thereby increasing the risk for functional decline and the onset and progression of chronic diseases.[15] Therapeutic strategies to combat aging and age-related diseases are a part of an investigation field commonly referred to as 'anti-aging medicine'. Anti-aging medicine has emerged as a new specialization in medical practice at the beginning of the 1990s. Over the past few years, it has become an increasingly discussed and debated topic.[16] Its main purpose is to prolong both healthspan and lifespan by specific regimes of exercise and dieting, as well as by advanced biomedical interventions aimed at slowing, stopping or reversing the aging process.[17,18]

Traditionally, the process of aging is believed to be 'natural' and therefore inevitable. However, in the view of many authors, the idea that aging is an indefeasible part of human nature is quite questionable.[19] In accordance with many modern evolutionary theories, aging has emerged as a by-product of evolutionary processes and does not have a specific function.[20] If aging is really not an intrinsic, irrevocable component of life, then it could be manipulated similarly to other processes that are generally deemed to be unnatural or pathological. The major assumption underlying anti-aging research is that age-associated senescence may be regarded as a pathophysiological phenomenon that might be prevented or even reversed.[21] Modern anti-aging medicine promotes biomedical technologies and approaches that have the potential to delay or postpone aging processes.[2] The success obtained in this research field is greatly attributed to the increasingly broad application of omics-based approaches, such as genomics, transcriptomics, proteomics and metabolomics.[22] Through the implementation of these technologies, a better understanding has been achieved regarding the key molecular and cellular pathways involved in the aging process, including inflammation, proteostasis, autophagy, mitochondrial efficiency and nutrient signaling, and regarding the most effective interventions to counteract age-related senescence.[23,24] The impetuous progress in highlighting the mechanisms underlying aging and longevity and first successful pharmacological interventions to extend healthy lifespan in different model organisms indicate that the aging process is malleable.

1.3 Anti-Aging Pharmacology: Promises and Pitfalls

The development of pharmacological agents targeting aging-related functional declines and pathological manifestations ('anti-aging drugs') is now in the spotlight in geroscience. An exponential growth of research in the field of geriatric pharmacology, including the study of prospective anti-aging drugs, has been observed over the past 20 years.[25] The first step in the process of drug development is known to involve the selection of druggable targets.[26] The situation when gene targets are determined by the study of genetic variations linked to either gain-of-function or loss-of-function phenotypes is especially useful because these targets can be considered as those that have been reliably validated.[27] Over the last two decades, a number of genetic pathways have been identified that play an unequivocal role in control of the aging