

ALCOR LIFE EXTENSION FOUNDATION

A Non-Profit Organization

# CRYONICS

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# CRYONICS



## COVER STORY: PAGE 11

### Member Profile: Steve Graber

A seasoned designer, versatile maker, extreme mountain biker, and unabashed dreamer who also happens to be Alcor's Technical & Readiness Coordinator, Steve Graber fuses form and function to elevate cryonics.

*On the cover: Steve Graber takes a mountain biking break. Watch out for cactus!*

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Ben Best travels the world for the Life Extension Foundation to attend scientific conferences about health and life extension. This issue features a breakdown of the proceedings and findings of some important stem cell research conferences.

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Christine Gaspar catches up with former Alcor staff member, and current consultant, Aaron Drake about his cryonics work in China. What are the prospects for cryonics in China? How does cryonics fit in the cultural framework and burial practices of the Chinese? What are the logistical and technical challenges of conducting cryonics case work in China? Learn about this and more as we meet with Aaron again.

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Mike Perry surveys the news and research to report on new developments that bring us closer to the revival of cryonics patients.

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# QUOD INCEPIMUS CONFICIEMUS

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Photo: Cryo-Care Equipment Corporation at 2340 E. Washington St., Phoenix, AZ.  
Dr. Bedford's "home" about 1970.



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## DOES CRYONICS OFFER “FALSE HOPE”? Guest Column by Ralph Merkle, Ph.D.

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Critics say cryonics gives “false hope.” Michael Hendricks, in MIT Technology Review (see <https://www.technologyreview.com/s/541311/the-false-science-of-cryonics/>), said

While it might be theoretically possible to preserve these features in dead tissue, that certainly is not happening now. The technology to do so, let alone the ability to read this information back out of such a specimen, does not yet exist even in principle.

... reanimation or simulation is an abjectly false hope that is beyond the promise of technology and is certainly impossible with the frozen, dead tissue offered by the “cryonics” industry.

Harsh!

Unfortunately his piece gave no references, so his words, while bold, lacked any support. I sent him an email and asked “Are there any references you can cite in support of this claim?”

He replied with a comment from... someone. A critical, unattributed someone. But no references.

I asked again, explaining that anonymous critics weren't exactly what I was interested in.

This time, he sent me a much longer email which provided no references. It was a very nice email, which started by saying “I think we share an understanding of the issues here, ...” and opined that “...one of the last good things we do for future generations is unburden them by getting out of the way.” But still, no references.

I persisted. Finally, he sent me a reference! A link to the site <http://www.brainpreservation.org/>

Wait, what? Michael Hendricks, who said cryonics is an “abjectly false hope” is backing up his claim by giving me a link to the Brain Preservation Foundation? Which recently gave their prize for essentially perfect brain cryopreservation (Aldehyde-Stabilized Cryopreservation, or ASC) to a team from 21st Century Medicine consisting of Robert L. McIntyre and Gregory M. Fahy (<http://dx.doi.org/10.1016/j.cryobiol.2015.09.003>)?

What does the Brain Preservation Foundation say?

It now seems clear that, if the medical and scientific communities were to expend a modicum of effort, a reliable, inexpensive, and scientifically proven procedure for brain preservation could be made available, in short order, in hospitals to all terminal patients that might

desire it over the current alternatives (i.e. burial and cremation).

At this point one can only smile. The Brain Preservation Foundation wants the world to adopt ASC, a method developed by 21st Century Medicine that uses glutaraldehyde *followed* by vitrification. Alcor, on the other hand, uses the *vitrification* method developed by 21st Century Medicine *without* using glutaraldehyde. For the non-expert, we're arguing over which one of two methods, both of which were developed by 21st Century Medicine, we should use. What's the difference between the two methods? Let's read the article that won the Brain Preservation Foundation's prize to find out:

Successful vitrification protocols must therefore make a compromise between minimizing exposure to toxic CPAs (by minimizing CPA equilibration times) and minimizing exposure to dehydration and osmotic stress (by maximizing CPA equilibration times) [17]. For cryoprotecting the brain, the problem of dehydration is particularly severe because of the blood-brain barrier (BBB), which limits the rate at which cryoprotectants can enter the brain,

thus causing major osmotic brain shrinkage [10]. For the purposes of connectomics, this dehydration is undesirable because it distorts the brain's ultrastructure and causes difficulties in tracing fine neural processes.

To address the limitations of the previous methods discussed, we conceived of a simple solution that meets our four brain banking goals: aldehyde-stabilized cryopreservation (ASC). We fixed brains using aldehyde perfusion, then gradually perfused those brains with sufficiently high concentrations of cryoprotectant to enable vitrification. The aldehydes immediately stabilize the fine structure of the brain to an extent sufficient for connectomics research, meeting our goal of high-quality preservation. Once the brain is fixed, cryoprotectant toxicity and other chemical insults are of minimal concern. Therefore we were able to add cryoprotectant more gradually and to include a surfactant to accelerate CPA introduction by breaking down the BBB, allowing us to achieve dehydration-free vitrification.

Rather obviously, if you want to cryopreserve someone you'd rather not perfuse them with glutaraldehyde. It's a fixative. On the other hand, if you don't use glutaraldehyde, then you're going to get dehydration and shrinkage, which means

you won't get the pretty pictures that neuroscientists like.

So, what's your preference? Better pictures, or better biological viability? The neuroscientists want the pictures. Alcor has traditionally worked to achieve better biological viability.

Ultimately, Alcor members are going to make the choice. So, what do you, the members of Alcor, want? Do you want Alcor to add glutaraldehyde to our solutions, and deliver the better pictures that Michael Hendricks wants? Or do you prefer our current protocol, without glutaraldehyde, which results in dehydration and shrinkage? To quote the article that describes the winner of the Brain Preservation Foundation's prize: Alcor's current protocol "...causes difficulties in tracing fine neural processes." Or, to be more accurate, Alcor's current protocol makes it more difficult for **existing** technologies to trace fine neural processes. Molecular nanotechnology based methods should have no difficulty in tracing fine neural processes, whether or not they suffer from dehydration and shrinkage.

Also, Alcor and associated laboratories are currently exploring methods to deliver vitrification solutions to the brain *without* shrinking and dehydration by modifying the blood brain barrier. If this work is successful, we may be able to offer better biological viability *and* better pictures.

As an expert in molecular nanotechnology, I'm happy to say we should be able to revive you whichever protocol Alcor chooses. The cryobiological experts who advise Alcor

favor the use of Alcor's current protocol (or we would have changed it). I hesitate to name those experts, as officially the Society for Cryobiology still has bylaws that call for the expulsion of members who are "engaged in or who promote" "...any practice or application of freezing deceased persons in anticipation of their reanimation."

As for the critics: now you've seen what happens when you ask one to back up his claim that cryonics offers "false hope." He cites *the research done by the cryonics community*, research which favors cryonics. In my experience, Hendricks is one of the more honest and scientifically educated critics. When asked to provide references, he understands what he needs to provide and realizes he has nothing. Less educated or less honest critics would have provided "references" to substandard or dishonest articles.

But the fact remains: there are no published articles in the scientific literature that provide even one technical reason for believing that cryonics won't work. Not one. Hendricks couldn't find any. Neither has anyone else (see <http://www.alcor.org/FAQs/faq01.html#say>). The simplest explanation for this remarkable absence is that cryonics, when carried out under reasonable conditions, actually works.

Someday, Alcor's patients are going to start waking up. I wonder what the critics will say then? Perhaps they'll retract their claims that cryonics offers "false hope." Unfortunately, by that time many people will have died of the false despair being spread by the critics. ■

JULY 17, 1969: On Jan. 13, 1920, Topics of The Times, an editorial-page feature of *The New York Times*, dismissed the notion that a rocket could function in a vacuum and commented on the ideas of Robert H. Goddard, the rocket pioneer, as follows.

"That Professor Goddard, with his 'chair' in Clark College and the countenancing of the Smithsonian Institution, does not know the relation of action to reaction and of the need to have something better than a vacuum against which to react – to say that would be absurd. Of course he only seems to lack the knowledge ladled out daily in high schools."

Further investigation and experimentation have confirmed the findings of Isaac Newton in the 17th century, and it is now definitely established that a rocket can function in a vacuum as well as in an atmosphere. The *Times* regrets the error."



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# CEO Update

By Max More



## END-OF-YEAR MEMBERSHIP SUMMARY

At the end of 2016, Alcor had 1,116 full (cryopreservation) members. That's a net gain of 62, and a growth rate of 5.9%. This is the fastest rate of growth since 2005, and the largest absolute gain in members of all years except 2005.

341 Associate Members

– a gain of 65, or 23.6%.

1,606 total members. Up from 1,394.

Gain of 212, or 19.8%.

New patients: 6. Total 149.

## OPERATIONS ACCOUNTS

Some time ago we moved a good portion of Alcor's operating and reserve funds out of holdings that were being eroded by inflation into investments designed to generate a reasonable return over the medium term. (The reserve funds were invested more conservatively than the operating funds. Plenty of funds still remain in safe and practically zero-return accounts.) Essentially, we were sitting on several hundred thousand dollars that were earning zero return. Here are the year-to-date returns as of 12/08/16 (the market has moved a fair bit higher in the month since then):

**Operations investments:** 15.09%

(compared to 9.5% S&P as of 12/02/16)  
= gain of \$57,566.

**Reserve investments:** 6.03% = gain of \$45,083.

**Total gain for both funds** = \$102,649

On September 12, we had the following operating funds:

**Checking:** \$895,000

**General Operating Investments:** \$397,000

**Reserve Fund Investments:** \$783,000

**Total:** \$2,075,000

## PRIORITIES FOR 2017:

In addition to the standard and ongoing tasks and goals, these are areas where I aim to focus this year:

- Continue improving protocols and technologies for each stage of the cryopreservation process.
- Make more progress catching up on case reports.
- Push for publication of more cryonics-related scientific papers.
- Vastly grow the number of Associate Members. Aim for 10% growth in full membership.
- Streamline the membership application process to make it much easier and less time-consuming for staff.
- Enhance the efficiency of billing, purchase orders, and other routine financial tasks.
- As part of a move to improve our IT architecture, I would like members to have their own accounts online, which would include the ability to upload personal information to be stored for use in restoring memories.
- Continue the recent effort to enhance quality control.
- Fundraising – for Operations, Research, and the Endowment.
- Follow through on expansion of Patient Care Bay and new office and workspace.
- Survey the membership: (a) to gather their views about Alcor's

performance and priorities; (b) to learn more about our demographics and mindsets in order to improve outreach.

- Further Website improvements – primarily to the content.
- Continue improvement documentation of tasks and procedures and build up redundancy by training backup personnel.

## BACKUP FOR MIKE PERRY, CARE SERVICES MANAGER

For some time, I've been somewhat concerned that Mike Perry is the sole Care Services Manager with no real backup. Happily, long-term local member Don Johnson has volunteered to learn Mike's responsibilities. I mentioned that Mike hasn't completed all of his SOPs and that it would be helpful if Don would fill in the blanks as he learned Mike's duties. Don was very open to doing so. In situations where Mike might be away from Alcor (which might be more often than usual based on the past), Don could stay overnight here to ensure that patients – and the building as a whole – are monitored. That is especially important when Hugh is also absent (rare but does happen).

## TOUR FOR AZ STATE REPRESENTATIVE REGINA COBB

Thanks to Barry Aarons, I met with and gave a tour to Regina E. Cobb, AZ State Representative, Republican Party. Cobb was involved with the bill "AZ HB2475: Funeral establishments; procurement organizations" and helped amend the language so as to not adversely affect Alcor's operations. Cobb has a dentistry



background and, as part of medical schools, had the experience of participating in autopsies, so she is not squeamish. My take is that she is a reasonably socially-liberal Republican, and is sympathetic to what we do. More so now that she has visited. Barry told us that she has talked a great deal to her colleagues about the visit, and in a good way. Barry aims to bring in more legislators after the new year, to visit and build our political connections and relationships.

### STORAGE OUTSIDE OF ALCOR

I went with Hugh, Bonnie, Marji, and Linda to review the contents of Alcor's offsite storage on nearby Grey Road. We catalogued the contents of the filing cabinets there, noted some hard drives from my predecessor that should be reviewed, and reviewed access credentials. We will probably either/both digitize or move to the Kansas underground storage facility some of the records found.

### BUILDING CHANGES

On December 22, our architect came for final space planning and to finish measurements. Based on the most recent site visit, I estimate that actual work to expand the Patient Care Bay and to carry out the other building changes will not start before March at the earliest. The exact date will depend on the time taken by the City for permits. On Tuesday January 17, the subcontractors came with the general contractor to see the site.

On December 21, 2016, Josh and I met with the medical director at HonorHealth Scottsdale Osborn Medical Center. He seemed very open to working with us in preparation for cryonics cases, and is putting us in touch with senior doctors and nurses so that we can give them a presentation.

On Thursday December 2, on the initiative of Linda Chamberlain, we held a lunch to commemorate Fred Chamberlain, Jr., Alcor's first case. (Linda's husband Fred Chamberlain III was this man's son.) We celebrated the 40th anniversary of his cryopreservation, which actually occurred last summer, July 16.

Alcor's Medical Response Director, Josh Lado has been very proactive in several

areas. One of his projects has been to investigate the feasibility and cost of Alcor buying its own CT scanner. This could be used during cryopreservations rather than just after patients have reached liquid nitrogen temperature. To buy the machine discovered by Josh, we would have to raise dedicated funds.

Josh also spearheaded a move to replace our old security system with a more capable one from Tyco. Among the new features: New LCD display at the front door for ease of use; all doors including roof hatches are monitored on hardwire monitoring; glass breaks for all windows including suite 104; 10 panic buttons for staff; temperature monitoring in the server room.

We have been using Skype for board meetings for years now. All too often we run into problems – even if we check the software the day before. Skype updates constantly, often breaking the system. We finally had enough. Steve Graber and then Josh looked into a replacement. We bought a new (but very inexpensive) computer for the conference room, and installed Zoom teleconference software. We are starting with a basic package but can easily expand if needed. We could use Zoom to broadcast conferences around the world as well as conduct medical training. We tested the new system at the January 14 board meeting. For the first time, we had multiple people calling in using video (with about 16 people altogether). The sound and video quality were a great improvement.

Linda Chamberlain has been on a relentless march to further shape up the keeping of records on our patients, as well as to review funding of living members. So far, Linda has reviewed the funding arrangements of 124 members. Most of these signed up prior to 2000, when Alcor started requiring that Alcor be the owner of the insurance policy (so that we are informed of change in beneficiary, or failure to maintain the policy). This project also helps us to update member contact information, note when members with term insurance will face expiry of their policy, and identify other members who are underfunded and who should be contacted.

Linda has also been going through the Red Books, which are a compilation of all

available information on a patient. They are maintained in fire-resistant filing cabinets, on our server, in an NAS backup, and in an encrypted backup in the cloud. Linda aims to have a Red Book with a standardized format for every patient by the end of 2017. She has now reviewed and/or compiled Red Books for 95 of our 149 patients.

### MEDIA

It has been said that media attention to cryonics is mostly negative and that we should avoid or minimize it. I disagree with that view on more than one level. The first part of the claim may be true if it refers to all the media attention since cryonics started around 50 years ago. If it refers to the last five or six years, the claim is surely false. Alcor has enjoyed dozens of instances of radio, newspaper, magazine, television, and documentary coverage that are substantially or primarily positive and helpful. Even when the tone is mixed, the story brings cryonics to the attention of potential members who might not otherwise have heard of it.

But do we really need to keep doing interviews? Surely the message is out there now? This view is understandable. I have probably done more interviews on cryonics than anyone else at this point. It feels like it should be enough. But I know it is not. Frustratingly, there are still many millions, no, tens of millions, no hundreds of millions of people who have not even heard or cryonics or who think it's something only in science fiction. Of those who have heard that it's a real thing, the vast majority have a poor understanding of it. Of those who understand a bit about it, many have absorbed negative messages from critics or harbor the standard rationalizations that lead to rejection.

Even among those who have heard of it, know a bit about it, and are open to the idea, the vast majority will take no action. As every marketing person will say, you have to repeat a message multiple times – and it has to be heard multiple times before someone will take action. (Some of us are exceptions to that rule, but the rule remains true.)

It is certainly true that media attention brings some risk of stirring the interest of regulators and others who could make

our lives more difficult. **But we must distinguish between coverage in which we are involved and coverage in which we are not.** For example, a huge amount of media attention was sparked by the recent case in England involving a 14-year-old girl who went to court to secure her right to be cryopreserved, due to opposition from her (estranged) father. This was not an Alcor case. Alcor did nothing to generate the publicity. Most of the resulting stories were critical and scathing, often calling for cryonics to be stopped or regulated.

By contrast, media in which Alcor has either participated or played a role in generating coverage has generally had far more positive outcomes. That is because we have been able to shape the outcome by providing information, addressing questions, rebutting criticisms, and by establishing a personal connection with the journalist. Another reason for the largely positive coverage when Alcor has participated is that we turn down many requests. We turn down those that seem a poor return on time and energy investment (considering the target audience and approach). We also turn down those where we get a bad feeling from the journalist.

Some examples of the primarily positive and informative coverage in stories where Alcor has actively participated:

- Discover
- Vice
- Motherboard
- BuzzFeed
- Gizmodo
- New Scientist
- io9
- *Inverse*
- PBS
- Showtime
- *Wired*
- *The New York Times*
- *The Boston Globe*
- *MIT Technology Review*
- Fox News
- NOVA

- National Geographic
- *The Doctors*
- Episodes of TV shows such as on Castle.

