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A Non-Profit Organization

CRYONICS

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CRYONICS



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Cryonics in Conflict: 25 Years of Activism in British Columbia, Canada

Keegan Macintosh and Carrie Wong review the history of the British Columbia law against the sale of cryonics services and its reception by Canadian cryonicists. They also review recent, renewed efforts towards challenging this law and the associated need to establish a regional cryonics company to make a credible case.

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Keegan Macintosh and Carrie Wong

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QUOD INCEPIMUS CONFICIEMUS



Photo: Cryo-Care Equipment Corporation at 2340 E. Washington St., Phoenix, AZ.
Dr. Bedford's "home" in 1970 or 1971.

HOW TO VALIDATE NEW CRYONICS TECHNOLOGIES By Aschwin de Wolf

Evidence in cryonics is a complicated concept. For starters, it is not possible to “prove” cryonics will work, here and now, because the fundamental idea of cryonics is to stabilize critically ill patients (people considered “dead” by less rigorous criteria) in anticipation of more advanced *future* medical technologies. What we can do is validate cryonics technologies with reversible cryopreservation (“suspended animation”) as a benchmark. As a general rule, we can state that we make progress in cryonics when stabilization, cryopreservation, and maintenance (“storage”) technologies cause less damage than the technologies that preceded them. But how do we know if this is the case?

The most rigorous form of validation, human clinical trials, is usually not available in cryonics. There are often new (approved) emergency medical technologies, however, that can be modified to be used in cryonics procedures. A major advantage of adopting such technologies is that the validation has already been done by other organizations or companies. Examples of such technologies will often fall under the rubric of emergency medicine. For example, an FDA-approved technology that improves blood flow during cardiopulmonary resuscitation can be added to Alcor’s stabilization equipment to improve stabilization procedures.

One step down from rigorously designed human clinical trials are animal studies. In cryonics we often make a distinction between small animal studies (e.g., mice, rats) and large animal studies (e.g., pigs, dogs) etc. It seems common sense to think that large mammals provide stronger evidence for a technology than smaller animals but the real issue at stake here is not how large an animal is but how closely an animal model tracks what happens in humans. For example, if cat brains have an uncharacteristically high tolerance for cerebral ischemia, the (smaller) rat may actually be a more realistic model for validating neuroprotective strategies in humans.

One area where choosing the correct animal model has proven itself to be of crucial importance concerns the effect of cryoprotectants on the brain. Most mammalian species experience dehydration of the brain after equilibration with a vitrification agent. Because it is reasonable to assume that severe dehydration adversely affects brain viability it is tempting to select an animal model that experiences little cryoprotectant-induced dehydration. But one thing that we have learned from burhole measurements and CT scans in human cryonics patients is that under optimal conditions cryoprotective perfusion with both glycerol and the modern vitrification agents produces severe shrinkage of the brain. So if we want to validate strategies to

eliminate this dehydration the most important consideration is not how “large” the animal is but how well the animal tracks the effects of cryoprotectants on the *human* brain.

Most technologies in cryonics need to be evaluated with *ultrastructure* or, preferably, *viability* as an endpoint. But there are also new developments in cryonics where such a benchmark would not make a lot of sense. For example, if we build a new patient enclosure to keep the patient cold during cryoprotective perfusion we can just measure the core temperature of the patient to see if we have done a satisfactory engineering job. Another example is the design of new dewars where we can look at variables like the boiloff rate and long-term durability of the design.

In conclusion, there are a number of ways to validate new technologies in cryonics. If a new technology has undergone human clinical trials we often can just adapt that technology for cryonics without designing new experiments. In the case of more cryonics-specific technologies animal studies can be conducted and the choice of animal model will be dictated by how close a model tracks what we know to occur in humans (among other considerations like ethics and cost). Finally, when a new development in cryonics is mostly an engineering challenge, validating its efficacy is often just an issue of doing basic physiological measurements or practical tests. ■

Cryonics in Conflict

25 Years of Activism in British Columbia, Canada

By Keegan Macintosh and Carrie Wong

In 1990, the first law in the world explicitly forbidding cryonics services passed in British Columbia, Canada. This law passed under Section 57 of The Cemetery and Funeral Services Act. The law states:

“No person shall offer for sale or sell any arrangement for the preservation or storage of human remains based on cryonics, irradiation or any other means of preservation or storage, by whatever name called, that is offered or sold on the expectation of the resuscitation of human remains at a future time.”

When Canadian cryonicists learned of this law, they were shocked and confused. Where had this law come from and what on earth did irradiation have to do with it? One thing that was clear was that this law had been written without consulting any cryonicist organization, in Canada or abroad. In the 25 years that followed, cryonicists in Canada and the United States have been working to understand how this law came about and ultimately, how to overturn it.

HISTORY (1990-2010)

The history of this anti-cryonics law was uncovered and studied by cryonicists in the early 90s. The Act had been 14 years in the making. It was primarily based on the Gosse Royal Commission of 1976, a study conducted by a former law professor, Richard Gosse. Before the Act became law it had been reviewed by the following organizations: 1) the Cemeteries Association 2) Old Age Pensioners 3) the

Association of Churches 4) the Funeral Directors' Association 5) the Consumer's Association of Canada and finally 6) the Memorial Society. There was no mention of cryonics in the Gosse Royal Commission of 1976, so by deduction, it was probably added by the government internally or at the suggestion of one of the six organizations listed above. No experts within the field of medicine, cryobiology or cryonics appear to have been consulted in the making of this law.

In 1991, Ben Best, a board member of the Cryonics Society of Canada, contacted the government and a number of organizations involved in the passing of this law in an attempt to figure out how it came about. Pursuing a lead on who had written the law, Ben contacted David Oliver of the Ministry of Labour and Consumer Services. Mr. Oliver expressed hostility to the idea of cryonics, but denied responsibility for the specific provision and stated he had merely recorded the consensus of the committee. Ben also contacted Mr. Snikars, the Registrar for the Cemeteries and Funeral Services Branch at the British Columbia Funeral Association

to gather more information. Ben asked which scientists had been consulted in the making of this law, but most of his critical questions were evaded. There were a number of attempts by Ben and other B.C. cryonicists to figure out which persons or organizations were responsible for Section 57, but little hard information came out of those efforts.

In the years that followed, several cryonicists across Canada engaged in political activism in an attempt to have the law repealed. They engaged in phone and letter writing campaigns to the provincial government in power, The New Democrat Party (NDP). The NDP were in power in 1990 and continued to be in power for another four years after they were elected again in 1996. The NDP were not open to amending this law but they did inform Ben Best that they would consult B.C. cryonics activist Douglas Skrecky if the Funeral Services Act was reviewed. Once again, cryonicists in B.C. and Canada were not consulted when the law was rewritten. In 2004, Section 57 was rolled over into Section 14 of the Cremation, Interment and Funeral Services Act.



The original anti-cryonics provision was included with only minor changes in the wording and format. There was no change to the puzzling part about irradiation and furthermore there remained an ambiguity in the scope of this law. To clarify the matter, a few cryonics activists contacted politicians and bureaucrats with questions. They were told that the law did not prevent cryonicists from making arrangements outside of British Columbia. The government officials reassured cryonicists that it was only commercial transactions for cryonics, or its marketing in the province that was prohibited. The B.C. cryonicists were told that B.C. funeral directors were not prohibited from preparation and transport for cryonics purposes. They received a letter from Solicitor General Olaf Henry (September 2002) and Registrar Tayt Winnitoy (July 2005) to confirm this.

In 2006, Charles Grodzicki, a cryonicist in Vancouver, B.C. became increasingly worried about the impact of the anti-cryonics law on his attempts to make cryonics arrangements. He was rejected by a number of B.C. funeral directors when he approached them about assisting with cryonics. He was rejected despite B.C. politicians and bureaucrats' letters of assurance that it is perfectly legal for funeral directors to transport patients for cryopreservation. This renewed another letter-writing campaign, this time directed towards the B.C. Funeral Services Association (BCFSA). This activism resulted in cryonics being discussed at a meeting of the BCFSA, and then subsequently by the Cemetery, Interment & Funeral Services Advisory Group, a part of Consumer Protection B.C. Cryonicists won a limited victory when the Consumer Protection B.C. released the following statement about cryonics:

July 21, 2006

THE ARRANGEMENT AND SALE OF CRYONIC SERVICES IN B.C.

