Apelin and Sirtuin 1 Dysregulation induce Endocrine and Metabolic Disorders in Chronic Disease

Ian James Martins*
Edith Cowan University, Australia

*Corresponding author: Ian J Martins, School of Medical Sciences, Edith Cowan University Western Australia, Tel: +61 8 6304 2574, Email: i.martins@ecu.edu.au
Submission: September 11, 2017; Published: October 02, 2017

Editorial

Interests in chronic diseases have increased globally with the global death related to the increased chronic disease rate [1] with the most prevalent chronic disease such as cardiovascular disease linked to the metabolic syndrome and non alcoholic fatty liver disease (NAFLD). The role of the peptide apelin to the global obesity and diabetes epidemic has become of concern with relevance to its role in ischemic heart failure [2-4], treatment for obesity/diabetes [5-7], neuroendocrine function [3,8], glucose/energy metabolism [5], kidney disease [1,3,9] and NAFLD [10]. Analysis of plasma apelin levels and their regulation by nutrigenomic diets, exercise, drugs, lifestyle changes has become critical to prevent and reverse various chronic diseases that are linked to cardiovascular disease and NAFLD.

Apelin is a peptide and present in a number of tissues such as the GI tract, stomach, heart, brain and adipose tissue [1]. The apelin receptor is a G protein coupled receptor (GPCR) and referred to as the APJ receptor and present in various tissues and in neurons of the hypothalamus [3]. The peptide apelin originates from preproapelin and apelins are a family of peptides and a substrate for angiotensin converting enzyme 2 (ACE2), a carboxy peptidase in the renin-angiotensin-aldosterone system (RAS) responsible for conversions of apelin and angiotensin II [11-13]. Apelin its regulation of the ACE2 and the RAS provide links between hypertension and cardiovascular disease [11-13]. Apelin-13 peptides are potent regulators of cardiovascular function [12] with longer peptides such as apelin-36 more effective in inhibiting HIV infection by blocking the HIV coreceptor APJ [14]. Apelin is involved with the kidney [1,3,9] and water balance with apelin found as a complex with vasopression (co-localization) and the apelin-APJ signaling inhibits the secretion of arginine vasopressin (antidiuretic hormone).

Sirtuin 1 (Sirt 1) is a nuclear receptor that is now important to insulin secretion with relevance to lipid/glucose/energy metabolism [15], insulin resistance [16], cardiovascular disease [17-20], kidney disease [21] and NAFLD [22]. The effects of stress interfere with apelin-Sirt 1 interactions [23] that are essential for the prevention of insulin resistance and mental disorders in diabetes. The pathways for apelin-Sirt 1 interactions and nitric oxide (NO) homeostasis have become of major interest to global endocrinology and metabolism with NO now referred to as the hormone [24] that is involved with the early induction of autoimmune disease [25-27] that is connected to various chronic diseases and neurodegeneration (Figure 1).

Apelin and Sirt 1 levels are of critical importance to NO imbalances connected to cardiovascular disease, autoimmune disease and the induction of global chronic diseases. Plasma apelin and Sirt 1 levels require analysis to assist with evaluation of early NO imbalances with relevance to autoimmune and endocrine/metabolic disorders that involve adipose tissue disease, NAFLD and neurodegeneration (Figure 1).

Sirt 1 is also of primary relevance to endocrine and metabolic disorders that involve adipose tissue disease, NAFLD and neurodegeneration (Figure 1). Plasma levels of apelin and Sirt 1 require analysis [27] to indicate relevance of early chronic disease detection to prevent irreversible immunologic endocrine disease [31,32] that is connected to the global chronic disease epidemic.

Keywords: Apelin; Sirtuin 1; NAFLD; Chronic disease; Cardiovascular disease; Nitric oxide; Hormone; Autoimmune disease
Conclusion

Diet and nutrition have become important to stabilize the global chronic disease epidemic. Excess calorie consumption inactivates the calorie sensitive gene Sirt 1 relevant to apelin dysregulation in endocrinology/metabolism with relevance to irreversible global chronic disease.

Acknowledgement

This work was supported by grants from Edith Cowan University, the McCusker Alzheimer’s Research Foundation and the National Health and Medical Research Council.

References