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CRYONICS

May 2015 · Volume 36:5

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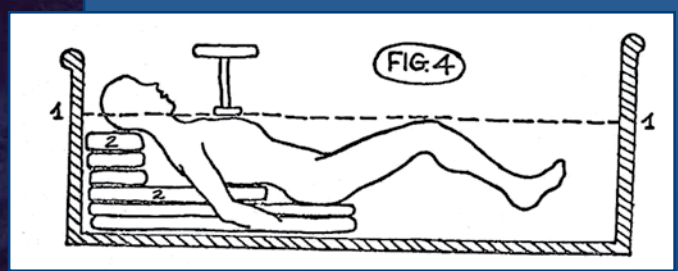

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CRYONICS

On the cover:
Dante Brunol, Via Veneto, Rome, Italy, May 1969. Photo courtesy of Robert Nelson (cropping).

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What Did Brunol Say? Notes from the Architect of the first Controlled Human Cryonics Preservations
Some previously unpublished correspondence of Dante Brunol sheds light on his role in early cryonics cases, including that of James Bedford. Also included is an unpublished letter from Saul Kent to Brunol and a pro-cryonics article by Brunol from 1967, "Is Suspended Animation a Crazy Dream?"

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CRYONICS

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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.

COMPETITION AND COOPERATION IN CRYONICS By Aschwin de Wolf

When I told Jordan Sparks that his new cryonics organization, *Oregon Cryonics*, would be featured in *Cryonics* magazine he was quite surprised. To me it is obvious. I think that cryonics is still in such a fragile state that new organizations can have a positive effect on other existing organizations. I also believe that the existence of multiple cryonics organizations with different services and pricing will bring cryonics within the reach of more people and can create a safer environment for the existing organizations.

Of course, not every new cryonics organization should be enthusiastically welcomed by existing cryonics organizations. A cryonics organization which does not disclose any information about its protocols or cases should be treated with great caution. An organization that accepts patients on a "pay as you go" basis is at much greater risk of having to thaw their patients and cause a bad reputation to the field as a whole. A cryonics organization that seeks to gain members through the dissemination of unrealistic promises or denigrating statements about other organizations would not be helpful either.

One reason why I think existing cryonics organizations should not feel threatened by the existence of other organizations is because I do not think that a membership gain by one organization is necessarily at the expense of the other organizations. At this point the two major existing cryonics organizations (*Alcor* and the *Cryonics Institute*) approach cryonics from a different philosophy and have different price structures. It is also conceivable that in the future there will be a new cryonics organization that pursues an explicit for-profit model.

"In the future we may see a wider embrace of brain-only cryopreservation, or even the addition of chemical preservation as a low-cost option."

The existence of multiple cryonics organizations also spurs innovation and quicker adoption of new technologies. After all, most cryonics organizations would like to be perceived as "state of the art" and the introduction of a new technology at one organization often causes the other organization to adopt it (sooner) as well. The most prominent example of this is the transition from conventional cryoprotection to vitrification. No sane cryonics organization today would decide to offer freezing with a poor cryoprotectant as the preferred protocol. In the future we may see a wider embrace of brain-only cryopreservation, or even the addition of chemical preservation as a low-cost option. The existence of multiple cryonics organizations also leads to greater national and international press coverage.

In an ideal world, a cryonics organization should be close enough to do prompt stabilization and cryoprotection without the need for air transport or prolonged ground transport. If cooperation among organizations is excellent we may even see that organizations make available (for a fee) their space to stabilize and cryoprotect a patient of another organization to minimize long periods of cold ischemia. Such an arrangement could be advantageous for all organizations involved.

I admit being also rather relieved. Other than KrioRus, there has not been a new all-service cryonics provider since the mid-1990s, and none at all in the Western Hemisphere. Running a cryonics organization is not trivial so it is extremely encouraging to see there are still people who want to to do it. Let us wish *Oregon Cryonics* good luck and hope that we both grow faster as a result. ■

