A049 Inhibitory effects of oleanane triterpenoids on some macrophage functions

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In the present communication, seven naturally occurring compounds with anti-inflammatory properties (1) were examined for their effects on some macrophage functions of relevance to the inflammatory process. The present work concerns the effect of seven triterpenoid compounds possessing an oleanane skeleton: β-amyrin, erithrodiol, hederagenin, friedelin, 3α-hydroxy-friedelan-2-one, oleanolic acid and oleanolic methyl ester. These triterpenoids have been tested in two experimental systems: calcium ionophore A23187-stimulated mouse peritoneal macrophages serve as a source of COX-1 and 5-LOX, and LPS-stimulated macrophages testing COX-2, iNOS and GR activities.
Hederagenin, 3α-hydroxy-friedelan-2-one and oleanolic acid showed significant inhibitory effect on PGE_2 (COX-1) and LTC_4 (5-LOX) with $IC_{50} < 50$ μM, while friedelin showed a strong inhibition of COX-1 ($IC_{50} = 9$ μM).
Hederagenin was an active inhibitor of nitric oxide (NO) and PGE_2 production, showed by western-blot inhibition of iNOS and COX-2 expression. Friedelin and oleanolic acid inhibited NO generation ($IC_{50} = 8.8$ and 1.10 μM, respectively), while 3α-hydroxy-friedelan-2-one was only slightly active. β-amyrin significantly increased GR activity (inhibition percentage 94.4% at 100 μM). Oleanolic acid was an active scavenger of hypochlorous radical. None of the triterpenoids showed superoxide scavenger activity.

References: 1. Rios, J.L. et al. (2000). Natural Triterpenoids as Anti-inflammatory Agents in Studies in Natural Products Chemistry (Atta-ur-Rahman, Ed.), Elsevier.

A050 Inhibitory effects of lupane triterpenoids on some macrophage functions

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Triterpenoids have been described as effective anti-inflammatory agents and are recognised as the active principles of several medicinal plants (1). In order to establish the mode of action of the anti-inflammatory activity seven triterpenoid compounds possessing a lupane skeleton (betulin, betulin diacetate, betulinic acid, betulinic acid methylester, lupeol acetate, lupeol, lupenone) have been evaluated as potential inhibitors of some macrophage functions. These triterpenoids have been tested in two experimental systems: calcium ionophore A23187-stimulated mouse peritoneal macrophages (source of COX-1 and 5-LOX enzymes) and LPS-stimulated macrophages (COX-2, iNOS and GR enzymes). None of the compounds assayed had any significant effect on PGE_2 production when catalysed by the COX-1 enzyme. Betulin and betulinic acid significantly inhibited LTC_4 production with $IC_{50} < 17$ μM, while lupenone exhibited slight inhibition of 5-LOX. All triterpenoids assayed were active inhibitors of nitric oxide (NO) production, showed by western-blot inhibition of iNOS expression, being less active on their effects on COX-2 enzyme. Betulinic acid diacetate showed the strongest activity on NO assay ($IC_{50} = 0.92$ μM), while betulinic acid methylester on COX-2 assay ($IC_{50} = 10$ μM). Betulin diacetate showed a marked increase of GR activity. All triterpenes assayed except betulinic acid and betulin diacetate were active scavengers of the hypochlorous radical. None of them scavenged superoxide anion.

References: 1. Rios, J.L. et al. (2000). Natural Triterpenoids as Anti-inflammatory Agents in Studies in Natural Products Chemistry (Atta-ur-Rahman, Ed.), Elsevier.