I'm S. Jay Olshansky, an epidemiologist at the University of Illinois at Chicago School of Public Health. I study human longevity and am part of a study group investigating whether a drug used to treat diabetes can slow the aging process. Ask me anything!

Jay$_{O}lshansky^{1}andr/ScienceAMAs^{1}$

[1]Affiliation not available

April 17, 2023

Abstract

Hi Reddit! I am S. Jay Olshansky and I'm a professor of epidemiology in the University of Illinois at Chicago School of Public Health. I'm also on the board of directors of the American Federation of Aging Research; the first author of The Quest for Immortality: Science at the Frontiers of Aging (Norton, 2001); A Measured Breath of Life(2013); and co-editor of Aging: The Longevity Dividend(Cold Spring Harbor Laboratory Press, 2015). I have spearheaded The Longevity Dividend Initiative – an effort to extend the period of healthy life by slowing aging. I study the upper limits of longevity and ask which populations are living longer and why, and what that means for society. Living a longer life is a monumental achievement of public health and modern medicine – it is exactly what we set out to achieve more than a hundred years ago when life was short. More people today are living to 65, 85, and 100 and beyond than ever before, but it has created a Faustian trade. In exchange for our longer lives, we now live long enough to experience heart disease, cancer, sensory impairments, and Alzheimer's disease. The fact is that our bodies were not "designed" for long-term use . While improved lifestyles can enhance health and quality of life, the aging process marches on unaltered beneath the surface – leading to the diseases and disorders we fear most. My research focuses on investigating ways to extend the period of healthy life and compress sickness and disease as much as possible to the very end. Recently I have teamed with a group of researchers to study the ability of the diabetes drug metformin to do just that; although metformin is just one of many research pathways scientists are pursuing to slow biological aging. My research suggests that slowing down aging will be the next great public health advance in this century because it targets multiple age-related chronic diseases. Importantly, this approach to public health can save far more health care dollars than treating one disease at a time. The time has arrived to take a new approach to chronic fatal and disabling diseases. I'll be back at 1 pm EST (10 am PST, 6 pm UTC) to answer your questions, ask me anything!

the WINNOWER

REDDIT

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JAY_OLSHANSKY R/SCIENCE

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Hi Dr. Olshansky, and thank you for doing this AMA!

As you might infer from my user name, I am a big fan of longevity research, so with that in mind here are some nitty-gritty questions for you:

1. Gerontologists have dreamed of doing clinical trials on compounds that may slow aging for quite a while. A big challenge, however, has always been how do you measure aging? In this metformin study you describe, how do you plan to quantify healthy aging? What biomarkers will you look at? What endpoints will you measure?

2. Metformin is thought to tap into the 'calorie restriction' pathway. CR has been one of the most robust ways of extending lifespan in the literature. However, it's effects vary quite dramatically between species. Worms live 200% longer on CR, flies 50% longer, mice 10% (and even that can vary quite dramatically by strain). How do you interpret this trend? And doesn't it cast a troubling

Public Health. I study human longevity and am part of a study group investigating whether a drug used to treat, *The Winnower* 3:e146063.34660 , 2016 , DOI: 10.15200/winn.146063.34660

shadow over the prospect of CR mimetic a meaningfully extending longevity in humans?

3. As you note, metformin has been prescribed to diabetics for quite some time now. Has anyone attempted a retroactive analysis of patients taking metformin and comparing them to other diabetics, taking different medications to see if metformin may have a longevity benefit. Obviously this type of research is subject to a lot of confounding effects, but it is a good way to sanity test the metformin hypothesis. Similar studies have been done on rapamycin, for example, and generally hint at a longevity effect in humans (namely in the form of less cancer).

Thanks!

EDIT: If anyone is interested in learning more about the biology of aging, I wrote aprimer on the subject for Reddit. Also feel free to ask me any questions. But maybe, wait until after the AMA out of respect to the guest.

SirT6

I'm just now making my way back through the questions to pick up on some I might have missed earlier. This is a good one. With regard to #1 and #2, I'm going to turn you over directly to Dr. Barzilai who will be conducting the trial. With regard to #3, this issue has come up often, and as far as I know, there has been at least one major retrospective study of Metformin in a population in the U.K., and the evidence suggested the positive impact could be on multiple disease endpoints. Please contact Dr. Barzilai directly to learn more about that study -- I last heard him talk about it several months ago.

What are you, personally, doing to increase your own healthy lifespan?

bsrubin

This is a question that comes up all the time. Here's my recipe: 1) choose long-live parents (begin there – guess what, it all begins with genetics); 2) exercise every day (this is like an oil, lube and filter for your car – you don't have to do it, but when you do, the machine operates better); 3) eat less and have smaller meals more often (this is a way to control your insulin levels – perhaps one of the primary gatekeepers of rate of aging); and 4) have sex every day (this may not make you live longer, but hey, it's not about life extension, it's all about the journey along the way ☺).

