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

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## 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 GItract, 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 angiotens in 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 forthe 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 neuro degeneration (Figure 1).

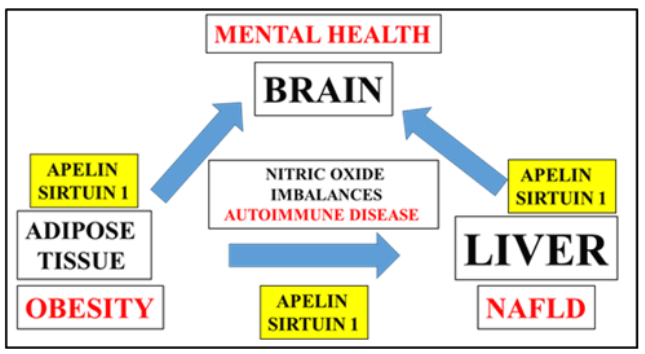


**Figure 1**

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 connected various organ diseases.

Apelin and Sirt 1 are both vasodilators with their role in NO balance imbalances associated with cardiovascular disease [28-30]. In the heart the effects of apelin and its receptor are involved in vasodilation with protection of the heart from uncontrolled contractility and cardiac hypertrophy. NO imbalance is now critical to autoimmune disease [25-27] with defective apelin-Sirt 1 interactions now of primary relevance to endocrine and metabolic disorders that involve adipose tissue disease, NAFLD and neuro degeneration (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 that is connected to NO balance, cardiovascular disease and NAFLD. Sirt 1 repression induces autoimmune disease and has become of primary concern to apelin dysregulation in endocrinology/ metabolism with relevance to irreversible global chronic disease.

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