Section 14 of The Cremation, Interment & Funeral Services Act continues to prohibit the sale in B.C. of an arrangement for the preservation or

storage of human remains based on Cryonics and other processes with the expectation of resuscitation of human remains at a future time.

The section reads:

Prohibition on sales, and offers of sale, of Arrangements relating to cryonics and irradiation

14 A person must not offer for sale, or sell, an arrangement for the preservation or storage of human remains that is based on:

- (a) cryonics,*
- (b) irradiation, or*
- (c) any other means of preservation or storage, by whatever name called, and that is offered, or sold, on the expectation of the resuscitation of human remains at a future time.*

This section of the Act does not prohibit funeral directors in B.C. from performing preparation and transport services related to a cryonic arrangement assuming that these services are in compliance with provincial health regulations [...] and human remains transfer regulations [...]

To be clear, should a consumer wish their remains to be preserved using cryonics, a B.C. funeral provider is not prohibited from performing any related services such as preparation and transport, as per the Cremation, Interment & Funeral Services Act regulations.

We describe this as a brief victory because there are still significant misconceptions and confusion surrounding this law. The interpretive guideline was not enough to convince many funeral directors that cryonics is a procedure they want to get involved with. End of life matters are controversial socially and legally, and with this law on the books, it becomes very difficult to get full cooperation.

Before even addressing the basic legitimacy or rationality of Section 14, the law itself is extremely ambiguous in its drafting, and far from assisting, the interpretive guideline from Consumer Protection B.C. only muddies the water further. “[A]n arrangement for the preservation or storage of human remains” is not further defined, thus it is essentially impossible to know precisely which steps of a standard cryonics procedure

can be offered by B.C. funeral directors as “preparation and transport services related to a cryonics arrangement”. From a functional perspective, *every* step in cryonics stabilization procedures is carried out with the intent to preserve; starting with cooling the patient using ice and providing external cardiovascular support. This is true also of administration of anti-coagulants, anti-ischemic medications, and so on through the process. If the purpose of these procedures is not to “preserve” the “human remains,” then what *are* we doing, and why? Thus, either Consumer Protection BC is privy to some extralegal definition of “preservation” that we are not, or their own interpretation of s.14 is incorrect, and we are left with the simpler result that s.14 prohibits the sale and marketing of cryonics in British Columbia, including standby and stabilization procedures.

This is especially relevant in light of the fact that s.14 is specifically written to target not just cryonics but rather *any* means of preservation or storage of human remains, “based on” cryonics, or for that matter any other such arrangement sold on the expectation of future resuscitation. This seems intrinsically designed to capture arrangements or offerings repackaged as something not *quite* cryonics, but with the same end goal in mind—and especially considering that any funeral director or organization offering standby and stabilization services would be doing so in direct cooperation with a *cryonics* organization. Could such a person *honestly* say they weren’t offering an arrangement based on cryonics? Hardly.

The word “expectation” in the provision is problematic also. The words “promise” and “representation” have much more clearly defined meanings in law. An expectation is neither of these, so what is it? A hope? A belief in a non-zero probability of resuscitation? 50/50 odds? And how does the expectation get there? Does it matter if the person who offers the arrangements doesn’t create the expectation in the consumer’s mind, in fact explicitly denying any certainty regarding the outcome of the procedure (as both Alcor and Cryonics Institute do)?



And this points to the deeper, more insidious problem with Section 14. By homing in on the “expectations” of the buyer (and maybe the seller as well), the law is discriminating against cryonicists on the basis of their beliefs. Has any other group with as-yet-unprovable theories regarding the essential nature of life and death ever had to *prove* their ideas in order to be allowed to practice their prescribed, necessary treatments of legally dead persons, provided they harm no one else? Certainly this is unthinkable in a modern, plural society with constitutional protections for liberty, freedom of expression, and belief. Taking steps to extend one’s life, in some format, beyond the tangible, corporeal death is one of the most core and primal expressions of life, liberty and conscience that has ever existed. And yet because *our* beliefs smell more of objective reality than the rest, *we* are singled out and told our ideas are a fraud on the public, and even amongst ourselves.

No. This goes too far. This is not a permissible approach to the regulation of cryonics. And in our view, cryonicists are lucky this hasn’t caught on elsewhere. British Columbia is often looked to as a highly progressive jurisdiction. Section 14 remaining on the books in the province is unfair and harmful to cryonicists here, but is also harmful to the image of

cryonics generally, and could be pointed to as legitimizing discrimination against cryonicists elsewhere in the future.

TODAY (2010 — PRESENT)

In the spring of 2010, law student Keegan Macintosh learned about cryonics and reached out to the Cryonics Society of Canada to make contact with others in British Columbia who shared his interest. This resulted in a meeting with Charles Grodzicki, Doug Skrecky, and some others who had been involved in Section 14 agitation in previous years. The group of them started contacting local funeral directors to gauge willingness to work on cryonics cases.

In July 2010 B.C. had its first cryonics case (the Cryonics Institute’s 98th patient), although this was only discovered by the group after the fact. Unfortunately, the circumstances of this case were far from ideal, so the mere fact that it had occurred without government or other obstruction on the basis of Section 14 was cold comfort to the group of B.C. cryonicists. However, they were able to get in contact with the funeral director who had worked on that case, and discuss with him working on future cases under more proactively planned circumstances. That funeral director was willing to work on future cases, but only on condition that he was not contractually obligated to provide anything beyond storage and shipment on ice (i.e. no heparin or other drug administration, etc.), as he could not guarantee he would be personally available once a case arose, and he was not willing to oblige his staff of family members to be involved.

*“Our equipment would be real,
our personnel legitimate, so why
not just create a standby company
that would provide a lasting
service to Canadian cryonicists?”*

Other, larger funeral homes which were contacted expressed superficial willingness to work with cryonicists, but subject to long lists of preconditions, including some

which were essentially impossible to comply with, such as the cryonicist obtaining pre-clearance from the coroner’s office (a clearance the coroner cannot give pre-mortem). In the years since, another small-scale funeral director has been found who is willing to work with cryonicists in the Lower Mainland, though it is not at all clear just how far he is willing to go, given the ambiguity of both Section 14 and the statement issued from Consumer Protection B.C.

In early 2011, Keegan proposed founding a non-profit organization to advocate on behalf of cryonicists and life extension enthusiasts in the province. With the group’s support, Keegan reached out to Pro Bono Students Canada at UBC (PBSC) to locate a lawyer willing to supervise him in drafting the constitution and by-laws of the nascent organization. Later that year, he initiated another project with PBSC, finding a second law student to start researching the constitutional validity of s.14 under Canada’s Charter of Rights and Freedoms. The preliminary conclusion of that research was that s.14 was vulnerable to attack under multiple sections of the Charter.

Serendipitously, just as that research was concluding, Ben Best put Keegan in contact with Bill Faloon of the Life Extension Foundation to discuss the situation in B.C. Bill expressed that the Life Extension Foundation (LEF) was willing to fund the B.C. non-profit’s work towards removing s.14. And thus, with the LEF’s support and an additional significant contribution by Vancouver-resident Alcor advisor Geoff Shmigelsky, Lifespan Society of B.C. was rapidly incorporated, going to work looking for suitable legal counsel. By the end of the summer of 2012, the organization had found what seemed to be a beneficial arrangement whereby a solo-practicing lawyer worked together with Keegan on the s.14 case. They embarked on this plan in the fall of 2012; unfortunately, by February 2013, it became clear that this arrangement was not going to work as imagined, and Keegan went back to being Lifespan’s executive director to pursue alternative strategies. That spring, Lifespan Society retained Jason Gratl, a renowned civil liberties lawyer in Vancouver to pursue the s.14 challenge.