Pharmacist here! I've always thought of metformin as an incredibly effective medication to maintain health, without regard to diabetes. In your opinion, would you recommend younger, healthy people to start taking metformin for its protective traits? Obviously this is something that needs to be discussed with one's primary care physician, but I feel that everyone could really start to benefit from its effects. Could you see metformin as the next "baby aspirin"? (everybody starts taking one a day just to be" healthy?)

drycellsk8ertrs

Great question. The short answer is no, we're not ready for metformin as the next equivalent of a baby aspirin. We can't know the answer to this until the research is done and the data thoroughly analyzed. While I would encourage everyone to remain excited about this work, keep in mind that no intervention of this kind should be taken today without approval and evaluation by your personal physician. There is a tendency in this field for the entrepreneurs to try and take over as soon as the science offers a glimmer of hope, so I would urge extreme caution. In the interim, please try and help out the world of aging science by following the work and encouraging the effort.

Has the first 200 year old person already been born?

thepikey7

The idea that the first person to live to 150 or 200 or 1,000 or 10,000 years has already being born is hype cooked up by some who want to advocate for radical life extension. All of these numbers are made up out of thin air – they're designed to get the attention of the media, and frankly, this makes it more difficult to get funding for aging science because funders have no interest in creating a new set of challenges that would come with people living for hundreds or thousands of years. Keep in mind that life extension is not the primary goal of aging science; health extension is the primary goal.

What do you think will be the biggest obstacle when it comes to development of anti-aging drugs? Either biologically or otherwise.

Along those lines, what is the current most promising solution to counter aging, and what are the potential difficulties with that solution as we currently understand it?

t3hasiangod

Obstacles to aging science? 1) finding an intervention that simultaneously slows down the aging of both body and mind. Any intervention that accomplishes one without the other would be viewed as harmful; 2) time: it takes time to run clinical trials, and I would strongly encourage all of us to wait for the science before intervening in any way based on preliminary science (the classic example is growth hormone – often touted as a magical elixir by the anti-aging industry; evidence suggests it could cause more harm than good); 3) exaggeration: too many people (including some scientists) are prone to exaggerate either the science or their findings in order to profit or obtain funding – let's please step back for a moment and consider the impact of what we're saying.

What are your thoughts on diet? The longest living people like the people from Okinawa and the 7th day Adventist seem to eat close to a vegan diet with meat only special occasions.

JustHookItToMyVeins

I spoke with a reporter from the New York Times today, and this question was one of the first asked. Some have suggested that an intervention to slow aging should be plan A, and diet and exercise would then be a fallback. I would reverse this. Plan A should be diet and exercise, since these are the only equivalent of a fountain of youth that exists today. While these interventions won't necessarily yield much longer lives, they can improve quality of life. Plan B is an intervention to slow aging. This may very well move to the forefront in the future, but for now, stick with what works.

In how near future should we expect to take a daily pill which will slow aging?

Niawtkram

When will an aging intervention come online? No one can know the answer to this question in advance since it takes years to study the safety and efficacy of potential interventions. However, we're no longer talking about something theoretical here. We can observe decelerated aging today in people that, in many cases, may be your friends, relatives, or even yourself. Centenarians today are in all likelihood living that long because their bodies and minds are not really 100+ years old – they might very well be 10, 20 or even 30 years younger. Scientists like Dr. Barzilai at Albert Einstein or Dr. Tom Perls at Boston University are studying the genetics of these long-lived subgroups in order to discover (and perhaps recreate) their genetic advantage for the rest of us. It's an exciting time to be involved in

aging science, and I'm optimistic that an intervention that slows aging in people will arrive in time to positively influence most people alive today.

Thoughts on Aubrey DeGrey and the SENS foundation ideology on anti-aging research?

hpfan5

Aubrey is a friend, but we do have healthy disagreements. We need this kind of open dialogue in science, and it should be conducted with respect and decorum. Having said that ☺, don't expect radical life extension any time soon. Think about it for a moment. Even if you had an intervention in hand that could make people live for 1,000 years, how could anyone prove that using the tools of science? You would have to wait for 1,000 years to make that statement, which is why I say that anyone making these claims is making up numbers out of thin air. The fact is, even if a genuine magical elixir found its way into anyone's lab, the scientist who discovered it wouldn't know its effect – even if the intervention could talk and declare its effectiveness. Our goals in aging science must be measurable using the tools of science!!!

