**Inhibitory activity of 1,8-cineol (eucalyptol) on cytokine production in cultured human lymphocytes and monocytes**

[Uwe R.Juergensa](https://www.sciencedirect.com/science/article/abs/pii/S1094553904000562#!)[TanjaEngelen](https://www.sciencedirect.com/science/article/abs/pii/S1094553904000562" \l "!)[a](https://www.sciencedirect.com/science/article/abs/pii/S1094553904000562" \l "!)[KurtRacké](https://www.sciencedirect.com/science/article/abs/pii/S1094553904000562" \l "!)[b](https://www.sciencedirect.com/science/article/abs/pii/S1094553904000562" \l "!)[MeinolfStöber](https://www.sciencedirect.com/science/article/abs/pii/S1094553904000562" \l "!)[a](https://www.sciencedirect.com/science/article/abs/pii/S1094553904000562" \l "!)[AdrianGillissen](https://www.sciencedirect.com/science/article/abs/pii/S1094553904000562" \l "!)[c](https://www.sciencedirect.com/science/article/abs/pii/S1094553904000562" \l "!)[HansVetter](https://www.sciencedirect.com/science/article/abs/pii/S1094553904000562" \l "!)[a](https://www.sciencedirect.com/science/article/abs/pii/S1094553904000562" \l "!)

**Abstract**

***Background:***

The therapeutic value of [secretolytic agents](https://www.sciencedirect.com/topics/medicine-and-dentistry/mucolytic-agent) in COPD and asthma is still disputed. For this reason, in a [preclinical study](https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/preclinical-study) we aimed to test the potential anti-inflammatory efficacy of [1,8-cineol](https://www.sciencedirect.com/topics/medicine-and-dentistry/cineole) (eucalyptol) in inhibiting polyclonal stimulated [cytokine production](https://www.sciencedirect.com/topics/medicine-and-dentistry/cytokine-production) by human unselected lymphocytes and LPS-stimulated [monocytes](https://www.sciencedirect.com/topics/medicine-and-dentistry/monocyte).

***Methods:***

Cytokine production was determined following 20 h of incubation cells with 1,8-cineol simultaneously with the stimuli in culture supernatants by enzyme immunoassay.

***Results:***

Therapeutic concentrations of 1,8-cineol (1.5 μg/ml=10−5 M) inhibited significantly (*n*=13–19, *p*=0.0001) cytokine production in lymphocytes of [TNF-α](https://www.sciencedirect.com/topics/medicine-and-dentistry/tumor-necrosis-factor) > IL-1β> IL-4> IL-5 by 92, 84, 70, and 65%, respectively. Cytokine production in monocytes of TNF-α > IL-1β> IL-6> IL-8 was also significantly (*n*=7–16, *p*<0.001) inhibited by 99, 84, 76, and 65%, respectively. In the presence of 1,8-cineol (0.15 μg/ml=10−6 M) production of TNF-α>IL-1β by monocytes and of IL-1β> TNF-α by lymph-ocytes was significantly inhibited by 77, 61 and by 36, 16%, respectively. 1,8-cineol (10−6 M) had a larger impact on TNF-α and IL-1β-production in monocytes compared to lymphocytes (*p*<0.03) and similar effects (*p*>0.59) at therapeutically relevant concentrations of 1,8-Cineol (10−5 M).

***Conclusion:***

These results characterize 1,8-cineol as strong inhibitor of TNF-α and IL-1β and suggest smaller effects on [chemotactic cytokines](https://www.sciencedirect.com/topics/medicine-and-dentistry/chemokine). This is increasing evidence for the role of 1,8-cineol to [control airway](https://www.sciencedirect.com/topics/medicine-and-dentistry/airway-management) mucus hypersecretion by cytokine inhibition, suggesting long-term treatment to reduce exacerbations in asthma, [sinusitis](https://www.sciencedirect.com/topics/medicine-and-dentistry/sinusitis) and COPD.