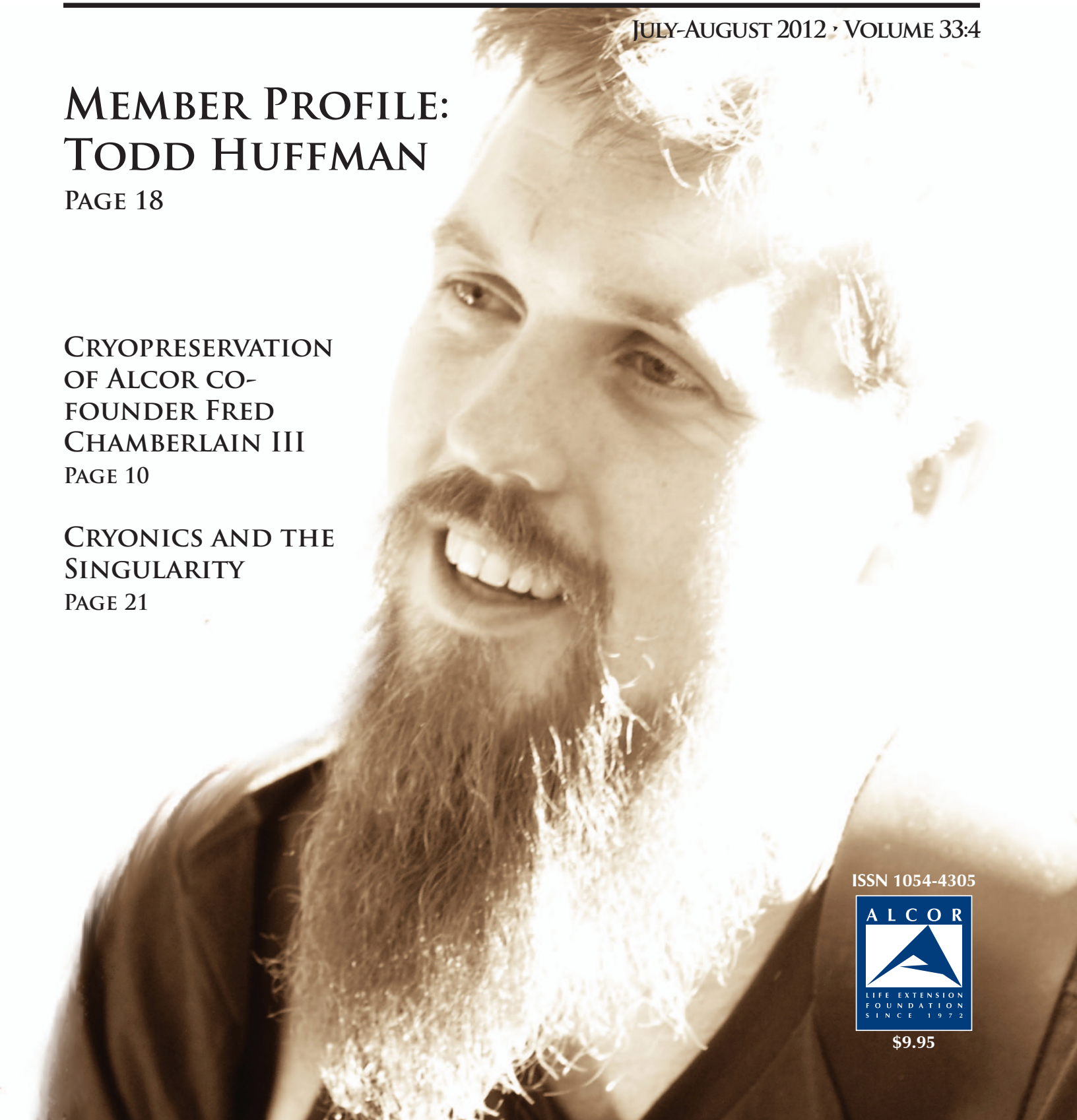
Alcor Life Extension Foundation

Cryonics

July-August 2012 · Volume 33:4



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ISSN 1054-4305

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SINCE 1972

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ALCOR LIFE EXTENSION FOUNDATION
CRYONICS

Cover Photo:
Todd Huffman - Neuroscientist and Alcor member since 2002

COVER STORY: PAGE 18

Member Profile: Todd Huffman
Neuroscientist Todd Huffman has been involved with Alcor since the early 2000s as a staff member and standby team member. In many of his intellectual and business endeavors, the link with life extension is undeniable. Learn more about this colorful individual and what his work in brain scanning can mean for the field of cryonics and personal survival.

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CRYONICS

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FROM THE EDITOR

As the previous issue of *Cryonics* magazine went to press Alcor co-founder Fred Chamberlain III was cryopreserved. In this issue, we publish the report for this case and also a selection of writings by Fred. As will be evident from this report, Fred and his wife Linda clearly recognize the importance of relocating to Alcor when terminally ill. Recent cryonics research has further reinforced that rapid cooling and minimizing the time between pronouncement of legal death and start of cryonics procedures is a necessary condition to fully take advantage of the properties of vitrification to eliminate ice formation. In fact, Alcor's Comprehensive Member Standby (CMS) includes up to $5,000 of relocation assistance for terminally ill Alcor members.

Publication of each new case report in *Cryonics* magazine was the rule during most of Alcor's existence but as the number of Alcor cases increased, and the number of issues decreased, over the years, I have been rather selective in choosing them for paper publication. Now that increased funding and resources are available again to publish the paper magazine more frequently, I intend to run more of them. As discussed in my article for the 4th Quarter 2010 issue of *Cryonics*, the preparation and publication of case reports serve a number of important objectives, including quality control, identification of challenges and solutions, public accountability, and preliminary data gathering for future resuscitation.

Not only does the future for the magazine look bright (thanks to the generous support of the Life Extension Foundation) but Alcor's 40th anniversary provides the perfect opportunity to collect some of the best contributions to the magazine in the form of a book. To this purpose, former *Cryonics* Editor Steve Bridge and I are carefully re-reading all the back issues of the magazine to make an initial selection which will be further discussed with other Alcor officials before a final selection is made. We aim to have the publication of the book coincide with the upcoming Alcor-40 conference.

As can be seen in the new Alcor CEO update, the line-up of speakers for the October Alcor 40 conference is almost complete. I am excited to present the research of my own neural cryobiology company Advanced Neural Biosciences and am looking forward to hearing different perspectives on aging ('programmed aging', 'wear and tear' etc.) and personal survival. Make sure to register early for the conference to take advantage of the lower rates. Existing Alcor cryopreservation and Alcor associate members pay even less! New updates about the conference will be made available on the Alcor website, the Alcor News blog, Facebook, and the magazine website. Opportunities to sponsor the Alcor conference can be found in this magazine.

I am also glad to report that Alcor's new Associate Membership program is looking successful. If you have any relatives or friends who support Alcor's mission but are still on the fence about making cryonics arrangements themselves, please tell them that they can now join and support the Alcor Life Extension foundation for $10 a month (or $30/quarter or $120 annually) and receive attractive benefits such as a subscription to the paper magazine and discounts at conferences. More information at: http://www.alcor.org/BecomeMember/associate.html

Aschwin de Wolf

CEO Update

By Max More

My report for this issue will be limited primarily to an update on the Alcor-40 conference. But first a brief update on spreading the word.

Communication

I was interviewed by a writer working on a book on life extension, which started out as a TEDx talk. An earlier interview on Radio Ireland's Future Proof, hosted by Jonathan McCrea, is available online. My interview (dated May 12) starts 11:45 into the program: http://www.newstalk.ie/programmes/all/futureproof/podcasts/

On June 12, Alcor member Maria Entraigues joined us for an all-day filming by Argentina's Discovery Channel show. This was an elaborate piece of filming, starting with me answering questions about the cryopreservation procedure and what Alcor does. Then the more interesting part took up the bulk of the day, as the film crew followed while Aaron explained to Maria what would happen to her if she needed to be cryopreserved. In preparing for this documentary filming, we decided that there are some inexpensive measures we can take to modify the lighting in the patient care bay, reducing the harsh, chilly, silvery appearance.

One amusing incident occurred recently when a couple of senior baseball fans showed up without notice, hoping to see where Ted Williams was kept. Given the damage done to Alcor's reputation by false and sensational claims made in a fairly recent book, these baseball enthusiasts were far from being hostile or combative. They were excited to see where Mr. Williams is being cared for, and even asked me to sign the Williams' page of their book on baseball greats. It is not true that any publicity is good publicity. However, at least some readers are sufficiently critical to investigate matters for themselves.

"We will give full credit of the registration fee to anyone who makes cryopreservation arrangements at the conference."

Alcor-40 Conference: Looking Forward to the Next 40 Years

The latest details of the conference and registration information are available on the Alcor website.

When: Friday, October 19 to Sunday, October 21, 2012

Where: Scottsdale Plaza Resort, 7200 North Scottsdale Road, Scottsdale, AZ 85253

Rooms are $159/night for single & double rooms.

Speakers and sessions include:

- **Sebastian Seung** on testing how well cryopreservation (and alternatives) preserves the connectome.
- **Todd Huffman** on brain scanning.
- **Michael Rose,** "How to Control Your Aging."
- A panel discussion on long-term financial planning, including investing strategies, inflation protection, and personal trusts.
- **Aschwin and Chana de Wolf** from Advanced Neural Biosciences, "Cryopreservation of the Ischemic Brain."
- **Greg Fahy**, from 21st Century medicine on advances in cryoprotection.
- **Aubrey de Grey** from the SENS Foundation.
- **Joshua Mitteldorf,** "Four Paths to Extending Life."
- **Anders Sandberg** on "Handling the unknowable and undecidable: rational decision making about future technology."
- **Catherine Baldwin,** "Advances at Suspended Animation."
- A panel on medical monitoring devices for improving your chances of a quick response in case of a critical physiological failure.
- **Max More** on how to improve your prospects for an optimal cryopreservation.
- Sunday afternoon cookout and tour of Alcor.

If you are familiar with other recent conferences (and compare to Alcor's 2006 and 2007 events), you'll see that our registration rates are being kept low. We recognize that, especially in the current economy, high conference fees are an obstacle. These are the rates for (associate) members and non-members:

- **Early registration, until July 31:** $275 ($295 non-members)
- **August 1 to September 14:** $325 ($345 non-members)

- **From September 15:**
  $365 (385 non-members)

We will give full credit of the registration fee to anyone who makes cryopreservation arrangements at the conference.

Since we are keeping registration low, we are asking for sponsors to step forward and help cover the costs of bringing in speakers and contributing to the many other expenses of what we aim to be Alcor's best-attended conference to date. You will find sponsorship opportunities here in the magazine and on the conference webpages. (Remember that your contributions may be tax-deductible.)

It's not too late to provide us with suggestions on how to do better than previous conferences. We have pored over the feedback many of you gave on the last two events and we're acting on the most consistent comments. For instance, we're working to ensure that we provide healthy food that is compatible with a range of dietary preferences.

Following is a preliminary schedule. See the conference website pages for a current version, including scheduling of specific talks.