We hear a lot about how the average age at which we die has increased drastically since the last century. However, these waters seem to be very muddied by the extremely high infant mortality rates of earlier generations, and therefore such averages may not reflect the lifetime of a person who made it through their infant years. If we exclude high infant (and perhaps childhood) mortality, how does the average age at which we die today compare to 100 years ago?

Thanks!!

izethebyze

Great question! Even if you examine life expectancy at age 10 a century ago relative to today, the differences in longevity are still quite dramatic. We've reduced death rates at middle and older ages throughout the last century, and now we're gaining on causes of death expressed at later ages. However, life expectancy is an insensitive metric that becomes less sensitive to declining mortality as it rises. My colleagues and I demonstrated this decades ago in an article in Science in 1990 (In Search of Methuselah: Estimating the Upper Limits to Human Longevity) where it became evident that once life expectancy for a population reaches about 80, it becomes extremely difficult to raise it further. As such, don't expect any radical increases in life expectancy in this century. People making claims about radical life extension have probably never actually worked with the statistics required to generate the metric -- that's why they're unaware of it's increasing insensitively with rising longevity.

Should a well-informed society in a capitalist system really support extending life spans? Given the socio-economic pressures this would place on a planet with limited resources?

in_question

This is a very important question -- thank you for asking this. The primary focus of aging science is health extension, not life extension. However, keep in mind that even if we could hypothetically achieve immortality today where death rates are zero, the growth rate of the population would then be defined by the birth rate (which is often less than 1%). This means that even with immortality, the growth rate of the population would only be a fraction of what it was in the post World War II era. The environmental effects of successful interventions to delay aging are greatly exaggerated – we would not be placing undue stress on the environment. Also, keep in mind that you may want to be asking the same question of scientists trying to find cures for heart disease and cancer.

What are your thoughts on resveratrol? Many people are claiming its a "miracle" supplement when it comes to its anti-aging qualities, but that being said, it is just an untested supplement by the FDA so should I remain skeptical?

1BigUniverse

I suggest remaining skeptical until the science is in. The first trials at GlaxoSK did not yield the expected results, but there is good science there so I would suggest you stay tuned. In the interim, as indicated earlier, I strongly suggest that everyone stay away from any potential intervention until thoroughly evaluated for safety and efficacy. There was a lot of hype about resveratrol when first studied -- so far the hype has not been supported by the science.

What role do you believe the "culture" surrounding the FDA contributes to the following:

1- Acc. to FDA, "aging" is NOT a disease, so research is artificially hobbled by having to focus on one specific disease, with a longevity benefit being a "side-effect" (wink-wink) in the data.

2- Rejuvenation (reversing aging) is even more "fringe", and has to suffer the effects of private funding.

3- Anti-aging and rejuvenation will be forced out of country (medical tourism).

Side question: I'm 46 and taking metformin (2,000 mg q24h) myself. Other than... GI issues if I haven't eaten... should I be hoping to merely age slower (long-term NOT seeing biophysical entropy), or should I be assessing other markers of aging (wrinkles, grey hair progression, liver spots, etc)? (I understand you might not be able to comment because of the FDA, lol.)

4CatDoc

Aging is not a disease, any more so than puberty or menopause. However, aging contributes to the onset and age progression of diseases. It's important to distinguish between them.

The FDA includes a large number of exceptionally smart scientists -- we met many of them during our visit last Summer for the Ron Howard documentary. They fully understand and appreciate what we've proposed here, and in fact, they went out of their way to help us out with the research design. I have the highest respect for the FDA.

The word "rejuvenation" is one that I would not normally use in aging science since going backwards is generally thought to be difficult if not impossible, but I'm reserving judgment on this until I learn more about parabiosis. Look it up -- there has been some fascinating new work on this old phenomenon, and the word "rejuvenation" seems to be used legitimately within this context. If true, this might be another breakthrough among the many now being studied.

What is the #1 advice you would give for a normal American working 40-50 hours a week with all of the stressors in life, for them to extend their life? We all know the usual suspects: eat healthy, exercise, sleep, and de-stress, but is one of those more important than the next for extending your life? If not, is there something else?

Saw a report on 60 minutes once where a bunch of centarians were studied as to why they lived so long and the conclusion of the study was that they all had one thing in common: they had nothing in common. Some smoked for 80 years, some drank, some exercised, some didn't, some slept good, others didn't sleep but 4-5 hours a night, etc. Also saw a lady over 100 years old who drinks 3 Dr. Peppers a day. She said the Dr told her that would kill her, and he died like 20 years ago.

