ALCOR LIFE EXTENSION FOUNDATION

CRYONICS

4TH QUARTER 2007 · VOLUME 28:4

Marketing Cryonics: Thinking *Inside* the Box

PAGE 12

PROMOTING CRYONICS

PAGE 7

CRYONICS: USING LOW TEMPERATURES TO CARE FOR THE CRITICALLY ILL

PAGE 16

UNIFORM ANATOMICAL GIFT ACT: PROTECTING ALCOR'S INTERESTS

PAGE 19

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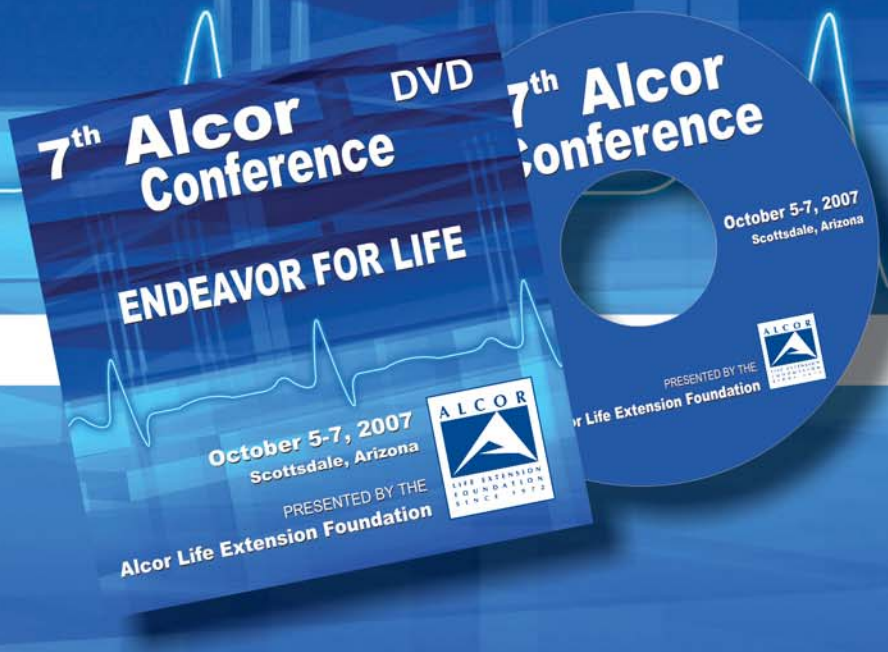

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ALCOR LIFE EXTENSION FOUNDATION

CRYONICS

4TH QUARTER 2007 · VOLUME 28:4

Cover by Lily Henson

COVER STORY: PAGE 12

Marketing Cryonics: David Pascal, a marketing consultant who worked with the Cryonics Institute and started the Cryonics Society, seeks a better response to cryonics from the public by delving into the marketing process.

INSIDE CRYONICS

ALCOR LIFE EXTENSION FOUNDATION
CRYONICS

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FROM THE EDITOR

It has been a lively couple of months at Alcor with the entire staff in high gear preparing for the 7th Alcor conference – checking and rechecking all of the logistical details, working as a team to tear out cabinets and countertops for facility renovations, industriously putting the finishing touches on equipment so that it was ready for demonstration. Although the pace of everyday life has returned to normal, the positive energy remains. Look for details about the recent Alcor conference in the 1st quarter 2008 issue.

One of the great pleasures of hosting an annual conference is the opportunity to meet the people in attendance, especially because the Alcor staff is often restricted to somewhat impersonal interactions with its worldwide membership base, via email or the telephone. At the conference, I was busily checking to ensure our next speaker was on hand and ready to take the stage when a lovely lady named Maria Entraigues introduced herself. In this issue, she shares her story about the value of her Alcor membership and how it interplays with her career in the arts and entertainment industry (pg. 10).

Meeting your valued customers in person during a conference is one form of outreach, but what about formal marketing? An Alcor member recently wrote me an email, saying, "All of the proponents of cryonics combined have not been able to convince more than 1,000 to 2,000 people that this program makes sense. To me, *that* makes no sense!" David Pascal, a marketing consultant who has given considerable thought to marketing the cryonics industry, proclaims that the solution is hiding in plain sight (pg. 12). And Aschwin de Wolf shares his insights into how the industry could benefit from a fresh perspective on the philosophical basis behind cryonics (pg. 16).

Finally, you will find a letter to the editor published in this issue. Others are encouraged to follow this example by sending comments to: Jennifer@alcor.org

LETTER TO THE EDITOR

Ben Goertzel's article "What is a Self that it Might be Revived?" (28:2) addresses, but does not fully answer, similar questions about identity that I've been struggling with. Below are three illustrative scenarios.

Scenario 1:

An entire individual is replaced, molecule-by-molecule, with identical molecules (except where needed to repair the cause of death) while the individual is in cryopreservation.

Comments: This is basically the scenario that Dr. Goertzel addresses. It isn't much different from what is happening to us now, with cells constantly being replaced. I suspect that most of Alcor's members would agree that the self is preserved in this scenario.

Scenario 2:

An entire individual is both replaced and replicated, molecule-by-molecule, while the individual is in cryopreservation, resulting in two identical individuals.

Comments: If we were to awaken these two identical individuals, each would think that he or she was the original, though neither would be. Neither one would be any more (or any less) like the original than the other, and neither would have any more or any less continuity with the original. Would the original self have now become two selves?

Suppose you were the person whose body was both replaced and replicated, and suppose further that we were to awaken only one of you. If you could decide in advance which one of these bodies to awaken, would it matter to you? If we told you now that we were going to awaken only the replica, do you think that it would be you to awaken? If there was damage repairing and replacing the original, would you feel that you had been preserved if we awoke only the replica?

My own opinion (subject to change!) is that, yes, there would now be two of my "selves." And while I have a preference that my replaced self (rather than the replicated self) be the one that is revived if only one of my selves is revived, I think this is an irrational preference that I should abandon.

Scenario 3:

We make several replicas of you and awaken them all.

Comments: Are they all you? If your lover is alive, would he or she think all of them were you? Would "you" be OK if the other replicas treated "your" lover as their lover too, or would you be beside yourself with anguish? In general, what rights accrue to each of "you"?

My own opinion is that each of us should decide, prior to our demise, how we would want most of our rights and assets distributed – sort of like writing a will where our multiple selves are analogous to our children. Not knowing in advance how we'll be revived, or how many of "me" will be revived, does make it more difficult, though perhaps a phrase such as "equal shares for each of me" might suffice for many things that we want to leave ourselves.

As for our lovers, well, I think that picking which one of us they like the best is up to them, and the rest of us/me will just have to get over it.

Norm Haberly, MBA, MSCS
Alcor member since 2004

The Author Replies:

The scenarios Norm Haberly describes are important ones, which are plausibly likely to occur in our future. However, I don't consider them particularly problematic from the perspective of self-theory.

My view is that, in Norm's Scenario 2, both the replica and the replacement contain genuine and valid continuations of the self of the individual who was cryopreserved. The specific mechanism of physical continuation doesn't make any difference. What matters is the experiencing self, which is the same in both the replica and the replacement.

In Norm's Scenario 3, again, it seems clear to me that, yes, if multiple replicas of a person are made and they all initially contain the self of the pre-replica person at the moment of replication, then all these replicas are validly that person.

These questions Norm raises, while important, don't strike me as being nearly as troublesome as the question of whether a superhuman being that evolves incrementally out of a person, but has very little in common with the person who seeded it, is still in any real sense "that person." This question raises the issue of the extent to which a person is a set of patterns immanent in a system over a brief interval of time, versus an ongoing process of evolution over time.

This is a somewhat subtle matter, whereas, to me, the question of whether mind lives on the level of pattern/process or on the level of the underlying physical substrate is basically a moot point. What makes you "you" is the pattern/process of your self, not the molecules or bits from which the self emerges.

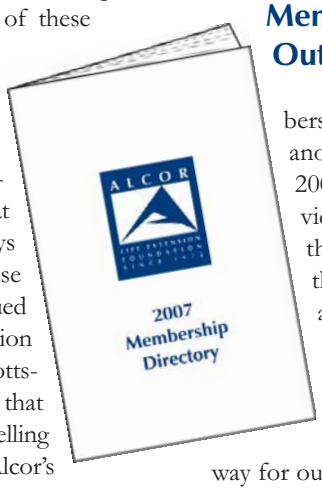
Benjamin Goertzel, Ph.D.

EXECUTIVE DIRECTOR'S REPORT

The Company You Keep

I've had the pleasure of keeping some good company lately, having conversed with countless members and supporters while attending recent conferences. It started up north in Chicago at the World Transhumanist Association (WTA) conference in late July. Attendees were exposed to cryonics at the Alcor information table run by Alcor member Shannon Vyff and during presentations to the audience, including one by our own Tanya Jones. In early September, I headed out to San Francisco for the Singularity Summit, another forward-thinking gathering.

While Alcor has no official policy on transhumanism and the related futurist topics which are often the centerpiece of these and similar conferences, there clearly is a strong cross-over in interest among Alcor members and these organizations. Indeed, it truly makes my day when people come up to me and ask that burning question they've always had about cryonics. So, I see these conferences as a rare and valued opportunity for personal interaction with those from outside the Scottsdale area, a kind of outreach that holds strong potential for dispelling common myths and growing Alcor's membership base in the future.



Coinciding with the Singularity Summit, the annual Alcor board meeting was held in San Francisco. The significance of the annual meeting is the election of board members and officers as required by the organization's bylaws. Alcor has a self-perpetuating board of directors. This means that the outgoing board elects the incoming board, which is very common among non-profits, particularly those with significant financial assets, such as museums and hospitals. Meet the current board of directors in the "About Alcor" section of our website: http://www.alcor.org/AboutAlcor/meetdirectors.html

But by far the best company I've kept has been at the 7th Alcor Conference in October. Seeing old friends and making new ones was definitely the highlight, followed closely by some fireworks sparked by audience questions. If you missed it, all is not lost. We will shortly have a conference DVD set for sale. Look for an announcement soon on Alcor News and here in *Cryonics* Magazine. And if you're interested in reading a live blog about the conference done by some volunteers, check it out in the October issue of Alcor News (www.alcornews.org/weblog).

Membership and Outreach

It's no secret that Alcor members want to get to know one another and the newly released 2007 Membership Directory provides a resource for doing just that. Often conferences like those mentioned above publish an "attendee list," which lists those in attendance who are willing to give out their contact information to other attendees – another good way for our community to network.

We strongly encourage our members to get active in a local group, which tends to support Alcor's membership growth objectives.