WHAT DID BRUNOL SAY?
NOTES FROM THE ARCHITECT OF THE FIRST CONTROLLED HUMAN CRYONICS PRESERVATIONS

By R. Michael Perry

Dante Brunol (full name: Mario Dante Bruno-Lena) was an experimental physician and biophysicist active in the late 1960s in southern California. Records indicate he was born at Locana, Italy, 14 Feb. 1926 and died at Boscanero, Italy, on 1 Jan. 1978, when he was not yet 52 years old.[1] He is mainly remembered in cryonics for devising the first protocol for cryopreserving a human being with the hope of eventual resuscitation ("The Method for Freezing Humans"[2]), and for his role in two of the earliest human cryopreservations, those of James Bedford (January 1967) and Marie Phelps-Sweet (August-September 1967).[3] At the time of the freezing of Bedford it appears he was employed at the University of Southern California near where the freezing took place. Apparently he lost his position briefly as a result of his involvement but soon regained it (some details are unclear).[4] Robert Nelson, who headed the Cryonics Society of California and organized the freezings, offers this description in his 1968 book about the Bedford freezing, *We Froze the First Man:*

Dr. [Brunol] is a very colorful gentleman. Born in Northern Italy, his fair hair and skin and light blue eyes belie the stereotyped image most Americans have of Italians. His accent, however, gives him away. Throughout our association I was 'Bob-a-Nelson' to him and this and his courage will always provoke fond memories of the fiery, dedicated scientist who did so much to advance the concept of cryogenic interment.[5]

This article mainly consists of material by Brunol himself relating to these cryonics cases recently discovered in Alcor's archives, much of it not previously published. Included is an article by Brunol, "Is Suspended Animation a Crazy Dream?" and an unpublished letter to Saul Kent and Curtis Henderson from October 1967, replying to a letter of Saul Kent which is also included. (All pieces included here are lightly edited by me. See "DB" in Sources for full, original correspondence as PDF file—RMP.) Brunol here shows mixed feelings about the fledgling practice of cryonics and its principals, including Robert Ettinger and Robert Nelson, and is very concerned that the material not be published, fearing (no doubt rightly) a negative impact on his scientific career.

By way of additional background, at the time of Brunol's writing four people had been cryopreserved with some idea of eventual reanimation. The first was a woman frozen in April 1966 by Cryo-Care Equipment Corporation in Phoenix, Arizona.[6] This was after embalming and several weeks of storage in a mortuary refrigerator. (She was thawed and disposed of conventionally around the time of the second freezing.[7]) The second freezing was that of James Bedford in January 1967, carried out by the Cryonics Society of California, headed by Robert Nelson, with Dante Brunol presiding. Unfortunately, Brunol's complicated perfusion apparatus could not be properly activated on the short notice he was given before Bedford arrested and a compromise procedure was necessary; perfusate was injected with likely minimal cryoprotective effects.[8] The third freezing, again by the CSC with Brunol's participation and supervision, was of Marie Phelps-Sweet starting at the end of August, 1967. In this case the cryoprotection was likely much better though somewhat mooted by the patient's having been discovered only several days after arrest and hampered additionally by the inexperience of the mortician assistants (actually two young mortuary students, Jeff Hicks and Richard Duffy).[9] The fourth freezing (a

Dante Brunol, Via Veneto, Rome, Italy, May 1969. Photo courtesy of Robert Nelson (cropping).

Brunol and the two mortuary assistants at the freezing of Marie Phelps-Sweet, Aug.-Sep. 1967. From left: Jeff Hicks, Dante Brunol, Richard Duffy. Photo courtesy of Robert Nelson.

straight freeze) was of Louis Nisco by Cryo-Care Equipment Corp. in September 1967; Brunol was not involved.[10]

The freezing of Miss Sweet (who actually was married to Russ Le Croix Van Norden but preferred her maiden name) was followed by an article in *True – The Man's Magazine*, October 1967, by J. F. Wilkinson, entitled "The Deep Freeze Scheme for Immortality." Needless to say, this was not the sort of article likely to endear itself to a scientist who wanted to maintain credibility with his colleagues and obtain funding for further research. To underscore the point, the subtitle comments: "If the disciples of this bizarre cult are right, death need not be a finality, but merely an inconvenience—a frozen interlude for the body—until modern medicine finds cures for today's diseases." From there the article focuses on Robert Ettinger, the main founder of the "bizarre cult," and his plans in case one of his family members is stricken and needs cryopreservation.