Lifespan has also worked during this time to establish a base of community support, growing both its membership and reach by educating the public on life extension science and ideology. Cryonics is by no means the only strategy we are pursuing in order to live healthier, longer lives, it is simply the one with an almost distracting level of attention drawn to it (for us) due to the presence of Section 14.

One crucial issue that has become apparent through Mr. Gratl's work on the matter is the lack of a concrete factual matrix in B.C. upon which a court could make a decision about Section 14, if asked to. That is to say, courts are wary of (and some might argue, prohibited from) deciding on matters in the abstract. For a challenge to Section 14 to proceed properly, it simply isn't enough for a B.C. cryonicist to claim that their rights are infringed by the law impeding access to hypothetical services offered by a hypothetical local cryonics rescue operation. Someone else needs to be seeking to *offer* such arrangements, and credibly so, for the picture to come into crisp focus for the courts. Mr. Gratl's advice made it clear that we needed to start a British Columbian cryonics service provider in order to have the best possible chance at pleading our case successfully.

In March 2014, in order for Keegan to finish the process of becoming a lawyer in his own right, another local cryonicist, Carrie Wong took over as Executive Director of Lifespan Society. Her role was to put together a cryonics standby company for the purpose of challenging section 14. Mr. Gratl had already drafted a cryopreservation agreement for this cryonics standby company, so we had the offer itself; we just needed a company to offer it. It was up to Carrie to start putting together the corporate structure of the company and to assemble expertise and equipment to make the case convincing in the courts. One of Carrie's first tasks was to find an experienced and knowledgeable cryonics advocate to run the standby company. After some brainstorming with Lifespan's board we came up with our ideal CEO of the standby company: Christine Gaspar. Christine is the current president of the Cryonics Society of Canada, as

well as a registered nurse who has been a cryonics advocate for 15 years, with writings recently appearing in publications such as Humanity+, KurzweilAI, IIEET, and Cryonics Magazine. She has received training with the Alcor Southern California standby team and was involved in a cryonics case in Toronto, Canada. Carrie contacted Christine to gauge her level of interest, and Christine got on board with the project enthusiastically. Christine has wanted to be a part of a standby team for a number of years, and with the input of the board of Lifespan and Christine, we decided to call this company Biostasis Canada.

The original approach was to create a "starter" company, a company that didn't quite have everything that was needed to do proper standby. We would just borrow or rent equipment from some of our contacts for the duration of the case. This original approach was relatively cost effective but in the process of putting together this "starter," we started to strongly recognize the need for permanent standby services in B.C. that extended beyond just challenging Section 14. Our ambitions became greater; we wanted to produce something as a result of striking down the law.

Our equipment would be real, our personnel legitimate, so why not just create a standby company that would provide a lasting service to Canadian cryonicists? Why stop at Section 14? So now, not only were we preparing for the section 14 challenge; we were also attempting to assemble a lasting cryonics company. This was no trivial feat; it required coordinating the efforts and expertise of a number of key players, and this was not even getting into the financial cost of such an undertaking. Cryonics is a small and tight-knit community and there are many who wanted to help with our cause. What is time consuming and difficult is coordinating people and resources.

We had found the potential CEO of Biostasis, but we still needed a board of directors, a science advisory board, and also separate expert witnesses to provide affidavits for the court challenge. We also needed funding for equipment such as a transport vehicle, portable ice bath, storage space, medications, and at least

some limited personnel. Lifespan Society had started its legal challenge with a very generous donation from Life Extension Foundation, but we soon realized we did not have enough funding to launch the strongest possible challenge against Section 14 and we certainly did not have enough funding to start Biostasis Canada.

In April 2014, Carrie Wong went to the Young Cryonicist Gathering in Florida, to represent Canadian cryonicists and to advocate on behalf of Lifespan Society regarding the anti-cryonics law. Carrie spoke to Ben Best to update him on how the legal challenge was going and what steps we were taking. She also spoke to Bill Faloon and let him know that a summary letter of the legal situation was available from our lawyer, Mr. Gratl. After meeting Ben in person, Carrie started corresponding with Ben via email to try to organize Biostasis Canada. Ben was very helpful and insightful, being the first activist on the scene nearly 25 years ago. We hope one day Ben will get to see another person finish what he started.

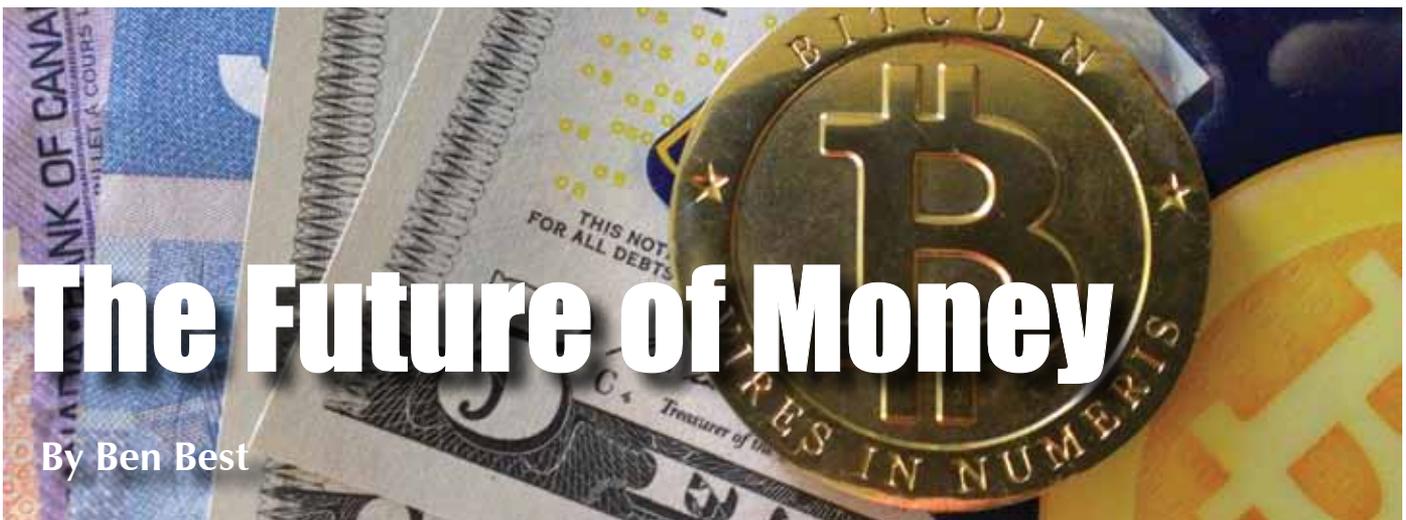
As of today, Biostasis Canada is still in the works. We crafted a business proposal and budget reflecting our most ambitious plans, but thus far there haven't been any takers. It is possible for us to start our legal challenge with the smaller, more budget-conscious version of the company but ultimately we still need donations to continue our work into the future. We realize that cryonics traditionally has not been profitable business, but perhaps that is something that can change in the future. One way or another, dedicated Canadian cryonicists are still hard at work. It's been 25 years but it isn't over yet. ■

If you are interested in donating to our legal challenge:

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By Ben Best

Many cryonicists not only want to preserve themselves for future reanimation, but also wish to preserve at least some of their wealth. Often the plan is to have monetary assets placed into a reanimation trust. But this approach raises a crucial question: will future money be the same as current money? When I was President of the Cryonics Institute, one of our patients had French francs in a safe deposit box. Because the date of allowed conversion of French francs to Euros had long passed, the Francs were worthless. Any cryonicist interested in preserving wealth for the future should give thought to the risk that what is currently valued as money might not continue to be valued as money.

Money has historically and originally been used as a medium of exchange, as a store of value, and as a unit of account (prices). Prices allow producers in a market to assess costs and benefits of production, and allow supply and demand to determine a clearing price.

Private coinage and production of money has been prohibited by all governments of the world, resulting in world monetary socialism (control of the means of production of money by governments). Central banks (such as the Federal Reserve System in the United States) are empowered by legal tender laws to have a monopoly on the production of money. Government money has not been backed by precious metals for many decades. Government money derives its value by command (legal tender laws), hence government money is called *fiat*

(Latin: “it shall be”). Governments use their monopoly on money to engage in covert taxation (“printing money,” especially in wartime) and as a means of influencing the economy.

