

## INTISARI

Aktivitas apoptosis p27Kip1 *sense* dengan oligonukleotida phosphorotioate terhadap sel limfoma Burkitt's belum optimum karena memiliki penyerapan seluler dan waktu paruh relatif rendah pada oligonukleotida, terutama dalam terapi sistemik. Strategi yang berpotensi dikembangkan adalah memanfaatkan vektor *organically modified silica* dengan basis ampas tebu (*Saccharum officinarum* L.) yang kaya natrium silikat dan mudah ditemukan di Indonesia. Tujuan kajian literatur ini adalah untuk mengkaji potensi apoptosis p27kip1 *sense* dengan vektor ORMOSIL berbasis ampas tebu terhadap sel limfoma Burkitt's oral berdasarkan kajian literatur.

Jenis literatur adalah *narrative review*. Sumber literatur didapatkan dari database PubMed/NCBI, Cochrane, EBSCOhost, IntechOpen, dan GoogleScholar.

Apoptosis pada sel limfoma Burkitt's oral diinduksi oleh p27Kip1 *sense* melalui peningkatan ekspresi p27Kip1, penurunan ekspresi *metastatic associated protein-1*, dan peningkatan ekspresi *non-metastatic protein 23*. Efikasi terapi gen seperti p27Kip1 *sense* dapat ditingkatkan oleh *Organically modified silica* melalui peningkatan biodistribusi, peningkatan penyerapan seluler, pencegahan degradasi nuklease dan endosomal/lisosomal, serta fasilitasi *sustained-release*. Ampas tebu dapat dikembangkan sebagai basis *organically modified silica* melalui perlakuan asam dan peningkatan suhu serta waktu saat proses pemanasan. Kesimpulan kajian literatur ini adalah p27Kip1 *sense* dengan vektor ORMOSIL berbasis ampas tebu (*Saccharum officinarum* L.) berpotensi meningkatkan aktivitas apoptosis pada sel limfoma Burkitt's oral berdasarkan kajian literatur.

Kata Kunci: p27Kip1 *sense*, apoptosis, *organically modified silica* (ORMOSIL), *Saccharum officinarum* L., limfoma Burkitt's oral

## ABSTRACT

The apoptotic effect of the p27Kip1 sense with phosphorothioate oligonucleotide on Burkitt's lymphoma cells is not yet optimal because it has relatively low cellular uptake and half-life time of oligonucleotide, especially in systemic therapy. A potential strategy to increase the efficacy of the p27Kip1 sense is by utilizing sugarcane bagasse (*Saccharum officinarum* L.)-based organically modified silica (vector which is rich in sodium silicate and abundant in Indonesia). The objective of this literature review is to review the cell apoptotic potential of p27Kip1 sense with sugarcane bagasse-based ORMOSIL vector against oral Burkitt's lymphoma cells.

A narrative review was confirmed in the literature review study. Literature sources were obtained from PubMed/NCBI, Cochrane, EBSCOhost, IntechOpen, and GoogleScholar databases.

Apoptosis on oral Burkitt's lymphoma cells was induced by p27Kip1 sense through increased p27Kip1 expression, decreased expression of metastatic associated protein-1, and increased expression of non-metastatic protein 23. Efficacy of gene therapy such as p27Kip1 sense can be increased by organically modified silica through increased biodistribution, increased cellular absorption, nuclease and endosomal/lysosomal degradation prevention, as well as sustained-release facilitation. Sugarcane bagasse can be developed as a basis for organically modified silica through acid treatment as well as increased temperature and time during the heating process. The conclusion of this literature review is the p27Kip1 sense with sugarcane bagasse (*Saccharum officinarum* L.)-based organically modified silica vector has the potency to increase apoptotic activity on Burkitt's lymphoma cells based on literature review.

Keywords: p27Kip1 sense, apoptosis, organically modified silica (ORMOSIL), *Saccharum officinarum* L., oral Burkitt's lymphoma