MinusTheBun

Check out my recipe provided in an earlier thread. What's important here is the fact that some people survive to extreme old age in the presence of harmful behavioral risk factors, like smoking. Jean Calment, the person who lived to 122, smoked for nearly a century. This is not a license to smoke, but it does tell us a fundamental story about genetic heterogeneity and that fact that what's harmful for many is not not harmful for everyone; and the flip side is also true; what's beneficial for many may not be beneficial for everyone. Rule # 1: choose long-lived healthy parents!

How would this research affect conditions such as Alzheimer's and MS? Would delaying the aging process potentially delay their onset?

FrozenJakalope

The primary goal of aging science is to delay the age at onset and age progression of all fatal and disabling diseases -- simultaneously. If this works as planned, we would experience a compression of morbidity and mortality into a shorter duration of time at the end of life (as my friend and colleague Jim Fries postulated back in 1980 in an article in the NEJM). This would include Alzheimer's in particular. However, some genetic disorders probably will not be influenced by efforts to slow aging.

A lot of people say that all these investments on longevity are originating from rich people who are themselves very concerned about their own longevity. Tech giants like Google is an example. Some people also say that the 'bubble' of companies in this sector will explode as soon as the first companies get introduced in Stock exchange markets, taking people's savings, leaving them with nothing at the end when it'll be clear that it's not possible to live *forever* 120 years.

How do you see the sector in next couple of decades?

Thanks.

Duke--Nukem

I'm actually pleased that Google's Calico and Venter's Longevity have come into the mix. Competition is good; the presence of funds to accelerate aging is good; there are a lot of outstanding scientists already in this field, and I expect we'll soon attract many more. It's the next great frontier of human biology. Having said that, I'm very careful about claims that are made here, which is why I shy away from exaggeration and I think the rest of us should as well. Someone will eventually develop a breakthrough in the field, and when that happens, it will fundamentally change the way in which we think about aging, disease and longevity. Someone will win the race, and perhaps there will be more than one winner, but when that happens, we all win. The fact that there is a race at all is what is so exciting now.

While I don't expect 120 is in the cards, I do expect many of us to benefit from an intervention that extends our healthy life and preserves our youthful vigor for a longer period of time. I expect the competition to go on even after the first intervention makes its way into the marketplace. I see a healthy sector moving forward.

Professor Olshansky, welcome!

1) What are the best measures available for determining the rate of aging within an individual? Can we know if interventions are working without waiting to see when someone dies?

2) What has been your key insight or innovation in the field of aging?

PS. It appears your personal website (first Google hit) sjayolshansky.com has been hacked with pictures of naked ladies (NSFW).

Famousoriginalme

You can find out more about my work by going to sjayolshansky.com Feel free to download articles, books, chapters, watch interviews, etc. I don't think my site has been hacked by anyone, but perhaps they'll try now. I'll deal with it if it arises. With regard to one of my key insights on this topic, I would refer you to a paper written by Dana Goldman at USC and colleagues (myself among them) where we demonstrated that even a minor deceleration in the rate of aging would have a dramatic effect on health and quality of life, and importantly, save the U.S. alone somewhere along the lines of $7.5 trillion dollars. I operate more at the 30,000 foot level where I explore the consequences of aging; my colleagues working in the trenches of aging science are the ones that will make the actual discoveries.

Why can't we get somebody like Sean Parker to fund longevity/immortality studies?

bettorworse

Let's get the language correct. Healthy lifespan extension. I'll repeat, healthy lifespan extension! This may very well become the next great public health paradigm -- we made the case for this in an article in the British Medical Journal in 2008 with Bob Butler as the lead author. We are in fact going to high net worth individuals with the suggestion that they can get in on the ground floor of what could prove to be one of the most important accomplishments in medicine in the modern era. Just as Bill Gates has made his impact in public health by attacking infectious diseases in the developing world -- and there are very few examples like this -- we expect someone to step up to the plate and make a declaration just like President Kennedy did years ago when he decided to send someone to the moon and return them safely. The time has arrived to fundamentally change the way in which we attack disease, and once done, it's fairly easy to make the case that the modern era will have witnessed one of its greatest accomplishments. I don't think the money for this effort will come from governments (not enough funds and too slow); it's going to come from someone like Sean Parker with a vision and the funds to back it up. The question now is, who will it be?

I've often heard people mention that grip strength is an indicator of longevity. Seems far-fetched, is there any truth to this?

glenglenglenglen

There is science behind this. Ask Dr. Brad Willcox in Hawaii about this -- I think he's published on this topic.

