**Discuss The Chemical Changes in Human Bodies in The Process of Aging**

ILIAS OLAKUNLE SHITTU-GBEKO

ID: 396983456

Aging is an inevitable process that brings about numerous chemical changes in the human body. As time progresses, our bodies undergo a myriad of transformations at the molecular level. One significant aspect of aging is the alteration in our chemical composition. Key chemical changes include the depletion of collagen, leading to wrinkles and sagging skin, and the decline in the production of elastin, which results in loss of elasticity in various tissues (Schulte & Perera, 2012, p. 24).

Aging is marked by a decline in key hormones, including growth hormone, estrogen, and testosterone, which can have significant effects on muscle mass, bone density, and metabolism (Priego et al., 2021). This decline in hormone production and action can increase the risk of chronic diseases and reduce lifespan (Pataky et al., 2021). For example, the reduction in anabolic hormones like growth hormone, insulin-like growth factor IGF-1, testosterone, and estrogen can lead to a decrease in muscle mass and strength, a condition known as sarcopenia (Pataky et al., 2021). These changes can also impact bone density and metabolism, contributing to frailty and age-related diseases.

Oxidative stress, a result of an imbalance between reactive oxygen species (ROS) and antioxidants, is a key factor in aging and age-related diseases (Moldogazieva et al., 2019). It leads to the formation of advanced glycation end products (AGEs), which are implicated in various pathologies, including inflammation, neurodegenerative diseases, atherosclerosis, and vascular complications of diabetes (Moldogazieva et al., 2019). AGEs also contribute to oxidative stress, further exacerbating the aging process (Yang et al., 2024). Lifestyle changes can help reduce AGEs burden and promote healthy aging (Prasad, 2014).

Mitochondrial decline, characterized by impaired mitophagy and DNA damage, is a central player in inflammaging, contributing to the release of mitochondria-derived damage-associated molecular patterns (DAMPs) and the subsequent inflammatory response (Walker et al., 2022, Picca et al., 2017). This process is further exacerbated by the senescence-associated secretory phenotype (SASP), which is influenced by mitochondrial activity and can lead to chronic low-grade inflammation (Giuliani et al., 2017). The resulting chronic inflammation, in turn, is a significant risk factor for age-related diseases such as type II diabetes, Alzheimer's disease, and cardiovascular disease (Fougère et al., 2016).

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