Canadian Society for Exercise Physiology Symposium on Integrative Physiology Honouring Dr. Bengt Saltin: The use of Exercise to Study Integrative Physiology

In March of 2015 the field of exercise physiology lost a champion with the passing of Dr. Bengt Saltin. Over the last 50 years Dr. Saltin performed experiments that laid the foundation for the contemporary field of exercise physiology and stimulated advancements through establishing connections to many other fields of science. His integrative studies of exercising humans encompass an incredible range of topics, publishing over 450 peer review articles that examine exercise and exercise training from all angles. He published formative studies in the area of energy substrate utilization, with work on fatty acids and lipids, glucose, glycogen, proteins and amino acids, and oxygen, as well as the areas of cardiovascular responses to exercise and skeletal muscle blood flow. What truly set Dr. Saltin apart as a scientist was the fact that he studied exercise through such a wide variety of lenses, including altitude, training, and genetics, and also examined both the respiratory and neural components of exercise and conducted seminal work on bed rest, which changed the standard of practice for recovering patients. His studies include over 80 papers on a variety of special populations, such as work on children, women, teenagers, patients with depression, hypertension, aging, ischemic heart disease, obesity, and also includes studies on myokines, blood doping, and the development of the pioneering concept of exercise as medicine. He was a true innovator and integrator in the area of exercise physiology. Of equal if not greater importance to the integrated nature of Dr. Saltin’s scientific work was how he conducted this monumental scientific endeavour. Through his dedication to training, scientific cooperation, collaboration, and collegiality he has left a legacy of equally dedicated, collaborative trainees and colleagues in the area who will carry on the work and strive to embody this honorable approach to their scientific careers, thereby ensuring that the field of exercise physiology will be a healthy, vibrant field for decades to come. The Canadian Society for Exercise Physiology honoured Dr. Saltin’s contribution to this field in a special symposium in October 2015. One symposium to encompass the breadth of Dr. Saltin’s work was impossible to mount; therefore, the symposium was constructed to honour the integrated nature of his work and his dedication to training by inviting speakers whose work embodies the same integrative spirit and share his dedication to mentorship and collegiality. The speakers were asked to write reviews based on their symposium presentations and Applied Physiology, Nutrition, and Metabolism honouring Dr. Saltin by publishing the proceedings from this symposium.

The reviews begin with a historical reflection by Dr. Michael Joyner on the field of what was originally called “work physiology” to set the context in which Dr. Saltin established his scientific direction. Dr. Joyner tracks the leadership role that Dr. Saltin played in the emerging field of exercise physiology by summarizing the scientific impact of his contributions in this area but also, importantly, reminds us of Dr. Saltin’s significant contributions to the scientific enterprise through his development of the Copenhagen Muscle Research Centre and the collaborative spirit that he built it on.

The second review, by Dr. Philip Ainslie, provides an overview of the important contributions that Dr. Saltin made to the field of environmental physiology with a focus on thermal regulation and the physiological adaptations to hypoxia. Dr. Ainslie highlights the field studies at altitude that resulted in Dr. Saltin’s major contributions to the field of altitude physiology.

Dr. Martin Gibala, a postdoctoral trainee of Dr. Saltin’s, wrote a review that highlights Dr. Saltin’s work in the field of physical exercise and training that culminated in his pioneering concept that exercise is medicine. Dr. Gibala highlights seminal papers and important advances made by Dr. Saltin in the areas of exercise training, exercise metabolism, and exercise physiology.

Finally, the fourth review, by Dr. Robert Boushel, a trainee and longtime colleague of Dr. Saltin, reflects on the scientific contributions of Dr. Saltin to the field of exercise physiology, focusing on skeletal muscle blood flow regulation and human performance. Dr. Boushel also emphasizes the importance of the field studies performed by Dr. Saltin and highlights their importance in the field of altitude and sport physiology.

In keeping with the spirit of Dr. Saltin’s dedication to mentorship, during the symposium, each of the speakers urged graduate students and faculty alike to know their history and to learn about the foundation upon which their science is based through reading both the history of exercise physiology and the seminal papers in the field. This history is dominated by important, seminal work contributed by Dr. Saltin, as his work forms the fundamental principles on which the field of exercise physiology is built. As Dr. Gibala comments in his review, much of what is common knowledge in exercise physiology is based on work conducted in Bengt’s lab or through his collaborative efforts. These reviews provide insight and context into the seminal work of Dr. Bengt Saltin, and although not an exhaustive list, the reviews’ reference lists provide a starting place for the treasure trove of Dr. Saltin’s formative work.

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