

ALCOR LIFE EXTENSION FOUNDATION

A Non-Profit Organization

# CRYONICS

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# CRYONICS



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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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## PREMEDICATION IN CRYONICS REVISITED By Aschwin de Wolf

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**Disclaimer:** Alcor cannot provide medical care for living patients and must regard the care and medication of legally living members as the sole responsibility of members and their treating physicians. To avoid conflict of interest Alcor cannot advocate premedication protocols for cryonics patients.

If there are medications, nutrients, minerals, and/ or vitamins that can mitigate the adverse effects of ischemia after circulatory arrest, it stands to reason that some of these strategies may even confer greater benefits if they are already being pursued *prior* to pronouncement of legal death.

Two surveys of the topic of premedication, the only such writings that I know of, were penned by Michael Darwin many years ago. The first is "Reducing Ischemic Damage in Cryonic Suspension Patients by Premedication" (*Cryonics*, April 1991). The second, more extensive treatment is "Premedication of the Human Cryopreservation Patient," Chapter 7 of the 1994 reference *Standby: End-Stage Care of the Human Cryopreservation Patient* (<https://alcor.org/Library/html/standby7.html>). One case report showing use of premedication is that of James Gallagher, 1995 (Alcor Patient A-1871).

In his contributions Darwin covers topics such as medico-legal issues, risks and benefits, patient evaluation, drug categories, specific medications, evidence, contraindications, etc. Here I briefly review some recent stabilization medications research for its relevance to premedication protocols.

Broadly speaking, there are two categories of premedication drugs: (1) Drugs aimed at preventing events following circulatory arrest and (2) drugs aimed at mitigating the damage that follows circulatory arrest. An example of the former is prevention of blood clots and an example of the latter is ischemia-induced free radical generation.

When our lab *Advanced Neural Biosciences* conducted stabilization medications research we administered medications prior to or concurrent with circulatory arrest. This model is effective in looking at the efficacy of drugs but in real human cryopreservation administration of medications is often delayed. An interesting feature of this model, however, is that it may tell us something about the efficacy of these medications had they been part of a premedication regime.

As reported in our research summary in the January-February issue of *Cryonics* magazine, we only found consistent and beneficial effects for two medications; heparin and sodium citrate. Both agents prevent the formation of blood clots, although sodium citrate may also exhibit general neuroprotective properties as a calcium chelator.

If we reflect on these results with the two categories of drugs discussed above in mind, it is tempting to conclude that only drugs that can *prevent* a specific ischemia-induced effect (like blood clotting) can improve the cryopreservation of the patient. This would be premature to conclude at this stage. Not just because of our choice of animal model and sample size, but because some of the medications in Alcor's stabilization protocol may better help to sustain biological viability after the start of cryonics procedures and/or inhibit biochemical events that degrade brain ultrastructure.

Stabilization medications research can provide data to formulate an evidence-based premedication program, but there are issues that are unique to premedication. For example, a highly effective agent like sodium citrate cannot be administered prior pronouncement of legal death because it immediately stops the heart. There are also medications that may be effective for the critically ill patient (for example, drugs aimed at preventing arrhythmias and sudden death during decline) that have no meaningful role to play in cryonics stabilization procedures. ■

# CEO Update

By Max More



## ALCOR'S 150TH PATIENT

Meihuei Kao, A-2998, a non-confidential whole body member, was pronounced on February 19, 2017 in Tijuana, Mexico. Meihuei became Alcor's 150th patient on February 22.

## SEOUL, SOUTH KOREA – AGAIN!

Just three months after my first trip to South Korea, I invited to another, entirely distinct event: The MBN Y Forum 2017 at the Jangchung Arena in Seoul, from February 21-22, 2017. This was the sixth such event and consisted of two quite different gatherings. The first was the VIP Reception on the evening of Tuesday February 21 at the Shilla Seoul Hotel. The second was the main event at the Jangchung Arena.

The VIP Forum was a dinner with introduction and a panel discussion including only four speakers, one of them me. The audience for the panel discussion was 100 CEOs, government ministers, and other senior figures. You might expect such a group in a country with almost-zero exposure to cryonics to be baffled or unreceptive. On the contrary, both during the question session and over dinner, interest was genuine and attitudes friendly. It didn't hurt that I was one of few speakers for that limited session and the selection was made by Dr. Chang Dae-Whan, Chairman of the Maekyung Media Group, which includes the Maeil Business Newspaper and Maeil Broadcasting Network (MBN), a leading business news media group in Korea. He served as Acting Prime Minister of Korea (2002). He also served a brief stint as South

Korea's acting prime minister in August 2002 under President Kim Dae-Jung,

The main event took place the following day at the Jangchung Arena. The audience for the talk was 3,000 to 4,000 Korean students. (The capacity of the arena is 4,618 and it looked to be filled close to capacity.) The one-day MBN Forum consisted of four sections: The Hero Show ("Enjoy the Impossible"), The Future Show ("The Future Where Everything is Possible"), the Dream Show ("Dream, Do It!"), and the Anchor Show ("Challenge the World"). My talk and discussion was part of the Future Show. The session was moderated by Dr. Dennis Hong, Professor and the Founding Director of RoMeLa (Robotics & Mechanisms Laboratory) of the Mechanical & Aerospace Engineering Department at UCLA. Other speakers were Gary Geunbae Lee, Senior Vice-President of Samsung Electronics, and Dr. Jane Oh, Principal Investigator at NASA.

I'm told that my cryonics talk and panel discussion were a big hit, stimulating a lot of discussion. Dr. Dae-Whan was especially interested and I was told he talked about it positively at every meeting he was in. Apart from picking me for the Tuesday VIP reception, we had a private half-hour solo conversation which he asked me many questions about Alcor and cryonics. As a further sign of favor, during opening of the main event the next day, he selected a few speakers to highlight, starting with me. According to one of the main organizers, he enthusiastically raised the subject in several meetings.

I made some good contacts from several countries (including China and Japan) and from diverse but high-level backgrounds. Several people seemed genuinely interested in making cryonic arrangements. South Korea seems to be a promising place for cryonics to catch on, given more exposure. As I noted when I reported on my November 2016 trip, also to Seoul, the country's culture is strongly pro-technology and pro-innovation.

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*"You might expect such a group in a country with almost-zero exposure to cryonics to be baffled or unreceptive. On the contrary, both during the question session and over dinner, interest was genuine and attitudes friendly."*

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**The trajectory of membership dues, updated:** In estimating the cost of your membership dues over your lifetime, it would be a mistake to take the amount you are paying today and multiply that by the number of years before you expect to be cryopreserved. There are two main reasons for this. First, any such calculation must take into account the fact that long-term members now receive discounts that

grow over time. Second, the real (inflation-adjusted) level of dues may be more or less than the general rate of inflation.

Here are Alcor's membership annual dues (nominal, not inflation-adjusted) over the years:

- 1982 – \$130
- 1984 – \$160
- 1986 – \$200
- 1990 – \$252
- 1992 – \$288
- 1995 – \$360
- 2002 – \$398
- 2005 – \$398, \$120 CMS added
- 2010 – \$478, \$120 CMS
- 2011 – \$620, \$180 CMS
- 2013 – \$590, \$180 CMS
- 2015 – \$530, \$180 CMS
- 2016 – \$525, \$180 CMS
- 2017 – \$525, \$180 CMS (or zero CMS if CMS waiver chosen)

These are the most expensive rates for single members or first members of families, with no length-of-membership discounts or CMS waivers. The percentages below do not reflect those lower rates. (I'm also using only the dues number and ignoring CMS.) So, for members who have stuck with Alcor for an extended time or who are family members, the following numbers overstate increases.)

It's interesting to calculate the average annual percentage and to compare it to general inflation. This is useful since it gives members and prospective members some sense of the trajectory of that cost. However, it should be noted that, since 2013, *dues have only decreased, not increased.* (The average per annum change since 2011 is -4.07%.) From 1986 to today, membership dues have increased at a rate only modestly ahead of general inflation (3.16% compared to 2.58%). Given economies of scale (and, we hope, a growing Endowment), I venture to say that dues will increase less than general inflation henceforth and, eventually, on average since the start.

If you look at increasingly recent years, the rate of increase of membership dues tends to go down:

From 1986 to 2017 (31 years), dues went from \$200 to \$525 = 3.16%. [2.58% general inflation in the USA.]

From 1995 to 2017 (22 years), dues went from \$360 to \$525 = 1.73%. [2.1% general inflation in the USA.]

From 2002 to 2017 (15 years), dues went from \$398 to \$525 = 1.86%. [1.97% general inflation in the USA.]

From 2010 to 2017 (7 years), dues went from \$478 to \$525 = 1.35%. [1.5% general inflation in the USA.]

From 2011 to 2017 (6 years), dues went from \$620 to \$525 = -4.07%. [1.13% general inflation in the USA.]

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*“South Korea seems to be a promising place for cryonics to catch on, given more exposure.”*

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#### ANSWERING QUESTIONS ABOUT CRYONICS

Such questions pop on Quora frequently. It's one of the more thoughtful sites of its kind and you can find good answers to a stunning range of questions. I've recently written brief answers to two questions:

Q. “Cryonics: Isn't it a waste of energy for Alcor to be cryo-preserving bodies in a place as hot as Arizona?” (February 10.)

A. Not in the least. Outside temperatures are unimportant. For one thing, the Patient Care Bay is air conditioned, since people have to work inside it. (Note added: the cost of this A/C is minor compared to the cost of maintaining patients in cryopreservation, given the A/C.) Much more importantly, the vacuum flask Dewars insulate internal temperatures from external temperatures very thoroughly. So, cryopreserved patients are not, in any relevant sense, “in Arizona.” They are in a special room that is generally quite cool, and inside vessels whose vacuum layer makes the external temperature essentially irrelevant. More important is the Phoenix/Scottsdale area's lack of seismic activity, lack of tornadoes and hurricanes

and tsunamis, and remarkable supportive political environment.

Q. “Is cryonics ethical?”

A. This question cannot reasonably be answered in a simple “yes” or “no” form. The answer is that it depends on the cryonics organization and on what is being offered. In practice, at least with respect to cryonics as practiced by the Alcor Life Extension Foundation, the largest and most advanced cryonics organization, the answer is “yes.”

Alcor makes no promises that anyone will ever be revived. That is because (a) we cannot know under what conditions any specific individual will enter cryopreservation. Some will be in excellent condition with full perfusion of the brain, eliminating ice formation (as shown in CT scans), while others will suffer delays or have damage from stroke, aneurysm, brain cancer, or Alzheimer's; (b) Alcor's published materials, including the detailed contracts, clearly identify numerous ways in which things could go wrong. Informed consent is required – a crucial element of ethical practices.

Offering a means by which there is a real although uncertain possibility of extending your life is absolutely ethical. What is unethical are the pronouncements of those who have not bothered to do their research who declare cryonics to be impossible. Unethical, uninformed, and irresponsible criticisms were recently made in England following a case (not by Alcor). Here is a fact-based response: <http://alcor.org/Statement-on-Cryonics.pdf>

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*“From 1986 to today, membership dues have increased at a rate only modestly ahead of general inflation (3.16% compared to 2.58%).”*

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For a more detailed set of answers, see: Alcor: FAQ – Moral: <http://alcor.org/FAQs/faq03.html>

## NEURO PATIENT CT SCANNING CONTINUES

Many thanks to Don Laughlin for his continued support of the Research Fund. This has made possible several projects, including the CT scan project. Mike Perry selected two good candidates for the next scan – tentatively scheduled for March 18. This allows us to economically scan a sample of nM22 and then adjust our calibrations for future neuro cases. The M22 vitrification solution is the same for both neuro and whole body cases, but they differ in the carrier solution for the cryoprotectant mixture. Our study needs to be done before we can accurately interpret future cases of neuro patients who have been cryoprotected with the nM22 formulation.

## MEDIA AND PUBLIC EDUCATION

Readers of this magazine find the idea of cryonics familiar and sensible. Sometimes, it's hard to comprehend just how outside the mainstream we are, even after so much progress. That's why we continue, very selectively, to give interview after repetitive interview. And also why we publish case reports and other materials on our website, to be as transparent and non-strange as possible. It's also why we give tours twice per week. These can be one person – an inquirer of unknown interest; an individual who seems like a potential member; or a relative of a patient – or they can be couples, multiple independent visitors – or they can be classes or professional organizations or other groups (such as the Scottsdale Violent Crime Unit). In late January, we enjoyed a return visit from curious students from Arizona State University.

On March 2, we talked and gave a tour to 22 attorneys as part of their continuing legal education. Surely, attorneys would not be interested in Alcor or cryonics? Surely, they would look elsewhere for their continuing education credits? Surely, they would provide almost-uniformly negative or at least uninterested feedback on the (anonymous) forms? No, no, and no. The far more positive reality is doubtless due partly to the host of the CLE (continuing legal education) event, a well-established company specializing in trusts and financial advice which I hope to talk about more very

soon. The event was such a success, that we expect another two groups of similar size, just to accommodate all the attorneys who expressed interest even before the first tour/discussion/class.

Despite requests from media on a daily basis (typically more than daily), we have granted few interviews recently, especially if they involved filming. Filmed interviews always take more time than is promised. For instance, on February 27, my supposedly 30-minute time with the VPRO film crew from the Netherlands expanded with a sense of inevitability to between two and three hours.

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*“Offering a means by which there is a real although uncertain possibility of extending your life is absolutely ethical.*

*What is unethical are the pronouncements of those who have not bothered to do their research who declare cryonics to be impossible.”*

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On January 26, I was supposed to spend 15 minutes with Discovery, Canada. It ended up being close to two hours. I also spent more time than planned – several hours – being filmed for “60 Second Docs.” As the name suggests, all that recording time is boiled down to just 60 seconds. (Apart from the recording time, I invested more time thinking of ultra-brief statements that would work for their format while still conveying something useful.) At least for the first three-quarters, I'm fairly happy with how it turned out, even if I am now saddled with the supervillain name of “Doctor Freeze.” Although recently uploaded, as of March 4, the video has received 168,000 reviews. If just 1% of those viewers – even 0.1% – eventually follow through and pursue cryonics more seriously, it will have been well worth it:

<https://www.facebook.com/60SecDocs/videos/1716358052010352/>

Alcor receives a huge amount of publicity compared to the tiny fraction of interviews we grant. Several people have pointed out how this represents many millions of dollars' worth of free advertising. But others worry about the consequences of attracting attention to ourselves. But I don't want to repeat what I wrote in my Update for the previous issue... ■

# MEMBER PROFILE

## MIKE O'NEAL

By Nicole Weinstock



*Mike stands amidst flurries of snow in Northern Louisiana.*

Travel with us to Louisiana to meet computer science professor, cat lover, tech startup founder, long-time cryonicist, and Alcor Board Member, Mike O'Neal.

"Cats think they're higher on the food chain than you are," says Mike on the other end of the phone, as his reportedly big-bellied, tawny pet of 15 years settles down for a nap. "He's the cat and you're the monkey. You gotta put it this way: he doesn't clean my cat litter so you tell me who's right."



*Life wouldn't be the same without JC, Mike's pet cat named after a former roommate (JC is short for "John's Cat").*

A wry sense of humor and a weakness for feline strays are just a couple of qualities that round Mike's very accomplished résumé, not to mention his weakness for sous vide steak.

Southern by birth, Mike grew up on a farm in rural Louisiana in the town of Oak Grove. Though populated by just 1,700 people during his childhood, it now holds a unique claim to fame in northeast Louisiana: Oak Grove's downtown landmark, the Fiske Theatre, is the region's oldest operating movie theatre, dating back to 1928. It is a fitting juxtaposition of city-meets-country, much like the union of Mike's parents, who met in New York before moving to Louisiana.

"My mom was from Brooklyn originally, and my father was from the south. They met as a result of World War II. He was in the navy. She spotted a cute sailor across the way in Central Park and told a girlfriend she was gonna marry him at some point."

They did indeed marry, having two children quickly thereafter, and four more several years later. Mike was born in those later years, along with his brother Eddie, who was one of his earliest students.

"I was probably destined to be a teacher early on," Mike admits. There was no

kindergarten at the school that he and his siblings attended, just first through twelfth grade, but he did his part to keep everyone's schoolwork on track. Thanks to his patient and dedicated instruction, his younger brother Eddie had already learned the standard kindergarten curriculum by his first year in school (first grade).

Fast-forward to 1987: Mike is Assistant Professor of Computer Science at Louisiana Tech University, a Tier 1 national research university that conducts research for the likes of the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), and the Department of Defense (DoD). To say that it is known for its engineering and science programs is an understatement.

Interestingly enough however, computer science was Mike's second love, and in the end, surfaced by way of his first: space. Born in 1960, three years after the Soviet Union launched *Sputnik* and the space race began, Mike was one year old when President JFK expanded the space program by several billion dollars to safely get an American to the moon and back. He was two when John Glenn Jr. became the first American to orbit Earth. And, perhaps most importantly, Mike was nine years old



Mike and his mom lean in for a photo. She was close to 90 years old at the time.

when Neil Armstrong landed on the moon. His pre-teen years were, quite literally, filled with space.