Hey Jay! We had dinner together when you were in vancouver bc for a lifespan event. You were telling us about eating raw chicken. Any other crazy food experiences lately? Hope everything is well.

grossguts

Just so everyone knows, I've eaten raw chicken only once (and probably never will again) -- it was at a tasting at the Culinary Institute of America in California where the chef who invented 'farm to table' was preparing meals for a small group participating in an event arranged by Mark Schatzker, the author of The Dorito Effect (excellent book). There is a new food movement underway that involves the introduction of more intensely flavored nutrient dense foods that are not genetically engineered. We

visited the farm where the chickens were raised, and we were assured by the chef that this would be a very unique and safe experience. It was indeed!!! But no other crazy food experiences lately, except perhaps the wonderful experience I had not long ago when in Kobe, Japan where I was able to sample fresh Kobe beef. Amazing!!!

Is there a way to "open source" your research so that resulting drugs are not proprietary and only available to the very rich?

openprivacy

Not sure about the open source question, but I do want to respond to the issue of cost. Metformin is an inexpensive compound and no one really stands to profit from its use for this purpose. Having said that, nothing in life is equitably distributed (e.g., water, food, income, education), so if a more expensive intervention eventually becomes available, the laws of economics will operate -- making interventions of this kind first available to those that can afford it. Keep in mind the history of aspirin, which was also not readily available to everyone when it first came out. Now it's cheap and almost anyone can gain access.

Hi! Thanks for doing this AMA. I have two questions - how far do you think the healthy lifespan could be extended by 2050?

And would there a point in your life where you would consider lengthening your own lifespan? Thanks again

ThrowawaytheHorizon

By 2050 I'd be surprised if we could achieve anything more than a few years of additional healthy life, even with a breakthrough in aging science. This may not sound like much, but keep in mind that in long lived populations, it takes very large reductions in death rates to achieve even a 1 year increase in life expectancy. A 1 year increase in healthy life expectancy is even more difficult to achieve.

My personal view here is that if we continue with the current medical model of attacking one disease at a time, we will not see an extension of healthy, but instead, the exact opposite -- a prolongation of the period of frailty and disability. This is the very reason we're working so hard now to change the culture of thinking on this topic.

How feasible is caloric restriction as a longevity strategy in humans? Am I oxidizing myself more quickly when I do cardio?

sagan_drinks_cosmos

I addressed CR earlier, but your question about cardio is an interesting one. My father, who was a plumber and lived to age 96 and healthy right up until the end, used to tell me that I should stop exercising because I was using up all of my heartbeats. I wasn't going to argue with him on this, but your question and my father's view raise an interesting point. Is it possible that some of the behaviors we think are beneficial, might actually be harmful? I don't know the answer to this definitively -- I merely wish to point out that we need to be careful about taking what appears to be definitive medical evidence, and running with it for the rest of our lives. It's entirely possible that too much exercise of a certain kind could place an unnecessarily harmful risk on certain parts of the body. I should point out that this is the reason why I replaced running (which I did for 35 years) with walking.

Hi! Thankyou for doing this AMA.

In your line of work, are the ethical implications of extending biological aging often discussed? Are there concerns that a way to entend only basic functionality but not more complex cognitive functionality (or the other way around) might be found, leaving the dilemma of whether or not such finding should be applied? Also, are the implications of extending the human lifespan for society and the environment often discussed? As my studies are leading me deeper into neuropsychology, I find this work very interesting. Thankyou!

ReluctanceEmbodied

The ethical implications are front and center. Again, life extension without health extension would be harmful -- no one, especially not in the world of aging science, is seeking one without the other. The fear I have is that health issues with the aging brain will become our greatest problem if we succeed in efforts to reduce just heart disease and cancer, which is why slowing aging is being pursued.

Thank you for taking questions, Dr. Olshansky. Your name seems to be everywhere in the anti-aging literature. It's an honor!

I've seen that you are generally (and, to this layman, appropriately) skeptical about the purported anti-aging qualities of various compounds. In addition to metaformin, what other compounds appear most promising and why? The compounds I've seen mentioned most often are: - quercetin-dasatinib combinations to target & eliminate senescent cells, - bisphosphonates, - rapamycin, - ubiquinone (MitoQ) and plastoquinone (SKQ), - sirtuin-activating compounds, - algebrium (ALT-711), and - C60 Fullerenes. Also, and related to all of this, what effect do you think the involvement of the pharmaceutical industry has on this? Are there potential conflicts that could taint research or diminish the urgency for this work? Thank you again!

JamesInDC

Instead of providing you with a list, I would direct your attention to our latest book on this topic -- just published a couple of months ago. The title is Aging: The Longevity Dividend (Cost Spring Laboratory Press, 2015); I co-edited this with George Martin and Jim Kirkland, both of whom could rattle off a long list of potential interventions. We don't make any money on the sale of this book in case you're wondering.

Hello professor Olshansky!

I have decided to pursue a Master's in Epidemiology and I was wondering what I can do to get exposed to the field as an undergraduate?

