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Capsaicin-induced apoptosis in H-ras MCF10A cells involves activation of MAPkinases

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Capsaicin (8-methyl-N-vanillyl-6-nonenamide), the principal pugent ingredient found in hot red pepper, has been recently known to have anticarcinogenic or chemopreventive properties. In the previous study, we showed that capsaicin selectively induces apoptosis in H-ras MCF10A cells. In the present study, we provide evidence that the molecular mechanism of capsain-induced apoptosis involves activation of stress-activated protein kinase/c-Jun N-terminal kinase (SAPK/JNK) and inhibition of active extracellular signal-regulated protein kinase (ERKs). Treatment with capsaicin in H-ras MCF10A cell markedly activated JNK-1 and reduced the revel of active ERKs, whereas in the parental MCF10A cell were not responsive to the same concentration of capsaicin. Inhibition of JNK-1 either by DN JNK-1 transfection or treatment with CPT-cAMP, a JNK inhibitor, reduced the capsaicin-induced growth inhibition, implying that JNK activity may be critical for the effect of capsaicin in H-ras MCF10A cells. Capsaicin-induced growth inhibition were also inhibited by SB203580, a specific p38 inhibitor, suggesting a potential role of p38 in capsaicin-induced growth inhibition. Involvement of Racl will also be presented.