A willing participant, Ettinger, when visited for an interview, leads the way downstairs to his rumpus room and shows off his Westinghouse Iron Heart—a heart-lung machine powered by compressed oxygen. In action it supplies the purified, breathable gas to a patient while the heart is externally massaged to help circulate oxygenated blood through the body. As Ettinger explains, the heart-lung machine is normally used to resuscitate victims of heart attack, electrocution, or drowning. In his case, however, it would be used as part of a procedure to cryoprotect a patient—a family member who has just been pronounced dead—prior to cooldown to cryogenic temperature. The preparation in this case would involve replacing the blood with a solution containing dimethyl sulfoxide (DMSO) to (partially) protect the tissues against freezing damage.

Wilkinson elaborates on what would be done in such an event, a do-it-yourself procedure Ettinger or someone else without advanced schooling could perform: "Screwed into the ceiling of Ettinger's rumpus room is a clothesline hook. He'll hang the bottles of DMSO solution from this hook, attach a long plastic lance-tipped hose and pierce a vein [artery?] in one of the body's arms to inject the solution. The flow of the DMSO solution through the body, aided by the action of the Iron Heart, will force the blood out through a hole made in a vein in the other arm."[11]

It is an understatement to say that such a procedure is a gross simplification of the protocol devised by Brunol, and it might well contain errors of transmission. (Perfusion would normally involve both arteries and veins; to use just the venous or arterial system would grossly shortchange the other part, plus the very important capillary bed!) It is impossible to say at this point, either how accurately Ettinger's intentions are recorded or how well he understood the issues involved in devising his own procedure. (It appears also that the procedure was never actually used.) In any case Brunol was incensed and dismissed the reported procedure as "irresponsible"—unfortunately without much in the way of further comment.

Brunol's letter is in response to a letter from Saul Kent which I quote first. Included are fifteen questions about Brunol's protocol to which Brunol in his reply supplies answers; these I've inserted in the text of the letter in italics. I've also included figures which are included in the correspondence and referred to in the questions, with captions (Arial italics). These are similar to those found (with figures redrawn) in Brunol's published protocol.[12]

.....

Oct. 14, 1967

Dr. Dante Brunol
79 Patrician Way (3F)
Pasadena, California

Dear Dr. Brunol,

Some questions regarding your Description of the Method for Freezing Humans:

1. You present three possible methods for freezing the body: one with a heart-lung machine (closed circuit); and two & three without (open circuit). Your procedure, however, details only the third method (perfusion through the femorals). Why have you neglected the second method (perfusion through the carotids)? *Safe perfusion through the internal carotids requires greater skill than perfusion through the femorals.*

2. Wouldn't the brain temperature be lowered more rapidly with the second method? *The brain can be cooled more rapidly via the carotids only if their communications with the aorta are interrupted. But as long as a heart-lung machine is used (even filled up with special saline instead of blood) time ceases to be the most important factor.*

3. Wouldn't it be better to start perfusion immediately, rather than cool the body in an ice and water bath first? *Yes in case of open circuit perfusion via the carotids with interruption of communications. Yes in case a heart-lung machine is used (closed circuit). No in case*

of open circuit via the femorals. Ask a biophysicist to compute the time necessary for heat transfer.

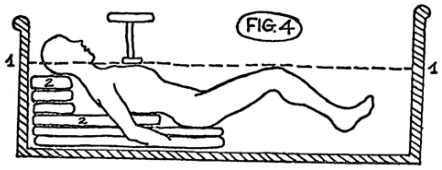

Fig. 4 – (1) casket (2) flat supports to keep the body in proper position

4. Fig. 4 shows a special container in which the patient is to be placed with the third method. How is it possible to operate the Iron Heart with the patient in the type of container shown? *It is possible if the container is large enough. Anyway I no longer advise perfusion without a heart-lung machine. This machine eliminates the necessity of precooling.*

5. Wouldn't you need a container shaped to the contours of the Iron Heart? *It is not necessary [but] I do not have an objection.*

6. Why is it necessary to inject the heparin solution at the rate of ¼ liter per minute? *To avoid uneven distribution.*

7. What should be used to inject the heparin solution? *A phleboclysis apparatus. Every nurse knows how.*

8. Fig. 6 shows the perfusion apparatus. We would appreciate a more detailed examination of this perfusion procedure. The existing diagram and explanation is very difficult to follow. *The understanding is subordinated to a knowledge of heart-lung machines. See my answer to the criticism of Dr. Gouras (letter to Ettinger—Nelson has copies). Recently I greatly simplified the perfusion apparatus.*

