

## Complexity of the endocannabinoid system, and challenge of developing selective drugs to target its distinct elements

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### Abstract

Endocannabinoids (eCBs) are endogenous lipids able to activate cannabinoid receptors, the primary molecular targets of the cannabis (*Cannabis sativa* or *Cannabis indica*) active principle 9-tetrahydrocannabinol (THC). During the last 25 years, several N-acyl ethanolamines and acylesters have been shown to act as eCBs, and a complex array of receptors, metabolic enzymes, (transmembrane, intracellular and extracellular) transporters, that altogether form the so-called “eCB system”, has been shown to finely tune the manifold biological activities of eCBs. It appears now urgent to develop selective drugs that allow to dissect the contribution of the distinct components of the eCB system to the overall biological activity of these compounds, thus putting in a better perspective their relevance as key-player of human health and disease conditions. A modern view of the eCBs, the eCB system and of natural or synthetic compounds able to selectively hit its various elements with very limited side effects (if any) is presented here. This information should form the basis for more rationale and effective therapeutic strategies to combat (endo) cannabinoid-related human pathologies.

### Biography

Mauro Maccarrone, Dr. Enzymology and Bio-Organic Chemistry, is Professor and Chair of Biochemistry and Molecular Biology, and Co-ordinator of the Bachelor’s Degree in Food Science and Human Nutrition at the School of Medicine, Campus Bio-Medico University of Rome. He is the Director of the Laboratory of Lipid Neurochemistry at the European Center for Brain Research (CERC)/IRCCS Santa Lucia Foundation, Rome, Italy. He was awarded the “4th Royan International Research Award for Reproductive Biomedicine”, the “2007 IACM Award for Basic Research” and the “2016 Mechoulam Award”, and has been Chair of the 2015 Gordon Research Conference on “Cannabinoid Function in the CNS”. He published > 485 full papers, of which 55 with I.F.  $\geq 9$  and 45 with  $\geq 100$  citations (total I.F. > 2410; citations > 15180, h-index = 64 according to Scopus).

### Publications

1. The endocannabinoid hydrolase FAAH is an allosteric enzyme
2. Structure of a nucleotide pyrophosphatase/phosphodiesterase (NPP) from *Euphorbia characias* latex characterized by small-angle X-ray scattering: clues for the general organization of plant NPPs
3. Advances in the discovery of fatty acid amide hydrolase inhibitors: what does the future hold?
4. Lipid Signalling in Human Immune Response and Bone Remodelling under Microgravity
5. Opening the Gate to the Serism Project: From Earth to Space and Back
6. Corrigendum to “Artificial Neural Network to Predict Varicocele Impact on Male Fertility through Testicular Endocannabinoid Gene Expression Profiles”
7. Erratum to “Proresolving Lipid Mediators: Endogenous Modulators of Oxidative Stress”
8. Proresolving Lipid Mediators: Endogenous Modulators of Oxidative Stress
9. Role of Major Endocannabinoid-Binding Receptors during Mouse Oocyte Maturation
10. Artificial Neural Network to Predict Varicocele Impact on Male Fertility through Testicular Endocannabinoid Gene Expression Profiles
11. Role of the Specialized Proresolving Mediator Resolvin D1 in Systemic Lupus Erythematosus: Preliminary Results

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