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A Non-Profit Organization

# CRYONICS

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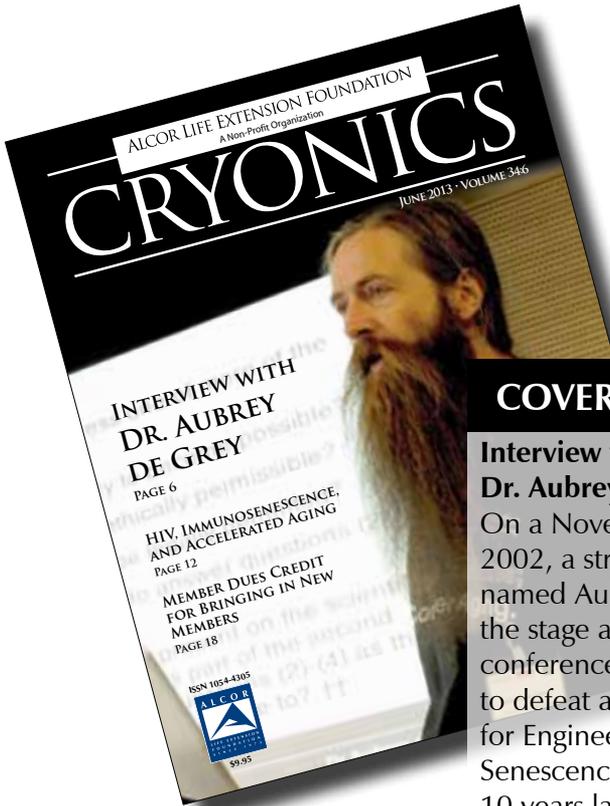
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# CRYONICS



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### Interview with Dr. Aubrey de Grey

On a November weekend in 2002, a strange looking fellow named Aubrey de Grey took the stage at the 5th Alcor conference to present a proposal to defeat aging called Strategies for Engineered Negligible Senescence (SENS). More than 10 years later we meet with Aubrey again to talk about the nature of aging, rejuvenation, and the future of cryonics.

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# QUOD INCEPIMUS CONFICIEMUS

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Photo: Cryo-Care Equipment Corporation on Indian School Road in Phoenix, AZ.  
Dr. Bedford's "home" from 1967 to 1969.



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## MARKETING CRYONICS By Aschwin de Wolf

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Since I have been involved in the field of cryonics I have encountered two distinct views on the marketing of cryonics. One view holds that cryonics is characterized by a disproportional involvement of scientists, intellectuals, and people with computer backgrounds who are totally unequipped to sell the idea to the larger masses. The marketing of cryonics should be done by people with a “business” or “marketing” background.

The other view is that people who expect a lot from marketing of cryonics are blind to the most obvious fact about our field. Most people reject cryonics and don't want it. No sane business would spend vast amounts of time and money on a product or service that people don't want.

While I am personally more sympathetic to the latter perspective, I suspect that a rather obvious point is being overlooked. What seems to matter a great deal is how cryonics is conceptualized and “sold” to the general public. Let me illustrate this by contrasting two really different ways of talking about cryonics. I am purposely *simplifying* things here to get the point across.

1. The belief in a “soul” (or dualism) is nonsense. There is nothing in our understanding of the laws of physics that prohibits the manipulation of

matter at the molecular level and extremely long lives will be possible, even for people considered “dead” today. Technology is accelerating towards the Singularity. Most likely, cryopreserved people will be resuscitated as substrate-independent minds. Cryonics is part of the broader “immortalist” and “transhumanist” movements. Not all people agree with us and we need to identify the biases that give rise to these attitudes so we can change their minds. If you are concerned about resuscitation in a different and strange world, you need to toughen up.

2. Current developments in science and medicine increasingly throw doubts on the idea of “death” as a single and uniform event. We can stabilize people at ultra-low temperatures to allow them to benefit from future medical developments. Cryonics is a logical extension of other medical procedures in which people are stabilized for further treatment. The pace of technological progress may not be linear but assuming complete scientific and technological stasis is not reasonable either. Cryonics raises a lot of concerns for many people. We have to address these concerns

and calibrate our message to show that cryonics is not something threatening but something aimed at preserving lives and keeping people together.

Now, think about these different ways of conceptualizing cryonics from the perspective of marketing. It seems to me that the first perspective is not only extraordinary difficult to sell but that the most proper expectation here would be more akin to damage control. If you are frustrated about the fact that you are always discussing “something else” instead of cryonics there is a good chance that this is the result of either a lack of restraint in promoting other ideas you care about under the rubric of cryonics or that the person in question has read just too many popular accounts about cryonics that discuss the Singularity, immortality, mind uploading, or chopping off heads. As much as I hate to admit it, some of the bad PR surrounding cryonics is self-inflicted.

If anyone would ask me today if successful marketing of cryonics is possible I would answer that this really depends on whether we are trying to sell a complete worldview that most people seem to reject or whether we are trying to connect to the rest of us with a proposal to update our current views on what it means to practice critical care medicine and end-of-life care. ■

# INTERVIEW WITH DR. AUBREY DE GREY



The following interview with biogerontologist Aubrey de Grey is the first in a series of interviews with prominent scientists in the field of aging. Questions were submitted by fans of the Alcor Facebook page and the magazine editor.

**1. At what age, currently, should someone feel that there is very little chance of life extension research benefiting him before the end of his (current, average projected) life expectancy?**

There's no way to answer that in terms of chronological age, because different people aged (say) 60 have such different states of health and chances of living another (say) 30 years. All we can say is that there seems to be a good chance—I'd say at least 50%—that we will be able to control aging pretty comprehensively within 20-25 years from now, allowing those who are not too frail to be treated to benefit greatly. I think anyone who is in a good enough state of health that they can reasonably expect to avoid serious age-related disease or disability for another

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*“...one big reason why exercise is not bad for you is that the mitochondrion, the main source of free radicals as a side-effect of releasing energy from nutrients, actually works more cleanly (producing fewer free radicals) when it is working harder than when it is ‘idling.’”*

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10 years has a non-negligible chance of benefiting. But I should point out that the humanitarian motivation for striving to hasten the defeat of aging is much the most powerful in my view—much more powerful than the desire to benefit oneself, or to benefit any particular other person.

**2. What advice can you give to cryonics organizations and activists to improve the public's perception of cryonics?**

That's pretty hard: very smart people have been trying to perfect a pitch that works for a long time, so I'm unlikely to have any ideas that are really new. The only thing I think might be more effective is to promote certain aspects of the logic of cryonics a bit more aggressively, and especially to educate the public better concerning aspects of that logic that are already mainstream. For example, I think it would be useful if the public knew that mainstream cryobiologists, the type who publicly deride cryonics with great vigor, nevertheless typically have a very positive view of research aimed at vitrifying organs and reviving them for transplant purposes. If this were better known, the question of what makes the brain any less revivable in principle than a kidney becomes rather obvious, and the absence of any good answer from the mainstream critics of cryonics becomes rather conspicuous.

**3. Where do you see cryonics in both society and technology in the next 40-50 years?**

The societal aspect depends almost entirely on the extent of technological progress, I think. The minute we revive a mouse and have it live healthily for even a week or two, there will cease to be appreciable doubt that cryonics will eventually work. I think there's a very good chance of getting to that point in under 20 years.

**4. When do you believe the first tangible and effective product or technique for increasing human life span will result from SENS research? What do you believe that product/technique will most likely be?**

Well, SENS is a divide-and-conquer strategy, so we can't expect to see significant postponement of aging resulting from it until pretty much all of it is working quite well. Thus, there's no one answer to the second part of the question. As to the first part, see question 1.

**5. How can an individual without extensive formal education but with a passion for the science and potentially great ideas become directly involved in producing viable results in the fight against aging?**

There are numerous ways. One is to get extensive informal education!—that’s how I started out, having originally been a computer scientist with no biology education since the age of 15. Other than that, the most obvious way is of course to donate to the research; without the generosity of a few very wealthy people we would not be where we are today, and we are also extremely happy that the number of small donors is rising rapidly at the moment. But there are also non-monetary ways, because a huge part of getting this work to happen sooner is simple advocacy, educating the public to realize how important it is. Advocacy comes in many forms: doing interviews, organizing lectures and meetups, and even just talking to one’s friends/family/colleagues. The more familiar people become with this field, the more they will appreciate that it may bear fruit quite soon.