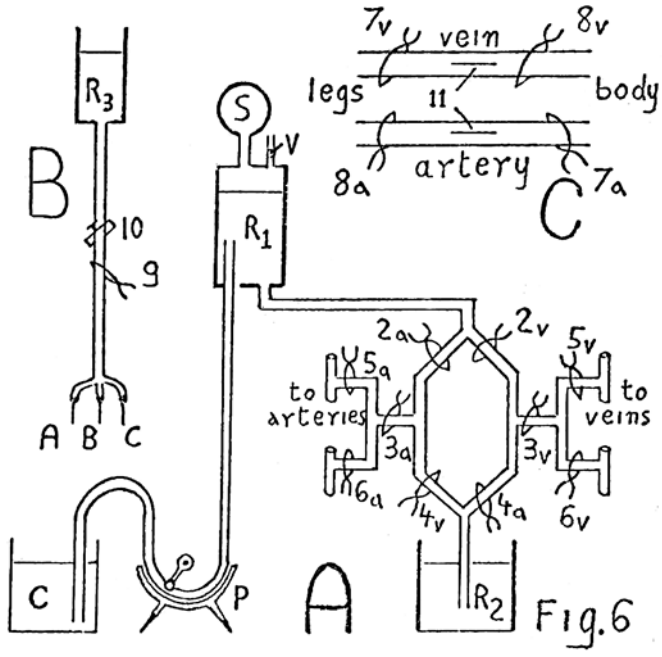

Fig. 6 – Apparatus for perfusion.

Section A: C is the container (5 gallons) for the solution to be injected; P, the pump; 1 is a clamp for adjustment of pressure; R_1 is an air-tight reservoir (1 gallon); S is the sphygmomanometer for measurement of pressure; v can be open to allow air to escape when the level of liquid inside R_1 decreases; R_2 is the reservoir (5 gal.) in which the liquid exhausts after passing through the vessels. The other numbers are forceps used to open or close the rubber tubes. All connections between tubes must stand a pressure of 200mm Hg. (Close all outlets, one by one, with the fingers and increase the pressure to 200mm Hg.) All tubes are .5" diameter, but the terminal branches for connection to arteries and veins are .25".

C and R_2 are placed on the floor. R_1 must be placed only slightly higher than the body in order to read on S a pressure near the one existing inside the vessels.

Section B: is a simple apparatus for perfusion (2 gals) with 3 needles, A, B, C, instead of only one. 9 is a forceps, 10 is a clamp for regulation of pressure.

Section C: shows how the forceps are disposed around the incisions (11) in arteries and veins.

9. Why is it necessary to have a system of forceps attached to the veins and arteries? *To avoid air bubbles. The method described is a proposed simplification of methods used in surgery.*

10. Aren't there difficulties which you haven't outlined in attempting to carry out this procedure? *I could not describe surgical techniques.*

11. Doesn't it require surgical capability to set up and carry out this rather complex procedure?

Yes. Absolutely. Would you like to have your appendix taken out by a mortician who does not have surgical knowledge?

12. Isn't valuable time lost in attempting to set up and carry out this rather complex procedure? *The scientific freezing of a person is a complex problem. All sources of damage must be minimized. It is not possible to write "How you can freeze yourself at home in your spare time."*

13. Why not perfuse the lungs by pouring solution down the throat? *Are you serious? What about uneven distribution due to trapped air? Have a biophysicist compute the pressure necessary to achieve sufficient diffusion. It is sufficient to blow the lungs.*

14. What is the purpose of the dextran in solution B? *To decrease diffusion from cell membranes.*

15. What is purpose of the ethyl alcohol in solution C? *To decrease the freezing point.*

Answers to these questions would be [are] greatly appreciated.

I strongly urge you to attend the LES conference in Washington, D.C. on the 28th of October. Most of the people involved in the movement have stated they will attend. There will be many important things to discuss. *I am not interested in discussion but in finding funding for my research.*

Sincerely, Cryonics Society of New York

Saul Kent, Corresponding Secretary

.....

Brunol replied a few days later:

.....

