Hormonal Rejuvenation Course

Aubrey de Grey-A Roadmap To End Aging

F. Karl Weddige

Panama College of Cell Science

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HORMONAL REJUVENATION – 2015 ASSIGNMENT #1

STUDENT: KARL WEDDIGE

Essay Questions

(1) Please re-read the Syllabus and watch the video featuring Aubrey de Grey which is found there. Please write a brief report giving your impressions of the content and also of Aubrey de Grey: What is his main premise? How good are his facts…meaning, is he convincing? What do you conclude from viewing this video? Has the video made you think differently about aging? What do you make of this video??

Note: We are just having some fun as an introduction to the course…not looking for a scientific paper here.

Aubrey de Grey is not an unintelligent man - In fact, some might suggest that he is a deep thinking genius while others criticize his scientific prowess. De Grey is a Biomedical Gerontologist who holds a PhD in Biology from Cambridge University, was a computer scientist prior to receiving his PhD, and is the founder of multiple scientific foundations (SENS Research Foundation, Methuselah Foundation). The lyrics of the song "*Forever Young*" by the musical group Alphaville are purely indicative of Aubrey de Greys premise behind his research: "A Roadmap to End Aging".

…Some are like water, some are like the heat
Some are a melody and some are the beat
Sooner or later they all will be gone
Why don't they stay young?

It's so hard to get old without a cause
I don't want to perish like a fading horse
Youth's like diamonds in the sun,
And diamonds are forever

So many adventures given up today,
So many songs we forgot to play.
So many dreams swinging out of the blue
Oh let it come true.

Forever young,
I want to be forever young.
Do you really want to live forever,
Forever, and ever?

Forever young
I want to be forever young
Do you really want to live forever,
Forever young

De Grey defines aging as a side-effect of being alive in the first place and "the set of accumulated side effects from metabolism that eventually kills us", and, more specifically, as follows: "a collection of cumulative changes to the molecular and cellular structure of an adult organism, which result in essential metabolic processes, but which also, once they progress far enough, increasingly disrupt metabolism, resulting in pathology and death". He adds: "geriatrics is the attempt to stop damage from causing pathology; traditional gerontology is the attempt to stop metabolism from causing damage; and the SENS (engineering) approach is to eliminate the damage periodically, so keeping its abundance below the level that causes any pathology."[1] The linear representation of De Greys hypothesis is as follows:

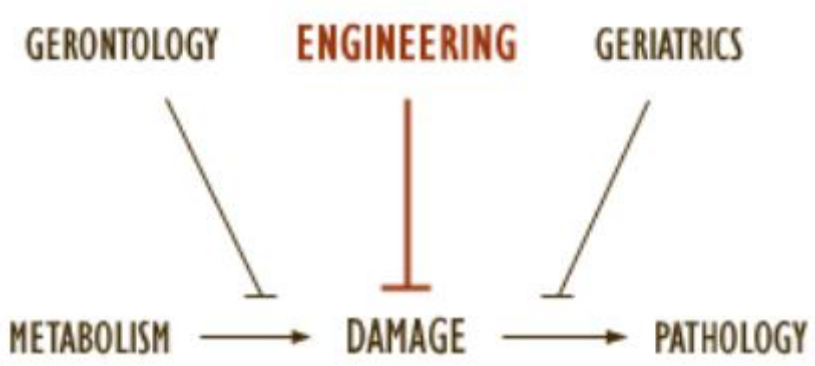

Image 1:
http://www.bing.com/images/search?q=de+grey+SENS+approach&view=detailv2&&id=FF45C8321D49D2667F63C31B22F41E135EAA2C58&selectedIndex=72&ccid=MYmS6dl2&simid=608012609273529508&thid=JN.8YOhUIaeyUQ9ygZPbl1UqQ&ajaxhist=0

De Grey's has created a regenerative medicine theory which is termed: Strategies for Engineering Negligible Senescence – the SENS approach. His approach to biomedical gerontology is unique because of its emphasis on tissue rejuvenation rather than attempting to slow the aging process. Based on this approach, de Grey also created the SENS Research Foundation which focuses on using regenerative medical approaches to repair the underlying damages to the human body from aging.

