Should we live for 200 or more years : Aubrey de Grey has a plan to radically extend human life span. Is it a good idea?

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Strategy to engineer negligible senescence (SENS) is a project established by eccentric scientist Aubrey de Grey. With several scientific publications, interviews, and a foundation established in 2009, around SENS, de Grey aims to build funds that support research on reducing the body's response to human metabolism and consequent pathology. These processes accumulatively result in the aging of the population and ultimately the deaths of 100,000 people per day in the world. De Grey has identified 'seven deadly aspects of cellular life' that contribute to aging and death. He proposes that elimination of these aspects, along with the exponential rise in technology advances, will see a cascading effect to increase longevity and improve quality of human life. Clearly some moral considerations should be made surrounding the artificial extension of life significantly beyond the normal life span of a human being. This article will address how and why this concept of radical life extension is morally acceptable by examining key components of arguments put forward by those who oppose radical life extension, such as Walter Glannon, and those who support SENS, John Harris and de Grey.

De Grey casts a broad net when he aims to remove 'the seven deadly cellular processes.' De Grey's net includes: cellular loss or atrophy; extracellular debris; extracellular cross links; cell senescence; microtubule deoxyribonucleic acid (DNA) mutations; lysosomal storage diseases; and finally epigenetic mutations significant in the development of cancer. All these processes occur naturally with age. Increasing levels of each process, and induction of further categories of these deadly processes occurring in the individual allows aging, as it is commonly recognized. De Grey proposes that we rid the human body of cancers, neurological degeneration, motor degeneration, and immune dysfunction among a myriad of other aspects of aging. Since many of these processes also occur upon introduction of a pathogen into the body, which is essentially anything that is recognized as unfamiliar enough to generate an antigenic response from the body, de Grey is also attempting to propose solutions to some infectious diseases. This is a highly ambitious proposal from de Grey.

As can easily be imagined, de Grey's intense proposal has elicited strong responses in both support and in critique of SENS. Notably, the debate between Glannon and Harris, published in the journal Bioethics in 2002, examines many problems associated with the proposal of de Grey's SENS. These include a potential increase in risk aversion and the loss of a sense of self due to limits within the brain for memory capacity. Moreover, Glannon raises concerns that de Grey's life extension theory ignores more immediate problems such as the growing strain on our global resources from an ever-growing population. We must comprehensively examine the root of de Grey's self-styled 'War on Aging'.

It is important to initially distinguish between extending lives and immortality. De Grey is not arguing for immortality as extensively discussed by Glannon and Harris. Instead, de Grey is proposing the extension of human lives by ridding the population of age-related diseases and disorders. People will still die from traumatic events such as being hit by a bus or a random natural disaster. However, under de Grey's proposal to radically extend the human life span, we would have a much higher chance of being able to treat the one off bus injury via cellular repair technology. Conversely, we would not be able to treat every victim of a natural disaster before cellular damage has progressed so far as to become irreversible. SENS technology will not mean that people cannot die. Instead, de Grey aims to reduce factors contributing to cellular disruption and in this way we will see a reduction in so called age-related diseases. These problems can affect almost any human body, at any age, but they are most commonly seen after a build up of these effects due to senescence or aging. By removing some or all of these problems we would allow people to live extended lives at more or less the same quality of life that one would expect in the earlier years of life.

The advantage of enquiry into advancing this type of technology is dramatic. In the world of medicine, cancer is an almighty foe. Sitting among many illnesses that humanity has failed to overcome, cancer is the biggest killer according to almost every statistic on human mortality available. De Grey classes cancer as a fixable cell malfunction that contributes to the aging process. Many other diseases would also fit into this category. In fact, looking through medical textbooks, one would be hard-pressed to find a disease without a cellular level. Pertussis toxin, which causes whooping cough, could be fought against, as could malaria, in which a parasite wreaks havoc on red blood cells. This list could continue to the extent of any disease that affects the body on a cellular level, which is to say almost every single disease. Even extensive trauma from events such as burns would be potentially covered by de Grey's theories concerning cell restoration.

SENS technology would not be available overnight, nor would it be available all at once, providing a chance for medical ethics and practices to adjust. Still, there is a life-saving advantage to the world to invest in the technology surrounding radical life extension, which cannot be ignored. The dramatic spin-off effects of any progress in the area of life preservation, which may have influence efforts to save any life in the world, regardless of whether it is someone trying to extend his or her 87 year-old life potentially at an end due to a cancer, or a child suffering from amoebic dysentery in a developing country. These lives are both of equal moral relevance.7 To discriminate based on age is to ignore underlying equality to all. It would entirely negate the philosophy upon which the medical world is built. It is in the best interest of the world population to invest in attempts to create this type of technology simply because it will save lives, and it is our moral duty to try to do this.

Fair and accessible SENS, and thus medicine for all of humankind, would be an ideal situation. It is fair to use medical resources to extend the lives of those who have already lived for one century of 'unextended' life. A human life remains valuable at any age, and it is particularly imperative that we ensure that quality of life remains high throughout the ages by removing age-related damage. It is vital to ask 'are we morally culpable if we let these people die when we have the means to save their lives?' I believe that neglecting to save a life, or at least avoiding attempts to learn mechanisms of cell manipulation to prolong quality life are as intolerable as neglecting to come to the aid of another human being in distress. We have a moral imperative to undertake this research; it will increase opportunity for the autonomous decision-making surrounding end of life proceedings by allowing more functional capacity with age than would otherwise be possible. This technology can and should be developed since it has the potential to save lives of any kind, at any stage in life, not just the aged or aging.