“If you had asked me at 12 years old where I’d be living at 40, I would’ve told you ‘on the moon,’” says Mike. “But I’m five foot two with terrible eyesight, so that wasn’t in the cards.”

His passion for space converged with the seed of interest in computer science in Stanley Kubrick’s epic sci-fi movie, *2001: A Space Odyssey* (1968). “It was a mind-blowing experience for me. I wanted to build a HAL computer.”

For those of you who may not know—no spoilers!—HAL 9000 was a Heuristically programmed ALgorithmic computer. A now famous example of artificial intelligence as depicted in cinematic history, HAL is a principal character and central antagonist in the movie. He controls the operation of a spacecraft en route to Jupiter, interacting with the human crew onboard by voice, his only physical characterization being the red or yellow light of a camera lens.

For Mike, the fascination with HAL and the desire to replicate this sentient computer went deeper than an interest in space travel.

“People tend to think that computer science is for boring people, but the truth of the matter is that it’s a very creative kind of thing. It’s extremely precise but very creative. When you build something and you run it, and it takes on a life of its own,

that’s a very empowering experience. I was completely hooked on it because of that. You get to feel creation.”

Though less prominent than the theme of artificial intelligence, cryogenic hibernation was another element of *2001* that struck a chord in Mike. But over the years, despite his growing repertoire of science reads, he couldn’t find any real world work on the subject. When he reached graduate school in the mid ’80’s, he decided to devote an afternoon to the hunt for some kind of scholarly coverage of cryonics. His efforts resulted in a few disappointing articles on cryobiology.

Fortunately for Mike however, serendipity took hold just a few months later. After reading a copy of *Free Inquiry*—a magazine that he accidentally subscribed to—he saw an ad on the back page that included the words “Physical Immortality” in bolded letters. Like any good scientist, Mike reacted with no small reservations:

“I literally laughed out loud that someone would post so preposterous an ad. Reading a bit farther though, I saw the word ‘Cryonics’ and ‘Alcor Life Extension Foundation.’ I was *highly* skeptical, to say the least, but the ad offered a free information package for those interested.”

He wrote off for the package, which included an issue of *Cryonics*. It covered the work of Mike Darwin and Jerry Leaf, who, at the time, were carrying out deep hypothermia experiments in the canine model.

“What impressed me was that Alcor was truly trying to do science. And it wasn’t just that. They were approaching it from a very professional way, and I had mad respect for that... What I especially liked that made me take it seriously was that they were very careful not to make claims that were unsupported. You can attract a crowd to anything by telling people what they *want* to hear. Alcor and cryonics are brave enough to tell people the truth and what they *need* to hear. It takes a lot of integrity to do that.”

Mike became a member at Alcor just a few years later, when he began his position as Assistant Professor at Louisiana Tech. He was the only dot in Louisiana on *Cryonics* magazine’s member heat map for

a good chunk of his now nearly 30 years of membership.

As of 2016, Mike is also one of two recent additions to Alcor’s board. One of his central areas of focus is cost control over the long term, with hopes of slowing any increase in the organization’s cryopreservation minimums. His drive to mitigate costs is motivated by a deep desire to make cryonics an affordable option to all who support it.

“There’s a certain tragedy in the world of people who pass away and do not embrace the cryonics idea. Religious people have an answer to that, but if you are an agnostic [like me] or you are an atheist, death is final unless you choose the cryonics option. So to me, the thing that’s even sadder is someone who embraces the idea, and for financial reasons, is unable to pursue that. That is a tragedy of epic proportions.”

While Mike works hard to influence the feasibility of cryopreservation for any interested party from within Alcor, he also urges members to take initiative in their wishes and embrace cryonics as a long-term commitment. The recent passing of his mother weighed heavily in shaping this attitude.

“By 21st century standards she didn’t suffer and was surrounded by people she loved. But it made me think about the fact that, you know, you really need to have your duckies in a row. You need to be prepared for contingencies since you yourself can’t provide for them at the end.” This is also, as Mike is quick to add, a reason to make your wishes known to others that are near and dear, so ignorance and foul play are avoided when your time comes.

He encourages members to approach cryonics from a long-term lens, minding finances, yes, but also giving thought to just what type of arrangement you should select.

“Try to plan your finances accordingly,” urges Mike, “so that when you are most likely to need the services you can still afford them. If you are young and are funded through term insurance, think about switching to whole life. If you are middle aged, think about saving not only for retirement, but also putting away some extra money as a hedge against potential

future inflation of cryopreservation minimums.”

Though financing your future is important, Mike also touches on how this long-term lens can influence the ideological landscape of your cryonics arrangements. He encourages members to give whole body cryopreservation fair consideration. Though it is more expensive than neuro preservation—Mike is the first to empathize with this, which is one reason why he is so dedicated to cost control in his board member responsibilities—he shares some very compelling arguments in favor of this arrangement.<sup>1</sup>

One point that Mike raises is the potential value of the body in maximizing information about the person. If the identity of the person emphasizes their physicality in some special way, there could be a distinct advantage in cryopreserving the rest of the body along with the brain. “I’m not a musician,” Mike admits, “but I can imagine a musician. That’s all muscle memory. And if your brain was transplanted into a different body, making all of those connections back, I have a hard time believing that it’s just going to be a seamless process, and you’ll wake up and feel exactly the same.”

Mike also raises the value of whole body cryopreservation as a backup source of information in the event of a complication in your neuro cryopreservation or resuscitation. “Neuro is a lower bar to entry, but one that doesn’t really have a safety net. It doesn’t really have a fallback plan.”

Ever the economist-inclined computer scientist, he also urges whole body consideration for pragmatic reasons. In the event of drastic market change and, accordingly, shifts in cryopreservation minimums, “[whole body cryopreservation] forces you to put aside more money for cryonics. On neuro,” he continues, “individuals can find themselves in a very uncomfortable place.”

Apart from targeted cost control, Mike is also focused on growing Alcor over time. This, in and of itself, can help reduce member costs, but more importantly, it helps keep the organization alive. As Mike puts it, “Any group that’s not growing is dying. There’s no in-between.” Yet growth,



Mike studies the digital horizon during the dot com years of his life.

and more specifically, change, generally runs counter to human nature. What’s the antidote? “The way organizations grow is they need new people who come in with new energy and new ideas. You get both of those things from the young.”

For Mike, the value of young people extends beyond the realm of cryonics into his daily life, where they are a welcome source of inspiration and camaraderie. “I learn more from my students and from friends of mine who are younger than me sometimes than what I teach.”

In fact, he credits his first use of the World Wide Web to these relationships. “I can remember the day when one of my students rushed into my office to tell me about this new thing called the ‘World Wide Web’. I said, ‘What is that?’ He said, ‘It’s this hierarchical way of organizing information, and one article can link to another article.’ He brought up a website in Mozilla I think it was—in beta—and I said, ‘No Don. You’re wrong, this has turned the Internet into magazine pages.’”

Another interest that’s kept Mike in the know is gaming. He played video games quite heavily in the ’90s, including the famous *Myst* (1993) and its sequel *Riven* (1997). “I loved those games,” says Mike,

“but I was waiting for the moment when you could break out and actually explore a 3D environment.”

*Real Myst* (2000) was the answer to his wishes. According to his description, it allowed players to explore the whole environment instead of just pre-rendered scenes. But after downloading the demo and playing for an hour, Mike ended up with a case of video game induced seasickness, and had to stay away from this hobby for several years, until a slow reintroduction allowed him to partake in *Heavy Rain* (2010). Since then, he has played a host of third person games and RPGs (Role-Playing Games), tending toward complex storylines that empower the player with the ability to determine the game’s direction.

“It’s absolutely fascinating to me that we’re at the point where characters have their own simulated lives... And you can see the thread there, because it takes me back to AI. AI in gaming is something that I do find fascinating.”

This thread of futurism runs deep in Mike’s movie preferences as well. Akin to the blog, *Paleo Future*, he too is drawn to the theme of past visions of the future; indeed, this forms a unique critical lens for some of his favorite films. In Fred Wilcox’s



*When you have a PhD and a sense of humor, the average birthday cake just won't do.*

*Forbidden Planet* (1956) for example, Mike notes the rather extensive relationship between the alien technology that was discovered and its functions—or rather, lack thereof:

“There was a different device for every single function. There’s a power-indicating device, there’s a modeling tool device—there are all these separate devices. And you look at today and we don’t think of things that way anymore. We’ve evolved in the way we think about objects and technology. Look at your phone. We call it ‘technology,’ but what is it really? I have a clock, a weather app, a calculator, a map program... And that’s just the first couple.”

Speaking to his own life, Mike senses change on the horizon. “I’ve been teaching for about 30 years, and Louisiana, when I started, had a wonderful retirement system. So I’m eligible to retire here in two years at full salary. I’m thinking the West Coast.” He has fond memories of the Pacific-adjacent states of the U.S. ever since his sabbatical to Los Angeles in 2000. During that time he and his nephew created a web start-up company together, giving him ample opportunity to enjoy the sunshine state. “The weather is perfect,” he says. With a

smile on his lips he asks, “How do they afford to air condition the outdoors there?”

Like many cryonicists, the future has many meanings for Mike, the most important of which extend beyond typical notions of tomorrow, or even years from



*Friends are an important part of Mike's life, whether they're sharing a backyard BBQ or relaxing in the Bahamas as seen above.*

now. In his own words, “I would love to live to see Man in general, and Mike in particular, explore the galaxy to see what’s out there. Signing up for cryonics is the only practical step one can currently take to improve one’s chances of seeing such a future.” And take it he has. ■

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- 1 To review them in detail, you can read, “The Case for Whole Body Cryopreservation,” originally published in *Cryonics* magazine, and later revised and co-authored with Aschwin De Wolf for publication in *Preserving Minds, Saving Lives*.

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# Interview with Aschwin de Wolf

Conducted in February 2017.  
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## 1. How has the cryopreservation procedure evolved since the first human was placed in cryostasis?

The most important element in the progress of cryopreservation procedures in cryonics is the progressive elimination of ice formation. When cryonics started, patients were often cryopreserved without any cryoprotection or very low concentrations of cryoprotectant. In the 1980s and 1990s organizations such as Alcor started adapting mainstream perfusion technologies to introduce high concentrations of cryoprotectants (such as glycerol) to mitigate ice formation. In 2000 Alcor formally introduced vitrification with the aim of eliminating freezing altogether.

## 2. Have changes in the procedure over the last decades (composition of cryoprotectant, rate of cooling, etc.) led to a measurable decrease in the damage that occurs during vitrification?

Yes. The elimination of ice formation, which can be achieved in good cases, removes one major form of mechanical damage in the cryopreserved brain. One very attractive feature of a low-toxicity vitrification agent like M22 is that it does not require rapid cooling to prevent ice formation. Under good

circumstances (no prior ischemia) it can also be used in whole-body patients without edema – a problem that seemed to plague prior DMSO-based cryoprotectants in cryonics. Elimination of ice formation and reduced toxicity has substantially reduced the degree of damage associated with cryopreservation.

## 3. Which foreseeable advances in the field of cryobiology do you believe will lead to improvements in how humans are preserved and decrease the damage done on the bodies?

I foresee further advances in two areas; a more detailed understanding of the nature of cryoprotectant toxicity and the design of brain-optimized cryoprotectants. Cryoprotectant toxicity is currently the most formidable obstacle preventing reversible cryopreservation of complex mammalian organs. With the exception of the work of Dr. Greg Fahy and his colleagues at *21st Century Medicine*, it is rather surprising how little theoretical and experimental research has been done to illuminate the mechanisms of cryoprotectant toxicity. It is also increasingly recognized that the poor penetration of cryoprotectants across the blood-brain barrier causes dehydration of the brain. We need to develop brain-optimized vitrification solutions and/or identify better methods to deliver

cryoprotectants to the brain without such significant changes in brain volume. Resolving these two issues will bring us much closer to reversible brain cryopreservation.

## 4. People have experimented in the past with a wide variety of antioxidants, chelators and membrane stabilizing molecules to reduce the damage to the body at the start of the procedure (so just after legal pronouncement of death). Have any of these been successful and are people still trying to find such substances to reduce damage at the early moments of the procedure?

I think it is important to recognize that all these anti-ischemia interventions are more important when there is a delay between pronouncement of death and the start of cryonics procedures. If there is a rapid and smooth transition between the two, immediate restoration of circulation, rapid induction of hypothermia, and aggressive anti-thrombotic therapy should be sufficient to maintain viability of the brain by contemporary medical criteria.

Our lab, *Advanced Neural Biosciences*, has collaborated with Alcor to conduct a rather comprehensive study of the effects of Alcor's stabilization medications protocol and the most

robust finding in this research has been that the combination of heparin and citrate allows for ice-free cryopreservation of the brain when these compounds are administered immediately after pronouncement of legal death. When medication administration is delayed by more than 15 minutes, things get more challenging and breakdown of the blood brain barrier and whole-body edema during cryoprotective perfusion is a typical outcome. Preventing edema of the patient during cryoprotective perfusion after prolonged periods of ischemia remains one of the most difficult research challenges to solve.

**5. Preventing damage to the brain during cryopreservation is most definitely the top priority. However some damage remains inevitable. What evidence is there that the brain is not damaged by the cryopreservation process to such an extent that the information in it may be lost forever?**

I can answer this in two ways. To start with, if we can eliminate ice formation in the brain, the damage associated with cryoprotectant toxicity is assumed to be mostly of a biochemical nature (i.e. denatured proteins) and does not alter the ultrastructure of the brain in a way that precludes inferring the original state. Cryoprotectant-induced dehydration of the brain is a little more of a wild card because we do not have much detailed information about the kind of ultrastructural changes associated with it. Hence, the priority to avoid the brain shrinking that is routinely observed in “good” cases. Ultimately, our incomplete knowledge of the neuroanatomical basis of identity, and about the exact capabilities and limits of future medicine, prompt us to be agnostic about the degree of damage that is still compatible with meaningful revival. Advocates of cryonics are sometimes

accused of being too optimistic about future science, but perhaps skeptics are too pessimistic.

**6. Do any changes take place in the bodies during cryogenic storage? And if such changes take place does that mean that the chance of successful reanimation will decrease over time?**

No. To our knowledge (which is based on cryobiological studies and theoretical calculations), deterioration of patients stored at cryogenic temperatures should be non-existent or negligible. Things get a little bit more complicated when we store patients at intermediate temperatures (intermediate temperature storage or “ITS”) instead of liquid nitrogen temperatures. It has been suggested that nucleation may still occur slightly below the temperature where the vitrification solution turns into a glass (-123°C). At that temperature, however, nucleation does not translate into ice formation but it might create more challenging repair and revival scenarios.

**7. Do you have any hypotheses on how the cryoprotectant could be removed from the body during the reanimation procedure and how hypoxic injury during this removal procedure could be prevented?**

Roughly speaking, there are two distinct approaches to the repair and revival of cryonics patients. In the vision of researchers such as Robert Freitas and Ralph Merkle, a mature form of mechanical nanotechnology will be used to conduct the initial stages of repair and cryoprotectant removal at cryogenic temperatures. If this vision of nanotechnology is plausible, cryoprotectant can be removed while providing (local) metabolic and structural support to prevent damage or freezing. An

alternative vision of nanomedicine will involve the use of biological repair machines such as modified viruses or modified white blood cells that operate using conventional diffusion-driven chemistry rather than molecular mechanical nanotechnology. Repair is more challenging in this biological scenario because tissue first needs to be warmed to temperatures at which the cryoprotectant solution inside cells and tissue becomes liquid. This risks movement of damaged structures, possible growth of ice, and cryoprotectant toxicity accumulation occurring at the same time as repairs are being made. To my knowledge, there have not been many serious studies of how such devices can operate and navigate through these problems at the same time.

**“Many people feel quite comfortable with reconstruction of ancient DNA or forensic inference, but when it comes to cryonics, people tend to treat the brain in a somewhat superstitious fashion and cannot imagine forms of medicine that operate with molecular precision.”**

**8. What is in your opinion the chance that a cryopreserved person would be revived in a human state versus an uploaded version as uploading may be a way around irreparable cryopreservation damage?**

I am personally partial to the idea of doing molecular level repairs through mechanical or biological nanomedicine because it does not require a paradigm shift in how we think about the nature of identity and consciousness. The feasibility of mind

uploading is ultimately about the feasibility of substrate-independent minds and I do not think that the debates surrounding this can be resolved prior to empirical verification. In my opinion, the proposal of cryonics is intrinsically linked to the idea that the non-damaged state of the brain can be inferred from the damaged state through some form of molecular medicine. Many people feel quite comfortable with reconstruction of ancient DNA or forensic inference, but when it comes to cryonics, people tend to treat the brain in a somewhat superstitious fashion and cannot imagine forms of medicine that operate with molecular precision.

**9. Even if reanimation after cryopreservation becomes technologically possible, what would make you believe that future generations will spend the money and resources on reanimating all people from cryostasis rather than just one or a few as an experiment?**

This is an easier question to answer because it is the aim of cryonics organizations *themselves* to resuscitate their patients, not the general public, or curious scientists. The *Alcor Life Extension Foundation* parks a rather substantial portion of the cryopreservation fees in a so-called Patient Care Trust that should permit patients to be maintained in perpetuity (in theory) and revived when the technologies are available and affordable. Of course, if the technologies to revive cryonics patients will come to fruition, it seems quite reasonable to assume that the legal status of cryonics patients will also change and patients at cryonics organizations will be considered living people in a critical condition.