A great deal of media resulted from the CI case in the UK of 14-year-old girl who went to court to secure the right to be cryopreserved. Alcor and our allies produced an official response to critics, underscoring the scientific evidence supporting cryonics. Another burst of media interest happened even before we sent out a press release noting the 50th anniversary of the cryopreservation of Dr. James Bedford – the first “cryonaut.” Interestingly, Hollywood, Florida Mayor Josh Levy proclaimed January 12 as Dr. James Bedford Day. An example of the coverage:

The First Cryonic Preservation Took Place Fifty Years Ago Today

Today, we still have no idea if the process will ever produce results

<http://www.smithsonianmag.com/smart-news/first-cryonic-preservation-fifty-years-180961788/>

The main media we dealt with over the last two months:

- filming by 60 Second Documentary
- recorded interview for NTN24 news in Columbia
- radio interview by BYUradio for the show Top of Mind with Julie Rose, distributed on Sirius XM channel 143, DISH Network channel 980, and other outlets
- follow-up conversations with an author finishing up his book for *National Geographic*
- interview for *Israel Daily*
- interview for the UK’s talkRADIO
- interview for Turkey’s SciTech Voyager for a documentary about Longevity and Anti-Aging
- an interview for Vice Magazine
- an interview for Spain’s *Muy Interstante*

- The Fox News piece turned out well. (On October 11, I was interviewed by Susan Stratford for Fox News Cleveland.)

A new Netflix show hosted by Chelsea Handler asked if they could film at Alcor. After consulting with some members who are familiar with Handler’s past work, I turned them down.

And, for a bit of fun:

10 Most Interesting Companies In The World

Insider Monkey, January 13, 2017

by Tim Frederick

<http://www.insidermonkey.com/blog/10-most-interesting-companies-in-the-world-518473/6/>

“While there are a lot of companies doing some impressive work in the life extension arena, Alcor is one of the few that already has a business model in place and is making money from it. Among its other clients are billionaire Peter Thiel and Google’s Ray Kurzweil... Interestingly, while the fee seems exorbitant, it can be covered by a life insurance policy (of course if you have loved ones, they wouldn’t get any of it then), which makes it more palatable even for less affluent people. The company currently has over 1,000 members, about 150 of which are dead, though possibly not for long...” ■

# MEMBER PROFILE

## STEVE GRABER

By Nicole Weinstock



*Steve takes a mountain biking break. Watch out for cactus!*

Not all paths to cryonics are straight lines, and Steve Graber's is no exception. But unlike the curved lines of other cryonicists, his moved at 155 miles per hour...

Steve found out about cryonics through contract work between Alcor and his company, Graber Cars. It specialized in the design and production of lightweight, efficient, and economical sports cars. Steve built everything about them from the ground up, apart from the engines, steering racks, and brakes. Evidently, these components are so heavily tested before going to market that it's safer and more cost-effective to use existing ones rather than develop your own.

Why cars from scratch? Because when you stand at six feet, three inches tall, you quickly realize that most sports car drivers are not.

"I love small cars," confesses Steve, a conviction that was only confirmed when he discovered Elise. Manufactured by the UK-based company, Lotus, the Lotus Elise is a range of extremely lightweight sports cars known for their agility and exceptionally low CO2 emissions. "That's the ideal car for me," continues Steve. "But these British

people...Their maximum height is five foot eight or something. I couldn't fit into the car—I literally couldn't get into the driver's seat. And I thought 'this is ridiculous, I'm just gonna build my own damn car.'"

And build it he did.

Steve's first car design-build attempt made the cover of Kitcar Magazine in 1998. It was a replica of a 1962 Ferrari. Unsurprisingly, Graber Cars quickly made

a name for itself in the niche sports car community. The company is well-known for the design and build of a 1.6 liter 4-cylinder sports car called *La Bala*, or "the bullet." This 1,500 pound speed demon tops out at 155 miles per hour while still averaging about 60 miles to the gallon. It's so efficient, economical and gorgeous that you might start to wonder why you bought that Toyota Prius in the first place.



*Steve takes La Bala out for a whirl.*





*The Graber garage was home to Steve's sports car design-build business. Here he works on La Bala, "the bullet," in 2004.*

And for the sake of comparison: the Prius, a common commuter car much lauded for its eco-efficiency, makes around 53 miles per gallon on the highway—a few miles shy of La Bala. As far as its looks and speed are concerned...Well, suffice it to say that a Prius just ain't no sports car.

So what's a from-scratch sports car guru got that a leader in cryonics might need?

As many of you already know, a key element of Alcor member benefits is its emergency response service, which relies on a well-functioning, customized vehicle that can house specialized equipment for patients in transport. Alcor needed an astute car professional to support those aims. The then Technical & Readiness Coordinator, Regina Pancake, reached out to a friend in the Hollywood special FX industry for vendor suggestions. That friend just so happened to be one of Graber Cars' very satisfied customers from earlier in the year. He recommended Steve for the job, and the rest is history.

Interestingly, Steve was entirely unfamiliar with cryonics when he first headed to Alcor's headquarters to talk business with his new client. Steve admits, "I hadn't even looked up what Alcor did... But Regina gave me a tour, and I'm like,

"[Cryonics] is so incredibly awesome. I couldn't believe that someone had come up with this concept." For Steve, it was an instant source of fascination and ideological camaraderie. After all, his passion for

cars was also seeded in the realization of something that existed only in his mind, despite the skepticism of others.

A resilient imagination was key to Steve's upbringing. The youngest of six kids, and the only boy to boot, he grew up in a small Puerto Rican mountain town during the '70s. His family had a television with one station (in black and white), for which his parents limited the screen time. On the flip side, they had a library full of books at their disposal, a resource that fueled Steve's curiosity and zeal for ideas and concepts. At one point, the *Encyclopedia Britannica* was the only text available for him to read, so he read it straight through, from A to Z.

Steve managed to turn lemons into lemonade when it came to cars back then too. His first car was a Ford Pinto station wagon, complete with faux wood paneling. It was a veritable eyesore for a growing aesthete. His dad bought it for him shortly after pooh-poohing his efforts to buy a Fiat Spider convertible. He warned Steve, "You'll have to do maintenance on it all the time."

Nevertheless, Steve eventually bought that car during his junior year of college—the 1982 Fiat Spider 2000 convertible



*A small Puerto Rican mountain town was home for Steve and his five sisters featured above. Growing up, they had one TV station and a sizable library.*



*The SuperDewar, or “SuperD” that Steve designed makes its grand arrival at Alcor in the fall of 2016. None other than Steve’s son, Jacob, helped to unpack it.*

with the Legend turbo engine, to be exact. Then a friend driving it on loan jumped the railroad tracks at high speed, causing considerable damage. No sooner had the “I told you so” issued forth from his father’s mouth, than Steve took the car apart to fix it himself. What transpired was an eye opening moment. He quickly realized the interrelationships of the various car systems, and how adjustments to one could influence the whole. In the best culinary simile of this magazine to date, he says between laughs, “Building a car is like peeling away the layers of an onion. It stinks at first, and then it just gets worse.”

In the end, Steve was able to survive the stink. With no mechanical experience to speak of, he not only fixed the Fiat Spider, but improved the engine as well. “After that point, I was hooked on designing and building things,” says Steve.

It was precisely this hook that made him a great fit for Alcor years later. Following his initial work on the emergency response

vehicle in 2009, Steve continued to support the organization through contract gigs and volunteerism. In July of 2010, his track record of success, innovation and dedication was rewarded: he was hired as Alcor’s full-time Technical & Readiness Coordinator.

Over the years, Steve helped with the standby and cryopreservation of several cryonicists, the most memorable of which was that of Alcor co-founder, Fred Chamberlain, in March of 2012. Steve describes this privileged experience:

“It was just such an amazing thing to think, ‘Here I am, however many years later, and we’re getting ready to do a cryopreservation on the guy that had the foresight to start such a thing and act on it.’ Linda and Fred were people who took huge leaps of faith. They knew that the future would hold great promise of technology... They didn’t take the naysayers [at their word]... These are strong people, and I like that kind of strength, and I wish that I had more of it [myself]... I got strength from thinking about what [Fred] had been through to get to that point.”

With Yoda-level humility, Steve claims to only recently have been making his mark at Alcor. But it’s obvious from a single conversation that he has made significant contributions to its mission. As the Technical & Readiness Coordinator, Steve is responsible for ensuring that they are ready to receive patients in the operating room (O.R.). He keeps vigilant tabs on their stock of supplies and makes certain that any and all equipment is performing optimally. For international cases, Steve makes sure that the Alcor team is ready to travel with the appropriate response kit.

Given his considerable talent in design and building, Steve is also called upon to create new and improved equipment for the cryopreservation process. His design of the SuperDewar—lovingly coined the “SuperD”—is one such innovation. It is an advanced iteration of the Bigfoot Dewars, the cylindrical double-walled metal vacuum flasks that currently hold cryopreserved patients. Whereas the Bigfoot Dewar holds four whole body patients or up to 45 neuro patients, the SuperDewar promises to house up to nine whole body patients—

possibly more, depending on their size and the combined use of his newly proposed patient storage backboard design—or 90 neuro patients, with potentially half of the liquid nitrogen boil-off. Ever the design buff, Steve also reduced the overall footprint of the SuperDewar, by situating the wheels of the capsule directly underneath the cylinder as opposed to protruding from the perimeter of the base. According to Steve, this newest dewar should “dramatically lower long-term storage costs in the patient care bay.”

If you’re reading this magazine from outside the US, you’ll be delighted to hear about Steve’s work creating a mobile operating room (O.R.) with the Field Neuro Kit. Based on the step ramp work of Hugh Hixon, these kits are “a complete O.R. in pelican cases.” Once assembled, they can easily be prepositioned in foreign countries for patients in need, so they can benefit from the best cryopreservation possible. Alcor needs to fly personnel to each location, or train people on-site on the kits’ use. “Better services for our members is what it’s all about,” says Steve.

He has also contributed to fine-tuning Alcor’s own O.R. In addition to designing and building an updated whole body surgical table, Steve also masterminded a



*The ability to design, build and operate 3D printers is one of the many assets that Steve brings to Alcor. Here he poses with a sizable piece from his 3D printer portfolio.*





*A quiet man with a big heart, Steve poses with his beloved dog on a 2007 camping trip in Flagstaff. An Anatolian Shepherd/Bernese Mountain Dog mix, Suki was her name.*

way to integrate the Alcor PPC perfusion process control system (for whole body) into the neuroperfusion process. In layman's terms, that means that he found a way to computerize the system that measures all of the factors—temperature, refractive index, etc.—that are vital to successfully cryopreserving a patient's brain. Before the new control system, someone had to sit in front of a dial for several hours monitoring a gauge. Ultimately, this new system integration and its requisite backup—"there's always a backup system in place," reassures Steve—free up staff to attend to other pressing patient needs without sacrificing the quality of patient care.

With the SuperDewar, the Field Neuro Kit and the neuroperfusion process control system under his veritable Batman belt of gadgets, what more can one man do? If you're Steve Graber, you start designing and building 3D printers.

You see, after his many years of a very active lifestyle, Steve's back started to protest. Several surgeries and one titanium plate later, he decided to stop working on cars. But, he says, "I had to find something new to satisfy my craving to build things...I can't just go home and watch TV. I have to do stuff." Steve dove into all things 3D printing. He made small printers that sit on a desk on up to huge printers that you can stand in. It wasn't long before he designed

and built one for Alcor. "We do some pretty unique things here at Alcor and you can't just order some parts out of a catalog." No, you certainly can't. That's why now, you just call Steve and he'll make them for you on-site.

One of his greatest print accomplishments to date is the sampling head of the refractometers used to measure the refractive index. The original heads were the wrong size and didn't allow Alcor staff to sample at their specific requirements. These pieces may be small, but their impact is huge: "If I had designed them and sent them out to be machine produced it would've cost more to have that part machined than the cost of the whole 3D printer." He might not be building cars right now, but Steve continues to innovate with efficiency, cost, and aesthetics in mind.

Like many introverts, Steve is a quiet personality who may not wear his heart on his sleeve. But it's easy to see that this threefold approach to his work is born from a deep commitment to the human side of cryonics. "We are a technology and forward looking company. But in reality we're about humans. Cryonics is actually a very personal thing and I think that we don't really get to show a lot of that and how much we actually think about that." Appealing to this side of the movement may very well be the most influential way of driving membership and expanding the cryonics community, something Steve calls out as a priority.

To that end, he dreams of transforming Alcor's headquarters to make a simple visit more of a sensory experience. He envisions a light, airy space that draws inspiration from museums in its use of helpful placards, infographics, and interactive devices. Together, they will guide visitors through the various technologies, patients, and researchers of the movement, highlighting their individual stories and contributions.

This may seem far-fetched, but these are the ideas that feed the life force of Steve Graber. "You can't be a dreamer if you dream about things that already exist.... That's the sort of stuff that I love doing. So this is sort of my dream job."

Steve isn't the only person who thinks so. Alcor's President and CEO, Max More,

known for once sending a memo to staff and officials with a brief but bold call to "question everything," admits that Steve, more than anyone else, has acted on and exemplified that directive.

As much as he is committed to his work, Steve is a devoted family man. He and his wife and their two kids save up their pennies to go on a family trip every year. "Normally, we'll be watching some travel channel show, and then 'Oh man, look at that place, we gotta go there.' And then, you know, we go and make it happen." The Grabers have made it happen in Canada, Germany, France, England, Spain and New Zealand, in addition to domestic destinations, like Moab, Utah.

"Every place I can stop and look at my family is memorable. Every trip that we take is not just a chance for me, but a chance for me to open up my kids' eyes to what's in the world."

And that attitude doesn't just apply to family vacations. It's as much a truth in Utah or Spain as it is on the trails near the Graber home, where Steve and his family often mountain bike together. "I really enjoy the feeling of working my lungs and legs until they are ready to burst and fall off, then flying down the trail at the limit of my capabilities." It's Arizona, so I should mention that the trails are also lined with cactus. But to Steve, "The cactus makes it interesting. It gives you that feeling of euphoria. 'I made it.'" Of course, that assumes that you don't accidentally hit one. (But if you do, don't worry. Steve tells me that duct tape usually does the trick to remove any errant needles.)

From cars to cacti, Steve brings a near palpable sense of wonder and dedication to all his pursuits. And yet when asked, he describes his life as "pretty boring." If that is so, then may we all lead equally "boring" lives so that we can muster any fraction of his infinite creativity, winsome humility and valuable contributions to the people and technologies of cryonics. ■



Options for Safe, Secure and Legal Asset Preservation for Post-Resuscitation Access

## The Eighth Annual Young Cryonicists Gathering

# Teens & Twenties 8 2017: Getting to Know You - You Getting to Know Each Other

Fri-Sun; May 26-28, '17 Deerfield Beach FL Host: Life Extension Foundation SCHOLARSHIPS AVAILABLE

★★

Greetings to *ALL Young Cryonicists*,

You are receiving this invitation because you are among the future leaders in cryonics.

All attention will be focused on:  
our getting to know you and  
you getting to know each other.

PLUS: an update on the latest emergency response technologies and revival strategies.

### Who is Eligible?

Fully signed up young cryonicists from all cryonics organizations in their late teens through age thirty (18-30 as of May 28, 2017) - may apply to attend.

### Younger Cryonicists With Parent(s):

Thirteen through seventeen year olds may attend when accompanied by their parent(s) or guardian(s).

Parents/guardians of attendees aged 18-19 are also encouraged to accompany their child. All attending parents will be put in touch with each other should they choose to have their own "get together" during the "young cryonicists" gathering.

### Program

Some individuals are social butterflies. This is not so for everyone. And we want everyone to meet everyone. Therefore, I have designed a diverse range of "getting to know you" activities. IF you would enjoy participating in these various getting acquainted activities, THEN this is for you.

Enjoy this exciting & fulfilling weekend.

### SCHOLARSHIPS:

Life Extension Foundation, through a generous education grant, is offering 40 scholarships that pay for **ALL** of the following:

- ◆ **U.S. airfare** to/from Fort Lauderdale, FL (up to \$1000 for origin outside the U.S.)
- ◆ **Hotel** accommodations for Friday & Saturday nights - plus Thursday & Sunday nights (specifically) for scholarship attendees who room together.
- ◆ **Meals** and beverages on Friday night, all day Saturday, & Sunday breakfast & lunch
- ◆ **Registration** fee - \$350 - also covered

Please click on this website for a full packet with all details and application forms.

[http://www.alcor.org/T2\\_8\\_2017\\_details.pdf](http://www.alcor.org/T2_8_2017_details.pdf)

Forever,

Cairn Erfreuliche Idun

Founder/Director: T2

PS Come Early. Stay Late.

Some attendees to T2 enjoy spending extra time in Florida - especially since their flight is already paid for via their scholarship.

This is at their own expense for additional lodging and food.

I look forward to getting to know you.



# 2016 STEM CELL CONFERENCES

By Ben Best

*Reprinted with permission from the Life Extension Foundation*

Stem cells continuously replenish and repair many body tissues.

Red blood cells are replenished about every four months, skin cells are replenished in less than a month, and cells lining the small intestine are replaced every few days. The stem cells performing this function are called somatic stem cells. Somatic stem cells are important contributors to wound healing.<sup>1</sup> The decline in somatic cell function with age might be one of the reasons why wounds heal more slowly, and with more scarring, as people grow older.<sup>2</sup>

Somatic stem cells usually are only capable of becoming the type of cell found in the tissue where they reside. Some stem cells are **multipotent**, capable of differentiating into many types of cells. Notable examples include **hematopoietic stem cells (HSCs)** which can become any type of blood cell (red blood cells, white blood cells, or other immune-system cells) and **mesenchymal stem cells (MSCs)**, which can differentiate into bone cells, fat cells, muscle cells, or cartilage cells.<sup>3,4</sup>

## STEM CELL TRANSPLANTS

HSC transplantation has been performed for decades, but only for life-threatening conditions. Chemotherapy or radiation therapy against cancer can destroy bone marrow immune cells. So HSCs can be extracted from a patient before therapy and replaced after therapy. Often, however, it is necessary to use stem cells from another person, matched as closely as possible with compatible **human leukocyte antigens (HLAs)**. Many different HLA proteins

occur on the surface of cells, which vary considerably from person to person, and which are the major cause of immune system rejection associated with organs or tissues transplanted from one person to another. Even when well-HLA-matched sibling tissues are used, drugs to suppress the immune system are required.<sup>5</sup>

## REGENERATIVE MEDICINE

A dream of stem cell therapy is to only use stem cells that are HLA-compatible with the body tissue of the patient to prevent immune rejection, and to avoid the need to use drugs to suppress the immune system. Only stem cells that originate from the body of the patient receiving the treatment would fulfill that requirement. Such stem cells would be essential for **regenerative medicine**, allowing for the replacement or repair of any defective tissue or organ.

