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ENCODE recombination and longevity

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Abstract

Epigenetic mechanisms, such as histone modification, DNA methylation and acetylation, miRNA, shRNA, and piRNA are scattered throughout the genome and may serve as a “switch” to turn on or off the target gene. But unlike a simple switch, its components must work in harmony and the outcome depends on many factors, such as their physical location (inter or intra) with reference to the target gene they either silence or evoke. Epigenetic responses to gene X environmental interactions offer the flexibility to adapt to changes in the environment that does not depend on occurrence of functional mutations in the DNA. Thus, aging, which can be characterized as a slow adaptation to physiological and environmental changes, would benefit greatly from excessive epigenetic loci that add complexity to gene regulation by ENCODE [**Enc**yclopedia **O**f **D**NA **E**lements] recombination (different "switches" for diverse environments) and more importantly, provide a level of flexibility that allows adaptation to environment. We propose that ENCODE recombination provides protection from the environment, delaying the onset of diseases and prolonging life span. Understanding the epigenetic mechanisms may offer the key to potential external interventions in aging and decrease age associated disease burden.

Biography

Dr. Gil Atzmon is currently an Associate Professor in the Division of Endocrinology, Department of Medicine, at Einstein, NY. A graduate in Population Genetics from Hebrew University, he completed his fellowship in Human Genetics at Einstein where he then joined as a faculty and rose to the rank of Associate Professor. The foremost focus of Dr. Atzmon's research career has been the understanding of the association of the whole genome to disease, performance, health and longevity and as Associate Professor, Dr. Atzmon's focus shifted towards a new and challenging field involving the role of epigenetics in diseases, aging and longevity.