

# Efek pemberian ekstrak akar pasak bumi (*Eurycoma longifolia* Jack) terhadap produksi sitokin pro dan anti-inflamasi pada mencit mus musculus yang diberi vaksin BCG = The effect of root extract pasak bumi *Eurycoma longifolia* Jack on cytokine production of pro and anti inflammatory in mice mus musculus were given BCG vaccine

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## Abstrak

[<b>ABSTRAK</b><br>

Tuberkulosis penyakit infeksi yang mematikan terutama di negara berkembang, termasuk Indonesia. Upaya pencegahan dengan vaksinasi BCG yang dapat meningkatkan respon imun masih belum maksimal. Faktor yang mempengaruhi keberhasilan vaksin adalah status imun host, genetik dan kualitas/kuantitas vaksin. Indonesia sebagai negara kaya tanaman obat, misalnya pasak bumi (*Eurycoma longifolia* Jack) digunakan sebagai antimalaria serta meningkatkan imun tubuh. Penelitian ini menilai efek ekstrak akar pasak bumi sebagai imunomodulator terutama IFN- $\gamma$ , TNF- $\alpha$ ; dan IL-10 pada mencit yang diberi vaksin BCG. Eksperimental in vivo dan in vitro darah mencit di kultur pada medium RPMI dengan stimulasi PHA dan BCG. Analisis tidak ada perbedaan yang bermakna ( $p > 0,05$ ) diantara kelompok perlakuan, analisa dari nilai median terlihat adanya efek ekstrak pasak bumi terhadap peningkatan TNF- $\alpha$ ; dan tidak berpengaruh terhadap produksi IFN- $\gamma$ ; dan IL-10 pada mencit yang divaksin BCG. Ekstrak akar pasak bumi mempengaruhi respon imun tubuh mencit yang diberi vaksin BCG, walau tidak besar maknanya.

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<b>ABSTRACT</b><br>

Tuberculosis is a deadly infectious disease that occurs mainly in developing countries, including Indonesia. Preventive efforts by BCG vaccination to improve the immune response is still not maximum. Factors that affect the success of vaccine are the host immune system, the host genetic and the quality/quantity of the vaccine. Indonesia is rich in medicinal plants, one of those is Pasak Bumi (*Eurycoma longifolia* Jack) that is widely used as antimalaria and to improve immunity. The research assessed the effects of extracts of Pasak Bumi roots as immunomodulator by measuring IFN- $\gamma$ , TNF- $\alpha$ ; and IL-10 on mice that were given with BCG vaccine. In vivo and in vitro experiments of mice blood cultured in RPMI medium stimulated with PHA and BCG. The result has shown no significant difference ( $p > 0,05$ ) among the treatment group, result of median values has shown the effect of Pasak Bumi extract to an increase of TNF- $\alpha$ ; and has no effect on the production of IFN- $\gamma$ ; and IL-10 in mice vaccinated BCG. Extract of pasak bumi roots affects the immune response of mice that have got BCG vaccine, although it has no significant meaning., Tuberculosis is a deadly infectious disease that occurs mainly in developing countries, including Indonesia. Preventive efforts by BCG vaccination to improve the immune response is still not maximum. Factors that affect the success of vaccine are the host immune system, the host genetic and the quality/quantity of the vaccine. Indonesia is rich in medicinal plants, one of those is Pasak Bumi (*Eurycoma longifolia* Jack) that is widely used as antimalaria and to improve immunity. The research assessed the effects of extracts of Pasak Bumi roots as immunomodulator by measuring IFN- $\gamma$ , TNF- $\alpha$ ; and

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