Embryonic stem cells (ESCs) isolated from a patient can differentiate into any type of cell needed by the patient (**pluripotent**). In 1998, human ESCs were first derived from human embryos only a few days old, but only by destroying the embryo.<sup>6</sup> In 2006, however, a method was found to remove an ESC from an embryo without destroying the embryo.<sup>7</sup> But that same year, Japanese researcher Shinya Yamanaka discovered a way of inducing mouse skin cells to become pluripotent as ESCs.<sup>8</sup> The following year he was able to create **similar induced pluripotent stem cells (iPSCs)** from human skin cells.<sup>9</sup> For these achievements, Dr. Yamanaka together with Sir John B. Gurdon won a Nobel Prize in 2012.

Much work remains to be done, however, to fulfill the hope that iPSCs represent. Human iPSCs take weeks to derive, efficiency is often as low as 0.1% and quality is often poor.<sup>10-12</sup> Differentiating somatic cells from iPSCs is far from an exact science. Despite being derived from the patient for whom they are to be used, iPSCs can often produce an immune response due to poor quality.<sup>13</sup> iPSCs become cancerous much more often than ESCs.<sup>14</sup>

## URGENT NEED TO ACCELERATE STEM CELL RESEARCH

Although many scientists believe pluripotent stem cells (ESCs and iPSCs) hold great potential for regenerative medicine, it will probably be at least a decade before technologies are developed to safely and effectively expand and differentiate them.

**iPSCs** are the most promising source of patient-specific pluripotent stem cells, yet iPSCs have many more genetic abnormalities than ESCs, and about ten times more mutations than the cells from which they were derived.<sup>15,16</sup>

It is essential to expand the number of stem cells in order to have sufficient quantity of those cells for therapy, but iPSCs are far more difficult than ESCs to expand without defects.<sup>16</sup> It is likely that technologies developed in the coming decade will help overcome these limitations.

Fetal tissue is rich in stem cells, and those stem cells have a low risk of immune system rejection because HLA immaturity protects the fetus from immune rejection by the mother. Although fetal tissue has been

used to treat a wide variety of diseases, low availability and ethical concerns constrain its use.<sup>17</sup> Stem cells from umbilical cord blood have similar advantages, but also have limited availability.<sup>18</sup>

Hematopoietic Stem Cells (HSCs) are the most commonly used curative stem cell therapy in modern medicine,<sup>19</sup> but MSCs are by far the most common type being tested in clinical trials.<sup>20</sup> MSCs can be used without HLA matching because MSCs do

not express a broad class of HLA antigens.<sup>21</sup> Moreover, MSCs possess many anti-inflammatory properties, so MSCs have often been used to suppress the immune system after organ transplantation.<sup>22</sup> Although MSCs were originally derived from bone marrow, MSCs can now be derived from a wide variety of tissues and body fluids.<sup>23</sup> The main benefit of MSCs is their ability to enhance the repair capabilities of tissues, rather than their ability to engraft

(which is poor).<sup>24</sup> A major challenge with MSCs is their wide cell-to-cell variability.<sup>25</sup>

**Parabiosis** experiments which connect the circulatory systems of genetically matched young and old mice have been shown to restore somatic stem cell function in the old mice.<sup>26</sup> The **Life Extension Foundation**<sup>®</sup> is seeking to raise funds for clinical trials with the hope of reversing frailty in elderly humans who are given extracts of young blood. ■

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# 2016 STEM CELL CONFERENCES (continued)

## CLINICAL TRIAL OF iPSCS



*Shinya Yamanaka,  
MD, PhD*

Shinya Yamanaka, MD, PhD (Director, Center for iPS Cell Research and Application, Kyoto University, Kyoto, Japan) was involved in the world's first clinical trial of iPSCs, which cost about a million dollars, was very time-consuming and only resulted in treatment for one patient. Dr. Yamanaka has concluded that for the foreseeable future, well HLA-matched iPSCs from donors must be used rather than iPSCs derived from the intended patient.<sup>1</sup>

Because HLAs differ so much between individuals, transplantation of an organ or tissue results in a strong immune system rejection in proportion to the HLA mis-match. But a reasonably good match of HLAs between an organ donor and an organ recipient can minimize the amount of immune suppressant drugs required. Close matching of three HLAs (HLA-A, HLA-B, and HLA-DR) have the strongest influence on whether a kidney transplant will be successful.<sup>2</sup>

Dr. Yamanaka wants to create banks of 140 different iPS Cell lines, which could provide a good match for 90% of the population of Japan (which is genetically very uniform). Each of the HLAs should be **homozygous**, meaning the same HLA type is inherited from both parents. To find the 140 ideal iPSC donors will require screening about 160,000 Japanese.<sup>3</sup>



*Masayo Takahashi,  
MD, PhD*

Masayo Takahashi, MD, PhD (Project Leader, Retinal Regeneration, RIKEN Center for Developmental Biology, Kobe, Japan) conducted the world's first clinical trial using iPSCs for regenerative medicine. More than 7% of those over age 75 lose the ability to read or recognize faces due to degeneration of the macula of the retina in the eye.<sup>4</sup> Dr. Takahashi used skin cells from

two people with macular degeneration to create iPSCs, which she differentiated into retinal cells.<sup>5</sup>

There are no standards for differentiating in such a way as to ensure that the cells do not become cancerous in the process. So she did extensive testing of the cells on laboratory mice to ensure that there was no chance of cancer.<sup>6</sup> She generated sheets of cells, rather than use an artificial scaffold,<sup>7</sup> and transplanted the cells into the first patient from whom the cells had been derived. The transplant halted the macular degeneration and improved the patient's vision.<sup>5</sup> One year after surgery there was no sign that any of the transplanted cells had become cancerous.<sup>8</sup>

But Dr. Yamanaka's team detected mutations in the second patient's iPSCs as Dr. Takahashi was preparing to transplant them. Although there was no definitive evidence that the mutations would become cancerous, in the interest of safety, there was no second transplant.<sup>5</sup> Together, the two cases had cost about a million dollars,

and had taken ten months — mostly due to cautious measures taken to avoid the possibility of cancer. This convinced Dr. Yamanaka that patient-derived iPSC therapy is not currently practical.



*Koji Eto, MD, PhD*

Koji Eto, MD, PhD (Professor, Department of Clinical Application, Kyoto University, Kyoto, Japan) has worked on the derivation of platelets from iPSCs. Platelets are blood components found only in mammals, and which stop bleeding by adhering to blood vessel walls. Patients with deficient platelets rely on transfusions from donors, but these transfusions generally

result in harmful immune system reactions.<sup>9</sup> Platelets derived from iPSCs would avoid this immune system incompatibility. Dr. Eto has been perfecting methods to derive platelets from iPSCs, but his major problem has been that the number of platelets he is able to derive is too low to be clinically useful.<sup>10,11</sup>

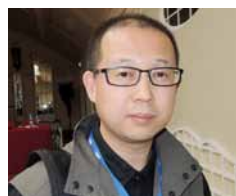
## EXPERIMENTS WITH IPSCS



*Hideyuki Okano,  
MD, PhD*

Hideyuki Okano, MD, PhD (Professor and Dean, School of Medicine, Keio University, Tokyo, Japan) has been working to derive neural stem cells from iPSCs that can be used to treat spinal cord injuries. In deriving neural stem cells from iPSCs, Dr. Okano has taken great care to prevent them from becoming cancerous.<sup>12</sup>

Despite iPSCs coming from the patient for whom the neural stem cells are intended, there is still danger that imperfections in the differentiation process can lead to immune system rejection.<sup>12</sup> Dr. Okano has restored motor function in spinal cord injury in mice by transplanting neural cells derived from human iPSCs into the mice.<sup>13</sup> He has also treated spinal cord injury in monkeys using neural stem cells derived from human iPSCs.<sup>14</sup> In neither experiment did cancer occur.



*Guang-Hui Liu, PhD*

Guang-Hui Liu, PhD (Professor, Institute of Biophysics, Chinese Academy of Sciences, Beijing, China) has derived iPSCs from patients suffering from a variety of disease conditions, and used those cells to better understand the molecular mechanisms causing those diseases. He has done this with Parkinson's Disease,<sup>15</sup> Werner's Syndrome,<sup>16</sup> xeroderma pigmentosum,<sup>17</sup> and Hutchinson-Gilford progeria syndrome.<sup>18</sup>

With the latter syndrome, he was able to use gene therapy to correct the disease-causing mutation in the iPSCs (but only in cells, he has not attempted this in patients).<sup>19</sup> He has also attempted to use gene therapy to correct mutations in cells from patients having Falconi Anemia.<sup>20</sup>

## TREATMENT OF PATIENTS WITH MSCS



*Katarina Le Blanc,  
MD, PhD*

Katarina Le Blanc, MD, PhD (Professor of Clinical Stem Cell Research, Karolinska Institute, Stockholm, Sweden) has used bone-marrow derived mesenchymal stem cells (MSCs) to treat patients suffering from transplant-induced immune reactions who did not benefit from steroids.<sup>21</sup> Whether the MSCs were HLA matched to the patient did not affect the outcome.<sup>21</sup> MSCs inhibit the immune system.<sup>22</sup> The number of MSCs are normally increased by expansion in tissue culture before being administered to patients. Dr. Le Blanc has found better therapeutic benefit from MSCs that have not been expanded too many times.<sup>23</sup> Dr. Le Blanc has found that MSCs are an effective therapy to treat patients who have been newly diagnosed with type 1 diabetes.<sup>24</sup>



*Shigeki Sugii, PhD*

Shigeki Sugii, PhD (Group Leader, Fat Metabolism and Stem Cell Group, Singapore Bioimaging Consortium, Singapore) has investigated the use of MSCs from fat deposits rather than from bone marrow. MSCs cells can be extracted from fat deposits through liposuction, whereas obtaining MSCs from bone marrow is much more painful and invasive.<sup>25</sup> Moreover, MSCs are a thousand times more plentiful in fat than in bone marrow.<sup>26</sup> Fat-derived MSCs more readily differentiate into bone or fat cells, whereas bone marrow derived MSCs more readily differentiate into cartilage cells.<sup>27</sup> Fat-derived MSCs promote wound-healing.<sup>28</sup>

Dr. Sugii has found that MSCs from subcutaneous fat proliferate and differentiate better than MSCs from visceral fat<sup>26</sup> and are less likely to cause metabolic abnormalities.<sup>29</sup> Dr. Sugii has investigated the molecular mechanisms underlying these differences.<sup>30</sup>

## SOMATIC STEM CELLS IN MUSCLE



*Pura Munoz-  
Canoves, PhD*

Pura Munoz-Canoves, PhD (Research Professor, University Pompeu Fabra, Barcelona, Spain) attempts to find means of opposing the loss of muscle function contributing to frailty in the elderly. A young person will typically have twice the number of somatic muscle stem cells as an elderly person.<sup>31</sup> Dr. Munoz-Canoves has found that a decline in autophagy in muscle stem cells is a main cause of their loss.<sup>32</sup> Autophagy is the process by which defective proteins and organelles are removed from cells, thereby maintaining cell quality. Dr. Munoz-Canoves has shown that she can prevent age-associated decline in muscles of mice by administering to them the autophagy-inducing drug rapamycin.<sup>33</sup>

## CANCER STEM CELLS



*Jonathan Pachter, PhD*

Jonathan Pachter, PhD (Chief Scientific Officer; Verastem, Inc., Needham, Massachusetts) is attempting to cure cancer by killing cancer stem cells. Chemotherapy or radiation therapy often kills most cancer cells, but often the cancer recurs. Multiple myeloma, for example, recurs more often than not.<sup>34</sup> Cancer stem cells are the suspected reason for this problem.<sup>35,36</sup>

Most cancer cells divide rapidly, so cancer and radiation therapy kill all rapidly dividing cells. Stem cells are characterized by infrequent division, the ability to create at least one copy of itself on division (“self-renewal”) and the ability to differentiate into a specific cell type. Infrequent cell division would make cancer stem cells resistant to radiation and chemotherapy. Studies of cancer cells show that only a small percentage can form new tumors on transplantation, so these cells are believed to be cancer stem cells.<sup>35</sup>

Focal Adhesion Kinase (FAK) is an enzyme believed to promote cancer stem cell growth and migration. So using drugs to inhibit FAK is a strategy to suppress cancer stem cells.<sup>37</sup> Dr. Pachter has used FAK inhibitors as well as other drugs to substantially inhibit cancer stem cells in mice as well as in cell cultures.<sup>38,39</sup>

## OXYGEN AND STEM CELLS



*Heather O'Leary, PhD*

Heather O'Leary, PhD (Postdoctoral fellow, Indiana University School of Medicine, Indianapolis, Indiana) is concerned about the effects of oxygen on stem cells. Stem cells normally reside in a low-oxygen environment, but are typically harvested in air, which has a higher oxygen content. Counteracting the oxygen stress associated with stem cell harvesting produces better results.<sup>40</sup> Dr. O'Leary has studied the molecular mechanisms reducing the quality of stem cells harvested in air.<sup>41</sup>



*Badrul Yahaya, PhD*

Badrul Yahaya, PhD (Head, Regenerative Medicine Cluster, University Sains Malaysia, Malaysia) wishes to use stem cells to treat Chronic Obstructive Pulmonary Disease (COPD, the fourth leading cause of death in the United States). COPD is caused by chronic exposure to noxious particulate matter (usually cigarette smoke), which obstructs airways and destroys air sacs in the lung.<sup>42</sup> COPD could be treated with mesenchymal stem cells, which reduces lung inflammation.<sup>43</sup> Dr. Yahaya has shown that fibroblast cells can be delivered to the lungs of rabbits as an aerosol without reduction of cell survival, but cancer cells did not survive.<sup>44</sup> Cancer cells are similar to stem cells in that they exist in a low oxygen environment. Dr. O'Leary's work suggests that it will probably be necessary to counteract oxygen stress to deliver stem cells to the lungs as an aerosol to effectively treat COPD. ■

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# A Conversation with Aaron Drake

24 January 2017 Transcript

By Christine Gaspar



It has been almost a year since the departure of Aaron Drake, from the role of Medical Response Director at Alcor Foundation. *Cryonics* magazine recently caught up with the man of the hour and sat him down for a proper reunion. Aaron was a critical part of Alcor's team and brought immeasurable value to his role. It was very exciting to hear about what he has been up to, and what his plans are for the future.

**CG: So! Aaron! It has been a while, and I am sure that many people would love to know how you are doing, and what you have been up to these last several months. Please tell me: Where did you go?**

**AD:** Well, I went Independent, which means that I can really go just about any place at all. I have been spending the majority of my time over in China. That has been an adventure; on all levels; not only in terms of the food, people, the environment, the culture, language, the currency: It has just been really fun.

**CG: What has been the best moment of this experience? I do not mean related to business but just the best moment.**

**AD:** Honestly, this may sound odd, but the best moment was re-appreciating what we have here.

**CG: Such as...**

**AD:** We take many things for granted here in the United States.

**CG: I sure took for granted our toilet seats when I went to France.**

**AD:** That is very true. [Laughing] I have been fortunate enough to have western amenities where I work, but most places sure do not have anything resembling a western style toilet. Going out takes careful planning, as you need to carry your toiletries with you.

**CG: Ok, seriously now, from the Alcor website:**

*Du Hong, Alcor member A-2833, was pronounced clinically dead on May 30, 2015, at the age of 61. Du Hong, a neurocryopreservation member, was Alcor's first patient from China, and 138th patient overall.*

**Would you tell us a little bit about her and her case?**

**AD:** The Du Hong case was really a revelation on many different levels. It was a logistical nightmare, and it took a real team effort. I had to rely on some of the international shipping consultants that we have worked with. I learned a lot from them about regulations. There are different regulations in every country I have gone to, so that is not new, but they were even more challenging in China.

We met many involved people in China who had been interested in cryonics for quite a while. They were helpful, in fact, instrumental, in seeing that Du Hong's case made it all the way to fruition. Du Hong's

case was also influential in introducing cryonics to many Chinese people. She was a famous writer, editor, and publisher. The news of her cryopreservation created a lot of press interest.

**CG: Was it mostly positive, or was it a little more critical?**

**AD:** It was mostly positive with some negative, mainly in the commentary, which is similar to what we have here. I think by-and-large, that the articles were good, and shone a light on cryonics as just another available option; a new option for people to consider.

**CG: Once you mentioned that many Chinese people do not believe in cremation, and that this opens up a door for cryonics. Is that right?**

**AD:** I do not think that this is a way to market cryonics in China—to avoid cremation, but yes, the vast majority of people in China are cremated. This is strongly related to the cost, and the available space. You know, Beijing has 22 million inhabitants during business hours, and it is a very densely packed, vertical city. If you were particularly affluent, maybe “one of the one percent” as is said in the US, then you could be buried. It is extremely expensive; around \$100,000 a year, and your family has to keep paying that every single year or you will probably be eventually removed and cremated. The

family is very, very important in China, and the elders are highly revered.

It rather harkens back to the way our country used to be, but now it seems like so many of us are stuck in nursing homes. This does not happen over there. The grandparents remain part of a multi-generational household, often taking care of the children while the younger adults earn a living. This level of respect for the elders continues through death. The family is not going to want to bury their elder in a plot somewhere very far away from them, so most become cremated. This can be hard on them if they philosophically disagree with cremation. Many of the Chinese feel it is an affront to their values.

