# INTERNATIONAL SYMPOSIUM
# ON BIOLOGICAL CLOCKS:
# PATHOPHYSIOLOGY AND CLINICAL ASPECTS

## JUNE 25, 2011, CRACOW, POLAND

**GUEST EDITORS**

**Prof. Dr Stanisław J. Konturek**
**Prof. Dr Tomasz Brzozowski**

**CHAIRMAN**

**Prof. Dr Stanisław J. Konturek**

**STANDING ORGANIZING COMMITTEE**

**Prof. Dr Stanisław J. Konturek**
*Chairman*

**Prof. Dr Wiesław W. Pawlik**
*Polish Physiological Society*

**Prof. Dr Tomasz Brzozowski**
*Department of Physiology, Jagiellonian University College of Medicine, Cracow, Poland*

**Dr Artur Hartwich**
*Foundation for Medical Faculty of Jagiellonian University, Cracow, Poland*

**OUR SPONSORS**:

**Foundation for Medical Faculty,**
**Jagiellonian University of Medical College,**
**Cracow, Poland**

**LEKAM**
**Przedsiębiorstwo Farmaceutyczne Lekam Sp. z o.o.**
**ul. Podwale 23,**
**Warszawa, Poland**

**HONORARY COMMITTEE:**

**Prof. dr hab. Zbigniew Gonciarz**
**Prof. dr hab. Tomasz Grodzicki**
**Prof. dr hab. Ryszard W. Gryglewski**
**Prof. dr hab. Ryszard Korbut**
**Prof. dr hab. Karol Okrasa**
**Prof. dr hab. Ewa Szczepańska-Sadowska**
**Prof. dr hab. Jerzy Vetulani**

# NEW INSIGHT IN PATHOGENESIS OF METABOLIC DISEASES RELATED TO THE GASTROINTESTINAL TRACT

N. HRYCEVYCH, L. BEZPALKO, O. ZAYACHKIVSKA, M. GZHEGOTSKY

*Physiology Department, Lviv National Medical University, Lviv, Ukraine*

The increased incidence of metabolic diseases is a global trend and gastro-intestinal-related metabolic disorders (GIMD) are common chronic medical problems. The types of cancer linked to GIMD are esophageal adenocarcinoma (EA), hepatocellular carcinoma, colorectal cancer, the incidence of which markedly increased in the past 30 years. This probably cannot be explained by the usual economic and cultural "westernization" of environmental factors. It is estimated that the elderly patients are at higher risk for esophageal disorders, we hypothesized that melatonin (MT) plays an important role in cell-cycle regulators in every stage of GIMD sequence as well as analyze the trend in their changes in molecular and cellular mechanisms of gastro-esophageal reflux disease progression toward EA. The aim was to conduct a case-control study on the alterations of angiogenesis-related peptide regulators in GIMD and demonstrate their association with gastro-esophageal reflux diseases – EA sequence. Methods: non-erosive esophagitis (NEE) were induced by water-immersion restraint stress (WRS) in in young (YR) and old rats (OR) without/with MT (20 mg/kg) pretreatment; the healing process of NEE was monitored at various time points after induction of WRS; estimation of injury, inflammation and hyperplasia via histological score index (HSI); VEGF, EGF, IL-1β, TNF-α were determinate by ELISA. Results: in OR versus YR baseline content of VEGF is 5-fold increased and EGF is 12% decreased. WRS-induced NEE in OR present by constantly increased HSI in 150% in compare to YR and in YR twice decreased in VEGF and EGF and markedly rise in IL-1β and TNF-α versus OR. At 24 hr after WRS in OR EM healing was significantly delayed and defective response of EM basal layer indicated. 24- and 48-hr changes of VEGF were less remarked in OR than in YR; after 48 hr TNF-α was markedly rise in OR versus to YR and was observed indication of impaired chemotaxis and/or function of leukocytes. MT accelerated NEE healing in OR and YR and this was accompanied by decreased synthesis of VEGF, EGF and signs of inflammation.

Conclusion: MT plays significant role in the GIMD and age-depended mechanisms of esophageal cytoprotection and healing and possible in persistent inflammatory cell infiltration.