**6. The idea of SENS has been around for more than 10 years now. What do you consider your greatest achievements and failures?**

I think the greatest achievement has been in legitimizing the idea of rejuvenation biotechnology in the eyes of scientists and the media. There are still skeptics, of course, but the acceptance of this approach is now such that I am regularly invited to organize sessions at mainstream biogerontology conferences, whereas as little as five years ago I would never even be invited to speak at them. Similarly, I am hardly ever characterized in the media as “maverick” or “heretic” any more—“controversial,” sure, but of course that means “might be right.” As for failures, well, there are no real scientific failures—SENS has pretty much exactly the same structure now as a decade ago—but I guess I would say that I’m quite disappointed that the number of very wealthy donors to this cause has not increased as rapidly as I’d expected since Peter Thiel led

the way in 2006. We’re working very hard on changing that!

**7. If aging is the accumulation of damage, how is it possible that activities that generate more stress (such as exercise) can improve health and lifespan?**

The simple answer is that stress doesn’t necessarily cause damage! But of course it depends on the type of stress. Exercise is a particularly interesting case: one big reason why exercise is not bad for you is that the mitochondrion, the main source of free radicals as a side-effect of releasing energy from nutrients, actually works more cleanly (producing fewer free radicals) when it is working harder than when it is “idling.”

**8. Is there any scientific finding (or set of findings) that you think undermines the idea of aging as accumulation of damage?**

No. However, there are some phenomena that seem inconsistent with that idea until one examines the details carefully. For example, the malleability of the rate of aging in response to simple interventions, such as calorie restriction or single-gene mutations, superficially implies that aging is determined by a program that orchestrates decline in many tissues semi-simultaneously, but in fact the consensus is that the effect on aging is just a side-effect of the

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*“The minute we revive a mouse and have it live healthily for even a week or two, there will cease to be appreciable doubt that cryonics will eventually work.”*

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recalibration of metabolic priorities that the organism undergoes in order to optimize its reproductive potential in the context of particular environmental circumstances.

**9. One of the distinguishing features of SENS is the explicit advocacy of rejuvenation. Are there currently any examples of successful rejuvenation in the lab?**

I guess that depends on what you mean by successful rejuvenation. There are examples of the restoration of molecular or cellular composition—that’s what most stem cell therapies are, and the removal of amyloid in Alzheimer’s disease by vaccination is another example. Also, there are clear cases of relief from age-related decline in models of accelerated aging, such as late-generation telomerase knockout mice, by removal of the single cause of the acceleration (so in that case, reintroduction of telomerase). But in order to demonstrate restoration of youthful health in an aged organism that is aging normally, one would need to repair all of the multiple types of damage that are causing impaired function, and we can’t do that yet.

**10. Which element of the SENS program do you think is well taken care of by mainstream science and which element requires full community support?**

The only area that is currently quite well taken care of is stem cell research to combat cell loss. All the others need much more work than mainstream funding is currently allowing. ■

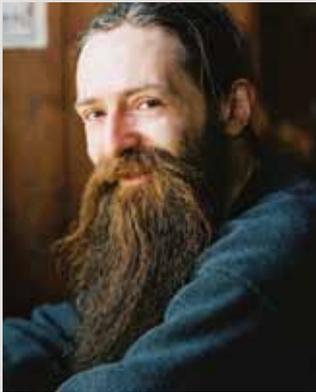
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Professor, Dept. of Genetics,  
Harvard Medical School

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Donald Ingram, Rozalyn Anderson, Luigi Fontana
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**Conference website: <http://www.sens.org/sens6>**

**For further information, please contact the organiser: Dr. Aubrey de Grey [email [aubrey@sens.org](mailto:aubrey@sens.org)]**

Please bring this notice to the attention of your associates involved in biomedical aging research



## THE VALLEY OF THE SHADOW OF DEATH

By Keegan Macintosh



The “uncanny valley” is a theory described in 1970 by robotics professor Masahiro Mori which posits that as a robot’s appearance becomes more human-like, observer affinity towards it will increase until the likeness reaches a certain threshold, after which affinity will drop sharply into the negative—the uncanny valley—before rebounding again towards levels exhibited toward ordinary, healthy-appearing humans.[1] The theory has received more widespread exposure since the advent of 3-D animated films, where attempted realistic depictions of human characters have sometimes resulted in quite negative viewer reactions, citing “creepiness” of the characters, despite animators’ efforts to render them as close to life (and presumably not-creepy) as possible.

The phenomenon is not unique to humans—it has been observed in monkeys presented with photographs and 3-D rendered images of monkey faces of varying degrees of realism. Mate selection and pathogen avoidance have been suggested as possible evolutionary reasons why subtle deviation from appearance norms would evoke a stronger negative response than a more substantial deviation. However, one researcher, Roger K. Moore has come up with an explanation of the uncanny valley effect, using Bayesian models, that suggests that the effect applies to all conceptual categories (to some degree), not just human vs. non-human.[2]

According to Moore, “the uncanny valley effect is a particular manifestation of... [the] ‘perceptual magnet effect’, in which stimuli close to a category boundary are judged by observers to be more dissimilar than stimuli that are away from a category boundary”. Where membership in one category or the other is determined by reference to more than one perceptual cue, and these cues are in conflict with each other, the differential distortion that results at the class boundary will cause “a form of perceptual ‘tension’... [that] may be experienced as physical or emotional discomfort, e.g. feelings of eeriness or creepiness.”

Moore posits that the drop in affinity described by Mori is a function of (1) decreased familiarity near the class boundary between a ‘target’ perception (i.e. human) and a ‘background’ perception’ that does not overlap significantly with the target (i.e. non-human), and (2) perceptual tension arising from conflicting cues to category membership. Individual observers have varying sensitivities to perceptual conflict, so the depth of the valley will differ from observer to observer, but the feelings of creepiness/eeriness “may induce the observer to take action in such a way as to reduce its effect.” Moore suggests four possible behavioural responses: withdrawal, attack, willfully ignoring one or more conflicting cues (“turning a blind eye”), or integrating the new information into the category schema (i.e. habituation). Which behaviour results from a particular

stimulus depends on the stimulus itself, and intrinsic properties of the observer. Moore’s model even accounts for the different curves Mori proposed for still human-like artifacts versus moving ones. However, Moore asserts that “the model derived here provides a more general mathematical explanation... for a range of real-world situations in which conflicting perceptual cues give rise to negative, fearful or even violent reactions.”

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*“I suspect that the sensitivity of an observer to particular perceptual tension, and the nature of the behavioural response exhibited, may depend in part on whether the target perception is a category the observer considers themselves to be a member of.”*

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One piece that I believe is missing from Moore’s explanation of the uncanny valley is the role that observer category membership plays. I suspect that the sensitivity of an observer to particular perceptual tension, and the nature of the behavioural response exhibited, may depend in part on whether the target perception is a category the observer considers themselves to be a

member of. This would explain why the effect seems more pronounced when the target perception is 'human'. It may be that the individual observer sensitivity Moore discusses is generally higher when the cue conflicts force introspection into why the observer themselves is a member of the target category, which could result in feelings of insecurity as cues previously assumed to be sufficient for determining category membership need to be reconsidered. It may also be relevant whether the observer considers themselves to be a core member of the target category, or on the fringe—or alternatively, a member of the background category.

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*“Reliance on life insurance to fund cryonics arrangements seems to pull in the wrong direction, as we are opportunistically capitalizing on a definition of death we fundamentally disagree with, in order to afford an opportunity to disprove it—to our benefit.”*

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Now, let us consider cryonics. Might the uncanny valley theory shed some light onto why cryonics has such a difficult time garnering public and mainstream scientific support? I think it can. Mike Darwin has written about the conflict between cryonicists and cryobiologists, pointing out that there was not always a “war” between them, and that “[s]everal cryobiologists who later became some of the most vocal critics of cryonics were not only not hostile, but actually demonstrated interest in and support of cryonics; particularly with an eye towards getting money to pursue cryobiological research.”[3] Several cryobiologists sat on the Science Advisory Council to the Cryonics Societies of America in those early years, and Arthur Rowe, who went on to become a prominent anti-cryonics cryobiologist, at one time

even wished Robert Ettinger “continued success in [his] endeavors”, was consulted for his expertise in an early cryonics case... and obliged! Though the collapse of the Cryonics Society of California and tragic loss of the patients at Chatsworth no doubt contributed to rising anti-cryonics sentiment, it is interesting that the move to ban cryonicists from entry to the Society for Cryobiology appeared to occur in reaction to close exposure to “medicalized” cryonics in an impromptu presentation by Darwin at the Society’s meeting in 1981.