New groups recently started:

Where: **Chicago, IL**
Contact: Paul Battista
Email: pbatt72@hotmail.com

Where: **St. Petersburg, FL**
Contact: Greg Jordan
Email: arcturus12453@yahoo.com
Webpage: http://cryonics.meetup.com/46

Membership Billing Difficulties

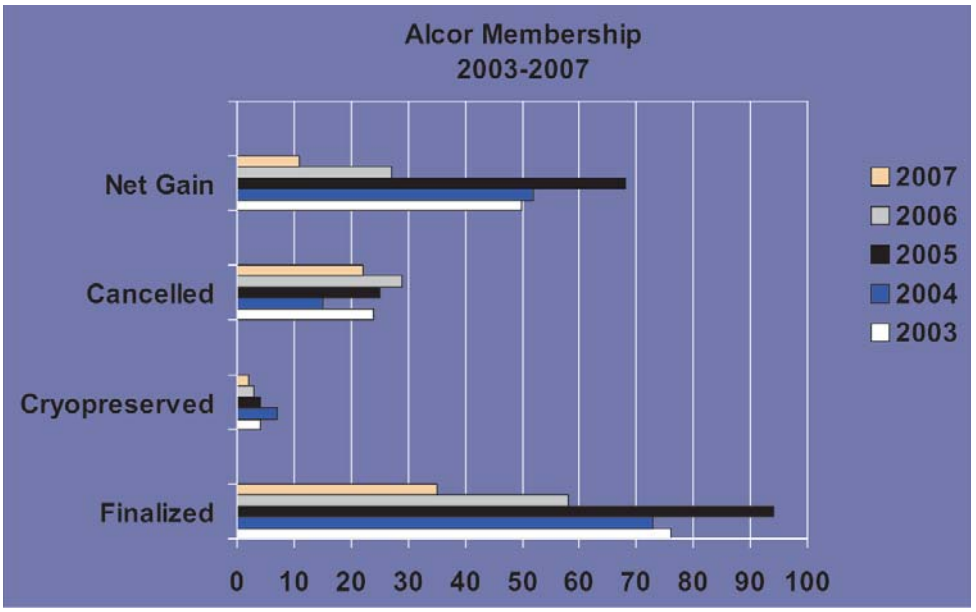
In late 2006, Alcor began mainly sending membership dues invoices by email, in an attempt to streamline operations and minimize postage expenses. This was less reliable than desired, so printed invoices are again being sent through the postal mail. Those currently receiving invoices by email for online payment will continue to do so, in addition to receiving printed invoices.

We regret that some members have not received one or more invoices as a result. We are attempting to contact those who show a balance over 90 days past due and appreciate timely response to our letters and phone calls. If you'd like to check on your account with Alcor, please contact:

Sheila Kimbrell, Bookkeeper
877-462-5267 x 114 (toll-free)
480-905-1906 x 114 (local)
480-922-9027 (fax)
sheila@alcor.org

Cryopreservations

In July, a last-minute case was accepted. The patient was a Canadian resident with a will stating his wish to be cryopreserved by Alcor and directing his estate to pay the bill. The Alcor board chose to accept this case because of the clear statement of the individual's wishes for both cryopreservation and for Alcor specifically to perform the cryopreservation, and because the funding appeared to be readily available. However, when the estate's executor ran into challenges with the trust company holding the estate funds, he



Membership data as of October 1, 2007

abruptly resigned. The lack of an executor for the estate means there is no one to carry out the decedent's wishes, leading to a delayed payment. Several strategies are being discussed with our attorneys.

The patient, A-2309, was straight-frozen, because of his unexpected death and the time delays in getting his body to Arizona from Canada, which placed him beyond the point where vitrification was possible. We instrumented the patient for acoustic monitoring and collected fracturing data. The first fractures appeared, naturally, at higher than normal temperatures and this data will become interesting as we collect more on similar cases in the future.

During the last few months, we also cryopreserved two members' cats and a member's dog. These individuals had been making pre-payments toward the pet's cryopreservation, but the animals all died suddenly. If you are interested in cryonics for your companion animal, it is best to make arrangements well in advance. Alcor now has 33 pets in its care.

Advanced Cryoprotective Perfusion System

Alcor's Advanced Cryoprotective Perfusion System (ACPS) for whole-body vitrification is nearing completion. All of the necessary elements for perfusing the cryoprotectants through the body have control systems now, i.e. the computer can control the cryoprotectant's temperature, pressure, flow, refractive index and more. We are adding the alarm conditions and constructing the user interface. Of course, we must yet rigorously test the new system to make sure it works as intended. The ACPS will be the most advanced human cryopreservation system in the world, with complete integration and control of the relevant cryopreservation parameters, cooling, operator feedback, safety systems, and graceful failure modes. More details will be provided in 2008.

Nanomedicine Support Continues in 2007

In June, Alcor announced on its blog the continuing support for development of theoretical nanomedical protocols and devices. For the third year, Robert A. Freitas Jr. will receive a grant from Alcor to continue his pioneering work in nanotechnology. Freitas has acknowledged Alcor's support in several peer-reviewed, published papers. ■

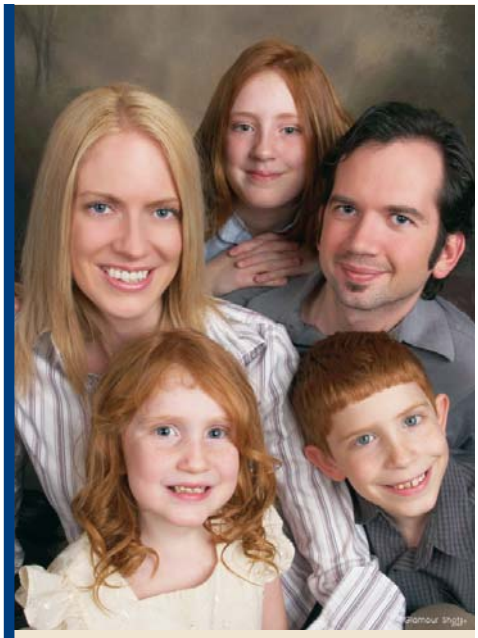
Sincerely,

Stephen J. Van Sickle

21ST CENTURY KIDS

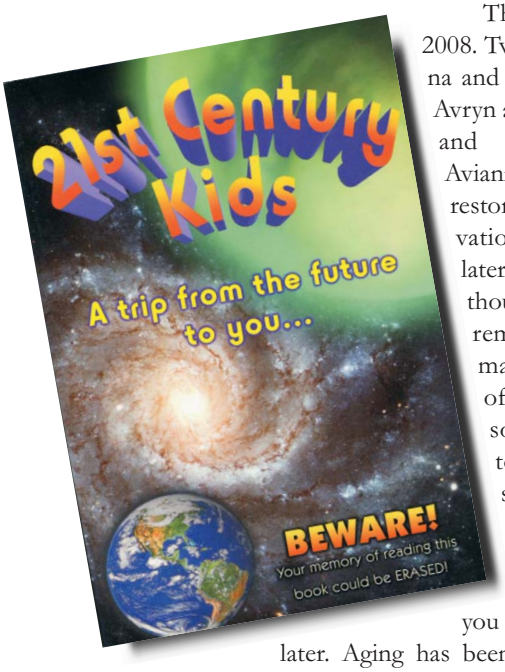
Author: Shannon Vyff

BOOK REVIEW BY R. MICHAEL PERRY, PH.D.



Shannon, her husband Michael, and her children (clockwise from top), Avianna, Avryn, and Avalyse

What will the future bring? This question is especially important and haunting to those of us who have chosen cryonics: we want to reach the future! However it turns out, we are betting it will be worth seeing and sharing. One such hopeful futurist, Alcor member Shannon Vyff, has written a science-fiction novel called *21st Century Kids*. It offers adventure and excitement for the young at heart of all ages who like to stretch their imagination and ponder what life might be like in the world to come.



The story starts in 2008. Twelve-year-old Avianna and her younger brother Avryn are in a fatal car crash and are cryopreserved. Avianna is hurt less so is restored from cryopreservation first, 180 years later. A lot has changed, though basic similarities remain. People still mainly inhabit bodies of flesh, though with some enhancements to make them stronger and smarter. There is an option to upload into a robot body and then, if you wish, download back later. Aging has been halted but not yet reversed, so people already old might elect to upload into artificial bodies and stay there, letting the original flesh die naturally in an unconscious state. There are many new faces and almost no familiar ones. Relatives and others who were born after Avianna was cryopreserved have now developed into adults she must depend on as she continues with her education and upbringing. Her naturally high intelligence and the newly available brain enhancements rapidly close the gap between her and others her age.

A mystery has developed, however, with her little sister Avalyse, who was in the accident with Avianna and Avryn but survived. Avalyse has long since grown to adulthood and had a long, distinguished career, finally in her nineties uploading to a robot body to continue her life unhindered. But more recently she joined an expedition to a distant extrasolar planet. At some point all communications ceased, and no one knows the fate of the missing explorers. Avianna is determined to find out what happened, but she too disappears on her journey to the planet.

Not long afterward Avryn is restored to health. When he learns what is going on he burns with determination to solve the mystery and find his missing sisters. Starting as a physical ten-year-old but very bright and purposeful, he progresses quickly, further enhances his powers to become a bit larger than life, and presses for a third expedition to the planet. He is allowed to join by the expedient of uploading his personality to a robot body while, as a precaution, his natural body is safely dormant on Earth. If he — the robot — doesn't return, his body on Earth can be awakened and take up where he left off.

Anti-uploaders and robots' rightists may be disturbed by these antics which, along with the ending, I found jolly good reading. If you are among the bothered, you may have to suspend a little disapproval along with the usual science-fictional disbelief. Overall, though, I think most with a reasonable futuristic itch will enjoy this anticipation of some of the possible future wonders. Don't take it too seriously as prophecy — the real future will probably be different for a number of reasons, including social, scientific, and so on. But it's a fun read and I could imagine it might convince some readers, especially the young people it's mainly directed at, to look further into cryonics. (It could also make a fine holiday gift for children of cryonicists or friends.) ■

For more information about *21st Century Kids*, visit:
http://www.21stcenturykidsbook.com/

Promoting CRYONICS

By Shannon Vyff

There are many intriguing ideas about how cryonics can be promoted, but what's a simple thing we can all do? I've recently had the opportunity to give interviews about cryonics while promoting my newly published book, *21st Century Kids*. Interviews are always a fun way to hear the basic assumptions society has about cryonics, positive and negative.

But not everyone is comfortable giving interviews, so what else can active Alcor members do to promote cryonics? I suggest handing out Alcor materials at a cryonics-friendly conference – a place where you are popular just because you are a cryonicist!

When asked to run the Alcor information table at the World Transhumanist Association's TransVision 07 conference in late July, I happily accepted. The conference, I knew, would be filled with people who had heard about cryonics. I spent three days talking with people from all religions and different economic and educational backgrounds.

