Over time, cells malfunction, the endocrine system starts to fail, bones become brittle, muscles atrophy, vital organs sputter and our senses diminish until the body finally grinds to a halt. This is inevitable, but that hasn’t stopped researchers from striving to cure ageing.

The goal is not only limited to increasing the number of years lived, but also to enhance the quality of life. Can you live for 150 years, but feel as young as a 50-year-old? The answer could be in our genes. Optimism fuelled by billions of dollars drives this quest for the elixir of longevity.

A recent venture in this field is Rejuvenate Bio, a start-up co-founded by American geneticist George Church. Rejuvenate Bio’s consumer base is dogs, for now. It claims that it will make pets younger through targeted gene therapies, noting that its strategy “allows us to enter the large ($70 billion) pet market quickly and to create a large valuable anti-ageing data set, before moving on to humans.”

Others are more circumspect. A non-profit organisation, Betterhumans, which has an advisory board that is the scientific equivalent of a Vanity Fair party guest list, strives to “radically extend healthy lifespans, end human diseases, improve human cognition and wellbeing.” Betterhumans collected 60 DNA samples of supercentenarians (105-119 years old), and sequenced 45 samples that have been made public to researchers. Supercentenarians appear to have hit the genetic lottery. When researchers analysed the relationship between the age of survival, morbidity and disability among centenarians (100-104 years) and supercentenarians, they found that the older the age group, the later the onset of diseases such as cancer, dementia and even cognitive and functional decline.

According to biomedical gerontologist Aubrey de Grey, an early proponent of longevity, there are seven types of age-related cellular damage including mitochondrial mutations, cell loss and atrophy, death resistant cells and cancerous cells. The California-based Strategies for Engineered Negligible Senescence Research Foundation, where he is Chief Science Officer, is developing therapies that “remove, repair, replace or render harmless” the damage. Calico, Google’s secretive research and development biotech venture founded in 2013, is delving into how human life can be extended. Early this year, it published a paper on how the naked mole rat’s risk of death does not increase with age. However outlandish these goals may sound, most of the current research into longevity is backed by science, which makes it more jarring in this Anthropocene age that has choked the earth with plastic and carbon emissions. Humans represent just 0.01% of all life on earth but are responsible for the destruction of 83% of wild mammals. The social and environmental implications of such longevity research raise ethical questions on equal access to therapies, use of diminishing natural resources and humankind’s impact on biodiversity.

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