Friday • October 19, 2012

Registration	5:00 pm – 8:00 pm
Welcome reception	7:00 pm – 10:00 pm
Welcome address	8:00 pm
Networking	10:00 pm until late

Saturday • October 20, 2012

Registration	7:30 am – 12:00 pm
Breakfast	7:30 am – 8:30 am
Speaker Presentations	9:15 am – 12:30 pm
Lunch	12:30 pm – 2:15 pm
Speaker Presentations	2:15 pm – 5:30 pm
Banquet Dinner	7:00 pm – 10:00 pm
Networking	10:00 pm until late

Sunday • October 21, 2012

Breakfast	7:00 am – 9:00 am
Speaker Presentations	9:30 am – 1:00 pm (or a bit later?)
Alcor Open House & Cookout	2:30 pm – 7:30 pm

Alcor 40th Anniversary Conference Sponsorship Opportunities

	Amount	Available
General Conference		
Alcor Patron	$5,000.00	3
Alcor Sustainer	$2,500.00	4
Alcor Supporter	$1,000.00	5
Journal Publisher	$1,750.00	2
Friday, October 19th		
Opening Reception		
Reception Grand Host	$1,000.00	1
Reception Host	$500.00	2
Reception Contributor	$250.00	4
Saturday, October 20th		
Continental Breakfast		
Provider	$1,000.00	1
Contributor	$500.00	2
Program Panels		
Speaker Host	$2,000.00	3
Speaker Associate	$500.00	6
Hosted Breaks		
Provider	$500.00	2
Contributor	$250.00	4
Evening Reception		
Reception Grand Host	$1,000.00	1
Reception Host	$500.00	2
Reception Contributor	$250.00	4
Sunday October 20th		
Alcor 40th Anniversary Cookout		
Food Sponsor	$2,000.00	2
Beverage Sponsor	$500.00	2
Tour Sponsor	$250.00	2

Parachutes and Safety Ropes

By Fred Chamberlain III

{Reprinted from* Cryonics *1st Qtr 1999, 6-7.}

Fred Chamberlain III

Recent Call

In November of 1998, an Alcor Member called just after learning that his uncle had suddenly died.

"He's dead, and now his brain cells are losing ground every minute," the Member exclaimed. "How do we get his suspension started?"

I had to say that Alcor could advise, but could not become involved at the beginning. There might be provisions in the will for cremation. The uncle might have told others he did not *want* to be frozen. There were the questions of who was legally "next of kin" and could consent to a suspension. These were only the tip of the iceberg, in the way of problems.

Past Experience

"I know what you're going through!" I told the Member.

Starting in 1965, I told *my* relatives about cryonics, after reading Bob Ettinger's *Prospect of Immortality.* When a cousin or uncle of *mine* had a terminal illness, I gave them names of cryonics groups and suggested they "check them out." None were ever frozen. I felt it wasn't right for me to *push* them, to interfere with their personal life/death choices.

Four years later, in mid-December, 1969, I suddenly learned that my mother had died, in Florida, three thousand miles away.

The Specifics

"They found her in the driveway," I was told by friends living near the small apartment my parents rented for the Holiday Season. My father, a helpless stroke victim, had wondered for hours why my mother hadn't come back from checking the mailbox.

"We don't know what to do!" my parents' friends continued. "Can you fly out here right away?"

It came to me in a flash! I knew those early cryonics groups were tiny, but I'd never asked for details, had I? My mother's will would say, "cremation," wouldn't it? My Father was "next of kin." He would have to approve. Why hadn't I thought ahead?

How shallow the suggestions to my relatives now seemed! I'd asked them to consider something I didn't even have facts about, myself! Now, with many hours gone by, my mother was probably already embalmed, for the funeral. Cryonics was not a viable option for my mother, given all the factors involved. I had to face that!

"Without arrangements in advance, cryonic suspensions are unlikely to take place."

The Outcome

For the next few months, I pondered what had happened. Then I joined the Cryonics Society of California (CSC). There, I found a young woman (Linda McClintock) helping to organize the Third National Cryonics Conference, to be held in May 1970. I started the signup process for my dad and myself. Within the next year, Linda and I had joined forces, formed a corporation to consolidate resources for improved cryonics technology and rescue, and had realized that deep-seated problems within CSC now necessitated a new cryonics organization (Alcor).

Back to the Recent Call

I explained this to the Alcor Member calling about the sudden death of his relative. "I've been there!" I said. "I know what you're feeling!"

There was a sigh of relief at the other end of the phone. The Member now knew that what we want, and what we can actually do in a practical sense, may be very different. Inevitably, we *will* lose people we want to take along. There is no way around this. All we can do is to do what we can, and not mentally torture ourselves endlessly about irrecoverable losses.

Important Points

1. Without arrangements in advance, cryonic suspensions are unlikely to take place. The basic idea of cryonics is simple. Arrangements in advance are *not* simple. Those arranging to be frozen need to weigh the technical challenges and other uncertainties, as well as the costs. "Snap decisions" under great stress, on behalf of others, are not a reasonable way to deal with complex life/death options.

2. Freezing people without advance arrangements *is* possible, but only if the next of kin takes independent action or finds others to help, who rush in blindly without due regard to potential problems or liabilities. Alcor, with 35 suspendees to protect and about 450 signed up [1999 numbers] suspension members, cannot take these risks, no matter how much we want to help.

3. If you communicate with others about cryonics, as a personal option for them, you owe them an explanation of the above two points. Please do not advocate cryonics as a way of attempting to deal with death, without pointing out the essential need for arrangements in advance.

"Cryonics arrangements are like parachutes. If life is like a flight, and there is a possibility you might fall from the sky, the parachute must be there when you need it. You cannot reach for a ripcord as you fall, and pull it, or have someone pull it for you, if you do not wear a parachute to begin with."

Parachutes and Safety Ropes

Cryonics arrangements are like parachutes. If life is like a flight, and there is a possibility you might fall from the sky, the parachute must be there when you need it. You cannot reach for a ripcord as you fall, and pull it, or have someone pull it for you, if you do not wear a parachute to begin with.

In another sense, we are like climbers going upward, toward the future. If someone falls, cryonic suspension is like a very long safety rope, which tugs on the rest of us as the suspended member "falls into the clouds below." Is the member alive, or not? We will not know for many decades. Still, we climb on, toward the future. If those climbing near us are not tied into the safety rope and fall, as they pass into the clouds below, they are lost to us forever, so far as we know or have any concrete reason to believe.

Parachutes and safety ropes are not for everyone. For some of us, however, the thirst for the future, the company of each other, and the enjoyment of life are one continuous whole. We rope ourselves together for safety, and wear parachutes so that we stand some chance of rejoining the others if all else should fail. Despite unknowns of many kinds, we fly and climb as if our lives were the most valuable things we possess. For indeed, they are! ■

Notes

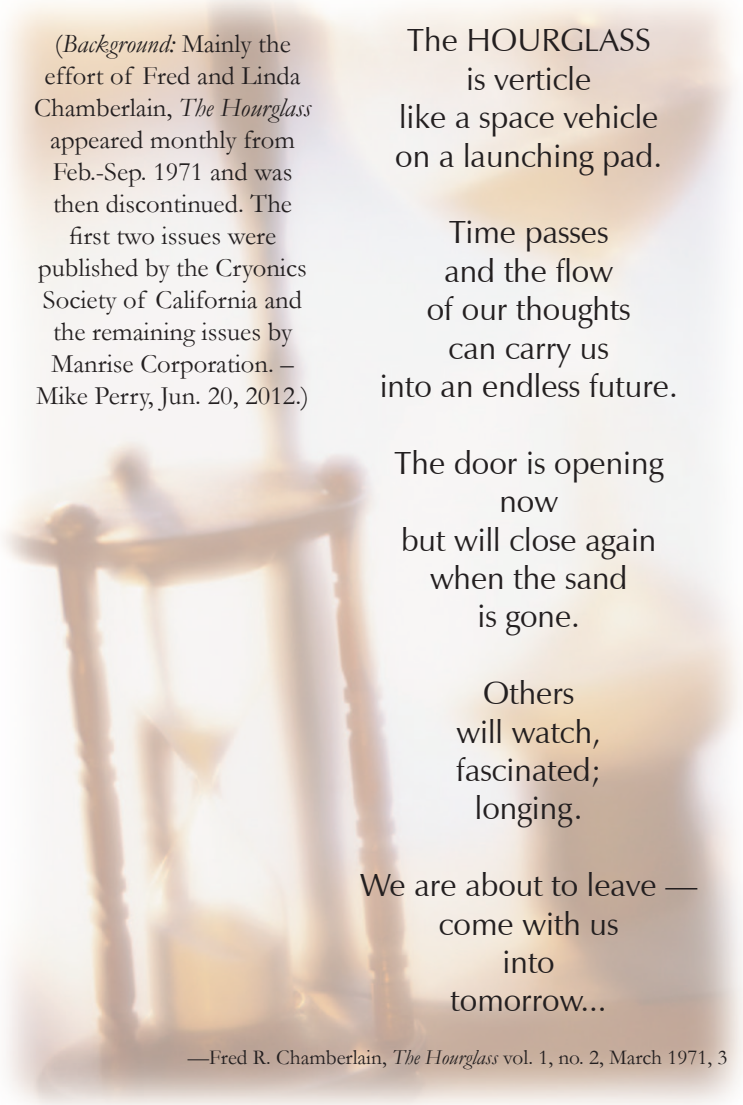
Fred Chamberlain was president of Alcor at the time and this article is headed "Alcor President's Report."

The sentence that ends "the sudden death of his relative" originally read "the sudden death of his cousin" whereas earlier the relative is said to be an uncle. I have left "uncle" in place but made the other change as indicated and corrected minor typos.

Records show that patient was not preserved at Alcor.

—Mike Perry, Jun. 20, 2012

(*Background:* Mainly the effort of Fred and Linda Chamberlain, *The Hourglass* appeared monthly from Feb.-Sep. 1971 and was then discontinued. The first two issues were published by the Cryonics Society of California and the remaining issues by Manrise Corporation. – Mike Perry, Jun. 20, 2012.)



The HOURGLASS
is verticle
like a space vehicle
on a launching pad.

Time passes
and the flow
of our thoughts
can carry us
into an endless future.

The door is opening
now
but will close again
when the sand
is gone.

Others
will watch,
fascinated;
longing.

We are about to leave —
come with us
into
tomorrow...

—Fred R. Chamberlain, *The Hourglass* vol. 1, no. 2, March 1971, 3

Alcor Member Forums

Discussion board of the Alcor Life Extension Foundation

Discuss Alcor and cryonics topics with other members and Alcor officials.

- The Alcor Foundation
- Cell Repair Technologies
- Cryobiology
- Events and Meetings
- Financial
- Rejuvenation
- Stabilization

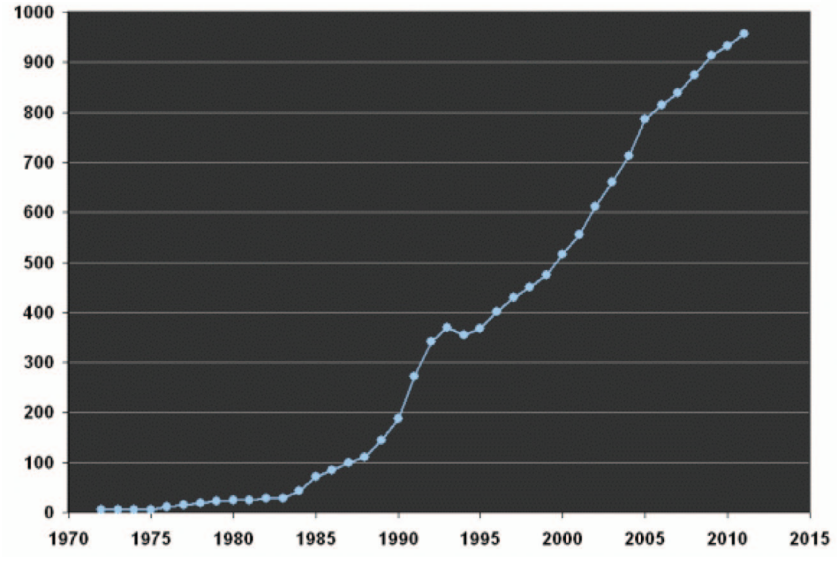
Other features include pseudonyms (pending verification of membership status) and a private forum.

