

# Diallyl-disulphide is the effective ingredient of garlic oil that protects primary human osteoblasts from damage due to cigarette smoke

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Cigarette consumption negatively affects bone-matter and -stability, partially due to increased oxidative stress. Garlic has been shown to have anti-oxidative properties. Therefore, the intention was to investigate whether garlic oil blend (GOB) reduces cellular damage in human osteoblasts exposed to cigarette smoke medium (CSM). Formation of ROS was rapidly induced in osteoblasts exposed to CSM and their viability decreased in a concentration- and time-dependent manner (EC<sub>50</sub> ? 0.75 OD 320). Co-, pre- and post-incubation with GOB significantly improved their viability. Testing both major components of GOB, diallyl-sulphide (DAS) and diallyl-disulphide (DADS), showed that DADS is more efficient. DADS markedly induced the expression of the anti-oxidative enzyme haeme-oxygenase (HO)-1. The HO-1 inhibitor zinc-protoporphyrin reduced the protective effect of all three substances. Summarizing, CSM damages osteoblasts by accumulation of ROS. GOB and especially DADS reduce this damage by scav