Terpinen-4-ol, the main component of the essential oil of Melaleuca alternifolia (tea tree oil), suppresses inflammatory mediator production by activated human monocytes.

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OBJECTIVE AND DESIGN: To evaluate potential antiinflammatory properties of tea tree oil, the essential oil steam distilled from the Australian native plant, Melaleuca alternifolia. MATERIAL AND METHODS: The ability of tea tree oil to reduce the production in vitro of tumour necrosis factor-alpha (TNFalpha), interleukin (IL)-1beta, IL-8, IL-10 and prostaglandin E2 (PGE2) by lipopolysaccharide (LPS)-activated human peripheral blood monocytes was examined. RESULTS: Tea tree oil emulsified by sonication in a glass tube into culture medium containing 10% fetal calf serum (FCS) was toxic for monocytes at a concentration of 0.016% v/v. However, the water soluble components of tea tree oil at concentrations equivalent to 0.125% significantly suppressed LPS-induced production of TNFalpha, IL-1beta and IL-10 (by approximately 50%) and PGE2 (by approximately 30%) after 40 h. Gas chromatography/mass spectrometry identified terpinen-4-ol (42 %), a-terpineol (3 %) and 1,8-cineole (2%, respectively, of tea tree oil) as the water soluble components of tea tree oil. When these components were examined individually, only terpinen-4-ol suppressed the production after 40 h of TNFalpha, IL-1beta, IL-8, IL-10 and PGE2 by LPS-activated monocytes. CONCLUSION: The water-soluble components of tea tree oil can suppress pro-inflammatory mediator production by activated human monocytes.