**10. Do you see a mutual exchange of techniques and knowledge between the human cryopreservation field and the**

**field of storing human biological samples (e.g. sperm, fertilized eggs, etc.)?**

Yes. As a general rule, the obstacles that are faced by researchers of storage of biological samples and complex mammalian organs are the same obstacles that need to be overcome for reversible cryopreservation of humans (medical biostasis). Any insights into the mechanisms of cryoprotectant toxicity, chilling injury, and the effects of cryopreservation on gene expression are of great relevance to cryonics. I should add, however, that I expect this exchange to be mutually beneficial. One of the least recognized and appreciated aspects about the field of cryonics is that researchers sympathetic to the idea of human cryopreservation have made meaningful and innovative contributions to mainstream fields such as cryobiology and cerebral resuscitation.

**11. Cryogenic storage of genetic mutants in laboratory animals could reduce the cost of biomedical research. This is already a common procedure in the roundworm *C. elegans*. Are you aware of any research taking place that tries to expand cryogenic storage to other model organisms?**

Natasha Vita-More, who conducted recent studies on the effects of vitrification on memory in *C. elegans*, has suggested that the next step would be a slightly more complex organism such as the Greenland Woolly Bear Caterpillar or the ozobranchid leech. One of the most common suggestions I get is to attempt suspended animation on a mouse or rat. This would definitely provide powerful proof of principle for the feasibility of human suspended animation, but I do not think that the challenges in achieving reversible biostasis in a small mammal are that much smaller than in humans. We would need to overcome

the same obstacles: minimizing cryoprotectant toxicity, chilling injury, dehydration of the brain, ischemia during cooling, and cryoprotective perfusion, etc. The majority opinion in cryonics is to solve these individual problems more thoroughly before attempting reversible cryopreservation of a complete animal.

**12. In his ruling on the 14-year old girl wanting cryonics, Justice Peter Jackson stated that there's a lack of regulation concerning cryonics. If the government would ask your advice on creating such regulations then what would you tell them?**

I think the first thing I would recommend is that experts (which should include researchers and practitioners of the field) create a protocol to conduct cryonics as a hospital-based, elective, medical procedure. Reviewing the technical requirements and supporting evidence for cryonics will lead to a greater recognition of the need of improved legal protection for cryonics patients. Too often, cryonics is dismissed because people do not understand the conceptual arguments in favor of it, or its multi-disciplinary nature. In particular, the idea of molecular medicine is usually ignored in discussions about the (potential) damage of cryonics procedures. If regulations and protocols are created based on a dispassionate examination of the arguments and evidence in favor of cryonics, I think we do not necessarily need to fear regulation of the field. ■

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# MODERN SURVIVALISM 2.0

By Christine Gaspar

For a long time now, I have considered how it might be possible to convince my fellow cryonicists and survivalists in the preparedness community that cryonics is a necessary component of the mentality of *Modern Rational Survivalism*, (or *Modern Survivalism 2.0*). I have been a proponent of both for many years, and have observed a curious blind spot in members of each group, which include some of the most avid cryonicists, as well as many of the most seasoned survivalists around.

They just do not *get* each other, or identify with the mindset of the other, even though in principle, their goal is the same, which is to *not die*.

## TERMINOLOGY

Perhaps a good way to start is by clarifying the nomenclature. The phrase *Modern Rational Survivalism* was coined to separate what are commonly seen as acts of *Doomsday* paranoia, carried out often by mentally fragile or deeply fearful individuals, and paraded on cable television; from something any thoughtful, non-radical individual can relate to. Modern Rational Survivalism is an ideology that tries to judiciously examine and evaluate the potential for risk to one's health, life, and security, and then, apply an effective, appropriate, and balanced response.

Cryonics is the ultimate in *blue-sky thinking*. It is the act of preserving a legally deceased individual at ultracold temperatures (-196°C) when the limits of modern medical knowledge have been reached. This is done in good faith to provide the patient with a chance to access future medical care and to be potentially restored to health. Currently, cryonics is irreversible, and it is not known if



Photo Credit: Penelope Cruz in *Vanilla Sky* (2001), Cameron Crowe, Cruise/Wagner Productions, Vinyl Films, Summit Entertainment

it will offer any measure of success in the future. The challenge of solving the reanimation problem will rely heavily on scientific research in many disparate disciplines, which will rely on support – be it from a government, private or corporate benefactor.

## COMMON GROUND

There seems to be more indifference than resistance to the suggestion that one should consider adopting both strategies – which is actually somewhat reassuring. Contempt is infinitely harder to overcome than apathy. Cryonics and survivalism are still considered fringe topics reserved for the outliers of society by our culture-at-large. As a result, they can be a hard sell to the average individual, who has not already been exposed to these ideas or experienced an emergency that left him feeling vulnerable and unprepared.

The winds seem to be slowly changing in terms of finding that people are becoming more tolerant of the idea of cryonics, and more open to the notion of *prepping*. They can see the potential that technology has to be utterly transformative in every aspect of life and as such, cryonics does not feel like such an alien concept. Equally, many sense an increasing instability in political institutions and growing distrust in the ability of government to look after its people in the face of disaster. This has led to a recent resurgence of interest in homesteading, off-grid living, and people seeking training in areas such as wilderness medicine, self-defence, and disaster management.

## THREAT PROBABILITY

Survivalism, when approached in a rational manner, views the likelihood of experiencing a disaster as inversely proportional to the

impact of such an event. What this means is that the lower the impact in terms of how many people are affected, or how extensive the crisis is, the more likely the event is to happen.<sup>1</sup> So for example, a tsunami that affects 100,000 people is incredibly rare and unlikely to affect any given individual. If it did occur, it would very likely have devastating consequences on a broad scale and would, therefore, require an extensive, multi-year survival plan.

Conversely, there are some events rarely thought of when making a list of probable prepper scenarios, and their impact is often underestimated. These are crises such as the critical illness of a family member, the death of a breadwinner, the loss of a job, or inadequate preparation for retirement. These types of disasters would be small in impact in terms of the number of people affected, but inversely, they would have a high, if not almost guaranteed likelihood of happening at some point in any given family. These disasters require greater consideration than those that are more photogenic. If one can adequately prepare to manage them, they have already gone a long way toward preparing for a larger scale event.



This point is illustrated because commonly, people become interested in survivalism when their attention is piqued by concerns over a large-scale disaster. Examples of such disasters might include electromagnetic pulses (EMP) from high altitude nuclear blasts, and strong solar discharge, both of which could damage the electrical grid over large areas – potentially taking years to repair. Additionally, plausible scenarios for large-scale civil disruption could include infectious pandemic, earthquake, or unexpected warfare.

The difficulty with trying to plan for such a cataclysmic event is that in many cases



<https://uscrow.org/2014/10/18/top-10-prepper-supplies/>

the threat is so large and so inextricable, that one could spend all one's time and energy trying to defend against it, and get nowhere. An extinction level event, such as a large comet striking the earth, or a nearby gamma-ray burst is not something one can survive, no matter how we feel about it or how much we prepare for it.

In the meantime, small and medium scale threats which can be mitigated are not addressed, leaving people as vulnerable as if they had done nothing at all. A more rational, thoughtful approach is to maintain an attitude and a mentality of survivalism, but rationally work toward primarily being self-sufficient. A person who is self-sufficient self-inoculates against the more common threats to their safety. Precautions that are more complex can always be added as time, budget and inclinations permit.

### **SOCIAL SAFETY NET**

Survivalists concern themselves with designing a life that accounts for the possibility of disaster. We live in a civilized society, where most of us have agreed to enter into a social contract which allows our society to function. We obey laws, pay taxes, and acknowledge the authority of the police and the justice system within

the constraints of a democratic, free society. For the most part, it works: in some places better than in others. However, careful observation reveals that good civics and group cooperation are governed under the constant eye of law enforcement, and the threat of punitive measures. The checks and balances that keep our way of life running smoothly can fail, and the thin veil of civility which protects us from barbarism can fall away in the blink of an eye. Hurricane Katrina which struck New Orleans in 2004 was evidence that order can quickly spin into chaos in the harshest possible way.<sup>2</sup>

Another relatively recent example where a social safety net failed to protect its citizens, and in fact contributed to the disaster by initiating a second wave of victims, was during the SARS epidemic that occurred in Toronto in 2003.<sup>3</sup> Politics literally got in the way of public safety by placing economics ahead of disease protocol at the cost of hundreds of new outbreaks and the loss of many lives.<sup>4</sup>

Humans are fallible. They can be driven by motivations which cloud their judgment, are deeply selfish, and cause catastrophic suffering. Survivalists tend to acknowledge this and prepare for this

possibility. They strive for self-sufficiency and disaster preparedness because they have a fundamental distrust that people will remain noble when the world stops turning.

### CONNECTION TO CRYONICS

What kind of person becomes interested in cryonics? Most simply, I believe that it is someone who wishes to live as long as possible, perhaps even indefinitely. They want and expect to live in robust health, and inhabit a reality that appreciates and encourages scientific progress and an open, free, and peaceful society. They are willing to go to extraordinary lengths to secure and execute such an ambitious goal, often risking a lifetime of controversy, doubt, and uncomfortable pleasantries.

As described above, the evaluations of threat probability that can be found in prepper literature only take into account an expectation of a natural lifespan. A supporter of radical life extension and cryonics technologies used as a means to extend one's natural lifespan, and defend against catastrophic illness or injury has a more formidable task in front of them. The more successful they are at extending their lives, the longer the timeline they create, which then increases the probability that bad things may happen to them. It would then seem entirely logical that a cryonicist should embrace the notion of survivalism, and the mindset of self-sufficiency.

On the flipside, in an effort to promote the idea of cryonics to the average prepper, it could be argued that the average survivalist devotes a significant amount of energy into planning for disaster and then just survives a mere handful of years anyway. What could it mean to them if they were presented with strategies which could extend their lives long enough that they could reach a time when their life expectancy accelerated more



quickly than their remaining number of years? What if cryonics then became the disaster plan which covered the difference if their efforts failed?

### FINAL THOUGHTS

My closing argument in favor of promoting this knowledge to the futurist-minded in the group is to point out that we are still fragile creatures. We easily succumb to illness or trauma. The time has not yet arrived where we can replace the parts of us which have failed with new ones. We seem to be getting so tantalizingly close, but for now, we are what we are. We still have to eat, move, breathe, and sleep. We can still so easily die.

For that reason, consider the fact that large undertakings can often be destroyed by small overlooked details. It is vital that, if one wishes to be cryopreserved, they make all the necessary arrangements, plan for standby in some geographic regions, and focus their attention on the development

and growth of the cryonics industry. The mistake, though, is forgetting the rest of one's life, and how those details can render any cryonics plan useless. You cannot live indefinitely if you run out of food in a long-term disaster, become fatally ill from contaminated water during a flood, or get killed by a person taking advantage of the chaos in order to rob you or otherwise do you harm. A cryonicist who is also a proponent of modern rational survivalism will look at both ideas from the same lens and strive to ensure that all risks are managed.

Essentially this type of discussion is an examination of the whole spectrum of the modern survivalist sentiment. We start with the preservation of what one has (disaster mitigation) and segue into the possibility of regaining what one has lost (cryonics). If one is truly intent on having an indefinite lifespan, one must embrace all of it. ■

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

Membership 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!





Sources:  
Aaron Drake, NREMT-P, NAEMSE, Alcor Medical Response Director  
Hugh Hixon, Alcor Research Fellow  
Steve Graber, Alcor Technical/ Readiness Coordinator

Prepared by:  
Christine Gaspar

## Alcor A-1624 James Baglivo Case Report

### OVERVIEW

*\*Names and specific identifying information have been removed in places to protect the privacy of third parties. All times are expressed in Mountain Standard Time (Arizona Time) (MST) unless otherwise indicated.*

In January 1994, Alcor Life Extension Foundation (Alcor) ran an essay contest in *Omni* magazine. Readers from around the US entered submissions as to “Why they wanted to be cryopreserved.” The winning writer, James Baglivo, was only 22 years old. His grand prize was a life insurance policy intended to pay Alcor for his cryopreservation, at the time services would be required.

James Baglivo, who was member A-1624, was pronounced legally deceased on 25 Aug 2015 at a hospital in New Jersey. He was 44 years of age. A nurse with an organ procurement company saw the member’s Alcor medical alert bracelet and notified them accordingly.

Alcor personnel were successful in preventing the member’s autopsy, and a field cryoprotection was authorized.. Otherwise, if the member had been transported to Alcor first, a straight freeze procedure would have been necessary, in view of the additional time required. Alcor secured an air ambulance to fly their personnel and equipment to the member’s bedside more quickly. The cryoprotection was performed and the member, now a neuropatient, was

placed on dry ice. The team returned the following day, 26 Aug., with the same flight crew to Scottsdale, bringing the member to Alcor His cooldown was then completed and he was placed in long-term storage as our 140th patient.

### PERSONNEL

#### Alcor Team:

**Aaron Drake**, NREMT-P, NAEMSE, Alcor Medical Response Director; Acting Surgeon, Cryoprotective Surgery; represented by (AD) in the report.

**Steve Graber**, Alcor Technical/Readiness Coordinator; Cryoprotective Perfusionist; (SG).

**Hugh Hixon**, Alcor Research Fellow; Cooldown Coordinator; (HH).

**Max More**, PhD, Alcor Chief Executive Officer; Direction and Oversight; (MM).

**Steve Harris**, MD, Alcor Chief Medical Advisor; Direction and Oversight; (SH).

### OMNI MAGAZINE ESSAY CONTEST

Back in the early 1990s, Charles Platt created a promotional campaign for cryonics: An “Immortality Prize” hosted by *Omni* Magazine, the winner of which would receive a cryopreservation free of charge. *Omni* magazine was a science and science fiction magazine published in print form from 1978 to 1995. It was shut down in early 1996 following the death of one of its founders, with a print run of over

700,000 copies per month, as reported. Offering a free cryopreservation as the prize for winning an essay contest generated an unprecedented degree of exposure for cryonics and Alcor.

James, as winner of *Omni*’s “Immortality Prize,” received a \$120,000 insurance policy which was purchased by Alcor for his cryopreservation arrangements. The arrangements still had to be completed, however, and took some time, until 18 Jan 1996. He also remained a member even though he had never responded to any notices, requests or communications of any kind in ten years. That lack of communication made responding to him later with speed and effect considerably more challenging. The first notice that Alcor received from him after many years was the emergency call.

### PRE-DEPLOYMENT AND HEALTH HISTORY

*\*Note: The narrative will be expressed in the member’s local time (EDT) for continuity, and then MST in the timeline and graphic data*

Two TeleMed calls on 25 Aug 2015 at 05:03 hrs MST (08:03 hrs EDT) notified Alcor that the member had experienced cardiac arrest and been pronounced legally deceased. One call came from a nurse representing an organ procurement organization, the other from the member’s mother.

The organ procurement nurse had noticed the member's medical alert tag and wondered if they could harvest some tissue depending on whether Alcor was able to fulfill his donation request. This would prove unfeasible.

The second caller, the member's mother, related that her son had been out with friends the previous evening and at approximately 22:00 hrs EDT, 24-Aug-2015, had collapsed. This collapse was witnessed by his friends who called an ambulance as he appeared to be in cardiac arrest.

The medical team was successful in resuscitating the member. They then conducted a CT scan of Mr. Baglivo's head and abdomen, both of which were negative for abnormal findings. A blood toxicology screen was negative for all drugs except alcohol which was already known as he had collapsed in a bar. They concluded that he had likely suffered an anoxic brain injury as a consequence of his cardiac arrest, resulting from too much time passing without oxygen.

James Baglivo experienced a second cardiac arrest when already in the hospital, at approximately 01:00 hrs EDT. He was on a ventilator although details of this event are limited. According to the member's mother, he was considered *brain dead* by hospital staff. At 05:55 hrs EDT he was removed from the ventilator and experienced his third and final cardiac arrest. James Baglivo was then pronounced legally dead.

The member's mother advised Alcor that because he was only 44 years old, the medical examiner was planning to perform an autopsy. AD called the Medical Examiner's (ME) Office to inform them of the member's intention to donate himself to Alcor upon his legal death. Alcor's objective was to work with the ME's office in the hope that they could waive their right to perform an autopsy, as this would be contrary to the member's directives.

The ME advised that they needed to find out why the member experienced cardiac arrest. They suspected a pulmonary embolism but did not have very much evidence to support this as the CT scans, and the toxicology screens were

negative. Once the ME's office received a faxed copy of information regarding the Uniform Anatomical Gift Act (UAGA) as it pertained to the member, they took his wishes into consideration. The ME's office did advise that the autopsy would not necessarily be absolute and that they could remain flexible, especially "in the name of science." AD sent a letter to the ME's office, along with the UAGA, which is described below.

