

Decoding the activation of nuclear receptor “ppar” in cardio- metabolic disorders

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Abstract

Cardio-metabolic disorders represent a cluster of metabolic abnormalities (including obesity, insulin resistance, hyperglycemia, hyperlipidemia and hypertension) that are risk factors for cardiovascular disease. It is a rapidly growing epidemic representing a serious health threat in many countries worldwide and is responsible for about 70% deaths worldwide. Increased oxidative stress, diabetes and obesity are the major causative components in the pathogenesis and progression of cardiometabolic disorders. Recently, several reports mentioned that downregulation of Peroxisome Proliferator activated receptor (PPAR) expression has been directly implicated in the pathogenesis of cardiometabolic disorders. Norbixin, a natural bioactive compound, has been shown to activate the nuclear receptor PPAR- γ . In the present study, computational and experimental methods were employed to explore the underlying mechanism of norbixin binding to the PPAR- γ receptor. Molecular docking and molecular dynamics (MD) simulation studies showed that norbixin could be embedded into the hydrophobic pocket of PPAR γ and stable hydrogen bonding interactions were found with residues Arg288, Glu295, Glu343, Ser289, His323, His449 and Tyr473 of PPAR γ . Moreover, experimental results of nobixin in high fat diet induced cardio-metabolic disorders in rats further confirmed that norbixin decreased insulin resistance (IR), hyperglycemia, dyslipidemia and anti-oxidant enzyme activities. These results were accompanied by reduced oxidative stress and arterial pressure in a dose-dependent fashion. The histopathology of heart sections also showed that norbixin could prevent the abnormal collagen deposition in heart. Furthermore, PPAR γ protein expressions were increased, whereas NF- κ B expression was decreased by norbixin treatment in western blot studies.



Biography:

I am an Economist by qualification and a Marketer by Profession. I did Masters in Economics from Punjab University, Pakistan. Furthermore, completed Diploma in Marketing, Sales

& Supply Chain from Pakistan Institute of Management. I have been associated with Marketing & Sales activities of Global Anti-Diabetics brands of a Multinational Pharmaceuticals. In that capacity, among other Projects, I have been involved in delivering Lectures and Trainings on Diabetes & Pre-Diabetes, both at National & International levels.

Speaker Publications:

1. “Unsupervised Self-learning, Few-Shot Meta Learning, and Real Data Generation for Realizing Universal Classification Systems
2. “A Universal Parking Lot Management System based on Deep Learning, Modality Fusion, and Transfer Learning
3. “Domain adaptation meets disentangled representation learning and style transfer
4. “High-speed data-plane packet aggregation and disaggregation by P4 switches
5. “IUML: Inception U-Net Based Multi-Task Learning for Density Level Classification And Crowd Density Estimation

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