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

Membership Statistics

As of April 30, 2012, Alcor had 967 cryopreservation members, 8 associate members, and 110 patients. Below is a chart with 2012 membership growth statistics to date and a graph showing the number of Alcor cryopreservation members at year end since inception.

2012	01	02	03	04	05	06	07	08	09	10	11	12	
TOTAL	956	959	963	967									967
FINALIZED	2	4	5	6									17
REINSTATED	0	1	1	0									2
CANCELLED	3	2	1	1									7
TRANS TO ASSOCIATE	0	0	0	1									1
CRYO-PRESERVED	0	0	1	0									1
NET GAIN	-1	+3	+4	+4									+10



Alcor A-1002 Case Report

Prepared by: Aaron Drake, NREMT-P, CCT Medical Response Director

Member's Background

Frederick Rockwell Chamberlain III (A-1002) was born November 21st, 1935, in Fort Monroe, Virginia. Considered one of the pioneers in the science of cryonics, in 1972 Fred and his wife Linda founded the Alcor Society for Solid State Hypothermia, better known today as the Alcor Life Extension Foundation. Over the years, both were intermittently involved with Alcor along with numerous other life extension based endeavors.

Fred was diagnosed with prostate cancer in 1993. Fred's cancer slowly developed over 19 years. It was closely monitored as Fred and Linda planned to return to Scottsdale at some point to receive the best possible cryopreservation. In early March 2012, Fred's health took a dramatic turn for the worse and it appeared that the window of opportunity to relocate to Scottsdale had been missed. After a medication change, causing a brief respite in decline, Alcor helped facilitate Fred's move to Scottsdale and placed him into care at a local hospice facility.

After six days of standby, Fred's clinical death occurred on March 22nd, 2012. He is survived by his wife, Linda, and a son and daughter. Fred's father, Frederick Chamberlain II was the first Alcor member to be cryopreserved (in 1976) and Fred III was the 111th member of Alcor to be cryopreserved.

Personnel

Standby, Stabilization and Transport: Aaron Drake, Medical Response Director; Steve Graber, Readiness/Technical Coordinator; and Sandra Russell of Critical Care Research. They were supported by Max More, Alcor CEO; and Steve Harris, M.D., Chief Medical Advisor.

Personnel at Alcor's surgery suite included José Kanshepolsky, M.D., Surgeon; Aaron Drake, Surgical Assistant; Steve Graber, Cryoprotection Perfusionist; Hugh Hixon, Cryoprotection Perfusionist and Scribe; Max More, Refractometry; and R. Michael Perry, Ph.D., Cooldown Coordinator. Surgical support staff: Sandra Russell, Bruce Cohen and Jerry Searcy. Observers: Tom Wolvos, M.D. and Kara Villareal, M.D.

Pre-Deployment

Fred was first diagnosed with cancer in 1993 when a routine blood test showed elevated prostate specific antigen (PSA) levels. A biopsy was taken which confirmed the presence of prostate cancer. A radical prostatectomy was recommended but Fred declined and instead decided to "watch and wait" while implementing holistic support methodologies to prolong life to the greatest extent possible.

Fred cancelled his Alcor membership in May of 2002 for various reasons and joined the Cryonics Institute (CI) as a safety net in the event of an unexpected death. Time passed without incident until 2009 when Fred elected to have two procedures performed to reduce the size and effects of the cancer. Now living in Melbourne, Florida, Fred and Linda discussed their intentions of reinstating their membership with Alcor when Fred's health began to deteriorate. In March of 2011, they switched their membership once again from CI back to Alcor.

A year later, in March of 2012, Fred's condition suddenly deteriorated. He was unable to get out of bed without assistance, his speech was difficult to understand and his thought process lacked clarity. The internist caring for Fred determined that he was very sick and made a referral to hospice-at-home. He also advised that air travel to Scottsdale was probably not achievable, given his condition. Everyone was disappointed in this news, nonetheless plans were being developed to stage a standby at their home in Florida.

When a change in Fred's medication occurred, there was a significant improvement in his ability to ambulate, talk and think. In discussing this change with Alcor, the decision was made to attempt to get Fred on a plane to Phoenix so he could be placed in a hospice facility in Scottsdale. On March 14th, Aaron Drake – Alcor's Medical Director – flew to Melbourne, Florida, to help facilitate the move. With the assistance of Loraine Rhodes, team leader for the Terasem Cryonics Response Team of Satellite Beach, Florida, Fred and Linda were packed and driven to the airport in Orlando for a direct flight to Phoenix. Aaron provided the support needed to ensure the airlines would allow a medically frail individual to travel on a commercial flight.

After landing at Sky Harbor airport in Phoenix, Fred was taken to a local hospice facility – one that has a long tradition of accepting Alcor members. Alcor had pre-coordinated with the hospice to have Fred accepted into their facility without the requirement for their normal evaluation process.

Friends, family and former employees visited to share stories of Alcor's early days and to see Fred once again. Despite the reunion-like atmosphere, Fred spoke of his increasing level of pain as a result of his cancer and was determined to make his suffering time minimal. Fred decided that he would discontinue all intake of food and fluids. He asked that the nurses keep him comfortable throughout this process. The hospice physician evaluated Fred on Friday and indicated he would have a better idea of how much time he had remaining over the next day or two. Based upon Fred's decision not to eat or drink, it was expected that he would experience a steady decline in health over the next five to seven days.

Deployment

The next morning, Saturday March 17th, the nurses were concerned that Fred's health was declining faster than expected and strongly suggested that it was time to start the standby. Aaron and Steve Graber, Alcor's Readiness and Technical Coordinator, met at Alcor to take the response vehicle over to the hospice. Six coolers filled with ice were staged at the facility with towels placed under them as a precaution against the possibility of any leakage. Sandra Russell from Critical Care Research in California was contacted and requested to help out on the standby. Alcor's rescue vehicle was parked just outside the entrance of the facility to allow for fast egress when needed. Reservations were secured at a motel located only four blocks away so one team member could get some quality sleep to stay fresh, once shift rotations began.

A combination pulse oximeter and heart rate monitor was attached to Fred with an audible alarm that would sound if there was any dramatic change in his condition. Either his wife Linda, who had been on numerous standbys over the years for Alcor, or another team member was in his room monitoring him around the clock. The portable ice bath and major stabilization supplies were also prepositioned in his room.

Sandra's arrival the next morning (Sunday) allowed the team to begin rotations so two people could remain at the facility full time while one person stayed at the motel to rest. Each team member would be on duty for approximately 16 hours and would rest for 8 hours. This rotation continued over the next four days as Fred's health gradually declined.

Late at night on Tuesday, March 20th, Fred had increasing periods of apnea that extended to almost a minute. The nurses were sure his clinical death was near and so all team members stayed at the facility and prepared the medications in anticipation. This breathing pattern continued throughout the night and finally resolved in the morning. The team went back on rotation to recover from the extended hours of remaining awake.

On Wednesday evening, March 21st, Fred began to exhibit the same breathing pattern as the previous night, however the effort to breathe appeared to be much more labored. The medications that lose their efficacy within 12 hours were redrawn and at the ready. Around midnight, the nurses were certain his clinical death would occur sometime in the following hour. Fred's personal items were packed and any extra supplies were packed away in preparation for a quick departure. A base layer of ice and water was placed in the portable ice bath and the backboard of the Lucas 2 cardiopulmonary support device was positioned on top of the ice.

At 12:45 am, Thursday, March 22nd, Fred's heart rate monitor could no longer detect a pulse but as he had jugular venous distention, you could still easily visualize pulsation. The nurse was called into the room in anticipation that there were only minutes remaining. While the nurse watched Fred, she removed his indwelling urinary catheter. At 12:49, Fred took his last breath and the nurse made the pronouncement at 12:50 am, Thursday March 22nd.

Field Stabilization, Cooling and Transport

Immediately after official pronouncement, team members established an intraosseous infusion line with a bone injection gun in the patient's left tibial plateau. The low volume medications: Propofol, Heparin, Streptokinase, Ketorolac, and Gentamicin were administered followed by a 100 ml bolus of Citrate Dextrose to flush. Simultaneously, two thermocouple probes were placed bilaterally in the patient's nasopharynx and attached to a DuaLogR for temperature recording. The thermocouples were secured in place with a surgical stapler and swimmer's ear wax was used to keep water and ice from entering the patient's nose.

The patient was rolled onto his right side and a rectal occlusion device was inserted. A portable transport sheet was tucked under his body to provide support while being moved to the ice bath. The patient was lifted off the bed and moved onto the layer of ice in the portable ice bath. His back was positioned directly over the Lucas 2 backboard. The top of the Lucas 2 was inserted between his arms and torso and aligned so the ACD suction cup was centered over his sternum. The battery powered unit was turned on and compressions/decompressions were started.

All the remaining ice in the room was added and his body was completely covered, except for his chest and face. An attempt was made to establish an advanced airway with #4 King esophageal airway but something prevented the lumen from being advanced. Either ice accidently entered the oropharynx or an anatomical anomaly blocked the opening to the esophagus preventing insertion of even the small diameter gastric tube used for Maalox.

A second bone injection gun was used to establish an additional intraosseous access site specifically for the Baxa infusion pump to administer epinephrine and vasopressin. Once patency was verified, an initial bolus of the combined medicines was pushed to promote efficacy and then the automated pump was started. Both Acetylsalicylic acid and SMT were also administered through the original intraosseous port.

The hospice nurses were notified that the team was ready to depart the patient's room so they could close the doors of any other rooms along the hallway. The patient was covered with a privacy drape and the Lucas 2 was turned off, per the hospice facility's requirements, while the nurse escorted us to the secured exit door. After entering the exit code, the door opened and we left the building. The Lucas 2 was turned back on once outside, compressions having been interrupted for 61 seconds.

Upon arriving at Alcor's rescue vehicle, the portable ice bath was loaded onto the hydraulic lift gate and into the mobile medical room before being locked and secured in place. A five gallon container of water was poured into the ice bath to increase the effectiveness of the patient cooling. The Squid

was placed over the patient to begin circulating the chilled ice water.

A second attempt was made at establishing an advanced airway with an endotracheal tube without success. Although the mobile medical room was lighted, it was dark outside which did not add any ambient light and the airway obstruction could not be visualized using a non-lighted laryngoscope.

The decision to remain in the parking lot to administer the remaining medications, as opposed to leaving for Alcor immediately, was based on the knowledge that surgery would have to wait until core body temperature reached the target of 20º C or colder. Since the facility is less than 10 minutes driving time to Alcor, the patient would arrive before reaching this temperature objective under either scenario. By staying, this allowed an extra set of hands to continue pushing medications rather than having to drive the vehicle. The remaining medications of Ni- Ky, 4-Hydroxy-Tempo, THAM, Hetastarch, Vital Oxy and Mannitol were administered over the next 20 minutes.

The remaining supplies were loaded into the vehicle and everything was secured prior to transport. A call was made to the Alcor surgical team to inform them we were departing the hospice. Due to the light traffic at that time of night, the drive took five minutes. The nasopharyngeal temperature was 21.4º C on arrival.

Surgery and Perfusion

The patient was moved into the surgery room with the Lucas 2 still performing compressions. Within 20 minutes, compressions were stopped and the patient was lifted out of the ice. Dr. José Kanshepolsky, assisted by Aaron Drake, made two vertical incisions with a scalpel to expose the skull. The scalp was parted with Weitlanders and two burr holes were made using a Codman craniotome perforator. The exposed dura mater of the brain was cut through using a #10 scalpel blade and the remainder was cleaned up with a Kerrison rangeur. A thermocouple probe was inserted into the right burr hole and secured to the scalp with 2-0 Silk.