.....  
**LETTER FROM AARON DRAKE,  
 ALCOR MEDICAL RESPONSE  
 DIRECTOR TO ATLANTIC COUNTY  
 MEDICAL EXAMINER**

August 25th, 2015  
 Atlantic County Medical Examiner  
 Attention: XXX  
 New Jersey

RE: James Baglivo

Dear Ms. XXX,

Thank you for taking my call this morning. This communication concerns the disposition of the human remains of James Baglivo, who died on August 25th, 2015. At the time of his death, Mr. Baglivo was a member of the Alcor Life Extension Foundation, a 501(c) (3) Non-profit Scientific Research Foundation, based in Scottsdale, Arizona.

Mr. Baglivo donated his body to Alcor under the Uniform Anatomical Gift Act for the purpose of having his body immediately cooled and then cryopreserved by Alcor. In accordance with Mr. Baglivo's post-mortem directives, it is our request to the Medical Examiner not to abrogate his civil rights and instead consider waiving the authority to perform a destructive autopsy to determine the cause of death. Mr. Baglivo already declared that he did not want an autopsy carried out on him, and there is absolutely no public interest which would be served by the performance of an autopsy. This is confirmed by the medical alert tag (bracelet/necklace) that he was purported to have been wearing at the time.

(...)

Within the paperwork, on page two (2) of his application, Mr. Baglivo states

a history of diabetes, heart disease and numerous complications following an automobile accident that occurred in 1991. His mother stated this morning that he developed a seizure disorder following his accident and was non-compliant with respect to taking his prescribed medication. Hopefully, this information along with any diagnostic imaging that was performed by the hospital and toxicology screening will be sufficient to consider this request.

(...)

Regarding the last attachment, Mr. Baglivo won an essay contest in 1993, sponsored by *Omni Magazine*, where we wrote about his desire to be cryopreserved upon his death so that as medical and technological advancements progress, he may have the opportunity to be resuscitated and restored to health at some unknown time in the future. His submission was published (*Los Angeles Times*, among other news publications) and \$100,000 [actually \$120,000, see above] was awarded to help fulfill his directives.

Thank you in advance for your consideration,

Aaron J. Drake, NREMT-P, NAEMSE

.....

When the member completed his Alcor application, he was 5'11", 24 years old, and weighed 91 kg. His 1991 auto accident (see above letter) resulted in injuries to his head, spine, right hip, and legs. In addition it caused a seizure disorder, and other unspecified complications, on top of which, as noted, he was noncompliant with his medications.

According to his Alcor application, written 16 Feb 1995, the member had two plates in his right orbital socket, Harrington rods in his lumbar spine, a screen in his jugular vein [sic], and ankle reconstruction. The member reported a family history of diabetes and heart disease. He denied having any allergies or taking any medications.

**PREPARATION AND DEPLOYMENT**

Flights from Scottsdale to Atlantic City were limited, and direct flights were unavailable. The closest major airport was in Philadelphia, and the last available flight

was at 18:00 hrs EDT on 25 Aug. 2015, which created a logistical challenge. As a result, AD contacted a local air ambulance company, which provided a one-way and a return trip quote.

Alcor received notification from the ME's office that the coroner was going to waive the right to do an autopsy and that the member would be released to Alcor's care. The coroner was planning to do a non-invasive examination of the member and thus was not prepared to release him until the next day. AD reiterated that they really could not wait, as the window to perform surgery was only 24 hours long.

Concurrently, the team at Alcor prepared for the field perfusion according to the direction of Alcor's CEO, Dr. Max More (MM). The timeframe for flying to the member meant that Alcor's only options would be to do a *field neuro cryoprotection* or a straight freeze. There would be no time to fly to the member and get back in time for a perfusion at Alcor.

A short time later, AD received a callback from the ME's office, stating that they would go ahead and allow for the member's release the same day, but with some time constraints. The morgue space at the hospital where the member was being kept was rented, and the personnel there ended their day at 15:00 hrs EDT. After that, the member would not be able to be released. That gave Alcor about 90 minutes to find a mortuary that was willing to participate and retrieve the member within that timeframe.

Fortunately, they had a referral for a small family-owned mortuary that they said would probably be interested in helping. AD reached out to them. They were very interested in helping and willing to comply with the time restrictions.

The mortuary was advised that Alcor's requirements would be that they would need a mortuary prep room to use for about six hours for surgery and perfusion, and a need for coolers, purchased water ice, and dry ice to keep the member as cold as possible throughout the entire process. They agreed and said that they would pick up the member within the time restriction.

This message was conveyed back to the ME's office which was in agreement. Documentation was transmitted by

fax, filled out, notarized, and returned, authorizing the release of the member from the Medical Examiner to Alcor.

Back in Scottsdale, the team continued to put together the *field neuro* kit and confirmed the flight with the air ambulance. As the team was unable to prepare quickly enough to get to the airport by 13:30 hrs MST, the air ambulance was the only option. As well, many of the flights were connections, which meant spending too much time in transit to be feasible. The only other commercial flight was at 22:30 hrs MST that would not arrive at the location until 09:00 hrs MST the next day.



Aaron Drake and Steve Graber loading the air ambulance at Scottsdale Airport 25 Aug 2015.

Alcor went ahead and authorized the air ambulance company to notify their pilots, as there was a two-hour advance window necessary for flight preparations. The team was to meet the plane at Phoenix Sky Harbor, on the private side of the airport by 15:00 hrs MST. The flight was scheduled to last four and a half hours, with a one-hour fuel stop in St. Louis, MO.

The team arrived at Phoenix Sky Harbor Airport just a few minutes before 15:00 hrs MST. Loading took a bit longer than usual as they had more equipment than they would normally carry on a typical flight. The plane was a Lear 35 Air Ambulance/Medical Airlift Configuration. Much of the Alcor equipment had to be strapped down, so the departure was at 15:30 hrs MST. The approximate arrival time was 23:00 hrs MST or a bit later.

It ended up that the mortuary was about 45 minutes outside of Atlantic City. It was 24 miles from the Philadelphia airport, so the flight re-routed to Philadelphia, PA,

instead of Atlantic City, NJ. There was a van waiting for the team.

Stopping the invasive autopsy was a good start and (among other things) saved time, yet time was still short and it drove the decision-making process. There was insufficient time to retrieve the physical entirety of James Baglivo and bring him to Alcor for a whole body *cryoprotection*. As it was, options were limited to a straight freeze (with massive attendant damage from ice crystals) or a *field neuro cryoprotection* and transport on dry ice. MM made the decision to authorize the *field neuro cryoprotection protocol*. This would enable the Alcor team to cryoprotect the member's brain with minimal delay even if an operating room would not be available. The move from *whole-body with no cryoprotection* (with a long delay), to *neuro cryopreservation with field cryoprotection* (with a much faster timeline), also enabled Alcor to pay for an air ambulance specifically to meet the member's time sensitive needs.

## FIELD CRYOPROTECTION SURGERY AND WASHOUT

*\*Note: The member is now the patient; Times are now all expressed in MST. [time] means that the intervention time was not provided.*

### Summary

Through the night, AD, in the role of Acting Surgeon, performed the *field neuro cryoprotection* and cannulation while SG ran the portable pump-powered perfusion equipment. He achieved target concentration through a 15-step cryoprotection ramp. The team then used dry ice to provide rapid cooling in Alcor's specially designed neuro shipper container.

### 25 Aug 2015

The team arrived at the funeral home at 22:43 hrs MST. The documentation was dropped off, and the patient was visually assessed. He was found to be morbidly obese, with no visible neck. His shoulders were elevated in an attempt to visualize his neck better, with his arms above his head. An intraosseous needle was initiated in the patient's left shoulder. Mannitol was administered, and the patient's head was shaved.

By 23:10 hrs both of the carotid arteries were raised, and the burr holes were initiated. The decision was made to perform the cephalic isolation after the burr holes were made, and prior to cannulation, due to the size of the patient's neck. The burr holes were completed by 23:13 hrs.

At 23:29 hrs, the nasopharyngeal (NP) thermocouple was inserted, and temperature logging was started. The patient's NP temperature was 14.8°C.

AD cannulated the left side of the patient's neck and started the washout with the first bag of the ramp. Their plan was to run two bags of B1 for washout. The pressure in the system was 111 mmHg, and the NP temperature was 1.0°C. The burr hole thermocouple temperature was reading 14.3°C, NP temperature 14.6°C, and HH's pressure monitoring value (expressed informally as *Hixon units*) was 321.3 (99 mmHg) and dropping. <sup>1</sup> (*time not noted*)

The system pressure was 140 mmHg, and there was no visible jugular flow. The surgical team focused on trying to improve this by clamping the bypass. This created a pressure of 170 mmHg once the bypass was off. It was noted that unclamping the bypass dropped the pressure and increased flow. (*time not noted*)

<sup>1</sup> \*Note: The *Hixon unit* represents a pressure which was recorded by adapting a thermocouple measurement meter to read input from a pressure sensor. The pressure figures are an alias which must be translated by an empirical equation:

$P = 1.1092 T - 257.46$  (Where *T* is the value displayed on the pressure channel)

## 26 Aug 2015

By 00:02 hrs the left vertebral artery was clamped, and the right was being sought, which marked the first time this had been performed in a *field neuro cryoprotection* procedure. The ramp had also been started at the same time.

Also at the same time, the patient's perfusate temperature was 2.4°C, his neural temperature was 4.9°C, and his NP temperature was 10.4°C. His pressure was 334.1 *Hixon units* (113 mmHg). At this point, the team was halfway through the second bag, and the third bag was hung.

The right carotid artery had become nicked, and AD was repairing it.

The system pressure was 138 mmHg along with a pressure of 335.5 *Hixon units* (115 mmHg) (*time not noted*)

At 00:10 hrs, AD inserted a thermocouple into the patient's left jugular vein. The thermocouples from the left jugular vein and the burr hole were switched. At this point, the burr hole temperature reading became the left jugular vein reading during the procedure, and at the end, it was switched back for cooldown transport. This was done to enable HH to collect the jugular vein readings.

By 00:16 hrs, half of bag #4 was infused. A refractive index reading was taken from the left jugular vein: 13.3 Brix.

At 00:20 hrs, the right jugular vein refractive index was 15.6 Brix at the end of bag four.

At 00:24 hrs the refractive index was 17.4 Brix from the left jugular vein. The system pressure was 140 mmHg. It held steady the entire time. The left jugular vein temperature was 4.1°C, and the right jugular vein temperature was 6.5°C. The temperature of the perfusate was 2.5°C. The pressure was 338.4 *Hixon units* (118 mmHg).

At 00:29 hrs bag #7 was hung, but it had not been spiked yet, as Bag #6 was still flowing. The system pressure was 138 mmHg, and the pressure was 335.5 *Hixon units* (115 mmHg). The left jugular vein temperature was 4.0°C, the right jugular vein temperature was 6.8°C, and the temperature of the perfusate was 2.5°C.

At 00:31 hrs the refractive index was 22.5 Brix. At this point, half of bag #6 was infused.

At 00:37 hrs the pressure was 130 mmHg, and the refractive index was 24.3 Brix. Bag #7 was initiated. The left jugular vein temperature was 4.2°C, the right jugular vein temperature was 6.5°C, and the temperature of the perfusate was 3.2°C. The pressure was 330.2 *Hixon units* (109 mmHg).

At 00:44 hrs the refractive index was 30.6 Brix. Bag #7 was  $\frac{3}{4}$  completed (emptied). At this time bag #8 was opened. The left jugular vein temperature was 4.2°C, and the right jugular vein temperature was 7.2°C.

The temperature of the perfusate was now 8.2°C because more pressure needed to be supplied to the patient which would reduce the number of times the perfusate could be run past the heat exchanger. The unusually slow flow was noted across the body of the patient and into the cephalon, with the conclusion that the room temperature was warming up the perfusate. A satisfactory solution for this has yet to be found.

At 00:45 hrs, salt was added to the chiller to lower its temperature to below 0°C. Bag #8 was flowing. The system pressure was 110 mmHg, and the refractive index was 33.3 Brix. The left jugular vein temperature was 4.1°C, and the right jugular vein temperature was 7.0°C. The temperature of the perfusate was 2.5°C. Opening the recirculating clamp on the perfusate caused the temperature to drop. This told the team what temperature the heat exchanger was capable of supplying versus the temperature then being observed in the patient.

At 01:03 hrs, the refractive index was 40.4 Brix, and Bag #8 was halfway complete. The left jugular vein temperature was 3.9°C, the right jugular vein was 6.8°C, and the temperature of the perfusate was 1.6°C. The team tried to get the perfusate below 0°C but was unsuccessful.

At 01:13 hrs the refractive index was 42.7 Brix, and the system pressure was 112 mmHg. The left jugular vein temperature was 3.8°C, the right jugular vein temperature was 7.4°C, and the perfusate temperature was 2.2°C. The pressure was 316.4 *Hixon units* (93 mmHg).

At 01:23 hrs SG announced that a correction had to be made. After speaking with AD, they discovered that a thermocouple was not inserted into the right jugular vein; thus, all of the temperature readings for the right jugular vein were incorrect. The team set out to correct the error and provide the proper readings.

Concurrently, the remaining readings were as follows: A refractive index of 52.7 Brix on the left-hand side and 43.5 Brix on the right-hand side. There was a left jugular vein temperature of 3.8 °C, and a perfusate temperature of 2.8 °C. There was no temperature reading available for the right jugular vein. The system pressure was 112 mmHg.

Of note, at 01:26 hrs, while attempting to insert the right jugular vein thermocouple, the left jugular vein thermocouple was momentarily pulled out but was then reinserted immediately. Once reinserted, the thermocouple showed a temperature of 4.8°C despite previously reading at a lower temperature. At this point, there was no right jugular vein temperature reading.

At 01:29 hrs the right jugular vein thermocouple was completely removed, and the burr hole thermocouple was plugged into slot #2 on the instrument. Previous to this, from the beginning of the procedure the burr hole thermocouple was plugged into slot #1.

Another change was made to the thermocouple leads: The nasopharyngeal and burr hole thermocouples were removed. Then the jugular vein thermocouple leads were plugged in, with the left jugular vein in #1 and the right jugular vein in #2. The right jugular vein thermocouple was then removed, and the burr hole thermocouple was plugged into #2. The temperature reading was 2.9°C. There was no nasopharyngeal temperature reading at the time, but the left jugular vein temperature was 4.8°C, perfusate temperature was 2.5°C, and burr hole temperature was 2.9°C.

At 01:46 hrs a visual examination was performed of the burr holes. Normally they are visible immediately, but because of the procedure and the position of the cephalon, they were oriented in a downward position. When lifting the cephalon to examine the burr holes, they appeared flat. There was no extrusion, but also no retraction of the brain within the burr hole space.

At the same time, the system pressure was 107 mmHg, perfusate temperature was 2.3°C, and the left jugular vein temperature was 4.8°C, although the vein was moved from its original location when the cephalon was lifted. Burr hole temperature was 2.6°C, and pressure was 308.7 *Hixon units* (85 mmHg).

The last Brix reading was fluctuating. The SPER Scientific refractometer was not providing a good reading. Alcor might have to find a different refractometer or go to an analog refractive unit. It read 52.3 Brix, and the next time the button was pressed it read 45.7 Brix.

At 01:59 hrs the refractive reading was 52.9 Brix. The left jugular vein temperature was 5.0°C, but this value may have been inaccurate. The cephalon temperature was 2.7°C, and perfusate temperature was 2.2°C. The system pressure was 102 mmHg. The Hixon unit reading was 304.4 (80 mmHg).

The temperature of the salted ice water coming out of the heat exchanger was -2.4°C. (*time not noted*)

The temperature of the salted ice water coming from the heat exchanger was -2.2°C. (*time not noted*)

At 02:24 hrs the perfusion was completed. Cleanup was underway, and the cephalon was transferred into the cooldown transport case with dry ice.

### SHIPPING

The team departed with their equipment and with Patient A-1624's cephalon in the customized cooldown transport case. They boarded the plane at 11:12 hrs MST. While they were en route, Alcor acquired 18 lbs of dry ice in preparation for the patient's arrival. The aircraft landed at Scottsdale Airport and unloaded without incident at 17:45 hrs. By 17:50 hrs they arrived at Alcor.

### COOLING TO LIQUID NITROGEN

The patient's cephalon was unwrapped, and an eye screw was placed in the neck stump at 18:00 hrs for lifting the cephalon. By 18:14 hrs, the cooldown was initiated.

Per HH: No isotherm was apparent in the dry ice transport cooldown data, but cooling was hampered by the patient's cephalon being wrapped in a towel. There seemed to be substantial cryoprotection.

### TIMELINES

*\*Times are standardized to MST/ Arizona time per protocol*

~1993 — James Baglivo won the *Omni Magazine Immortality Prize*, which was a \$120,000 life insurance policy, paid for by Alcor to fund a cryopreservation.

18-Jan-1996 — Mr. Baglivo finalized his membership arrangements with Alcor and then ceased responding to any communication attempts by Alcor.

### 24 Aug 2015

~19:00 hrs — James Baglivo, patient A-1624, collapsed in a bar, experienced cardiac arrest, was resuscitated and transported to the hospital by paramedics.

~22:00 hrs — The patient experienced a second cardiac arrest, in the hospital. He was placed on a ventilator.

### 25 Aug 2015

02:55 hrs — The patient was taken off of the ventilator, and then immediately experienced his third and final cardiac arrest. He was pronounced legally deceased.

