TECHNOLOGICAL INNOVATION AND BIOTECHNOLOGY IN AGING

Dayanne Renata temóteo da Silva; Gabriel Francisco da Silva;
Rosa Maria de Deus de Sousa; Michelle Souza Vilela; Valquiria Timóteo da Silva

Abstract

Introduction: Population aging is one of the most significant social transformations of the 21st century. According to the World Health Organization (WHO), by 2050, the number of people aged 60 and over is expected to double, reaching approximately 2 billion individuals worldwide. This scenario calls for effective public policies and technological solutions tailored to the specific needs of older adults, promoting autonomy, health, and dignity. **Biotechnology and Aging:** Industrial biotechnology emerges as a strategic field by integrating biological sciences, technology, and engineering to create solutions that support active aging. It enables the development of products and processes that minimize dependency, expand care, and reinforce the elderly's role as protagonists of their own life journey.

Technological Innovations Applied to Aging:

1. Remote Health Monitoring:

Devices such as the Apple Watch monitor vital signs and detect falls, automatically calling for help. This ensures greater safety and independence, especially for seniors living alone.

2. Smart Prosthetics and Orthotics:

Using technologies like 3D printing and motion sensors, adaptive solutions are created to promote mobility, comfort, and inclusion for older adults with physical limitations.

3. Assistants and Voice-Control Technology:

Platforms such as Alexa and Google Assistant help manage daily routines, remind users to take medications, and control home devices through voice commands, reducing physical strain.

4. Mobility Technology and Fall Prevention:

Innovative products like sensor-equipped canes, electronic stabilizing shoes, and AI-powered wheelchairs help prevent accidents and promote safer, more independent living.

5. Virtual Reality and Cognitive Stimulation:

VR headsets are used to evoke emotional memories and stimulate cognition in seniors with neurodegenerative diseases like Alzheimer's. Cognitive games are also effective tools for maintaining brain function.

6. Personalized Nutrition and Functional Supplements:

Through nutrigenomics, biotechnology has enabled the development of supplements and foods designed to meet the specific nutritional needs of aging, helping prevent conditions like osteoporosis and sarcopenia.

Final Considerations: Technological innovation for aging is more than a technical advancement, it represents an ethical commitment to the dignity and well-being of older individuals. The solutions presented in this article demonstrate how science can be applied with sensitivity to transform the aging experience. Governments, health professionals, and researchers play a vital role in ensuring equitable access to these innovations, fostering a more dignified, active, and future-oriented aging proces

Keywords: Aging; Industrial Biotechnology; Innovation; Quality of Life; Assistive Technology