UJI AKTIVITAS SEDIAAN NANOPARTIKEL KITOSAN MiRNA 217 TERHADAP mRNA KRAS DAN mRNA MTDH PADA *CELL LINE HEPATOCELLULAR CARCINOMA* HEPG2

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Abstrak

Latar belakang : *Hepatocellular Carcinoma* (HCC) merupakan salah satu penyebab umum kematian terkait kanker. MTDH dan KRAS berperan penting dalam mengatur perkembangan dan ketahan HCC. Pengembangan terapi berbasis nanopartikel kitosan mikroRNA (miRNA) memberikan perspektif baru dalam pengobatan HCC, meskipun mekanisme yang mendasari belum jelas. Salah satu miRNA yang mengalami downregulasi pada HCC yaitu miRNA 217.
Tujuan : untuk mengkaji pengaruh miRNA 217 dalam sediaan nanopartikel kitosan terhadap ekspresi mRNA KRAS dan MTDH cell line Hepatocellular Carcinoma HepG2.
Metode : Formulasi kitosan berdasarkan penelitian lain dengan menggunakan perbandingan kitosan dan NaTPP sebesar 5:1. Dosis miRNA yang digunakan sebesar ¼ IC50, ½ IC50 dan 1 IC50. Mimik miR-217 yang dienkapsulasi oleh nanopartikel kitosan menggunakan metode gelasi ionik ditransfeksikan pada cell line HepG2 dan uji ekspresi miRNA 217 endogen, mRNA KRAS dan MTDH dengan menggunakan qPCR**.** Berdasarkan analisis bioinformatika menunjukkan adanya peran miRNA yang dapat meregulasi ekspresi KRAS dan MTDH.
Hasil: Transfeksi mimik miR-217 menunjukkan adanya peningkatan yang signifikan secara statistik ekspresi endogen miRNA 217 sel HepG2 dibandingan kontrol. Peningkatan ekspresi miRNA 217 tersebut berkorelasi negatif terhadap mRNA KRAS dan MTDH.
Kesimpulan: Menurut hasil tersebut, mimik miR-217 dapat menghambat proliferasi sel *Hepatocellular Carcinoma* HepG2 dengan meregulasi ekspresi KRAS dan MTDH.
Kata kunci : mimik miRNA 217, HepG2, KRAS, MTDH

Abstract

Background: *Hepatocellular Carcinoma* (HCC) is one of the most common causes of cancer-related deaths. MTDH (Metadherin) and KRAS had important role to regulate of development and survival of HCC. Development of microRNA-based chitosan nanoparticle for HCC treatment gives new perspective, however its underlying mechanism has not been known yet. One of miRNA had downregulation ini HCC is miR-217.
Purpose: to elucidate the effect of 217 miRNA in chitosan nanoparticle preparations on KRAS mRNA and MTDH cell line Hepatocellular Carcinoma HepG2 expressions.
Methode: Formulation of chitosan based other research which comparison between chitosan and NaTPP was 5:1. The dosage of miRNA 217 were ¼ IC50, ½ IC50 and 1 IC50. miR-217 expression were encapsulated by chitosan nanoparticles using ionic gelation method that was transfected on HepG2 cell line and test expression of endogenous 217 miRNA, KRAS mRNA and MTDH using qPCR**.** Based on bioinformatics analysis revealed that miRNA 217 can regulate the expression of MTDH and KRAS.
Result: The were statically significant cell viability nanoparticle chitosan copared to naked miRNA. miR-217 expression transfection showed a statistically significant increase in endogenous expression of 217 miRNA HepG2 cells compared to controls. There were a statically significant increase in expression of mRNA KRAS and MTDH compared to control, respectively. The increased expression of 217 miRNA is negatively correlated to KRAS mRNA and MTDH.
Conclusion: According to these results, miR-217 expression may inhibit the proliferation of *Hepatocellular Carcinoma* HepG2 cells by regulating KRAS and MTDH expressions.
Keywords: miRNA 217 expression, HepG2, KRAS, MTDH