Also, what were/are some challenges or hardships that you had to or have faced during your career?

Yoshi_The_Dino

Wonderful! A masters degree in this field will be a great help in your career. Keep in mind that I currently chair admissions in our epi/bio program at UIC :-). The answer to begin with is simple: read, read, read. The literature in this topic is very large and growing fast, so begin there. If your University offers any courses in aging biology, epidemiology, public health, evolution biology, demography of aging, etc. -- take them. As for challenges, I spent many years seeking a Ph.D., and then many more years seeking additional graduate level training in the biological sciences. I became a genuine interdisciplinary scientist, and then the challenges began to appear. These came in the form of some people not quite understanding the linkages between these various scientific disciplines, so my

colleagues and I spent quite a bit of time finding ways to communicate complex ideas in simple ways. The best example of this was published originally in an article in Scientific American in 2001 in an article entitled If Humans Were Built to Last. What's the message here? Be persistent and don't give up on any element of your education -- seek out an interdisciplinary background because it's through this lens that you'll obtain a more thorough understanding of the field.

People in their 20s and 30s are planning financially for retirement in their mid 60s and death around 80. In the next 50 years do you see longevity science progression forcing us to re-evaluate these horizons?

everythingstakenFUCK

Yes, we most definitely need to plan differently for retirement. I've been to meetings with financial planners where I discovered that their primary source for figuring out how long people will live, is to just ask them. Most people really have no clue how long they're going to live, so the development and use of new platforms that do this for people more efficiently and reliably, are needed. We're already working on this now.

Hello! Thank you got doing this AMA.

I am still young! (18-22) If your hypothesis on slowing aging being the next big scientific advancement comes true, how will it affect me at the end part of my life?

Thanks!

tallu309

Well, I'm 62 and I still consider myself young! Great question. For younger people, if everything goes as planned, what we hope to achieve for you is an extended period of youthful vigor. Think of it this way. If it could take you 70 years to turn 50, or 60 years to turn 40, we will have accomplished what we set out to achieve. Keep in mind that about 15% of the population in the U.S. today that is now over age 85, is functionally not far different from people decades younger. We want to make this kind of healthy life available to a much larger segment of the population.

Besides a healthy diet and exercise - how can the average person slow the biological aging process? I know there are some supplements on the market - do any of them work in your opinion?

PoodPound

There is nothing on the market today that has been documented to slow aging in humans, period. If anyone is making that claim, protect your wallet and your body.

What are your recent thoughts on life expectancy gaps at older ages between racial groups? What about gender, where males continue to die earlier? Will these gaps tend to close over time, or will they continue to grow?

kangolkyle

Good question. My colleagues and I at the MacArthur Foundation Research Network on an Aging Society, run by Dr. Jack Rowe, just published a paper not long ago on this issue in Health Affairs. The gap in longevity between racial groups is substantial; the gap is even larger by level of completed

education; there is reason to believe the gap will grow larger; and evidence has already surfaced indicating that some subgroups will fare much better in the future while others will experience an actual decline in life expectancy (it's already begun).

As for the gender gap in longevity, I don't see this closing any time soon. This is observed among many species, where females live longer than males, so there is a fundamental biological force at work here that has yet to be fully understood.

Good afternoon Dr. Olshansky.

Do you have any advice for young, wily molecular biologists who want to devote their careers to making an impact on human longevity?

I'm still not sure of the most effective paths to take in graduate school, or even if graduate school is the only option. Perhaps there are still significant entrepreneurial opportunities for individuals who do enough independent research & have sufficient starting capital...

Thank you.

LabBadger

Graduate school is a requirement in my view. Learn about the various scientific disciplines that influence human longevity -- not just molecular biology, but also evolutionary biology, genetics, epidemiology, etc. It's a big picture -- you really need a very big lens to understand this phenomenon.

Any thoughts on the blue zone concept by Dan Buettner? I've been adhering for ~1 year and I'm very happy with the weight loss and digestive effects, not too surprisingly...

hyperproliferative

Dan's work is very interesting, and we've known each other since he began his work in this area. The blue zone concept preceded Dan, but he's run with it in a productive way. The bottom line is that pockets of long-lived people do exist, and we have a lot to learn from them, but I'd be far more interested in their genetics than their lifestyle.

Incidentally, when I make the comment "choose long-lived parents", this is my tongue-in-cheek way of saying that your genetic lineage plays a very powerful role in your longevity prospects.

Hi Dr. Olshansky, thanks for doing this AMA! I think about the subject of aging an awful lot, and I'd like to start with my questions, and then get down to some background.

1. Would you say that you (and others in your field) are generally pursuing this field with the goal of making humans immortal?

