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Nitric oxide and heart disease: New discoveries and innovations in diagnostics and therapeutics

Nitric oxide (NO) is a multifunctional signaling molecule, intricately involved with maintaining a host of physiological processes including but not limited to host defense, neuronal communication and the regulation of vascular tone. The endothelium-derived NO plays a crucial role in regulating a wide spectrum of functions in the cardiovascular system, including vasorelaxation, inhibition of leukocyte endothelial adhesion, vascular smooth muscle cell (SMC) migration and proliferation, as well as platelet aggregation. In this regard, NO is a potent vasodilator as well as a powerful antiplatelet and anti-leukocyte factor. NO is one of the most important signaling molecules in our body. Loss of NO function is one of the earliest indicators or markers of disease. Experimental and clinical studies provide evidence that defects of endothelial NO production, referred to as endothelial dysfunction, is not only associated with all major cardiovascular risk factors such as hyperlipidemia, diabetes, hypertension, erectile dysfunction, smoking and severity of atherosclerosis, but also has a profound predictive value for future atherosclerotic disease progression. Emerging published literature reveals that NO insufficiency may manifest itself differently in different patients. 30 plus years after its discovery and 20 years since a Nobel prize was awarded for its discovery, innovations into safe and effective therapeutics has been slow. The current state of the science surrounding nitric oxide in the etiology of a number of different disease states will be reviewed and also the latest technology to safely and effectively restore nitric oxide in patients will be revealed. The audience will learn the challenges and opportunities that exist in understand NO homeostasis in their patients and how this may translate into better management of their patients. New discoveries on novel compositions of matter to generate NO gas and recouple endogenous NO production may lead to new class of NO active drugs.

Biography

Nathan S Bryan has earned his undergraduate Bachelor of Science degree in Biochemistry from the University of Texas at Austin and his doctoral degree from Louisiana State University School of Medicine in Shreveport where he was the recipient of the Dean's award for Excellence in Research. He pursued his postdoctoral training as a Kirschstein Fellow at Boston University School of Medicine in the Whitaker Cardiovascular Institute. After a two-year post-doctoral fellowship, in 2006 he was recruited to join as Faculty at the University of Texas Health Science Center at Houston by Ferid Murad, MD, PhD, 1998 Nobel laureate in Medicine or Physiology. His 9 years at UT led to several discoveries which have resulted in over a dozen issued US and international patents and nine pending worldwide. He is also a successful entrepreneur who has successfully commercialized his nitric oxide technology through human. He has published a few highly cited papers and authored or edited five books. He is an international leader in molecular medicine and nitric oxide biochemistry.

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