Annonaceous Acetogenins Promote Cell Death in Cancer cells by Targeting both Na+/K+ ATPase and SERCA ATPase Pumps


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The leaves of Annona muricata, commonly known as Graviola, are known to be rich in flavonoids as well as annonaceous acetogenins. Graviola extracts have previously been shown to have anti-cancer activity. The precise target of action for these plant-base anti-cancer agents is unclear. Recently, using an in silico approach, we showed that the active agent acetogenins of Graviola is a novel target for inhibiting Na+/K+ ATPase and SERCA ATPase Pumps. In the present study we demonstrate that that acetogenins are able to promote cell death in a variety of cancer cell lines but not in non-transformed cells. Moreover, specific inhibitors to Na+/K+ ATPase and SERCA ATPase Pumps were shown to induce cell death in cancer cells but had little toxic effect on normal cells. Finally, using an in vivo xenograft model, Graviola acetogenins was able to reduce the tumour size/volume. The present data indicates that acetogenins are able to promote cell death by targeting and inhibiting Na+/K+ ATPase and SERCA ATPase Pumps and therefore may be potential therapies for the treatment and prevention of cancers.