Introduction

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This Special issue of the European Journal of Applied Physiology contains articles mainly in the areas of human thermoregulatory research presented at the Third International Symposium on Physiology and Pharmacology of Temperature Regulation, held in Matsue, Izumo, Japan, on July 23–26, 2009 (PPTR2009). The series of meetings on Physiology and Pharmacology of Temperature Regulation was created by the Thermal Section within Commission VII of the International Union of Physiological Sciences (IUPS) in an effort to unify two series of symposia: the Thermal Physiology Symposia that run as satellites to the IUPS Congresses (1972–2000) and the Pharmacology of Thermoregulation Symposia (1972–1999). The first and second meetings on Physiology and Pharmacology of Tem-

perature Regulation were held on Rhodes, Greece, in 2004 and in Phoenix, USA, in 2006, and PPTR2009 took the baton from the Phoenix conference.

PPTR2009 was opened with a special lecture entitled “History and future of body temperature regulation”. This category of presentation was expressly for eminent researchers who have made significant and consistent contributions to the field of temperature regulation. In this lecture, Professor Emeritus Taketoshi Morimoto and Professor Emeritus Duncan Mitchell introduced history and progress of thermoregulation research and gave valuable suggestions concerning the future of this field. A planned speaker, Professor Emeritus Clark M. Blatteis, was not able to join the meeting through unavoidable circumstances. It is hoped that this kind of lecture will become a tradition in future PPTR congresses. The lectures were followed by 10 selected symposia which were devoted to the topics of hyperthermia-induced hyperpnea and thermal panting (Entin et al. 2005; White 2006; Fujii et al. 2008), TRP channels in body temperature regulation (Tajino et al. 2007; Gavva et al. 2008), heat stroke (Chen et al. 2007), acclimation plasticity and limits of heat tolerance (Taylor 2006, Buckley 2007, Horowitz 2008, Matsuzaki et al. 2009), thermoregulation and the sudden infant death syndrome (Blair et al. 2008; Brown et al. 2008; Hodges et al. 2008), control and coordination processes within the thermoregulatory system (Romanovsky 2006; Werner et al. 2008), mechanisms and mediators of immune-to-brain communication during inflammation (Weiland et al. 2007; Harden et al. 2008; Rummel et al. 2008), neuronal mechanisms contributing to body temperature regulation (Bautista et al. 2007; Tanaka et al. 2007; Nakamura and Morrison 2008) and adaptive thermogenesis (Nedergaard et al. 2007; Wijers et al. 2007). The meeting also included a session of the presentation of six young researcher award winners,

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Fig. 1 The participants of the third international symposium on physiology and pharmacology of temperature regulation

two sessions of oral presentation (10 speech) and two poster sessions (126 posters). The total number of attendants was more than 170 from 25 countries and regions (Australia, Canada, China, Brazil, Bangladesh, Finland, Germany, Greece, Hungary, Israel, Japan, Jordan, Korea, Mexico, Netherlands, New Zealand, Poland, Russia, Slovenia, South Africa, Sweden, Taiwan, Turkey, UK, USA) (Fig. 1). The scientific activities in PPTR2009 highlight the significance of human and animal thermoregulation research, and actively promote the growth and continued development of this field of research.

Prior to starting the scientific program of the PPTR2009, a general meeting was held by Professor Rüdiger Gerstberger, a chair of The Section on Thermal Physiology of IUPS, to give memorial addresses to honor the scientific contributions of our deceased friends and colleagues; Professor Valery N. Gourine, Professor Ladislav Janský, Professor Friedrich-Karl Pierau and Professor Evelyn Satinoff. The main research fields of Prof. Gourine were Central nervous control of metabolism and body temperature, Effects of cytokines and pyrogens on sensory elements and CNS neurons, and Thermoregulation and sympathetic nervous system, those of Prof. Janský were Thermoregulation and energy metabolism under different environmental conditions, Cold adaptation in man, and Thermogenesis, those of Prof. Pierau were Temperature dependence of the electrogenic sodium pump, Neuropeptides and hypothalamic thermosensitivity, and Neurogenic inflammation, and those of Prof. Satinoff were Neural control of behavioral thermoregulation, Fever, cytokines and behavioral thermoregulation, and Circadian rhythms of body temperature and sleep.

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