During my stay, I talked with at least 50 people, none of whom were hostile to cryonics. I talked with young and old, couples and singles, parents and children – and it felt great to have people wanting to talk to me to find out more about cryonics. About all of them took *Cryonics* Magazine and other literature and around 60% of people took an application for membership. However, only one signed to become an Alcor member. He had life insurance already in place and had been researching cryonics for years. For most others, the process of acquiring insurance seemed daunting.

Now I had sort of assumed people would be applying for membership with Alcor left and right. I quickly realized that – yes, the attendees did know about cryonics, had researched it extensively in many cases – yet they were still not ready to sign the required membership contracts.

Many people said they were planning on being cryopreserved at Alcor – their family knows and is supportive, they have the funds set aside, or they'll sign *someday*. I explained that in the event of an accidental death, it can be very difficult, almost impossible, to be cryopreserved at Alcor without first becoming a signed Alcor member. I tried to convey the peace of mind I get from knowing that if something unexpected happened, I'd have the support of Alcor to assist in acquiring an optimal cryopreservation with the best technology in the field.

So I encourage you to help with promoting cryonics in a fun and non-confrontational manner by simply manning an information table at a futurist conference: Accelerated Change, Singularity Summit, World Future Society, TransVision, and more... just contact Alcor about acquiring materials and key talking points. In some cases, you can also inform Alcor about cryonics-friendly events that they may want to speak or network at in the future.

After you've gained some experience you may want to try a technology conference or even an end-of-life workshop in your area where you may encounter people who have misconceptions about cryonics or simply haven't heard of it. I find such experiences rewarding. Many say they never thought of it before and are thankful to have heard more. I've taken materials to end-of-life workshops at my church and talked with many friends. In simply being open about my cryonics arrangements in my everyday life, I am promoting the idea.

Finally, when people ask hard questions about the soul or the pathophysiology of ischemic injury – questions that you may not be able to answer to their liking – refer them to Alcor's extensively informative website where just about all questions can be answered. It is important to encourage them to consider signing up for cryonics as they learn more. At any point they can always choose not to complete the process, but I've found that the more that people learn, the more they appreciate the comfort of taking a chance on cryonics.

Overall, I had a splendid time at TransVision 07 talking with so many who knew about cryonics and were enthusiastic about its chance of working. It was exhilarating to be around so many humans that care about and work towards a better future for humanity. Even though I enjoy promoting cryonics to people who've heard nothing about it, there is something special about being in a room full of people who fully support it. ■

Photo by Helene De Lillo Photography. www.helenedelillo.com

Shannon Vyff met some interesting people while handing out literature about Alcor at TransVision 07 in Chicago.

Shannon Vyff

Shannon Vyff is one of the authors of *The Scientific Conquest of Death* and the author of *21st Century Kids*. She is a K-2nd grade religious education teacher and a La Leche League Leader who lives in Austin, Texas, with her husband and three children. She has been an Alcor member since 2005.

Contact the author:
shannonvyff@yahoo.com

Conferences of Interest:

Accelerating Change
http://www.accelerating.org/accelerating_change.html

Singularity Summit
http://www.singinst.org/summit2007/

World Future Society
http://www.wfs.org/2007main.htm

TransVision
http://www.transvision2007.com/

The Forsight Institute
http://foresight.org/news/index.html

Know of more? Let us know!
jennifer@alcor.org

Chatting with...

ALCOR'S TANYA JONES AT TV07

By George Dvorsky

William Shatner was a much-anticipated speaker at TV07, but one attendee found his conversation with Tanya Jones equally captivating.

It's funny how these things go. There I was at the TransVision 2007 celebrity reception in late July, drinking white wine, munching on hors d'oeuvres and eagerly awaiting the arrival of William Shatner. I was looking forward to a once in a lifetime opportunity.

And then I realized that I was in the company of Tanya Jones, chief operating officer for Alcor. I had never met Tanya before and I have yet to visit the Alcor facility in Arizona. I was very impressed with her TV07 presentation from earlier in the week, and I was bursting with questions.

So, as we were waiting for Shatner to arrive, we began to chat.

To Freeze and Protect

During her talk two days prior, Tanya gave conference attendees the rundown on some of Alcor's more recent work and initiatives. It was a fascinating glimpse into the world of cryonics and what it takes to run a company on the technological and social outskirts.

She noted how Alcor teams can be rushed to the bedside of dying patients as they ready for the suffusion of cryoprotectants in preparation for cryopreservation. Without this highly-engineered liquid, preservation would be completely disastrous with each cell suffering a host of problems, including extensive ice crystallization and the eventual threat of it losing all its physical integrity. The cryoprotectant gel, which replaces the blood after death, essentially converts the body into a glass-like state. The body's informational state is thus retained at the highest level currently possible.

Consequently, getting the patient into cold storage quickly is paramount. As Tanya noted during her presentation, "Time is trauma." During the cocktail reception, I asked her how long would be too long. She replied that any kind of delay is detrimental, but that after 24 hours the real serious and irrevocable damage starts to occur, namely cellular degradation and a host of other neural problems as the brain begins to lose its cohesion and organization.

I asked her if Alcor has a policy for refusing to treat severely damaged patients, say a person that had been terribly damaged by autopsy or by a motor vehicle accident. She answered that in such cases, where information theoretic death is all but assured, it is not up to Alcor but rather the predetermined wishes of the Alcor member. When an individual signs up with Alcor they specify the various extremes to which they will still agree to be cryopreserved. Alcor unquestioningly adheres to those wishes.

Several presenters at TransVision 07 represented cryonics, including (left to right) Ralph Merkle, Ph.D., Tanya Jones, Shannon Vyff, and her husband Michael.

Tanya also described the freezing process which is done under strictly controlled conditions. The body is slowly brought down to the optimally low temperature and is carefully monitored for tissue fracturing. Quite frustratingly, every preservation that has ever been conducted at Alcor has suffered from fracturing of some sort. Tanya described the sound as similar to ice-cubes popping when added to a drink.

Tanya Jones presented at the World Transhumanist Association's conference about the engineering developments underway at Alcor.

I squirmed in my seat listening to this description, wondering how our high tech descendants will repair this sort of "information theoretic" brain damage.

Honesty, Integrity, Credibility

I was impressed with Tanya's honesty, and I told her so. By being open about current limitations, Alcor come across as being less interested in the "sell" aspect and more concerned with creating a credible and legitimate industry. Along these lines, I asked Tanya about regulation and whether or not she believes there will ever be such a thing as a monitored cryonics industry.

Not only did Tanya wholeheartedly agree, she is convinced that it is inevitable and that a big battle is looming. "But Alcor," claimed Tanya, "is ready." She quickly outlined her plans and strategy for what she thinks will be a long and drawn out struggle to get the kind of regulation in place that would be to the benefit of Alcor and the burgeoning industry of cryonics – a battle that she believes will come sooner rather than later. As it currently stands, Alcor is regulated under the Anatomical Gift Act, which makes Alcor a kind of glorified research lab and organ storage facility, which I suppose is better than being acknowledged as a funeral parlor.

It's this lack of recognition and backwards thinking that has arguably landed Alcor in trouble in the past. The scandalous Ted Williams affair, which Tanya claims is finally all over and done with, is an example of how a new and unrecognized industry can face undue challenges and public scrutiny. More formal and cogent regulation will not only give Alcor needed credibility as they work to create a viable business, it will also result in a safer and more effective industry.

From Grave to Cradle

Interestingly, while Alcor is primarily concerned with cryopreservation, they are also looking ahead to a time when cellular repair will finally become possible. They project themselves as being an all-in-one facility. Today they cryopreserve people; tomorrow they hope to be the company that restores health to those that are cryopreserved.

To this end they are creating a research lab in which rats will be cryopreserved and experimented upon. This approach makes perfect sense. It will allow them to not just look ahead, but to gauge the effectiveness of current preservation procedures and technologies.

Jokingly, I complained to Tanya about their use of rats. "The thought of a little cryonics lab filled with frozen rats in tiny dewars is unsettling," I said. "Who wants to see a revived rat running around? Why couldn't you guys have used cute little bunny rabbits instead – it would be much better PR to see a bunch of revived bunny rabbits hopping around." Tanya laughed and noted how animal experimentation will likely escalate to include larger animal models.

Cool Company

I have yet to sign up for cryonics. My reasons are, admittedly, personal, complicated and even non-nonsensical. There may come a day, however, when I've reconciled my broader existential outlook with the prospect of cryonics.

Until then, however, I will laud the efforts of Alcor and continue to advocate for the right to a long life. They are certainly blazing a fascinating trail into the future.

Oh, and I totally missed the opportunity to meet William Shatner. I barely even noticed that he was in the room when I was chatting with Tanya. Now why do you suppose I have absolutely no regrets about that? ■

George Dvorsky

George Dvorsky serves on the Board of Directors for the Institute for Ethics and Emerging Technologies. George is the Editor-in-Chief of Betterhumans, co-founder and president of the Toronto Transhumanist Association, and the producer of Sentient Developments blog and podcast. Mr. Dvorsky served as conference chair for TransVision 2004, the WTA's annual conference.

Taken from George P. Dvorsky's blog, Sentient Developments, which offers transhumanist and technoprogressive perspectives on science, philosophy, ethics, and the future of intelligent life: http://sentientdevelopments.blogspot.com

MEMBER PROFILE:

MARIA ENTRAIGUES AND RUY FOLGUERA

By Chana de Wolf

Maria at a music video shoot for the end titles song she co-wrote with Ruy called "Free Our Love" for the film "The Magnificent Ambersons," which Ruy scored.

As a child, Maria Entraigues would fly with her parents to Spain each year to visit her family. While there, she especially liked watching performances by her uncle, a well-known Spanish singer. Maria fondly recalls attending his concerts, which nourished her budding desire to become a performer herself. "My uncle encouraged me early on," she says. Later in life, as lead singer for the house band at the Sheraton Hotel in Buenos Aires, Argentina, Maria was already beginning to live her dream. But that dream got a little bigger in 1991 when band auditions were held and she met Ruy Folguera, a talented pianist who easily passed the trial.

Maria and Ruy began dating shortly thereafter, brought together by their love for music. Ruy is the progeny of a long line of mathematicians and engineers, but he was always most interested in music and film and sought to be a composer. He was especially enamored with the combination of music and film, and remembers recording movie music on tape as a young boy. Encouraged and inspired by one another, Maria and Ruy both applied for and received scholarships to attend Berklee College of Music in Boston, where they lived from 1992 until 1995. Maria is now a degreed voice performer, while Ruy earned degrees in commercial arranging and film scoring, which refers to writing the background music for a movie or other production.

