SYNERGIE SKIN
CLEAN SCIENCE

CLINICAL DATA – DIPOTASSIUM GLYCERRHIZINATE

Pure Derivatives of Glycyrrhiza for Cosmetics:

Mechanism of Inflammation:

- Topical inflammation occurs when cells are injured by factors such as the following:
  - Environment (the drying wind, the scorching sun, etc.)
  - Hypersensitivity to certain compounds
  - Application of harsh chemicals to the skin such as deodorants or permanent wave solutions.
- The injured cells release chemicals that attract white blood cells to phagocytize the irritants such as prostaglandin E_2.
- Prostaglandin E_2 is produced from the cyclooxygenase pathway of a complex set of chemical reactions collectively called the arachidonic acid cascade.
- The arachidonic acid cascade is responsible for producing many inflammatory mediators as well as compounds that cause allergic and hypersensitivity reactions through the 5-lypoxigenase pathway.

Prostaglanin E_2 inhibition:

- Glycyrrhizin inhibits prostaglandin E_2 production.
- By incubating activated macrophages with glycyrrhizin, which produce prostaglandins E_2 though the same chemical pathways as skin cells do, there is a decrease in prostaglandin E_2 production.
- Prostaglandin E_2 production is further inhibited the longer the glycyrrhizin is incubated with the activated macrophages.
- The longer the application of liquorice products, the more anti-inflammatory activity it exerts.

Anti-Allergic and Hypersensitivity effects:

- Topical allergic and hypersensitivity reactions caused by the arachidonic acid cascade are also inhibited by liquorice products.
- Glycyrrhizin decreases vascular permeability by estimating the leakage of dye from a passive anaphylactic reaction in rat conjunctiva.
- Allergic conjunctivitis is mediated by causing an anaphylactic (hypersensitivity) reaction in the eye, thereby, increasing vascular permeability and causing dye leakage.
- Comparing the inhibitory effects of glycyrrhizin to l-epinephrine bitartrate, and dexamethasone, shows that glycyrrhizin has a definite effect in inhibiting allergic reactions yet has subtle effects compared to a prescription drug such as dexamethasone.
- Based on similar studies various eye drop products have been developed containing glycyrrhizin to soothe irritated eyes.
- Glycyrrhizin can also be formulated in eye products such as eye shadows, mascara, and eye make-up removers to reduce the hypersensitivity they sometimes cause.

Phospholipase A_2 inhibition:

- The direct inhibition of phospholipase A_2, which is responsible for initiating the arachidonic acid cascade and producing inflammatory mediators and products causing allergic and hypersensitive reactions, is one of the anti-inflammatory pathways by which glycyrrhizin exerts its activity.
- Inhibiting arachidonic acid release prevents it from being a substrate for either the cyclooxygenase enzyme (pathway which produces inflammation mediators) or the 5-lypoxygenase enzyme (pathway produces compounds that cause allergy and hypersensitivity reactions).
- By measuring the effect of glycyrrhizin on the phospholipase A_2 activity mimicking a cell membrane with an artificial unilammellar liposome containing carboxyfluroescin (CF) (the greater the CF release, the greater the phospholipase A_2 activity), glycyrrhizin was found to inhibit phospholipase A_2 activity.

Hydrocortisone Potentiation:

- Liquorice products exert anti-inflammatory activity by indirectly inhibiting phospholipase A2 by potentiating glucocorticoids such as hydrocortisone.
- Glycyrrhetinic acid is a potent inhibitor of the enzyme 11 beta-hydroxysteroid dehydrogenase (OHSD) which metabolizes the active hydrocortisone to inactive cortisone.
- By inhibiting the OHSD found in skin, glycyrrhetinic acid increases the half-life of hydrocortisone to cause an anti-inflammatory action.

Dipotassium Glycerrhizinate

- A potent calming agent that has powerful anti-inflammatory and absorption properties.
- Improves skin tone and visibly reduces the appearance of skin discolouration.
- Helps to hydrate, cool, calm and reduce the appearance of redness in flushed or stressed skin, and is very effective in improving dry and sensitive skin.
- Sebum regulating properties inhibit excessive release of skin lipids through the sebaceous gland.