

Nrf2 activation as a future target of therapy for chronic diseases

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ABSTRACT

Chronic inflammation integrally related to oxidative stress has been increasingly recognized as a contributing factor in various chronic diseases such as neurodegenerative diseases, pulmonary diseases, metabolic syndrome, and cardiovascular diseases as well as premature aging. Thus, inhibiting this vicious circle has the potential to delay, prevent progression, and treat those diseases. However, adverse effects of current anti-inflammatory drugs and the failure of exogenous antioxidant encourage scientists to develop new therapeutic alternatives.

The nuclear factor E2-related factor 2 (Nrf2) is the transcription factor that is responsible for the expression of antioxidant response element (ARE)-regulated genes and have been described as having many therapeutic effects. In this review, we have discussed the role of oxidative stress in various chronic diseases. Furthermore, we have also explored various novel ways to activate Nrf2 either directly or indirectly, which may have therapeutic potential in attenuating oxidative stress, inflammation and mitochondrial dysfunction that contributes to chronic diseases.

Keywords: Oxidative stress, Mitochondria, Inflammation, Nrf2, Nutrition, Chronic diseases