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1995

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PREFACE

The 23rd annual meeting of the International Society on Oxygen Transport to Tissue took place from August 23–27, 1995, at the Station Square Sheraton along the shores of the Monongahela River where it meets with the Allegheny and Ohio Rivers to form the “Point” of the city of Pittsburgh. Pittsburgh was a convenient location for the meeting being between both the East and West coasts of the United States and between the Asian and European continents. It is easily accessible by air via its large international airport. In addition, Pittsburgh has just recently undergone a transition from the steel mills and industries of old to an age of computers and biotechnology as evidenced by the new Biotechnology Center of the University of Pittsburgh where a lunch and tour were provided for interested participants. On the tour, the participants got to see the mix of projects ranging from molecular biology to clinical projects studying membrane oxygenators, ventricular assist devices, oxygen carriers, and more, representing the forefront of research on oxygen delivery systems to tissue.

This small 300-member society of physicists, chemists, clinicians, engineers, biochemists, and biological scientists is responsible for some of the major developments in the delivery of oxygen to tissues such as: (1) Microelectrodes for oxygen, carbon dioxide, and various ions; (2) Fluorocarbons; (3) Methods of tissue oxygen mapping; (4) Blood substitutes; and (5) Noninvasive near infrared spectroscopy or cerebral oximetry, clearly attesting to the success of this peculiar blend of scientists, engineers, mathematicians, and clinicians. One hundred fifty registrants with 115 free presentations participated in this meeting to continue the tradition of open debate and scientific exchange in free presentations highlighted by special invited lectures aimed at bringing new areas of focus. Lectures on positron emission tomography and functional magnetic resonance imaging brought to this society for the first time, emphasized the application of these powerful imaging techniques in assessing regional brain oxygen metabolism and function. A lecture on angiogenesis emphasized the dynamic processes occurring within tissues in adapting to oxygen deficiency while a lecture on metabolic compartmentation reminded us of the heterogeneity and compartmentation of not only tissue oxygenation and perfusion, but also metabolism at the cellular level. Lectures on hemoglobinopathies and potential mechanisms of amelioration in addition to the development of oxygen carriers bring to the fore the potential for molecular biology in addressing problems in tissue oxygenation. Finally, lectures on the chemistry of nitric oxide and other oxygen radicals, and the role of free radicals in tissue oxygenation brought to fore, other roles of oxygen in regulating tissue oxygenation and its potentially detrimental effects.

To encourage the participation of young scientists and clinicians in the society, two awards are presented at each meeting. Dr. Clare E. Elwell of the Department of Medical

Physics was the winner of the Melvin H. Knisely Award for her contributions in near infrared (NIR) spectroscopy and consistent productivity in the field and to the society. Dr. Phillip E. James was awarded the Lubber's award for his paper entitled, "Intrarenal PO_2 Measured by EPR Oximetry and the Effects of Bacterial Endotoxin."

In the area of assessing tissue oxygenation, the free papers revealed the clinical application of NIR spectroscopy and cerebral oximetry, a brain-child of this society, in various clinical states, touching the surface of this potentially valuable monitoring technique in noninvasive monitoring. The early development of NIR for optical imaging was also presented. The use of NIR phosphors was also developed for tissue oxygen mapping attaining greater penetration into the tissue. Several papers from one group highlighted the application of electron paramagnetic resonance (EPR) oximetry to the measurement of tissue oxygenation using paramagnetic materials introduced into the tissue. Highlighting one aspect of bioengineering in molecular biology from the industrial aspect, a group of papers focused on all aspects of protein kinase C separation and production on an industrial level from transgenic animals. As in the past, various aspects of tissue oxygen delivery and measurements of tissue oxygenation were presented as it relates to the brain, heart, and tumors in terms of oxygen delivery with oxygen carriers, tissue adaptation to hypoxia by angiogenesis, and the role of leukocytes and the immune response to tissue hypoxia and injury. Finally, the continued role of nitric oxide and oxygen free radicals to tissue injury and regulation of tissue oxygenation was also explored.

Following the meeting in Pittsburgh, some of the ISOTT members attended a satellite meeting on "Adaptation to Hypoxia" at Case Western Reserve University in nearby Cleveland, Ohio. A total of 70 attendees discussed hypoxic adaptation from the cellular level to macro adaptations in human populations living at high altitude for generations.

The editors wish to thank the local organizing committee for their painstaking work in reviewing and grading the abstracts presented and their enthusiastic support. We also thank the consulting editors for their work on the manuscripts and by doing so, have provided peer-review. We owe special thanks to Ms. Laraine Visser for her meticulous work in editing all of the manuscripts and the staff of Plenum Press who have been very cooperative and have done a great job. Finally, we would like to especially thank the staff of the Continuing Education Center of the University of Pittsburgh Medical Center, and in particular, Ms. Diane Applegate.

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