Since moving to their current residence in Los Angeles, California, in 1995, Maria and Ruy have continued to combine their talents in such a way that allows them to work together on many creative projects. Sometimes Maria is even able to keep up her acting chops with roles in movies such as the Woody Allen film *Picking Up the Pieces,* which Ruy scored. Most recently, Ruy did the electronic music and orchestrations for *Rush Hour 3,* while Maria worked as music direction assistant.

As part of their careers as performers, they often get to travel when a director asks them to compose the music while a film is being shot. Their next project, in which Maria has acting and singing roles, takes them to Romania to work on the movie *Dare To Love Me,* a musical directed by famous director Alfonso Arau about the life of Carlos Gardel. "We work on movies together a lot," says Maria. "We're lucky that way." With a studio in their L.A. home and an endless supply of Hollywood productions seeking soundtracks, it may seem like their luck will never run out.

But Maria knows better. "Since I was a child I have been obsessed with the fact that we have to age, deteriorate, and die and that there's still no way out of it." This obsession drove her to zealously research anti-aging subjects in her spare time. "I always have my little laptop with me," she says. "I keep reading as much as I can on subjects related to life extension, medicine, biology, genetics, transhumanism, and bio-nanotechnology. I think I first read about Alcor ten years ago, but somehow I thought it was only for very wealthy people and kind of a long shot anyway."

Then, around three years ago, Maria began reading about Dr. Aubrey de Grey and

Maria and Ruy at the premiere of the movie "Zapata." Ruy scored the music for the movie and Maria sang and co-wrote songs for the soundtrack.

his plan for defeating aging called Strategies for Engineered Negligible Senescence (SENS). Realizing that she might be of help in communicating his ideas, she offered her services as a Spanish translator for his website. While attending Dr. de Grey's second SENS conference in Cambridge in 2005, Maria and Ruy met Dr. de Grey in person. "It was there, while at dinner, he passionately explained to me why I should become an Alcor member," Maria recalls. "I had no doubt then."

Maria and Ruy are licensed pilots and are shown here flying their personal airplanes.

As a next step, Maria and Ruy attended the 2006 Alcor conference in Scottsdale, Arizona. Having had such a positive experience at SENS, Maria was already convinced that she should sign up with Alcor. Ruy was "hooked" on the idea, but still needed to hear more about it. "Going to the conference was perfect," Maria recalls. "We met many members there and had the chance to ask them questions. The presentations were very educational, and the tour of the [Alcor] facility was impressive. In a way we were able to see that *this is real*, and we left the conference really believing in it."

Maria in the Alcor patient care bay during her tour of the facility at the 6th Alcor conference

But that doesn't mean they are totally convinced that one day cryopreserved people will be repaired to a healthy state. "Nobody can guarantee that yet, but we really believe in the project, and we understand that this is an option we have now. In reality, it is the only option we have now, and even though the whole concept sounds farfetched to most people, it is plausible." The more Maria and Ruy informed themselves about the cryonics experiment, the more reasonable it became to them. It was a mere two months after the Alcor conference that Maria and Ruy formalized their memberships with Alcor.

And their adventurous spirits don't stop there. Maria, who has fostered a lifelong fascination with astronomy and space exploration, woke up one morning in the not too distant past with a strong urge to leave earth. "I have always wanted to go to space," she proclaims. Instead of becoming an astronaut, she did the next best thing – she learned to fly. Although many cryonicists would tremble at the thought of taking up such a risky hobby, Maria feels that pursuing her true happiness is one of the most important aspects of being a life extensionist. "What is the point of living a long life if you don't use that time to do what you enjoy most?" she asks earnestly.

Because of her interests, Maria sometimes wishes she had dedicated her life to science, enabling her to work on humanity's biggest problems with her own hands. "Becoming an Alcor member has, in a way, put me at ease in the sense that I am doing my part towards helping something I really believe in," she reflects. "I feel special to be part of an exclusive group of pioneers trying to achieve probably the biggest milestone in the history of humanity." ■

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MARKETING CRYONICS

By David Pascal

When it comes to successfully marketing cryonics, David Pascal has a bright idea:

Think inside the box

How can we get a better response to cryonics from the public? Clearly our existing efforts have not been a success. The numbers speak for themselves. There's been over forty years of media coverage and press attention. And the result? Barely more than a thousand people signed up and funded for cryopreservation. Each year cigarettes, illegal drugs, and pop tunes sell in the billions. Cryonics memberships sell in the dozens. More media attention has been lavished on cryonics than on Madonna. Yet almost no one seems to want it.

Why? Advocates of cryonics speculate that we seem hard-wired by evolution to crave self-termination or that we live in a culture of death. Of course these are myths; no 'death gene' has ever been found, and our 'culture of death' spends billions each month on medical care and longevity enhancement.

But perhaps the most crippling myth is that we have done all we can to sell cryonics. Our marketing efforts have failed, and so any marketing efforts will always fail. This is a bit like saying that since if you try to hop to the moon in one mighty bound, but only rise a few feet, then rockets can never reach the moon either.

But rockets *have* reached the moon. And well-funded, carefully-researched, thoughtfully-designed marketing efforts have gained worldwide popularity for innumerable products. Professional marketing expertise *can* help. That's why every major firm in existence engages in marketing. Because, done right, it works.

But how *do* professionals do it properly? What is marketing? How does it really function? And how might we successfully apply it to cryonics?

The Marketing Process

The first step in understanding marketing is to put aside misunderstandings.

First of all: marketing is not advertising. It is not about getting press attention or media coverage or even about better public relations. Yes, those things are sometimes – not always – elements in a marketing campaign. But the *core* of marketing lies in specialized processes of information-gathering, and in using that information to shape what one offers to the market, and how one presents that offer.

It isn't about presenting something *you* want and promoting the reasons that you want it. It's about asking the public what *they* want, and providing and presenting it in ways that *they* respond to.

Marketing is a kind of creative empathy. And it is through such creative empathy – professionally structured and applied – that the challenge of building memberships and gaining public approval can be found. Provided we have the will and discipline to seek it.

How is professional marketing structured and applied? Essentially it involves six steps. The first step is defining your goals. And in business, goals are best achieved the more tightly they are focused. It isn't always a matter of pursuing growth in every sense and every way. Rolls-Royce, aimed at a tiny niche market, is a thriving success. The Edsel and the Yugo, aimed at mass sales, are out of business. Does an organization want more customers or more income? Does it want prestige or notoriety? Either can be achieved, but the first step involves vision: what and where specifically do you want your organization to be?

Answering that question shapes what the research goals should be. And once the research goals are set, marketers gather as much relevant information as they can about the consumers they're targeting. Common tools are surveys, questionnaires, focus groups, interviews, and covert or direct observation.

Sample markets need not be huge – Gallup Polls of nationwide accuracy require no more than 1500 people. But that population must be carefully balanced and selected. Fifteen hundred individuals at random attending a Billy Graham rally, or kindergarten, will not be representative. Once a representative sample is determined and explored, however, something priceless results: hard data about that target market's likes, dislikes, concerns, preferences – all the relevant factors that go into their behavior as a consumer.

The next step? Marketers apply that information to shaping or packaging the product in a way that satisfies consumer criteria for making a purchase. This step is critical. Again, and contrary to rumor, marketers do *not* ram unwanted products onto the public through relentless repetition. It is far safer, easier, and more effective simply to find out the consumers' preferences, and then create or present products that satisfy those preferences.

When an appealing product or approach is crafted in this way, and when tests show samples of the public responding positively, then mass promotional approaches are added. This is where advertising often comes in. Although alternative means of promotion are common too, such as word-of-mouth marketing, telemarketing, direct sales, 'stealth' or viral marketing, and other approaches.

Once this carefully-designed product is presented to the public, the fifth step begins: monitoring the reaction of the market and getting feedback.

And the last step? The last step involves incorporating that feedback, looping it back into the beginning of the process, and going through the whole process again, so that the product is continually being upgraded and reconfigured to mesh as tightly as possible with consumer preferences.

That's why the process is so powerful. It doesn't push things people don't want. It finds out what they *do* want and then gives it to them. Resisting good marketing means resisting the things you most desire. Very few people can do that. Very few want to.

And what particularly makes it powerful is the fact that it is not rooted in speculation, but in hard data. It's easy enough to sit around a table and express one's gut feeling as to what the market may want. But an expressive gut is not a marketing tool. Market researchers do not speculate. They gather data until they can make statistically valid predictions about public tastes and public behavior.

Marketing is the systematic discovery of what the market wants and how the market likes to be approached based on qualitative and/or quantitative market research. It then shapes and re-shapes the product and/or its presentation until those wants are satisfied.

Learning How to Listen

Could we apply this process to cryonics? Certainly. And I strongly encourage the existing cryonics organizations to give it a try. A statistically valid study of public reactions to cryonics could be done easily enough through a competent marketing research firm. I personally would suggest an extensive in-depth professional study examining everything from the packaging, pricing and services the public might like in this area, to more subtle approaches such as psychographic and segmentation analysis.

Gathering the data will be challenging. But it will be rewarding. Because all we know now for sure is that the existing approaches have not worked. They haven't worked because we've been presenting cryonics to people in a way that doesn't appeal to them. We need to find out exactly why it doesn't appeal, and we need to find out what does. If all we do repeat what doesn't work, all we'll get is the same results.

Numbers and Depths

Suppose that Alcor considered offering some form of DNA testing to the public as part of its business service. Or suppose that it considered opening a Toronto facility. These are closely focused, specific questions. Once such questions have been developed, simple polling or data gathering can provide information that would help Alcor make a better business decision. This is the function of what is called quantitative marketing research.

Other marketing questions are wider and more open-ended. "Why do people join or leave?" "What kind of visual imagery might be most effective?" "How can we get more people to sign up?" And then there's the most challenging question of all – "Which questions are the best ones to ask?" Because the fact is that you often have to study the market before you can even frame the right questions.

This area involves qualitative, or exploratory, research. Good qualitative research probes deeper market preferences. The questions used in quantitative research ideally develop from qualitative research, and that's where good marketing really begins.

I suspect this will especially be the case with cryonics. You see, few people realize that casual information-gathering often misleads more than it informs. Consumers often don't really know what motivates them to buy, and the reasons they give when they're asked have little – although not nothing – to do with it.

Political marketers know this well. In interviews and focus groups, respondents often select the more politically correct candidate because that's the choice that's socially approved. Yet once in the ballet box, votes go to the hard-liner who calls for criminals to hang.

This isn't simple hypocrisy. People's reports about themselves are honest ones. Respondents really do believe that health food is healthy and junk food is junk. Unfortunately, they go out and buy the junk food anyway. And marketing is concerned with what they do, not what they say.

How does this affect cryonics? Greatly. Simply put, the rational case has failed. Cryonicists have made a very rational case for decades, and the case could not be stronger. If cryonics works, you live – perhaps for a very, very long time. If it doesn't, you remain no deader than you would have been otherwise. It is an affordable choice between potentially tremendous gain and nothing to lose. Yet, the choice has almost invariably been against cryonics.