This negative reaction by cryobiologists to the arrival of cryonics as a serious scientific endeavour can be explained using the uncanny valley theory. The target category here is clear enough—cryonics aspires to be recognized as a medical procedure. But what is the background category causing perceptual tension? One option is quackery, and certainly many public comments from scientists superficially seem to support this. However, remembering back to Moore’s explanation of the uncanny valley, perceptual tension arises from conflicting cues to category membership near the boundary between categories *with low overlap*, whereas quackery and actual medicine share many perceptual cues in common (if they didn’t, the snake oil wouldn’t get sold). So while we might not expect scientists to provide ringing endorsements of a practice they perceived to sit near the boundary between quackery and medical procedure, we also would not expect a previously neutral (and in some instances positive) response to shift sharply into the negative as a result of that same practice transitioning towards operating on a more rigorously scientific basis.

I believe the background category causing the trouble is *ritual burial practice*. The tip-off is that the regulators that anti-cryonics agitators invariably prod to clamp down on “cadaver freezing” are state funeral boards—even though the supposed cause for governmental intervention is that “it won’t work,” a standard which would never be applied to beliefs associated with other burial practices. This approach is illogical: a better strategy against cryonics would be to push for its regulation within the medical establishment, and in particular any devices

which fall under FDA’s authority over “medical devices.” This strategy would require cryonics to prove its efficacy, which of course, by presently accepted definitions, cannot be done. Instead, cryonics is shoved in the direction of regulators responsible for burial practices and other modes of disposition of human remains, where, of all places, it might actually have a chance of being protected on the basis of the practitioners’ beliefs. It is telling, too, how often negative responses by scientists to cryonics will ignore or distort well-established science, often from their own field. To me, this all points to the irrational/emotional nature of these responses—many of these researchers no doubt consider themselves members of the extended medical community, and are trying to put distance between themselves and something that looks like them and talks like them, but is nevertheless decidedly *not them*. Without necessarily realizing it, their instinctive reaction is to push cryonics back towards the background category causing the perceptual conflict.

Ritual burial practice and medical technology are far more dissimilar from each other than medicine and quackery, and thus Moore’s model would predict any cue conflict near the class boundary to cause perceptual tension. Here, cryonics is the perfect storm of conflicting cues: it is a procedure performed after the person is already declared dead, that looks at first like attempts to resuscitate, followed by surgery (possibly involving decapitation) and then preservation, with the ultimate objective of continued life in an as-yet-unknown form, on the basis of a theory that can never be absolutely disproven... so long as the person’s remains are left undisturbed. These perceptual cues are a complete and utter jumble, pointing 100% in both directions at the juncture of life and death.

And if that all weren’t confusing enough, what role might the category of ‘scientific research’ have in this? We utilize anatomical gift legislation to effect transfer of the body for the purpose of research, but then refer to our specimens as “patients” and wait for *other* research to produce the evidence and technology in order for *this* research to become a medical procedure. In

my opinion, the ‘scientific research’ label is a red herring—it has obvious utility for us, but it is a loose foothold in the uncanny valley, given how candid we are about our objectives.

So, will any amount of R&D short of actually resuscitating someone increase our public approval, or will it just heighten perceptual tension and plunge us further into the valley? Moore’s model tells us that individual sensitivity to perceptual tension isn’t something we can directly control for, other than perhaps through desensitization, but that is hard to accomplish with a movement so small. Also, some of the conflicting perceptual cues are not ones we can change. If our objectives sound quasi-religious to others, we can try to explain how we reject the ordinary definition(s) of death while still being rational people—but if they are not persuaded, there’s not much else we can do other than keep building up our evidence, brick by brick. However, we may be able to reduce cue conflict on other dimensions. We can accomplish this by continuing to emulate medicine in more positive ways, and also by de-emphasizing cues that pull the other direction (i.e. the trend away from the word “immortality” is a good one, at least for the public acceptance of cryonics).

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*“This negative reaction by cryobiologists to the arrival of cryonics as a serious scientific endeavour can be explained using the uncanny valley theory.”*

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The current legal definition of death is a source of perceptual conflict that we may not be able to do much about just yet, but in the interim, we can at least try to minimize its apparent importance to the procedure. Reliance on life insurance to fund cryonics arrangements seems to pull in the wrong direction, as we are opportunistically capitalizing on a definition of death we fundamentally disagree with, in order to afford an opportunity to disprove it—

to our benefit. Of course, for many life insurance is the only real means of access available to them, but perhaps down the road, we could negotiate or design a new form of insurance specific to cryonics, formally triggered not by the patient’s legal death, but initiation of cryonics procedures. This is really just a rose by another name, but it would also finally put to rest that old worry that the insurers will come back for their money if the patient is resuscitated.

A feature of mainstream medicine which is conspicuously underdeveloped in cryonics are surrogate decision makers for patients post-cryopreservation. As it stands currently, cryonics organizations have complete or near-complete authority over their charges, and while this is for the good purpose of preventing interference by third parties, it does give the appearance that the patients are essentially the property of the care provider. Given the potential time frames we are looking at, recognizing something like a power of attorney for health care, in cryonics care, still might not stretch far enough, unless it contained a power to delegate the authority further, or was vested in a trusted organization instead of an individual. Due to the legal status of the patients, the cryonics organizations would have a lot of latitude in designing what exactly their obligations were to the patient’s representatives, post-cryopreservation, keeping in mind the precarious and high stakes nature of the cryonics venture. However, one scenario which should be seriously considered, is under what circumstances a surrogate decision maker (or self-regulatory body, see below) could insist that the patient be moved.

Another aspect of medical practice which cryonics can and probably should emulate sooner or later is self-regulation. Mainstream medicine is of course regulated through a mix of government and professional self-regulation, and the cryonics organizations’ proactively developing shared standards and oversight mechanisms will give the public confidence that whatever the patients’ status is in law, they are being treated with due care and respect. In the same vein, self-regulation may help ward off the risk of inappropriate

government regulation down the road.

These are only a few ideas of how to keep non-research, non-technical dimensions of cryonics progressing smoothly toward recognized medical practice, mitigating as much as possible any perceptual tension with the background category of ritual burials.

If the uncanny valley theory holds true, there’s a high mountain of public acceptance on the other side waiting. The question is, have we already reached the bottom? ■

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## HIV, IMMUNOSENESCENCE, AND ACCELERATED AGING

By Chana de Wolf



After a few articles considering Alzheimer disease from several angles, I would like to switch gears this month and talk more generally about the interaction between the immune system and aging.

In his 2012 paper[1], Caleb E. Finch documents the evolution of life expectancy in the course of human history. The life expectancy at birth of our shared ape ancestor 6 millions years ago is hypothesized to approximate that of a chimpanzee, 15 years. The first *Homo* species appeared 1-2 million years ago and had a life expectancy of ~20 years, while *H. sapiens* came onto the scene ~100,000 years ago and could expect about 30 years of life. But starting around 200 years ago, concurrent with industrialization, human life expectancy jumped rapidly, to somewhere between 70 and 80 years today.

As many readers are likely aware, the huge recent increases in life expectancy are commonly attributed to improvements in hygiene, nutrition, and medicine during the nineteenth and twentieth centuries that reduced mortality from infections at all ages. Finch hypothesizes, generally, that early age mortality over the course of human history is primarily due to (acute) infection, while old age mortality is primarily due to (chronic) inflammation. Further analysis of mortality rates over the last several hundred years leads him to further hypothesize

that aging has been slowed in proportion to the reduced exposure to infections in early life. These hypotheses are supported by twentieth century examples which strongly demonstrate influences of the early life environment on adult health, such as the effects of prenatal and postnatal developmental influences (e.g., nutrition, exposure to infection) on adult chronic metabolic and vascular disorders as well as physical traits and mental characteristics. This leads Finch to suggest “broadening the concept of ‘developmental origins’ to include three groups of factors: nutritional deficits, chronic stress from socio-economic factors, and direct and indirect damage from infections.”

dietary fat and caloric content; infections from pathogens ingested from carrion and from exposure to excreta; and non-infectious inflammagens such as those in aerosols and in cooked foods. He hypothesizes that exposure to these pro-inflammatory factors, which one would expect to shorten life expectancy, actually resulted in humans evolving lower mortality and longer lifespans in response to highly inflammatory environments.

