Synopsis of Original Research Paper

Secretion of skin moisture-related substances mediated by environmental sensor TRPV channels in keratinocyte

Katsuhiko Muraki

Laboratory of Cellular Pharmacology, School of Pharmacy, Aichi-Gakuin University

Recent studies demonstrate that TRPV3, TRPV4, and TRPA1 channels could be useful targets in skin health and cosmetology fields because of their highly expressions in human keratinocytes. Here we examined Ca²⁺ response of HEK293 cells transfected with wild-type TRPV4 (HEK-wTRPV4) and a novel variant of TRPV4 (HEK-vTRPV4) to TRPV4 agonists to determine molecular targets of these agonists on TRPV4. When 4α-phorbol 12,13-didecanoate, an well-known standard TRPV4 agonist, was cumulatively applied to HEK-wTRPV4 and HEK-vTRPV4, intracellular Ca²⁺ concentration was increased in both TRPV4 transfectants in a similar manner. In contrast, a novel and potent TRPV4 agonist, GSK, induced a small Ca²⁺ response in HEK-vTRPV4, while highly effective on HEK-wTRPV4. Moreover, activation of TRPV4 potentiated cell-proliferation, hence suggesting that amino acids mutated in vTRPV4 are putative binding sites of GSK and the activation of TRPV4 by its potent agonists may change the barrier function.