05:03 hrs — Alcor received two notifications via TeleMed of the patient's legal death; one from the organ procurement service and the other from the patient's mother.

05:19 hrs — TeleMed called again to verify that the original text messages were received.

05:29 hrs — AD spoke with the Medical Examiner assigned to the patient.

05:59 hrs — AD advised that the ME was amenable, but needed more information. AD then went to the Alcor facility.

09:15 hrs — Alcor received permission from the ME to proceed. The ME's investigation consisted of a body surface inspection and drug screen.

11:58 hrs — The team was cleared to leave; the ME, hospital, mortician and aircraft were ready.

15:00 hrs — The team departed Alcor for Phoenix Sky Harbor (PHX) airport.

22:43 hrs — The team arrived at the mortuary and the patient was present.

23:10 hrs — AD raised the carotids.

23:13 hrs — The burr holes were drilled.

23:29 hrs — Began logging.

### 26 Aug 2015

00:02 hrs — Cephalic isolation was performed; the team was working to clamp

off the second vertebral artery. Perfusion was initiated.

00:10 hrs — A thermocouple (TC) was placed in the left jugular vein.

00:20 hrs — Bag #4 completed.

00:37 hrs — Bag #7 initiated.

00:44 hrs — Bag #8 initiated.

01:46 hrs — Burr holes were examined. No retraction of neural tissue was visible.

01:59 hrs — Above desired terminal concentration.

02:24 hrs — Perfusion completed.

10:38 hrs — As reported by SG, the cephalon was significantly swollen with a temperature just below 0°C. He surrounded the cephalon with dry ice for the return trip to Alcor.

11:12 hrs — The team was ready to board the plane.

13:18 hrs — Alcor acquired 18 lbs of dry ice in preparation for the patient's arrival.

17:45 hrs — The aircraft landed at Scottsdale Airport and unloaded.

17:50 hrs — The team and the patient arrived at Alcor.

18:00 hrs — The patient was unwrapped. The eye screw was placed.

18:14 hrs — Cooldown was initiated.

**Cooldown: No isotherm apparent in the dry ice transport cooldown, but cooling was hampered by the patient's cephalon being wrapped in a towel. There seemed to be substantial cryoprotection.**

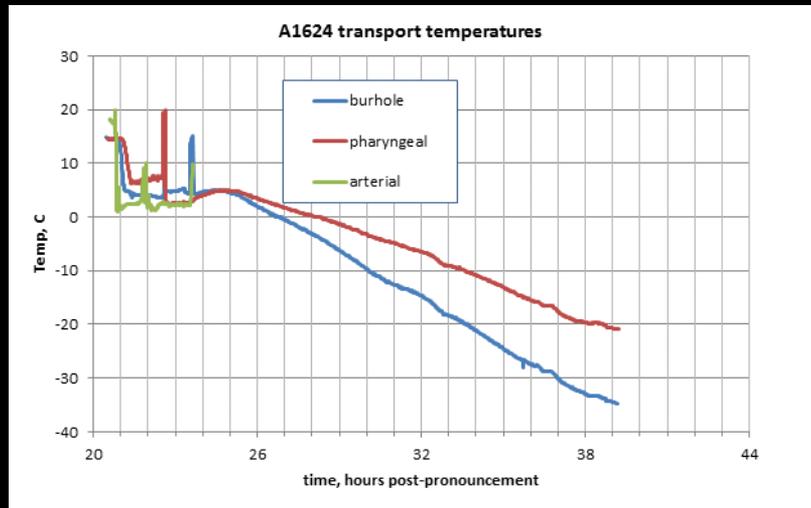
**CT Results: No shrinkage; erratic and incomplete cryoprotection.**

**Times**

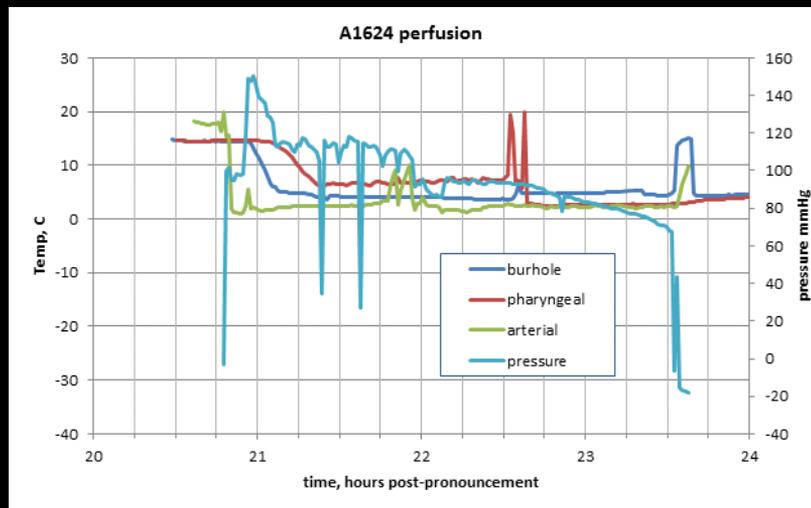
\* Times are expressed in the number of hours

# GRAPHS & CHARTS

1. **A-1624 Stabilization Temperatures Graph not available as the patient was not a suitable candidate for stabilization.**
2. **A-1624 Transport Temperatures**

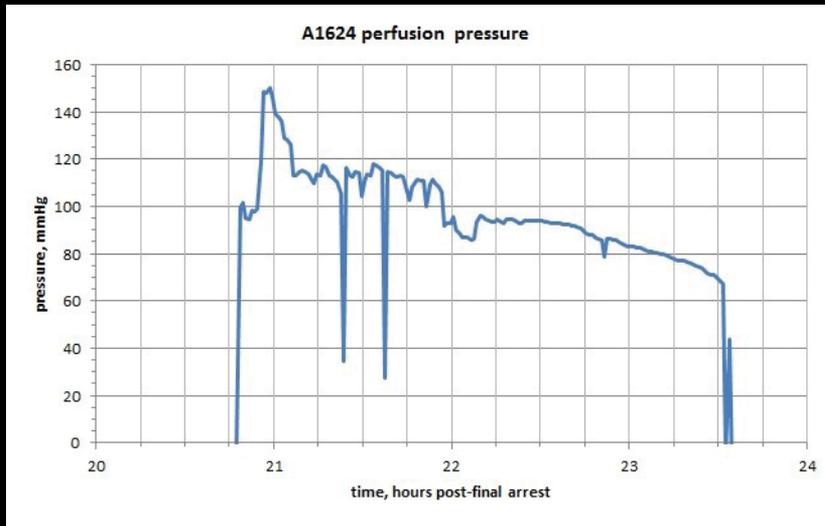


3. **A-1624 Cryoprotectant Perfusion Concentration Graph not available as patient received step ramp perfusion.**
4. **A-1624 Cryoprotectant Perfusion Temperatures and Pressure**

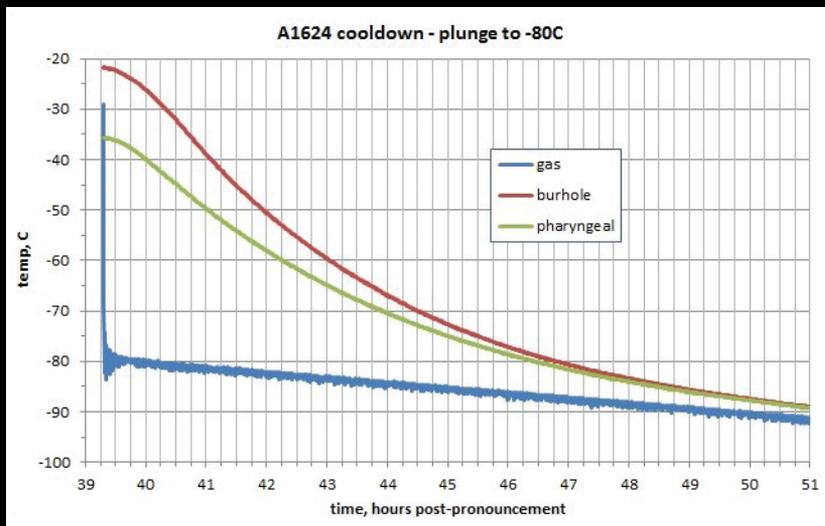


# GRAPHS & CHARTS

## 5. A-1624 Perfusion Pressure: Flow Not Provided



## 6. A-1624 Cryogenic Cooling Temperatures



and minutes as shown on this list, and they are not to be added together.

(hh:mm)

~08:00 — From first cardiac arrest to legal pronouncement.

~02:00 — From pronouncement of legal death to Alcor receiving notification.

~04:10 — From notification to release of the patient by Medical Examiner.

~10:30 — From notification to when the team boarded the aircraft in Scottsdale, AZ.

07:13 — From aircraft boarding to arrival at the mortuary, including refueling stop.

01:20 — From arrival at the mortuary to the onset of perfusion, including performing burr holes and cephalic isolation.

02:22 — From the start of perfusion to dry ice cooling.

~09:00 — From dry ice cooling to departure.

06:15 — Return flight, including refueling stop.

00:30 — Meeting at aircraft to the beginning of cooldown.

~29:00 — First cardiac arrest to the beginning of the ramp.

~47:00 — First cardiac arrest to the beginning of cooldown.

### Perfusates used:

Field neuro step ramp; 1x 2 L of B1  
Ramp 1-8, 2x M22x1.08 B1 - 13.8 L  
M22x1.25 in B1 carrier solution- 7.65 L

### ISSUES & ACTIONS

**Issue:** As per the Cooldown Coordinator, no isotherm was apparent in the dry ice transport cooldown, but cooling was hampered by the patient's cephalon being wrapped in a towel. There seemed to be substantial cryoprotection.

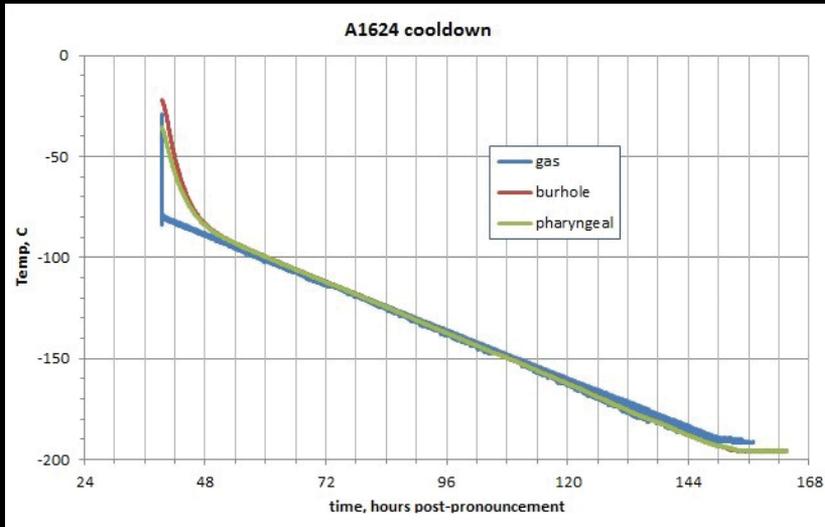
**Corrective Action:** Do not cover or wrap the patient's head for transport.

### POST CRYOPRESERVATION CT SCAN LINK

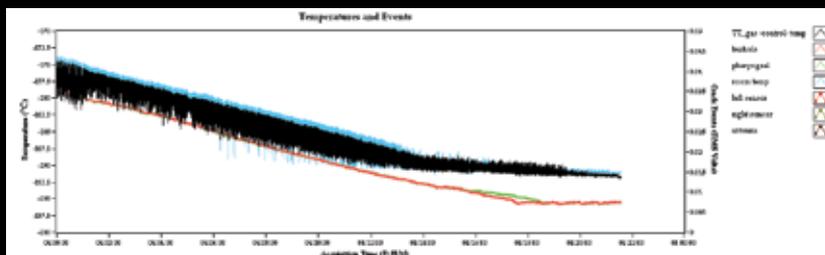
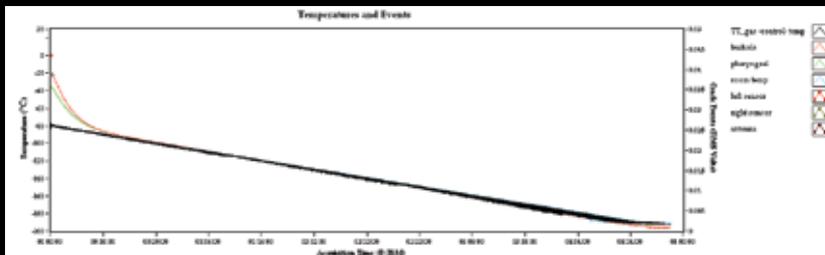
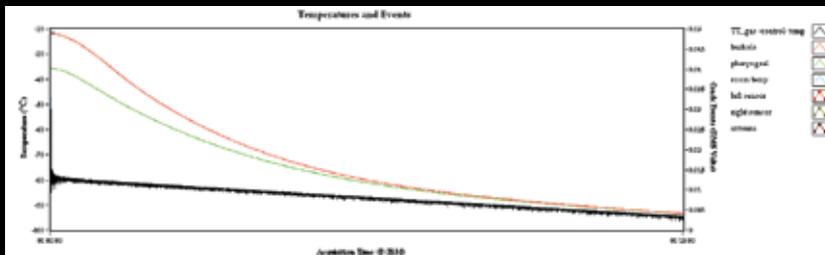
CT scans were conducted at liquid nitrogen temperature. However, the results are not ready for publication due to the need to complete the calibration of CT density to cryoprotectant concentration for the cryoprotectant solution used for this case. Once the scans have been calibrated appropriately for nM22 (M22 cryoprotectant mixture prepared in the carrier solution presently favored for neuro cases), a link will be added to the results. ■

# GRAPHS & CHARTS

## 7. Final Cooling Temperatures



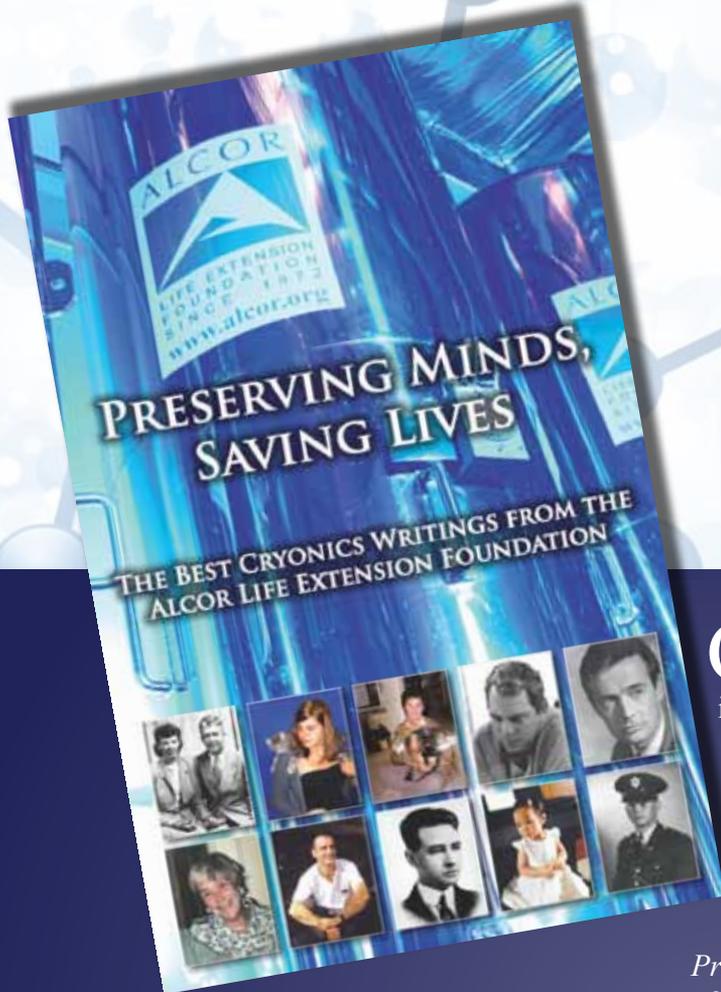
## A-1624 Additional Data



**ORDER  
NOW!**

# PRESERVING MINDS, SAVING LIVES

## THE BEST CRYONICS WRITINGS OF THE ALCOR LIFE EXTENSION FOUNDATION



*“Cryonics magazine introduced me to Alcor and cryonics at its best back in 1983. The visions and technological breakthroughs that you will read about in this book continue to shape Alcor’s mission to preserve life through science.”*

– Max More, Ph.D.  
President and CEO of Alcor

Cryonics is an experimental medical procedure that uses ultra-low temperatures to put critically ill people into a state of metabolic arrest to give them access to medical advances of the future. Since its inception in the early 1960s, the practice of cryonics has moved from a theoretical concept to an evidence-based practice that uses emergency medical procedures and modern vitrification technologies to eliminate ice formation.

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This book presents some of the best cryonics writings from *Cryonics* magazine from 1981 to 2012. There are clear expositions of the rationale behind cryonics, its scientific validation, and the evolution of Alcor procedures. Also covered are repair and resuscitation scenarios, philosophical issues associated with cryonics, and debates within the cryonics community itself.