A means for this, he argues, was the development of the apoE4 genotype. Noting that the apoE4 allele favors advantageous fat accumulation and is also associated with enhanced inflammatory responses, Finch argues that heightened

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*“An unforeseen consequence of these successful therapies is that HIV patients are living longer but a striking number of them appear to be getting older faster, particularly showing early signs of dementia usually seen in the elderly.”*

---

Finch also considers the effects of inflammation and diet on human evolution, proposing several environmental and foraging factors that may have been important in the genetic basis for evolving lower basal mortality through interactions with chronic inflammation, in particular:

inflammatory response and more efficient fat storage would have been adaptive in a pro-inflammatory environment and during times of uncertain nutrition. As has been discussed in prior articles in *Cooler Minds Prevail*, the apoE alleles also influence diverse chronic non-infectious degenerative

diseases and lifespan. "Thus," Finch concludes, "the apoE allele system has multiple influences relevant to evolution of brain development, metabolic storage, host defense, and longevity."

With the general relationship between inflammation and the evolution of human aging and life expectancy in mind, let us now consider immune system involvement in more detail, and the relationship between HIV and immunosenescence more specifically.

Immunosenescence refers to the age-associated deterioration of the immune system. As an organism ages it gradually becomes deficient in its ability to respond to infections and experiences a decline in long-term immune memory. This is due to a number of specific biological changes such as diminished self-renewal capacity of hematopoietic stem cells, a decline in total number of phagocytes, impairment of Natural Killer (NK) and dendritic cells, and a reduction in B-cell population. There is also a decline in the production of new naïve lymphocytes and the functional competence of memory cell populations. As a result, advanced age is associated with increased frequency and severity of pathological health problems as well as an increase in morbidity due to impaired ability to respond to infections, diseases, and disorders.

It is not hard to imagine that an increased viral load leading to chronic inflammatory response may accelerate aging and immunosenescence. Evidence for this is accumulating rapidly since the advent of antiretroviral therapies for treatment of HIV infection. An unforeseen consequence of these successful therapies is that HIV patients are living longer but a striking number of them appear to be getting older faster, particularly showing early signs of dementia usually seen in the elderly. In one study, slightly more than 10% of older patients (avg = 56.7 years) with well-controlled HIV infection had cerebrospinal fluid (CSF) marker profiles consistent with Alzheimer disease[2] – more than 10 times the risk prevalence of the general population at the same age. HIV patients are also registering higher rates of insulin resistance and cholesterol imbalances,

suffer elevated rates of melanoma and kidney cancers, and seven times the rate of other non-HIV-related cancers. And ultimately, long-term treated HIV-infected individuals also die at an earlier age than HIV-uninfected individuals[3].

Recent research is beginning to explore and unravel the interplay between HIV infection and other environmental factors (such as co-infection with other viruses) in the acceleration of the aging process of the immune system, leading to immunosenescence. In the setting of HIV infection, the immune response is associated with abnormally high levels of activation, leading to a cascade of continued viral spread and cell death, and accelerating the physiologic steps associated with immunosenescence. Despite clear improvements associated with effective antiretroviral therapy, some subjects show persistent alterations in T cell homeostasis, especially constraints on T cell recovery, which are further exacerbated in the setting of co-infection and increasing age.

Unsurprisingly, it has been observed that markers of immunosenescence might predict morbidity and mortality in HIV-infected adults as well as the general population. In both HIV infection and aging, immunosenescence is marked by an increased proportion of CD28- to CD57+, and memory CD8+ T cells with reduced capacity to produce interleukin 2 (IL-2), increased production of interleukin 6 (IL-6), resistance to apoptosis, and shortened telomeres. Levels of markers of inflammation are elevated in HIV-infected patients, and elevations in markers such as high-sensitivity C-reactive protein, D-dimer, and interleukin 6 (IL-6) have been associated with increased risk for cardiovascular disease, opportunistic conditions, or all-cause mortality[4].

But even as we are beginning to identify markers that appear to be associated with risk of poor outcome in HIV infection, it is still unclear how patients should be treated on the basis of this information. To that end, several trials are underway to evaluate the effects of modulation of immune activation and inflammation in HIV infection. At the same time, clinicians at the forefront of advancing knowledge and

clinical care are performing research aimed at optimizing care for aging HIV patients.

The implications for such research may be far-reaching. In fact, many HIV clinicians and researchers think that HIV may be key to understanding aging in general. Dr. Eric Verdin states, "I think in treated, HIV-infected patients the primary driver of disease is immunological. The study of individuals who are HIV-positive is likely to teach us things that are really new and important, not only about HIV infection, but also about normal aging."

Dr. Steven Deeks stresses the collaborative efforts of experts across fields. "I think there is a high potential for tremendous progress in understanding HIV if we can assemble a team of experts from the world of HIV immunology and the world of gerontology," he says. "Each field can dramatically inform the other. I believe HIV is a well described, well studied, distinct disease that can be used as a model by the larger community to look at issues of aging." ■

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## CRYONICS IN NEW YORK: OPTIMISM BEFORE THE FIRST FREEZING, 1966-68

By R. Michael Perry



In an earlier column we looked into the beginnings of cryonics in New York, in which Curtis Henderson, Saul Kent and others formed the Cryonics Society of New York in Brooklyn in July 1965. It was the intention of CSNY to offer cryopreservation services to the public but that actuality with its challenges and cares would not materialize for another three years. With the worry over actual cryonics a ways off (and freezings elsewhere just getting started and still in a “honeymoon” phase), a heady optimism prevailed. At first CSNY was a private group with small, informal meetings and limited correspondence with other groups, particularly Evan Cooper’s Life Extension Society in Washington, D.C., the parent organization they had separated from over matters of policy. Here we take up the story in 1966.

In June that year CSNY published the first issue of their monthly newsletter, *Cryonics Reports*, which over the next 18 months would eclipse Cooper’s *Freeze-Wait-Reanimate* as the leading publication in the field. To achieve a more professional look the editor, Saul Kent, typed each article twice over, the second time adding extra spaces to create a master with even right margins.[1] Saul in fact deserves much credit as a driving force behind the New York group and most of what is reported here comes from the newsletter and appears to be written by him (unless noted otherwise). The first issue notes efforts to arrange for cryopreservation services. Land for a facility to store cryopreserved patients is being sought, and a letter is being sent to

funeral directors in the area with an appeal for assistance. Notes the letter: “Perfusing the body with a protective chemical solution, which is a necessary part of the procedure, is similar to the embalming process. The embalmer has the basic training to administer this treatment properly. Immediately after death, he could work with or without the doctor, if necessary, to help bring the patient to the frozen state.”[2]

A conflict is recognized early between cryonicists who advocated freeze-now and non-cryonicist scientists who felt that human cryopreservation should be postponed. This was underscored by events at the Third Annual Conference of the Society for Cryobiology, held August 8-10, 1966 at the Statler Hilton Hotel in Boston. Curtis Henderson, Saul Kent, and Karl Werner of CSNY attended.