**“There are different regulations in every country I have gone to, so that is not new, but they were even more challenging in China.”**

So then, the idea of cryonics is presented to the Chinese. Not only is it considered an element of life extension, which the Chinese are very interested in, but it also removes the dilemma of unwanted cremation. Fundamentally, this removes one of the many obstacles towards acceptance of cryonics by the Chinese people.

The Chinese do not tend to have the same sentiments as those with western-based faiths. There is no concern about where one's soul might go after one dies; if it leaves the cryopreserved body or is trapped in the dewar and unable to fulfill its purpose. This can be a major roadblock towards the acceptance of cryonics by Westerners, as many cannot reconcile their religious beliefs with the idea of cryonics. This is really not a major issue in the Far East.

**CG: Take a step back for a moment. Can you reflect on where you came from, and how that has transformed you?**

**AD:** When I look back to when I was first hired by Alcor, my main role was to manage cases, so I was tasked with performing all of

the standbys and stabilizations throughout the US. I was also tasked with training various regional teams. They had already been established and developed. I was to continue to outfit them with equipment and supplies and make sure they were trained: So I did that. We did the training, team development, outfitting with the latest and greatest tech that the budgets would allow for, but ultimately this was all at the tail end of an initiative. Honestly, Alcor and the board of directors wanted to move away from volunteer teams, and more into professional teams.

So, at about the halfway point of my seven and a half years of working at Alcor, the thrust of what I was working on changed. Suspended Animation had designed a very professional approach to standbys in terms of integrating surgeon and perfusion networks, and that really matched what Alcor wanted as the next stage in the evolution of standbys. The program that SA developed was meant to replace our regional teams, so my role went from training everybody, to really just performing the standbys in Arizona, Alaska, Hawaii, and internationally with SA covering the rest of the continental US. SA was also not planning to manage international cases. Because my domestic standby role decreased, I was able to focus more on international members. I thought that was an excellent move. About 15% of their membership base was international, but the service Alcor was able to provide was practically nil, in comparison to the US. There was no equipment over there; we did not have trained people over there, supplies, perfusate—almost everybody was a straight freeze if they were international clients. Yet, at the time, international clients paid a premium. They were getting less service for more money. As a result, the introduction of SA into our system was a positive thing. Now I could begin to focus on the development of international cryonics services.

We began to pre-position equipment and perfusate overseas. We began to work with some international groups that were providing cryonics-related standby services. Alcor did have some international media attention at the time, which brought in new

clients, but many were last-minute clients who were very much end stage. The timing was beneficial. All of a sudden, I started going on a lot of international cases. The logistical planning changed dramatically as a result. I learned about international laws—about what could or could not be done—many times on the fly, while in another country. I had to be really flexible, and I had to think of multiple contingency plans throughout the entire process, always anticipating that there would be a problem so that I would always have a plan in place. That was a very fun time; I really enjoyed it, and it truly opened my eyes up to this international group of cryonicists. I really felt good about now being able to provide existing groups some real quality level of services.

Around the time of the Chinese case, we had a tremendous amount of interest from China. Groups were trying to contact Alcor frequently about trying to collaborate with us or buying technology and equipment.

**CG: Was that just timing or was there an event that triggered that interest?**

**AD:** Well I think it was starting to come in anyway, but the Du Hong case really brought it to the forefront. It really opened the doors, because after Du Hong there was a tremendous amount of media, as she was a publisher, editor, and writer; she was a household name. Newspapers covered it; I did radio interviews; I did magazine interviews; television shows covered it, and there was US press interest as well. So all of a sudden, cryonics was a brand new thing for China. Even though it had been going on in the US for 45 years, for China, it was a brand new technology. It became the cool thing to do; if you pardon the pun. From there, there was a significant increase in the flow of people contacting Alcor, wanting support for their international efforts.

Alcor still had a limited budget and limited resources which certainly made it challenging to expand internationally. Even though I was excited to do more, we were limited because we would really need a lot of money to try to do it properly. While this was going on, I met a lot of people that were doing projects. They were very serious and had significant funding to



back up how serious they were about really pursuing cryonics as a *science*. Throughout this process, I had developed a number of contacts, as I did in the rest of the world.

I had already been training and working with some of Alcor's more affluent clients around the world, and many had wanted their own *special teams*, in the event that they could not wait for Alcor to arrive to start the process. Many had their own equipment. Alcor already had some worldwide pockets of private coverage, both foreign and domestic, that I had worked with. These were very influential people who really wanted to expand on an international basis.

**“The Chinese do not tend to have the same sentiments as those with western-based faiths. There is no concern about where one's soul might go after one dies; if it leaves the cryopreserved body or is trapped in the dewar and unable to resolve its purpose.”**

It became an opportunity that would allow me to follow what I really loved. I felt though that the only way I could do that was to step away from the role of a regular employee of Alcor. I could not do it otherwise. I really enjoyed my time at Alcor and did not want to abandon it, but continue to support its growth. I sat down with Max and discussed it. I proposed the idea that I really wanted to become an independent consultant. That would free me up to work on a variety of projects, still within the cryonics industry. We came to an agreement on that, and I was very pleased with the results.

**CG: I am glad that you are still around; I really am.**

**AD:** Well, thanks. Scottsdale is my home, and I am only four minutes away from Alcor.

**CG: Yes but what I mean is that I have watched you for a while. I have**

**been involved in cryonics for years, and I was always impressed with your ability to be a firefighter, in a sense. Being able to put out fires; to command people; being personable; being diplomatic; being an atypical cryonicist in that, you are a good bridge between the medical world and the world of cryonics. I was very pleased when I heard about this, for you, but at the same time afraid because I did not want to lose such a good friend and such a good contact. You are such a valuable resource for this community. I am very pleased that you have a solid connection with Alcor, and we can still reach out to you if needed.**

**Do you mind talking about what you are currently working on? I am not sure how much you are able to share.**

**AD:** No! I do not mind talking about it at all. I wish I was doing that more!

**CG: Then go for it. Tell me about your day; tell me about your setup there. What have you been working on in your beautiful facility?**

**AD:** I have a few contracts, but the major contract is in the Shandong Province in the city of Jinan. For that contract, I work in China for about seven months of the year, broken up into three or four different trips. It is not one continuous seven-month period; that would be really tough.

This is an existing biotech company that has been very successful at developing a large client base in the areas of cord blood stem cell storage, skin and tissue storage, gene cell analysis, and stem cell research. They are also trying to develop an umbrella of anti-aging services. So if a child with a congenital disease needed his cord blood stem cells, he would have access to them; and if someone needed tissue or gene analysis, this would be available. They are doing research into using stem cells to treat degenerative brain diseases right now.

Towards the goal of having an anti-aging umbrella, they wanted to provide cryonics as an additional service. It is a very natural fit, not only in terms of a closely related service but also in terms of equipment. Therefore, what they wanted to do, was

develop this service *soup to nuts* and pretty much mirror what Alcor is doing, because not only did Alcor have the storage (similar to the Cryonics Institute), but they also have the standby and stabilization components and the perfusion that was done all prior to long term storage. The Cryonics Institute simply breaks down the process into components, and the clients choose their level of care.

So, they hired me with the hope that I could develop every aspect of that, including training medical professionals, their teams and personnel, and helping them establish this entire program. It has been a fascinating time. It has been almost a year now, and in that time they have acquired all of the equipment and supplies that they need, hired all of the personnel, including surgeons and perfusionists (who are practicing in hospitals, not unique to cryonics). They have a staff of around 22 people; they have a huge, gorgeous facility; and I have completed the training to ensure everyone is up and ready to go. They are at the stage now where they are ready to accept their first patient. They have had a few opportunities but so far have been very selective, at least for their first patients, to ensure that they have the right candidates who are doing it for the right reasons. I am actually encouraged by that.

**CG: Logistically, when you think about taking the patient from the bedside to the surgical table, are there any differences, or surprises that you have run into because you are in China, dealing with their medical system: or simply on a more basic level?**

**AD:** Well, there are a couple of differences that are pretty stark. One has to do with geographical challenges, the other more related to cultural challenges. I would like to speak briefly on each.

Obviously, China is vast, and some of these patients could be very far away. The idea of transporting someone and getting them to a timely perfusion and surgery is really challenged by the differences. Air ambulances are not something the patients have access to, and so the workaround, which has been fascinating, is they really want to use a service called an ECMO.

This stands for extracorporeal membrane oxygenation. Essentially this is external cardiopulmonary bypass. What they are planning is that when they have a patient that is at some considerable distance, they will place that patient on ECMO immediately. Obviously, they would want to cool but instead of using the LUCAS 2 for external compressions, and intubation with a small portable ventilator; and hoping to get good circulation and ventilation, they want to take this to an entirely new level. So even though the patient has been declared legally dead under their regulations, and would be considered clinically dead because their heart has stopped, this patient would be biologically alive because they would be on life support. In conventional medicine, they can keep a patient alive on ECMO for up to 60 days.

**CG:** Are they getting the local hospitals to do this—where they will call ahead and say that this patient is signed up for cryonics; however the speech goes, and get an agreement from the local doctors to place the patient on ECMO while waiting for the team to arrive, or how does this work?

**AD:** Well they are not at that stage yet. They have been able to get permissions because they own a hospital, and are affiliated with the hospital chain. They really have all of the standard permissions that one would need so to go to another hospital is not a big deal. They can go into another hospital and do these procedures under their existing hospital license, but the current model is not to convince another hospital to do ECMO on their behalf. They would rather send an advanced team of surgical professionals and a perfusionist to actually put the patient on ECMO, and leave them on it the entire trip back; keeping them cool but on life support, despite the distance and the time it may take to make the journey.

**CG:** Can this be done post-mortem? In other words, if the patient is pronounced, and then the family calls the cryonics facility, can the ECMO be initiated from the morgue and offer any benefit?

**AD:** There is an analysis that would have

to be completed, very similar to the way Alcor's deployment committee would take a look at the variables of the case, including the amount of time that has passed, to make a decision that would be best for that patient. That could mean that they would go straight to dry ice or an appropriate alternative.

**CG:** Ok, I need to rephrase the question. Let me provide an analogy. There are geographical challenges, as we have in Canada. Say we have a patient in northern Saskatchewan, in the middle of nowhere, who goes down. He is dying; he is in the hospital, and the family calls you or calls Alcor (it doesn't matter who). The first geographical problem is that the patient might die before the standby team could arrive. The second geographical problem is effectively managing that patient from point A to point B, and improving the care available now.

Therefore, for the second issue of managing that patient effectively, one useful tool is ECMO, with the intention that it be part of the protocol under the right circumstances, as I understand it.

**For the first problem of managing a patient from the moment the family calls the team until anyone related to cryonics arrives, is there a role for ECMO?**

**AD:** The use of ECMO for the first geographic problem is not part of the current protocol. There are too few facilities with the means and skill to use the technology. The last I looked, there were only 83 registered ECMO centers in the world. This Jinan organization has already sent some of the team members for specific ECMO training beyond their current skills.

That is one of the remarkable things that are going on, related to the geographical challenge. Let us also discuss the cultural challenge of delivering cryonics in China.

Unlike here in the US, where the individual has the right to decide what happens to their body when they die, in China, the family unit is so strong, that it is actually a family decision. I managed two cases for Alcor that were in China.

On the Du Hong case, the doctor had told the patient that cryonics was not her decision but instead based on what her children wanted. Her parents were no longer living, so the decision went to her son and daughter-in-law. Luckily, they were supportive of her choice.

**“Air ambulances are not something the patients have access to, and so the workaround, which has been fascinating, is they really want to use a service called an ECMO.”**

For the second case, we went to Beijing for Alcor. The member was a US citizen, Chinese-born, and she worked in the University of California school system as a professor. She was in Beijing getting treatments for cancer. They were not working so she wanted to be cryopreserved. The doctor said, “But it's not your decision; it's your parents' decision.” She was not married and had no children, so the only ones in her family were her parents. The parents did not understand cryonics and really did not want to understand, and they just said “no.” So, therefore, the doctors and the hospital would not consent to her doing this.

**CG:** Wow.

**AD:** This is something that would never enter your mind in the United States. Individual choice is a right: but not in China. That is a social challenge that will have to be worked out. These two unique challenges—geographical and cultural—take standby to a whole new level. In terms of ECMO, we will see if this can realistically be achieved on a regular basis, but I believe it holds great promise. In terms of the cultural challenge, it seems hard for me to understand or accept that a person does not have the right to choose. When I worked at Alcor, I fought for that patient's right. Often times, hospital administrators, or doctors would tell me that I could not do this. I would point out that actually, this was the patient's right. I was their advocate. In China, they do not have that.

**CG: What did you learn about yourself this last year?**

**AD:** That I can still continue to learn in my fifties. [Laughs]. That you think you know everything but don't, and yet you can still learn things. I have learned a lot more about cryonics because I have been forced to. At Alcor, the work was a team effort, and everyone contributed. Here I have been obliged to learn every aspect of it. On top of that, I have had to learn a new language. I have been encouraged by the fact that I still have the capacity to learn a lot and keep going.

**CG: I heard you speaking French in Scottsdale. It must be hard to learn Chinese. That sounds insane.**

**AD:** It is. With French, or Spanish, or Italian, some words carry over, and there is a familiarity with the sounds. There is none of that in Chinese. Absolutely none. For example, here you learn the word "brick," which might be used a couple of different ways; but a brick is essentially a brick. Let us take the word "Li" in China: if you type that word into a Chinese keyboard, there are 360 different definitions of the word "Li." It is very common for a word to have 200 or more meanings. It has been a very challenging language to learn but at the same time, fascinating. Chinese pictograms are really a visual sense of what things are. They are quite descriptive in their terms when they are trying to speak. It can be a pretty language, not necessarily to speak or to listen to, but as you break down the words and the sentences and you understand the meanings of what the words are; it can be a very beautiful way to describe things.

**CG: Interesting. It must also use an aspect of your brain that you are not used to activating with language learning. All of a sudden, you are visualizing words in a completely new way. That is amazing.**

**AD:** It is a very different process that they use to speak their language and a much more creative style of expression.

**CG: How are they treating you in terms of interactions with the government?**

**AD:** I have actually been treated very warmly by the Chinese government; I am not just saying that in case they are

reading this article. [Laughs] The Chinese government is very interested and has been for over a decade, in bringing in foreign experts and broadening their capabilities.

In the Shandong province where I am located, the government has bought into the entire program; they endorse the entire project, and they have even gone so far as to support my being there. So, towards that, they actually provide a relatively generous stipend towards my salary.

They have even inducted me into the Chinese Foreign Expert Bureau as a Distinguished Member. This particular province only takes three people per year, so it was a real honor to not only come to China and work for a foreign company but actually to have the government support me in this project and the associated recognition that comes with it. It is nice to have that designation, and it means a lot to me to be recognized as an "official foreign expert." It shows the level of commitment that the government has backing this project, and they are actually backing me being there to help.

**CG: It is well deserved.**

**AD:** This is my main project, but I still have other very affluent clients, both domestically and internationally, that have come to rely on having me involved heavily in training either their own private teams or making sure that we can integrate into their country's medical systems and infrastructure. There are those private clients that want to pay to ensure that things are going to go as planned, or at least to the best of their ability. That is also part of what I have been doing.

Overall, I get to work with a hugely diverse group of professionals. I get to talk to hospital administrators, hospital CEOs, physicians, attorneys, trust lawyers, foreign insurance agents, stem cell directors. Many international clients want to have their stem cells stored in addition to their bodies. I have met stem cell directors that are coupling their services with the cryonics arrangements these people are making.

I am actually laying the groundwork with individuals who are going to do the international shipping and the people that are going to be filing the paperwork so that their government is not going to impede

on the process. I am clearing the way with hospitals to make sure that the patient can have these procedures done in that hospital, with these doctors, and when the time comes, everything goes smoothly. Are their trusts in place? Is the money in place? Are their cryonics arrangements in place? Those are fun to work on because you have lots of planning time; they are not last minute, and you can make sure everything is in place. I really enjoy those.

**"Unlike here in the US, where the individual has the right to decide what happens to their body when they die, in China, the family unit is so strong, that it is actually a family decision."**

In the next five or ten years, there are going to be some significant opportunities in cryonics, and of course, growing interest and competition will begin to drive prices down. Unfortunately, for now, it is a costly venture, and you need to spend money in order to get it done right.

I am so excited about what I am seeing, and the growing interest in cryonics.

**CG: What is in Aaron Drake's future?**

**AD:** Well, my main interest is just to continue doing what I love: bringing quality cryonics to the international community.

**CG: Mandarin or Cantonese?**

**AD:** Mandarin, of course.

**CG: Aaron, thank you so much for your time, and for all the efforts you are making.**

**AD:** Thank you for doing this and taking an interest in my work. ■



# INTERNATIONAL LONGEVITY & CRYOPRESERVATION SUMMIT

## Madrid ~ Seville ~ Barcelona, Spain 2017

May 25-26-27, 2017 | Madrid (international audience)

May 29, 2017 | Seville

May 30, 2017 | Barcelona

Spain will host the first International Longevity and Cryopreservation Summit during May 25-30, 2017. **Fundacion VidaPlus** will be the main organizer of this world congress, with the help of other leading associations and organizations working on longevity, indefinite lifespans, cryopreservation, and other biomedical areas.

Longevity extension has been one of the dreams of humanity since the beginning of recorded history, when average lifespan was merely 20 years. Even starting the 20th Century average lifespans were just about 40 years in the first industrial nations, and starting the 21st Century average lifespans have doubled again to around 80 years in the most advanced countries. The possibility of again doubling lifespans is increasing rapidly thanks to exponential technologies and new medical research and development. On a parallel front, cryopreservation has also advanced considerably since the first spermatozooids were frozen and successfully reanimated about half a century ago. Then followed eggs, embryos, many tissues and complete organs, in different kinds of animals, including some small mammalian organs. What will the future bring? Science and technology should lead the way!

