

## Joseph Adrian Jeevendra Martyn, M.D., F.R.C.A., F.C.C.M., Recipient of the 2010 Excellence in Research Award

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THE 2010 Excellence in Research Award has been presented to J. A. Jeevendra (Jeeva) Martyn in recognition of his exceptional career of scientific inquiry and endeavor. Dr. Martyn is Director of the Clinical and Biochemical Pharmacology Laboratory of the Department of Anesthesia at Massachusetts General Hospital and Shriners Hospital for Children, Anesthetist-in-Chief at the Shriners Hospital for Children in Boston, and Professor of Anesthesia at Harvard Medical School. The highest recognition that can be bestowed by the American Society of Anesthesiologists, this award represents the pinnacle of professional achievement, acknowledging the designee for research of an original, sustained, clinically relevant, and lasting nature.

Dr. Martyn is an outstanding anesthetist *cum* intensivist who has profoundly influenced the science and practice of anesthesiology and critical care medicine. In his role as clinical investigator, he has revolutionized the care of burn patients, a discipline in intensive care medicine that is not practiced extensively by anesthesiologists. He is a world authority on disease-induced up-regulation and down-regulation of the acetylcholine receptor in muscle and its interaction with agonist and antagonist drugs. He has contributed most of what we know about the molecular mechanisms of critical illness-induced insulin resistance, with the therapeutic goal of correcting the muscle wasting and associated disuse-induced muscle atrophy. Finally, he is the world's leading authority on the clinical therapeutics of critically ill burned patients.

Arthur Keats' Rovenstine Lecture (1983) referred to the view of Myron Laver (1926–1982) (Late Professor at Harvard Medical School and Massachusetts General Hospital) that anesthesiology was at its best when observations made on a sample of patients could be applied to a broader class, thereby contributing to the benefit of medicine at large. This sentiment aptly describes the most defining aspect of Dr.



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Martyn's work. Throughout his career, he has applied his clinical interest and personal observations to define clinically important questions identified in the operating room or intensive care unit and then used these observations as the impetus to create and guide laboratory studies to define mechanisms and improve care. To accomplish his goals, he often has transformed himself as a scientist by learning and applying a myriad of new techniques. Most of his findings, usually arising from observations in the burn population, have led back to the bedside, where they have proved beneficial to a much broader spectrum of patients than originally envisioned. This approach epitomizes the goals of modern investigative medicine.

Dr. Martyn was born in Sri Lanka and received his medical degree from the University of Colombo, Sri Lanka, before coming to the United States. Having completed his residency in Anesthesiology at the College of Physicians and Surgeons, Columbia University-Presbyterian Hospital, he extended his training at the Radcliffe Infirmary and the University of Oxford, England. After a formal National Institutes of Health-sponsored postdoctoral research training fellowship, his self-directed evolution as a research scientist and academic career commenced. He has spent his entire post-training career at Massachusetts General Hospital and Shri-

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ners Hospital for Children, spawning a gamut of investigation from cell culture, whole-animal/human studies, and pharmacokinetics to molecular medicine. Early in his career (1979), his investigations in humans led to the use of thermodilution as a measure of cardiodynamics, a mainstay of clinical intensive care unit practice for many years. His studies on the clinical and basic pharmacology of a number of important drugs, such as neuromuscular blocking agents, adrenoceptor agonists, sedative and narcotic drugs, and H<sub>2</sub>-receptor antagonists, have explained the mechanisms that account for the altered responses to these drugs in critically ill and burned patients. These studies have ultimately redefined the dosing schedules for several drugs commonly used in the burn intensive care unit. Over the years, his work has become increasingly more sophisticated, not only in terms of technique, but also in the hypotheses under examination.

All of these studies set the stage for Dr. Martyn's most important research into the mechanics of insulin resistance, dating back to his first report in the *Journal of Biological Chemistry* in 1997, which preceded Van den Berge's seminal article in the *New England Journal of Medicine* by 4 yr. He continued with this line of investigation, by documenting the nature of disease-induced alterations in insulin signaling, focusing on the role of protein kinase B and glycogen synthase kinase-3 as the nexus of decreased insulin function. His laboratory was the first to document apoptosis in muscle as an important mechanism of muscle mass loss in critical illness and the first to describe the apoptotic pathways that are most often activated in muscle cells.

To date, the single most important and clinically relevant discovery to come from his laboratory is the role of inducible nitric oxide synthase in the posttranslational modification

(nitrosylation) of insulin-signaling proteins. This finding lies at the heart of decreased insulin signaling *via* protein kinase B and the glycogen synthase kinase-3 pathways and also explains the accelerated breakdown of insulin-signaling proteins, key mechanisms that lead to insulin resistance in critical illness. His laboratory is currently studying novel therapies that stem from this knowledge. Many will concur that, to date, his effective use of burned subjects as a model for insulin resistance in all critical illness represents his greatest and most lasting contribution to medical practice.

In Boston, Dr. Martyn has instituted a meticulous laboratory that is reflected in his continuous record of funding by the National Institutes of Health and the Shriners Hospitals Research Philanthropy. He has attracted talented individuals, many of whom have benefited from his mentorship in their own careers. He is an outstanding example of the best in U.S. academic anesthesiology. Dr. Martyn is well regarded by colleagues for his warm and congenial personality. Humble to a fault, he is sometimes overlooked when we list the giants of our field. Given his multidisciplinary impact, however, he very much deserves to be listed among the leaders of our discipline. He is one of the anesthesiologists of this century that has truly made a difference. His clinical and basic science research findings have formed the foundation upon which modern burn care is practiced in many disciplines across medicine. In short, Dr. Martyn exemplifies the kind of physician-scientist for whom this esteemed prize was created. A dedicated husband and father, I know it pleases him to share the fruits of his success with his wife, Raji, his sons, Rajeeve, Sanjeeve, and Trejeeve, and his daughter-in-law, Melissa. I join the society and his peers and colleagues in saluting his stellar achievements.