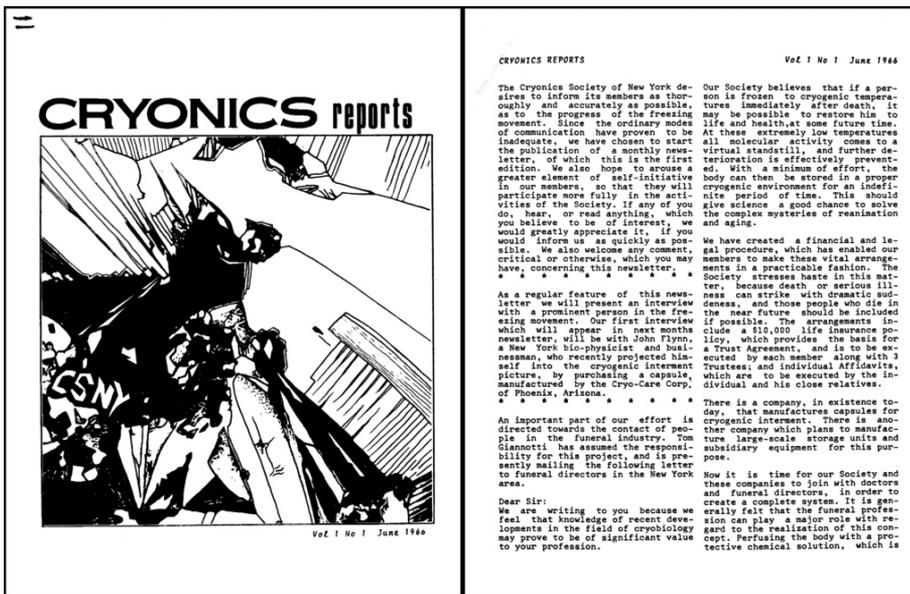
“On the first day of the conference we obtained permission from the chairmen of the exhibits to set up a table alongside the commercial exhibits [by prominent manufacturers of cryogenic equipment]. After 15 minutes of distributing our literature, Dr. Arthur Pappas, the co-chairman of the entire conference, decided not to let us continue our display. When Mr. Kent asked him why, he explained that they did not feel that the purpose of our Society was in keeping with the scientific nature of the conference.”[3]

An editorial by Saul Kent cites two reasons for opposition from scientists. First, human cryopreservation is seen as “premature in its development” and something that

should not be done until the process is perfected—starting with individual organs and graduating up to small mammals then large mammals. (A point apparently overlooked is that the brain is an “individual organ” that might be preserved to save the patient’s life before a process had been perfected for an entire body.) The objection, it is noted, ignores the basic cryonics premise that technology will improve in the future so that resuscitation of persons cryopreserved today might become feasible. A second objection is that the public may be defrauded by an unscrupulous practitioner who offers them “immortality” then fails to deliver. “Their alternative,” Saul writes, “is to freeze no one, and thus guarantee certain death. Apparently the promise of something definite, even death, is more appealing to these scientists than any uncertainty.”

“The time has come, the article concludes, “for scientists to openly support cryogenic interment [human cryopreservation]. This will greatly stimulate public demand, and influence businessmen favorably. As more people are cryogenically interred, the pace of scientific research necessary for resuscitation will be accelerated. What is there to lose? – certainly nothing more valuable than life.”[4]

Not all reputable scientists were hostile however. It helped if cryonicists could offer at least some token financial support, which CSNY was prepared to do. “The possibility of reanimation is based on our hopes for scientific progress,” writes Saul Kent in an entry in the newsletter feature “Cryonics Log” dated August 24, 1966. “We must,



*Cryonics Reports no. 1, cover and first page.*

therefore, encourage it in every way possible. We intend to allot a certain percentage of our budget for contributions to scientific research.” In fact this had already occurred. The same log entry, preceding paragraph, records: “We made our first contribution to scientific research in Cryobiology. A check for \$100 was sent to Interscience Research, a non-profit, independent group of scientists working in Jackson Mississippi. Their research director, Armand Karow, Jr., is writing an article for *Cryonics Reports*, which will be a comprehensive coverage of the work on organ and whole animal preservation.”[5] (Karow, a young college graduate who would soon obtain his doctorate and in 1968 join the faculty of the Medical College of Georgia, would go on to a distinguished career in cryobiology but distance himself from cryonics under peer pressure. He died in 2007, aged 65.)[6]

In November the article by Karow, “The Freeze Preservation of Organs and Animals,” appeared. Some six pages of closely printed text including nearly a page of references, it sketches the history of cryobiology, discusses difficulties and recent research, and recounts successes such as the resuscitation of dog kidneys after brief storage at 20°C. Finally, it offers an optimistic forecast. “The results achieved to date will encourage new research. The field of cryobiology is in need of vigorous, imaginative, and creative thinking from individuals in many disciplines including biology, chemistry, physics, engineering,

and medicine. This inter-disciplinary approach offers the greatest hope for future success.”[7]

Over the next year and a half Karow would contribute many other columns, all under the heading SCIENTIFICALLY SPEAKING, detailing other matters in cryobiology and biology more generally. In one he comments on the freezing of Dr. James Bedford that happened in January 1967 (in California). “Dying of cancer, he desired and provided for his cryonic suspension. Showing even greater foresight, he went one step further, and endowed a foundation to support research in cryobiology.” (This was the Bedford Foundation, unfortunately to be bankrupted in a legal battle over the Bedford will, so that it actually would have little effect, though Bedford remained frozen.[8]) “Whether it will be possible to restore Dr. Bedford to life cannot be predicted. However, by his act, he has definitely improved the chances of those who will be frozen in the future.”[9]

With cautious scientific endorsement such as this, cryonics gained a foothold of respectability—or so it seemed. Proponents might place it among other phenomena of the times that pointed to an unprecedented, technology-enhanced future. Indeed, exciting things were happening: space exploration, computers, and human organ transplants, to name a few of the most prominent. The mysteries of DNA were being unraveled,[10] pointing toward a more general control of and enhancement of human biology. The American economy

was strong and benefitting from developing technology,[11] which, among other things, would feedback into scientific research on many fronts.

The heady optimism inspired a 1967 book, *The Year 2000: a Framework for Speculation on the Next Thirty-Three Years*, by Herman Kahn and Anthony J. Wiener.[12] Excerpts of a preliminary draft are quoted in *Cryonics Reports*. The book included a listing of 100 “very probable” technical innovations which were expected to occur by the year 2000. Heading the list were: (1) multiple applications of lasers; (2) extreme high-strength structural materials; and (3) new or improved superperformance fabrics. [13] (Arguably all had been well-realized by the stated date.) These and others of the “100” are not listed in the *Cryonics Reports* summary, however, but instead 25 others that were “of greater interest,” though judged in the book as only “less likely, but important possibilities.” Among these were: suspended animation (for years or centuries); “true” artificial intelligence; and verification of some extrasensory phenomena. In addition ten other “far out” possibilities are included, such as life expectancy extended to more than 150 years and creation of artificial live plants or animals.[14] None of these more speculative possibilities have been more than marginally realized (cryonics might in fact prove to be “suspended animation” but this is unverified). It has to be concluded that the optimism of the cryonicists was overblown and unwarranted, though it is to their credit, as we in cryonics would say, that their dream of life extension by cryonics was doggedly pursued.

Going back a bit, in November 1966 Saul Kent wrote an article, “Enlist Now in the



*Armand Karow, 1962 yearbook photo, Duke University.*



Saul Kent's article in *Cavalier*.

War on Death," that would be published in the March 1967 men's magazine *Cavalier*. It offers a survey of the cryonics movement as it then existed (with only one person frozen, a woman who preceded Bedford,[15] but plenty of other activity) and an appeal for involvement by the general public. One forceful paragraph gives the general tone. "The proposal to freeze people at death is the first step in the most profound revolution of all time. It is a direct, radical break with the past. Death has always dominated human existence by setting conditions and imposing insuperable limitations over man. If death is no longer inevitable, it signifies the beginning of a new concept of existence—of a new species—one that will very quickly come to regard the entire history of man as a tortured, primitive step in its development."<sup>[16]</sup> In other places practical matters are considered; it is estimated that around \$10,000 (about \$70,000 today<sup>[17]</sup>) should suffice for perpetual, whole-body cryogenic storage, including initial preparation. Here I cannot do justice to the full article which occupies several finely-printed, triple-column pages but note that with space in a major publication cryonics was being taken seriously, at least as a topic that could spark reader interest and generate sales.

