AJP: Regulatory, Integrative and Comparative Physiology: 2007 and beyond

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"in-te-gra-tive, adj., serving to form, coordinate, or blend into a functioning or unified whole (1)."

THIS SINGLE TERM BEST describes, in my eyes, the main theme of our journal. I am pleased to introduce to you, the readers of AJP: Regulatory, Integrative and Comparative Physiology, the new editorial team. I am very excited and honored to be starting my term as the new editor-in-chief of this journal.

I have a hard act to follow. For the past 6 years, Dr. Pontus Persson has led the journal with class and distinction. Among his accomplishments has been the implementation of an extremely successful Call for Papers program. The journal’s impact factor has also steadily risen under his watch. I want to take this opportunity to congratulate Pontus and his editorial team on their success and to thank them for their efforts. In addition, I urge the readers of the journal to offer Pontus and his editorial team congratulations on a job well done. I am pleased to report that Dr. Persson has agreed to serve as Consulting Editor to provide me with his learned advice and ensure that there is no conflict of interest in reviewing papers submitted from the University of Iowa or from the Associate Editors.

Over the past few months I have been asked “Why the AJP-Regulatory, Integrative and Comparative Physiology?” Apparently, some were surprised by my interest in editing this journal. Although I am by training, a geneticist and a molecular biologist, I have come to appreciate that integration of techniques, ideas, and hypotheses can be an extremely powerful means to answer significant biological questions. Indeed, I have come to embrace the power of integrating genetics, comparative genomics, molecular biology, pharmacology, and physiology in my research. Although it is noteworthy that some define this as “systems biology,” I prefer the term “integrative physiology.” Consequently, my editorial team and I will continue the commitment of the past editors of the journal to publish and highlight the most significant research in integrative physiology, focusing on regulatory pathways and physiological mechanisms. We hope to publish papers using diverse methodologies embracing molecular, genetic, genomic, and comparative approaches. More on this later.

I am very fortunate that a group of talented investigators has agreed to serve on my editorial team. As you will see, the editorial team exhibits the same diversity as the journal itself. In the area of neurohumoral control of cardiovascular function are Alan Kim Johnson and Celia D. Sladek. Dr. Johnson is from the University of Iowa and is primarily interested in elucidating the neural and hormonal mechanisms involved in the maintenance of body fluid homeostasis. His major emphasis is on the role of ingestive behaviors important for the determination of overall fluid balance and the interactions of environmental stimuli regulating the cardiovascular system. Dr. Johnson was a member of Dr. John Hall’s editorial team and rejoins as one of a small cadre of editors from The University of Iowa. Dr. Sladek is from the University of Colorado Health Science Center. Dr. Sladek’s research interests include fluid and electrolyte homeostasis, neuroendocrinology, regulation of vasopressin and oxytocin secretion, neurotransmitter and steroid hormone receptors and cell signaling mechanisms, and the hypothalamus and its connections with brain stem and limbic structures.

Research interests of both Drs. Johnson and Sladek overlap with the most rapidly evolving section of the journal, neuroendocrine, metabolism, appetite and obesity. Here, I am fortunate to have recruited Willis (Rick) K. Samson from St. Louis University and Barry E. Levin from the New Jersey Medical School of the University of Medicine and Dentistry of New Jersey and the Veterans Affairs Medical Center of East Orange. Dr. Samson is interested in the actions of neuropeptides related to cardiovascular, endocrine, and behavioral responses to stress. He is interested in the actions of neuropeptides, in particular, their actions in the hypothalamus and brain stem. He studies the actions of these peptides in isolated tissues, primary cells, and cell lines, and he then works back into the whole animal setting, using immunological and molecular tools to compromise either their production or action in an attempt to determine their physiological relevance. Dr. Levin’s research interest is the neural control of energy homeostasis in animal models of obesity and diabetes. His areas of expertise include central neurotransmitters, peptides, and anatomical pathways involved in the regulation of energy balance; genetic, nutritional, and neurohumoral influences on brain and metabolic development; exercise and stress in obesity and diabetes; metabolic sensing by neurons in the brain; and hypoglycemia-mediated effects on the brain and neuroendocrine systems. I predict that, considering the growth rate of this research area in our journal (and so many other journals), Dr. Levin is bound to be among our busiest editors.

Providing leadership in renal hemodynamics and cardio renal integration are David M. Pollock from the Medical College of Georgia in Augusta and Ulla C. Kopp from the University of Iowa. Dr. Kopp is the second member of the core Iowa group and also holds an appointment as a visiting professor at the Karolinska Institute in Stockholm, Sweden. Dr. Kopp’s research is in the neural control of renal function in health and disease, with special emphasis on the afferent renal innervation of the kidney. Her research currently focuses on the interaction between efferent and afferent renal innervation and the role of angiotensin and endothelin in this interaction. The overall goal of Dr. Pollock’s laboratory is to elucidate the physiological and pathophysiological role of endothelial-derived factors in the control of renal function relative to hypertension and cardiovascular disease. The work in his laboratory utilizes an inte-
igration of animal models with cellular and biochemical approaches. With this multidisciplinary approach, his laboratory is exploring physiological and pathophysiological mechanisms of vasoactive mediators, including endothelin, nitric oxide, and superoxide, all involved in hemodynamic and renal tubular mechanisms.

