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[Pharmacological Manipulation of the Aging Pathways to Effect Health Span and Lifespan with Special Reference to SGLT2 Inhibitors as Powerful Anti-aging Agents in Humans]

Calorie restriction has been shown to slow the aging process in numerous organisms including primates. Caloric excess states, such as type 2 diabetes, are associated with accelerated aging and the incidence and severity of chronic diseases. The nutrient-sensing pathways and intestinal microbiome are important systems that affect aging and chronic disease development. This manuscript reviews the various pathways involved with aging and chronic disease development and examines the pharmacological manipulation of these systems which appear to slow aging and the chronic diseases of aging in experimental model organisms and collaborating human data when available. Finally, the abundance of experimental and human data suggesting the newer diabetic medications, the sodium-glucose transport inhibitors, are potent anti-aging agents is provided.

Review Article **Published Date:- 2024-06-25**

[Microbiome-Gut-Brain Axis: AI Insights]

Microbiome-gut-brain axis represents a complex, bidirectional communication network connecting the gastrointestinal tract and its microbial populations with the central nervous system (CNS). This complex system is important for maintaining physiological homeostasis and has significant implications for mental health. The human gut has trillions of microorganisms, collectively termed gut microbiota, which play important roles in digestion, immune function, and production of various metabolites. Some current research shows that these microorganisms strongly influence the brain function and behaviour of individuals, forming the basis of the microbiome-gut-brain axis. The communication between gut microbiota and the brain occurs via multiple pathways: neural pathway (e.g., vagus nerve), endocrine pathway (e.g., hormone production), immune pathway (e.g., inflammation modulation), and metabolic pathway (e.g., production of short-chain fatty acids). Dysbiosis, or imbalance of gut microbiota, has been linked to mental health disorders such as anxiety, depression, multiple sclerosis, autism spectrum disorders, etc, offering new perspectives on their etiology and potential therapeutic interventions. Artificial Intelligence (AI) has emerged as a powerful tool in interpreting the complexities of the microbiome-gut-brain axis. AI techniques, such as machine learning and deep learning, enable the integration and analysis of large, multifaceted datasets, uncovering patterns and correlations that can be avoided by traditional methods. These techniques enable predictive modeling, biomarker discovery, and understanding of underlying biological mechanisms, enhancing research efficiency and covering ways for personalized therapeutic approaches. The application of AI in microbiome research has provided valuable insights into mental health conditions. AI models have identified specific gut bacteria linked to disease, offered predictive models, and discovered distinct microbiome signatures associated with specific diseases. Integrating AI with microbiome research holds promise for revolutionizing mental health care, offering new diagnostic tools and targeted therapies. Challenges remain, but the potential benefits of AI-driven insights into microbiome-gut-brain interactions are immense and offer hope for innovative treatments and preventative measures to improve mental health outcomes.