In what was possibly the high-water mark of New York cryonics of this period, a conference was held in March 1968 at the New York Academy of Sciences, 2 E. 63rd St., New York City. Announced as

the First Annual Cryonics Conference, it covered four broad categories: (1) cryonic suspension techniques, (2) cryonics and society, (3) research and future technology, and (4) legal and financial problems<sup>[18]</sup> Afterward the conference proceedings were

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printed in a volume of nearly 100 pages.<sup>[19]</sup> A full summary is not possible here, but one item that stands out is a talk by Rev. Kay M. Glaesner, Jr., "The Extension of Life – a Spiritual Goal." Grandly and piously Rev. Glaesner concludes: "... advancement in any area of scientific research, including the cryonic treatment of the human body or any part thereof, does not negate the sanctity of man nor the ultimate purpose of God. If we discover laws for extending life, we are only the recipients of divine revelation. Life is still spiritual and eternal. The processes that evolve this aspect of man's existence are indicative of spiritual forces uniting man and nature."<sup>[20]</sup> Saul Kent's closing line in the Introduction is more prosaic but also pertinent: "Our goal is the indefinite extension of *our* lives under increasingly better conditions. Cryonics is the first realistic step in this direction."<sup>[21]</sup>

Today we still want to extend *our* lives, radically, through a scientific process, and we see cryonics as a means to proceed immediately in that direction, even if the outcome is unknown. Most of the world has not accepted this "gospel" but we keep trying. ■

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# BRING IN A NEW MEMBER AND WE WILL CREDIT YOUR MEMBERSHIP DUES

By Max More, Ph.D.

Membership growth has slowed to a crawl. This is unfortunate because Alcor has reached a point where we could enjoy considerable economies of scale: We could manage many more members with minimal or no increase in staffing costs. That would enable us to reduce membership dues while building up our resources. A modest acceleration in membership growth would,

I believe, move us into a virtuous circle where growth enables reductions in dues which further spurs membership growth.

The most effective way to bring in new members has been through direct encouragement by existing members. Many of us realize this, but may not make it a priority to nudge our friends a little more to sign up and potentially save their lives.

How can we spur more members to gently persuade those they care about to move ahead with making cryonics arrangements? Perhaps some financial incentive will help. At the April 6, 2013 board meeting, I proposed that anyone who is primarily responsible for getting a new member to sign up will, at their request, be given a one-year waiver of membership dues. The board approved this proposal.

For an existing member to receive the dues waiver, they must (a) be credited by the person who has signed up; (b) ask for the waiver; (c) not be otherwise profiting from the signup; (d) wait until the new member has completed all essential paperwork and has paid at least six months of dues. If the member signs up two new members, they are eligible for a two-year waiver of dues. If the new member is a student or family member, the existing member is eligible for a waiver of six months of dues.

Who do you know who could do with some encouraging to sign up? Please, give it some thought, then help yourself and help the organization by helping to stimulate membership growth. ■



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<http://www.alcor.org/forums/>

## Peering into Living Cells at the Nanoscale without Chemicals

Two young EPFL scientists have developed a device that can create 3D images of living cells and track their reaction to various stimuli without the use of contrast dyes or fluorophores. In the world of microscopy, this advance is almost comparable to the leap from photography to live television. Researchers Yann Cotte and Fatih Toy have designed a device that combines holographic microscopy and computational image processing to observe living biological tissues at the nanoscale. Their research is being done under the supervision of Christian Depeursinge, head of the Microvision and Microdiagnostics Group in EPFL's School of Engineering. Using their setup, three-dimensional images of living cells can be obtained in just a few minutes – instantaneous operation is still in the works – at an incredibly precise resolution of less than 100 nanometers, 1000 times smaller than the diameter of a human hair. And because they're able to do this without using contrast dyes or fluorescents, the experimental results don't run the risk of being distorted by the presence of foreign substances. Being able to capture a living cell from every angle like this lays the groundwork for a whole new field of investigation. "We can observe in real time the reaction of a cell that is subjected to any kind of stimulus," explains Cotte. "This opens up all kinds of new opportunities, such as studying the effects of pharmaceutical substances at the scale of the individual cell, for example."

EPFL

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<http://actu.epfl.ch/news/peering-into-living-cells/>

## New Injectable Hydrogel Promotes Healing and Recovery after Heart Attack

University of California, San Diego bioengineers have demonstrated in a study in pigs that a new injectable hydrogel can repair damage from heart attacks, help the heart grow new tissue and blood vessels and get the heart moving closer to how a healthy heart should. The results of the study were published Feb. 20 in *Science Translational Medicine* and clear the way for clinical trials to begin this year in Europe. The gel is injected through a catheter without requiring surgery or general anesthesia—a less invasive procedure for patients. There are an estimated 785,000 new heart attack cases in the United States each year, with no established treatment for repairing the resulting damage to cardiac tissue. Lead researcher Karen Christman said the gel forms a scaffold in damaged areas of the heart, encouraging new cell growth and repair. Because the gel is made from heart tissue taken from pigs, the damaged heart responds positively, creating a harmonious environment for rebuilding, rather than setting off a chain of adverse immune system defenses.

Becky Ham / UC San Diego  
20 Feb. 2013

[http://ucsdnews.ucsd.edu/pressrelease/new\\_injectable\\_hydrogel\\_encourages\\_regeneration\\_and\\_improves\\_functionality](http://ucsdnews.ucsd.edu/pressrelease/new_injectable_hydrogel_encourages_regeneration_and_improves_functionality)

## In a First, Experiment Links Brains of Two Rats

In an experiment that sounds straight out of a science fiction movie, a Duke neuroscientist has connected the brains of two rats in such a way that when one moves to press a lever, the other one does, too—most of the time. The neuroscientist, Miguel Nicolelis, known for successfully demonstrating brain-machine connections, like the one in which a monkey controlled a robotic arm with its thoughts, said this was the first time one animal's brain had been linked to another. The question, he said, was: "Could we fool the brain? Could we make the brain process signals

from another body?" The answer, he said, was yes. He and other scientists at Duke, and in Brazil, published the results of the experiment in the journal *Scientific Reports*. The work received mixed reviews from other scientists, ranging from "amazing" to "very simplistic." Much of Dr. Nicolelis's work is directed toward creating a full exoskeleton that a paralyzed person could operate with brain signals.

James Gorman / *New York Times*  
28 Feb. 2013

<http://www.nytimes.com/2013/03/01/science/new-research-suggests-two-rat-brains-can-be-linked.html>

## Protein "Filmed" While Unfolding at Atomic Resolution

When proteins get "out of shape," the consequences can be fatal. They lose their function and in some cases form insoluble, toxic clumps that damage other cells and can cause severe diseases such as Alzheimer's or Parkinson's. Researchers at the Max Planck Institute for Biophysical Chemistry and the German Center for Neurodegenerative Diseases in Göttingen—in collaboration with Polish colleagues – have now "filmed" how a protein gradually unfolds for the first time. By combining low temperatures and NMR spectroscopy, the scientists visualized seven intermediate forms of the CylR2 protein while cooling it down from 25°C to -16°C. Their results show that the most unstable intermediate form plays a key role in protein folding. The scientists' findings may contribute to a better understanding of how proteins adopt their structure and misfold during illness. (*Nature Chemical Biology*, 10 February 2013).