Glannon negates negligible senescence as personal identity is undermined across 1 thousand life spans.6 Glannon proposes this because people must assume a new identity with loss of memory over time. He suggests that it is better for a person to die at an approximate prescribed 80 years as opposed to maintaining her life artificially through SENS. Preserving the normal life span of an individual prevents the inevitable transition to an altered state of personhood.

In negating Glannon's definition of a discontinuous self across a radically extended lifespan, I propose that people are continuously changing their identity through successive selves in our current approximate 87-year lifespan (in the developed world). A person is affected continually by each experience in every moment. These experiences shared among people shape different responses. Some people deal well with being let go from a job, others do not. This is equally true of varied and transient responses from individuals. In one given time frame, an individual may respond positively to being fired and look on it as an opportunity. After struggling to find a position after being fired a second time, however, a person might change her positive or nonchalant attitude to the event. We are not, as Harris suggests 'immortal persons, identical to immortal human organisms,'—the physical body is a biological entity that can exist without personhood. This biological body forms a vessel for continuation of successive selves across time. Personhood or psychological self, thus far, cannot exist without a biological entity to encase it. Possibilities of transhumanism and mind uploading remain technical and moral challenges for the future.

Glannon is right to distinguish between biological and psychological selves.5 It is, however, incorrect to assume a distinguishing factor between the successive selves of 87 years and the successive selves of 200 or even 1000 years. The collective consciousness of the extended-life being would allow continuation of the person. There is no defined capacity for memories in the human mind, merely age-related build up of debris known to the medical world as neurofibulary amyloid tangles and plaques made up of tau proteins aptly referred to by de Grey as 'intra and extra cellular junk.'3 De Grey addresses the build up of these materials in his paper on lysosomal storage diseases, 'Bioremediation meets biomedicine: therapeutic translation of microbial catabolism to the lysosome.' With adequate removal of these buildups, which are the only known cause for memory failure, or 'reaching capacity' that Glannon so dreads as a route of identity destruction, humankind may very well achieve maintenance of memory of all the successive selves experienced by a single person in one lifetime.5 For Glannon or other critics of radical life extension to judge what is or is not possible before something has even occurred is presumptuous and possibly even arrogant.

Having a child or children in some way allows a continuation of the self, but in an altered biological entity.9 A parent will never share the mind of their child but will have some shared memories as we might expect to remain from 200 years ago in a person 400 years old. These children are a biological continuation of the self with less chance of preservation of the psychological self. It is rational to maintain one's own life span instead of reproducing because retaining one's psychological self is better than the end of being. There is self-motivation for longer lives. As Harris says, "I am far from convinced that I cannot have my cake and eat it, or rather have my descendants and be them too."4

Borrowing from economic terminology, the 'Law of Diminishing Marginal Utility' states that with increasing units of an item x consumed, pleasure or utility associated with item x decreases. This is often applied to buffet-style 'all you can eat' restaurants, but is equally relevant to consider when de Grey proposes to increase lifespan to 1000 years, above roughly ten times the current average of 87 years in the developed world. By increasing the lifespan of humans, we might not see a reduction in risk taking behavior from the individual. With more life to be consumed, we could instead see an increase in risk taking behavior, as life becomes less valuable the more it is available. Societal pressure to stay alive may instead be the cause of reduced risk taking. The market for extra years of life becomes increasingly flooded with exponential

increases in technological developments against cellular metabolism, pathology, and the associated ‘seven deadly cellular processes.’

We must also address the problem of increasing population size, which Glannon presents in the work ‘Identity, prudential concern and extended lives.’4 Glannon falsely draws conclusions of increased population if SENS is achieved. De Grey proposes the idea that people must make a trade-off between an extended life and reproductive freedom. This seems to be a morally reasonable trade-off. Having children essentially allows a parent to replace themselves with roughly 50 percent of their own genome. The strategy to enhance one’s life span would replace the need for procreation.9 This would see population continue at the same levels as expected or with slightly decreased rates of death among populations with access to life-extension technology. Problems with access to resources are likely to change and be challenged in the future with an increasing middle class in countries such as China and India as they transition between income brackets. With more time on earth for the individual, however, cohabitation and connection to resources will provide a personal incentive for every individual to see the proper management of resources and relationships.

Harris raises the clear issue of cohabitation of the world by those with extended life spans and those that are normal.4 Should it be a moral requirement that we should not enhance any individual person’s life unless every other person in the world is able to receive this treatment? Is fairness in this regard a realistic moral issue? These are reasonable questions of practical concern for the development of SENS technology.

We have seen some incredible advances in technology in the past 200 years. Quite possibly to be within reach very soon, of the required exponential level that de Grey proclaims, is the beginning of developing radical life-extension technology.1 I, instead, propose that the development of SENS has already begun in the simplest forms of knowledge of a proper healthy diet, limiting exposure to toxins, and an ever-growing understanding of how the human body functions. This information in itself can and has saved lives; removal of chlorofluorocarbons (CFCs) from production has had an impact on melanoma rates, as has screening for certain types of cancers.2 Incremental steps towards building a big picture are steadily accumulating and breaks in technology are becoming so widespread that many have ceased to be reported outside of primary literature. These basic forms of knowledge see a better-nourished population in the developed world and increasing awareness and attempts to increase essential nutrient intake in the developing world. This knowledge is already enhancing our life spans well beyond those of our predecessors by decreasing the accumulation of the ‘seven deadly cellular processes’.

De Grey’s plan to radically extend human lives is a good idea. It is morally sound and contributes to the ever-growing overall body of knowledge that we call science, technology, and medicine. To rule out attempts towards SENS is to discriminate on who should live and who should die, based simply on Gregorian calendar years. It is also the projection of one’s own values and ideals onto another, which is a removal of autonomy. If it is within our power to save the lives of others, we have a moral duty to fulfill this obligation and to provide these individuals with the option of radically extending their life.

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