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Determinants of Respiratory Pump Physiology in Health and Disease



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ABSTRACT:

In my talk, I will discuss progress made towards understanding the physiology of respiratory pump. Specifically, I will cover mechanisms that alter respiratory muscle function in health and disease. I will focus on the diaphragm as the main inspiratory muscle in mammals, and examine certain determinants of diaphragm mechanics, utilizing both in vitro and in vivo studies. These determinants include the unique mechanical properties of the diaphragm, as well as structural characteristics such as its shape and the fiber architecture of its muscles. I will present numerous approaches to assessing the physiology of the diaphragm, including measuring diaphragmatic muscle fiber curvature, muscle contractility, and associated volume displacement. I will also cover the mechanical role of a key cytoskeletal protein in modulating respiratory muscle mechanics and summarize published data from our lab on mechanotransduction of the respiratory pump.

BIOGRAPHY:

Dr. Aladin Boriek is a tenured Professor of Medicine and Molecular Physiology and Biophysics at Baylor College of Medicine. Dr. Boriek received a master's degree from the University of Michigan in Mechanical Engineering in 1984 and a PhD degree from Rice University in 1990. In 1994, he completed his postdoctoral training at Baylor College of Medicine in respiratory mechanics under the mentorship of Dr. Joe Rodarte. Dr. Boriek has been a regular member of the Respiratory Integrative Biology and Translational Research Study Section. He has served on other NIH study sections including The Respiratory and Applied Physiology, The Skeletal Muscle Biology and Exercise Physiology, and The Bioengineering and Physiology. He has also served as an external reviewer for the Surgery Review Board of the Department of Veteran Affairs, the Canadian Institutes of Health Research, the Canadian Thoracic Society, and the Research Grant Council of Hong Kong. He has also served on numerous review panels for the National Science Foundation. He served as a member of the editorial Board of the Journal of Applied Physiology and is currently a member of the editorial board of multiple journals including the American Journal of Physiology. Dr. Boriek has active NIH and NSF grant funding. He has published nearly eighty papers in peer reviewed journals in the areas of respiratory muscle mechanics, mechanical signal transduction, muscular dystrophy, aging, obesity, and chronic obstructive pulmonary disease