CHEST

Giants in Chest Medicine: Emeritus Professor Peter D. Wagner, MD

VIDEO

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Following a distinguished career spanning > 50 years, Dr Peter Wagner reflects on having made his "best" career decision when he chose to train in medicine. Even at 17 years of age, his characteristic clarity and critical consideration led him to this path where his hard skills in mathematics and physics could meet challenges of complex problems related to health and disease. Built upon this foundation, Dr Wagner's research has made extraordinary contributions in respiratory physiology and is complemented by his substantial contributions in mentoring and scientific leadership at local, national, and international levels.

As a medical student, Dr Wagner worked with physicians studying lung physiology and, following his passion to integrate research, published some of his earliest work in the *Journal of Applied Physiology*. After obtaining his medical and BSc (Medicine) degrees from Sydney University in 1968, he sought opportunities to work with top physiologists, including Dr John West at the University of California San Diego, from whom he accepted a postdoctoral position in 1970. Following the first lunar landing, Dr West had a NASA grant to study gravitational effects on lung function, providing the first of numerous opportunities throughout the course of Dr Wagner's exemplary career in which he could rigorously apply his medical training to his scientific curiosity. Dr

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Wagner joined the faculty at University of California San Diego a few years later and remains there today as Emeritus Faculty.

Early in his career, Dr Wagner recognized a gap in the understanding of limitations to pulmonary gas exchange and sought innovative collaborations to advance the field. By coupling experimental measurements with computer modeling, he developed the multiple inert gas elimination technique (MIGET) to determine the distribution of ventilation and blood flow throughout the lungs. MIGET elegantly exploits the ability to simultaneously measure the exchange of six inert gases, each with distinct blood solubility, and from these

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ADDITIONAL INFORMATION: See video interview of Dr Wagner online at chestjournal.org.

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measurements, reconstruct the functional distribution of ventilation-perfusion ratios. This major contribution to the field, founded on Dr Wagner's rare combination of skills and drive to solve complex problems, has led to major advancements in respiratory physiology. More than 500 published studies have applied the principles of MIGET to contribute insights into lung physiology under various conditions in healthy individuals, patients, and animals.

Dr Wagner continued his pioneering investigative work as a member of the Operation Everest II research team, which examined, at unprecedented levels, human responses during a 40-day simulated ascent of Mount Everest. The simultaneous, multidisciplinary efforts of the investigative team captured extraordinary insights that simply could not be achieved in the field. These insights included Dr Wagner's work on diffusion limitation and ventilation-perfusion ratio inequality in the lung as well as establishing novel insights regarding the role tissue diffusion limitation plays in limiting maximal oxygen consumption. Dr Wagner's research continues to address the theoretical and experimental basis of oxygen transport and its limitations in the lungs and skeletal muscles utilizing multiple methods: mathematical modeling, cellular and molecular biology, and whole-animal and human research projects in the context of health and disease. The breadth and depth of his work are reflected in hundreds of invited chapters and more than a few hundred manuscripts.

As a mentor, Dr Wagner explains complex concepts with impeccable clarity, models high standards, and invests his time and effort far beyond the call of duty to help others answer the question at hand. He has established collaborations and training opportunities in more than a dozen countries and provided mentorship to hundreds of individuals, including many leaders in the field with successful research programs of their own. In addition, his formal teaching efforts are well recognized by numerous distinguished lecturer and teaching awards.

Dr Wagner's scientific leadership is exemplified by his roles as President of the American Thoracic Society, President of the American Physiological Society, and Division Chief of both Physiology and Pulmonary Critical Care at the University of California San Diego School of Medicine. Furthermore, he has served as both member and chair of National Institutes of Health study sections and dedicated his efforts as an Associate Editor of the *Journal of Clinical Investigation* and Editor of the *Journal of Applied Physiology*.

Dr Wagner recently entered the "retirement" phase, in which he continues to pursue his varied interests in physiology with the same clarity and dedication he demonstrated throughout his career. While he remains focused on scientific and research objectives, he has reignited another passion also born during his early adulthood: an interest in wine and winemaking. Anyone who knows Dr Wagner will be impressed but not surprised that he has since built his own vineyard overlooking the Pacific Ocean. I encourage everyone to listen to Dr Wagner's interview, perhaps with a glass of wine made with the fruits of his labor, and be inspired by his insights, passion, and dedication to advancing our scientific understanding of respiratory physiology.

Suggested Readings

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