The Federal Reserve System (“the Fed”) was established in 1913 to stabilize the economy. Depression, inflation, financial crises, and bank failure rates have been much worse in the century following 1913 than was the case in the century prior to 1913. In a productive economy, if the total number of goods and services increase while the money supply does not increase, the value of money will increase. The purchasing power of the American dollar doubled between 1813 and 1913 due to the industrial revolution and expanding world trade. The world was on a gold standard much of that time. The purchasing power of an American dollar in 1913 was 23 times greater than it was in 2013. The Fed targets 2% price inflation per year. If increasing productivity results in a 3% annual increase in goods and services, while the Fed (with the fractional reserve banking system) increases the money supply by 5%, there will be a net 2% price inflation. This benefits the government by reducing the real value of government debt. Because of the benefit to governments resulting from their control of money, those attempting to create alternatives to government money have been punished severely and accused of “domestic terrorism.”

In the past there has been a trend for paper currency to replace precious metals as money, and for checks to substitute for cash. The modern trend with money is for

credit and debit cards to replace coins and paper currency. Coins and paper currency are inconvenient and unsanitary (can be a vehicle for transmission of disease). Bill payments are increasingly made on-line rather than by check. With the increasing digitization of money transactions, smartphones are likely to replace plastic credit and debit cards. Smartphones can use Near Field Communication (NFC) for money transmission. Examples of NFC payment systems include Google Wallet, MasterCard PayPass, and Visa payWave, which can substitute for plastic credit cards for in-person payment to retailers, such as pharmacies, supermarkets, and department stores.

Cell phones have become universal. Countries that never had land-lines or telephone poles have rapidly adopted cell phone use. Moreover, cell phones have become a means of money storage and money transfer in countries where much of the population has never had a bank account, credit card, or credit rating. **M-Pesa** allows people with no credit card or bank account to store and transfer funds on their cell phones. M-Pesa has tens of millions of users in Kenya, Tanzania, and South Africa. According to Bill Gates, half of all financial transactions in Kenya use M-Pesa.

Bitcoin is a decentralized digital currency based on cryptography. (“Bitcoin” with a capital “B” refers to the network and protocol, whereas “bitcoin” with a lower-case “b” refers to the currency.) Many details of the Bitcoin cryptocurrency were described by Keegan MacIntosh in

the October and November, 2013 issues of *Cryonics* magazine, including the key role played by cryonicists in the creation of Bitcoin. Bitcoin is based on public key cryptography, which Alcor Director Ralph Merkle helped formulate. The original design paper for Bitcoin was posted on a cryptography mailing list run by Alcor activist Perry Metzger.

Bitcoins are digital rather than physical entities. Ownership and transfer of ownership is validated by a distributed network with no central authority. New bitcoins are created by validating bitcoin transactions, a process called “**mining**.” Bitcoins are valued because other people will accept them as payment. No more than 21 million bitcoins can ever be created. So unlike central bank money, bitcoin cannot be inflated arbitrarily. Bitcoin was released in January 2009. As of July 2014 there are just over 12 million bitcoins and the price is just under \$600 per bitcoin. Bitcoins are identified by a string of about 30 letters and numbers (a **bitcoin address**), which can be translated into a QR code for easy reading by a smartphone or other electronic device. These bitcoin addresses can be stored in a **bitcoin wallet**, which can be software on your computer or smartphone, or software on the computer of an on-line service provider. A bitcoin can also be stored by writing it onto a piece of paper (“cold storage”) or memorizing a phrase that can be translated into the bitcoin address (“brain wallet”).

A **bitcoin exchange** is a company that exchanges fiat currencies for bitcoins (or vice versa)—as well as for other cryptocurrencies. **Coinbase** (coinbase.com) is the largest and most reputable bitcoin exchange, at present. Coinbase allows for transfer of fiat money from your bank account to bitcoins in your account at Coinbase. Other notable bitcoin exchanges include **Blockchain.info** and **Bitstamp**. Regulation of bitcoin exchanges in Canada has been less stringent than in the United States. In October, 2013 the world’s first ATM converting between bitcoin and fiat was introduced in a Vancouver, British Columbia, Canada coffee shop. **Mt.Gox** was an exchange founded in Japan in July 2010. In 2013 Mt.Gox was handling more

volume than all other bitcoin exchanges combined. Mt.Gox declared bankruptcy in February 2014 after nearly half a billion dollars’ worth of bitcoin had been hacked (stolen), reportedly due to its lax security measures.

Bitcoins can be obtained by other means than by an exchange. Bitcoins can be “mined” (with a computer), can be received in exchange for goods or services (often provided on-line), can be obtained from an ATM (if available) or can be obtained by meeting someone (arranged through LocalBitcoins.com). (People have been jailed for exchanging more than \$10,000 through LocalBitcoins.com because of money laundering laws.)

“Any cryonicist interested in preserving wealth for the future should give thought to the risk that what is currently valued as money might not continue to be valued as money.”

Bitcoin is well-suited for on-line commerce. Transaction fees can be 1% or less, in comparison with 3% for credit cards. There are no chargebacks. International payments are as convenient as domestic payments. There is no risk of credit card theft (in 2013 the retailer **Target** had 40 million credit card numbers stolen). Merchants who accept bitcoin are respected as “early adopters” by an enthusiastic Bitcoin community. When the on-line retailers TigerDirect and Overstock.com started accepting bitcoin in January 2014 they saw an immediate jump in sales. Other large companies accepting bitcoin include Tesla (automobiles), Virgin Atlantic (airline tickets), Expedia (hotel bookings), and Wordpress.com (internet content management).

BitPay (bitpay.com) is an American company which simplifies Bitcoin transactions for merchants. BitPay has processed over \$100 million worth of bitcoin transactions for the over 20,000

merchants for which it provides service. BitPay will convert a bitcoin transaction to US dollars in less than 15 minutes. For users making on-line purchases, the products are quoted in US dollars, but the user is offered the opportunity to pay in bitcoins at the time of on-line checkout.

Like the internet, bitcoin has no national boundaries. Immigrants from the developing world are able to send money to their home countries through Bitcoin, avoiding bank 10-15% transaction fees and delays of up to 5 days. Foreign governments with the most inflationary practices have higher rates of Bitcoin adoption. Buenos Aires, Argentina has 30% more bitcoin-accepting sites per capita than New York City.

In December 2013 the Chinese government forbade domestic financial institutions from conducting payments in bitcoin, although individuals are not prohibited from buying or selling bitcoin. Bitcoin prices fell sharply at the time of this announcement by the Chinese government. The Russian government has given mixed messages, although individuals are not prohibited from buying and selling bitcoins. The Russian government is still developing guidelines. In June 2013 the State of California issued a “cease and desist” order against the Bitcoin Foundation, charging the organization with engaging in money transmission without a state license. This legal action showed ignorance on the part of the California government. Bitcoin Foundation is a non-profit bitcoin educational organization that does not engage in bitcoin trading. There is no central authority for bitcoin for government officials to attack, although bitcoin exchanges are vulnerable. The US government does not recognize bitcoin as money, despite the fact that the Treasury Department requires money transmitter licenses for bitcoin exchanges. The Internal Revenue Service has ruled that buying and selling bitcoins is like buying and selling stocks.

On July 22, 2010 the US dollar price of a bitcoin was five cents. By the end 2010 the price had risen to 25 cents. In December 2011 the price was just over \$3. By August 2013 the price had risen to about \$100,

and peaked at \$1,126.82 in November, 2013 just before the Chinese government announcement caused the price to plummet. Although bitcoin could provide defense against the inflation of government fiat currency, bitcoin is still vulnerable to high volatility based on political and speculative forces. Bitcoin prices must stabilize before it will become preferred over fiat as a medium of exchange.

