Cannabidiol (CBD) has been shown to be anti-arrhythmic (Walsh et al, 2010) and tissue sparing (Durst et al, 2007) in an in vivo rat model of coronary artery occlusion (CAO), although the receptors through which this occurs have yet to be identified.

This study was designed to investigate whether the antiarrhythmic effects of CBD are modified by co-administration with a CB1 receptor antagonist (AM251). Experimental CAO was induced by ligation of the LAD coronary artery for 30 min; in sodium pentobarbitone anaesthetised male SD rats. Experimental groups included; (i) vehicle, (ii) CBD (50 mg/kg) alone, (iii) AM251 (1 mg/kg) alone, (iv) CBD followed by AM251, and (v) AM251 followed by CBD. CBD or AM251 alone each reduced the incidence of VT and the total number of VEBs compared with the control group, as did AM251 when administered 5 min after CBD. However, in animals treated with AM251 followed by CBD, the antiarrhythmic effect was significantly more pronounced (VT, P<0.01) and (total VEBs, P<0.001) when compared with all other treatment groups. The ability of AM251 to suppress arrhythmias suggests that endocannabinoids may exert pro-arrhythmic effects via the CB1 receptor.

The preservation of anti-arrhythmic effects of both AM251 and CBD when co-administered, implies that a simple agonist/antagonist relationship at the CB1 receptor, may not be responsible for the antiarrhythmic effects of either alone. The observed synergism which persists when CB1 receptors are blocked prior to CBD administration, suggests cross-talk between CB1 and other CB receptors in the heart during ischaemia.