2. If you could achieve arbitrarily long lifespans for humans, do you think that it is ethically acceptable to do so?

I'm sure others (with biology backgrounds) will ask more interesting technical questions, but I'm curious to see what somebody in the field thinks of the ethical implications. As a geologist, I think in terms of "deep time"; millions and millions of years. Watching evolution in fossils and what-have-you. I'd come to the conclusion recently that death is a pretty important aspect of the evolutionary chain; if things didn't die (aging renders even the strongest of creatures weak and infirm), the species that are currently there would likely either out-compete the young, or the system would be subject to periodic,

cataclysmic restructuring. It would almost seem as though aging is a *product* of evolution, rather than simply a component; an optimal death/reproduction rate might speed the rate at which species improve their "fitness". In human terms, I see this as "sure, you'll die, but there was nothing Stalin could do against the inevitable march of time, and thank fucking god". Or, as Max Plank once said (translated): "A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather its opponents eventually die, and a new generation grows up that is familiar with it.".

Do you reconcile your work with the ethics side of this, at all?

Cronanius

Immortality and radical life extension just aren't in the cards -- that's not what we're talking about at all.

This is less of a science question and more of a social question. Do you think the awareness that an AMA like this brings on a site like Reddit will lead to an uncontrolled / unmonitored spike in people getting prescriptions to Metformin and giving it a shot?

What do you think the impact of an uncontrolled parallel "study" going on at the grassroots level would mean relative to formal studies like you're taking on? Any thoughts on ways to get any statistically useful data at all from that sort of a situation?

IAmDotorg

It is unclear whether we will see an uptick in prescriptions for Metformin as a result of stories like this. I would hope that physicians who prescribe these medications are reluctant to conduct experiments on their own patients. Clinical trials have to be conducted very carefully, with controlled conditions, so I'm not optimistic that citizen science based on accumulated records from people already taking Metformin, will withstand the rigors of the scientific method.

Hello Dr. Olshansky, I am so excited to be able to ask you questions because I quit my full time job back in January to purse my dream to research this very subject. More specifically, I want to increase human longevity in order to allow farther space travel for astronauts. But the whole subject is extremely interesting on learning the foundations of how our bodies age. Anyways my questions:

What average age do you think we can progress to as a society?

If we succeed with life-extension will it be as we are living in our prime for a longer period of time or will we get older slower towards the end.

On the cellular level what causes aging?

What kind of school curriculum should I be looking for to get to where you are at right now?

Do you recommend any books that will help me understand the fundamentals of this subject?

How is the life of a researcher? What are some things that are not shared until you actually get there?

Thank you so much for your work! I hope to be there one day!

Dudeops

Welcome to the field and I strongly encourage you to pursue your dream of working in this area. My main advice is to obtain an education based on interdisciplinary sciences where you learn about more than one scientific discipline. As for the life of a researcher, it doesn't get much better than this. We get to answer our own questions -- the kinds of questions we used to ask when we were younger. I've lost

none of my youthful enthusiasm for science, and this is the main reason why I strongly encourage the asking of questions. Most of your questions are answered in our latest book entitled Aging: The Longevity Dividend, but you may want to examine the references provided by the many authors of this book -- they're quite extensive.

Sometimes I think there is something strange about my genetics. All of my Great Grandparents lived well into their 100's and all died from injuries related to falling down and all smoked for over 80 years. I never seem to get sick and have almost always looked 10-25 years younger then my actual age. Are these circumstances common for many people or do I have something strange going on?

TheCommishTheCommish

You just described one of the most common observations in our field. It's not strange, it's normal for people who seem to be "protected" from a rate of aging that seems to be occurring at a faster pace for the rest of us. Consider yourself fortunate.

Hi Professor Olshansky,

Thanks for taking the time to do this AMA. I currently work in health consulting and aging as a topic has been an interest of mine for a while. As someone who's considering pursuing graduate education in the realm of public health (most likely tox, epi, or perhaps data science) what advice would you have? As far as careers and job outlook, what do you think the field of public health will look like in 5, 10 years, particularly outside of academia?

Thanks again.

sfe_dog

Aging science and the various disciplines associated with it are the wave of the future. Jump in now and ride the wave!!!

So is slowing down aging going to look like longer periods of adolescence, or will it be something that people will start when they feel themselves "getting older" to push that off? Strikes me that, at least neurologically, longer adolescence has supreme pros and serious cons.

Gh0st1y

Good question. I don't expect any delays in development, but once adulthood is achieved, I expect the negative effects of aging to take its toll at a slower pace. There will still be great variation in a genetically heterogeneous population, but more people should have access to healthy life extension.

