Activations of $TRPV_1$ promote cellular proliferation and migration in esophageal squamous cell carcinoma (ESCC)

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Abstract $TRPV_1$ is a member of the transient receptor potential family of non-selective cation channels, which could be activated by noxious thermal stimuli (>43°C), protons, and the alkaloid irritant capsaicin. In the human body, $TRPV_1$ act as noxious heat sensor, play roles in pain management, osmosensing in the brain. It was also involved in various pathophysiological processing such as inflammation, immunity nociception, thermal hyperalgesia, gastrointestinitis and tumorigenesis. In the present study, we found $TRPV_1$ was expressed in ESCC cell lines and immortalized esophageal epithelial cells at both mRNA and protein levels, and its electrophysiological activities were confirmed by patch clamp and calcium image experiments. CCK-8 and wound healing assay were carried out to investigate the role of $TRPV_1$ in the progression of ESCC. $TRPV_1$ was activated by capsaicine and heat (43°C), the activation of $TRPV_1$ by capsaicine (1~ 55μM) could promote cellular proliferation and migration in Eca109 and TE-1 cell lines ($P<0.01$) while higher concentration of capsaicine induced apoptosis in these cell lines. The TRPV1 antagonist AMG9810 inhibited cellular proliferation, migration and apoptosis. Taken together, activation of TRPV1 enhanced the carcinogenesis of the ESCC and it maybe the potential target for the remedy of ESCC.