Several institutions have been advancing research on longevity extension, from governments to private companies. Institutions like the Life Extension Foundation and the SENS Research Foundation, to name just two, have been pioneers in promoting investigations and applications of human longevity extension. Additionally, the two major US cryopreservation institutions, Alcor Life Extension Foundation and Cryonics Institute, have been holding successful regular meetings for their members and other interested audiences during the last four decades. In Europe, there was an initial regional meeting in Goslar (Germany) in 2010, followed by Dresden (Germany) in 2014, Utrecht (Netherlands) in 2015, and then Basel (Switzerland) in 2016. KrioRus has also been promoting cryopreservation in Russia and other countries.

Now we are planning to host in Spain the first International Longevity and Cryopreservation Summit — open to people from all continents. Participants from

the United States, United Kingdom, Argentina, Australia, Africa, China, Russia, Venezuela, and elsewhere, are hoped-for and welcome. The topics considered will be very broad, ranging from recent medical advances to human cryopreservation.

Spain will become the meeting point for this first International Longevity and Cryopreservation Summit, where the different groups from around the world will gather to connect and closely work together. The first part of the May events will be the international academic congress in English during May 25-26-27 in Madrid, followed by national events in Spanish on May 29 in Seville, and May 30 in Barcelona. The objective is to combine the international reunions with local audiences and to help promote longevity and cryopreservation research and development in Spain. In partnership with pioneering sponsors like Cursos.com, we will do our best in scientific dissemination to make society aware of the new economy and opportunities coming with Life Extension and Longevity advances.

Abstracts from participants are welcome for posters, papers and oral presentations until March 1, 2017. People interested in participating should go to our website (<http://internationalcryonicssummit.com/>) and follow submission instructions. Organizations interested in sponsoring our summit, and other media and institutional partners and allies should also contact the organizing committee through our website.

This year, 2017, will be a very important year for organ transplants and cryopreservation, since we will celebrate the 50th anniversary of the first heart transplant and also the 50th anniversary of the first full human cryopreservation. Major leading associations working on longevity, indefinite lifespans, cryopreservation, and

other biomedical fields will be present in Madrid (May 25-26-27), Seville (May 29), and Barcelona (May 30).

Fundacion VidaPlus, our sponsors and partners welcome you all to sunny Spain next May for the warmest cryopreservation meeting in history. Come and enjoy life extension in a country that never sleeps!

### Organizing Committee

- Conference Chair: José Luis Cordeiro, MBA, PhD
- Organizing Institution: Fundacion VidaPlus

### Scientific/Academic Committee

- President: Javier Cabo, MD, PhD, Universidad Internacional de Andalucia
- Felipe Debasa, PhD, Universidad Rey Juan Carlos
- Rodolfo Goya, PhD, Universidad Nacional de La Plata
- Aubrey de Grey, PhD, University of Cambridge
- Joao Pedro de Magalhaes, PhD, University of Liverpool
- Ralph Merkle, PhD, Stanford University
- Max More, PhD, University of Southern California
- Ramon Risco, PhD, Universidad de Sevilla
- Anders Sandberg, PhD, University of Oxford
- Natasha Vita-More, PhD, University of Advancing Technology
- Javier Wrana, PhD, Universidad Rey Juan Carlos

### Technical/Administrative Committee

- Felix Capell, BlueSwiss Capital
- Noel Garcia Medel, PhD, Innovative Health Group
- Txetxu Mazuelas, VidaPlus Celulas Madres
- Carlos Rodriguez Sau, Expert in Technology and Cyberlaw
- Alejandro Sacristan, Vector001

### Madrid Committee

- Luis Gonzalez-Blanch, Singularity University, Madrid Chapter
- Gonzalo Ruiz, Civeta Investment

### Seville Committee

- Luis Rey Goni, Singularity University, Seville Chapter
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### Barcelona Committee

- Joaquin Serra, Singularity University, Barcelona Chapter
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### Other Partners and Allies

- HumanityPlus
- Life Extension Foundation
- Lifeboat Foundation
- Global Healthspan Policy Institute
- Longevity Reporter
- Millennium Project
- Alcor Life Extension Foundation
- Cursos.com
- SingularityWebLog
- London Futurists
- Crionica.org
- Sociedad Crionica
- GiBiomed
- Dutch Cryonics
- CryoSuisse
- KryoFin: Finnish Cryonics Society
- Cryonics Germany
- Svenska Kryonikföreningen

**International Longevity and Cryopreservation Summit:**  
<http://longevitycryopreservationsummit.com/>

**Fundacion VidaPlus:**  
<http://fundacionvidaplus.org/>



*VidaPlus directors with Max More, CEO of Alcor, at 2016 International Cryonics Conference in Basel, Switzerland*



# Bring in a **NEW** member and save **a year of dues!**

**M**embership growth has been slowly accelerating since bottoming out in 2013. But we would benefit from faster growth. Alcor is now at 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 move us into a virtuous circle where growth enables reductions in dues which further spurs membership growth. Growth will also make it easier to hire highly skilled people in medical and technical areas.

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.

**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.**

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 cryopreservation paperwork and has paid at least six months of dues; and (e) the new member must not be a member of their family. 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, the existing member is eligible for a waiver of six months of dues.

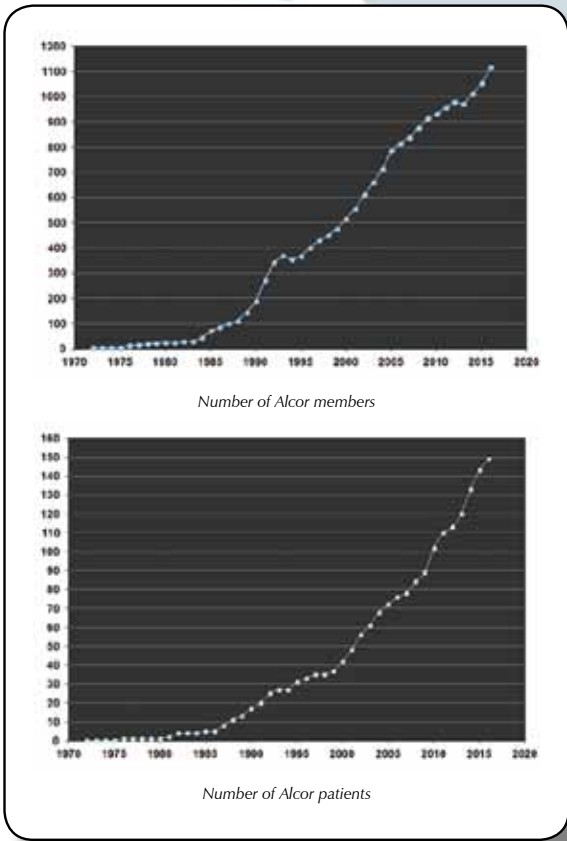
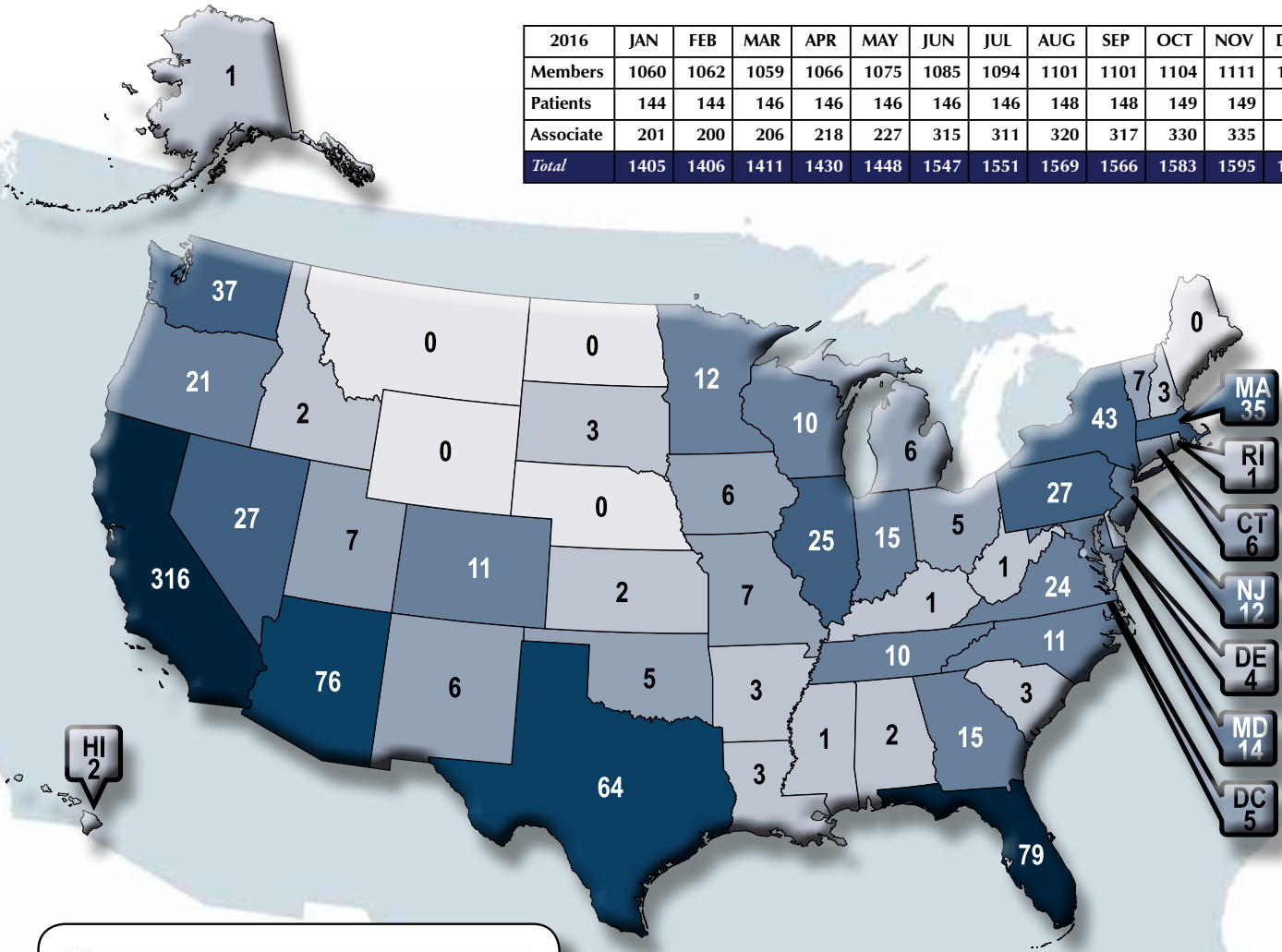
Who do you know who could do with some encouragement to sign up? Please, give it some thought, then help yourself and help the organization by helping to stimulate membership growth. Bring in one new member per year, and you will never pay dues again!





# Membership Statistics

2016	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Members	1060	1062	1059	1066	1075	1085	1094	1101	1101	1104	1111	1116
Patients	144	144	146	146	146	146	146	148	148	149	149	149
Associate	201	200	206	218	227	315	311	320	317	330	335	341
<b>Total</b>	<b>1405</b>	<b>1406</b>	<b>1411</b>	<b>1430</b>	<b>1448</b>	<b>1547</b>	<b>1551</b>	<b>1569</b>	<b>1566</b>	<b>1583</b>	<b>1595</b>	<b>1606</b>



### International

Country	Members	Patients
Australia	14	3
Canada	51	2
Chile	2	0
China	0	1
Germany	10	0
Hong Kong	2	0
Israel	1	1
Italy	3	0
Japan	4	0
Luxembourg	1	0
Mexico	4	0
Monaco	1	0
Netherlands	1	0
New Zealand	1	0
Norway	1	0
Portugal	4	0
Singapore	1	0
Spain	3	1
Thailand	4	1
United Arab Emirates	1	0
United Kingdom	31	3
<b>TOTAL</b>	<b>140</b>	<b>12</b>



# REDUCE YOUR ALCOR DUES WITH THE CMS WAIVER

Alcor members pay general dues to cover Alcor's operating expenses and also make annual contributions to the Comprehensive Member Standby fund pool to cover the costs of readiness and standby. Benefits of Comprehensive Member Standby include no out-of-pocket expense for standby services at the time of need, and up to \$10,000 for relocation assistance to the Scottsdale, Arizona area.

Instead of paying \$180 per year in CMS dues, Alcor also provides members the option to cover all CMS-associated costs through life insurance or pre-payment. Members who provide an additional \$20,000 in minimum funding will no longer have to pay the \$180 CMS (Comprehensive Member Standby fund) fee. This increase in minimums is permanent (for example, if in the future Alcor were to raise the cost of a neurocryopreservation to \$90,000, the new minimum for

neurocryopreservation members under this election would be \$110,000). Once this election is made, the member cannot change back to the original minimums in the future.

To have the CMS fee waived, these are the minimums:

- **\$220,000 Whole Body Cryopreservation** (\$115,000 to the Patient Care Trust, \$60,000 for cryopreservation, \$45,000 to the CMS Fund).
- **\$100,000 Neurocryopreservation** (\$25,000 to the Patient Care Trust, \$30,000 for cryopreservation, \$45,000 to the CMS Fund).

If you have adequate funding and would like to take advantage of the CMS waiver, contact **Diane Cremeens** at [diane@alcor.org](mailto:diane@alcor.org).

## Become An Alcor Associate Member!

Supporters of Alcor who are not yet ready to make cryopreservation arrangements can become an Associate Member for \$5/month (or \$15/quarter or \$60 annually). Associate Members are members of the Alcor Life Extension Foundation who have not made cryonics arrangements but financially support the organization. Associate Members will receive:

- **Cryonics magazine by mail**
- **Discounts on Alcor conferences**
- **Access to post in the Alcor Member Forums**
- **A dollar-for-dollar credit toward full membership sign-up fees for any dues paid for Associate Membership**

To become an Associate Member send a check or money order (\$5/month or \$15/quarter or \$60 annually) to Alcor Life Extension Foundation, 7895 E. Acoma Dr., Suite 110, Scottsdale, Arizona 85260, or call Marji Klima at (480) 905-1906 ext. 101 with your credit card information.

Or you can pay online via PayPal using the following link: <http://www.alcor.org/BecomeMember/associate.html> (quarterly option is not available this way).

Associate Members can improve their chances of being cryopreserved in an emergency if they complete and provide us with a Declaration of Intent to be Cryopreserved (<http://www.alcor.org/Library/html/declarationofintent.html>). Financial provisions would still have to be made by you or someone acting for you, but the combination of Associate Membership and Declaration of Intent meets the informed consent requirement and makes it much more likely that we could move ahead in a critical situation.



## THE FUTURE OF SEX: SOME CONTRASTING VIEWS

By R. Michael Perry



**S**igmund Freud, perhaps the best-known pioneer in the study of human sexuality, begins one of his public lectures on the subject somewhat tongue-in-cheek:

“Ladies and gentlemen,—One would certainly have supposed that there could be no doubt as to what could be understood by ‘sexual’. First and foremost, what is sexual is something improper, something one ought not to talk about.”<sup>1</sup>

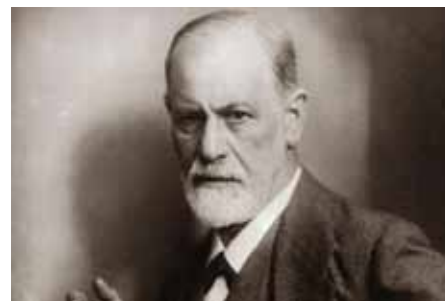
Sexuality has traditionally been a taboo subject, an embarrassment. Nowadays, after Freud and others made it “respectable”—well, it’s still something many find embarrassing. Others in turn wonder what the fuss is about; “just go for it and enjoy,” they would say, or some more ardently, “if you can’t find a partner, well, use your hands, dummy!”

Anyway, the subject of sexuality is large and complex, and much will have to be omitted here, as we consider in limited space, not so much all that is happening today, but what we might expect for the future. (And here too much will have to be omitted so that a beginning can be made. The interested reader is invited to do an online search, where thousands of articles can easily be found.) As usual with prognostications, we will be on uncertain ground—we won’t really know what the future will be like until we get there. But we need to make the effort, just as we are gearing up for the future in other ways (including trying to bring it about).

For the discussion of sexuality and what might be in store for it in the future I’ve

chosen four main sources. First is some writing by the venerable Freud himself, who I think had some important insight that hasn’t lost its punch in the century or so since he was active. (The connection of this century-old thought with our main focus on the future may seem doubtful at first, but should become clear as we proceed.) Second on our list, and closer to home, is from cryonics founder Robert Ettinger in his 1972 book *Man into Superman*. There we find a chapter entitled “Transsex and Supersex” that explores the topic of the future of sex in some thirty pages. Third and fourth are two essays that appeared in 2003 in a Society for Venturism newsletter, *Physical Immortality*, with largely self-explanatory titles, James Swayze’s “Joy of Sex Forever,” and my own alternative, “Joy Forever without Sex.” (We did strive for balance in presenting our speculative views in this publication, as is being attempted here also.)

### WHAT DID FREUD SAY?²



Sigmund Freud

Freud, considered to be the father of the psychiatric therapeutic technique known as

psychoanalysis, was a controversial figure in his own time and still is. His basic approach was “talk therapy,” getting a patient to talk about their mental problems and trying to determine their causes and make these causes known to the patient. Such knowledge should then have therapeutic value; ideally, the patient, knowing and understanding what had been troubling them, would then be cured of their ailment. (This assumes, of course, that the ailment was essentially mental in nature and not, for example, a consequence of organic brain disease.)

Freud recognized the importance of sexuality in human psychology and human mental problems and had much to say about it, most of which we will have to pass over here. What we will consider comes from a 1912 essay, “The Most Prevalent Form of Degradation in Erotic Life,” which deals with the problem of “psychical impotence,” which he explains as follows.