Many of us have experienced this, I'm sure, in talks with people. Objections no sooner come up than we shoot them down. *'No reputable scientist supports cryonics.'* Drexler, Minsky, Merkle, Fahy, Wowk, de Grey, Harris. *'It's too expensive.'* Insurance can make cryopreservation as affordable as cable. *'You can't raise the dead.'* What about the thousands who've died on operating tables and been revived? The embryos that have been frozen, implanted, and brought to term?

Each objection has an answer. And when all the objections are answered – the listener still creeps away. Clearly there are aversions to cryonics that have nothing to do with the reasons given.

The reasons given are certainly not irrelevant, and the practice of educating the public is certainly very important. Advertising icon David Ogilvy nailed this perfectly when he said that buyers have a very deep need for rational reasons – to justify the irrational urges that *really* drive their choices.

Can marketing techniques unearth those deeper, less obvious reasons? Of course. Entire branches are devoted precisely to uncovering visceral and unconscious reactions. Marketing analysts such as Harvard's Dr. Gerald Zaltmann[1] and France's Dr. Clotaire Rappaile[2] regularly – and successfully – employ projective psychological techniques to probe such factors for leading Fortune 500 companies.

What might such factors be in cryonics? They may well be related to subjective fears involving helplessness and dependency while in a vulnerable state. Or fears of social condemnation. Or the result of childhood phobias relating to fears of defying God or the 'natural order of things.' Or quite probably something which we don't, at the moment, even suspect. Which reasons are central? How can they best be addressed? You simply don't know until you do the research.

But one thing we *do* know: the explicit responses people give in focus groups and questionnaires are not clearly reflected in their subsequent behavior. Those responses matter; they are a critical part of shaping or justifying that behavior. But they don't always predict it or explain it. In the case of cryonics a depth approach will almost certainly be necessary.

Social Psychology

Semi-rational factors explored by both qualitative and quantitative research are part of the discipline of social psychology. Academic researchers from Stanley Milgram[3] to

To choose cryonics is often to stand alone – and to face the social criticism that accrues to anyone who does something outside the ordinary. Social psychology predicts that very few people indeed will take such a singular option. And the history of cryonics confirms it.

Robert Cialdini[4] have shown decisively that many of our most important choices are made simply because of social influence. We see similar others making a choice and we make the same choice. Humans are an imitative species, deeply predisposed to group pressure and peer influence. And I suspect this has affected the acceptance of cryonics profoundly.

Cryonics members are rare. Many of them are isolated or anonymous. Few advertise their affiliation. Fewer still are household names known to the common man. The vast majority of potential cryonics members don't know, see, or associate with anyone who has chosen the cryonics option.

Fortunately, marketing problems tend to contain the clues to their solution. I once suggested to more than one cryonics organization that it write a letter to every agent in the entertainment and arts industries, pointing out the media attention likely to follow their famous client should that client sign up for cryonics. Would it be possible to persuade a publicity agent that if publicity at any price is good, worldwide publicity for the price of an Alcor membership would be a good bargain indeed? I think so. If Qaballah can get Madonna in the papers for months, why can't cryonics?

Behind the suggestion lies marketing practice and social-psychological principle. Research in both areas shows that people will do what they see others doing. Most Americans are not moved by Eric Drexler's or Mar-

vin Minsky's choice for cryonics because most Americans do not know who these worthy gentlemen are. If they saw a Tom Hanks, a Danny De Vito, a Tiger Woods opting for cryopreservation and liking it, would they be more inclined to sign too? The studies predict yes.

Or consider families. One reason the growth of family memberships in cryonics is on the rise is that children and spouses and siblings see significant, similar, respected others making the choice for cryonics. They see others do it, and so they make the same choice. The more families join, the more the effect spreads. And marketing policies can be shaped to encourage this and to encourage it in other social networks, possibly with social networks with compatible outlooks such as transhumanists, extropians and other futurists.

Another social psychology principle is cognitive dissonance. Get people supporting an idea intellectually, even without commitment, and commitment follows. People who are asked to make a positive case for something end up convincing themselves.

One marketing idea along these lines might be to blanket as many universities as possible with the annual offer of a thousand dollars in scholarship funds for a winning essay about why one should sign up for cryonics. The organization would look good for supporting education; students would benefit; and many of them would be thinking and arguing strongly in favor of cryonics membership. Theory and practice suggest memberships would burgeon.

Science and the Science of Marketing

Marketing cryonics can be a frustrating business. Perhaps understandably. Existing cryonics organizations are not marketing firms. They have many other duties to perform, and many other services to provide.

But the value of a specialist organization focused on such efforts is obvious. To that end, in late 2005 publisher and direct mail specialist Nick Pavlica, Canadian attorney Bruce Waugh, and I formed a nonprofit organization called the Cryonics Society (www.cryonicssociety.org) to do just that – put a polished professional case for cryonics before the public.

So far the Society has already put a positive message about cryonics before hundreds of thousands of people. And it has not been easy to do. The Cryonics Society is not affiliated or supported by any cryonics services organization. The only support we get comes from tax-deductible contributions by people in the cryonics community. What we can do in the future depends totally on how much support people give us today. But to the degree that the Society has already raised awareness of cryonics and the need to market it better, our efforts have been well spent.

And what should we be *most* aware of? That ways to make cryonics more acceptable to the public are *there* and that there are proven methods to find them. Cryonics *can* be made appealing, attractive, desirable, even popular. If pet rocks and tobacco and bungee jumping can be sold, cryonics can too. It is simply a matter of studying the market and finding the key.

I have always been surprised at the way advocates of cryonics champion science, analysis, and the use of qualified professionals in technical research – yet rely on luck, intuition, and guesswork when it comes to marketing. When we learn to apply the same professional rigor to social research that we apply to cryobiological research, we will take a giant step towards making cryonics a reality. ■

Photo by John Retallack

David Pascal

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More information about the Cryonics Society is available online at www.CryonicsSociety.org.

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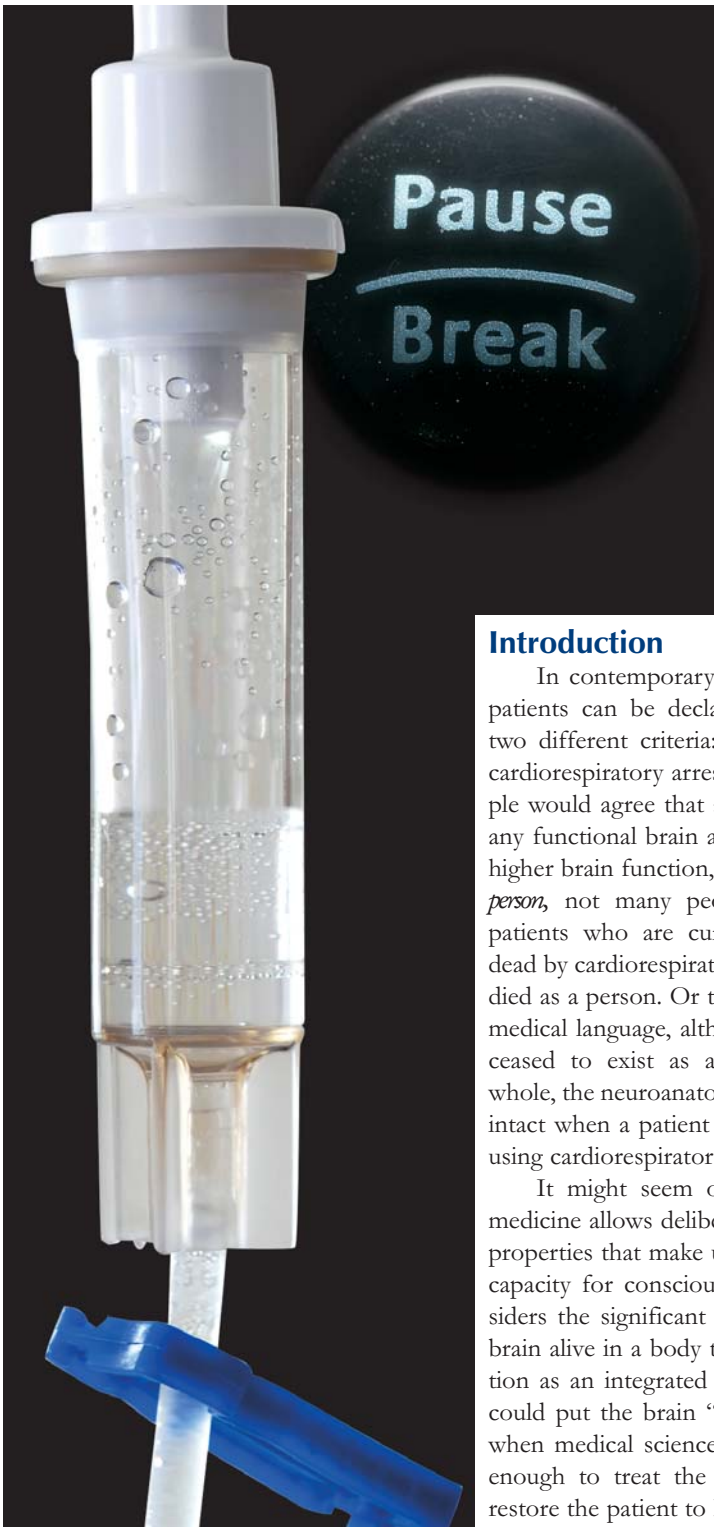
CRYONICS

USING LOW TEMPERATURES TO CARE FOR THE CRITICALLY ILL

By Aschwin de Wolf



Conventional medicine routinely puts the brain "on pause" to treat a patient, such as with general anesthesia and hypothermic circulatory arrest. Because the person is capable of being restored to health, these unconscious states are distinguished from death. Using the same philosophy, is it possible that cryonics patients could come to be seen as undergoing long-term critical care?

Introduction

In contemporary medicine terminally ill patients can be declared legally dead using two different criteria: whole brain death or cardiorespiratory arrest. Although many people would agree that a human being without any functional brain activity, or even without higher brain function, has ceased to exist as a *person*, not many people realize that most patients who are currently declared legally dead by cardiorespiratory criteria have not yet died as a person. Or to use conventional biomedical language, although the organism has ceased to exist as a functional, integrated whole, the neuroanatomy of the person is still intact when a patient is declared legally dead using cardiorespiratory criteria.

It might seem odd that contemporary medicine allows deliberate destruction of the properties that make us uniquely human (our capacity for consciousness) unless one considers the significant challenge of keeping a brain alive in a body that has ceased to function as an integrated whole. But what if we could put the brain "on pause" until a time when medical science has become advanced enough to treat the rest of the body and restore the patient to health?

