Fuente: www.fitoterapia.net

## PL03 Biological activities of capsaicinoids

*Eduardo Muñoz*
Departamento de Biología Celular, Fisiología e Inmunología, Facultad de Medicina, Universidad de Córdoba, Av. de Menéndez Pidal, s/n, Córdoba 14004. Spain.

The hot taste of chili pepper (*Capsicum annuum* L.) has generated an intense research activity aimed at the characterization and exploitation of the pungent compounds responsible for the sensory properties of this spice. The active principle, named capsaicin (*E*-8-methyl-*N*-vanillyl-6-nonenamide, CPS), was first isolated in 1876, and an enormous body of literature has been accumulated on its chemistry and pharmacology. The outgrowth of this attention was the discovery and cloning of a cell surface receptor (VR1) that binds CPS in a specific way, and a structurally heterogeneous group of pungent compounds named vanilloids. VR1 belongs to the family of putative store-operated calcium channels, and is expressed mainly in peripheral pain-sensing neurons. The generation of *knock out* mice for the VR1 gene supported a correlation between the pungency of CPS and the activation of this receptor *in vivo*, while several investigations have highlighted the therapeutic value of vanilloids to treat painful disorders such as peripheral neuropathies and rheumatoid arthritis, considerable amounts of CPS-like compounds have also been reported in sweet pepper, but the lack of pungency of these CPS analogues has long made them unattractive targets for research. Recent studies have shown that hot pepper and sweet pepper contain similar compounds, whose structural hallmark is the presence of a vanillyl core bound to a branched fatty acid. The remarkable difference between the sensory properties of these plants is solely due to the way the vanillyl and the acyl moieties of this basic structural motif are linked, via amide bond in hot pepper (capsaicin-type compounds) and via ester bond in sweet pepper (capsiate-type compounds). Despite the growing interests in secondary metabolites from edible plants, and the presence of sizeable amounts of capsiates in sweet pepper, no biological property apart from the lack of pungency has been reported for these compounds. We will show that capsainoids have anti-inflammatory properties by targeting the NF-κB pathway independently of the VR1 and that this type of compounds could serve as lead compounds for the development of novel, potent anti-inflammatory drugs for the treatment of inflammatory disorders.

**Prof. Dr. Eduardo Muñoz**

Prof. Muñoz was born in 1958 in Córdoba (Spain). He studied Medicine at the University of Córdoba, where he got his PhD degree in 1986. He has been a postdoctoral in Tufts University with Prof. Brigitte T. Huber (Boston, USA) from 1987-1990 working in Th2-type cell signaling and cytokine gene expression. He continued working in the field of gene transcription with Prof. Alain Israël during two years at the Institute Pasteur (Paris, France). Since 1992, he is Associated Professor of Immunology at the University of Córdoba. He is interested in two overlapping areas of research centered in the identification of new anti-inflammatory and anti-AIDS natural compounds.

His group is aimed to identify novel health food nutraceuticals and plant based medicines (phytomedicines) with anti-inflammatory activities, specially in the field of non pungent capsaicinoids and synthetic AEA-capsaicin "hybrids" molecules such is Arvanil and other N-AVAMs (vanillylamides of fatty acids), which have been recently developed and represent lead compounds amenable for pharmaceutical development as anti-inflammatory and analgesic compounds. The second area of his research deals with the identification of cellular genes that are regulated by the HIV-1 Tat protein, specifically upregulated cellular genes by viral proteins may represent new molecular targets of interest in the development of therapeutic strategies anti-HIV-1. In addition to the validation of new anti-HIV molecular targets, we are isolating new natural phytochemical compounds targeting Tat-LTR-HIV-1 interaction.