I come from a family that has great longevity on both sides (multiple people lived/living to 90s, recently two passed who were 108 and 105). How much do you see "good" genetics like these truly affect the lifespan of their children?

HuffleMcSnufflePuff

This is perhaps one of the most important factors influencing duration of life. Chances are that if you come from a long line of long-lived relatives, most probably looked younger for their age throughout most of their lives.

Do you foresee any moral obstacles arising from your research? From yourself or backlash from the public?

robsbob18

No. If the public does not want to participate in an effort to enhance their quality of life, they can choose not to do so. They might also want to avoid going to their physician for routine physicals and get treated for heart disease or cancer if they arise. It's all about choice. We're trying to make the healthy life extension option a choice.

Hello! Thanks for the AMA.

I've always wondered but I can't find much information about it. Does Intermittent Fasting offer longevity benefits similar to Calorie Restriction?

What about high protein diets, for athletes? Are they detrimental?

StarlitSonder

Intermittent fasting might be the next paradigm of caloric restriction. New research on this topic just emerged recently -- it's exciting work.

[deleted]

[deleted]

That fact that we are unable to deal effectively with mental and physical challenges at advanced ages is precisely the reason why we think aging should be the next target. I'll repeat -- extending life is not the goal here; extending healthy life is the goal. We have the same goal in mind.

Einstein suspending the scientific process when creating the atomic bomb. He said we didn't have the time for it. Is there any thought of suspending the scientific process when it comes to treating aging?

irerereddit

Emphatically no. We should not be conducting biological experiments on our own bodies, and doctors who prescribe Metformin should not be conducting biological experiments on their patients. Let's wait for the science to come in. I understand the lack of patience and desire to see this all come to fruition, but the scientific method is a process that require time. Having said that, there are ways to accelerate parts of the science without sacrificing the scientific method, but this requires larger sample sizes and, in the end, more money to conduct the trials.

Science might be able to "prolong" life, but what would the quality of life be? How early in ones life would a person have to start taking a medication to prolong their life to have the quality of life they want to have? this seems like one of those things that people should ask the question, "just because science can do this, Should science do this?"

RavenKing40

This question is right on target! In fact, this is the primary question we ask. Life extension without health extension would be harmful and should not be pursued in my view, and no credible scientist in the field today is pursing anything other than both mind and body making it out intact to older ages.

Thank you for doing this Dr. Olshansky!

Do think there is an age that taking these kinds of anti-aging therapeutics becomes more effective? As in, would a teenage or twenty year old benefit as much as someone in their 50's?

I suppose the underlying question would be whether aging damage accumulates evenly throughout life, and whether natural repair mechanisms are good enough on their own earlier in life.

Arete2

The question about what age to begin an intervention of this kind will be addressed in the research. No one knows yet what the best age is to begin an effort to module aging.

Thanks so much for doing this! From a social epidemiologic perspective, could you speak to the ways in which you are (or are not) observing changes to social gradients in life expectancy associated with these sorts of medical advances? What steps or research is being undertaken on the unintended consequences these sorts of interventions may have on widening social inequities in life expectancy? Or on using these interventions to promote life expectancy among groups that are disproportionately impacted by chronic stress related to their relative social status?

loopsonflowers

The question is a bit more detailed and nuanced, but let me just say that the intervention we seek is designed to yield healthy life extension for everyone. Having said that, I'm not naive enough to think that everyone will have first access. This is not a reason not to pursue it -- it's just a recognition that any major medical breakthrough like the one I speak of here, is unlikely to be equitably distributed once first discovered. Eventually though, almost everyone will benefit.

Hello Dr. Olshansky, and thanks for doing this AMA!

1. How realistic (whether in the short term or in the long term) do you think immortality is as a goal?
2. Which path do you think is the most efficient towards extending longevity: researching medication (as in a pill that would be taken regularly), stem cell research for organ cloning (if an individual were to become diseased, they could replace the malfunctioning organ, for example) or an other path?

Thanks in advance for your answers!

TheCheeseCutter

I don't think the term "immortality" should even be part of scientific discourse, although I recognize that the word appears in the title of my first book. Of course, throughout the book I explain why it's not going to happen.

Let's say, hypothetically, that a breakthrough is discovered that can considerably slow aging. Like, I could live until I'm 150 or 200. Do you expect external forces would exist to squash such a discovery because of what it could potentially do to society? Overpopulation for example.

eagerbeaver1414

Keep in mind that even if we hypothetically had an intervention in hand that could make us all live to 150 or 200, and I don't expect this will happen, we wouldn't even know it or be able to prove it. Why? Because it would take many decades of use to know that such an intervention actually had that effect. That's why these high numbers for life expectancy used by so many are made up out of thin air.