Aaron aseptically prepped the region to be incised and then the patient's face and chest were draped and secured with Backhaus towel clamps, leaving only the neck exposed. Dr. Kanshepolsky then proceeded make a skin incision with a #10 scalpel blade along the anterior border of the left sternomastoid and divided the loose areolar tissue through dissection using a Metzenbaum and Debakey forceps. The surgical field was held open with two Army Navy retractors. Once the left common artery was identified and isolated with a right angle Mixter forcep, a silk tourniquet and a Debakey bulldog clamp were used to maintain vascular control. The same procedure was repeated for the right common carotid artery. Using a #11 scalpel blade, the arteries were then severed distal to the clamps.

Using scalpels, the remaining tissue around the neck was severed, leaving only the spinal column intact. The cephalon was separated with an osteotome and mallet before being moved from the operating table to the neuro box and mounted in the head ring. Both carotid arteries were cannulated with red robinson catheters and secured in place with a surgical basket stitch. After an initial flow of perfusate, the vertebral arteries were identified with rat tooth forceps and secured with Diethrich micro bulldog clamps. A crack phone element was inserted into each of the burr holes and secured with 2-0 Silk.

The washout and subsequent cryoprotection began, monitored by Hugh Hixon and Steve Graber. Cryoprotection terminated with [M22] > 50.3 Brix for over 30 min. Skin evenly darkened. Eyeballs shrank to about 1/2 volume; brain shrank to less than 1/2 volume. Flow equal for both carotids. Pressure held 100 mmHg to 130 mmHg. Used: B1, 20 liters, M22x1.25, ~9 liters.

(Timeline, see pages16 & 17.)

Discussions and Recommendations

***Problem*:** It was noted that the suction cup of the ACD Lucas 2 was not maintaining a seal on the patient's chest. This has not previously been a problem so it may have been due to the emaciated condition of the patient.

Solution: We will test a variety of gels under wet conditions to determine if we can improve the seal.

.....

Problem: An advanced airway could not be established due to a possible obstruction from ice accidentally entering the airway or from an anatomical anomaly. Initially, an esophageal airway insertion was attempted; however, the device could not be advanced much past the area where the oropharynx and esophagus meet. In fact, even the small diameter gastric tube could not be advanced past the obstruction. An unlighted laryngoscope and endotracheal tube were obtained, however the ET tube could not be advanced either.

Solution: 1) Extra care will be taken to make sure ice is carefully placed around the head prior to managing the airway; 2) A lighted laryngoscope will be added to the backup airway kit; and 3) A surgical cricothyrotomy kit will be added to establish an emergency airway if needed.

.....

Problem: The medication Vital Oxy is thought to be too viscous and therefore is being administered too slowly.

Solution: Critical Care Research will try to reformulate the compound so it is thinner.

.....

Problem: Standby fatigue became an issue during this extended standby and it was not uncommon for team members to have 18-24 hour shifts.

Solution: It would be better to have four response team members on rotation rather than three. We could then rotate-in two rested individuals every 12 hours.

.....

Problem: Arterial CPA concentration rose somewhat higher than normal early in the terminal plateau phase.

Solution: We overshot between two of the 15-minute manual refractometer reading intervals (we were using both the old B&L and the new electronic Sper). The notes don't indicate what we were doing. Obviously, we should have shut off the ramp shortly after the ~52 Brix arterial reading. When we did shut off the ramp, we also dumped volume from the reservoir. We ended the cryoprotection after the right jugular effluent caught up for over 1/2 hour. It was definitely a bad overshoot.

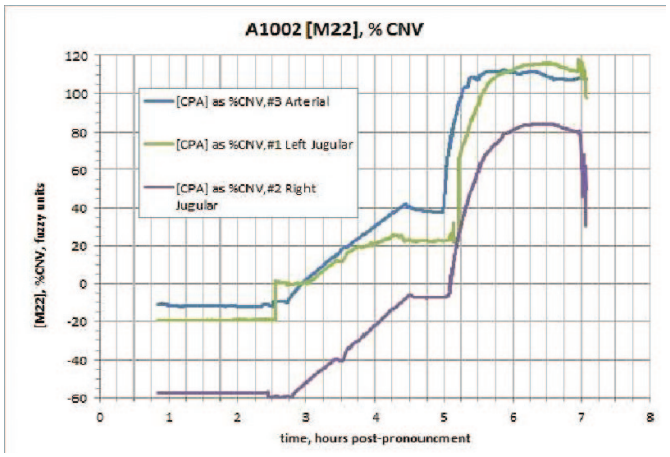
Regarding cryoprotectant equilibration with the tissue, the only immediate indica-

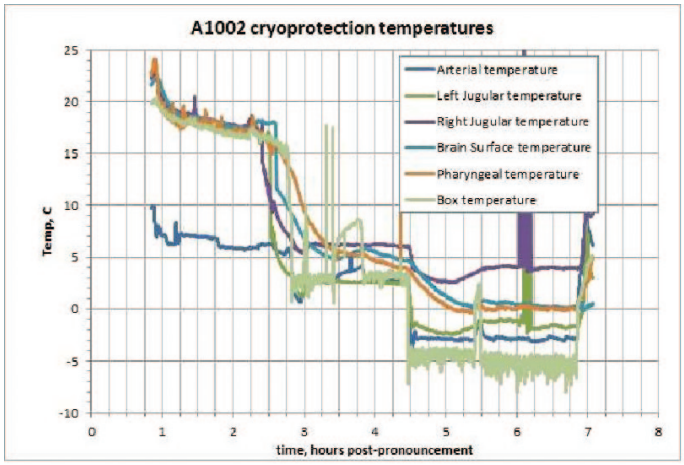
tors of tissue perfusion we have are the skin color, the shrinking of the eyes and brain, and the venous effluent [CPA], and venous effluent is the only measure we can put a number to. Since we also want to minimize the time at near-terminal [CPA], we have to force the [CPA] up by going over 100% CNV, and if the arterial [CPA] drops below 100%, then we have to do the cycle again. Close-enough equilibration time is about 1/2 hour for the arterial [CPA], but at the same time, we also want to get both venous [CPA] readings over 100% for over half an hour. So being somewhat aggressive on arterial [CPA] pays off in reduced perfusion time.

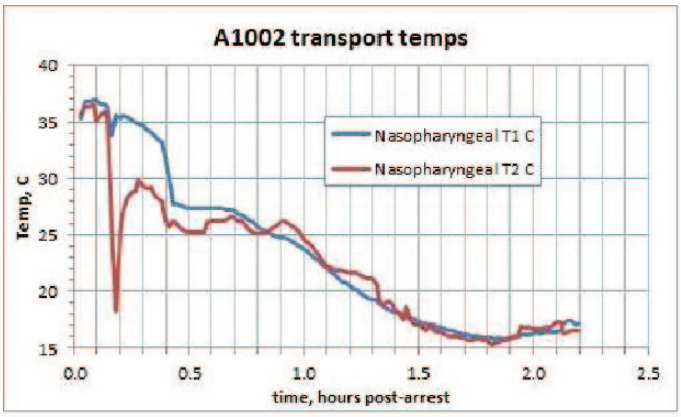
Yes, obviously we have no way of telling if the perfusion is uniform throughout the brain. (We transferred A-1002 to a neurocan the other day, and the skin around his jaw was white; i.e., the skin at least didn't get enough CPA to prevent ice formation). Our CAT scans apparently can see [CPA] and residual blood, so in the future we won't be completely blind as to what happened, but we have no way of knowing how uniform the cryoprotection is at the end of the procedure, and no way of doing anything about it anyway. We see asymmetries in eye shrinkage, brain shrinkage (may be a measuring method artifact; the CAT scans look more symmetrical), vascular resistance, jugular effluent temperature, and [CPA]. We've also seen a pressure excursion that implied that something broke free as the brain shrank and lodged further downstream (not A-1002).

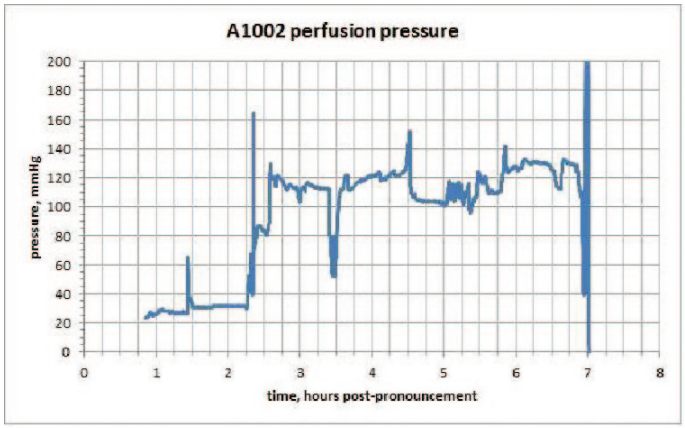
The time to the loss of the Blood Brain Barrier varies from patient to patient, and of course it doesn't go down like it was switched off, but cell by cell. We speculate that it might be possible to observe the transition in some detail by treating the BBB as a capacitor and measuring the impedance phase angle over time.

