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The Potential of Acanthaster Plancii Fractions as Anti-Atherosclerotic Agent by Inhibiting the Expression of Proprotein Convertase Subtilisin-Kexin Type 9

Authors : Nurjannatul Naim Kamaruddin, Tengku Sifziuzl Tengku Muhammad, Aina Farahiyah Abdul Manan, Habsah Mohamad

Abstract : Atherosclerosis which leads to cardiovascular diseases such as myocardial infarction, unstable angina (ischemic heart pain), sudden cardiac death and stroke is the principal cause of death worldwide. It has been a very critical issue as current common drug treatment, statin therapy has left bad side effects like rhabdomyolysis, atrial fibrillation, liver disease, abdominal and chest pain. Interestingly, the discoveries of proprotein convertase subtilisin-kexin type 9 have paved a new way in the treatment of atherosclerosis. This serine protease is believed to involve in the regulation of LDL- uptake by LDL-receptor. Therefore, this study was conducted to evaluate the potential of Acanthaster plancii fractions to reduce the transcriptional activity of the PCSK9 promoter. In this study, the marine organism which is Acanthaster plancii has been used as the source for marine compounds in inhibiting PCSK9. The cytotoxicity activity of ten fractions from the methanol extracts of Acanthaster plancii was investigated on HepG2 cell lines using MTS assay and dual glo luciferase assay was carried out later to analyses the effects of the samples in reducing the transcriptional activity of the PCSK9 promoter. Both assays used fractions with five different concentrations, 3.13µg/mL, 6.25µg/mL, 12.5µg/mL, 25µg/mL, and 50µg/mL. MTS assay indicated that the fractions are non-cytotoxic towards HepG2 cell lines as their IC50 value is greater than 30µg/mL. Whilst, for the dual glo luciferase assay, among all the fractions, Enhance Fraction 2 (EF2) showed the best potential in reducing the transcriptional activity of the PCSK9 promoter. The results indicated that this EF2 gave the lowest PCSK9 promoter expression at low concentration which is 0.2 fold change at 6.25µg/mL. This finding suggested that further analysis should be done to validate the potential of Acanthaster plancii as the source of anti-atherosclerotic agent.

Keywords : Acanthaster plancii, atherosclerosis, luciferase assay, PCSK9
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