SCIENCESPRINGDAY

FACULDADE DE CIÊNCIAS E TECNOLOGIA UNIVERSIDADE NOVA DE LISBOA

Chemistry Department

Anti-inflammatory and anticancer agents

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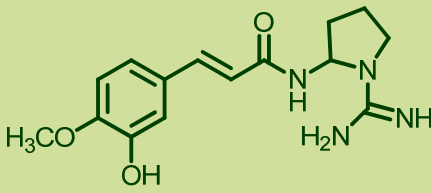
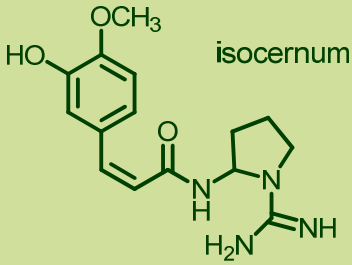
Research Interests: Organic Chemistry, Natural Products: semisynthesis and bioactivity, biosynthesis, chemotaxonomy.

Objectives

Medicinal plants play an important role in the discovery of new drugs. Nature is the main source of compounds for pharmaceutical purposes, either by providing the natural organic chemical compounds of interest or as a source of inspiration for the design of new drugs. The tasks of the organic chemist are the screening, the structure assignment, and the semi and total syntheses of active molecules. The present work is centred in the search of anti-inflammatory and anticancer agents produced by vegetal species. These metabolites belong to a great diversity of structural skeletons since inflammatory and cancer processes involve many different biological targets. *Solanum cernuum Vell.* (Solanaceae) is endemic in the states of *Rio de Janeiro* and Minas Gerais of brazil, and is used in traditional medicine for treatment of gastric ulcers, liver injuries, skin affection, and as antitumor, among other diseases. The anti-inflammatory, anticancer, and other roles of the illustrated metabolites from *S. cernuum* are studied.



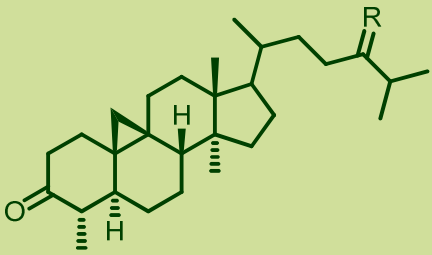
cernumidine



isocernumidine

Methodology

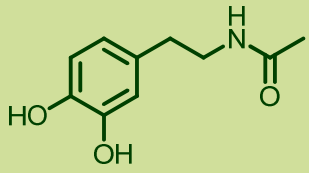
For the chemical studies that are part of the present work the following methodology is performed. Drying and grinding plant species. Extraction of the ground material with suitable organic solvents, or acidic/basic aqueous extraction. The extracts are separated by different chromatographic methods which is determined in each case. Purification by chromatographic methods that may involve derivatizations to make it possible. The identification of the structures is based on spectroscopic data of IR, UV, NMR, on MS data, specific optical rotation and CD, and X-Ray when suitable.



$R = CH_2$ cycloeucalenone
R = O 24-oxo-31-norcycloartanone

Expected Results

24-oxo-31-norcycloartanone has selective activity against lung tumor cell line (NCIH460), which expresses high levels of COX-2, indicating a link between cancer and inflammation. Cernumidine displays inhibition of interleukin-8 production by HT-29 colon carcinoma cells. This fact orients further research in gastric cancer prevention and treatment. Cernumidine and isocernumidine do not significantly influence most of the functions involved with inflammation which can be a valuable property for a potential selective application considering the compounds role over IL-8 generation. This understanding is underlying the on-going medicinal chemical studies on cernumidines as lead compounds. *N*-acetyldopamine is a catecholamine derivative. Catecholamines are neurotransmitters in mammals. Considering the structure of the metabolite, It will be prepared and its role will be evaluated in neurological systems.



N-acetyldopamine

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