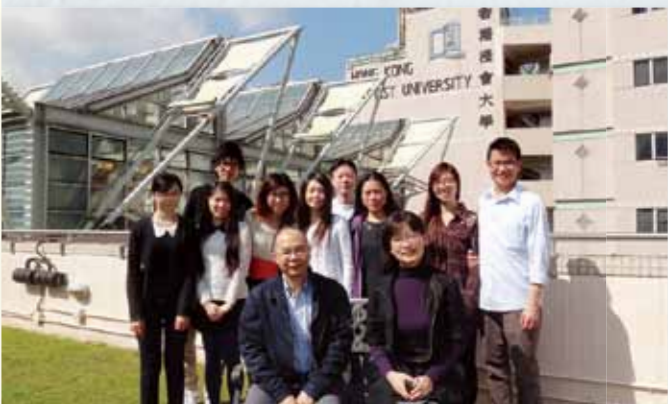


# Ginseng Keeps Skin Healthy

Ginseng is one of the most famous Chinese medicines; it has been widely used as health tonic or medicine to improve immunity and bodily condition. Historically, the medical use of ginseng was recorded about 3,500 years ago in “Shennong Ben Cao Jing”, which mentioned that long-term consumption of ginseng can promote longevity. No doubt, for most people, ginseng is a longevity elixir, but how and why ginseng exerts its effect is still an interesting quest of modern science.

Using the state-of-the-art technology, our laboratory tries to elucidate the fundamental pharmacology of this precious Chinese medicine. One of the basic questions we have recently addressed is the effect of ginseng on collagen expression.

Collagen is a protein of the connective tissue and the major supporting material of skin. It acts like the steel bars in concrete to support the firmness of skin. With aging, the collagen expression will decrease, and then result in progressive development of skin wrinkles. Everyone knows intake of ginseng can reduce the sign of aging, but we are not satisfied with our preliminary understanding of ginseng. We tried to unlock the molecular mechanism of it. Current research on ginseng shows that ginsenosides are the active components of it. Ginsenosides are steroid-like compounds which can be found all over the plant, but the function of individual ginsenoside can be either counteracting or synergistic; since different types of ginseng consist various compositions of ginsenosides, thus their application or usage should be different as well.



Prof. Ricky Wong (first row, first from left) and his research team members



Human dermal fibroblast cell culture

Our recent study found that, one of the most abundant ginsenosides Rb1 is a potent collagen inducer. We cultured human dermal fibroblasts (a major cell type in skin for production of collagen), and explored the inducing mechanism of Rb1 on collagen synthesis. Our previous studies revealed that ginsenosides can act through nuclear receptors, which are the important transcriptional factors mediating the functions of different hormones like estrogen, androgen or vitamin D. Here we demonstrated that ginsenoside Rb1 induces collagen expression in dermal fibroblast through activation of peroxisome proliferator-activated receptor-delta, another type of the nuclear receptors. Furthermore, upon binding, the Rb1-activated receptor not just increases the transcription activity, but also modulates the collagen expression at post-transcriptional level by affecting microRNAs level. MicroRNAs are non-coding RNAs which are important post-transcriptional regulators controlling the expression of about 60% of the genes in human. Collectively, ginsenoside Rb1 can increase target gene expression through classical transcriptional pathway, at the same time, regulate the corresponding microRNA expression to further enhance the protein expression. The results from our group can be interpreted to provide supporting evidence that ginseng indeed has the ingredients for use as cosmetic agent to improve skin condition. Our group hopes to use ginseng as an example to deepen our understanding on the pharmacological effect of Chinese medicine.

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