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*"Society's failure to take cryonics seriously is a tragedy that is probably costing countless lives. Alcor, notably via its magazine, is leading the fight to change that."*

– Aubrey de Grey, Ph.D.

Biomedical Gerontologist and Chief Science Officer  
of the SENS Research Foundation

*"Alcor appears to be the leading organization in the application of cryonics in medicine.*

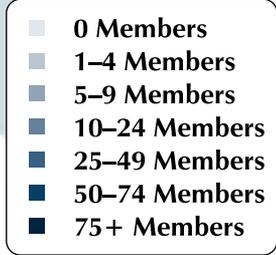
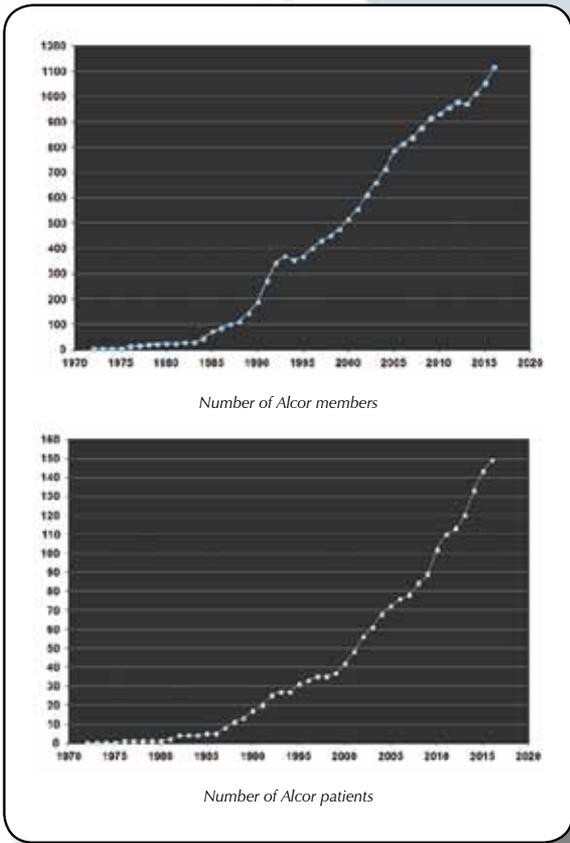
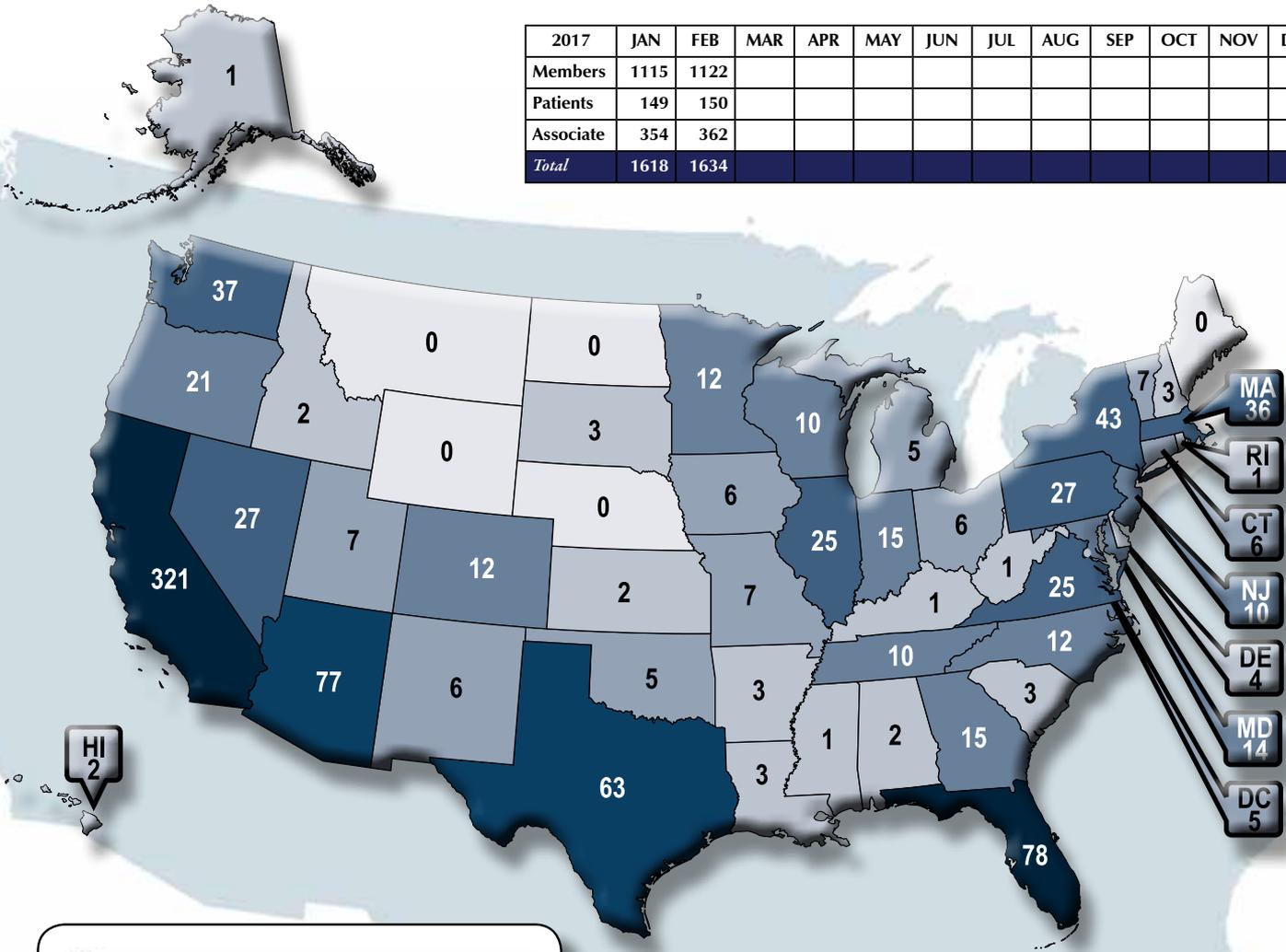
*I'm proud to be a part of this effort."*

– Michael D. West, Ph.D.

Stem Cell Scientist and Chief Executive  
Officer of BioTime, Inc.

# Membership Statistics

2017	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Members	1115	1122										
Patients	149	150										
Associate	354	362										
<b>Total</b>	<b>1618</b>	<b>1634</b>										



### International

Country	Members	Patients
Australia	13	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	5	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.



## A YEAR OF JUBILEES: SOME IMPORTANT CRYONICS ANNIVERSARIES

By R. Michael Perry



Every movement of any size and duration is likely to have its days of commemoration in which important past events are remembered. In cryonics we have Bedford Day—January 12—when the first person was cryopreserved under (crudely) controlled conditions. This was back in 1967, 50 years ago this last go-around, a “golden jubilee” event.<sup>1</sup> Other such anniversaries occurred during the year preceding. There was a prior “golden” in April 2016, for the 50th milestone of the first human cryonics-related freezing, that one cruder than Bedford’s. And in the following July there were two more dates, the 40th (“ruby”) jubilee of Fred Chamberlain II, Alcor’s first patient and father of Alcor cofounder Fred III; and the 25th (“silver”) jubilee of the cryopreservation of cryonics pioneer Jerry Leaf.

Nobody’s suggesting that the four above had any thought that their clinical deaths would be conveniently spaced for later historical retrospection or cared about it one way or the other. But the coincidence of round-numbered anniversaries does make a convenient backdrop to consider the four in one article, as we are doing here. Much of what is included has appeared in other publications through the years, though now collected into one place. And there is some information not previously made public, notably about the first freezing, where the patient is tentatively identified. Biographical and other human-interest details are emphasized rather than technical or other matters.

### THE FIRST FREEZING, APRIL 1966<sup>2</sup>

Cryonics got its start in the early 1960s, a milestone event being the formation of the Washington, D.C.-based Life Extension Society (LES) in December 1963, headed by Evan Cooper.<sup>3</sup> For the first year or two there was much discussion about the freezing (cryopreservation) idea. There was even an offer by LES to “freeze the first person for free” who had understood and expressed a wish for the cryopreservation option<sup>4</sup>—but no one was actually frozen. Finally, there was a success, reported by Cooper in the LES newsletter, May 1966, where he jubilantly reports: “Someone has been frozen at last!” He goes on to caution against too much optimism, however, though still sounding a hopeful note: “There is little or no thought that this first frozen pioneer will rise again in the 21st or 22nd century as considerable time elapsed between death and freezing. ... Yet this imperfect beginning may be a step forward toward bringing an extended life to others via cryogenics.”<sup>5</sup>

The freezing was arranged and funded by a relative of the patient (the “free freeze” offer of LES does not seem to have figured at all) and carried out by Cryo-Care Equipment Corporation. This organization had been started the previous year in Phoenix, Arizona by a local entrepreneur and wig maker, Edward Francis “Ed” Hope. Hope’s idea at the start was just to make body-sized insulated capsules for the cryogenic storage of people after legal death. Other organizations would buy the capsules and use them to store the clients

for possible later revival, in keeping with Robert Ettinger’s ideas which were then being popularized through his 1964 book, *The Prospect of Immortality*. There Ettinger had confidently predicted that a widespread practice would soon spring up,<sup>6</sup> and Hope wanted to cash in on it if possible by supplying the means for doing it—leaving the further details to the organizations that would be carrying it out.

To help him Hope enlisted two MIT-graduate engineers who lived and worked in the area, Ted Kraver and Frank “Rick” Rickenbacker. (The help of the two was voluntary and unpaid; both also hoped the operation would show success in the end and they would benefit.) Starting with their first meeting with Hope in September 1965, the two went to work and had a functioning prototype capsule by Christmas. Mounted horizontally on casters, the main component consisted of a hollow, cylindrical steel tube eight feet long and 32 inches in diameter – an off-the-shelf storage tank – together with a custom-built, aluminum inner liner to hold the occupant along with liquid nitrogen. The annular space between the outer tank and inner liner was evacuated to provide insulation in thermos-flask fashion. A week later, January 1, 1966, the capsule was shown at an LES conference in Washington, D.C., and over the next several weeks it was shown on the Merv Griffin Show and the Mike Douglas Show. You could climb inside it and it was a great publicity success, but it had its share of defects, and would never be used to store a human body or for any long-term storage.

Instead the two engineers set to work on an improvement, driven by an outside demand. A young man in Los Angeles wanted his mother who had just died frozen, and contracted with Cryo-Care. The woman, who had been embalmed about 18 hours after death, was stored in a mortuary refrigerator in Phoenix for about two months at near freezing temperature while the two engineers finished the new capsule and noted its greatly improved performance in holding liquid nitrogen.

Finally, on Friday, April 22, all was in readiness, and the body of the woman in its casket was brought into the Cryo-Care facility in a refrigerated truck. As it happened, as evening approached and it was time to start the freezing, Hope and Rickenbacker were not comfortable and found reasons to depart. This left Ted Kraver and the woman's son to handle everything. With some difficulty the heavy body was lifted from the casket into the horizontal capsule, the capsule was sealed, and liquid nitrogen was admitted to the inner liner that held the woman. It appears that the freezing started about ten p.m. and the operation was complete by one o'clock the next morning. Cryo-Care had not wanted to be involved in actual human freezing but, with no other facility at the time ready to accept patients, found itself reluctantly committed. (One reason for Cryo-Care's reluctance is that it had no means to do anything but a straight-freeze, unlike the more usual practice in cryonics of using cryoprotective perfusion.) For a few months the woman remained at the facility, expenses covered by the son, then she was removed from cryogenic storage.<sup>7</sup>

Hope said afterward he was "getting pestered quite a bit" (by the presumed relatives of the woman) and told them "she could never be resuscitated," inasmuch as "she'd already been embalmed when I got her." Embalming, however, could have preserved brain tissue, assisted by the cold storage of the body prior to freezing, so it's not clear what the woman's chances might have been, and it's sad the case was abandoned. The relatives did clearly have an interest in preservation for future revival and not just cosmetic preservation, which Hope, with at least good intentions, went to some length to discourage. In any case, supporting Cooper's speculation, this aborted first step was indeed a beginning to what has developed as cryonics today.

Who was this woman? Up to now there has been nothing in print as to her identity. The family requested anonymity, as Cooper informs us, but after half a century I am tentatively breaking the silence, based on some recent research that, among other things, suggests the main relatives in the matter are all deceased.<sup>8</sup>

Ted Kraver informed me that the man who arranged and paid for the capsule and the freezing, probably the son, was a certain W. M. Wilde<sup>9</sup> who lived in the Los Angeles area. A check of records shows a reasonable fit with just one individual, William Martin Wilde. Mr. Wilde was born March 9, 1928 in Bell, California, Los Angeles County, and died April 23, 2011 in Hemet, Riverside County, a few tens of miles away. He was the son of Robert Ogden Wilde and Sarah Frances Gilbert, and does not appear to have had any siblings.

Mrs. Wilde his mother did not stay married to her husband very long. In the 1930 census, Huntington Park, Los Angeles County, there is an entry for "Robert Wild" who is divorced, with other data confirming his identity as the father. In San Antonio Township, same county, there is an entry for "Sarah F. Gilbert," peculiarly claiming at first that she is single, then, with that crossed out, claiming she is married to a "G. E. Gilbert," whose entry now replaces hers, with hers shifted to one line below. She reports she is working as a waitress as is her husband, both 21 years old. I find no G. E. Gilbert, a rare combination of initials and surname, in the area after this or before. Did Ms. Gilbert contrive a ploy on the spot to disengage further from the man who lately had been her real husband? It seems so, in effect resuming her maiden name after the divorce. In the same census an infant, William M. (or "N" or "W" depending on how the record is read) Wilde, age 2, is shown living with his grandfather Harry Gilbert and Mary, wife of Harry, the three at a different but nearby residence to Sarah, in the same township.

Another record of Sarah Gilbert gives her birth date as August 8, 1908, with parents Harry and Mary (McLaughlin) Gilbert, place of birth Marcus Hook, Pennsylvania, a borough near Philadelphia. Other records show Sarah had several siblings, some surviving into the closing decades of the twentieth century. I have not yet found a record of her after 1930, though her death would have been about February 1966 to

fit the freezing hypothesis; she seems to have been rather secretive. (Did she die in Arizona rather than California? In Arizona, unlike California, death records do not become public until fifty years after the event, and then may be hard to access until finally being put online, which may take years, as I confirmed with the Maricopa County Public Records Office.)

In any case Sarah Frances Gilbert, who was briefly Mrs. Wilde, is my best guess as to the first person frozen. From the limited records seen thus far she seems to have been a feisty lady, not content with the status quo—did she eventually decide to challenge mortality also? As time passes more records should come to light and either confirm or refute this tentative identification, and add biographical details.



*The first person frozen, April 1966, approximate face reconstruction by the author, based on archival photos.*

#### **JAMES BEDFORD, JANUARY 1967<sup>9</sup>**

The freezing of James Bedford in Glendale, California on January 12, 1967 was a crucially important event in the early history of cryonics, because it was the first cryogenic preservation of anyone under controlled conditions. The event was organized by Robert F. Nelson of the newly-formed Cryonics Society of California, with technical supervision by Dante Brunol, biophysicist and M.D., and additional assistance by Robert Prehoda, a reduced metabolism expert. Due to some technical difficulties the preservation was very crude by modern standards, possibly little better than a straight freeze. Still, Bedford's freezing was more credibly the first "true" cryonics preservation since it was planned for and carried out starting with his cardiac

arrest, using some attempt at perfusion of cryoprotectant, followed by immediate cooling to cryogenic temperatures. Happily, after a long, eventful journey Bedford was accepted as a patient at Alcor and remains so today. January 12 is celebrated today by cryonicists as Bedford Day and Anti-Death Day.<sup>10</sup>

James Hiram Bedford, PhD, was born in Pittsfield Massachusetts, April 20, 1893, the son of Hiram Johnson and Fannie Louisa (Bryant) Bedford.<sup>11</sup> The future Dr. Jim did undergraduate work at Valparaiso University, Indiana where he graduated in 1917. The yearbook of that year shows his photo and notes his contributions to the student handbook and the yearbook itself, including photography. It adds, "Jim' is one of our hardest and most consistent workers. The bard must have been thinking of 'Jim' when he said: 'He was a gentleman on whom I built an absolute trust.'"<sup>12</sup> He was married that same year to Anna Chandler Rice who reportedly died the same year.<sup>13</sup> While his wife was ill he registered for the draft, claiming an exemption to care for her. He was then living in Chicago and working as a traveling salesman for a publishing company, John A. Herter.<sup>14</sup> According to a later report, however, he finally did serve in World War I and afterward helped servicemen fit themselves for return to daily life at home.<sup>15</sup>

About 1920 he married Ruby May McLagan; their five children, oldest to youngest, were Doris, Donald, Frances,



James Bedford, Valparaiso University, 1917.

