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Interoreceptors and Cardiopulmonary Pathology

Chronic Heart Failure (CHF) is among the several cardiopulmonary disorders that are responsible for 74.5% of deaths world wide according to the report from WHO in 2013. The malfunctioning carotid body (CB) is responsible for increasing output from the sympathetic nervous system (SNS). This increase affects breathing patterns, cardiac performance, kidney function. Experiments in animal models have uncovered ways in which the CB can return to normal. It is perhaps an opportune time to understand this interoreceptor, arguably the most important in the organism. Located bilaterally at the junction of the carotid arteries bifurcation into external and internal branches, this structure in humans is tiny…weighing 18 mg. Yet measured blood flow through the feline version exceeds 2 L/min/100gm tissue. CBs are the sole detector of decreases in P_aO_2; it also is stimulated by increases in P_aCO_2 and H+, and glucopenia. Stimulation produces reflex responses in the cardiopulmonary, endocrine, and renal systems. CHF reduces the production of nitric oxide (NO) in the CBs, allowing for a greater release of ACh and ATP which stimulates the increase in SNS output. Efforts to reduce CB output in both humans and animal models have uncovered three techniques which show promise. Reduction in CB neural output is the key factor to restore normal cardiac function and reduce hypertension.

Biography

Robert S. Fitzgerald received his PhD from The University of Chicago. He did post-doctoral training at UCSF/CVRI in San Francisco and in France at Universite de Nancy and Universite de Paris. Returning to his faculty position at The Johns Hopkins Medical Institutions, he eventually became Associate Chair, then Acting Chair of the Dept. of Environmental Health Sciences in the Bloomberg School of Public Health with Joint Appts. in the Depts. of Physiology and of Medicine in the School of Medicine. His CV includes over 200 contributions to peer-reviewed publications.

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