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The effect of cannabinoid receptor agonists on breast cancer and its interaction with bone cells

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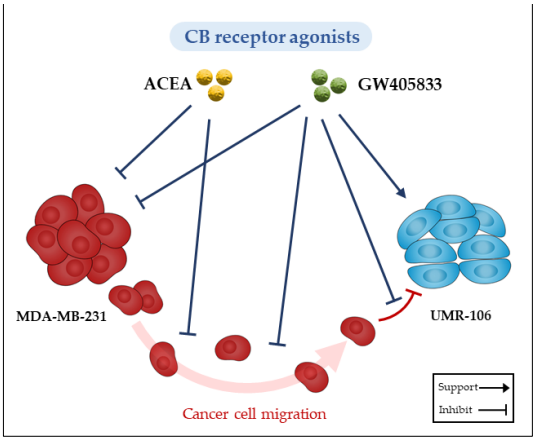
Abstract: Bone metastasis is a serious problem worldwide especially in advanced breast cancer patients. Unfortunately, the effective treatment for cancer bone metastasis is limited. Cannabinoids (CBs) are compounds that have been shown to possess diverse advantages in medical treatment including cancers. Therefore, this research aims to investigate the role of CBs on breast cancer and cancer and bone interaction by using CB receptor agonists including Arachidonyl-2′-chloroethylamide hydrate (ACEA) and GW405833 which are specific for CB1 and CB2 receptor, respectively. The results from cell viability assay revealed that both CB agonists suppressed MDA-MB-231 cell viability in a concentration dependent manner. Interestingly, ACEA and GW405833 also suppressed MDA-MB-231 cell migration at 24 hours after treatment. For the interaction between MDA-MB-231 and UMR-106, our results demonstrated that UMR-106 cell viability decreased by 25.7% when culturing with MDA-MB-231-derived conditioned media. Nevertheless, the pretreatment of GW405833 on MDA-MB-231 significantly improved UMR-106 cell viability by 18.5%. The activation of CB receptor function in breast cancer not only inhibited cancer cell survival and migration ability, but it also reduced the cytotoxic effect from breast cancer cells on bone cells. Therefore, this study provided a crucial information for the application of CB agonists as novel therapeutic agents for breast cancer bone metastasis.

Graphical abstract:



Keywords: Cannabinoids, CB receptor agonists, Triple-negative breast cancer, Osteoblast, Bone metastases

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