Metabolic Arrest

Putting the brain on pause is not as far fetched as it seems. The brain of a patient undergoing general anesthesia has ceased being conscious. But because we know that the brain that represents the person is still there in a viable body, we do not think of such a person as "temporarily dead."

One step further than general anesthesia is hypothermic circulatory arrest. Some medical procedures, such as complicated neurosurgical interventions, require not only cessation of consciousness but also complete cessation of blood flow to the brain. In these cases the temperature of the patient is lowered to such a degree (≈16 degrees Celsius) that the brain can tolerate a period without any circulation at all. Considering the fact that parts of the human brain can become irreversibly injured after no more than five minutes without oxygen, this ability of the brain to survive for at least an hour at these temperatures without any oxygen is quite remarkable.

Again, because we know that in the above cases the brain that represents the person is still there in a viable body, we do not think of such a person as "temporarily dead." These

examples illustrate that the medical community already recognizes and accepts the fact that a medical procedure that produces loss of consciousness, and even loss of circulation, does not constitute irreversible death.

Unfortunately, general anesthesia and hypothermic circulatory arrest cannot be used to pause the brain long enough to find a treatment for a person who has been declared legally dead by cardiorespiratory criteria. A person under general anesthesia may require tens, if not hundreds, of years of artificial circulation to keep the brain viable until medical science is able to return him to health. Leaving financial considerations aside, artificial circulation of an organ, let alone such a vulnerable organ as the brain, will produce increasing brain injury over time, and ultimately, destruction of the person.

Hypothermic circulatory arrest eliminates the need for metabolic support of the brain, but only for a limited period of time. Current research into hypothermic circulatory arrest indicates that the brain might tolerate up to 3 hours of complete circulatory arrest if the temperature is lowered close to the freezing point of water (zero degrees Celsius). This is not nearly long enough to put the brain on pause to allow the patient to reach a time where his current medical condition may be treatable. In light of these limitations, it is understandable that no serious attempts are currently being made to continue long-term care for a patient whose body has stopped functioning as an integrated organism.

But if low temperatures can extend the period that the brain can survive without circulation, much lower temperatures should be able to extend this period even further. At -196 degrees Celsius, during human cryopreservation, molecular activity has become so negligible that it can be said that the brain has been put on pause in the *literal* sense of the word. This allows the patient to be "transported" to a time when more advanced medical technologies are available, even if this would require hundreds of years. Advocates of human cryopreservation argue that long-term care at cryogenic temperatures offers a rational alternative to the current practice of burial and cremation of persons no longer treatable by contemporary medicine.

Vitrification

Contrary to popular views of cryonics, cryonics is not about preserving dead people but about l*ong-term care of critically ill patients.* The objection that cryonics is an attempt to resuscitate dead people reflects a misunderstanding of the philosophy behind cryonics. Human cryopreservation does not offer anything radically different than the already established rationality behind general anesthesia and hypothermic circulatory arrest; it merely introduces *lower temperatures* and *longer care*. Therefore, the difference between contemporary medicine and cryonics is quantitative, not qualitative, in nature. Likewise, the relationship between cryonics and religion is not qualitatively different than that between contemporary medicine and religion. In both cases medical technology is used to *preserve* life.

But does the procedure of cooling a patient to cryogenic temperatures not cause injury in itself? Most of the human body consists of water and lowering the body below the freezing point of water will produce massive ice formation. For this reason, patients who present for cryonics are protected from ice damage by using a *cryoprotective agent* to reduce, or even eliminate, ice formation. Conventional extracorporeal bypass technologies are used to circulate the solution throughout the body. When enough water is replaced with the cryoprotective agent the patient is maintained at cryogenic temperatures for long term care. Historically the cryoprotective agents that were used in cryonics are mainstream cryoprotective agents for cells such as DMSO and glycerol. High concentrations of glycerol or DMSO can significantly *reduce* ice formation, but cannot eliminate it altogether.

A better alternative to conventional cryoprotection is *vitrification*. Vitrification offers the prospect of cooling an organ to cryogenic temperatures without ice formation. Although vitrification of pure water requires extremely high cooling rates, these cooling rates can be greatly reduced if high concentrations of cryoprotective agents and "ice blockers" are added. Ice blockers are synthetic variants of naturally occurring anti-freeze proteins used by hibernating animals to protect themselves from freezing injury. This vitrification agent is introduced in a so-called "carrier solution" which includes molecules to prevent cell swelling, support metabolism, maintain physiological pH, and prevent oxidative damage. The vitrification agent is introduced in a gradual fashion to prevent excessive volume changes in cells. During the final stages of cryoprotectant perfusion the temperature is dropped below zero to protect the cells from toxicity that is caused by high concentrations of the vitrification agent at higher temperatures.

The current generation of vitrification agents can preserve the fine details (ultrastructure) of the brain without requiring unfeasible cooling rates. Although electrical activity has recently been demonstrated in vitrified rabbit brain slices, reversible vitrification of the human brain without loss of cellular *viability* is currently not possible. The current research objective, therefore, is to improve on these vitrification agents to allow for reproducible vitrification and recovery of organs with complete long-term viability. Such a breakthrough would not only lead to cryogenic organ banking for transplantation and research but would remove the most fundamental obstacle to suspended animation of humans.

Brain Death and Cryonics

Although a vitrified patient cannot be rewarmed and restored to health with contemporary technologies, the extremely low temperatures at which a patient is maintained permit possible resuscitation of a patient in the far future without any risk of deterioration during long-term care. In this sense it compares favorably to procedures such a hypothermic circulatory arrest which allow for only a few hours to treat a patient. This not only offers the option to treat patients who cannot be treated with contemporary medical technologies, it also offers the possibility to treat medical conditions where successful resuscitation *is* possible but higher brain function will be lost if care is resumed at normal body temperature.

A good example of this is cardiac arrest. Patients who have suffered more than 5-7 minutes of cardiac arrest can often be resuscitated, *but* some of the most vulnerable cells in the brain (such as the hippocampal CA1 neurons) will die within days of the insult. There are currently no effective medical interventions or neuroprotective agents that will prevent such damage. As a result, today's medicine *can* restore viability to such patients, but only by losing some, or most, higher brain functions.

If one believes that the objective of medical care is not just to preserve life in the sense of integrated biological function, but also to preserve the *person*, then one would agree that such patients might be better served by interventions that place them under long-term care in the form of cryonics. Although there is no guarantee that such patients will be restored to full functionality in the future, the certainty of higher brain death is an alternative that many people would prefer to avoid.

Conclusion

Human cryopreservation does not involve the freezing of dead people. Cryonics involves placing critically ill patients that cannot be treated with contemporary medical technologies in a state of long-term care using low temperature biostasis in an attempt to preserve the *person* until a time when future treatments might be available. Philosophically similar to such common medical practices as general anesthesia and hypothermic circulatory arrest, cryonics does not require a fundamental paradigm shift in how conventional medicine thinks about biology, physiology, and brain function. Although current cryopreservation methods are not reversible, under ideal circumstances the fine structure that encodes a person's personality is likely to be preserved. Complete proof of reversible vitrification of human beings would be sufficient, but is not necessary, to gain acceptance of cryonics as a form of long-term critical care medicine.

The current alternative is death; or for persons who are at risk of suffering extensive brain injury, loss of personhood.

For very old and fragile patients, meaningful resuscitation would require reversal of the aging process. Obviously, the objective of cryonics is not to resuscitate patients in a debilitated and compromised condition, but to rejuvenate the patient. Ongoing research in fields such as biogerontology, nanomedicine, and synthetic biology inspire optimism that such treatment will be available in the future. The fortunate thing for cryonics patients is that even if fundamental breakthroughs in these fields will be the result of long and painstaking research, the cold temperatures allow them time – a lot of time. ■

This article is an abridged version of an introduction to cryonics that was solicited and published by *Pharmaciae Sacrum*, the annual publication for pharmacology students at the University of Groningen, the Netherlands.

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THE FIRST MINUTES AFTER "DEATH"

As currently practiced, cryonics procedures can only be started *after* legal death has been pronounced by a medical professional. To prevent brain injury between pronouncement of legal death and long-term care in liquid nitrogen all major cryonics organizations offer standby services to ensure that the time of circulatory arrest is minimized. In ideal circumstances the cryonics organization of which the patient is a member will deploy a *standby team* consisting of cryonics professionals to *stabilize* the patient immediately after pronouncement of legal death.

A mechanical device is used to restart blood circulation and ventilate the patient. Because the objective of this intervention is not to resuscitate but to stabilize the patient this is called *cardiopulmonary support.* At the same time the patient is lifted into a mobile portable ice bath to induce hypothermia to slow metabolic rate. A number of medications are also given to support blood flow to the central organs, reverse and prevent blot clotting, restore physiological pH, prevent edema, and protect the brain from ischemic injury.

If the patient is pronounced legally dead at a remote location an additional step to this protocol is added and the patient's blood is washed out and replaced with an organ preservation solution to preserve viability of the tissue during transport at low temperatures. The organ preservation solution that is currently used by cryonics organizations is similar to the cold organ preservation solutions that are used in conventional medicine (like *Viaspan*) to preserve organs for transplantation.

At the cryonics organization the patient's blood (or the organ preservation solution) is replaced with the vitrification agent to prevent ice formation during cooldown to liquid nitrogen temperatures for long-term care.

Arizona lawmakers recently modified the Uniform Anatomical Gift Act. How has this affected Alcor, which accepts anatomical donations under that law?

Uniform Anatomical Gift Act

Protecting Alcor's Interests

By Barry M. Aarons

Three and one half years ago the Alcor membership learned the importance of remaining current and participating in the political process of our home state of Arizona. Without rehashing the issues that confronted us in 2004 suffice it to say that legislation introduced in that year could have had a devastating affect on our ability to fulfill our mission.

Part of the debate in that year centered on Alcor's ability to accept patients under the Uniform Anatomical Gift Act (UAGA). Under a California judicial decree Alcor received permission to accept anatomical gifts under the UAGA. Because one state (California) authorized Alcor to receive anatomical gifts the then existing UAGA applied in Arizona.

For many years Jim Bush, a prominent Phoenix attorney and member of the Uniform Laws Commission, has been pushing for revision of the UAGA to conform to the changes adopted by the Commission. In 2007, Arizona Senate Health Committee Chair Carolyn Allen agreed to run that legislation.

From early on in the deliberations we were deeply involved in the discussions and negotiations. We knew that the ability of Alcor to continue to accept its patients in Arizona was critically dependant on the clarity of the UAGA. Therefore, we inserted ourselves into the process early on.

One of the interesting aspects regarding any changes in the UAGA is the large number of organizations that hold a stake in the issue. When Senator Allen convened a stakeholder group to review the provisions of the proposed bill, literally dozens of lobbyists and attorneys were present.

