

2<sup>nd</sup> International Congress on

# EPIGENETICS & CHROMATIN

November 06-08, 2017 | Frankfurt, Germany

## A single gene inactivation with implications to diabetes and multiple organ dysfunction syndromes

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**Statement of the Problem:** Specific genes that are involved in epigenetics are sensitive to nutritional regulation, oxidative stress and the development of insulin resistance that can result from changes in cellular chromatin structure, DNA methylation and histone modifications with relevance to the global chronic disease epidemic. Epigenetic modifications induced by unhealthy diets or environmental xenobiotics involve adipose tissue and liver with immune alterations that determine the survival of cells in various tissues.

**Methodology & Theoretical Orientation:** Genomic analysis identify the defective gene in various chronic diseases as Sirtuin 1 (Sirt 1), a NAD<sup>+</sup> dependent class III histone deacetylase (HDAC) protein that targets transcription factors to adapt gene expression to metabolic activity, insulin resistance and inflammation. Interests in Sirt 1 have increased since it may override the effects of other anti-aging genes such as Klotho, p66Shc (longevity protein) and Fork head box proteins (FOXO1/FOXO3a).

**Findings:** Unhealthy diets inactivate the calorie sensitive gene Sirtuin 1 (Sirt 1) involved in epigenetic processes that promote immune system alterations, mitochondrial apoptosis, non-alcoholic fatty liver disease, diabetes and nitric oxide (NO) modification with relevance to core body temperature involved with appetite regulation, glucose homeostasis and hepatic xenobiotic metabolism. The interplay between NO and epigenetics has attracted interest with relevance to autoimmune disease and mitophagy that has become critical concern to diabetes and the development of multiple organ disease syndrome (Figure 1).

**Conclusion & Significance:** Global chronic diseases involve cellular immune alterations that lead to mitophagy in various tissues. High calorie diets are involved with transcriptional dysregulation and defective hepatic xenobiotic associated with immunometabolism disorders in genetic medicine. Nutritional regulation of Sirt 1 is essential to maintain the interplay between NO, glucose homeostasis, immune system and various nuclear receptors, transcription factors/signaling factors and miRNA involved in epigenetics with relevance to human diabetes.

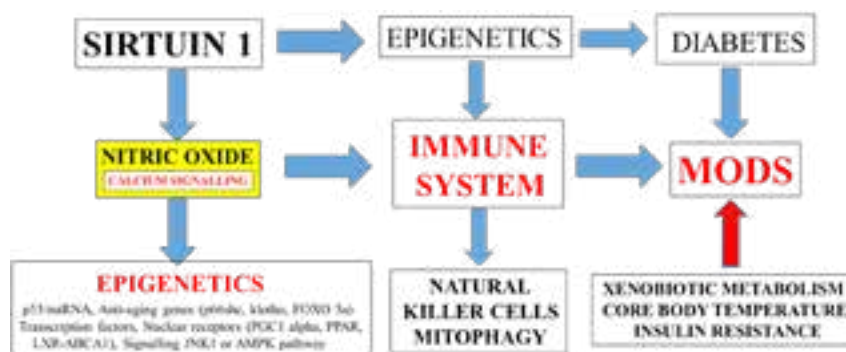


Figure 1: The heat shock gene Sirt 1 is critical to NO homeostasis and immune system imbalances connected to xenobiotic metabolism and mitophagy in various tissues with relevance to global diabetes and the development of MODS.

### Recent Publications

1. Martins I J (2017) Single gene inactivation with implications to diabetes and multiple organ dysfunction syndrome. J Clin Epigenet 3(3):24.
2. Martins I J (2016) Anti-aging genes improve appetite regulation and reverse cell senescence and apoptosis in global

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populations. *Adv Aging Res* 5:9-26.

3. Martins I J (2017) Regulation of core body temperature and the immune system determines species longevity. *Curr Updates Gerontol* 1:6.1
4. Martins I J (2013) Increased risk for obesity and diabetes with neurodegeneration in developing countries. *J Mole Genetic Medicine* S1:1-8.
5. Martins I J (2016) Heat shock gene Sirtuin 1 regulates post-prandial lipid metabolism with relevance to nutrition and appetite regulation in diabetes. *International Journal of Diabetes and Clinical Diagnosis* 3:20.

## **Biography**

Ian James Martins is the Editor and Reviewer of various international journals. He was appointed as the Chief Editor for *International Journal of Diabetes Research* (2014-2017). He is a BIT Member (BIT Congress Inc.) with an H-index of 43. He is now a Scientist of Science Advisory Board (USA). He completed his BSc in 1984; MSc in 1986 and PhD in 1989 from University of Western Australia. He is a recipient of grants/fellowship for scientific research conducted during postgraduate and early postdoctoral years. He has certificates of appreciation from various international conferences.

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