Boswellia carteri extract and 3-O-acetyl-alpha-boswellic acid suppress T cell function.

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Resins from various Boswellia species have a long track record in different cultures as a treatment for inflammatory diseases. This study was designed to provide evidence for the anti-inflammatory capacity and medicinal use of Boswellia carteri (Burseraceae). A dichloromethane (DCM) extract of B. carteri gum resin and isolated compounds thereof were immunologically characterized. Flow cytometric-based analysis was performed to investigate the impact of B. carteri extract on proliferation, viability, and function of anti-CD3 and anti-CD28 activated human primary T cells. The secretion level of IL-2 and IFN-γ was determined by a bead array-based flow cytometric technique. HPLC-based activity profiling of the B. carteri extract identified active compounds. The impact of B. carteri extract and isolated compounds on the IL-2 transcription factor activity was addressed using specially designed Jurkat reporter cells. The extract of B. carteri suppressed the proliferation of human primary T lymphocytes in vitro in a concentration-dependent manner, without inducing cytotoxicity. Thereby, the B. carteri extract further reduced the degranulation capacity and cytokine secretion of stimulated human T cells. Transcription factor analysis showed that the immunosuppressive effects of the extract are based on specific NFAT-conditioned suppression within T cell signaling. Through HPLC-based activity profiling of the extract, 3-O-acetyl-alpha-boswellic acid was identified as the compound responsible for the NFAT-based mechanism. The recent study presents a scientific base for the immunosuppressive effects of B. carteri gum resin extract including a mode-of-action via the NFAT-conditioned suppression of T lymphocyte proliferation. The immunosuppressive effects of 3-O-acetyl-alpha-boswellic acid are depicted for the first time.

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