Mainly, their interest was to retain the ability to receive anatomical gifts, but the give-and-take, as well as the jousting among the interests, was too significant. Organ donor organizations differ mightily on this issue. But while they all have issues with each other, they were ambivalent at worst, and for the most part supportive, of Alcor's concerns.

When the original bill was introduced, it was clearly flawed from Alcor's perspective and position. The clear statement of uniformity was missing. The provision allowing a procurement organization to accept donations if authorized to do so by the laws of any other state, was not initially included.

Following the original stakeholder meetings there were significant amendments developed which made improvements in the language of the original bill. Unfortunately, the language was not yet crystal clear.

In conversations with Senator Allen, it was obvious that she was not going to allow legislation that would damage Alcor's ability to contin-

ue operating in Arizona. She directed us to visit with Jim Bush and work out the language that would rectify the error in the original draft.

At the same time, others in the Legislature that have become Alcor supporters over the past few years were on alert to make sure that corrective action was taken before the bill could be enacted into law. Had difficulties occurred, there were plenty of stops in the process where we could recommend changes.

It turned out that a simple, one word language change, was all that was needed to rectify the problem. Jim Bush agreed with the change and in fact the change was so simple that it was made as a verbal amendment in the Senate Health Committee. But it is important to note that, simple or not, had the deficiency not been noticed and changed during the process our rights under the UAGA may well have been jeopardized.

As we have articulated in the past the legislative process is a marathon, not a sprint. It is important that we continue to be interested, observant and involved. Down at the Legislature, absence does not make the heart grow fonder. Down there, clearly out of sight is out of mind. When it comes to cryonics in Arizona, Alcor is committed to keeping the Legislature mindful of its best interests. ■

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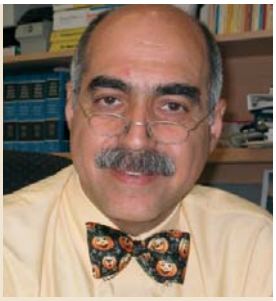
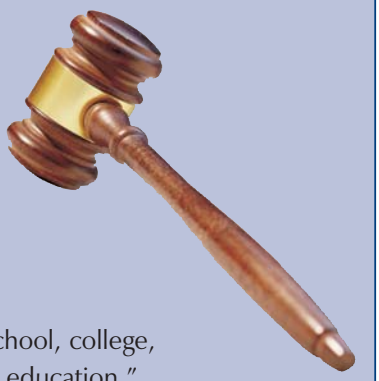


Barry M. Aarons

Barry M. Aarons is the owner of The Aarons Company, a public policy consulting firm. Aarons has over 30 years experience in policy development, public affairs implementation and lobbying in state legislatures and the U.S. Congress. He has represented the Alcor Foundation since 2004.

The new Arizona Anatomical Gift Act is clear and protects Alcor's interests.



The definitions section defines a procurement organization as:

> "A storage facility that is licensed, accredited or approved under federal law or the laws of any state to engage in the recovery, screening, testing, processing, storage or distribution of human bodies or parts."

Another governing section defining persons who may receive anatomical gifts says:

> "An anatomical gift may be made to…a hospital, accredited medical school, dental school, college, university, procurement organization or any other appropriate person, for research or education."

When taken together these two statutory declarations absolutely maintain the authority Alcor currently enjoys under the UAGA. An additional protective part of the new law that is generally part of all uniform laws says:

> "In applying and construing this article, consideration must be given to the need to promote uniformity of the law with respect to its subject matter among states that enact it."

Read the revised Arizona UAGA in full: http://www.azleg.gov/legtext/48leg/1r/bills/sb1099c.pdf

Tech News

R. Michael Perry, Ph.D.

Studies have shown that severe calorie restriction markedly extends lifespan in mice and many other species – but the reasons for this have remained elusive. Could a gene be behind this unusual effect?

Gene Clue to Longevity Uncovered

The mystery of how eating less boosts longevity is closer to being solved. US research on nematode worms (Caenorhabditis elegans) published in *Nature*, has uncovered a gene, pha-4, that is linked to this unusual effect. The scientists say mammals have a gene similar to pha-4. The find could lead to drugs that mimic the consequences of calorie restriction but negate the need for severe fasting regimes. Andrew Dillin is an author of the paper and an associate professor at the Salk Institute for Biological Studies.

BBC News
5/2/07
http://news.bbc.co.uk/1/hi/sci/tech/6612411.stm

To Treat the Dead

The new science of resuscitation is changing the way doctors think about heart attacks—and death itself. Cells cut off from their blood supply die hours later. So why can't doctors revive someone who has been dead for only one hour? Because once the cells have been without oxygen for more than five minutes, they die when their oxygen supply is *resumed*. This is known as reperfusion injury. It was that "astounding" discovery, says Dr. Lance Becker, an authority on emergency medicine, that led him to his post as the director of the University of Pennsylvania's newly created Center for Resuscitation Science. The Center researches one of medicine's newest frontiers: treating the dead. A study at four hospitals, published last year by the University of California, showed a remarkable rate of success in treating sudden cardiac arrest with an approach that involved, among other things, a "cardioplegic" blood infusion to keep the heart in a state of suspended animation. Becker also endorses hypothermia—lowering body temperature from 37 to 33 degrees Celsius—which appears to slow the deleterious chemical reactions touched off by reperfusion with oxygen.

MSNBC/Newsweek
5/7/07
http://www.msnbc.msn.com/id/18368186/site/newsweek?GT1=9951

Diamond Offers Stable Quantum Computing Building Block

Surmounting several distinct hurdles to quantum computing, physicists at Harvard University have found that individual carbon-13 atoms in a diamond lattice can be manipulated with extraordinary precision to create stable quantum mechanical memory and a small quantum processor, also known as a quantum register, operating at room temperature. The finding brings the futuristic technology of quantum information systems into the realm of solid-state materials under ordinary conditions. The results, described this week in *Science*, could revolutionize scientists' approach to quantum computing, which is built on the profound eccentricity of quantum mechanics and could someday far outperform conventional supercomputers in solving certain problems. "These experiments lay the groundwork for development of a new approach to quantum information systems," says Mikhail D. Lukin, professor of physics in Harvard's Faculty of Arts and Sciences.

ScienceDaily
6/1/07
http://www.sciencedaily.com/releases/2007/05/070531142118.htm

Nanotech Guru Turns Back on "Goo"

The scientist many regard as the father of nanotechnology, an umbrella discipline concerned with engineering objects and working devices from individual atoms and molecules, has backed away from his famous claim that nanomachines could turn the planet into "grey goo." Dr. Eric Drexler now says nanomachines that self-replicate exponentially are unlikely ever to enter widespread use. In the journal *Nanotechnology*, he stresses that tiny machines would need close control in order to be efficient. Dr Drexler says when he made the statement in the 80s, he underestimated the impact it would have on the field. "What I did not expect was that efforts to quiet concerns over grey goo would lead to false scientific denials of feasible technologies."

BBC News
6/9/07
http://news.bbc.co.uk/1/hi/sci/tech/3788673.stm

Pill to End Monthly Periods Approved

Lybrel, a birth-control pill that does away with a woman's monthly period, was approved May 22 by the U.S. Food and Drug Administration. The estrogen-progestin hormonal pill differs from traditional birth-control pills in that it does not include the "week off" of placebo pills that leads to a cessation of artificial hormones and onset of menstruation. Lybrel is described as "continual contraception" but it "works the same way as the 21-days on, seven-days off [pill] cycle—it stops the body's monthly preparation for pregnancy by lowering the production of hormones that make pregnancy possible," explained Dr. Daniel Shames, deputy director of the FDA's Office

of Drug Evaluation III at the Center for Drug Evaluation and Research.

Health.ivillage.com
5/22/07
http://health.ivillage.com/gyno/gynonews/0,,wbnews_bmz3b2sf,00.html

Cooling May Have Helped Save NFL Player's Spine

When paramedics wheeled Buffalo Bills tight end Kevin Everett into Buffalo's Millard Fillmore Hospital September 9, a life-threatening spine injury had rendered him functionally quadriplegic and potentially paralyzed for life. But an experimental treatment may have drastically improved his chances of walking again, according to some doctors. The treatment, which involves an infusion of ice-cold saline, nudges the body into a state of hypothermia—a step aimed at limiting the cascade of events in the body that can lead to further spinal cord damage after an injury. Dr. Kevin Gibbons, one of the neurosurgeons at Millard Fillmore Hospital who operated on Everett, said that his team had decided to go forward with the cooling after Everett's body temperature rose dramatically after his injury. "Although we are not sure that cold temperature is good, we know high temperature is bad in a neurological injury," Gibbons said. But the procedure may have done more than simply cool Everett down; it may also have helped limit the damage caused by the injury.

ABC News
9/12/07
http://abcnews.go.com/Health/story?id=3592871&page=1

Bush Aide Says Warming Man-Made

Professor John Marburger, who advises President Bush, said it is more than 90% certain that greenhouse gas emissions from mankind are to blame for global warming. The earth may become "unlivable" without cuts in carbon dioxide output, he said, but he labeled targets for curbing temperature rise as "arbitrary." His comments come shortly before major meetings on climate change at the UN and the White House. Despite disagreement on the details of climate science, he said: "I think there is widespread agreement on certain basics, and one of the most important is that we are producing far more carbon dioxide from fossil fuels than we ought to be. And it's going to lead to trouble unless we can begin to reduce the amount of fossil fuels we are burning and using in our economies."

BBC News
9/14/07
http://news.bbc.co.uk/1/hi/sci/tech/6994760.stm

Resveratrol is shown to protect against neuron degeneration in animal experiments. It is found in grapes, wine, grape juice, peanuts, and berries. In grapes, resveratrol is found only in the skins. The amount of resveratrol in grape skins varies with the grape cultivar, its geographic origin, and exposure to fungal infection. The amount of fermentation time a wine spends in contact with grape skins is an important determinant of its resveratrol content.

Source: http://lpi.oregonstate.edu/infocenter/phytochemicals/resveratrol/

Saving Memories

Physicians can treat the symptoms of Alzheimer's disease and other neurodegenerative disorders, but there is no way to prevent or reverse the underlying degeneration and death of neurons that characterize these diseases. Now research by scientists at Harvard and MIT suggests a potential new therapeutic approach. The scientists have shown that a gene called SIRT1 and a plant compound found in red wine called resveratrol can protect against neuron degeneration in a mouse model of Alzheimer's disease and amyotrophic lateral sclerosis. The researchers demonstrated that activating SIRT1 and injecting resveratrol, which have both been previously associated with life-span extension in lower organisms, can also prevent cognitive problems in the mice. "Thus, resveratrol is not only neuroprotective, it also improves cognitive function after severe neurodegeneration," says Li-Huei Tsai, the professor of neuroscience at MIT who led the research with David Sinclair, a professor of pathology at Harvard.