“This strange disorder affects men of a strongly libidinous nature, and is manifested by a refusal on the part of the sexual organs to execute the sexual act, although before and after the attempt they can show themselves intact and competent to do so, and although a strong mental inclination to carry out the act is present. The man gets his first inkling in the direction of understanding his condition by discovering that he fails in this way only with certain women, whereas it never happens with others. He knows then that the inhibition of his masculine potency is due to some quality in the sexual object,



and sometimes he describes having had a sensation of holding back, of having perceived some check within him which interfered successfully with his conscious intention. What this inner opposition is, however, he cannot guess, or what quality in the sexual object makes it active."

Freud attributes the "strange disorder" to a failure of maturation.

"Here again—as very probably in all neurotic disorders—the root of the trouble lies in an arrest occurring during the course of development of the libido to that ultimate form which may be called normal. To ensure a fully normal attitude in love, two currents of feeling have to unite—we may describe them as the tender, affectionate feelings and the sensual feelings—and this confluence of the two currents has in these cases not been achieved."

We might then expect that the Good Doctor would devote some considerable text to how to remedy the situation and, in short, restore the libido to its "normal" level so the problem goes away. But no, in this essay he devotes much thought to what he sees as a basic problem with human sexuality itself, one that is not remedied by restoring or attaining "normality." True, if "a fully normal attitude in love" exists, participants may feel things are fine, yet overall there is something disturbing about the whole thing, which is to say that Freud himself is not convinced everything is fine, nor does he see a way out, other than to admit an insoluble problem exists.

The problem appears to be one of "uniting" the "tender, affectionate feelings" which arise earlier in life, before puberty, with the "sensual feelings" that come to prominence later. Thus a man in adulthood is forced to have a different attitude toward his wife than the feelings nurtured earlier toward a sister or mother.

"It has an ugly sound and a paradoxical as well, but nevertheless it must be said that whoever is to be really free and happy in love must have overcome his deference to women and come to terms with the idea of incest with mother or sister. Anyone who in the face of this test subjects himself to serious self-examination will indubitably find that at the bottom of his heart he too regards the sexual act as something degrading, which soils and contaminates not only the body. And he will only be able to look for the origin of this attitude, which he will certainly not willingly acknowledge,

in that period of his youth in which his sexual passions were already strongly developed but in which gratification of them with an object outside the family was almost as completely prohibited as with an incestuous one."

So far we've considered what Freud said about the male side of sexuality, but his essay also does not overlook the other side.

"The women of our civilized world are similarly affected by their up-bringing and further, too, by the reaction upon them of this attitude in men. Naturally the effect upon a woman is just as unfavorable if the man comes to her without his full potency as if, after overestimating her in the early stages of falling in love, he then, having successfully possessed himself of her, sets her at naught. Women show little need to degrade the sexual object; no doubt this has some connection with the circumstance that they develop little of the sexual overestimation natural to men. The long abstinence from sexuality to which they are forced and the lingering of their sensuality in fantasy have in them, however, another important consequence. It is often not possible for them later on to undo the connection thus formed in their minds between sensual activities and something forbidden, and they turn out to be psychically impotent, i.e. frigid, when at last such activities do become permissible."

So what is the answer? Once again, Freud is pessimistic that there really is any good answer, and instead fears an impasse.

"The injurious results of the deprivation of sexual enjoyment at the beginning manifest themselves in lack of full satisfaction when sexual desire is later given free rein in marriage. But, on the other hand, unrestrained sexual liberty from the beginning leads to no better result. It is easy to show that the value the mind sets on erotic needs instantly sinks as soon as satisfaction becomes readily available. Some obstacle is necessary to swell the tide of the libido to its height; and at all periods of history, wherever natural barriers in the way of satisfaction have not sufficed, mankind has erected conventional ones in order to be able to enjoy love. This is true both of individuals and of nations. In times during which no obstacles to sexual satisfaction existed, such as, may be, during the decline of the civilizations of antiquity, love became worthless, life became empty, and strong reaction-formations were necessary

before the indispensable emotional value of love could be recovered. In this context it may be stated that the ascetic tendency of Christianity had the effect of raising the psychical value of love in a way that heathen antiquity could never achieve ..."

The sense of an impasse regarding the problem posed by sexuality is brought out more forcefully still in a paragraph near the end, which nevertheless sounds a hopeful note of another sort.

"So perhaps we must make up our minds to the idea that altogether it is not possible for the claims of the sexual instinct to be reconciled with the demands of culture, that in consequence of his cultural development renunciation and suffering, as well as the danger of his extinction at some far future time, are not to be eluded by the race of man. ... This very incapacity in the sexual instinct to yield full satisfaction as soon as it submits to the first demands of culture becomes the source, however, of the grandest cultural achievements, which are brought to birth by ever greater sublimation of the components of the sexual instinct. For what motive would induce man to put his sexual energy to other uses if by any disposal of it he could obtain fully satisfying pleasure? He would never let go of this pleasure and would make no further progress. It seems, therefore, that the irreconcilable antagonism between the demands of the two instincts—the sexual and the egoistic—have made man capable of ever greater achievements, though, it is true, under the continual menace of danger, such as that of the neuroses to which at the present time the weaker are succumbing."

Freud here appears to be saying that, unless there were a perception of something "wrong" about sex, unless people were uncomfortable with it in some way, it would so dominate human activity that civilization and human progress might not happen at all. We would instead perhaps remain at an animal level indefinitely. At the same time, though, some suffer considerably from the difficulties of a drive whose satisfaction poses such problems.

Freud, we note, had an appreciation of the magnificence of cultural achievements which civilization had produced, and was not about to denounce these in the face of the devil's bargain he saw in their realization, of the challenge to sexuality. Freud, on the other hand, was a person of his times (dying at 83 in 1939) and does

not appear to have taken seriously the idea that our culture and civilization might eventually lead to a complete remodeling of our physical makeup. If he had, then perhaps he would have viewed sexuality in a different light, as something not so fundamental or immutable psychologically, and also not so necessary, inasmuch as the critical urgency of reproduction will hopefully be alleviated by our progress in the life sciences.

In any case, we turn now to someone who was highly sensitized to the potential of humanity to progress beyond its present level. Robert Ettinger not only advocated cryonics for those dying today, but also authored much speculation about how we might live in the future, including the chapter of his book, *Man into Superman*, dealing with sexual matters.

### ROBERT ETTINGER: TRANSEX AND SUPERSEX<sup>3</sup>



Robert Ettinger

Ettinger starts off his chapter on sexuality with one possible if graphic scenario for the future:

“The sexual superwoman may be riddled with cleverly designed orifices of various kinds, something like a wriggly Swiss cheese, but shapelier and more fragrant; and her supermate may sprout assorted protuberances, so that they intertwine and roll all over each other in a million permutations of The Act, tireless as hydraulic pumps.”

In case this is too vulgar, he offers an alternative:

“[T]hose who choose [instead a] spiritual expression of supersex may not touch each other at all, except with tender tendrils of the mind. Each could represent the distilled essence of feminine or masculine personality, and quiver with exquisite joy

in an exchange of precisely the right word or glance, and after every such thrilling encounter retire for decades to analyze and relish it in prose, poetry, song, drama and fingerpaints before readying for the next.”

As for whether these two scenarios are too “far out,” he says: “No—the sober probability is that the above examples are too conservative: supersex could, and likely will, be much stranger.” He wishes, however, to “consider the null possibility” before “exploring the more zestful options.”

Arguments for the abandonment of sex take three forms.

1. It will be unnecessary. We already have artificial insemination for instance. In the future we will have more, such as artificial wombs and cloning or other replicative techniques. Plus, after radical life extension interest in making new people should substantially diminish.
2. Many people today get along fine with little in the way of interest in sex: children, nuns, many oldsters, for example.
3. We may just outgrow sex, go on to other activities very far removed from it that better suit our natures. As Ettinger colorfully puts it: “The ultra-fastidious may tell us that the future holds no place for lusty, grunty, bawdy, raunchy, leering, snorting, panting people, and instead our desexed superman will find much higher and purer delights in adventures of the intellect, beside which the squalid slaverings of sex will be disagreeable at best.”

“And yet,” Ettinger adds, “all this is unconvincing for many reasons, one of which constructs an analogy between the appetite for sex and the appetite for food.” There are many crudities in primitive cultures with regard to eating, he notes, yet still it is practiced at refined levels in more advanced societies. And so it will be with sex in the future.

This would not rule out the possibility that both, while retained in some form, would sink to minor importance, like bathing we might say is today. “Ah yes, he counters, “but you and I know, with our fifty thousand years of hindsight, that eating is not so trivial, nor bathing

either. For one thing, the immense variety and delicious taste of modern foods were unforeseen in troglodytic times, and the temptation to gluttony unappreciated. Primitive peoples today—such as the aborigines of the Kalahari Desert—are almost uniformly skinny, even when there is no scarcity, simply because the food is bad. A piece of tough or halfrotten meat, raw or badly cooked, a few staple roots boiled or pounded to a watery paste—these are eaten only by the hungry. A strawberry shortcake, on the other hand, is eaten because it is there. (Despite the proverb, hunger is not always the best sauce.) And of course the greatest invention of modern times is that which allows us to eat *and* work—the businessman’s lunch.”

So is the future of sex to be a kind of “naked lunch,” as Ettinger suggests?

“Other things may be more important, and people may not often *concentrate* on sex, nor devote much time to it exclusively, yet it could remain a very pleasant byplay. ... [It could] develop undertones and overtones, ramifications and extensions, intensifications and innovations such as we can scarcely guess, and in the far reaches of space and time we are likely to try just about everything.”

One point that is emphasized: the family “can be expected to persist.” Much of what Ettinger envisions in relation to sex is seen in this context, of an interaction between oneself and a significant other, as part of a loving relationship. (He also imagines children will still be important, though I don’t see much discussion of difficulties such as the possibility of overpopulation when lifespan has been radically extended and people are still producing offspring in quantity. The production of offspring, of course, will not necessarily happen as it does today, just happen somehow.) The types of relationships may vary considerably; various forms of multiple partnerships involving both genders are explored. These, of course, will be options some may be interested in and will be able to choose accordingly. Yet there will be a place for more traditional unions, only there too with a new twist or two; your partner may shape-change from time to time and so may you, et cetera.

In all it appears that Ettinger, while recognizing the possible negatives some may feel toward sexuality, is not so bothered by them as Freud in his essay above. Perhaps in part it is because Ettinger

is serious about the prospect of a radical transformation of life, including human physiology, through future technology. And, since his speculations concern the future not the present, a certain lightness is understandable. We turn now to two other explorations of the future of sex, one effusive, the other reserved.

### JAMES SWAYZE: JOY OF SEX FOREVER<sup>4</sup>



James Swayze

In a nutshell, Swayze sees much good and little if any bad in what we call sex, assuming consenting adults, and particularly as it might extrapolate to the future. Here I quote from the opening paragraphs of his essay:

“Will there be sex in heaven? When I was young I would often ask that question of those who would admonish me to mind my P’s and Q’s, not be so worldly—especially with women—and please take an interest in church. We in the Physical Immortality movement often refer to the future as being a sort of “techno heaven.” In that future, we hope, we can have all we want or desire just short of harming others or stepping on their reasonable rights—and I do most certainly mean *all*.

“Still, some in our movement would have us believe that future immortal beings will have better things to do than grunt and grind to form the two backed beast. I say maybe so, but why give up a good thing just because something else really good or even better comes along? I grudgingly use the term ‘better’ because I don’t think there is anything that could ever compare to sex... how could one judge anything else as better? ... When I asked that youthful question about heaven I felt I was already immortal, as most teens do, and all I wanted then was to stay in a state of constant ecstasy. Little has changed really in the decades since, if I could have my every secret wish. I also have

it on good authority that ‘what everyone wants is to get sex and live forever!’ The implication is to be able to do so (get sex, that is) constantly and for that to last forever. No doubt that might be possible but I do relent that we will become more enlightened than we presently are, and wish to spend some of our abundant free time in the pursuit of a great many worthy works and creations. This is not to suggest that sex is not itself enlightened. I happen to believe it can be quite transcendent, just ask any tantric sex practitioner. Sex has also played a vital role in many religions throughout history exactly for its transcendent, altered-state producing qualities.

“In fact, if anything, I believe sex will continue to become even more transcendent, even more abundant and more freely shared. It will become totally safe, fertility under complete control, more open and free of stigma of every current variety and, best of all, seen by all to be the necessary, healthy part of every adult life that it truly is. These are some far-reaching claims I admit. Can I back them up? I believe I can and will do so presently. I will also make an effort not to interject any personal wishes for what I would like to see in the future. Instead I will attempt to follow a logical progression from the past through the present to the future observing carefully the trend lines of particular issues while also extrapolating to what might happen if projected technologies have the effects we desire.”

From this starting point Swayze makes the case for a future advanced enough that problems like unwanted fertility and sexually transmitted diseases will be historical curiosities only, with options for interpersonal interactions well beyond those of today. A few more paragraphs capture some interesting thoughts.

“How might immortality and transcendent understanding affect our personal love relationships? Would we continue to be monogamous, even serially? Come to think of it, are we even now truly monogamous? Many sexuality researchers say no. Human semen for example has ‘killer’ sperm whose purpose seems to be not fertilization but preventing the action of foreign sperm, implying the competition of rival partners of one female; females too have mechanisms corroborating this multiple partnering. (In fact this is reminiscent of our close evolutionary cousins, the bonobo

chimps.) The ‘seven year itch’ of close bonding between childbearing couples appears to be more like four years, about what human hunter-gatherer females would need for protection during a vulnerable pregnancy and the toddler stage of the resulting offspring. So what happened to saddle us with an unnatural monogamy? The emergence, as it appears, of a male-dominated societal structure, enforced by religion, with a dependence on male genetic fidelity for property inheritance—this is one theory anyway. But if we aren’t really monogamous how might extreme longevity lead to changes in our love relationships?

“Imagine wedding vows a century from now. Would we still say, ‘till death do us part,’ if death has been banished? Would we try to maintain a relationship with only one person for a lifetime of more than 200 years or more than 20,000? In such a future we need not fear the physical passing of a partner and would be more enlightened about relationships. Jealousy then must hold less sway. After 300 years together, one spouse might reasonably say to the other, ‘honey, I love you so very much but I’m going on a walk-about, I’ll see you in about century so have fun and don’t be shy my pet, enjoy yourself.’ I truly believe the future of human social relationships will be polyamorous. We’ll be free to love many and love relationships will not necessarily be sexual.

“What should be said now about sexual augmentation, that is to say, going beyond things as they naturally evolved, even when ‘optimized’? Here I’ll leave most of the details to the human imagination, which is after all the most powerful creative force we know of. Just one clue though: think about our inventiveness where sex toys are concerned and take note of their evolution from ancient times. What might we do with nano and genetic technology applied to the real things? Okay, a few more clues. I can envision maybe more nerve endings in strategic places. Add in some real or artificial muscles. Anything is possible, so let your own ‘most powerful creative force’ take you on a journey of possibilities. We are inventive and we haven’t limited it where sex is concerned. I feel this focus on animal indulgences will continue in the future so that all will have the option of enhanced pleasure and enjoyment.

“With our new transcendent, enlightened state, would we not have transcendent



views of sexuality? How could we not? I truly believe that with greater and uniform understanding of science, evolution, and social interaction, archaic and damaging attitudes toward the range of human sexuality, some of which today are spiteful, hateful, and discriminating, will fall by the wayside like the proverbial scales from the eyes. We'll finally have permission to love freely and openly without recrimination for how and whom we choose to love. I'll give just one rather eye opening 'for instance.' Nanotech, with all it should have to offer, should permit an easy transition to the opposite gender. How might attitudes toward the range of human sexuality be affected when one could choose gender as readily as which coat to wear? Eventually, of course, gender will become meaningless.

"How might sexuality be viewed by beings so far removed from our current state that they should be considered posthuman rather than anything we would reasonably call human or even transhuman? They may well have the intellect and powers we attribute to gods. Some immortalists view such an exalted condition as no longer needing the barbaric and animalistic stimulation of 'sex' (whatever form it would take). In line with this topic I will now return to the question raised earlier, of whether extreme longevity *alone* would diminish our appetite for sex. In other words, would a loss of this interest follow inevitably from the extra years, centuries, and eons of life, assuming a reasonable developmental process? Some futuristic visionaries speculate on what is seen as the inevitable evolution of former humans into vast machine intelligences, basically, planet-sized brains drifting through space. Partly they would be engaged in discovering whatever the universe has to offer, and partly they would be living a virtual reality existence within their own minds. They would be physically solitary but perhaps exchange information with fellow beings over vast distances and, of course, spans of time. But within their virtual landscapes perhaps they could be living in any period of history real or imagined. Will such entities feel the need to engage in sex within such virtual space? I'm not sure anyone can dream that far ahead and guess with confidence what would be found useful for passing the time—if such beings will evolve anyway. However, I can dream far enough ahead to consider life for humanity

or transhumanity maybe fifty years hence. Beyond that my forecasting is admittedly less certain, though I have aimed for what seemed reasonable."

In any case, in the far future we may be so advanced that concepts like sex as we understand it today will have little significance, but some things must linger in some reasonable form, such as, we hope, ourselves, and I'll also say, caring about each other. So now we go on to the last of our main sources.

### **R. MICHAEL PERRY: JOY FOREVER WITHOUT SEX<sup>5</sup>**

Whaaaat? Life without sex? And in a long future when we can maybe have pretty much anything we want??? Well, I hope the critics of this position will at least continue to read and hear me out. We've noted that Freud had some misgivings about sex, one of them that if people didn't have some inhibitions they might be doing it so much that no civilization or progress would have happened, or at least not on the scale that actually has happened (which is leading, we hope, to something far greater and better still). And Ettinger spent some effort on the idea of abandoning sex, though it's clear his sentiments weren't dominant in that direction. So anyway, here we consider my companion piece to the Swayze article above, on why we, or some of us, might really want to give it up despite (or because of) the attractions it might have. At the start, I ask, like Swayze, Will there be sex in heaven?

