http://www.cossma.com
http://www.cossma.com/subscription
http://www.cossma.com/tv

Background: Relief for Sensitive Skin

The skin inflammation process

During skin inflammation specific types of sensory neurons release peptides and neurotransmitters that act on target cells, so liberating several substances such as cytokines, leading to further inflammation. Proteinase Activated Receptor 2 (PAR-2) participates in releasing some cytokines such as Interleukin-6 (IL-6) and IL-8, and is also involved in the delay of the barrier function recovery.

PAR-2 is expressed in keratinocytes of the skin, afferent neurons, and inflammatory cells among others, and can be activated by enzymatic and non-enzymatic compounds. Proteases from plants, mites, or human inflammatory cells, e.g., mast cell tryptase, can activate PAR-2. When triggered in nociceptive neurons it increases their excitability and may sensitise their responses to agonists of other receptors involved in inflammatory processes, such as the Transient Receptor Potential Vanilloid-1 (TRPV1).

TRPV1 is a non-selective, plasma-membrane cationic and heat-sensitive ion-channel that mediates responses to stimuli, including heat, protons, and chemical irritants, such as capsaicin, which causes burning, pain or pruritus. When it is over-activated it can stimulate neurogenic inflammation by releasing neuropeptides in the periphery such as Calcitonin Gene-Related Peptide (CGRP) and Substance P (SP), leading to neurogenic inflammation. These neuropeptides also interact with many non-neuronal cells, including endothelial cells, keratinocytes, mast cells, immune cells, and arterioles, which contribute additional inflammatory elements such as the cytokines Interleukin-6 (IL-6) and IL-8.

CGRP also promotes the release of SP that in turn stimulates the release of proteases, activating PAR-2 and exacerbating the neurogenic inflammation. SP and CGRP are also further released due to UV radiation.

In addition PAR-2 activation delays barrier recovery and inhibits secretion of lamellar bodies Moreover, serine proteases degrade the key lipid processing enzymes required for normal permeability barrier homeostasis, and acute barrier disruption raises the ambient pH of normal SC, activating serine proteases, which, in turn, activate PAR-2.