I watched multiple webcasts, interviews, and seminars in which de Grey discusses his theories of aging. De Grey refers to aging as a 'medical condition' and is something that can be 'fixed, reversed, or combatted.' De Grey's theories center around seven types of molecular and cellular damage caused by essential metabolic processes. De Grey goes on to suggest that the SENS approach is his proposed panel of therapies designed to repair this damage. I have created a table of the '7 deadly things' that de Grey mentioned in his presentation that he associates with our aging and his suggested 'fixes' to these alterations:

DAMAGE TYPE	MAINTENANCE APPROACH
Cell loss, cell atrophy	Replace using stem cells
Oncogenic nuclear mutation, division	Reinforce using telomere control (WILT telomerase)
Cell senescence (death resistant cell)	Remove using suicide genes (ablation of senescent cells)
Mitochondrial (mtDNA) mutations	Reinforce using backup copies
Intercellular waste products	Remove using foreign enzymes
Extracellular waste products	Phagocytosis using immune stimulation
Extracellular matrix stiffening (cross-linking)	Repair using cross-link breakers (AGE-breaking molecules – enzymes)

De Grey goes on to suggest, through the use of his Longevity Escape Velocity (LEV) graph that the first person who will live to be 100+ years old has already been born and that through Robust Human Rejuvenation (RHR) that he can add 30 extra years of healthy life on to people who are already 55 years old.

I am certainly no biomedical gerontologist and am yet to be a PhD level researcher but Aubrey de Grey's methodologies, philosophical, and scientific groundings seem to hold true. Aubrey de Grey is not the only scientist researching such scientific methodologies. It was stated during a de Grey interview with the BBC that Harvard has actually been able to reverse aging in mice using telomere lengthening technologies. With such advancements as these, de Grey has pointed out that medical care breakthrough timelines follow those of other worldly 'breakthrough timeline's' (e.g.: powered flight) and, if technology carry's on down the path of advancement as he argues then perhaps we will continue to see a progressive increase of average age.

Although I feel de Grey has sound facts and good scientific grounding I, like many others, have many questions. I wholeheartedly agree that the research he is conducting at his foundations is indeed a feat that needs to take place in order to help combat the issues of diseases associated with aging but how far do we go? I have a rebuttal for either argument.

First, is it right that so many research dollars be poured into such questionable research when we are still seeking cures for multiple deadly diseases – or even simple medical diagnosis? De Grey was even asked how he could justify diverting millions of dollars each year from true research and medical spending needs when over 1.5 million children die each year from something as simple as diarrhea. De Grey claims that he is not conducting this research for himself but rather, he is doing it for humanity.

If Aubrey de Grey and his colleagues are successful we will have a host of potential drawbacks and medically ethical questions to answer: what will happen to healthcare costs? Will de Gray's advances allow the mind and body to age in synchronicity? Will the wealthy have an unfair advantage to these new 'treatments'? Will dictators now be able to rule for centuries? Will these advances lead to global overpopulation?

If one were to argue this from a Biblical standpoint, what is said to be ethical? What does God want us to do? Did God give us this knowledge and give us the intellect to make such advances? If so, why did people 65 and older only account for $1/7^{th}$ (14.5%) of the U.S. population in 2009? (Demographics of the United State – Wikipedia). During de Grey's presentation a gentleman does report that we are seeing an increase in life-span of two years for every decade. Is this due to technology advances, better lifestyles, or both? And, again, it begs the question: What role does God have in this decision? We can look back to Biblical times and see that people were not only living as long as Aubrey de Grey hopes we will one day but, they were also having children at those advanced ages. Genesis 5:3 states: When Adam had lived 130 years, he had a son in his own likeness, in his own image… (New International Version). We can also find reference to Methuselah (of which de Grey named one of his research foundations). Genesis 5:27 states: And all the days of Methuselah were nine hundred sixty and nine years: and he died. (New International Version). It is even suggested that some never experienced death: "By faith Enoch was taken from this life, so that he did not experience death…" (Hebrews 11:5, New International Version).

In looking at this from a scientific perspective I needed to determine if a year in Biblical times was equivalent to that of a modern-day calendar year. All research findings reported that the calculation of a year hasn't changed in over 6,000 years.

So, is Aubrey de Grey correct in his quest for pursuing a roadmap to end aging? I honestly do not know the answer however, I do know that there will ***always*** be two sides to any argument.

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1. de Grey, Aubrey (January 8, 2003). "An engineer's approach to the development of real anti-aging medicine". *Sci Aging Knowledge Environ*. 2003 (1): VP1. doi:10.1126/sageke.2003.1.vp1. PMID 12844502.