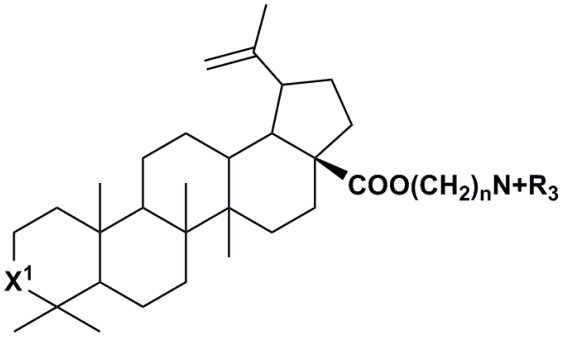
Anti-tumor triterpenoids substituted with nitrogen substituents

Introduction:
Triterpenoids are natural compounds with a number of biological activities including anticancer. Most of the triterpenoids are not sufficiently water soluble, which makes the biological tests difficult and also is a reason for low bioavailability. Therefore, it is important to improve the solubility by modifying the compounds with polar functional groups such as quaternary ammonium salts.



Technology description:
The invention is based on the introduction of quaternary ammonium salts into the triterpenic structure of active compounds. Those ammonium salts are connected to the 18-carboxylic acid via alkyl-ester linker. Compounds containing both aliphatic and aromatic quaternary ammonium salts were studied and patented and they showed high in vitro cytotoxic activities.

Advantages:
The invention provides a large group of novel compounds active on broad spectrum of cancer cell lines. New anti-cancer pharmaceu¬ticals can be based on the invention as well as abnormal proliferation therapeutics.

Development status:
Laboratory scale, data on cell lines, primarily human tumors, orientational pharmacology/toxicology on rodents.

Publications:
Kvasnica, M., M. Urban, N. J. Dickinson, J. Sarek. Pentacyclic triterpenoids with nitrogen- and sulfur-containing heterocycles: synthesis and medicinal significance. Natural Product Reports. 2015, 32(9), 1303-30. ISSN: 1460-4752. IF: 10.986. PMID: 26030604
Borkova, L., L. Jasikova, J. Rehulka, K. Frisonsova, M. Urban, I. Frydrych, I. Popa, M. Hajduch, N. J. Dickinson, M. Vlk, P. Dzubak, J. Sarek. Synthesis of cytotoxic 2,2-difluoroderivatives of dihydrobetulinic acid and allobetulin and study of their impact on cancer cells. European Journal of Medicinal Chemistry. 2015, 96, 482-90. ISSN: 0223-5234. IF: 3.902. PMID: 25942059.
Biedermann, D., B. Eignerova, M. Hajduch, J. Sarek. Synthesis and Evaluation of Biological Activity of the Quaternary Ammonium Salts of Lupane-, Oleanane-, and Ursane-Type Acids. Synthesis-Stuttgart. 2010, (22): 3839-3848. ISSN: 0039-7881. IF: 2.260

IP protection:
CZ 301158

Commercial offer:
Exclusive/non-exclusive license to the patent, related know-how and data.

Ownership:
Institute of Molecular and Translational Medicine, Faculty of Medicine and Dentistry, Palacky University, Olomouc

Contact:
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