Preface

This supplement of the Journal of Physiology and Pharmacology includes invited lectures presented at sessions of the XXIII Congress of Physiological Society - "Physiology without limits"- held in Warsaw September 14-16, 2006 and supported by Ministry of Science and Higher Education through the Committee of Physiological Sciences of VI Division of Polish Academy of Sciences.

In addition to opening lecture by M.Z. Ratajczak et al. related to the physiological and pathological consequences of identification of very small embryonic-like stem cells in adult bone marrow, several sessions have been organized and some of the invited lectures are included into this supplement of the journal. Most of the contributions are related to the session 2 entitled "Brain-gut axis". M. Karasek and K. Winczyk gave comprehensive overview on melatonin in humans including the biosynthesis and metabolism of this indole, its circadian variation, dependency on age and role in human pathology, especially in neurodegenerative and neoplastic diseases. G. Klupinska et al. described the nocturnal variations of plasma melatonin release and its decrease in patients with gastroesophageal reflux disease, functional dyspepsia and peptic ulcerations. S.J. Konturek et al. reviewed the role of melatonin in gastric mucosal integrity, protection against stress-induced gastric damage and healing of chronic gastric ulcerations in rats, showing that gastrointestinal system contributes to the formation of melatonin independently on pineal gland. The findings that melatonin and its precursor, L-tryptophan, are highly effective in gastroprotection and ulcer healing are in keeping with clinical observations that melatonin exerts beneficial influence on the upper digestive system. Brain-gut axis and its role in the control of food intake in Helicobacter pylori (H. pylori) infected humans have been evaluated by P.C. Konturek et al., showing that reduction in appetite and appearance of dyspeptic symptoms in such infected humans might be attributed to the attenuation of the production and release of ghrelin from the Gr cells in the oxyntic portion of gastric mucosa. J. Jaworek using rats with acute pancreatitis revealed that both ghrelin and melatonin are capable of preventing the inflammatory pancreatic changes due to antioxidative properties of these peptides and activation of central nervous mechanisms. A. Kotunia and R. Zabielski provided an evidence that ghrelin and obestatin, originating from the same gene in Gr cells of oxyntic mucosa exert biphasic effects on gastric and
pancreatic postnatal development and growth. The part of the 2 session related to melatonin has been partly sponsored by LEK-AM, Warsaw.

Session 5 concerning "Physiology and pathophysiology of cyclooxygenases", has been highlighted by R.M. Botting, who reviewed present status of the cyclooxygenase-1 (COX-1), COX-2 and COX-3. While COX-1 acts as housekeeping enzyme making prostaglandins (PG) for maintenance of the physiological functions, COX-2 is upregulated by inflammatory mediators and forms PG which intensify inflammatory response. COX-3 is a product of COX-1 gene, but retains intron 1 after transcription and translates into a COX enzyme. COX-3 appears to be highly sensitive to inhibiition by paracetamol. In humans, aspirin (ASA) is a well known agent causing mucosal damage and bleeding, but as shown by P.C. Konturek et al., this abnoxious action of ASA can be attenuated by its combination with vitamin C (ASA-VitC). Such ASA releasing vitamin C was found to be much better tolerated by human stomach than native ASA except when the stomach is infected with H. pylori, which reverses the beneficial effects of ASA-VitC. Further studies in vitro on human gastric mucosal cells (MKN-45) demonstrated that H. pylori added to these cells stimulated iNOS expression that was enhanced by native ASA but reduced by ASA-VitC. It has been concluded that ASA-VitC in humans exerts less gastric mucosal damage than native ASA and that this protective effect could be due to its inhibitory effect on iNOS expression. The session 5 was sponsored by Bayer Health Care, Warsaw.

Session 6 related to "Plant-derived bioactive substances" included lecture of A. Dembinski et al. demonstrating that activation of cannabinoid 1 (CB1) receptors exerts opposite effects on the stomach and the pancreas, namely protection against stress-induced gastric damage and enhancement of pancreatic inflammation in the same animals. O.S. Zayachkivska showed that proanthocyanidins (PA), the polymers of flavonoids, naturally occurring in fruits, vegetables, nuts and seeds show antiinflammatory, antioxidant and vasodilatory effects. PA obtained from Viburnum opulus VOPA was found to prevent stress-induced gastric lesions through the increase in nitric oxide production, the rise of activity of antioxidizing enzymes such as superoxide dysmuthase or glutathione peroxidase and stimulation of sensory nerves. Cintamani, Poland sponsored in part this session.

Guest Editors:
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