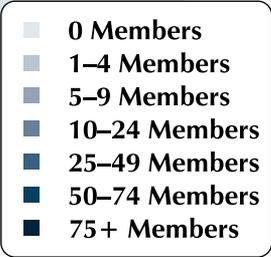
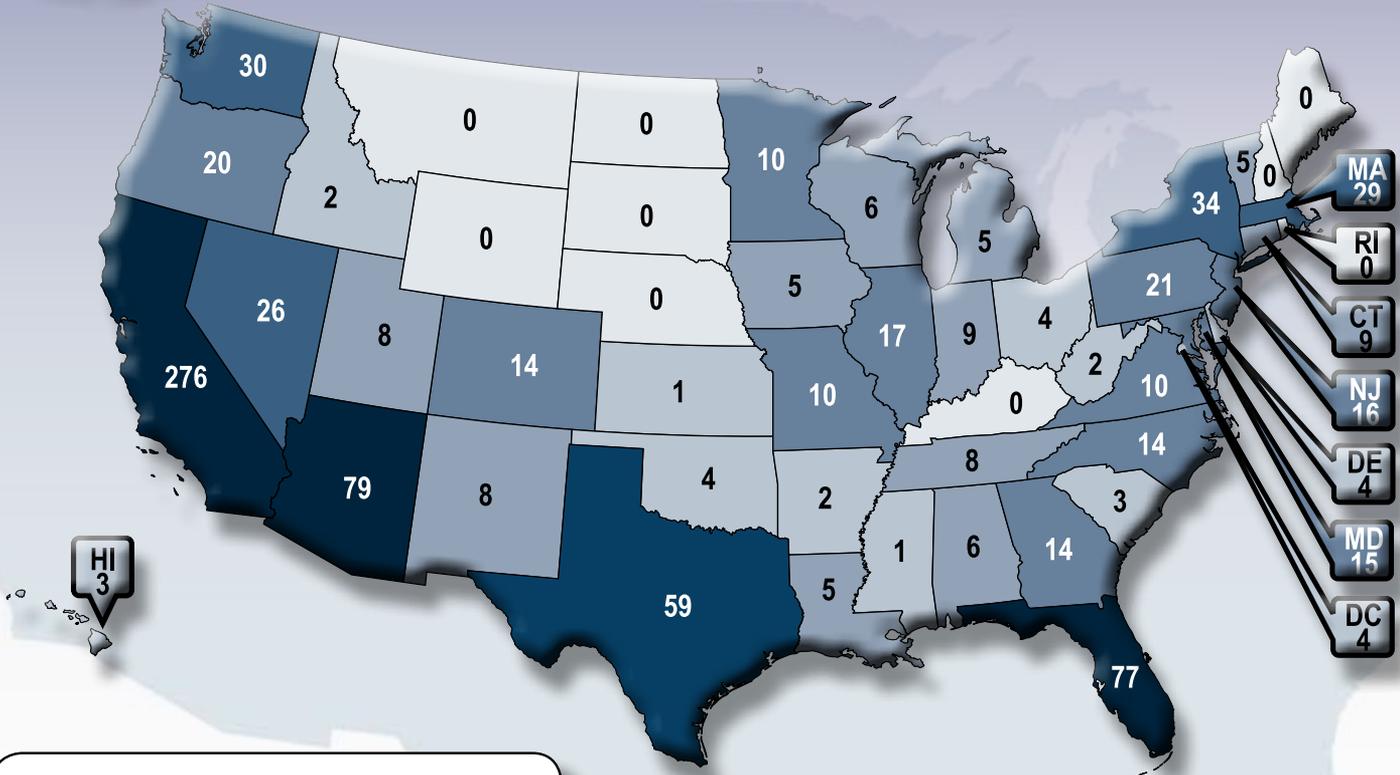
Max Planck Institute for  
Biophysical Chemistry  
11 Feb. 2013

[http://www.mpibpc.mpg.de/9606319/pr\\_1302](http://www.mpibpc.mpg.de/9606319/pr_1302)

# Membership Statistics

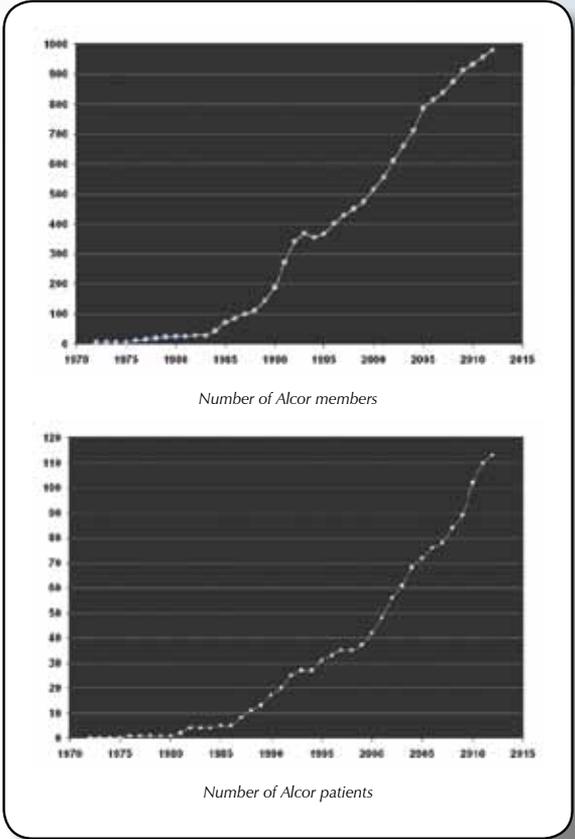


2013	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
Members	981	983	985										
Patients	114	115	117										
Associate	37	40	42										
Total	1132	1138	1144										



### International

Country	Members	Patients
Australia	11	2
Canada	42	2
Denmark	2	0
France	1	0
Germany	5	0
Israel	0	1
Italy	2	0
Luxembourg	1	0
Mexico	4	0
Monaco	2	0
Netherlands	2	0
New Zealand	2	0
Norway	1	0
Portugal	4	0
Spain	2	1
Thailand	3	0
United Arab Emirates	1	0
United Kingdom	24	2
<b>TOTAL</b>	<b>108</b>	<b>8</b>



# VASCULAR BENEFITS OF A Mediterranean Diet

## VALIDATED IN HUGE NEW STUDY

A large, rigorous study published in the *New England Journal of Medicine* confirmed the health benefits of those who switch to a **Mediterranean diet** rich in **omega-3 fish oil** as well as protective nutrients called polyphenols found in **olive oil**, fruits, vegetables, nuts like walnuts, and wine.<sup>1</sup> The study ended early because the benefits were so overwhelming, with startling benefits for vascular health, that it was considered unethical to continue to deprive the control group.<sup>1</sup>

In addition to the health-promoting benefits of vegetables and fruits with their abundance of polyphenol nutrients, the Mediterranean Diet group took at least **4 tablespoons** of polyphenol-rich extra-virgin **olive oil** a day.<sup>1</sup>

### LIFE EXTENSION® MEMBERS LONG AGO BENEFITED

Starting in **2005**, Life Extension members began taking a supplement (**Super Omega-3**) that provided potent concentrations of **fish oil and olive polyphenols** like hydroxytyrosol and oleuropein. This supplement also provided standardized **sesame lignans** to support the beneficial effect of omega-3 fatty acids in the body.<sup>2</sup>

Olive oil contains polyphenol nutrients that have demonstrated wide-ranging health benefits.<sup>3-5</sup> The recommended twice daily dose of **Super Omega-3** supplies a similar polyphenol content to that found in **4 to 6 tablespoons of olive oil**.

#### References

1. *N Engl J Med*. 2013 Feb 25.
2. *Crit Rev Food Sci Nutr*. 2007;47(7):651-73.
3. *Altern Med Rev*. 2007 Dec;12(4):331-42.
4. *Curr Top Med Chem*. 2011;11(14):1767-79.
5. *Med Glas (Zenica)*. 2012 Feb;9(1):1-9.
6. Available at: <http://www.ifosprogram.com/consumer-reports.aspx>. Accessed March 18, 2013.
7. *J Nutr Sci Vitaminol (Tokyo)*. 2003 Aug;49(4):270-6.

**CAUTION:** If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.

Supportive but not conclusive evidence shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease. IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc. These products have been tested to the quality and purity standards of the IFOS™ program conducted at Nutrasource Diagnostics, Inc.

### SUPER OMEGA-3 WITH SESAME LIGNANS AND OLIVE FRUIT EXTRACT

To ensure the purest, most stable, and easy-to-tolerate fish oil, **Super Omega-3 EPA-DHA** is *molecularly distilled*. It enjoys the highest **5-star rating** for **purity, quality, and concentration** from the renowned **International Fish Oil Standards** program.<sup>6</sup> The **sesame lignans** not only direct the omega-3s toward more effective pathways in the body, but guard the delicate fish oil from oxidation.<sup>2,7</sup>

A bottle containing 120 softgels of **Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract** retails for \$32. If a member buys four bottles, the price is reduced to **\$21** per bottle. If **10 bottles** are purchased, the cost is **\$18.68** per bottle. (Item #01482)

The daily dose (four regular size softgels) of Super Omega-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract provides:

<b>EPA</b> (eicosapentaenoic acid)	<b>1,400 mg</b>
<b>DHA</b> (docosahexaenoic acid)	<b>1,000 mg</b>
<b>Olive Fruit Extract</b> [std. to 6.5% polyphenols (39 mg), 1.73% hydroxytyrosol/tyrosol (10.4 mg), 0.5% verbascoside/oleuropein (3 mg)]	<b>600 mg</b>
<b>Sesame Seed Lignan Extract</b>	<b>20 mg</b>



Item #01482

To order the most advanced fish oil supplement, **Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract** (with or without enteric coating), call **1-800-544-4440** or visit **www.LifeExtension.com**

# MEETINGS

## About the Alcor Foundation

The Alcor Life Extension Foundation is a nonprofit tax-exempt scientific and educational organization dedicated to advancing the science of cryopreservation and promoting cryonics as a rational option. Being an Alcor member means knowing that—should the worst happen—Alcor's Emergency Response Team is ready to respond for you, 24 hours a day, 365 days a year.