"The question is well-known in certain religious traditions (Christianity in particular) and has various answers, a common answer being, more or less, *no*—because people will 'live as angels,'<sup>6</sup> who are immortal, spiritual beings at some remove from such worldly concerns as the human reproductive act. The implication here is that there is something lowly, impure, or 'animal' about sex that would not be suited to eternal life in paradise."

Today, of course, many thoughtful people doubt the existence of angels and other supernatural beings or heavenly domains. But a modern interpretation is possible in which future progress may be able to greatly extend human longevity and otherwise provide a world that somewhat resembles traditional concepts of paradise. We can then raise the question about sex along something like its traditional lines,

with the answer that it will be abandoned by future, advanced beings for one reason or another. Along with giving up sex would be an abandonment of other present-day interests such as pair-bonding. Love focused on a spouse or paramour would instead give way to a more universal, less narrowly focused but still deep and true love of fellow beings; agape would win out over eros. But unlike some traditions would have it, the changes would all be voluntary, dictated by individual conscience and reason, and not imposed by "house rules" or an Overseer's fiat.

More generally, in the future there should be many options for lifestyle choices. You might elect quickly to make radical changes in your physical makeup, or stay an extended time more-or-less as nature made you. If the latter is your choice, many human pursuits such as sex and erotic love might continue or perhaps intensify. (Certain others relating to aggression and dominance, if initially prominent, would hopefully diminish.) Alternatively, you might make changes in your constitution so that, over a period of time, many human pursuits would be outgrown and superseded entirely. Ending mortality, however, would bring great changes overall, and some of these would impinge on sexuality, since its function in continuing the species through reproduction would no longer be a priority.

"Sexuality, to the extent and in the forms that it survives, will serve purely psychological purposes: pleasure, bonding, intimacy, and so on. Essentially, however, these effects are selection-driven and their main importance up to now has been, again, in the making and raising of offspring. With the needs and pressures greatly diminished in this area, we can expect some profound changes in what we might regard as sexual behavior.

"Thus the question arises of what should 'sex' mean anyway, for an advanced future when many people may no longer be as nature made them, but enhanced posthumans. (Others may be created as posthumans thus not originally 'natural' at all.) It would be easy enough to simply say that this is unknown territory and leave it at that, but I think something more can and should be said, based on characteristics commonly associated with sexual experience in our world today. Many have offered observations on this subject; the paragraph I quote here is, as it happens,

by an early cryonics supporter, Dr. Dante Brunol, a biophysicist who was present at the freezing of James Bedford in January 1967, [generally considered the first true cryonics preservation.]

“It is my belief that there is a feeling of great ecstasy whenever the real ego is free from electrical impulses—a constant experiencing of pleasure similar to the height of sexual orgasm. During this time we lose all sense of self—we do not know our name or what we were or what we will become. Many people take chemicals such as LSD in order to reach for a similar state of consciousness. Eastern mystics practice exotic rituals in attempts to reach this kind of sublime happiness.”<sup>7</sup>

“It is worth pointing out that this ‘sublime happiness’ in which ‘we lose all sense of self’ is held forth as an ideal by some (Eastern mystics for instance). That ‘we do not know our name or what we were’ strongly suggests an incapacitating state, at least while it lasts. This I will assume at any rate, and it seems reasonable to do so. It is fair to ask whether such a condition, which I have elsewhere called hedonic stasis,<sup>8</sup> would be a desirable goal for a future existence. We might imagine, for example, that with the help of future technology such a state could be sustained for a considerable time, perhaps indefinitely.

“But I think we must be firmly discount the view that an unending, pleasurable paralysis would be a goal to aim for or a desirable outcome. One argument against this idea would be that unless there is significant and varied mental activity, including storage and eventual recall of memories, if instead, ‘we do not know ... what we were,’ there is no continuing awareness of time. Subjectively, one’s total experience is finite even if ecstatic. There is no true immortality but at best only an Eternal Return, in which the same, limited mental states and perceptions are experienced repeatedly. And, with time effectively limited, there would also be a limit to enjoyment, however intense it might be. In addition there would be the practical problem that such a state would be incapacitating, as we are assuming, so the participant would need outside help maintaining it. Others in turn would not be enthusiastic—what interest would they have in sustaining such a mental vegetable? Automation might seem to offer a possibility, but an automated support system, I should

think, would have limited adaptability, resourcefulness, and dedication—unless you made it sentient too, thus eventually again prone to disinterest and frustration, if not considerable resentment. So the best future life would, I think, involve both continuing mental development and self-sufficiency. Such a life could still contain a great deal of satisfaction, but it would also have more meaning.

“The foregoing critique applies to a (hypothetical) *unending* condition of hedonic stasis. Temporary experiences of this sort (which may be the only versions possible) should offer less difficulty, yet still I find this whole concept problematic. To seek such a state in the first place implies at least a desire to effectively end what we think of as the self since we are to ‘lose all sense of self.’ Once the pleasurable state is reached, moreover, there does not appear to be a serious wish to reverse it and restore the knowledge of one’s identity; it simply happens as the process runs its course. The whole process, then, has a divisive character in which one limited element of the personality seeks annihilation of the rest—it alone must operate, at least until order is restored by forces beyond its control. To me this is very unappealing. I would much prefer my life’s experiences be more coherent and not involve a willful attempt to obliterate the self, even if I know in advance that it will not succeed, and irrespective of how much pleasure may be had thereby. Let there be pleasure, even in great abundance, but not so divisive. This consideration clearly extends to sex as we understand it today; it too is one of the ‘hedonic’ variety of experiences, as the quote brings out forcefully. For me, then, it is to be avoided on grounds of being self-negating and divisive. I am not alone in thinking this way, of course, and we of this mindset have freely chosen sexual abstinence as a preferred lifestyle.”

It is interesting that sexual abstinence is as popular as it is today (being found in cultures worldwide) given its negating effect on reproduction. If everybody practiced it the species would die out yet the species supports a significant minority who do. As for “future sex” itself there is some doubt as to what it may become if we advance far beyond the present level of the biological species we are. To my thinking an experience, to qualify as “sexual,” must in some measure retain the hedonic,

self-negating character, and thus remain objectionable for the reasons I’ve stated. In the future, when the selection pressure that forged the sex drive is no longer operative, I think many will seriously consider whether primitive sexual impulses are really appropriate for the world of radical life extension in which they now find themselves.

“My guess is that divisive, self-negating, incapacitating experiences of whatever sort will give way by voluntary choice to those that are better integrated and more supportive of the total personality. There will be little if any sense of sacrifice in fulfillment or enjoyment in the changeover, but more likely even a heightening of overall satisfaction. Carefully handled, I also think that great adaptations will be possible without a sense of sacrificing one’s identity or negating previous versions of the self. Joy, love, and a sense of overall caring, healing, and benefiting will abound in all this, and ... will carry the day.

“Other adaptations will also follow from the sorts of pressures that are present and absent in the future world, including the all-important impulse to serve enlightened self-interest, informed by wisdom beyond our present level. There will be less pressure for pair bonding since offspring will no longer have the importance they do now. Thus we may expect a decline in relationships of the erotic sort, with their complications of jealousy, partiality, and dependence. A pure and serene, but no less intense, love of fellow beings in general should instead take center stage. Such heightened agape would, I think, serve us well in the centuries and millennia to come, and on into eternity.”

On the other hand, many if not most people today are probably not ready to accept all the above arguments with their various implications, and no doubt will want to live more usual lifestyles for the time being, whatever may happen in a marvelous, more distant future.

## BRIEF AFTERWORD

There is another source, Saul Kent’s 1974 book, *Future Sex*,<sup>9</sup> which details various speculative scenarios, something of a takeoff on Ettinger’s chapter we’ve considered. The basic premise is that in the future sex will be decoupled from reproduction, leaving people free to indulge in whatever sexual pastimes they find to their liking—and as

a consequence they will indeed be creative and dedicated in these pursuits, with whatever assistance advanced technology might offer. There was a hostile review of this book in the *Berkeley Barb*,<sup>10</sup> a leading underground newspaper of the time. The reviewer raises the point that, given that advanced technology might permit the kind of escapades the book describes, it

does not follow that people will care about and pursue them with the ardent devotion that allegedly would follow. In other words, they might actually find better things to do.

In any case, a future with radical life extension should have many other radical changes in store. In time many of our present concerns and givens will become historical artifacts, yet we hope some things

will endure, such as our very selves, in some reasonable sense, and our caring about others besides just ourselves. But we will be matured far beyond our present level, old but ever young Wise Ones who will look back on present human life as a period of infancy. ■

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## BRIEF COMMENT BY ASCHWIN DE WOLF

Mike Perry writes that sexual abstinence remains a popular choice today but I think he neglects to discuss in more detail that for most people committed to this practice this usually constitutes a delay, not a permanent decision. It is not necessarily linked to negative views about sex. In fact, religious and secular lifestyles in which abstinence is a *lifelong* commitment appear to be on the decline, at least in the secular West.

We can concur that sex and reproduction have become increasingly decoupled but I think it would be hard to argue that this phenomenon has gone at the expense of the former. If anything, this decoupling has made (secular) society actually more "sex-positive." For many people, sex now has "intrinsic

value" to use a popular philosophical phrase.

Is it possible that humans will evolve in such a manner that they will come to see sex as redundant, or even an obstacle to true human enhancement? This is possible but Robert Ettinger and Saul Kent give us plausible reasons to believe that sex will be subject to the same kinds of enhancements and refinements that we observe in other "primitive" features of life such as eating, drinking, or (competitive) physical activity.

At a more abstract level, it appears to me that thoughts about the future of sex are intrinsically linked to ideas about identity and consciousness in a "post-human" future. The challenge here is that sex has been as much associated with concepts like individualism and exclusiveness as it has

been associated with the loss of self and unity. This does make it rather problematic to link the nature of sex (if there is even such a uniform meaning) and the direction of human evolution. To further complicate matters, if evolution will be increasingly the object of choice instead of the outcome of natural selection, we may even have to abandon the idea of a common, "correct" future altogether.

At this stage it seems rather evident to me, however, that people who consider themselves secular, and supportive of the transformative nature of human technology, are not in a hurry to abandon sex, let alone to see it as a primitive left-over that needs to be overcome for a more civilised society to be possible. ■



# The Meaning of Life for Me

## Owen C. Middleton

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*In 1930 the historian and philosopher Will Durant received a number of letters from unhappy correspondents declaring a wish to commit suicide and asking for reasons to go on living. Durant responded by asking a number of luminaries for their views on the meaning of life. His 1931 letter reads in part: "Spare me a moment to tell me what meaning life has for you, what keeps you going, what help — if any — religion gives you, what are the sources of your inspiration and your energy, what is the goal or motive-force of your toil, where you find your consolations and your happiness, where, in the last resort, your treasure lies." The responses were collected into a book which was published in 1932. The publishers also sent the letter to Middleton, then an inmate at Sing Sing State Prison, New York. As On the Meaning of Life was about to go to press Durant received an eloquent response from Middleton; this was included in an appendix in the book and is reprinted here. Middleton's essay refers to the "eminent author and philosopher" Durant and the "equally eminent publisher" of the book Ray Long & Richard Smith, Inc. (Actually, though Durant was eminent enough the publisher was quite obscure and is no longer extant.) I've supplied a title to the untitled original—R.M.P.*

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An eminent author and philosopher seeks an answer to that age-old question: What is the meaning or worth of human life? An equally eminent publisher asked me how I manage to bear it in my present position.

To the philosopher, I — a man serving a life term behind prison walls — answer that the meaning life has for me depends upon, and is only limited by, my ability to recognize its great truths and to learn and profit by the lessons they teach me. In short, life is worth just what I am willing to strive to make it worth.

To the publisher, I say that life, even from within prison walls, can be as intensely interesting, as vitally worthwhile as it is to any man on the outside. It all depends upon the faith one has in the soundness of his philosophy.

My philosophy of life is a homely one, compounded of many simple beliefs of which truth is the guiding star. Upon my ability to see life in its true aspect, I depend for that mental equilibrium without which I find myself drifting in a welter of conjecture and contradictory speculation.

"We are driven to conclude," argues the philosopher, "that the greatest mistake in

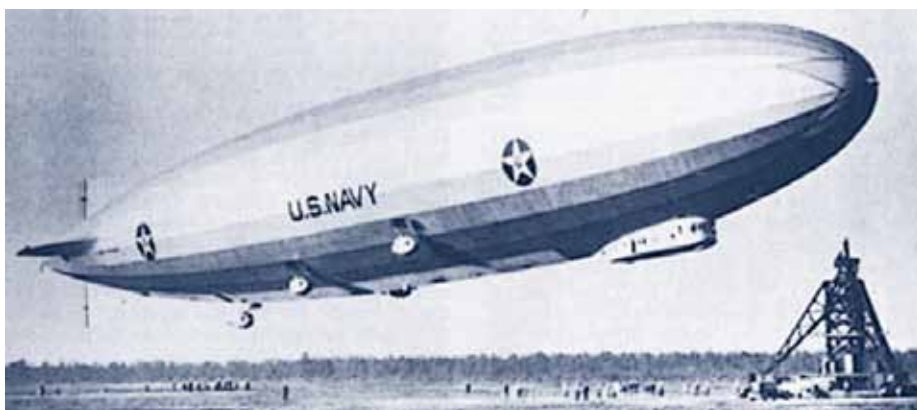
human history was the discovery of truth. It has not made us happy, for it is not beautiful. It has not made us free, except from delusions that comforted us and restraints that preserved us. It has taken from us every reason for existence except the moment's pleasure and tomorrow's trivial hope." If our happiness and our reason for existence depended upon our inherent tendency to seek comfort in delusions, false tradition and superstition, then I could agree. We should be unhappy, when truth deprived us of their questionable consolation, but they do not.

Truth is not beautiful, neither is it ugly. Why should it be either? Truth is truth, just as figures are figures. When a man wishes to learn the exact condition of his business affairs, he employs figures and, if these figures reveal a sad state of his affairs, he doesn't condemn them and say that they are unlovely and accuse them of having disillusioned him. Why, then, condemn truth, when it only serves him in this enterprise of life as figures serve him in his commercial enterprises? That idol worshipping strain in our natures has visioned a figure of Truth draped in royal raiment and, when truth in its humble

form, sans drapery, appears to us, we cry, "Disillusionment."

Custom and tradition have caused us to confuse truth with our beliefs. Custom, tradition and our mode of living have led us to believe we cannot be happy, save under certain physical conditions possessed of certain material comforts. This is not truth, it is belief. Truth tells us that happiness is a state of mental contentment. Contentment can be found on a desert island, in a little town, or the tenements of a large city. It can be found in the palaces of the rich or the hovels of the poor.

Confinement in prison doesn't cause unhappiness, else all those who are free would be happy. Poverty doesn't cause it, else the rich all would be happy. Those who live and die in one small town are often as happy, or happier than many who spend their entire lives in travel. I once knew an aged Negro who could not tell the meaning of one letter from that of another, yet he was happier than the college professor for whom he worked. Hindus are happy, so are the Chinese, the Africans, the Spaniards, and the Turks. The North, the South, the East and the West all contain happy persons. There are celebrities who are



The airship Los Angeles 23 Jun. 1932 (Source: <http://www.comicbookbrain.com/archive020.php>, accessed 5 Nov. 2016.)

happy, and there are many happy people living obscure lives. Happiness is neither racial, nor financial, nor social, neither is it geographical. What, then, can it be, and from what deep well does it spring?

Reason tells us that it is a form of mental contentment and — if this be true — its logical abode must be within the mind. The mind, so we are told, is capable of rising above matter. Can we be wrong then in assuming that mental contentment may be achieved under any condition, even in prison?

There are some who would have us believe that thought, discovery and invention have revealed life as a rather hopeless venture, and mankind a helpless pawn doomed to go down to defeat and oblivion, and from this gloomy prospect man turns and exclaims, “What’s the use?”

Natural history teaches us that in the great scheme of evolution, which is the only true and not comparative progress, certain forms of life, unable to adjust themselves to evolutionary changes, have been entirely blotted out. These were devoid of that constructive instinct we call “invention.” Life is in a constant state of change, and the development of thought and invention enables us to adjust ourselves to these changes. In fact our very fitness, our only hope of survival, depends upon the fertility of our inventiveness.

The prehistoric fish, when it developed legs with which to climb from its then native habitat or element, was as much of an inventor as were the Wright brothers. T. S. Eliot draws us a very convincing picture of a chaotic world in *The Waste Land*, but I dare to question the premise upon which he paints his picture. Science, discovery, thought and deduction all tell me that the

world is a living symbol of orderliness, that evolution is blind only according to man’s standards of blindness, that chaos exists only in the minds of men. Reason will not permit me to see life in any other aspect. To me, life is like a river, moving ever forward. There are eddies and crosscurrents, but the main stream sweeps onward.

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*“Those who decry the machine age as heralding the decadence of the race, do not stop to consider that manual labor is not a natural but an acquired habit of man.”*

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Life cannot retrogress, neither can man. He is an integral part of the universe in which he lives, that universe which is ever moving forward to some appointed destiny. That life was accidental is a theory I am willing to accept but it doesn’t follow that it need be meaningless. Any man who has thought deeply enough to arrive at the conclusion that life is without meaning must surely be an intelligent man. Intelligent persons do not do meaningless things, yet these exponents of this doctrine continue to live. I am forced to conclude from this that they do not feel entirely in sympathy with their doctrine. Each time I pick up a newspaper and read of some man committing suicide, I say, “There was a man who truly believed that life was without meaning.”

Those who decry the machine age as heralding the decadence of the race, do not stop to consider that manual labor is not

a natural but an acquired habit of man. It was a crude means by which primitive man sought to adjust himself, sought to survive, a method for accomplishing those tasks and overcoming those obstacles which life presents. The machine is simply a quicker, more efficient means to the same end: Man’s struggle to keep abreast, to survive. Just as man has changed his mode of living, so must he change his thoughts, his habits, and perhaps even his form. Back in the dim eons of time man has made several physical changes, why not in the far-distant future toward which we are traveling? Up from the deeps of the sea to the shallows came life, up from the shallows to the land.

