

Abstract

A biological role of G2A in human keratinocytes as a receptor for oxidized free fatty acids

Tomoyasu Hattori, Hideru Obinata, Ai Ogawa, and Takashi Izumi Department of Molecular Biochemistry, Gunma University Graduate School of Medicine, Maebashi, Gunma, Japan, 371-8511

G2A is a G protein-coupled receptor that can be induced by diverse stimuli in B cells. Recently, we reported that G2A is a receptor for oxidized free fatty acids such as 9-hydroxyoctadecadienoic acid (9-HODE) and 11-hydroxyeicosatetraenoic acid (11-HETE). Oxidized free fatty acids can be produced by many kinds of oxidative stresses. As skin is continuously exposed to oxidative stresses such as ultraviolet irradiation and microorganism infections, G2A might have some roles in mediating signals of oxidized free fatty acids in skin. Thus, we examined the effects of 9(*S*)-HODE on human keratinocytes and the involvement of G2A. G2A mRNA was expressed in normal human epidermal keratinocytes (NHEK) and an immortalized human keratinocyte cell line (HaCaT), and was upregulated by ultraviolet B irradiation. 9(*S*)-HODE evoked intracellular calcium mobilization in NHEK cells, and the response was enhanced by transient overexpression of G2A. 9(*S*)-HODE inhibited the proliferation of NHEK cells, which was caused by suppression of DNA synthesis and cell cycle arrest in the G0/1-phase, but not by apoptosis. Further, 9(*S*)-HODE evoked secretion of cytokines such as interleukin 6, interleukin 8, and GM-CSF in NHEK cells. These results suggest that G2A has a biological role as a receptor for oxidized free fatty acids in skin under oxidative pathological conditions.