

# *Review of Clinical Pharmacology and Pharmacokinetics*

ΕΠΙΘΕΟΡΗΣΗ ΚΛΙΝΙΚΗΣ ΦΑΡΜΑΚΟΛΟΓΙΑΣ ΚΑΙ ΦΑΡΜΑΚΟΚΙΝΗΤΙΚΗΣ  
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## Letter from Guest Editor

The progress and contributions of 20<sup>th</sup> century pharmacology has been immense with over 20 pharmacologists to have received Nobel Prizes. This field of medical studies covers many areas; it is built upon and at the same time incorporates many disciplines such as biochemistry, biology physiology, pathology, anatomy, molecular biology, while the development of new analytical and experimental techniques and instruments has given a new boost in pharmacological research. Yet, although a remarkable progress has been made in developing new drugs and in understanding how they act, the challenges are endless. Integrating a depth of knowledge in many related scientific disciplines, pharmacologists offer a unique perspective to solving drug and chemical related problems which impinge on human health, with ultimate goal the treatment and prevention of major diseases.

The 5<sup>th</sup> Panhellenic Congress of Pharmacology focuses on four *hot* subjects: Regenerative Pharmacology, Herbal Medicines, Pharmacology of Abuse and Dependence, and Education in Pharmacology.

- *Regenerative Pharmacology* is one of the newest areas in Pharmacology, represents a groundbreaking field of research and has the potential to radically alter the treatment of diseases and disorders.

- *Herbal Medicines* have acquired an important percentage among the drug used; according to WHO 80% of people worldwide rely on herbal medicines for some aspect of their primary health care. This continuously increasing use of plant medicines imposes the need for establishing new regulations.

- *Pharmacology of Abuse and Dependence*, still not a well defined area, presents a lot of challenge for researchers and clinicians.

- *Education in Pharmacology* remains a hot subject in the Medical education, following the knowledge *explosion* of the last decades accompanied by a decreasing reliance on didactic teaching. The crucial question is: how and what should we teach?

We hope that the round table discussions along with the invited lectures, included in this abstract book, will raise new and intriguing ques-

tions that will further stimulate research, and will contribute to new therapeutic approaches and attitudes.

I would like to thank the Editorial Board of *Review of Clinical Pharmacology and Pharmacokinetics* in particular Journal Editors Prof. S.T. Plessas and Dr C.T. Plessas for invitation and for providing the suitable and high-standard forum through which new research findings will become available to the scientific community.

*The Guest Editor*

*Charis Liapi*

Assist. Professor in Pharmacology  
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## Effects of a Selective Cyclooxygenase Inhibitor on Behavioural and Neurochemical Parameters

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*Key words:* Spontaneous activity, neurotransmitters, rat, brain.

### INTRODUCTION

Cyclooxygenase inhibitors comprise a class of drugs widely used in the treatment of pain and inflammation. Cyclooxygenase is the key enzyme that converts arachidonic acid to prostaglandins. COX-2 is expressed in the rat brain constitutively, predominantly in discrete population of neurons (1). Several studies demonstrate that COX-2 expression appears to be regulated by spontaneous synaptic activity, by glutamatergic receptors and glycocorticoids (1). Moreover, COX-2 mRNA and protein is induced by inflammation, acute stress, spreading depression, ischemia and seizures (2). Since, COX-2 is involved in pathophysiological situations, it is interesting to investigate the role of COX-2 inhibitors in central nervous system. Therefore, we examined a selective COX-2 inhibitor, etoricoxib on different behavioural and neurochemical parameters.

### METHODS

Male Wistar rats (3-months old) were included in all experimental protocols. Dose- and time-dependent effects of etoricoxib on behavioural and neurochemical parameters were studied. Spontaneous behaviour was recorded using a computerized activity monitoring system (ENV515, Activity Monitor, version 5, Med. Associates, USA). At the end of experiment several brain tissues were removed for evaluation of the serotonergic and dopaminergic function in discrete brain regions. A High Pressure Liquid Chromatography (HPLC) method was used to determine the levels of brain neurotransmitters (3,4).

### RESULTS

Etoricoxib induced alterations on behavioural activity and on rat brain neurotransmission. Fu-

thermore, etoricoxib, produced significant changes on serotonergic function observed in all brain regions being studied and at all different dose schedules. Statistical significant alterations were also observed on dopaminergic function.

### DISCUSSION

The fact that acute administration of etoricoxib can cause dopaminergic and serotonergic changes and alterations on behavioural activity even at therapeutic doses raises questions on the action of the drug. Whether or not etoricoxib produce neurochemical changes by a mechanism dependent or independent of the cyclooxygenase pathway, there is still a need for deepest investigation of COX-2 inhibitors as centrally acting agents.

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