Barbara, and Norman. Norman was instrumental in cryopreserving his father, following the elder Bedford's testamentary wishes, and in maintaining the preservation for many years on his own, including fending off a court challenge from some other family members who wanted the preservation terminated and the funds returned to the estate.<sup>16</sup> Dr. Bedford was transferred to Alcor's custody in September 1987, where he remains today. When he was placed in a modern, upright cryogenic capsule in 1991 after 24 years of storage in older, horizontal vessels, the still-unmelted ice cubes placed on his body the day of his cryopreservation showed he had been maintained at subfreezing temperature the whole time.<sup>17</sup>

Jim received a master's degree from the University of California, Berkeley in 1928<sup>18</sup> and a Ph.D. from the University of Southern California in 1934.<sup>19</sup> He wrote such books as *Youth and the World's Work* and *The Veteran and His Future Job*. For many years he taught at Glendale Junior College, Los Angeles County, Calif., and there founded a work experience program that emphasized on-the-job training. He also directed vocational guidance studies at John Brown University (Siloam Springs, Ark.) where his son Donald studied aeronautics.<sup>20</sup> He and a school friend, Dr. Bert F. Steelhead, collaborated on articles and books with vocational themes.

A serious-minded man of pleasant disposition, Jim made many friends. Mostly his talk was about practical ideals such as vocational guidance for young people and his ongoing interest in the readjustment of war-worn servicemen to civilian life, which extended to veterans of World War II after that conflict erupted. His heavy commitment to these subjects accounted for the habitual frown that marked his otherwise good-natured countenance. It was a frown of concentration not ill temper. "Progress must be made on the educational front," he once said, "to meet the challenge of the atomic age." "Don't be afraid to wear overalls," he would tell his students. "There is less competition in the overalls division of life than in the white-collar section and also greater opportunities and better pay."

Occasionally Jim took a radical departure from his course of life by going adventuring. He was among the earliest travelers to try out the Alcan road to the Canadian Northwest and to Alaskan

lands. Despite the hardships, he found the journeys fun and came back with stories and camera slides so he could pass on his hard-won information to others. Then he tried a wilderness tour in the Amazon country of South America and varied this research with an African safari which gave him close acquaintanceship with lions and other animals usually confined to zoos in civilized areas.

Such experiences might have made even as mild-mannered a man as Dr. Bedford give a serious thought to what may happen when the curtain comes down on a worldly existence. Still, one of Jim's closest friends expressed surprise at the unusual, icy aftermath of Dr. Jim's career. "It seems fantastic," he remarked, "and I can't explain it. I can offer a guess, however, knowing Jim as I did, that he might well have been thinking of others more than of himself." According to another commentator, "Actually, he felt his own chances for revival were slim, but by offering himself this way, as the first human being in history to embark on this venture, he would improve the conditions for others, members of his own family, perhaps, or a small child."<sup>21</sup>



Professor James Bedford, PhD, at Glendale Junior College, about 1949.

#### FRED CHAMBERLAIN II, JULY 1976<sup>22</sup>

From the Bedford freezing we jump forward a few years; in important ways cryonics had fallen on hard times. Though Bedford would remain preserved, most of the early freezings, which were poorly planned and massively underfunded, would terminate by 1980. Cryo-Care would cease operations, to be followed by the two main cryonics organizations of the 1960s, the Cryonics Society of New York (CSNY) and that of California (CSC).<sup>23</sup> Fred and

Linda Chamberlain had initially become active in CSC under Robert Nelson but would now break away and form their own organization, Alcor, in 1972. Fred, who was actually Fred III, had an ailing father he wanted to cryopreserve, and he and Linda were determined that their new organization would succeed where others were failing or had already.

Fred II, who was cryopreserved by Alcor July 16, 1976, was the first Alcor patient and also the first cryonics patient anywhere to be preserved as a neuro or head only. (The rationale was that the rest of the body could be rebuilt later, and meanwhile there would be a great saving of cost and inconvenience which was causing such problems with the patients thus far.) By this time replacement of body fluids with cryoprotectant, in this case a DMSO solution, had become the standard practice. Fred was attended by his son and others of the Alcor team, an early example of standby.

Frederick Rockwell Chamberlain II was born in San Francisco, California, March 28, 1897, the son of Frederick Senior and Julia Tewksbury (Robeson) Chamberlain. At an early age his family moved east to New Jersey, and settled after a few years in Plainfield where Fred finished middle school and went on to high school. There he was involved in school dances, sports, and other activities, but also recalled, no doubt with some embarrassment, how "I managed to flunk a few subjects, so, instead of graduating in 1914, I graduated at last in 1915." This had an unexpected benefit, however, since "each year the science teacher would pick a couple of boys from the graduating class and take them on a trip." He was picked, along with another student, Ted Ryder, who would become his college roommate. The trip was through the Presidential Range of the White Mountains of New Hampshire. Fred has left a vivid description:

"It was a wonderful trip and taught us how little it was really necessary to eat. We carried all our supplies on our backs, including a small tent. Our normal breakfast was 2/3 of an 8-inch pancake, 1/3 of an egg-powder omelet, and a cup of coffee. Lunch was usually a chunk of bread about the size of your fist washed down with water from a trail-side spring. Supper was a bowl of rice and coffee. Needless to say, we did not suffer from indigestion, and we did get rid of every bit of surplus

fat, and we were in wonderful condition before summer. We camped for a while in the Great Ravine. It was five miles to the nearest town where we got mail, and we used to run it both ways over rough rocky trails."

A few months later, in the fall of 1915, he was off to college at Brown University, Providence, Rhode Island, where he played football. (He was ineligible his second year because he flunked French.) But with the entry of the U.S. in World War I in 1917, two years before he would have graduated, he left school and enlisted in the Rhode Island National Guard. He saw active duty that summer as a U.S. Army private and later as a corporal at Ft. Wetherill, Rhode Island. He then went to Ft. Monroe, Virginia for officer training, and was commissioned in March 1918. Ordered to Puget Sound, Washington, he spent several months there and then was sent to Fort Eustis, Virginia, to join the 49th Artillery regiment then being organized. In September his regiment was ordered overseas and they marched from Fort Eustis to nearby Camp Stewart to board the transport ship. While at Camp Stewart there was a deadly outbreak of influenza in this pre-vaccine era, and nearly a third of the men in his battery died. More died on the transport before reaching its destination, Brest, France. After a week at Brest he was one of the officers sent to the French Artillery School, though the war was over before he saw any combat. Returning home and retiring from the service, during a short interval he was involved in oil prospecting in New Mexico, and also became a heavy equipment operator for a dam construction project. Then "the War Department announced that applications from former officers would be considered for reappointment." Sensing an opportunity, Fred applied and was accepted as a First Lieutenant in September 1920, becoming a career army officer, and remaining in the service until his retirement in November 1946. In 1929 he married Elizabeth Beverly Morecock; their son, Fred III, was born in 1935.

At the start of World War II, Fred was in charge of an experimental radar network protecting Washington, D.C. Later he became the Third Army's General Staff Antiaircraft Artillery Officer, serving under General George S. Patton. Colonel Chamberlain was responsible, among other things, for filing Antiaircraft Artillery After

Action Reports during the Third Army's campaign of 1944-45. The campaign itself played a major role in defeating and eliminating Nazi Germany. His reports fill many pages, including detailed maps of engagements, a book-length work of great historical interest. Here is a small sample, the opening paragraph of the report for January 1945, when the Third Army was in the vicinity of Luxembourg:

"The savage attacks by the Luftwaffe, in the attempt to slow down Third US Army's drive, reached their peak on 1 January when more than 308 hostile aircraft were over the area in 133 raids during the twenty four hour period. Attacks were heavy in the II Corps zone but the heaviest single attack of the day was on an airfield southwest of METZ (U8858). Here twenty five aircraft came in from all directions at low level and strafed the parked F-47's, twenty of which were destroyed and seventeen damaged. Of the twenty five enemy aircraft attacking however, sixteen were shot down by Antiaircraft Artillery and one more was claimed as probably destroyed."



*Gen. Patton (front row, fourth from left) and staff, Luxembourg, Jan. 1945. Col. Chamberlain is in the second row, third from right.*

After his retirement in 1946, Fred renovated and operated a farm in Keswick, Virginia for a number of years. Over the next two decades he lived in Charlottesville, Virginia; on North Manesota Key near Venice, Florida; and in Rockbridge Baths, Virginia. He devoted a lot of his time to architecture and art. Gradually the years took their toll, however, and by 1967 he had suffered a crippling stroke (remaining mentally competent). Late the following year, his wife Elizabeth died.<sup>24</sup> The unexpected loss of Betty to a sudden coronary, when she was otherwise healthy and vigorous, was a heavy blow both to father and son. Fred III soon got involved in cryonics, determined that at least his remaining parent would benefit from this procedure, when the time came. In 1972

he and his wife, Linda, were dissatisfied with existing cryonics organizations which were guttering out, including Nelson's group they had been involved with. They would start a new organization, the Alcor Society for Solid State Hypothermia (name changed to the present Alcor Life Extension Foundation in 1977<sup>25</sup>). Fred the father was sympathetic and financially supported the fledgling effort, including helping also establish the for-profit Manrise Corporation as a contractor for the not-for-profit membership organization, Alcor. (Alcor now does its own cryopreservations and has done so for many years.) When Fred arrested from a respiratory infection on July 16, 1976, all was in readiness and his cryopreservation occurred without major incident.



Col. Chamberlain



Betty Chamberlain and husband Fred, 1960s.

## JERRY LEAF, JULY 1991<sup>26</sup>

*I have been to war, and fought with valor.  
I have explored the unknown, and discovered.  
I have friends, and I care for them.  
I have found a fine woman, and I love her.  
I have fulfilled my commitments, and my  
name is integrity.  
I could not share my grief nor my anger, and  
now I am alone.  
I now have to decide, and live or die.*

—Jerry D. Leaf

Fifteen years minus a few days separate the cryopreservation of Fred II from that of Jerry Leaf, the last of our “jubilee” cases. A lot happened in cryonics and in Alcor during that time. Jerry is unique, among those reported here, and almost more generally, for the extent of his technical and other contributions to the very practice that finally was called to assist in his hour of need.<sup>27</sup> By the time Jerry was cryopreserved, Alcor's protocols had progressed to a glycerol-based perfusion that provided better protection than older approaches using DMSO. Partial efficacy had actually been demonstrated—dogs had been recovered from the initial stages of body washout and hypothermia, lending confidence that revival from the additional steps of cryoprotective perfusion and cryogenic cooldown would also be possible someday. In addition to the technical progress legal challenges had been weathered, and cryonics was on a stronger footing than ever, again thanks in part to contributions from Mr. Leaf himself.

Jerry Donnell Leaf was born April 5, 1941 in Artesia, California, close to Los Angeles, the son of Frederick Oliver and Alice Rowena (Barnes) Leaf. He spent much of his life in the Los Angeles area, punctuated by excursions to places far around the globe. At the time of his cryopreservation he had been living in nearby Downey for many years.<sup>28</sup>

As a toddler Jerry was already showing traits that would figure prominently in his later years. There was the time, aged three, that he went to the chicken pen to get some eggs and was chased back screaming by an angry rooster—but he got the eggs out undamaged! Another time, about age four, he went “exploring” while at a street fair and was found, about an hour later, by his dad and older brother, a police officer on

each hand. The young Jerry wasn't crying or asking for his mommy, just angry he had gotten caught. As he grew to manhood his attributes developed: a rare combination of dependability and independence, a desire for adventure, a cool competence informed by a rational outlook, a calm courage in the face of personal danger; a sensitivity to life, its values, and its problems.

After graduating from high school in 1959, Jerry and a friend, Doug Beverly, worked two months to buy equipment and supplies, then set off for the wilds of Guatemala, where they spent a month roughing it. Much later he would often talk about this trip, as Ralph Whelan remembered, and it seemed his opinions, values and ideals began to solidify with the adventure, “floating down a jungle river, meeting natives, hunting up dinner, encountering communists.” Though “he would later hold his own presenting scientific papers at the Society for Cryobiology,” Ralph said, “I will forever have the sense that this is what Jerry was all about. This was the sort of environment that allowed him to continually, moment to moment, prove to himself that whatever life had in store for him, he could take it. In fact, he would welcome it.” Jerry himself would rather modestly comment, “I'm probably like most people who enjoy living; I like to use all my senses. I like to see things that look good, smell things that smell good and use my body and mind to the fullest.”

On returning from Guatemala, Jerry faced three job opportunities, none of which he liked, so he chose a fourth: the U.S. Army. Sent to Germany, he witnessed atrocities attributable to the East German communist regime, and was there when they built the Berlin Wall. He wanted to strike back against world communism, so he volunteered for a Special Forces unit, and was sent on a secret operation to Vietnam. Bluntly, he became an assassin, “delivering death,” though under circumstances he felt were justified. “I do not regret having fought against an organized political system,” he said in 1986, “which, even today, threatens the freedom of its own citizens and those of neighboring countries.”<sup>29</sup>

Combat took its toll; the casualty rate in his own unit would eventually exceed 50%. The extreme hardship provided its own hard-won perspectives that would later bear fruit. “There is a special kind of chemistry

and feeling that is shared by people who face death together over a period of time. I came away from these missions with the face of death having a very specific meaning; it was defined by a roll call of men we carried out of North Vietnam. They went home; there were no MIAs. I lived because of these friends, and it was the worst feeling not to be able to reciprocate.”

Jerry’s wartime experiences would in fact orient him toward an unusual career in trying to extend human life. He lost his own fear of death “somewhere in the jungles of Vietnam” but retained “the fear of not being able to save someone else that I care about”—and also a love of life. After Vietnam he returned to Germany, and then to the U.S. “I began to become increasingly concerned over the issue of life and death—over the tremendous importance and preciousness of life.” When he left the military he tried gold panning for a few weeks in northern California and roughed it for a few more weeks in Honduras, alone. In 1965 he married Kathleen J. Connaughton; they would have two children. Meanwhile he had enrolled in Cerritos College. “I began to ask questions about life itself—I started studying biology and philosophy in college and I became particularly interested in suspended animation.” Then in 1966 he heard a lecture on cryonics (by Robert Nelson), and was intrigued. He started corresponding with cryonics groups.



*Jerry with wife Kathy and their daughter Kristen.*

After receiving a bachelor’s degree in philosophy, Jerry began doing graduate work in low-temperature biology at the University of Nevada, but within two years gave it up. The university was oriented toward ecological studies; Jerry “began to realize that I knew more about low temperature biology from my independent studies than they did! That, coupled with the lack of equipment available for graduate research caused me to make the decision to return to Southern California.”



*Jerry Leaf at Trans Time dog experiment, July 25, 1977.*

Jerry never did get an advanced degree. Instead he started working in the operating rooms at UCLA. In time he would become an instructor in thoracic surgery, coauthor over 25 papers from the UCLA laboratory, and set up a program for the cryogenic storage of heart valves and arteries for transplantation into children. Meanwhile he began to acquire equipment for his own use. In 1977 at Trans Time he directed the first total body washout and recovery of a dog by cryonics. (The animal lived 17 hours.) Later that same year he was the team leader in Alcor’s first experiment, a cryopreservation of a dog whose tissues were tested afterward for quality of preservation. (Recovery of live neurons from liquid nitrogen temperature was demonstrated.) Jerry soon set up an independent company, Cryovita, to further pursue this work, opening an office in Fullerton in 1978.<sup>30</sup>

Jerry was also a longtime member of the Society for Cryobiology, where he tried to educate the scientific establishment about cryonics and win its acceptance.

Unfortunately, this would prove elusive. In 1982 he campaigned, courageously if unsuccessfully, against an anti-cryonics faction within the Society. They were able to rewrite the Society’s bylaws to deny membership, and expel existing members, for “any practice or application of freezing deceased persons in anticipation of their reanimation.” Though Jerry was never expelled, known cryonists were afterward excluded. It was clear that the scientific mainstream was not the place to turn to for support.<sup>31</sup>

In the years following, Cryovita would instead work closely with Alcor, which would also be headquartered at the Fullerton address. (The two organizations moved to a facility in nearby Riverside in 1987.) In July 1984, Alcor/Cryovita under Jerry’s direction, assisted by Mike Darwin and others, revived a dog after total-body washout and hypothermia. It became a longterm survivor without detectable deficits, which again was the first achievement of its kind by a cryonics group. (A non-cryonist, Gerald Klebanoff, had pioneered this work in the 1960s.) Soon Jerry and Mike were reviving dogs from 4 hours of bloodless perfusion at 4°C, which lent much confidence that at least the initial stages of cryonics preservation were reversible. Their work led to such innovations as use of an extracorporeal membrane oxygenator for body washout, a better base perfusate, and silicone oil or “silcool” instead of isopropyl alcohol as a heat exchange medium in patient cooldowns as then performed (nonflammable and less injurious on contact with tissue).<sup>32</sup>

When a legal crisis erupted at the end of 1987 over the alleged pre-mortem cryopreservation (“homicide”) of Dora Kent, Alcor’s promising research was put largely on hold, and Jerry’s courage found a new outlet. His staunch dedication to Alcor and its patients during this well-publicized confrontation cost him his job at UCLA, but his support never wavered, and it helped pull the organization through. By mid-1991 the crisis had been weathered and Jerry was eager to resume cryonics research—but it was not to be. He was a heavy smoker who had tried to quit but not succeeded. On the night of July 10, 1991, at the age of fifty, he suffered a massive heart attack and was cryopreserved. Alcor suffered because of his untimely demise, but benefited greatly while he was active, and

cryonics achieved a new level of technical competence and respect.