This evening I stood in the prison yard amid other prisoners, with eyes lifted aloft, gazing at that great, beautiful sight, the airship *Los Angeles* as it sailed majestically over our heads. Into my mind came the thought that, just as that prehistoric creature struggled up out of the sea to the land, so is man struggling up from the land into the air. Who dare deny that, some day, up, ever up he will struggle through the great reaches of interstellar space to wrest from it the knowledge which will enable him to lift his life to a plane as high above this, our present one, as it is above that of prehistoric man?

I do not know to what great end Destiny leads us, nor do I care very much. Long before that end, I shall have played my part, spoken my lines, and passed on. How I play that part is all that concerns me. In the knowledge that I am an inalienable part of this great, wonderful, upward movement called life, and that nothing, neither pestilence, nor physical affliction, nor depression — nor prison — can take away from me my part, lies my consolation, my inspiration, and my treasure. ■

#### TEXT SOURCES

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# Who Was Owen C. Middleton?

By R. Michael Perry

Owen C. Middleton was reportedly serving a life sentence at the Sing Sing State Prison in Ossining, New York when he wrote his moving essay on the meaning of life for Will Durant's 1932 book on this topic. Online information about Middleton is scarce, but a brief biography can be pieced together from public sources.<sup>1</sup> It appears his career in crime started early and continued until he was in his thirties and became a "lifer." The crimes seem to be limited to armed robbery and similar, nonlethal acts, the long sentence resulting from repetition of the offenses rather than something worse. Apparently while at Sing Sing he became rehabilitated and was eventually released, living out the rest of his life a free man. There are some inconsistencies in the records regarding dates and places of earlier events; the following seems mostly correct with possible minor errors.

Owen Charles Middleton was born March 3, 1888 in Charleston, South Carolina, to African-American parents Jonas<sup>2</sup> C. and Elizabeth L. Middleton. The parents had previously lived in Ohio where an older brother, Oscar I., was born; a second brother, Ralph J., was born in South Carolina after Owen, and the family then returned to Ohio where a sister, Edith M., was born. The 1910 Federal Census that reports most of this information also peculiarly counts the 22-year-old Owen in two different locations. One is in Cleveland, Ohio where he is listed as living with his parents and siblings,<sup>3</sup> a laborer doing "odd jobs." The other is at the Ohio State Reformatory in Madison where he is a prisoner and clerk in the Railroad Office, said to have attended school within the year.<sup>4</sup> A newspaper report in July that year notes that Middleton has been granted parole from the reformatory, effective

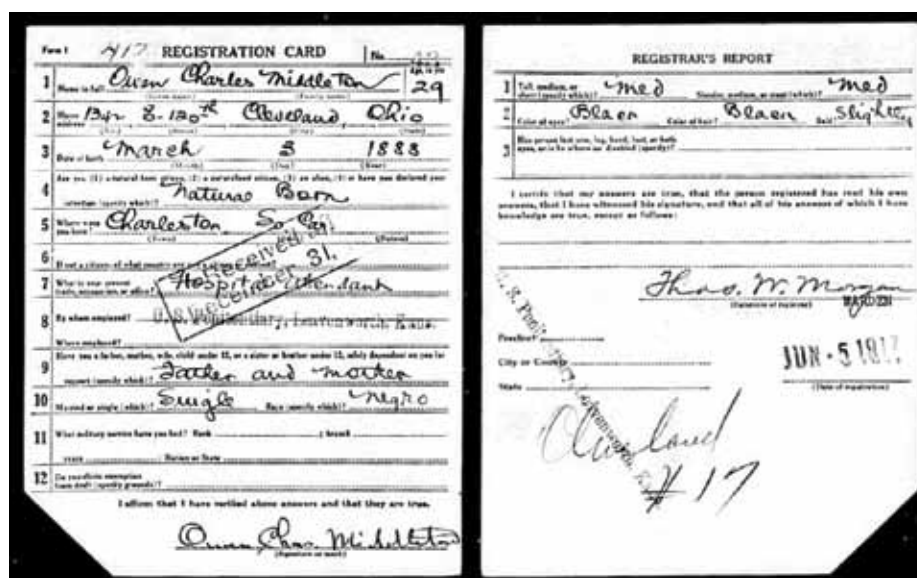
October 1.<sup>5</sup> The next source I find is a World War I draft registration card dated Jun. 5, 1917, place of employment and issuance of the card: "U. S. Penitentiary, Leavenworth, Kans." In this record the 29-year-old Owen is single, has home address in Cleveland, Ohio, and is supporting both parents. His present trade or occupation is "hospital attendant." It is not stated (or denied) that he is a prisoner himself.<sup>6</sup>

day, and assigned number 79206. The charge was 3<sup>rd</sup> degree robbery with use of a pistol. Under "previous criminal history" is a record of seven earlier incarcerations, with discharge dates ranging as far back as 1909. (This part of the record is partly censored and only the discharge dates are showing.) The length of the latest sentence was 15 years with eligibility for parole in March 1939, about 12½ years hence.

*"Owen C. Middleton was reportedly serving a life sentence at the Sing Sing State Prison in Ossining, New York when he wrote his moving essay on the meaning of life for Will Durant's 1932 book on this topic."*

The next mention I find is from the Sing Sing Prison Admission registers.<sup>7</sup> Owen C. Middleton was received at the prison Nov. 19, 1926, after sentencing the previous

In his criminal career he had used aliases Harry Coleman and Edward Lowell. On the "civilian" side Middleton's occupation is "furniture designer" at a salary of \$60/



*Middleton's 1917 draft registration card, front and back. The cut lower corner indicates a person of African descent.<sup>15</sup>*



week (equivalent to about \$820 in 2016<sup>8</sup>). At the time of arrest he was living at 201 W. 144<sup>th</sup> Street, NYC, and supported his mother and his wife, Lillian. His education included high school plus two years at “Case School” which could be Case School of Applied Science (now Case School of Engineering) in Cleveland.<sup>9</sup> His religion is listed as Catholic though his last regular church attendance was 3 years before. What motivated the latest crime? “Worry and sickness,” says the record.

The 1930 Census shows Middleton a prisoner at Sing Sing with the occupation of porter at a new prison building.<sup>10</sup> Shortly thereafter, in Durant’s 1932 book, *On the Meaning of Life*, he was reportedly serving a life sentence at the prison as a fourth offender.<sup>11</sup> (Perhaps the “life sentence” was really the 15-year sentence a trifle exaggerated. Or did Middleton commit some other offense for which an additional sentence was levied?) In penning the eloquent essay that was included in this volume, was Middleton also doing some major rethinking about his life and what he should be doing with it? In any case the next mention I find of him is on a World War II draft registration card dated 27 April 1942.<sup>12</sup> Middleton is apparently free again and is living at 9 Mt. Morris Park, NYC. (His birth date of 3 Mar. 1888 agrees with earlier records but place of birth is given as Cleveland, OH rather than Charleston, SC, likely not a different person.) I find him again on a ship’s passenger list (*S. S. Ganymede*) dated 8 Aug. 1952, traveling from New York, NY to Port Au Prince, Haiti, with Mary Middleton, presumably his wife (they lived at the same Brooklyn address), trip to last 30 days.<sup>13</sup> Finally in 1954 the then 66-year-old Middleton made a “life claim” for retirement benefits under Social Security.<sup>14</sup> No doubt further information could be found in records, including (one would hope) many offline sources; a full biography would be interesting. ■

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4. United States Federal Census, Year: 1910; Census Place: *Madison, Richland, Ohio*; Roll: *T624\_1225*; Page: *5A*; Enumeration District: *0172*; FHL microfilm: *1375238*, Enumeration Date: *19 April*. Both 1910 Census sources agree on the name, “Owen C. Middleton,” age, race, birthplace in South Carolina and birthplace of father and mother in South Carolina and Kentucky, respectively.
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## Primates Regain Control of Paralyzed Limb

On June 23, 2015, a primate with spinal cord injury regained control of its paralyzed leg with the help of a neuroprosthetic system called the “brain-spine interface” that bypassed the lesion, restoring communication between the brain and the region of the spinal cord. The results are published today (Nov. 9, 2016) in *Nature*. The interface decodes brain activity associated with walking movements and relays this information to the spinal cord — below the injury — through electrodes that stimulate the neural pathways that activate leg muscles during natural locomotion. The neuroprosthetic interface was conceived at EPFL in Lausanne, Switzerland, and developed together with an international network of collaborators including Medtronic, Brown University and Fraunhofer ICT-IMM. It was tested in collaboration with the University of Bordeaux, Motac Neuroscience and the Lausanne University Hospital (CHUV). “This is the first time that neurotechnology restores locomotion in primates,” says neuroscientist Grégoire Courtine who led the collaboration.

EPFL News  
9 Nov. 2016

<http://actu.epfl.ch/news/primates-regain-control-of-paralyzed-limb/>

## Brains Have a Basic Algorithm that Enables Our Intelligence

Our brains have a basic algorithm that enables us to not just recognize a traditional Thanksgiving meal, but the intelligence to ponder the broader implications of a bountiful harvest as well as good family and friends. “A relatively simple mathematical logic underlies our complex brain computations,” said Dr. Joe Z. Tsien, neuroscientist at the Medical College of Georgia at Augusta University. Tsien is talking about his Theory of Connectivity, a fundamental principle for how our billions

of neurons assemble and align not just to acquire knowledge, but to generalize and draw conclusions from it. “Intelligence is really about dealing with uncertainty and infinite possibilities,” Tsien said. It appears to be enabled when a group of similar neurons form a variety of cliques to handle each basic task like recognizing food, shelter, friends and foes. Groups of cliques then cluster into functional connectivity motifs, or FCMs, to handle every possibility in each of these basics like extrapolating that rice is part of an important food group that might be a good side dish at your meaningful Thanksgiving gathering.

Toni Baker / Medical College of Georgia,  
Augusta University  
18 Nov. 2016

<http://jagwire.augusta.edu/archives/39066>

## Scientists Tissue Engineer Human Intestines and Functioning Nerves

Scientists report in *Nature Medicine* using human pluripotent stem cells to grow human intestinal tissues that have functioning nerves in a laboratory, and then using these to recreate and study a severe intestinal nerve disorder called Hirschsprung’s disease. Published online Nov. 21, the findings describe an unprecedented approach to engineer and study tissues in the intestine – the body’s largest immune organ, its food processor and main interface with the outside world. Study authors at Cincinnati Children’s Hospital Medical Center say the paper puts medical science a step closer to using human pluripotent stem cells (which can become any cell type in the body) for regenerative medicine and growing patient-specific human intestine for transplant. “One day this technology will allow us to grow a section of healthy intestine for transplant into a patient, but the ability to use it now to test and ask countless new questions will help human health to the greatest extent,” said Michael Helmrich, MD, co-lead

study investigator and surgical director of the Intestinal Rehabilitation Program at Cincinnati Children’s.

Cincinnati Children’s Hospital Newsroom  
21 Nov. 2016

<https://www.cincinnatichildrens.org/news/release/2016/hirschsprungs-intestinal-nerve-disorder>

## New Drug Limits and Then Repairs Brain Damage in Stroke

Researchers at The University of Manchester have discovered that a potential new drug reduces the number of brain cells destroyed by stroke and then helps to repair the damage. A reduction in blood flow to the brain caused by stroke is a major cause of death and disability, and there are few effective treatments. The potential new stroke drug works in rodents, not only by limiting the death of existing brain cells but also by promoting the birth of new neurons (so-called neurogenesis). The finding provides further support for the development of this anti-inflammatory drug, interleukin-1 receptor antagonist (IL-1Ra in short), as a new treatment for stroke. The drug is already licensed for use in humans for some conditions, including rheumatoid arthritis. Several early stage clinical trials in stroke with IL-1Ra have already been completed in Manchester, though it is not yet licensed for this condition. The research, led by Professor Stuart Allan, is published in the biomedical journal *Brain, Behavior and Immunity*. Allan comments that, while the results are promising, “further large trials are necessary.”

University of Manchester (UK) /  
EurekaAlert!  
25 Nov. 2016

[https://www.eurekaalert.org/pub\\_releases/2016-11/uom-ndl112516.php](https://www.eurekaalert.org/pub_releases/2016-11/uom-ndl112516.php)

## Construction of Practical Quantum Computers Radically Simplified

Professor Winfried Hensinger and his team at the University of Sussex have invented a ground-breaking new method that puts the construction of large-scale quantum computers within reach of current technology. Quantum computers could solve certain problems in just a few milliseconds that would take the fastest supercomputer millions of years. They have the potential to create new materials and medicines, as well as solve long-standing scientific and financial problems. Universal quantum computers can be built in principle — but the technology challenges are tremendous. Quantum computing on a small scale using trapped ions (charged atoms) is carried out by aligning individual laser beams onto individual ions with each ion forming a quantum bit. However, a large-scale quantum computer would need billions of quantum bits, therefore requiring billions of precisely aligned lasers, one for each ion.

Instead, scientists at Sussex have invented a simple method where voltages are applied to a quantum computer microchip (without having to align laser beams) — to the same effect.

University of Sussex  
28 Nov. 2016

<http://www.sussex.ac.uk/broadcast/read/38093>

## New Hopes of Tissue Regeneration in Humans

What if humans could regrow an amputated arm or leg, or completely restore nervous system function after a spinal cord injury? A new study of one of our closest invertebrate relatives, the acorn worm, reveals that this feat might one day be possible. Acorn worms burrow in the sand around coral reefs, but their ancestral relationship to chordates means they have a genetic makeup and body plan surprisingly similar to ours. A

study led by the University of Washington and published in the December issue of the journal *Developmental Dynamics* has shown that acorn worms can regrow every major body part — including the head, nervous system and internal organs — from nothing after being sliced in half. “We share thousands of genes with these animals, and we have many, if not all, of the same genes they are using to regenerate their body structures,” said lead author Shawn Luttrell, a UW biology doctoral student based at Friday Harbor Laboratories. “This could have implications for central nervous system regeneration in humans if we can figure out the mechanism the worms use to regenerate.”

Michelle Ma / University of Washington  
Office of News & Information  
28 Nov. 2016

<http://www.washington.edu/news/2016/11/28/our-closest-worm-kin-regrow-body-parts-raising-hopes-of-regeneration-in-humans/>

## A Roadmap to Revival

Successful revival of cryonics patients will require three distinct technologies: (1) A cure for the disease that put the patient in a critical condition prior to cryopreservation; (2) biological or mechanical cell repair technologies that can reverse any injury associated with the cryopreservation process and long-term care at low temperatures; (3) rejuvenation biotechnologies that restore the patient to good health prior to resuscitation. OR it will require some entirely new approach such as (1) mapping the ultrastructure of cryopreserved brain tissue using nanotechnology, and (2) using this information to deduce the original structure and repairing, replicating or simulating tissue or structure in some viable form so the person “comes back.”

The following list is a list of landmark papers and books that reflect ongoing progress towards the revival of cryonics patients:

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# 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.

## PHOENIX

### VALLEY OF THE SUN:

This group meets monthly, usually in the third week of the month. Dates are determined by the activity or event planned. For more information or to RSVP, visit <http://cryonics.meetup.com/45/> or email Lisa Shock at [lisa@alcor.org](mailto:lisa@alcor.org).

## AT ALCOR:

Alcor Board of Directors Meetings and Facility Tours—Alcor business meetings are generally held on the second Saturday of every month starting at 11:00 AM MST. Guests are welcome to attend the fully-public board meetings. Facility tours are held every Tuesday at 10:00 AM 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).

## 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 (650) 772-1251 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.

## NEW YORK CITY

Alcor members in the NYC area can contact Javier El-Hage at [javier.elhage@gmail.com](mailto:javier.elhage@gmail.com) for information about local meetings.

## PACIFIC NORTHWEST

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

## OREGON:

The contact person for meetings in the Portland area is Aschwin de Wolf: [aschwin@alcor.org](mailto:aschwin@alcor.org). See also: <https://www.facebook.com/portland.life.extension>.

## BRITISH COLUMBIA (CANADA):

CryoBC, a special interest group within the nonprofit Lifespan Society of BC (<http://www.lifespanbc.ca/>) holds meetings for cryonists in the Vancouver area. To be notified of meetings join the CryoBC mailing list: <https://groups.yahoo.com/neo/groups/cryobc/info>.

## 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:

A new group for the Austin area has been started for those interested in discussion and understanding of the relevant technologies and issues for cryopreservation, genomics, epigenetics and medical research for increased life/health span. Contact Tom Miller, 760-803-4107 or [tom@blackmagicmissileworks.com](mailto:tom@blackmagicmissileworks.com).

## JAPAN

Cryonics meetings are held monthly in Tokyo. Send queries to [grand88@yahoo.com](mailto:grand88@yahoo.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).

## UNITED KINGDOM

Alcor members in the UK can contact Garret Smyth at [Alcor-UK@alcor.org](mailto:Alcor-UK@alcor.org) for information about local meetings.

**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 \$90 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.

Not ready to make full arrangements for cryopreservation? Then *become an Associate Member* for \$5/month (or \$15/quarter or \$60 annually). Associate Members will receive:

- *Cryonics* magazine by mail
- Discounts on Alcor conferences
- Access to post in the Alcor Member Forums
- A dollar-for-dollar credit toward full membership sign-up fees for any dues paid for Associate Membership

To become an Associate Member send a check or money order (\$5/month or \$15/quarter or \$60 annually) to Alcor Life Extension Foundation, 7895 E. Acoma Dr., Suite 110, Scottsdale, Arizona 85260, or call Marji Klima at (480) 905-1906 ext. 101 with your credit card information. You can also pay using PayPal (and get the Declaration of Intent to Be Cryopreserved) here: <http://www.alcor.org/BecomeMember/associate.html>



**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)**



# ALCOR



LIFE EXTENSION FOUNDATION  
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