Review of: "Staunch the Age Related Decline into Dementia, Cancer, Autoimmunity (Long Covid), Obesity, and Other Diseases with a Prebiotic, Probiotic, Postbiotic Triple Play"

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This updated review is a must-read for everyone interested in targeting age-related inflammatory and prooxidant changes by preserving a healthy microbiome that protects the host against chronic degenerative diseases. Conclusive evidence is provided that clearly identifies the key molecular mechanisms and mediators that drive the age-related decline in dealing with dementia, cancer, autoimmune disorders, obesity, and other diseases. Key to these disorders and diseases is aberrant senescence-associated signaling by proinflammatory cytokines, hormones, and tryptophan metabolites such as the bioactive kynurenines. An elevated kynurenine-tryptophan ratio is associated with neurodegenerative diseases, autoimmune disorders, and cancer progression. Autoantibodies related to G-protein-coupled receptors accumulate in combination with enhanced Angiotensin II, further potentiate aberrant signaling, and enhance oxidative stress and damage. The aldosterone paradox and paroxysmal orthostatic tachycardia syndrome are explained in the context of G protein receptor autoimmunity and gut dysbiosis. The triple play of a prebiotic (d-mannose), a probiotic (bifidobacteria and lactobacilli), and a postbiotic (butyrate) can restore symbiosis, suppress inflammation and oxidative stress, restore the balance between IFN-γ and TGF-β, tryptophan and kynurenine, angiotensin-converting enzyme and angiotensin-converting enzyme 2, elevate heart rate variability, and extend life expectancy and health span. The aging process and systemic inflammation with increased formation of reactive oxygen species are linked to the upregulation of the kynurenine pathway with a shift in tryptophan metabolism from synthesis of the indoleamines to the kynurenine pathway. Tryptophan, serotonin, and melatonin depletion by indoleamine-2,3-dioxygenase with enhanced formation of kynurenines is a key step in initiating a vicious cycle of immune system dysregulation that is associated with premature aging and multiple diseases. Supplementation targeted on safeguarding symbiosis and stress resilience can preserve protective tryptophan-dependent signaling that enables regeneration. This review gives a holistic view of the chances, challenges, and perspectives of supplementation with targeted precision immunonutrition and enteronutrition that can improve, maintain, and restore health. The aging society and the demographic transition call for new approaches to prevention and treatment that are safe, well tolerated, efficient, and easily adopted. The review gives us excellent guidance to manage the needs of the elderly population.