

Can Medical Research Help Modulate The Rate of Aging?

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Abstract

Research to understand the mechanisms behind attaining old age and senescence has received great impetus during the past 2 decades. While the inevitability of the process and the end is obvious, many interesting features of this evolutionarily opted phenomenon are being surfaced. Aging and life span of species seem to be influenced both by genetic component as well as environmental forces. It is also apparent that life span of species has a relation to the time taken to reach reproductive maturity. Work with model organisms and some human syndromes characterized by accelerated aging has indicated that there are about 250-300 genes that are closely linked to the process of aging. Any subtle changes in the expression of these genes seem to significantly alter the rate of aging and life span. Most of these genes are found to code for pathways related to energy and stress handling metabolism and maintenance and repair mechanisms. Among the maintenance and repair pathways, DNA repair mechanisms, in particular those pathways like base excision repair pathway vested with the function of repairing 'in house' damage to DNA are emerging as important modulators for the aging phenomenon and associated debilities like neurodegenerative disorders. These advances in aging research are also becoming initiators for a hope to achieve a considerably lengthy health span in human populations.

Key Words: Aging, DNA repair mechanisms, genetic component, environmental forces