MIT Technology Review
7/23/07
http://www.technologyreview.com/Biotech/19080/

Universal Flu Vaccine Being Tested on Humans

A universal influenza vaccine that has been pioneered by researchers from VIB and Ghent University (Belgium) is being tested for the first time on humans by the British-American biotech company Acambis. This vaccine is intended to provide protection against all 'A' strains of the virus that cause human influenza, including pandemic strains. Influenza is an acute infection of the bronchial tubes and is caused by the influenza virus. Flu is probably one of the most underestimated diseases: it is highly contagious and causes people to feel deathly ill. An average of 5% of the world's population is annually infected with this virus. This leads to 3 to 5 million hospitalizations and 250,000 to 500,000 deaths per year, with totals much higher should a pandemic develop. Today's flu vaccines need to be adapted every year and, consequently, they must also be administered again every year. A universal flu vaccine that provides broad and lifelong protection—like the vaccines for polio, hepatitis B or measles—is not yet available. However, in the 1990s, VIB researchers connected to Ghent University, under the direction of Prof. Emeritus Walter Fiers, invented a universal flu vaccine. After further development, phase I clinical trials of the vaccine are now underway.

Intern Daily
7/18/07
http://www.interndaily.com/reports/Universal_Flu_Vaccine_Being_Tested_On_Humans_999.html

Some people who live past 100 may have a natural genetic tendency for lower insulin signaling in the brain.

Insulin Signaling Possible Key to Extended Longevity

New research shows it may be possible to one day take a life-extending pill that mimics the healthy effects of exercise and a low-calorie diet by lowering insulin signaling in the brain. The key to a longer life is lower insulin levels, said Morris White, a pediatrician and endocrinologist at Howard Hughes Medical Institute. Less insulin helps cells fend off diseases that lead to an early death, like cancer, said White, whose study appears in the July 19 *Science*. "With calorie restriction and exercise, cancer, diabetes, cardiac disease and others all get postponed. It still happens, but at a later age. It's thought to be at least partly involved in the longer life span," White told United Press International. Insulin is the substance made by the pancreas that allows cells to metabolize glucose. But recent research shows that too much insulin is far from helpful and instead makes cells vulnerable to diseases that may shorten life, like cancer, artery disease, Alzheimer's and Parkinson's disease. While lowering insulin throughout the body can lead to a diabetic state, scientists found that the life of mice was extended by allowing insulin levels to be high throughout most of the body, while lowering the insulin signaling only in the brain through genetic manipulation.

Intern Daily
7/20/07
http://www.interndaily.com/reports/Insulin_Signaling_Possible_Key_To_Extended_Longevity_999.html

Memory Seen in the Making

The physical changes that occur when the brain makes a new memory have been observed for the first time, say researchers, who hope to go on to map the distribution of memory across brain regions. Gary Lynch of the University of California, Irvine, and his colleagues examined the junctions between neurons—synapses—in three dimensions using a technique called restorative deconvolution microscopy (RDM). In previous work the group developed a fluorescent marker that attaches to synapses in the brain that have recently undergone a certain type of neuron-to-neuron connection believed to be responsible for encoding memory, called long-term potentiation (LTP). In the current study the team exposed live rats to a novel environment and allowed them to learn its layout. They then removed the animals' brains to examine the hippocampus—a region involved in memory—using RDM to observe individual synapses. A second group of rats was shown the new environment but not allowed to explore it before their brains were examined. A third group was allowed to learn the same new environment but given a drug to block LTP. Only rats that had undergone learning and memory acquisition without blockage of LTP showed new synaptic growth.

Nature.com
7/25/07
http://intl.emboj.org/nature/journal/v448/n7152/full/448397a.html

Implant Boosts Activity in Injured Brain

Brain function has been improved in a patient who was in a minimally conscious state, by electrically stimulating a specific brain region with implanted electrodes. The achievement raises questions about the treatment of other patients who have been in this condition for years, the researchers say. Patients in a minimally conscious state, often the result of severe brain trauma, show only intermittent evidence of awareness of the world around them. Typically, they are assumed to have little chance of further recovery if they show no improvement during their initial 12-month rehabilitation program. In the latest case study, Nicholas Schiff of Weill Cornell Medical College in New York, and his colleagues describe how they implanted electrodes in the brain of a 38-year-old man who had been in a minimally conscious state for more than six years following a serious assault. By electrically stimulating a brain region called the central thalamus, they were able to help him name objects on request, make precise hand gestures, and chew food without the aid of a feeding tube.

news@nature.com
8/1/07
http://www.nature.com/news/2007/070730/full/448522a.html

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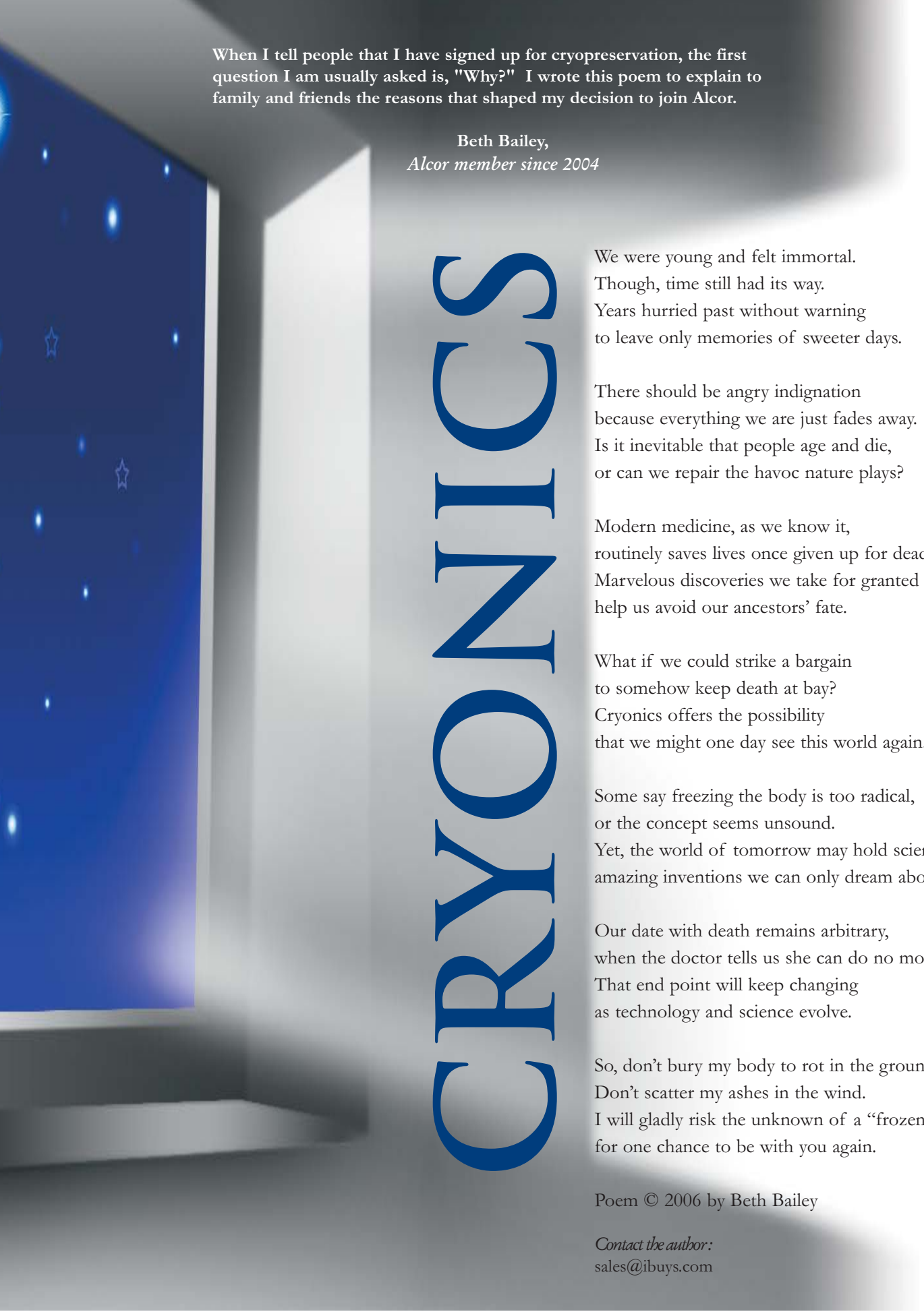

When I tell people that I have signed up for cryopreservation, the first question I am usually asked is, "Why?" I wrote this poem to explain to family and friends the reasons that shaped my decision to join Alcor.

Beth Bailey,
Alcor member since 2004

CRYONICS

We were young and felt immortal.
Though, time still had its way.
Years hurried past without warning
to leave only memories of sweeter days.

There should be angry indignation
because everything we are just fades away.
Is it inevitable that people age and die,
or can we repair the havoc nature plays?

Modern medicine, as we know it,
routinely saves lives once given up for dead.
Marvelous discoveries we take for granted
help us avoid our ancestors' fate.

What if we could strike a bargain
to somehow keep death at bay?
Cryonics offers the possibility
that we might one day see this world again.

Some say freezing the body is too radical,
or the concept seems unsound.
Yet, the world of tomorrow may hold scientific wonders;
amazing inventions we can only dream about.

Our date with death remains arbitrary,
when the doctor tells us she can do no more.
That end point will keep changing
as technology and science evolve.

So, don't bury my body to rot in the ground.
Don't scatter my ashes in the wind.
I will gladly risk the unknown of a "frozen future"
for one chance to be with you again.

Contact the author:
sales@ibuys.com

WHAT IS CRYONICS?

Cryonics is an attempt to preserve and protect the gift of human life, not reverse death. It is the speculative practice of using extreme cold 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 30-minute DVD documentary "The Limitless Future"
- 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?

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

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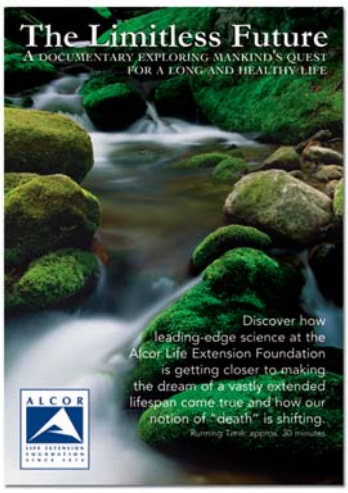
SINCE 1972



The Limitless Future
Get your FREE copy of Alcor's 30-minute DVD documentary by visiting the "Free Information" section of our website

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- Access to a toll-free phone line to speak with **knowledgeable health advisors**, including naturopathic doctors, nutritionists, and a cancer expert, about your individual health concerns. You can also receive help in developing your own personal life extension program.
- **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.

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

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