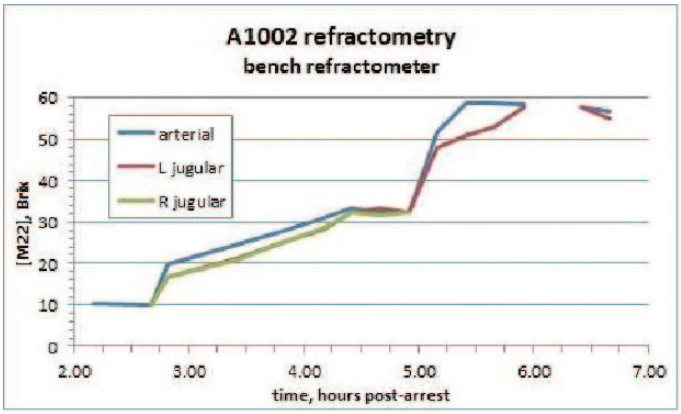
Graphs

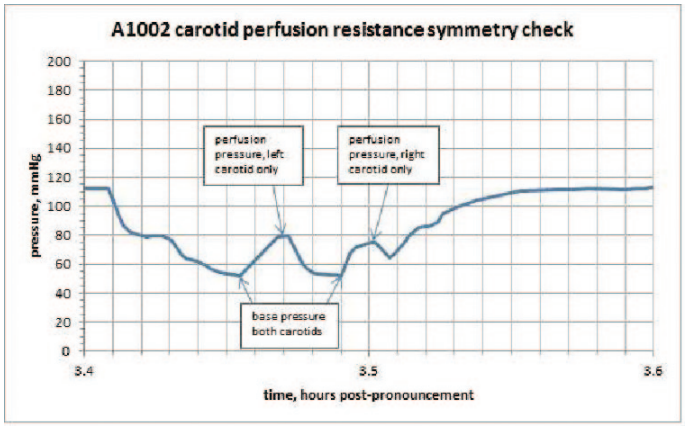


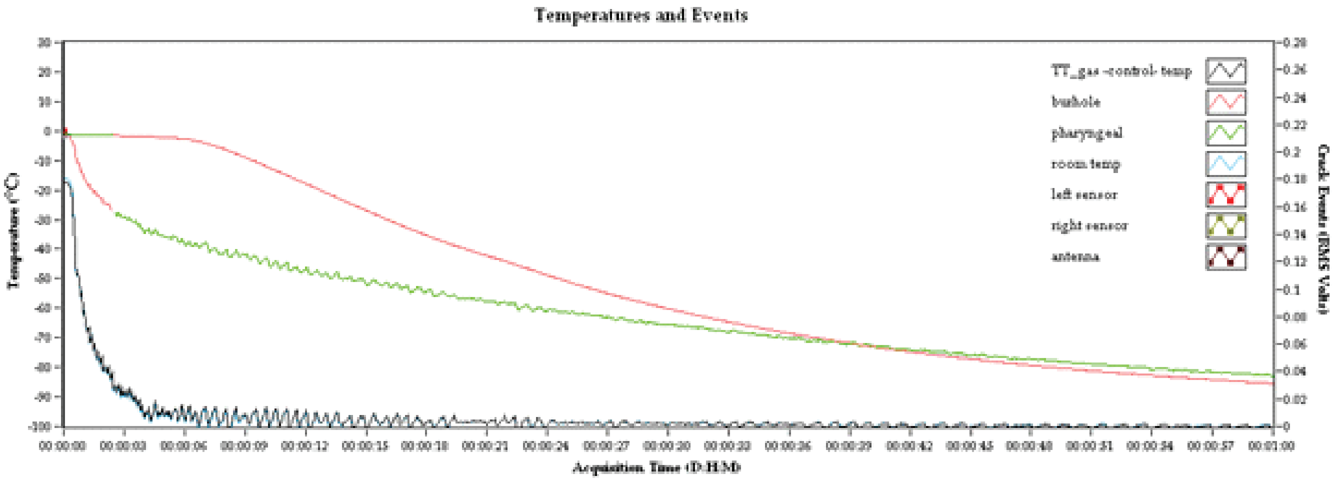








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Temperature (°C)
Crack Events (RMS Volts)
Acquisition Time (D:H:M)
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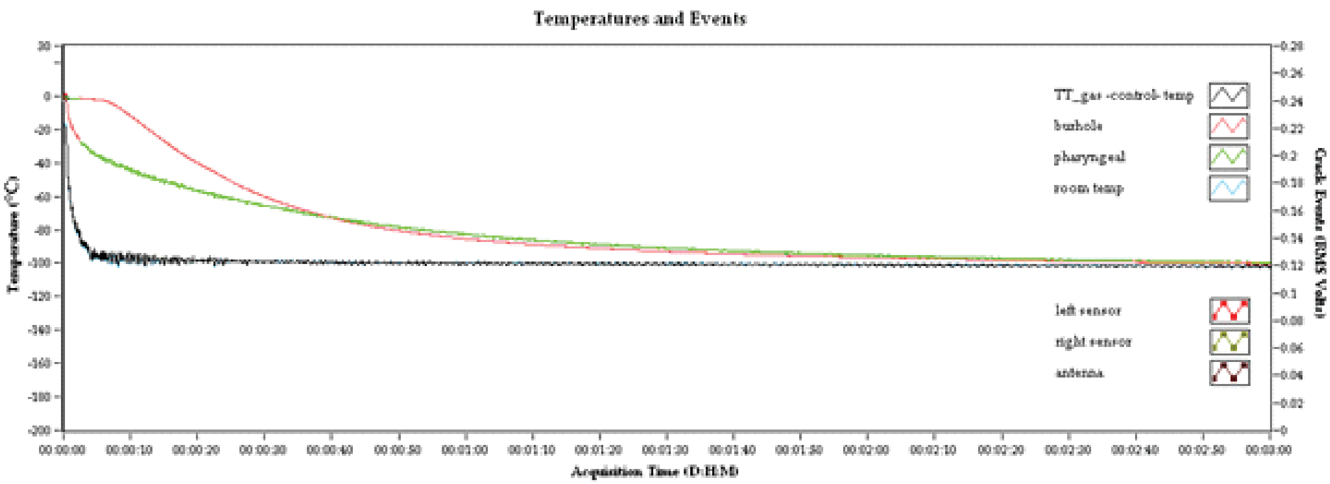
burhole
pharyngeal
room temp
left sensor
right sensor
antenna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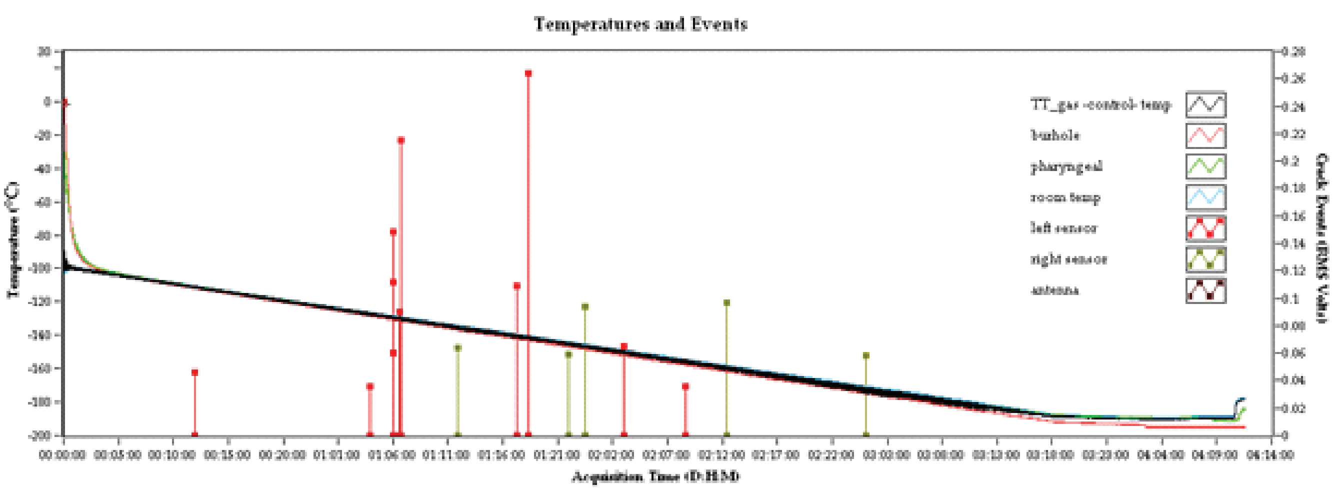
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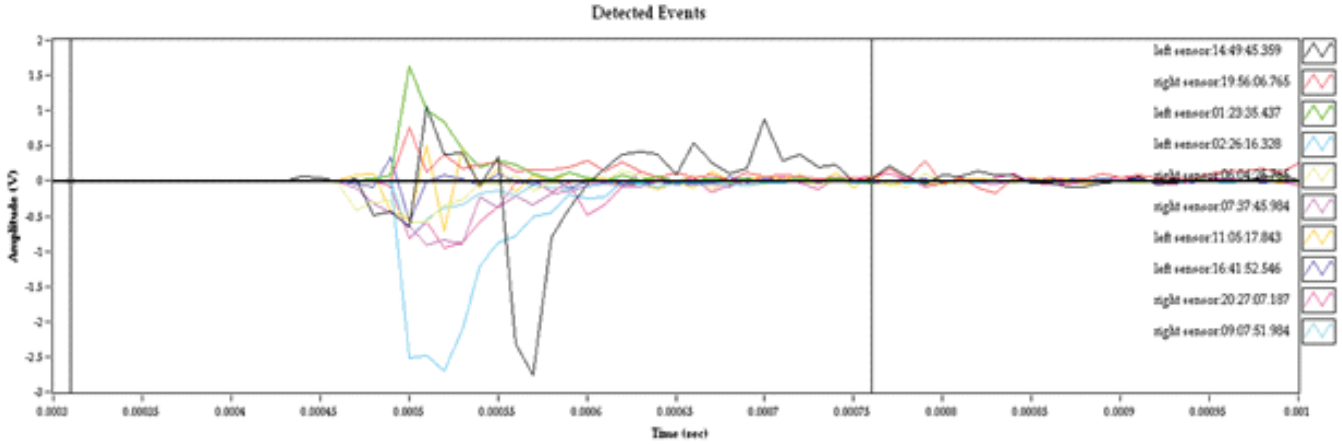
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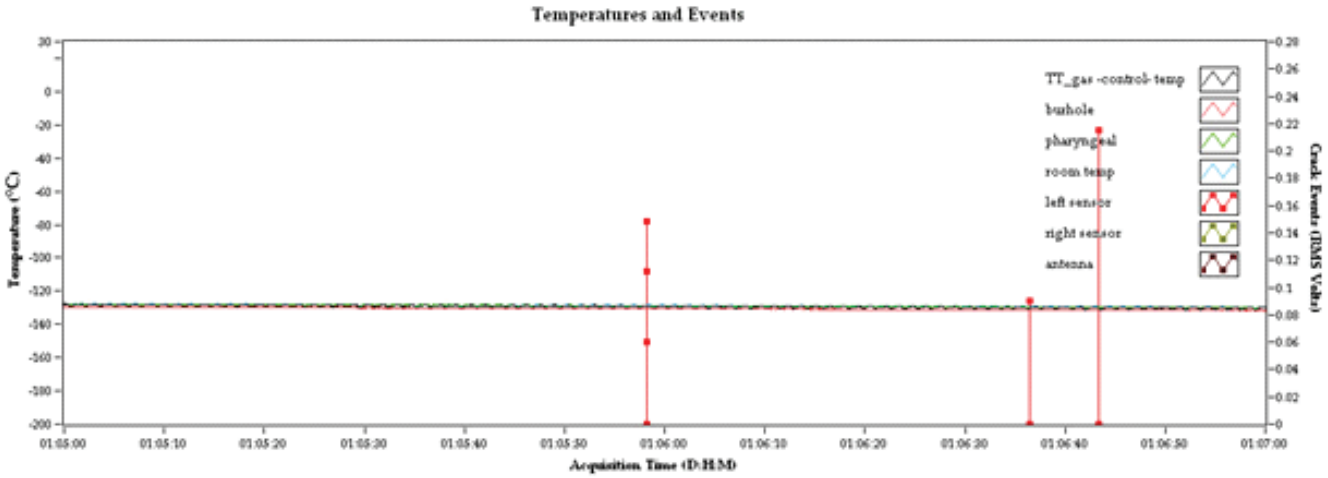
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Temperature (°C)
Crack Events (RMS Volts)
Acquisition Time (D:H:M)
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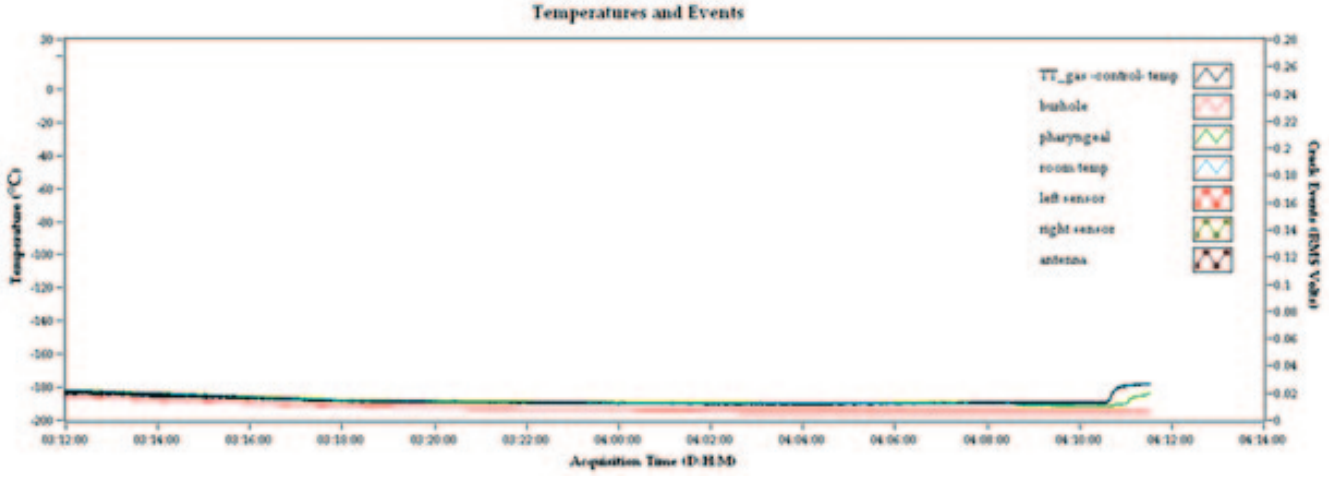
buhole
pharyngeal
room temp
left sensor
right sensor
antenna