The US dollar has been the world reserve currency since the 1944 Bretton Woods Agreement. Two-thirds of all US hundred dollar bills are outside the United States. The US dollar is used in nearly 90% of all foreign exchange transactions, and more than 60% of exchange reserves held by governments and institutions are based on US dollars. The only close competitor as a world exchange reserve currency is the Euro (25% of exchange reserves held by governments). Financial problems in the Eurozone do not make the Euro a likely successor to the US dollar as a world reserve currency. Special Drawing Rights (SDRs) issued by the International Monetary Fund (IMF) have been proposed as a world reserve currency. SDRs are based on a composite of four currencies, dominated by the US dollar (41.9%) and the Euro (37.4%). SDRs are unlikely to displace the US dollar as a reserve currency. The US dollar has remained the world reserve currency mostly because of the lack of a good alternative.

“Bitcoin is based on public key cryptography, which Alcor Director Ralph Merkle helped formulate.”

Gold has not been the world’s money for more than a century, but rising gold prices in recent years reflect decreasing confidence in fiat currencies as a store of value. Despite the official view that gold is no longer money, China, Russia, as well as governments in Asia, Eastern Europe, and Latin America have substantially increased their gold holdings in the last decade.

Western central banks stopped selling gold in 2009. These trends could be due to a lack of confidence by central banks in the future of the US dollar or Euro as a world reserve currency.

If widespread use of the US dollar in other countries ceased, those dollars would flood back into the United States, causing massive inflation. The British Pound Sterling lost considerable value overnight in the 1930s when the Sterling ceased to be a world reserve currency. China, Russia, Islamic nations, and many other countries want a better world reserve currency than the US dollar. Could bitcoin replace the US dollar as a world reserve currency?

In his *Cryonics* magazine articles about Bitcoin, Keegan MacIntosh describes some of the implications of using bitcoins for cryonics asset preservation. Insofar as bitcoins are cryptographic addresses, they could be stored on paper in a safe deposit box or could even be memorized. As Keegan suggested, the latter possibility could provide an incentive for thieves to literally “pick the brain” (possibly destructively) of a cryonics patient who had memorized a Bitcoin address for a substantial amount of bitcoin. But in my opinion, it would be a bad idea to believe that Bitcoin or any particular cryptocurrency or fiat currency will retain value over the span of the coming decades.

Bitcoin was the first cryptocurrency to gain widespread acceptance, but as of July 2014 there are hundreds of other cryptocurrencies, many of which have features which are superior to bitcoin. As of May 2014, Bitcoin’s market capitalization (US dollar price of a bitcoin multiplied by the number of outstanding bitcoins) is the equivalent of nearly \$6 billion—more than 20 times the market capitalization of the next largest capitalized cryptocurrency (Litecoin). Some people think that Bitcoin has too much momentum to be displaced by other cryptocurrencies, but I believe it is likely that other cryptocurrencies with superior features will displace Bitcoin as the prevailing cryptocurrency.

My predictions for the next 5-20 years are that the US dollar will cease to be the world reserve currency; that plastic cards, paper currency, and coins will cease being

used; that smartphones with cameras will become universal—becoming the primary means of monetary exchange; that cryptocurrency prices will become less volatile; and that other cryptocurrencies will displace Bitcoin as the prevailing cryptocurrency. My prediction for 20-50 years is that cryptocurrency will replace fiat currency as a world currency. This will first happen in countries with the worst inflationary policies, but will eventually occur in even the most developed countries (but not before a terrible fight by the governments of those countries).

My recommendation for cryonicists is not to use either fiat or any particular cryptocurrency as a store of value for reanimation funding. Nor should jewelry be used because jewels are becoming increasingly easy to cheaply synthesize. Precious metals and stock index funds are probably the best means of storing value for many coming decades or longer. Although Alcor offers Member storage in a Kansas salt mine of physical possessions wanted after reanimation, there is no guarantee that an employee could not steal precious metals being stored there. A safe deposit box with precious metals in Switzerland managed by a trustee could be more secure—assuming the trust arrangements are secure. Stock index funds could retain value because companies would shift their monetary assets into prevailing currencies on an on-going basis. And because those who manage stock market indices will shift companies into and out of the indices based on the existing financial success of the companies.

Note that bonds are based on fiat, and that bonds should therefore not be used as a long-term store of value. The bottom line is that cryonicists should avoid all fiat money (or fiat-backed financial instruments) and cryptocurrencies (or cryptocurrency-backed financial instruments) as a long-term store of value. ■

Small Animal Whole Body Cryopreservation: Past and Future Part IV



By Chana Phaedra and Aschwin de Wolf

INTRODUCTION

In the previous three installments of this series we reviewed a variety of challenges that researchers had to go through to achieve a protocol that allowed for reproducible resuscitation of small animals (rats and hamsters in particular) from ultra-profound hypothermic temperatures and even high subzero temperatures. Perhaps the most crucial finding in these experiments has been the importance of providing adequate metabolic support during the cooldown and warming phase for good functional recovery.

While Andjus and Smith were successful in recovering some small animals from high subzero temperatures, Smith recognized that recovering whole animals from temperatures lower than -5 degrees Celsius would necessitate the use of replacing the blood with a cryoprotectant. She writes, "If the artificial circulation was to be used to hasten the process of freezing, the fluid circulated would have to contain a substance to prevent it from freezing at temperatures below zero...So far no technique has been evolved for perfusing individual organs or the whole mammal with glycerol and removing it without damage. If this could be done it might be possible to cool the intact mammal to and resuscitate it from temperatures as low as -70 degrees Celsius. Long-term storage of frozen mammals might then be considered. It must be emphasized that there is no prospect of accomplishing this in the near future."⁽¹⁾ Smith clearly recognized that small animal whole body resuscitation from cryopreservation required a combination

of technological advances and specialized skills that were (almost) unavailable to her at the time.

BIOLOGICAL AND TECHNICAL REQUIREMENTS

Here we will outline a number of biological and technological issues that need to be addressed to make a credible attempt to resuscitate small animals from temperatures lower than Smith ever attempted.

- 1. Cryoprotection.** While Smith et al had mixed results with resuscitating small animals from high subzero temperatures (between 0 degrees Celsius and 5 degrees Celsius) it is generally recognized that recovery from lower temperatures necessitates the use of a cryoprotectant such as glycerol or DMSO. If the animal were cooled to the temperature of liquid nitrogen (or the glass transition point of the cryoprotectant) a simple mono-agent like this may not suffice and a contemporary low-toxicity vitrification agent that allows cryopreservation without freezing (such as M22) would be required.
- 2. Extracorporeal Circulation.** A corollary of the requirement to use a cryoprotectant is the need for an extracorporeal perfusion circuit to deliver and remove the agent. This will allow the blood of the animal to be replaced with a cryoprotectant to permit lowering the temperature without freezing. Such a perfusion circuit will also permit the researcher to control flow rate, pressure and temperature. To allow the cryoprotectant to be perfused in a controlled manner without causing excessive osmotic injury the researcher would either need to introduce the solution in a series of steps with successively higher concentrations, or build a device that allows instantaneous mixing of the so called "carrier solution" and the cryoprotectant to create a smooth (linear) ramp.
- 3. Surgical Access.** To replace the blood of the animal using extracorporeal perfusion microsurgical skills are required to place cannulae in the animal. A number of options are available for the researcher, including cannulation of the tail, femoral, heart and neck vessels. It is important to ensure that these vessels and nearby organs are not injured to a degree that would exclude resuscitation of the animal. For example, the transcatheter perfusion protocols that are routinely used for small animal fixation cannot be used because they irreversibly damage the heart and the ability of the animal to breathe on its own.
- 4. Temperature Control.** Rigorous control of temperature is important

in all parts of the procedure. During the initial cooldown cooling and metabolic support (respiration) need to be synchronized. Introduction of the cryoprotectant should be conducted at the lowest possible temperature to mitigate cryoprotectant toxicity. Uniform and rapid cooling below zero degrees Celsius is necessary to prevent ice formation and fracturing. Conversely, a suitable warming technology is required to prevent ice formation (or “devitrification”) and ischemia upon warming.

