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Applying principles of evolutionary medicine to prevent Alzheimer's disease

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Given the global epidemic showing no signs of slowing and approved treatments uniformly incapable of modifying the underlying disease, Alzheimer's prevention is an urgent public health priority warranting innovative stratagems. Evolutionary medicine, a systems biology approach to managing processes that promote disease vulnerability, shifts the conventional focus from health stabilization to aggressive promotion of resilience and robust adaptation to modern conditions. Human biology and behavior are genetically adapted to the specific evolutionary niche which was the historically normal environment for millions of years of human evolution. Antagonistic pleiotropy, the concept that genes beneficial in one setting may be detrimental in another, underlies the Darwinian explanation of Alzheimer's disease. Evolution selected for longevity and healthy brain aging by co-partnering productive hippocampal neurogenesis with neuronal rejuvenation, two natural processes that maintain brain plasticity to the highest age. Alzheimer's is a modern lifestyle disease arising from the mismatch between slowly paced genetic adaptation and rapid changes in lifestyle and environment that accelerated post-industrialization. Applying Darwinian theory to health and disease is an alternative perspective that can be leveraged to develop practical risk reduction and disease management measures. The SEEDS program is a multifaceted, evolution-based, comprehensive lifestyle plan that can be individualized to prevent, slow and, if in its early stages, reverse Alzheimer's disease. The recent Lancet Commission on Dementia Prevention reported that at least one-third of global dementia cases can be prevented by lifestyle modification. The SEEDS plan incorporates these and other evidence-based and epidemiological strategies to make Alzheimer's a distant memory.

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