Temperatures and Events
Temperature (°C)
Crack Events (RMS Volts)
Acquisition Time (D:H:M)
TT_gas -control- temp
buhole
pharyngeal
room temp
left sensor
right sensor
antenna

TIMELINE

Stabilization

An approximate timeline of events compiled from multiple sources. Times are Mountain Standard Time (MST)

March 22nd, 2012

Time / Post arrest

00:50	(0:00)	Patient pronounced
		Nurse grants permission for Alcor to begin procedures
		Intraosseous access gained through left tibial plateau
		Thermocouple probes placed and secured in nasopharnyx
00:51	(0:01)	200 mg Propofol administered
		100,000 IU Heparin administered
		250,000 IU Streptokinase administered
		DuaLogR data recording began
00:52	(0:02)	80 mg Gentamicin administered
		15 mg Ketorolac administered
		100 ml citrate dextrose bolus given to flush medications
00:53	(0:03)	Rectal occlusion device inserted and secured
00:54	(0:04)	Patient rolled onto megamover patient transport sheet
00:55	(0:05)	Patient moved to portable ice bath
00:56	(0:06)	Lucas 2 ACD cardiopulmonary device aligned over chest and started
00:57	(0:07)	Additional ice added to completely cover patient
		1st attempt at establishing an airway with King esophageal airway
01:00	(0:10)	Second intraosseous access site established in right tibial plateau
		300 mg Acetylsalicyclic Acid in 10 ml Tham administered
01:01	(0:11)	Initial bolus of 1 mg Epinephrine and 20 IU Vasopressin administered
		Baxa infusion pump started with 29 mg Epinephrine and 180 IU Vasopressin
01:02	(0:12)	400 mg SMT (S-methyl-isothiourea) in 50ml Citrate-Dextrose administered
01:03	(0:13)	Patient covered with privacy drape
		Nurse notified we are ready to depart patient's room
01:04	(0:14)	Lucas 2 shut-off while in the facility hallway: 61 seconds
01:05	(0:15)	Lucas 2 turned back on once outside
01:06	(0:16)	Portable ice bath loaded onto rear lift
01:09	(0:19)	Moved into back of rescue vehicle
01:10	(0:20)	5 gallons of water added to PIB
01:13	(0:23)	Squid placed in ice bath to begin circulating ice water
01:16	(0:26)	2nd attempt at establishing an airway with endotracheal tube *
		2.0 g Niacinamide-Kynurenine sulfate in 100 ml Citrate-Dextrose administered
01:20	(0:30)	4-Hydroxy-Tempo flakes in 50 ml Citrate-Dextrose administered
01:21	(0:31)	100 ml Tham (Tris (hydroxymethyl) aminomethane) administered
01:23	(0:33)	250 ml Hetastarch administered
01:28	(0:38)	More ice added
01:32	(0:42)	70 ml Vital Oxy administered
01:38	(0:48)	500 ml 20% Mannitol administered
01:45	(0:55)	Remaining items loaded and vehicle prepped for departure
01:50	(1:00)	Departed for Alcor

*Note: no Maalox was administered due to problem with establishing gastric access.

Surgical

Times are Arizona Time (MST)

T-1 = time of day

T-2 = hours post pronouncement

T-3 = hours post arrival to Alcor

T-1	T-2	T-3	Action
0:50	0.00		Patient pronounced
1:11	0.35		Filled perfusion circuit, chiller on
1:15	0.42		On circulation

1:18	0.47		Report: "being loaded"
1:26	0.60		Started video
1:27	0.62		Started data collection program
1:40	0.83		M22x1.25 looked cloudy - there was frost on the jug
1:43	0.88		Aaron calls; departing hospice facility
1:55	1.08	0.00	Arrived - Nasal 21.4º C
2:01	1.18	0.10	Added EG to chiller; arterial temp had been high
2:12	1.37	0.28	Patient on table several minutes
2:17	1.45	0.37	Completed burr holes
2:21	1.52	0.43	Pump back pressure ~7.5 psi
2:28	1.63	0.55	Pharyngeal probe 16º C
2:31	1.68	0.60	Both crackphone elements positioned
2:44	1.90	0.82	Steve retrieved more 0.2u filters just in case (re 2:21 comment)
2:46	1.93	0.85	Suction set up
2:57	2.12	1.03	Checked mixing reservoir with refractometers 10.35, 9.2 (B1)
3:08	2.30	1.22	Pharyngeal temp 17º C
3:10	2.33	1.25	Started washout - 44 mm Hg
3:27	2.62	1.53	Burr hole temp 11º C - effluent running fairly clear
3:29	2.65	1.57	Closed circuit, on ramp
3:35	2.75	1.67	Closed box, started cooling
3:39	2.82	1.73	Chiller about -3º C
3:40	2.83	1.75	Temps: L Jug = 1.5º C, R. Jug = 5.5º C, brain surface = 7.6º C, pharyngeal =10.9º C
3:55	3.08	2.00	Volumes: mix res = 1.46 l, conc. = 8.6 l, dump - 0.6 l, brain retraction L=10mm, R=5mm
4:07	3.28	2.20	Speed 37, 112 mm Hg
4:11	3.35	2.27	Mix res = 1.68 l
4:16	3.43	2.35	Differential pressure test: initial pressure 52.4 mmHg; L= 79.2 mmHg, R=75.1 mmHg, about the same resistance into both carotids
4:22	3.53	2.45	Mix res = 1.8 l - drained to dump
4:25	3.58	2.50	Mix res = 1.0 l -closed dump
4:36	3.77	2.68	Brain retraction L=1.5 cm, R=2.0 cm
4:42	3.87	2.78	Skin coloring changing evenly, corneas collapsed
5:14	4.40	3.32	Stopped ramp; mix res = 1.18 l, conc = 6.95 l, dump = 2.21 l
5:17	4.45	3.37	Chiller from 0º C to -6º C, LN2 injection switched to -3º C
5:22	4.53	3.45	Hugh; raised chiller temp to -5º C
5:22	4.53	3.45	Steve lowered pump speed due to pressure spike ~= 150 mmHg
5:23	4.55	3.47	Pressure = 107 mmHg
5:47	4.95	3.87	Steve opened dump line - mix res = 1.2 l
5:48	4.97	3.88	Steve closed dump, mix res = 0.9 l
5:48	4.97	3.88	Steve initiated ramp full speed
6:18	5.47	4.38	Hugh opened dump line; mix res = 1.92 l
6:21	5.52	4.43	Hugh noted skin tone medium to dark brown
6:49	5.98	4.90	Loss of M22 conc. from siphoning to drain - Added 3 liters M22x1.25
6:53	6.05	4.97	Temp channels CH05 and CH04 (jugulars) TCs flipped, yet CH05 remained abnormally high - apparently something wrong in DAQ box
7:03	6.22	5.13	Both jugulars over 55 Brix - ramp stopped
7:06	6.27	5.18	Both eyes shrank to ~1/2 volume, skin very even, very dark
7:23	6.55	5.47	Steve/Hugh discussed possible mis-wiring of AFAB refractometers; #1=L Jug by screen label, appeared to be logging #3 arterial data and vice versa
7:28	6.63	5.55	Steve increased pump speed due to slight drop in pressure (went from 132 mmHg to 119 mmHg)
8:09	7.32	6.23	Started cooldown

On April 25th 2012, A-1002 was moved to a neuro container for permanent storage.

Todd Huffman will be speaking at the Alcor 40th Anniversary conference (Alcor-40) in Scottsdale, AZ, this coming October.

MEMBER PROFILE:

Todd Huffman

By Chana de Wolf

"I feel that it is important to have other friends who are cryonicists," Todd says, "because cryonics is not a service where you slap down a credit card and it just happens."

There are few people in the world who blaze a trail through life like Todd Huffman does. Whether he is assisting in a cryonics case, developing new microscope technologies, or helping to stabilize technology infrastructure in conflicted environments, there is nothing run-of-the-mill about anything he is involved with. And since he is speaking at the upcoming Alcor-40 conference in October 2012, we were interested in learning more about Todd's background as well as his current and future endeavors.

Born in Long Beach, CA, Todd became interested in emergency medicine in high school and took EMT and CNA classes in preparation for entering the field. While attending college at California State University, Long Beach, he worked in a number of environments in order to apply his medical knowledge. Over the years he assisted in caring for dementia patients, in ER medicine, and in a neurology ward. It was during this time period that he learned of cryonics through the Extropy Institute's email list and also became acquainted with several Alcor members at Extropian conferences. Because of his background and interest in emergency medicine, it wasn't long before he was volunteering on Alcor's standby and stabilization team in Southern California. These experiences caused him to contemplate cryonics as an interesting long-term project to work on, and after participating in a few cases he became an Alcor member in 2002.

Todd obtained a B.S. in neuroscience in 2003. After graduation, he moved to Phoenix to work for Alcor full-time. He worked in both research and field recovery for about a year but eventually decided to pursue further education at Arizona State University, where he obtained a M.S. in bioinformatics in 2006. He then enrolled in the Ph.D. program at the Biodesign Institute at ASU. While in graduate school, Todd continued to consult for Alcor and for Suspended Animation, Inc., primarily in field work and training of field responders.

Ultimately, Todd left the doctoral program to pursue his interest in science and technology development. Specifically, he was interested in the role of science and technology in unstable and/or conflicted environments. As a freelancer he's worked for various international NGOs, commercial companies, the US Department of State, and US Department of Defense. Todd has been involved in projects in Afghanistan, Uganda, and Haiti, and he played supporting roles in developing technologies in a number of other countries experiencing conflict around the world.

These countries, often in the midst of war, suffer from a wide range of technological issues. Todd was one of a number of consultants recruited to address such problems. Together, as small 3 to 6 per-

son teams, these partners strategize ways to implement communications and energy technologies and the supporting infrastructure for those technologies in an assigned conflict zone. As a part of this effort, the team(s) must also assess the role of these technologies in reconstruction and ongoing stability efforts in the area.

In Afghanistan, Todd's team helped to support medical communications in rural parts of the country. They set up lines of communication and trained doctors how to use telecommunication to augment their medical staff. For example, where interpretation of an x-ray may have previously been impossible in a rural facility lacking a radiologist, implementation of stable long-distance communications technologies in these clinics enables staff to send and receive critical information to and from larger institutions with greater resources (such as radiologists).

"Sending a file to someone else and then being able to receive communication back from that person sounds really simple to us and is something we take for granted, but isn't commonly available in war torn environments," Todd explains. "The infrastructure for this type of communication didn't exist before we got there, so the doctors and staff also have to be trained how to use it."

Dressed to impress with girlfriend Katy.

In the cryonics community – where members sometimes shudder at the risk inherent in just taking a flight – purposefully entering a distant war zone when one is not personally involved in fighting the war may sound like insanity, but Todd's opinion on the matter is decidedly different. "The world is a complex and dangerous place," he says, "and the future of humanity as we envision it is not assured and is in fact threatened by global instabilities. Sources of violence and instability need to be understood and addressed for the kind of scientific and cultural advances necessary for cryonics to develop. An insular and myopic futurist community does not deserve and will not be able to realize a future of continued progress."