5. **Viability tests.** In a sense, testing for viability after small animal whole body cryopreservation is straightforward. If the animal recovers (long-term) cardio-respiratory and brain function the experiment can be deemed successful. In reality, however, the researcher may not immediately be successful and more modest viability tests can be used to measure whether progress is being made. Examples of such tests include tests of isolated organs (such as the heart) or electrophysiology measurements of brain slices of animals that underwent the whole body cryopreservation protocol.

CHALLENGES

In the remainder of this article we will discuss a number of specific challenges that need to be resolved to implement this model.

It is of crucial importance to first successfully establish a reproducible hypothermic resuscitation model. Without being routinely able to recover small animals from temperatures close to 0 degrees Celsius as a baseline it is going to be difficult to identify the unique challenges associated with cryopreservation. Along similar lines, it should also be recognized that unless one is able to load and unload the cryoprotectant at 0 degrees Celsius with recovery of the animal, it will not be useful to move to the next step where the

temperature is lowered below zero degrees Celsius. In other words, the next step after hypothermic resuscitation should not be going straight to cryopreservation but replacing the blood of the animal with the cryoprotectant of choice and re-introducing the blood again without loss of integrated functional activity. If this can be done successfully, lower temperatures can be introduced.

“Smith clearly recognized that small animal whole body resuscitation from cryopreservation required a combination of technological advances and specialized skills that were (almost) unavailable to her at the time.”

Choice of cryoprotectant and concentration is also a non-trivial challenge. This is not just a matter of adapting a human cryopreservation protocol for small animals. After all, the objective of small animal cryopreservation resuscitation research is to *recover* the animal. We do not know exactly when a person is rendered unrecoverable *by contemporary criteria* in modern cryonics but it is a reasonable assumption that the concentrations and protocols currently used still cause too much cryoprotectant toxicity. The most logical step therefore would not be to load the animal with a concentration necessary to vitrify (CNV) but to use a concentration that permits ice-free exposure to high subzero-temperatures first (say -5 degrees Celsius). It is not clear at this point whether this favors using a lower concentration of the least toxic vitrification agent known today or simply a low concentration of the more well-known mono-agents such as glycerol or ethylene glycerol, or a combination thereof. When it is possible to load and unload such a cryoprotectant, cool below zero degrees Celsius, unload the cryoprotectant and recover whole body

function, then the concentration can be slightly increased and the same protocol can be used for progressively lower temperatures.

There can be no successful recovery of a whole mammal without avoiding injury to the vessels and major organs of the animal. Audrey Smith already hypothesized that during deep hypothermia the selective permeability of the inner lining of the gastric mucosa is lost, which needs to be addressed in any successful resuscitation attempt. It has also been firmly established that exposure of the brain to a cryoprotectant will produce shrinkage, which can become quite severe with higher concentrations. How much shrinking of the brain is tolerated without loss of viability is an important question for whole body resuscitation because if brain function is not recovered, whole body resuscitation is not possible. As emphasized before, this issue further reinforces the need to first successfully load and unload a cryoprotectant in a whole body without subjecting it to cooling. Last but not least, how vulnerable are organs such as the lungs to cryoprotectants, osmotic injury, and cryopreservation?

“Without being routinely able to recover small animals from temperatures close to 0 degrees Celsius as a baseline it is going to be difficult to identify the unique challenges associated with cryopreservation.”

The cryopreservation procedures employed by Alcor exploit the perfusion methods originally developed for use in cardiopulmonary bypass. Research in cryonics has long depended upon the use of animal models to develop improved perfusates and related technologies. Previous research at Alcor was largely carried out using dogs. An initial experiment was performed in 1977 to duplicate Alcor’s

first human cryopreservation, which was carried out in the previous year, and to hone the skills of the suspension team (2). Afterward, a series of seven total body washout experiments were performed, of which five were successful (i.e., the animals recovered fully) (3). While such pioneering research efforts were instrumental to the development of current cryonics techniques and technologies, progress made toward miniaturization of the extracorporeal circuit renders the use of dogs as experimental animals less clearly necessary and creates an ethical imperative to explore a small animal model like the rat as a substitute.

The rat is a species in which the effects of cerebral ischemia on histology and neurological outcome have been studied and well-characterized. In addition, the cardiovascular system in the rat is similar to that found in humans (4). The ascending aorta, aortic arch, and descending aorta are completely analogous. The only major difference is that the rat has three vena cavae (two superior and one inferior), whereas the human has two.

The extracorporeal circulation circuit (ECC) itself should consist of specialized tubing to contain perfusate, a pump to circulate the perfusate, a membrane oxygenator to oxygenate the perfusate when necessary, a venous reservoir to serve as a buffer for fluctuations in venous drainage, and a heat exchanger for temperature control. Importantly, the priming volume (i.e., the total volume of perfusate within the circuit) should be as small as possible. In the past, rodent CPB circuits have utilized relatively oversized (10-25 times) clinical pediatric devices. Even using the smallest neonatal oxygenators on the market for CPB in the rat results in a disproportionately large prime volume, and therefore excessive hemodilution, as well as an imbalance in the membrane surface area to body mass and priming volume to blood volume ratios. Reducing circuit volume also helps reduce heat loss and confers greater control over perfusate temperature. The past 10 years have seen the design and manufacture of miniaturized extracorporeal circuit components for use in research which can

be modified to use in a small animal whole body cryopreservation model.

Surgery and associated procedures required for extracorporeal circulation in a rodent model are the same as those required by human cryonics cases, the most important of which is cannulation of specific vessels for introduction of perfusate to and return of perfusate from the body. The experimental preparation includes anesthesia, orotracheal intubation, ventilation of the lungs, and cannulation of the vessels. The small size of the animal does increase the level of difficulty of (micro)surgery, but most such difficulties are overcome with sufficient practice and expertise. For many years, adequate venous return was a major concern for researchers attempting full bypass using the rat model. But rapid improvements in cannulation techniques have resulted in consistent achievement of optimal flow rates (5). Several different vascular approaches for extracorporeal circulation have been attempted in the rat with varying degrees of success, but the literature now seems to strongly favor cannulation of the tail artery for arterial inflow and the jugular vein for venous return.

“How much shrinking of the brain is tolerated without loss of viability is an important question for whole body resuscitation because if brain function is not recovered, whole body resuscitation is not possible.”

As this review makes clear, it is now possible to create a physical infrastructure to continue the whole body small animal resuscitation experiments pioneered by researchers such as Andjus and Smith at even lower temperatures. Aside from contributing to the ultimate goal of developing full body suspended animation, a small animal cryopreservation model can also help address specific issues in human

cryopreservation such as cryoprotectant toxicity in vivo, and the effects of cerebral dehydration on viability. ■

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Decades-Old Mystery of How Cells Keep from Bursting Solved

A team led by scientists at The Scripps Research Institute (TSRI) has identified a long-sought protein that facilitates one of the most basic functions of cells: regulating their volume to keep from swelling excessively. The identification of the protein, dubbed SWELL1, solves a decades-long mystery of cell biology and points to further discoveries about its roles in health and disease—including a serious immune deficiency that appears to result from its improper function. “Knowing the identity of this protein and its gene opens up a broad new avenue of research,” said the study’s principal investigator Ardem Patapoutian, a Howard Hughes Medical Institute (HHMI) Investigator and professor at TSRI’s Dorris Neuroscience Center and Department of Molecular and Cellular Neuroscience. The report appears as the cover story in the April 10, 2014 issue of the journal *Cell*.

Scripps News and Views
14 Apr 2014
http://www.scripps.edu/newsandviews/e_20140414/patapoutiancell.html

Building ‘Smart’ Cell-Based Therapies

A Northwestern synthetic biology team has created a new technology for modifying human cells to create programmable therapeutics that could travel the body and selectively target cancer and other sites of disease. Engineering cell-based, biological devices that monitor and modify human physiology is a promising frontier in clinical synthetic biology. However, no existing technology enabled bioengineers to build such devices that sense a patient’s physiological state and respond in a customized fashion. “The project addressed a key gap in the synthetic biology

toolbox,” says Joshua Leonard, assistant professor of chemical and biological engineering in Northwestern’s McCormick School of Engineering and Applied Science. “There was no way to engineer cells in a manner that allowed them to sense key pieces of information about their environment, which could indicate whether the engineered cell is in healthy tissue or sitting next to a tumor.” Funded by the Keck Futures Initiative and DARPA, the research is available to read online in the journal *ACS Synthetic Biology*.

