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הרצאת התקדמות לתואר שלישי

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הנושא:

Effect of glabridin, an isoflavan from licorice root, on the antioxidant defense system and anti-atherogenic factors under glucose stress, in vitro and in vivo

המפגש יתקיים
ביום א', 1 פברואר 2015, בשעה 9:00
מועדון סגל

Abstract:

In females, hyperglycemia abolishes estrogen-vascular protection, leading to increased oxidative stress, impaired antioxidant defense and chronic inflammation, all of which accelerate diabetes-associated cardiovascular complications. Thus, the search for candidates to replace specific beneficial activities of estrogen is a goal in basic biomedical research, dealing with the preventive treatment of cardiovascular diseases in diabetic women. Glabridin, an isoflavan with features common to the structure of estrogen, is a candidate that is researched in our laboratory. It has estrogen-like activity in that it binds to the estrogen receptor, leading to beneficial health effects in estrogen-responsive tissues, e.g., vascular tissues. Such knowledge led us to examine the potential of glabridin, as an estrogen replacement for anti-inflammatory activity and regulation of antioxidant enzymes and anti-atherogenic factors, under high glucose conditions, in vitro and in vivo. We demonstrated in cells that glabridin, under high glucose conditions, may replace functions lost by estrogen, i.e. up-regulation of antioxidant enzymes, such as manganese superoxide dismutase and catalase, as well as the anti-atherogenic factor, paraoxonase 2 (PON2). Under high glucose conditions, glabridin, in contrast to estrogen, down-regulated the pro-inflammatory factor, inducible nitric oxide synthase (iNOS) and reduced the production of nitric oxide and the formation of nitrotyrosine (marker of the potent oxidant ONOO-) in cells. Glabridin supplementation of adult mouse offspring, which developed hyperglycemia, inflammation and oxidative stress, after early fetal exposure to a saturated fatty acid-enriched maternal diet, increased liver and heart PON2 levels and decreased liver iNOS levels. In order to elucidate the glabridin protective effect mechanism on PON2, we demonstrated, in vitro, by Trp-fluorescence quenching and mass spectrometry, that glabridin protects PON2 from CuSO4-induced oxidation by a specific binding hydrophobic interaction. In summary, our data imply that glabridin treatment may replace the beneficial effects of estrogen that are lost under diabetic conditions. Glabridin retains anti-inflammatory abilities and has the potential to strengthen the anti-oxidative defense mechanism, which may overcome oxidative stress and contribute to the attenuation of the development of vascular complications in diabetes.

סגל וסטודנטים מוזמנים להשתתף