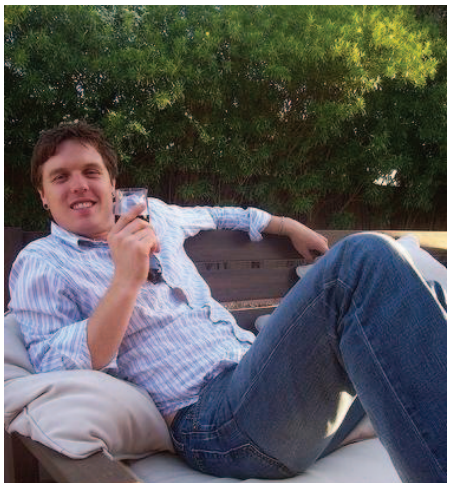
"Because of his background and interest in emergency medicine, it wasn't long before he was volunteering on Alcor's standby and stabilization team in Southern California."

While Todd remains involved in such efforts, he has become more focused on his own company, 3Scan, in recent years. 3Scan's goal is to revolutionize high throughput screening microscopy, and is predicated on technology that Todd helped develop in collaboration with a group at Texas A&M University. The machine, known as the Knife Edge Scanning Microscope (KESM), beams light through the back of a diamond knife to slice tissue and simultaneously image the slice using a continuously recording camera. This procedure not only completely automates the imaging of serial sections, it also prevents the well-known (and despised) artifacts introduced by physical handling of the tissue prior to imaging.

Todd founded 3Scan in 2010 as a spin-out company partnering with Texas A&M, and in 2011 began ramping up the company bringing on additional engineers to redesign the system for large scale commercial use. "For the past year, 3Scan has been rebuilding and optimizing the machine for a larger audience and to expand its capabilities. For example, the first machine could handle a maximum tissue volume of 1 cm^3, which is the size of a mouse brain and results in about a terabyte (TB) of data. The new machine, however, is capable of around 125 cm^3, which can fit a small primate brain and result in several hundred TB of imagery data."

*Leaving nothing to chance, Todd has had the instructions from his Alcor medic-alert bracelet tattooed on his torso. (**Note:** the above information is altered in minor ways for reasons of privacy and to prevent harassment.)*

All of Todd's work at 3Scan relates to his broader interest in neural computation and, ultimately, in developing the means to reverse engineer neural circuitry. "The original goal of the KESM was to do large scale reconstructions of neural connectivity," he explains. "I think the classical cryonics biological revival scenario is a bit naive and self-centered; humans and society are going to be dramatically different. I believe our preserved brains will more likely be subjects for cognitive archeology, the first person perspectives encoded in our neural circuitry will be useful and interesting for the purposes of understanding history and culture. Exactly how this will manifest is unknown, but I believe it to be a worthwhile endeavor as I see value in contribut-



Todd enjoys some wine at gathering of Alcor friends and colleagues in 2006.

ing to the overall knowledge base of our species even if I don't personally 'see' the future."

Which brings us to Todd's upcoming presentation at the Alcor-40 conference. "In general," Todd says, "my talk is going to be about large scale neuromorphology, what it tells us about the brain, and specifically what it tells us that is relevant to cryonics. I will also touch on what revival scenarios might look like, from my perspective."

His perspective, fittingly, is one which is based on an interest in neural architecture and the information that can be extracted from it – a sort of neural archaeology. "I think that reconstructions using the information extracted from neural circuitry about the collective human experience may be more likely than the classical biological resuscitation that most people envision," he reiterates.

And while this may be a contentious point for some (please, take it up with him at the conference!), one topic requires no debate: Todd's deep and personal involvement in the cryonics movement. Whether he is participating in a field recovery or developing technologies to speed along our understanding of brain structure and the information encoded therein, Todd is always making friends with existing members, promoting the cryonics cause within the scientific community, and encouraging those he meets to sign up with Alcor.

"I feel that it is important to have other friends who are cryonicists," Todd says, "because cryonics is not a service where you slap down a credit card and it just happens. It's a small community and the procedures are performed by the members. By having friends in this community it increases your chance of getting a good preservation – people are more likely to be motivated to help if the patient is someone they know and care about."

Given Todd's field experience, he also has much to say about how Alcor members can get involved, even if they don't have a lot of (or any) medical knowledge. As part of understanding how one can function in a support role, Todd stresses the importance of familiarizing oneself with how cryonics procedures work.

"Sources of violence and instability need to be understood and addressed for the kind of scientific and cultural advances necessary for cryonics to develop. An insular and myopic futurist community does not deserve and will not be able to realize a future of continued progress."

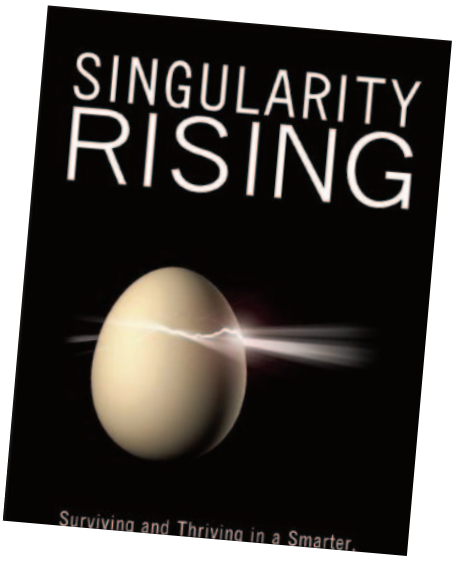
"There are many support tasks that are very important," he emphasizes. "Buying ice, renting a van, all sorts of things. In many cases, the professional staff on the case is not from the area where the procedure is taking place, but the volunteers are, and that local knowledge – like where to get the ice or the van – can really help out immensely."

In terms of personal hobbies Todd likes to experiment with building civilizations. He's the mayor of a 200+ strong Burning Man village, the Playagon, and is a citizen of Langton Labs, a 20+ person industrial living situation which could be described as "a commune but with scientists and engineers instead of hippies." He's also a founder of the BIL conference, a free and open event that happens to be down the street from the TED conference, and volunteers with a variety of other nonprofits and events. These small scale projects are good for exploring and innovating in important dimensions such as communication, logistics, infrastructure, and community.

Don't miss Todd's presentation at the Alcor-40 conference, October 19-21, 2012. ■

Cryonics and the Singularity

By James D. Miller



"The technological advances that they will likely give us in areas such as nanotech will (if AI doesn't give it to us first) significantly progress the day by which Alcor will be able to revive its cryonics clients."

I came to Alcor through contemplating the Singularity. Previously, I had heard of cryonics but didn't have enough trust in human innovation to believe that a frozen body could ever be revived. What I didn't take into account was the likelihood that artificial intelligence (AI) would soon supercharge scientific progress.

Imagine that some biologist laughs at your cryonics membership, claiming that the technology to bring back someone preserved in liquid nitrogen is unimaginably far off. You might argue with the biologist's premise, citing steady advances in nanotechnology. Alternatively, you could ask the biologist if he thinks that a million years of study would be enough time for science to crack the cryonics restoration conundrum. If the biologist, confident that an affirmative answer wouldn't give credence to cryonics, does admit that a million years would suffice, then next ask him whether he thinks that within eighty years it will be possible to create a computer as skilled at conducting research as a human scientist is. If the biologist answers yes to this final question then you've practically won your argument.

Because of Moore's Law, the amount of computing speed you can buy per dollar basically doubles every year and software advances further this long-term trend of exponentially increasing computer performance. Let's say that within eighty years we do create a human-level AI. If the software adjusted computing power doubles every year after this it would take only twenty more years for a single AI to have a million times the power/speed of a human scientist. Even if we soon hit an upper limit on the speed of computers, as long as the price per dollar of computing power continues to fall at an exponential rate, not a tremendous amount of time will transpire between when a human-level AI arises and when Alcor could afford to hire the computational equivalent of a million of these AIs to research cryonics.

Even without AIs, increases in human intelligences will soon almost certainly accelerate technological progress. It's extraordinarily unlikely that evolution just happened to stumble upon the smartest people our phenotype can support when it created individuals such as Albert Einstein and John von Neumann. The exponentially decreasing costs of gene scanning will soon allow us to find the genetic basis of genius. (The Chinese are already looking!) And it won't be too long after finding this that someone (such as the pro-eugenics Chinese) will create people vastly smarter than have ever existed. The technological advances that they will likely give us in areas such as nanotech will (if AI doesn't give it to us first) significantly progress the day by which Alcor will be able to revive its cryonics clients.

Of course, enhanced intelligences will do a lot more than make cryonics practical. They would give us what's call a *singularity*—a threshold of time at which AIs that are at least as smart as humans, and/or augmented human intelligences, radically re-

make civilization. Singularity expectations should be a game changer for the cryonics industry.

Because a successful singularity would massively increase the wealth of mankind it would reduce the resources Alcor would need to have saved to revive its clients. If, as many in the Singularity community believe, the Singularity comes about through an ultra-AI as above us in intelligence as we are from ants, then if this ultra-AI values human life it would revive all of Alcor's patients at a trivial cost to itself.

Singularity expectations eviscerate several anti-cryonics arguments. I've heard some object to cryonics because they wouldn't want to wake up in a world in which they had no skills. Well, after a good singularity we would all be so rich that this wouldn't be impoverishing, and if the Singularity arrives through ultra-AI then every human (not just the recently revived) would either have easily upgradeable skills because of their computer implants or be hopelessly obsolete compared to what super-intelligent AIs could accomplish.

The Singularity eliminates the moral complaint that cryonics is unjust because the earth is already too populated. As an economist I reject this overpopulation argument because I recognize that people are an extremely valuable resource. As a Singularitarian I further reject it because we live on a tiny planet in what appears to be an empty galaxy and the Singularity would make space travel easy.

Singularity expectations should mitigate concerns that you might be restored in a world in which all of your friends and loved ones have already died. Leading singularity scholar Ray Kurzweil has pegged 2045 as the most likely date for a kind of singularity that would almost certainly yield the technologies needed for cryonics revival. 2045 is close enough that most of us could expect to have some family members still around.

Singularity expectations open up a storage option for Alcor. If you consider yourself to have existed ten years ago then you must be defining yourself by the information contents of your brain rather than the exact physical components of your body, since all the atoms in your body changed over the last decade. Consequently, if Alcor could create a digital copy of your brain at sufficiently high resolution it should be possible for a future ultra-intelligence to recreate your brain and bring you (yes, the real you) back. Unlike a physical brain, a digital copy put on a sturdy hard drive could be cheaply and indefinitely stored. Alcor could probably put high quality hard drives in a plastic bag, bury them in the Arizona desert and expect them to be readable thousands of years later.

Ideally, Alcor would create this digital copy while maintaining your physical brain. Alas, the best way to scan a brain is to first cut it into extremely thin slices. Our current scanning technology isn't good enough to capture most of the details of your brain, so if you have trust in Alcor's ability to maintain your physical brain you shouldn't want them to destroy it to get a digital copy. Still I propose that Alcor ready a slicing and scanning doomsday plan against the contingency that it can't maintain cold storage because of, say, financial problems, government intrusion or even the collapse of civilization. Alcor could also offer an extremely cheap "cryonics" option where all it does is create and store this digital copy. As scanning technology improves it would become more and more likely that a post-Singularity super-intelligence could bring you back from the digital copy.

At some point it might become possible for Alcor to make extremely high resolution but non-destructive scans of its patients' brains. Copies obtained from these scans would provide some insurance against accidents.

The most actionable implication of singularity expectations is that Alcor should advertise in the Singularity community. Already many well-respected members of this community have signed up for cryonics, including:

- Ray Kurzweil, inventor and leading Singularity intellectual
- Robin Hanson, economist
- Eliezer Yudkowsky, leading friendly-AI theorist
- Michael Anissimov, Media Director for the *Singularity Institute.*

The Singularity is a variance booster that might end up destroying everything we care about. But if the singularity does go well it would deliver a utopia so fantastic as to be beyond anything we can imagine. Alcor could pitch itself with the slogan "don't die and miss out on the Singularity."