McCormick Northwestern
16 Apr. 2014
<http://www.mccormick.northwestern.edu/news/articles/2014/04/building-smart-cell-based-therapies.html>

How a Synapse Remains Stable When Its Proteins Are Renewed

When we learn something, new synapses are created or existing ones are strengthened. To enable us to retain long-term memories, synapses must remain stable for long periods of time, up to an entire lifetime. Researchers at the Max Planck Institute of Neurobiology in Martinsried near Munich have found an explanation as to how a synapse can remain stable for a long time despite the fact that its proteins must be renewed regularly. “We were interested first of all in what happens to the different components of a synapse when it grows during a learning process,” explains study leader Volker Scheuss. The scientists discovered that during synapse growth the different protein structures always grew coordinated with each other. If one structural component was enlarged alone, or in a way that was not correctly correlated with the other components, its structural change would collapse soon after. Synapses with such incomplete changes cannot store any long-term memories. The study findings show that the order and interaction between

synaptic components is finely tuned and correlated.

Max Planck Gesellschaft
16 Apr. 2014
<http://www.mpg.de/8125352/synapses-stability>

Technique Allows Whole-Brain Imaging with Single-Cell Resolution

In collaboration with several Japanese institutes, researchers at the RIKEN Quantitative Biology Center in Japan demonstrate an easy and fast way to achieve whole brain imaging for 3D analysis of gene expression profiles and neural circuits at the systems level. Whole-brain imaging at single-cell resolution is important for trying to clarify how neural activity is translated into consciousness and other complex brain activities. However, limitations in current methods prevent comprehensive study of the relationship. A new high-throughput method, CUBIC (Clear, Unobstructed Brain Imaging Cocktails and Computational Analysis), published in *Cell*, is a great leap forward, as it offers unprecedented rapid whole-brain imaging at single cell resolution and a simple protocol to clear and transparentize the brain sample based on the use of aminoalcohols. In combination with light sheet fluorescence microscopy, CUBIC was tested for rapid imaging of a number of mammalian systems, such as mouse and primate, showing its scalability for brains of different size.

RIKEN Institute
18 Apr. 2014
http://www.riken.jp/en/pr/press/2014/20140418_1/



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

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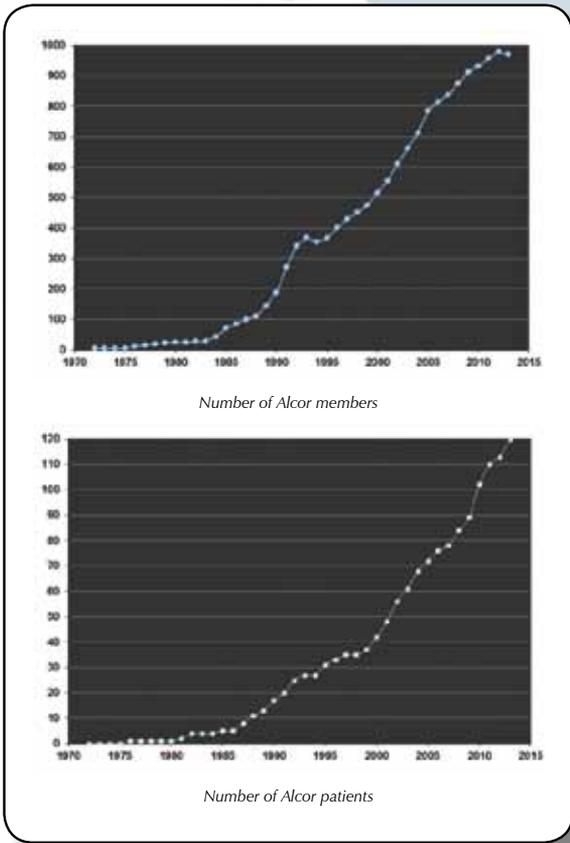
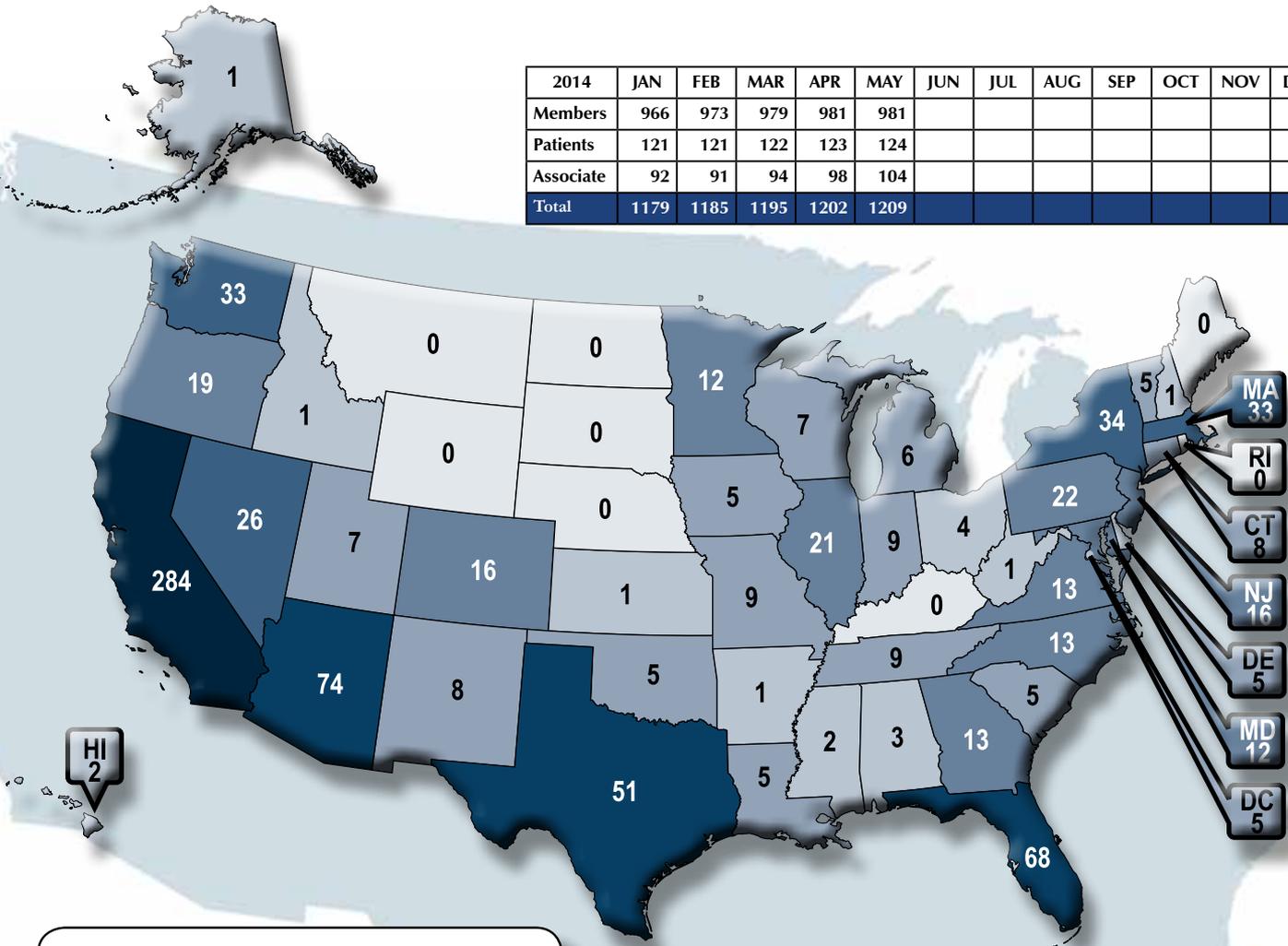
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Fisetin	10 mg

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2014	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Members	966	973	979	981	981							
Patients	121	121	122	123	124							
Associate	92	91	94	98	104							
Total	1179	1185	1195	1202	1209							

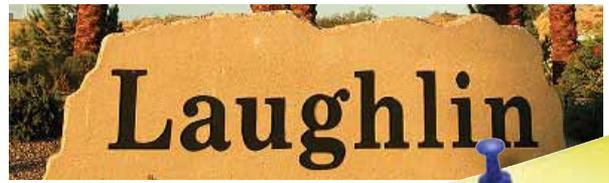


International

Country	Members	Patients
Aruba	0	0
Australia	11	3
Canada	42	2
Germany	5	0
Israel	1	1
Italy	2	0
Japan	1	0
Lebanon	1	0
Mexico	4	0
Monaco	1	0
Netherlands	2	0
New Zealand	3	0
Norway	1	0
Portugal	4	0
Singapore	1	0
Spain	3	1
Thailand	3	0
United Arab Emirates	1	0
United Kingdom	21	2
TOTAL	107	9

Announcing...

