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Promoting cardioprotection with fenugreek: Insights from CoCl₂-induced hypoxia in neonatal rat cardiomyocytes

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Abstract

Objective(s): This study aimed to investigate the protective effects of fenugreek on CoCl₂-induced hypoxia in neonatal rat cardiomyocytes. Materials and Methods: Primary cardiomyocytes were isolated from Sprague Dawley rats aged 0–2 days and incubated with various concentrations of fenugreek (10–320 µg/ml) and CoCl₂-induced hypoxia for different durations (24, 48, and 72 hr). Cell viability, calcium

signaling, beating rate, and gene expression were evaluated. Results: Fenugreek treatments did not cause any toxicity in cardiomyocytes. At a concentration of 160 µg/ml for 24 hr, fenugreek protected the heart against CoCl₂-induced hypoxia, as evidenced by reduced expression of caspases (-3, -6, -8, and -9) and other functional genes markers, such as HIF-1α, Bcl-2, IP3R, ERK5, and GLP-1r. Calcium signaling and beating rate were also improved in fenugreek-treated cardiomyocytes. In contrast, CoCl₂ treatment resulted in up-regulation of the hypoxia gene HIF-1α and apoptotic caspases gene (-3, -9, -8, -12), and down-regulation of Bcl-2 activity. Conclusion: Fenugreek treatment at a concentration of 160 µg/ml was not toxic to neonatal rat cardiomyocytes and protected against CoCl₂-induced hypoxia. Furthermore, fenugreek improved calcium signaling and beating rate and altered gene expression. Fenugreek may be a potential therapeutic agent for promoting cardioprotection against hypoxia-induced injuries. © 2023 Mashhad University of Medical Sciences. All rights reserved.

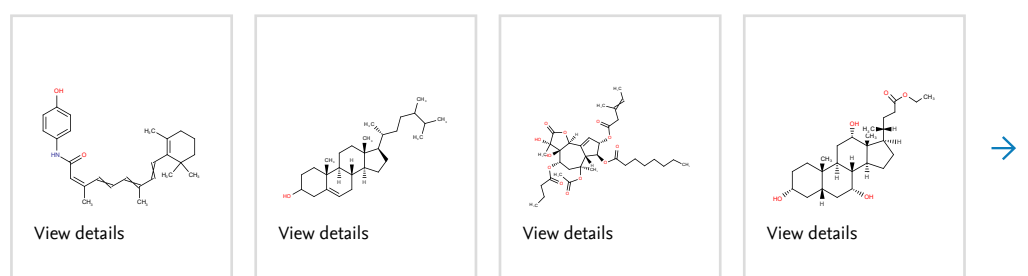
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Cardiomyocytes; Hypoxia; Ischemia; Therapeutics; Trigonella foenum-graecum


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