Alcor's Emergency Response capability includes specially trained technicians and customized equipment in Arizona, northern California, southern California, and south Florida, as well as many additional certified technicians on-call around the United States. Alcor's Arizona facility includes a full-time staff, and the Patient Care Bay is personally monitored 24 hours a day.

## ARIZONA

### Flagstaff:

Arizona without the inferno. Cryonics group in beautiful, high-altitude Flagstaff. Two-hour drive to Alcor. Contact [eric@flagstaffcryo.com](mailto:eric@flagstaffcryo.com) for more information.

### Scottsdale:

This group meets the third Friday of each month and gatherings are hosted at a home near Alcor. To RSVP, visit <http://cryonics.meetup.com/45/>.

### At Alcor:

Alcor Board of Directors Meetings and Facility Tours — Alcor business meetings are generally held on the first Saturday of every month starting at 11:00 AM MST. Guests are welcome to attend the fully-public board meetings on odd-numbered months. Facility tours are held every Tuesday and Friday at 2:00 PM. For more information or to schedule a tour, call Marji Klima at (877) 462-5267 x101 or email [marji@alcor.org](mailto:marji@alcor.org).

The Alcor Volunteer Network, Scottsdale Chapter has a variety of meetings on topics including: member education, training, community outreach, and fundraising. To RSVP, visit: <http://www.meetup.com/AVNScottsdale/members/>

## CALIFORNIA

### Los Angeles:

Alcor Southern California Meetings—For information, call Peter Voss at

(310) 822-4533 or e-mail him at [peter@optimal.org](mailto:peter@optimal.org). Although monthly meetings are not held regularly, you can meet Los Angeles Alcor members by contacting Peter.

### San Francisco Bay:

Alcor Northern California Meetings are held quarterly in January, April, July, and October. A CryoFeast is held once a year. For information on Northern California meetings, call Mark Galeck at (408) 245-4928 or email [Mark\\_galeck@pacbell.net](mailto:Mark_galeck@pacbell.net).

## FLORIDA

Central Florida Life Extension group meets once a month in the Tampa Bay area (Tampa and St. Petersburg) for discussion and socializing. The group has been active since 2007. Email [arcturus12453@yahoo.com](mailto:arcturus12453@yahoo.com) for more information.

## NEW ENGLAND

### Cambridge:

The New England regional group strives to meet monthly in Cambridge, MA — for information or to be added to the Alcor NE mailing list, please contact Bret Kulakovich at 617-824-8982, [alcor@bonfireproductions.com](mailto:alcor@bonfireproductions.com), or on FACEBOOK via the Cryonics Special Interest Group.

## PACIFIC NORTHWEST

Cryonics Northwest holds regular meetings for members of all cryonics organizations living in the Pacific Northwest.

For information about upcoming meetings and events go to: <http://www.facebook.com/cryonics.northwest>

A Yahoo mailing list is also maintained for cryonicists in the Pacific Northwest at <http://tech.groups.yahoo.com/group/CryonicsNW/>.

## British Columbia (Canada):

The contact person for meetings in the Vancouver area is Keegan Macintosh: [keegan.macintosh@me.com](mailto:keegan.macintosh@me.com)

## Oregon:

The contact person for meetings in the Portland area is Chana de Wolf: [chana.de.wolf@gmail.com](mailto:chana.de.wolf@gmail.com)

## ALCOR PORTUGAL

Alcor Portugal is working to have good stabilization and transport capabilities. The group meets every Saturday for two hours. For information about meetings, contact Nuno Martins at [n-martins@n-martins.com](mailto:n-martins@n-martins.com). The Alcor Portugal website is: [www.alcorportugal.com](http://www.alcorportugal.com).

## TEXAS

### Dallas:

North Texas Cryonauts, please sign up for our announcements list for meetings (<http://groups.yahoo.com/group/cryonauts-announce>) or contact David Wallace Croft at (214) 636-3790 for details of upcoming meetings.

### Austin/Central Texas:

We meet at least quarterly for training, transport kit updates, and discussion. For information: Steve Jackson, 512-447-7866, [sj@sjgames.com](mailto:sj@sjgames.com).

## UNITED KINGDOM

There is an Alcor chapter in England. For information about meetings, contact Alan Sinclair at [cryoservices@yahoo.co.uk](mailto:cryoservices@yahoo.co.uk). See the web site at [www.alcor-uk.org](http://www.alcor-uk.org).

If you are interested in hosting regular meetings in your area, contact Alcor at 877-462-5267, ext. 113. Meetings are a great way to learn about cryonics, meet others with similar interests, and introduce your friends and family to Alcor members!

# WHAT IS CRYONICS?

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Cryonics is an attempt to preserve and protect human life, not reverse death. It is the practice of using extreme cold to attempt to preserve the life of a person who can no longer be supported by today's medicine. Will future medicine, including mature nanotechnology, have the ability to heal at the cellular and molecular levels? Can cryonics successfully carry the cryopreserved person forward through time, for however many decades or centuries might be necessary, until the cryopreservation process can be reversed and the person restored to full health? While cryonics may sound like science fiction, there is a basis for it in real science. The complete scientific story of cryonics is seldom told in media reports, leaving cryonics widely misunderstood. We invite you to reach your own conclusions.

# HOW DO I FIND OUT MORE?

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The Alcor Life Extension Foundation is the world leader in cryonics research and technology. Alcor is a non-profit organization located in Scottsdale, Arizona, founded in 1972. Our website is one of the best sources of detailed introductory information about Alcor and cryopreservation ([www.alcor.org](http://www.alcor.org)). We also invite you to request our FREE information package on the "Free Information" section of our website. It includes:

A fully illustrated color brochure

- A sample of our magazine
- An application for membership and brochure explaining how to join
- And more!

**Your free package should arrive in 1-2 weeks.**

(The complete package will be sent free in the U.S., Canada, and the United Kingdom.)

# HOW DO I ENROLL?

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Signing up for a cryopreservation is easy!

**Step 1:** Fill out an application and submit it with your \$150 application fee.

**Step 2:** You will then be sent a set of contracts to review and sign.

**Step 3:** Fund your cryopreservation. While most people use life insurance to fund their cryopreservation, other forms of prepayment are also accepted. Alcor's Membership Coordinator can provide you with a list of insurance agents familiar with satisfying Alcor's current funding requirements.

**Finally:** After enrolling, you will wear emergency alert tags or carry a special card in your wallet. This is your confirmation that Alcor will respond immediately to an emergency call on your behalf.

**Call toll-free today to start your application:**

**877-462-5267 ext. 132**

**[info@alcor.org](mailto:info@alcor.org)**

**[www.alcor.org](http://www.alcor.org)**





# Will You Be Alive and Healthy 10...20...30 Years from now?

Your best chance at achieving future immortality is to protect your precious health now so you can benefit from future medical breakthroughs. Staying informed about the latest health discoveries can mean the difference between life and premature death.

And the **Life Extension Foundation** can be your passport to the future. As the largest anti-aging organization in the world, we are dedicated to finding scientific ways to prevent disease, slow aging, and eventually stop death.

For more than three decades, Life Extension has been at the forefront of the movement to support revolutionary anti-aging research that is taking us closer to our goal of extending the healthy human life span indefinitely. We inform our members about path-breaking therapies to help keep them healthy and alive.

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- Access to a toll-free phone line to speak with **knowledgeable health advisors**, including naturopathic doctors, nutritionists, and a cancer expert, about your individual health concerns. You can also receive help in developing your own personal life extension program.
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the latest vitamins and supplements, backed by scientific research and available through a unique buyers club.

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- ***Disease Prevention and Treatment* book** (\$49.95 cover price)...this hardbound fourth edition provides novel information on complementary therapies for 133 diseases and illnesses—from Alzheimer's disease to cancer, from arthritis to heart disease—that is based on thousands of scientific studies.

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