This Year's Cryonics Convention



This year marks the 50th anniversary of the publication in 1964 of *The Prospect of Immortality*, by Robert Ettinger, the book which started the cryonics movement. If you want to find the best information from authoritative sources about the current and foreseeable state of the cryonics movement as of this year, you have an excellent opportunity this coming November. The Society for Venturism is announcing its second Cryonics Convention at Don Laughlin's Riverside Resort in Laughlin, Nevada, to be held November 7, 8 and 9, 2014 at the Resort's Starview Room, a conference facility which offers a panoramic view of the Colorado River and the desert mountains beyond. The Starview Room also has space for the attendees' dining and for exhibition tables.

The convention will feature speakers who will discuss developments of interest to cryonicists, transhumanists, futurists and life extensionists. Some scientists who work in cryobiology and in the science of aging will report on their cutting-edge research. Other speakers representing Alcor and other cryonics organizations will report about developments at their respective organizations. Yet other speakers with long involvement in cryonics will discuss the history and philosophy of the cryonics movement on its 50th anniversary, the movement's current status, and where we would like to see it go in the coming years. And Mr. Laughlin himself will appear to take questions from the audience about anything, which he will answer with his humor and shrewd business sense, just like he did at last year's convention. The Society for Venturism will publish a list of speakers and their presentations in about a month at the Venturists' website: <http://www.venturist.info>.

Mr. Don Laughlin, a longtime cryonicist, has worked with the Society for Venturism to make the convention very convenient and affordable. The registration fee, payable to the Society for Venturism,

is only \$75. You have to reserve your own room accommodations through the Riverside Resort (details to be announced) at special low rates by mentioning that you are coming to the convention. Mr. Laughlin has arranged to provide all the meals for the attendees at special discounted rates inside the Starview Room so that you don't have to go down to the busy casino for your meals. The Starview Room also has a cash bar to provide beverages.

Attendees who have appropriate products or services they would like to offer or sell to cryonicists—books, T-shirts, supplements, CD's, magazines,

etc.—will also be able to reserve free table space at the convention.

So mark your calendars in November for this event, and keep on the lookout for the updated information about the convention at the Venturists' website, <http://www.venturist.info>. If you would like more information, email Mark Plus, Secretary of the Society for Venturism at mark.plus@rocketmail.com. You can also call him at (928) 273-8451. ■

Why Should You Join the Venturists?

The Society for Venturism is one of the oldest organizations (established in 1986) which defends the rights of cryonicists to be cryopreserved.

Membership in the Society for Venturism offers the following benefits:

1. Venturist members receive the Venturists' Religious Objection to Autopsy card. This offers possible protection from an autopsy which would compromise the quality of your cryopreservation.
2. The Venturists have a Backup Trust which could offer possible protection of your cryopreservation in case your cryonics organization can no longer keep you cryosuspended.
3. The Venturists offer possible Constitutional protection of your right to cryopreservation because of their church status.
4. The Venturists hold regular, affordable conventions which are open to everyone in the

cryonics community. These offer excellent opportunities to hear talks by scientists about their research into cryonics and life extension; they also provide a way to meet and network with cryonicists, transhumanists and life extensionists from around the world.

Membership in the Society for Venturism is very affordable, with an annual donation starting at \$25 a year. Full membership requires being signed up with a recognized cryonics organization, and affirming the Venturists' Principles: (1) To try to do what is right; and (2) To work for the worldwide conquest of aging and death. You can find the membership application and ways to donate on the Venturists' website, www.venturist.info. For more information, contact Mark Plus, Secretary of the Society for Venturism: mark.plus@rocketmail.com, phone (928) 273-8451. Or write to: Society for Venturism, 11255 S. Highway 69, Mayer, AZ 86333, USA. ■

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Item# 01808

How Much Curcumin Are You Absorbing?

Curcumin is an active compound derived from the Indian spice **turmeric**. It has been widely acclaimed for its diverse health-promoting effects on nearly every organ system in the body,¹⁻⁶ including its support for the body's natural inflammatory response system.⁷ But most curcumin is neither *absorbed well* nor *retained well* in the blood—posing a challenge to those who wish to maximize its benefits.⁸

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- 2. Ginger:** Curcumin and **ginger** are close botanical relatives. Research demonstrates that they have overlapping and complementary health benefits,¹³ and scientists are focusing on the therapeutic effects of *combining* these two plants.^{14,15} **Advanced Bio-Curcumin® with Ginger & Turmerones** provides a supercritical extract of ginger standardized to the greatest concentration of ginger compounds—including beneficial gingerols and shogaols.
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Caution: Do not take if you have gallbladder problems or gallstones. If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, contact your healthcare practitioner before taking this product.

MEETINGS

ABOUT THE ALCOR FOUNDATION

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

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

ARIZONA

FLAGSTAFF:

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

PHOENIX

VALLEY OF THE SUN:

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

AT ALCOR:

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

CALIFORNIA

LOS ANGELES:

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

SAN FRANCISCO BAY:

Alcor Northern California Meetings are held quarterly in January, April, July, and October. A CryoFeast is held once a year. For information on Northern California meetings, call Mark Galeck at (650) 969-1671, (650) 534-6409 or email Mark_galeck@pacbell.net.

FLORIDA

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

NEW ENGLAND

CAMBRIDGE:

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

PACIFIC NORTHWEST

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

BRITISH COLUMBIA (CANADA):

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

OREGON:

The contact person for meetings in the Portland area is Aschwin de Wolf: aschwin@alcor.org

See also: <https://www.facebook.com/portland.life.extension>

ALCOR PORTUGAL

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

TEXAS

DALLAS:

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

AUSTIN/CENTRAL TEXAS:

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

UNITED KINGDOM

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

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

WHAT IS CRYONICS?

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

HOW DO I FIND OUT MORE?

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

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

Your free package should arrive in 1-2 weeks. (The complete package will be sent free in the U.S., Canada, and the United Kingdom.)

HOW DO I ENROLL?

Signing up for a cryopreservation is easy!

- Step 1:** Fill out an application and submit it with your \$90 application fee.
- Step 2:** You will then be sent a set of contracts to review and sign.
- Step 3:** Fund your cryopreservation. While most people use life insurance to fund their cryopreservation, other forms of prepayment are also accepted. Alcor's Membership Coordinator can provide you with a list of insurance agents familiar with satisfying Alcor's current funding requirements.
- Finally:** After enrolling, you will wear emergency alert tags or carry a special card in your wallet. This is your confirmation that Alcor will respond immediately to an emergency call on your behalf.

Not ready to make full arrangements for cryopreservation? Then **become an Associate Member** for \$10/month (or \$30/quarter or \$120 annually). Associate Members will receive:

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

To become an Associate Member send a check or money order (\$10/month or \$30/quarter or \$120 annually) to Alcor Life Extension Foundation, 7895 E. Acoma Dr., Suite 110, Scottsdale, Arizona 85260, or call Marji Klima at (480) 905-1906 ext. 101 with your credit card information. You can also pay using PayPal (and get the Declaration of Intent to Be Cryopreserved) here: <http://www.alcor.org/BecomeMember/associate.html>



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