INTISARI

SARS-CoV-2, virus penyebab pandemi COVID-19, terus berevolusi sehingga kandidat antivirus terus dipelajari. Hesperidin diketahui mampu berinteraksi dengan *spike*, ACE2, dan TMPRSS2 yang berperan dalam SARS-CoV-2 *cellular entry* secara *in silico*. Oleh karena itu, penelitian ini dilakukan untuk mengetahui potensi hesperidin sebagai kandidat antivirus SARS-CoV-2 secara *in vitro* menggunakan model *pseudovirus*.

Metode penelitian meliputi uji sitotoksik hesperidin terhadap sel 293T dengan MTT, transfeksi sel 293T dan CHO-K1 dengan plasmid, konfirmasi ekspresi ACE2 pada model sel 293T dengan *IF staining*, dan uji *pseudovirus cellular entry* terhadap pemberian hesperidin pada model sel 293T. Data MTT dan *pseudovirus cellular entry* dianalisis dengan ANOVA dan dikoreksi dengan Bonferroni.

Data MTT menunjukkan bahwa hesperidin hingga konsentrasi 100 µM memberikan viabilitas sel 293T sebesar lebih dari 75%. Konsentrasi 1 dan 10 µM hesperidin tidak menimbulkan perbedaan viabilitas sel yang signifikan terhadap kontrol. Sel 293T memiliki efisiensi transfeksi yang lebih tinggi dari sel CHO-K1. Berdasarkan *IF staining*, model sel 293T berhasil mengekspresikan ACE2 di permukaannya. Hesperidin pada konsentrasi 10 dan 100 µM menunjukkan penurunan *pseudovirus cellular entry* yang signifikan ($p<0,05$) terhadap kontrol. Dengan demikian, hesperidin memiliki potensi untuk dikembangkan menjadi antivirus SARS-CoV-2 dengan mekanisme aksi penghambatan *cellular entry*.

Kata kunci: SARS-CoV-2, *cellular entry*, hesperidin, *pseudovirus*

ABSTRACT

SARS-CoV-2, the cause of the COVID-19 pandemic, continues to evolve, encouraging researchers to keep searching for antiviral candidates. In silico, hesperidin was known to be able to interact with spike and ACE2 receptors which play an important role in SARS-CoV-2 cellular entry. Therefore, this study was conducted to determine the potential of hesperidin as an antiviral candidate for SARS-CoV-2 with pseudovirus model in vitro.

The research methods were cytotoxic assay of hesperidin on 293T cells with MTT reagent, plasmid transfection into 293T and CHO-K1 cells, confirmation of ACE2 expression on 293T cell model by IF staining, and pseudovirus cellular entry assay on 293T cell model with hesperidin treatment. MTT and pseudovirus cellular entry data were analyzed with ANOVA, with Bonferroni correction.

MTT data showed that hesperidin, up to a concentration of 100 µM, gave 293T cell viability of more than 75%. Hesperidin 1 and 10 µM did not cause a significant difference in cell viability compared to the control. Transfection efficiency of 293T was higher than CHO-K1. Based on the IF staining data, 293T cell model successfully expressed ACE2 on its surface. Hesperidin at concentrations of 10 and 100 µM showed a significant reduction ($p<0.05$) of pseudovirus cellular entry compared to the control. Thus, hesperidin has the potential to be developed into a SARS-CoV-2 antiviral with cellular entry inhibition as the mechanism of action.

Keyword: SARS-CoV-2, cellular entry, hesperidin, pseudovirus