Jerry Leaf at the transfer of James Bedford to a new dewar, May 25, 1991, seven weeks before Jerry himself was cryopreserved.

## AFTERTHOUGHTS

With the exception of the abortive first freezing, all of the cases reported here are now Alcor patients and have been for many years. At least two, maybe all three of these remaining had military backgrounds with significant wartime experience, which may seem ironic in view of the aim of cryonics to circumvent clinical death and greatly extend one's healthy life. Yet we can

imagine that the very exposure to death and destruction that comes with war provided a special motivation to try for something better. Jerry Leaf in particular lost his fear of death in a place where there was much danger of it, which, it appears, made it more compelling in turn to focus on trying to do something physically about the problem. This will not account for everyone's interest who has embraced cryonics, of course. Nor is there a guarantee that a military background, with or without actual time on the battlefield, will keep a cryonicist dedicated until they, too, become a patient.

We note in passing the sad case of Ralph Whelan, once an Alcor member and even a board member. Ralph is an authority for some of the material here, and the one under whose urging that I started this very column back in 1990.<sup>33</sup> (He also made an important contribution in gathering archival materials on James Bedford.) Earlier in 1990, and in his early twenties, he was a soldier on duty in Germany who had heard about Alcor as the result of a lawsuit filed on behalf of Thomas Donaldson who

wanted a premortem cryopreservation to save himself from an advancing brain tumor. (Though he failed in his attempt, Donaldson's effort gained publicity for cryonics and also dramatized the need for legislative reform with end-of-life choices.) Soon Ralph himself was signed up with Alcor, had become a board member, and was editor of this magazine. Over the years, however, his enthusiasm for cryonics dwindled and, facing a financial problem, he dropped his membership and ended his involvement, though not ruling out the possibility of resuming it later. But he is now buried, felled by a sudden coronary at age 46 in 2013.

Life is a fragile thing. Trying to do something special and significant to prolong it, as we are doing with cryonics, can be a tough proposition. We can draw inspiration from the daring attempts reported here, however, even as we care for the ones who are with us, and maybe, someday, bring our enterprise to a gratifying success. ■

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“Sing me a song of a lass that is gone.”

# Jesus Wept

by Bridget Nash [CreateSpace Independent Publishing Platform, 2016. ISBN 978-1539340553]

## Book Review by Mark Plus

“Great is this power of memory, exceeding great, O my God—an inner chamber large and boundless! Who has plumbed the depths thereof? Yet it is a power of mine, and appertains unto my nature; nor do I myself grasp all that I am. Therefore is the mind too narrow to contain itself. And where should that be which it does not contain of itself? Is it outside and not in itself? How is it, then, that it does not grasp itself? A great admiration rises upon me; astonishment seizes me. And men go forth to wonder at the heights of mountains, the huge waves of the sea, the broad flow of the rivers, the extent of the ocean, and the courses of the stars, and omit to wonder at themselves...”

*“Nash, in a story of revival from cryopreservation, explores issues of the self, identity and especially memory in the ways real cryonicists have argued about for years in our online forums and print publications.”*

Bishop Augustine of Hippo, *Confessions*, Book X.

Normally I wouldn't bother to read so-called “young adult” novels, especially ones written for girls. I used to work with a young woman who had read all of the

Twilight novels, and she told me way more than I ever cared to know about them.

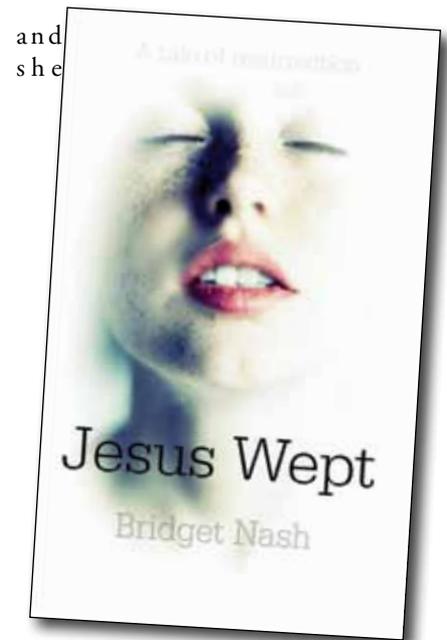
However this novel came up in an Amazon search of recently published novels with cryonics themes, so I thought I would buy a copy and give it try.

I couldn't put it down, and I don't regret my purchase.

Nash, in a story of revival from cryopreservation, explores issues of the self, identity and especially memory in the ways real cryonicists have argued about for years in our online forums and print publications. It looks as if Nash had done her homework before writing this novel, and I have to marvel at her sympathetic portrayal both of revived cryonauts (called “reanimates” in the novel) and of the cryonic-revival physician who puts his own career and freedom at risk to protect the rights of reanimates and look out for their welfare in a society when a demagogic politician wants to deprive them of their legal personhood.

Reanimates suffer from an unexplained retrograde amnesia where they retain their personalities, their sense of selfhood and their memories of the skills they acquired in their pre-cryonics lives, but they have lost all their episodic memories. Their ability to form new episodic memories remains intact, fortunately. The heroine and first-person narrator of the story, a teenage girl named Eira Donovan, died two days before her 18<sup>th</sup> birthday from injuries she suffered in an auto accident, and her distraught parents apparently put her into cryo.

But why would they do that? Her parents didn't make arrangements for their own cryo,



wakes up alone about a century afterwards in a special facility for patients like her. She struggles to recapture one elusive and possibly illusory memory that stands out in all the darkness of her past, however; and she interprets it eventually as a recollection of her existence in heaven during her time in cryopreservation. The mystery of Eira's life in this world deepens when she feels drawn to a young adult man, another reanimate like her, named Andrew; he likewise recognizes Eira without understanding why.

As Eira and Andrew try to reintegrate into a society where many things have changed, but human nature has remained

the same, they have to learn about each other again and try to unravel the mystery of their shared past. They also marry, but originally for legal advantages because they don't really know if they love each other; and then they adopt a four-year-old reanimate girl named Lavender who accepts them as her parents because she doesn't remember anything different. Lavender's youth makes her a blanker kind of slate than Eira's and Andrew's, and therefore she has more promising prospects for a successful life in Future World.

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*“Nash’s novel also hints at interesting questions about how religions would adapt in response to the technology to revive people long considered ‘dead.’”*

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What about the novel's title? Eira has no memory of any kind of Christian belief or observance, and the novel gives the impression that Christianity has nearly vanished in the world Eira has revived into. Perhaps a few enclaves of Christians survive here and there, like the world's remaining Zoroastrians in our time. While shopping in a kind of antique store for parts for her 100 year old camera, she comes across an old copy of the Bible:

“I knew what it was in a basic kind of way. A religious book that people used to guide their lives. Maybe I had even used one to guide my life when I was alive before now.”

She flips it open to the passage in the Gospels where Jesus hears of the death of his friend Lazarus. She reads in the text, “Jesus wept,” then the narration of how Jesus brings Lazarus back from the dead. Eira recognizes the similarities to her situation, and she buys the old Bible on impulse. While thinking about the story later, Eira wonders if Jesus wept because he knew that he would have to extract Lazarus' soul from heaven when he brought him back to life, much as Eira feels has happened to her, but through scientific means.

I have an issue with Nash's interpretation of the cryonics idea, however. Going back to Robert Ettinger's writings about cryonics in the 1960's, we have always emphasized that we expect the society that can revive us would enable us to live indefinitely in good physical and cognitive shape. I have heard of an individual who went into cryo with more modest goals, like wanting a chance to “finish life,” a phrase Nash actually uses in her novel for Eira's situation.

In Nash's Future World, by contrast, people still age and die, and they also have fragile immune systems because of the way public health and medicine developed after a devastating plague killed billions. In this world, even a stray, flea-bitten kitten introduced into the city can cause a public health emergency.

That aside, Nash's novel deals with the questions that real cryonicists have thought about for decades now. What would we cryonicists accept as “survival” from our revival from cryotransport? How attached do we feel to the episodic memories many of us hope to take with us across time? Would we still go into cryo if we knew we would revive with our pasts apparently erased like the reanimates in Nash's novel, and possibly having to deal with hostile elements in the receiving society?

Each cryonicist will have to come up with

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*“What would we cryonicists accept as “survival” from our revival from cryotransport? How attached do we feel to the episodic memories many of us hope to take with us across time?”*

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his or her own answers to these questions, given how little we know now. Memory's “inner chamber large and boundless” has fascinated thoughtful people since ancient times, as Augustine shows; and yet we still don't really understand it, despite advances in neuroscience. Perhaps the deep mystery

of memory will elude our understanding indefinitely.

Nash's novel also hints at interesting questions about how religions would adapt in response to the technology to revive people long considered “dead.” The story of Jesus and Lazarus in the Christian tradition allows some elbow room for “Christian cryonicists,” and I wish Nash had explored this further. Robert Ettinger likewise speculated about these kinds of adaptive theologies in his first two books about cryonics, written decades ago.

Despite the fact that the reanimates in *Jesus Wept* don't have the ability to “live forever” or become “immortal supermen,” Bridget Nash has made a valuable contribution to the small body of cryonics-friendly stories which can help to make the cryonics proposal emotionally accessible to ordinary people. ■

## Unique Visual Stimulation May Be New Treatment for Alzheimer's

Using LED lights flickering at a specific frequency, MIT researchers have shown that they can substantially reduce the beta amyloid plaques seen in Alzheimer's disease, in the visual cortex of mice. This treatment appears to work by inducing brain waves known as gamma oscillations, which the researchers discovered help the brain suppress beta amyloid production and invigorate cells responsible for destroying the plaques. Further research will be needed to determine if a similar approach could help Alzheimer's patients, says Li-Huei Tsai, the Picower Professor of Neuroscience, director of MIT's Picower Institute for Learning and Memory, and senior author of the study, which appears in the Dec. 7 online edition of Nature. "It's a big 'if,' because so many things have been shown to work in mice, only to fail in humans," Tsai says. "But if humans behave similarly to mice in response to this treatment, I would say the potential is just enormous, because it's so noninvasive, and it's so accessible." Tsai and an associate have started a company, Cognito Therapeutics, to pursue tests in humans.

Anne Trafton / MIT News Office  
7 Dec. 2016

<http://news.mit.edu/2016/visual-stimulation-treatment-alzheimer-1207>

## Gene Editing Takes On New Roles

What combinations of mutations help cancer cells survive? Which cells in the brain are involved in the onset of Alzheimer's? How do immune cells conduct their convoluted decision-making processes? Researchers at the Weizmann Institute of Science have now combined two powerful research tools – CRISPR gene editing and single cell genomic

profiling – in a method that may finally help us get answers to these questions and many more. The new technology enables researchers to manipulate gene functions within single cells, and understand the results of each change in extremely high resolution. A single experiment with this method, say the scientists, may be equal to thousands of experiments conducted using previous approaches, and it may advance the field of genetic engineering for medical applications. The gene-editing technique CRISPR is already transforming biology research around the world, and its clinical use in humans is just around the corner. Prof. Ido Amit of the Weizmann Institute of Science's Immunology Department led the study.

Weizmann Institute of Science /  
Eurekalert!  
15 Dec. 2016

[https://www.eurekalert.org/pub\\_releases/2016-12/wios-get121516.php](https://www.eurekalert.org/pub_releases/2016-12/wios-get121516.php)

## Pregnant Women's Stem Cells Could Treat Osteoporosis, Say Scientists

People with fragile bones could have their skeletons beefed up with infusions of stem cells harvested from pregnant women, researchers say. Scientists proposed the unusual therapy after studies showed that the treatment led to 78% fewer fractures in animals that were bred to have a brittle bone disorder. The finding has raised hopes for treating rare bone conditions that affect some babies from birth, but the same procedure has the potential to help older people with osteoporosis, and even astronauts who lose bone mass in orbit, the researchers said. "The stem cells we've used are excellent at protecting bones," said Pascale Guillot, who led the study at University College London. "The bones become much stronger and the way the bone is organized internally is of much higher quality." Osteoporosis affects more

than three million people in Britain alone, and the estimated costs of fractures reaches billions of pounds a year. Brittle bone disease is rare in newborns, but the 70 UK babies born with the condition each year can suffer fractures even before they leave the womb.

The Guardian  
20 Dec. 2016

<https://www.theguardian.com/science/2016/dec/20/pregnant-womens-stem-cells-could-treat-osteoporosis-say-scientists>



*If the treatment is found to be effective, it could be given to affected babies at birth, or even while they are still in the womb, to help them develop healthier skeletons. Photograph: Stocktrek/Alamy*

## Repairing Damaged Hearts with 3D Bioprinting

A printer that builds beating 3D hearts in a laboratory could soon be saving the lives of heart attack patients if a pioneering Australian trial proves successful. The Heart Research Institute (Australia) has bought a 3D bio-printer to engineer human heart tissue that can be stuck directly to a damaged organ following an attack. The experiment could dramatically alter the cardiac treatment landscape, giving heart-damaged patients a chance to fully recover and return to normal life. "If we can make it work we'll be changing the lives of thousands of Australians and flipping the world of heart attack treatment on its head" says Dr. Carmine Gentile, HRI research fellow and world leader in 3D tissue culture. The two common heart treatments, coronary angioplasty and reperfusion therapy, offer

excellent results for patients who receive them very soon after an attack, but those who miss out often suffer irreversible heart damage. Cardiac spheroids – unique 3D human mini hearts – developed by Dr. Gentile were built from stem cells to be used as “bio-ink” to print cardiac patches.

Heart Research Institute  
31 Dec. 2016

<https://www.hri.org.au/latest-news/december-2016/aussies-pioneer-new-approach-to-mend-broken-hearts>

## Natural Tooth Repair Method Using Alzheimer’s Drug

A new method of stimulating the renewal of living stem cells in tooth pulp using an Alzheimer’s drug has been discovered by a team of researchers at King’s College

London. Following trauma or an infection, the inner, soft pulp of a tooth can become exposed and infected. In order to protect the tooth from infection, a thin band of dentine is naturally produced and this seals the tooth pulp, but it is insufficient to effectively repair large cavities. Currently dentists use man-made cements or fillings, such as calcium and silicon-based products, to treat these larger cavities and fill holes in teeth. This cement remains in the tooth and fails to disintegrate, meaning that the normal mineral level of the tooth is never completely restored. However, in a paper published today in *Scientific Reports*, scientists from the Dental Institute at King’s College London have proven a way to stimulate the stem cells contained in the pulp of the tooth and generate new dentine in large cavities, potentially reducing the need for fillings or cements.

King’s College, London, Dental Institute  
9 Jan. 2017

<http://www.kcl.ac.uk/dentistry/newsevents/news/newsrecords/2017/January/Natural-tooth-repair-method-using-Alzheimer’s-drug-could-revolutionise-dental-treatments.aspx>



## 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:

Jerome B. White, “**Viral-Induced Repair of Damaged Neurons with Preservation of Long-Term Information Content**,” Second Annual Conference of the Cryonics Societies of America, University of Michigan at Ann Arbor, April 11-12, 1969, by J. B. White. Reprinted in *Cryonics* 35(10) (October 2014): 8-17.

Michael G. Darwin, “**The Anabolocyte: A Biological Approach to Repairing Cryoinjury**,” *Life Extension Magazine* (July-August 1977):80-83. Reprinted in *Cryonics* 29(4) (4th Quarter 2008):14-17.

Gregory M. Fahy, “**A ‘Realistic’ Scenario for Nanotechnological Repair of the Frozen Human Brain**,” in Brian Wowk, Michael Darwin, eds., *Cryonics: Reaching for Tomorrow*, Alcor Life Extension Foundation, 1991.

Ralph C. Merkle, “**The Molecular Repair of the Brain**,” *Cryonics* 15(1) (January 1994):16-31 (Part I) & *Cryonics* 15(2) (April 1994):20-32 (Part II).

Ralph C. Merkle, “**Cryonics, Cryptography, and Maximum Likelihood Estimation**,” First Extropy Institute Conference, Sunnyvale CA, 1994, updated version at <http://www.merkle.com/cryo/cryptoCryo.html>.

Aubrey de Grey & Michael Rae, “**Ending Aging: The Rejuvenation Breakthroughs That Could Reverse Human Aging in Our Lifetime**.” St. Martin’s Press, 2007.

Robert A. Freitas Jr., “**Comprehensive Nanorobotic Control of Human Morbidity and Aging**,” in Gregory M. Fahy, Michael D. West, L. Stephen Coles, and Steven B. Harris, eds, *The Future of Aging: Pathways to Human Life Extension*, Springer, New York, 2010, 685-805.

Chana Phaedra, “**Reconstructive Connectomics**,” *Cryonics* 34(7) (July 2013): 26-28.

Robert A. Freitas Jr., “**The Alzheimer Protocols: A Nanorobotic Cure for Alzheimer’s Disease and Related Neurodegenerative Conditions**,” *IMM Report* No. 48, June 2016.

# 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 which are held once a month at a midtown location.

## PACIFIC NORTHWEST

A Yahoo mailing list is also maintained for cryonicists 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 cryonicists 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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