Integrating several of the themes already mentioned is Quentin J. Pittman from the University of Calgary Health Sciences Center, and myself from the University of Iowa. Dr. Pittman’s research focuses on the central autonomic control of fever, antipryresis, and blood pressure and on the synaptic pharmacology of important endocrine and autonomic nuclei, such as the supraoptic nucleus of the hypothalamus and the dorsal vagal complex. In addition, he studies plasticity of neuronal function during pregnancy and lactation, and the influence of neonatal immune challenges on adult autonomic function. Dr. Pittman is interested in a number of transmitters, including cannabinoids, neuropeptides, and amino acids. My research interests center on the genetic and molecular basis of blood pressure regulation, central and renal mechanisms in hypertension, and the regulation of vascular function by ligand-activated transcription factors.

Rounding out the Iowa team is Allyn L. Mark, who along with Friedrich C. Luft from the Max-Delbrück Center and the Charité in Berlin, Germany will serve as Medical Consulting Editors, providing advice on clinical or human research.

Finally, one area of the journal that deserves a special focus is comparative physiology. It is my hope that our journal will become the home of the comparative and evolutionary physiology section of the APS, and with their help, the top comparative physiology journal overall. To illustrate our commitment to this, I have recruited two Associate Editors, Hiroko Nishimura from the University of Tennessee is making her second appearance as an associate editor, having been a part of John Hall’s editorial team. Dr. Nishimura’s research focuses on the humoral control of cardiovascular and renal homeostasis in intact and pathological states, using integrative and comparative approaches. She uses comparative approaches because they elucidate evolutionary perspectives of physiological functions and processes and provide unique animal models for biomedical research. Appointed as a new associate editor in this area is Martin Klingenspor from Phillips-University in Marburg, Germany. Dr. Klingenspor uses a combination of comparative genomics and genome-wide gene expression profiling to investigate the physiological and molecular basis of thermogenesis, energy storage, and body weight regulation in mammals. His main research interests are metabolic phenotyping of small mammals, diet-induced obesity, neuroendocrinology of energy balance, respiration control in cultured cells, and regulation of mitochondrial proton leakage.

Comparative genomics is an area of the journal we hope to strongly promote as we feel physiologists will increasingly seek integration of comparative genomics in their hypotheses and experiments. Indeed, one of the important tasks of integrative physiology is to connect genomic and proteomic information to the physiome, and comparative genomics provides an important tool to accomplish this. According to the Physiome Project (2).

“The Physiome is the quantitative and integrated description of the functional behavior of the physiological state of an individual or species. It describes the physiological dynamics of the normal intact organism and is built upon information and structure (genome, proteome, and morphome). It should define relationships from genome to organism and from functional behavior to gene regulation.”

Comparative approaches can be employed to search for conserved regions of the genome and proteome among species (invertebrates and vertebrates alike) at various stages of taxonomy and evolution, with the goal of relating this molecular information with function. It is fitting that there is a wealth of information in genomic, proteomic, and physiological databases that can be applied to this task. Where is this information and how can it be used? We pledge to help physiologists gather this information by highlighting the best databases and instituting a program of tutorials on how to mine existing data.

What else can you expect from us? We will continue the Call for Papers program and we anticipate new announcements to be released early in 2008. We will also strive to highlight in reviews and primary research articles the best of the Experimental Biology meeting and relevant APS conferences. Moreover, readers of the journal can expect us to provide fair, rapid, and unbiased reviews of their submissions. Our goal is to keep the time from submission to first decision to 30 days or less.

We are also committed to continue a tradition of promoting international physiology. In 2006, 50% of the submissions to our journal came from outside the United States. Demonstrating our commitment to European authors was the appointment of Drs. Persson and Luft as consulting editors, and Drs. Klingenspor and Kopp as associate editors. Importantly, Dr. Nishimura spends time each year in Japan and intends to open up a line of communication with Japanese physiologists. We also pledge to appoint scientists from around the globe to positions on the Editorial Board.

Should we as editors expect something in return? Of course, we seek to publish the most significant research on physiological regulation and integration, on studies exploring the convergence of physiological mechanisms using diverse experimental tools and on studies elucidating fundamental physiological mechanisms through comparative physiology and comparative genomics. At the same time, we demand a high level of scientific integrity from our authors and reviewers. Indeed, we expect that the studies submitted to the journal will be performed rigorously and reported responsibly.

In closing, I am energized by the prospect of future associations with the editorial team, members of the editorial board, reviewers, and authors. I am encouraging the readers of the journal to communicate to me their ideas for reviews, editorials, tutorials, point/counterpoints, calls for papers and any other special features you think should be considered. Feel free to contact me through the editorial office at AJP-Regulatory@uiowa.edu.

REFERENCES