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Building muscles: the molecular regulation of muscle regeneration by H₂S

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Hydrogen sulfide (H₂S) was originally considered toxic at elevated levels; however just in the past decade H₂S has been proposed to be an important gasotransmitter alongside nitric oxide and carbon monoxide. H₂S can be generated endogenously from L-cysteine by multiple enzymes. Numerous studies have demonstrated that H₂S influences various cellular functions and pathophysiological processes. Many of the effects of H₂S are mediated through reactions with cysteine sulfur on regulatory proteins via S-sulphydration, which affects the structure and functionality of the proteins and alters enzymatic activity, protein localization, protein stability, and protein interactions, etc. The discoveries on H₂S signaling in biology and medicine exhibit a continuous trend of increase, reflecting the increased research intensity and diversity globally. Considering the key role of H₂S in both health and diseases, a better understanding of the regulation of H₂S metabolism and its molecular mechanisms in regulating cellular functions will help us to develop novel and more effective strategies for clinical therapy. Our recent findings support an essential role for H₂S in maintaining myogenesis and building muscle upon various damage, presenting it as a potential candidate for prevention of age-related sarcopenia and treatment of muscle injury.

Biography

Dr. Guangdong Yang is a Professor in the School of Natural Sciences and the director of Cardiovascular and Metabolic Research Unit (CMRU), Laurentian University, Canada. Dr. Yang's research focuses on the regulation of cardiovascular health in general, and the pathogenesis and treatment of diabetes, atherosclerosis, and hypertension in particular. His research has been supported by the Canadian Institute of Health Research (CIHR), the Natural Sciences and Engineering Research Council of Canada (NSERC), and the Heart and Stroke Foundation of Canada (HSFC). Dr. Yang received New Investigator award from Heart and Stroke Foundation of Canada (2008) and Maureen Andrew Award from Heart and Stroke Foundation of Ontario (2010). He has published 130 peer-reviewed papers and many of them were published in high-impact journals, including as Science, Circulation, Proc Natl Acad Sci U S A, and EMBO report etc. The total citation number is 11600 (google scholar) with an H index as 46.

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