Review of: "The Convergence of Intelligence and Longevity"

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Very good review, on a topic of great interest, which explores the extent to which human intelligence is a significant determinant of our longevity. The review is written in a highly didactic and rigorous manner, providing a substantial amount of information that allows interested readers to delve deeper on their own. Furthermore, the reviewer offers excellent descriptions of how the structure and connectivity of our brains contribute to longevity, including their role in controlling the functions of other parts of our body. The reviewer also conducts a thorough analysis of how gene networks participate in longevity and intelligence. I particularly appreciate the well-referenced and explained examples of the ApoE and FOXO genes and the importance of gene networks for intelligence flexibility and variation.

In regard to the connection between FOXO, longevity, and intelligence, I find the references and the text adequate for justifying the first two aspects but less so for the relationship with intelligence. This is an area the author could expand upon, considering the evidence suggesting that the FOXO pathway is downstream of insulin signaling, which does play a role in synaptic plasticity. This aspect could complement the GWAS studies mentioned in the text. Additionally, I believe that the description of the FOX genes could be improved, as there are numerous repetitions.

On the other hand, I was somewhat surprised not to find information on the contribution of brain cell aging to the decline in -certain aspects of- cognition as we age. This includes phenomena such as the loss of synaptic plasticity due to defects in calcium buffering, reduced insulin signaling in the hippocampus, decreased expression of learning and memory genes, and reduced plasma membrane fluidity.

Another aspect that I believe could enhance this review (though it is not mandatory) is to present, perhaps in a dedicated section, how certain organic, cardiovascular, metabolic, hormonal, and immunological abnormalities, even if subclinical, or specific environmental conditions, even in early developmental stages, can not only lead to a decline in intelligence but also influence the lifespan of individuals irrespective of their IQ. If included, the review will also address the role of epigenetic regulation of gene expression, longevity, and intelligence.

Additionally, the author might consider removing the sections on FOXP2 and the similarities between genes present in the brain and testis, as they do not significantly contribute to the discussion on longevity and its association with intelligence, except in a somewhat hyperbolic manner regarding genetic pleiotropism and phenotype complexity. I believe the review would benefit from the author transitioning directly from the description of FOX to the section on Dynamic and Mutable Genome, thus avoiding the aforementioned distractions (FOXP2, testis-brain). Perhaps the author could even place this section before those discussing the potential roles of the ApoE and FOXO genes.

Minor criticism: There are some flaws in punctuation, lack of clarification of abbreviations, hyphenation issues, and a few spelling mistakes.