In my book, *Singularity Rising: Surviving and Thriving in a Smarter, Richer and More Dangerous World*, I end the introductory chapter with the following paragraph:

> This book has one recommendation that, if you follow it, could radically improve your life. It's a concrete, actionable recommendation, not something like "Seek harmony through becoming one with Creation." But the recommendation is so shocking, so seemingly absurd, that if I tell you now without giving you sufficient background, you might stop reading.
>
> Guess what I'm referring to. ■

James D. Miller is an associate professor of economics at Smith College and was a speaker at the 2008 Singularity Summit. He is the author of *Singularity Rising*, to be published on October 2, 2012, and *Game Theory at Work*. He has a Ph.D. in economics from the University of Chicago and a J.D. from Stanford. He joined Alcor in 2008.

Endnotes:

Author's Homepage
www.JamesDMiller.org
Singularity Institute
http://singinst.org/
Beijing Genomics Institute
https://www.cog-genomics.org/

Alcor Donation to Brain Preservation Technology Prize Declined

On July 13, Alcor announced that it would contribute $10,000 to the Brain Preservation Foundation toward the costs of testing both cryopreservation and chemopreservation. The Foundation has declined our donation because of concerns that it might be perceived as influencing the judges' decisions. Even though Alcor was not a competitor for the prize, we can understand the Foundation's concern.

We will instead look for other ways to validate existing cryopreservation methods, as well as continue to improve them.

The original post of July 13, with minor edits, follows.

Alcor Contributes to Brain Preservation Technology Prize

How well does cryopreservation (with current methods) work? Is the process sufficiently preserving personal identity-critical information stored in the brain? Are there any alternatives that might be as good or better? Although the Alcor Library already contains evidence that, under good conditions, we are preserving neural connections (the totality of which is now sometimes being referred to as the "connectome"), more evidence is desirable.

The Brain Preservation Foundation is offering a $100,000+ Brain Preservation Technology Prize to stimulate the scientific evaluation of such technologies as cryopreservation and chemopreservation (aldehyde or other chemical fixation followed by embedding in solid resin). The goal of the prize is to lead to "the development of an inexpensive and reliable hospital surgical procedure which verifiably preserves the structural connectivity of 99.9% of the synapses in a human brain if administered rapidly after biological death."

Alcor champions and supports objective feedback about the results of our procedures (and possible alternatives). Therefore, we are committing $10,000 towards the Evaluation Fund. This contribution will come from the Research Fund. Although the Prize itself is fully funded, funds are needed to conduct the evaluation. Alcor's contribution will make a big difference, since the tests are estimated to cost $25,000 to $50,000.

Alcor does not directly have a horse in this race. The cryopreservation approach is represented by a team from 21st Century Medicine. 21CM aims to demonstrate the quality of ultrastructure preservation that their low temperature vitrification technique can achieve when applied to whole rabbit brains.

In a forthcoming article, we will address claims (currently untested) for the advantages of chemopreservation over cryopreservation. We will critically examine the claim that chemopreservation or plastic embedding would be much cheaper (for individuals not committed to whole body preservation), look at some reasons to expect significant damage caused by chemopreservation of whole brains, identify problems for chemopreservation under less-than-ideal circumstances, explain why the Prize handicaps the cryopreservation option because of the way the test is to be carried out, and will argue why brain preservation technologies should be evaluated by viability criteria as well.

Even with these critical comments on chemopreservation and plastic embedding to come, Alcor supports the Brain Preservation Technology Prize. You may want to consider contributing.

One of the Prize judges, connectome expert and MIT professor Sebastian Seung, will be speaking at the Alcor-40 conference. So register for the conference and come engage in the discussion around the alternatives for preservation. ■

The James Bedford Society

Gifts have played a fundamental role in the cryonics movement since its earliest days. Dr. James Bedford, a man whose extraordinary vision led him to become the first person to be cryopreserved, and the first to make a bequest to a cryonics organization, exemplified the determination of the early pioneers of cryonics. We invite you to follow in his footsteps, and join the James Bedford Society.

The James Bedford Society recognizes those who make a bequest of any size to the Alcor Life Extension Foundation.

Giving to Alcor can be easy. If you have a pension, 401(k), 403(b), IRA, or any life insurance policy that is not held for cryopreservation funding purposes, you can assign Alcor as a beneficiary. If you have any of these types of retirement planning assets, simply contact your plan manager or insurance agent for beneficiary change forms.

Additionally, bequests can be made as part of your estate plan. Outright gifts of property or funds, trusts and annuities are all ways in which you can help secure Alcor's future. Contact your financial planner or attorney for details on how you can establish your planned gift for Alcor. We welcome your gift, regardless of size.

Alcor members who inform us of an existing bequest, or who establish a bequest for Alcor in 2012 will receive special recognition as Founding Members of the James Bedford Society.

If you have already provided a gift for Alcor in your estate, please send a copy of your relevant documents to Alcor's Member Communications Director. If your cryopreservation arrangements have funding over the current required minimum, and that overfunding is assigned as a gift to the Alcor Research Fund, General Operating Fund, or the Endowment Fund, you also qualify –just send an email to lisa@alcor.org or call 877-462-5267 x115 and let us know. The James Bedford Society is looking forward to welcoming you as a Founding Member. ■

2012 Annual Giving Program

Alcor provides a wide array of services for you the member, and the general public. We inform and educate, we protect and preserve, and we strive to remain at the forefront of cryonics technology.

Since its founding, Alcor has relied on member support to maintain its mission and attract new members. Your support, regardless of size, can provide a better future for all cryonicists. Please act now.

Suggested Giving Levels

$20	Friend
$60	Junior Supporter
$120	Sustaining Supporter
$500	Advocate Supporter
$1,000	Leading Supporter
$2,500	Visionary Supporter
$5,000	Silver Supporter
$10,000	Gold Supporter
$25,000	Titanium Supporter
$50,000	Vanguard Supporter

We encourage every member to donate. Even if you can only afford $5 right now, you will make a significant contribution to Alcor's future.

Donations may be made via the Donations button on the Alcor website or by contacting Alcor's Financial Director, Bonnie Magee, at bonnie@alcor.org. Your donation may be made as a lump sum or divided into easy monthly payments. ■

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Sample Ingredient Comparison	LIFE EXTENSION® TWO-PER-DAY	Centrum® Silver® Adults 50+
Vitamin C	500 mg	60 mg
Vitamin D	2,000 IU	500 IU
Vitamin B1	75 mg	1.5 mg
Vitamin B2	50 mg	1.7 mg
Vitamin B6	75 mg	3 mg
Vitamin B12	300 mcg	25 mcg
Niacin (as niacinamide)	50 mg	20 mg
Pantothenic acid	100 mg	10 mg
Vitamin E	100 IU (natural)	50 IU (synthetic)
Natural Folate	400 mcg	400 mcg (synthetic)
Zinc	30 mg	11 mg
Selenium	200 mcg	55 mcg
Lutein	5,000 mcg	250 mcg
Lycopene	2,000 mcg	300 mcg
Biotin	300 mcg	30 mcg
Boron	3,000 mcg	150 mcg
Chromium	200 mcg	45 mcg
Molybdenum	100 mcg	45 mcg
Magnesium	100 mg	50 mg
Manganese	2 mg	2.3 mg
Iodine	150 mcg	150 mcg
Potassium	25 mg	80 mg
Vitamin A (as beta-carotene)	4,500 IU	1,000 IU
Vitamin A (preformed)	500 IU	1,500 IU
Choline (as bitartrate)	20 mg	(none)
Inositol	50 mg	(none)
PABA	30 mg	(none)
Calcium	12 mg	220 mg
Alpha Lipoic Acid	125 mg	(none)

Contains soybeans, rice, and corn.

Commercial "one-a-day" supplements provide very low potencies.

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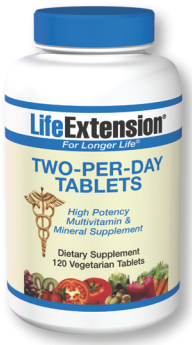
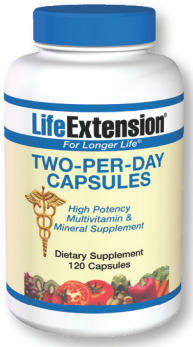
Commercial supplements often contain the cheapest form of nutrients that don't provide optimal benefits. For example, the 50 IU of synthetic vitamin E contained in Centrum® Silver® Adults 50+ may provide relatively little vitamin E to the bloodstream. The 100 IU of natural vitamin E contained in Two-Per-Day provides much more vitamin E activity.



Item # 01615
Tablets



Item # 01614
Capsules

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Two-Per-Day Tablets retail for $20, but members pay only **$13.50 each** when four bottles are purchased. **Two-Per-Day Capsules** retail for $22, but cost members only **$15 each** when four are purchased.

Each bottle of **Two-Per-Day** lasts **60 days**, so members can obtain the benefits of this high-potency formula for as little as **$7.50 per month**.

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 for more information.

Scottsdale:

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

At Alcor:

Alcor Board of Directors Meetings and Facility Tours – Alcor business meetings are generally held on the first Saturday of every month starting at 11:00 AM MST. Guests are welcome. Facility tours are held every Tuesday and Friday at 2:00 PM. For more information or to schedule a tour, call D'Bora Tarrant at (877) 462-5267 x101 or email dbora@alcor.org.

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

CALIFORNIA

Los Angeles:

Alcor Southern California Meetings—For information,call Peter Voss at (310) 822-4533 or e-mail him at peter@optimal.org. Although monthly meetings are not held regularly, you can meet Los Angeles Alcor members by contacting Peter.

San Francisco Bay:

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

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 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, or on FACEBOOK via the Cryonics Special Interest Group.

PACIFIC NORTHWEST

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

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

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

British Columbia (Canada):

The contact person for meetings in the Vancouver area is Keegan Macintosh: keegan.macintosh@me.com

Oregon:

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

ALCOR PORTUGAL

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

TEXAS

Dallas:

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

Austin/Central Texas:

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

UNITED KINGDOM

There is an Alcor chapter in England. For information about meetings, contact Alan Sinclair at cryoservices@yahoo.co.uk. See the web site at www.alcor-uk.org.

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

What is Cryonics?

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?

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). 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.)

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?

Signing up for a cryopreservation is easy!

Step 1: Fill out an application and submit it with your $150 application fee.
Step 2: You will then be sent a set of contracts to review and sign.
Step 3: Fund your cryopreservation. While most people use life insurance to fund their cryopreservation, other forms of prepayment are also accepted. Alcor's Membership Coordinator can provide you with a list of insurance agents familiar with satisfying Alcor's current funding requirements.
Finally: After enrolling, you will wear emergency alert tags or carry a special card in your wallet. This is your confirmation that Alcor will respond immediately to an emergency call on your behalf.

Call toll-free today to start your application:

877-462-5267 ext. 132
info@alcor.org
www.alcor.org

ALCOR
LIFE EXTENSION FOUNDATION
SINCE 1972

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

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

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

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

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- **A subscription to *Life Extension* magazine** ($59.88 yearly newsstand value)...Over 100 full-color pages every month are filled with medical research findings, scientific reports, and practical guidance about using diet, nutrients, hormones, and drugs to prevent disease and slow aging.
- Access to a toll-free phone line to speak with **knowledgeable health advisors,** including naturopathic doctors, nutritionists, and a cancer expert, about your individual health concerns. You can also receive help in developing your own personal life extension program.
- **Discounts on prescription drugs, blood tests, and pharmaceutical quality supplements** that will greatly exceed your membership dues. You'll receive a directory listing the latest vitamins and supplements, backed by scientific research and available through a unique buyers club.

FREE BONUS!

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

Life Extension Foundation funds advanced vitrification and gene-chip research. Your $75 membership fee helps support scientific projects that could literally save your life.

Call 1-866-820-4967 today.

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