

## The Influence of Polysaccharide Isolated from *Morinda citrifolia* Fruit to the Growth of Vero, He-La and T47D Cell Lines against Doxorubicin in vitro

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**Abstract :** Background: Doxorubicin is widely used as a chemotherapeutic drug despite having many side effects. It may cause macrophage dysfunction and decreasing proliferation of lymphocyte. Noni (*Morinda citrifolia*) fruit which has rich of polysaccharide content has potential as antitumor and immunostimulant effect. The isolation of polysaccharide from Noni fruit has been optimized according to four different methods based on macrophage and lymphocyte activities. We found the highest polysaccharide content from one of the four methods isolation. A method of polysaccharide isolation which has the highest immunostimulant effect was used for further observation as co-chemotherapy. The aim of the study: was to evaluate the isolated polysaccharide from the method of choice as co-chemotherapy of doxorubicin for the growth of Vero, He-La, and T47D cell lines in vitro. The method: in vitro growth assay of Vero, He-La, and T47D cell lines was done using MTT-reduction method, and apoptosis test was done by double staining method to evaluate the induction apoptotic effect of the combination. Every group was treated with doxorubicin and isolated polysaccharide from method of choice with 4 variances of concentrations (25  $\mu\text{g/ml}$ , 50  $\mu\text{g/ml}$ , 100  $\mu\text{g/ml}$  and 200  $\mu\text{g/ml}$ ) a long with negative control (doxorubicin only) and normal control (without doxorubicin or polysaccharide administration). Results: The combination of polysaccharide fraction in the concentration of 100 $\mu\text{g/ml}$  with 2 $\mu\text{mol}$  of doxorubicin against He-La and T47D cell lines influenced the highest cytotoxic effect by suppressing cell viability comparing with doxorubicin only. The combination of polysaccharide fraction in the concentration of 100 $\mu\text{g/ml}$  with 2 $\mu\text{mol}$  of doxorubicin-induced apoptotic effect the He-La cell line comparing with doxorubicin only. The result of the study: it can be concluded that the combination of polysaccharide fraction and doxorubicin effect more selective toward He-La and T47D cell lines than to Vero cell line. It can be suggested isolated polysaccharide from the method of choice has co-chemotherapy activity against doxorubicin.

**Keywords :** polysaccharide, noni fruit, doxorubicin, cancer cell lines, vero cell line

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