Dear Mr. Saul Kent and Curtis Henderson,

(not for public release)

I knew that the writing of The Method for Freezing Humans would jeopardize my career. I wrote it only because Prof. Ettinger assured me he could easily raise $100,000 for my research. He did not raise a single dollar for me. In my opinion he never tried.

To facilitate my readmission to the U.S.C. I had to go and explain my involvement with Bob Nelson to dozens of scientists. Somebody even believed I was the author of the irresponsible method described in *True* magazine –Oct. by Ettinger. The 5000$ donation of Mr. Lane was subordinated to my affiliation to a University. I do not want to jeopardize my position again. In 1967 I even did not make 3000$. Who did more than I did? Not certainly Prof. Ettinger. He made money out of his book.

My ideas had progressed a big deal. The method should be therefore rewritten. I certainly will not do it unless I can prove that my new method produces less damage than Suda's one. This could be proven within 2 months if financing ($3000) could be available.

My method has been written for doctors having good knowledge of surgery and heart lung machines. Would you have your appendix taken out by your mortician? The scientific freezing of a human is far more difficult than an appendectomy.

Ettinger and Nelson complain my method is too complicated. Were they expecting me to write "How Your Mother in Law Can Scientifically Freeze Your Body"? I am willing to discuss my methods in front of a panel composed of an open-heart surgeon, a biophysicist, a cryobiologist, a biochemist, a pharmacologist. Each of them can judge the true bases of my methods which are related to his field of specialization. I am not willing to answer to the criticism of doctors or incompetent scientists.

I am tired of people taking advantage of me. I am contemplating telling all the true to some magazine about facts and people involved in suspended animation. Fortunately I was smart enough to seek witnesses and [the] recording [of] telephone conversations.

Ask Ettinger to tell you who directed the freezing of Dr. Bedford and in what terrible way it was done and, after, read his statements to *True* magazine. The perfusion apparatus was not ready. So I refuse to take the responsibility. This is the reason I refused to meet the press.

About Mrs. Sweet: I assisted to the terrible mess made by two morticians. They were intelligent boys with good will and good surgical skill but no surgical knowledge. I do not believe in lying for political reasons. The true has good chances of coming out sooner or later.

Bob Nelson has now a profit corporation for freezing humans [Cryonic Interment,

Inc.—RMP]. I gave them advice hoping it could be a serious thing. He knows very well the people will not be frozen and stored in the proper way. I think I have a moral obligation to tell the true.

If one does not want to use a scientific method he should inject a sufficient quantity of heparin and simply freeze the body without making a mess of the vascular system by using improper methods. Mrs. Sweet has been filled up with air bubbles because of the use of an embalmer pump, which I always advise Nelson do not use, and because of the incompetence of the morticians. Air bubbles impede absorption of DMSO and will greatly jeopardize future revival.

I still have respect for you. This is the only reason I'll answer your questions. [See preceding letter from Saul Kent for answers Brunol gives here to questions in Saul's letter. Actually, there are two sets of answers, one given here and briefer, in-line answers following the questions in the letter. I have mostly used the lengthier answers given here but also used the in-line material for clarification. Interested readers should, of course, check the original documents under "DB" in "Sources" as noted earlier – RMP.]

I will not go to the LES conference. I do not have the money and I am not interested in discussion but in finding financing for my research. When I left the Bedford Foundation I begged for help. To borrow at least some money to give back with interest when donations would come. You even did not answer my letter.

I would consider a discussion of mine or other methods with competent scientists if you are willing to organize it. But my first asset is my research.

Mr. [Harlan] Lane sent the check to the U.S.C. for my project of supercooling [vitrification] approved by Dr. [Armand] Karow. I hope to start within one week.

Dr. Bedford and Mrs. Sweet have very remote chances of revival. It is illogical to believe their memory will be repristinated. Memory can be compared to a tape. Erase the tape and spray it with acid and after, ask future generations to find out what it was [that was] recorded on [it]. We must not confuse logical probability with impossibility.

As long as a single cell of a human revives, it is logical to believe future generations will be able to reconstruct a copy of the human who died. But it will be only a copy having even a different personality because of environmental differences and without any memory of the past. I do not care for having a copy of mine projected in the future to show how rough was the brain of that scientist (me) of the past. They will reconstruct a brother of myself but it will not be me. I do not care for this. I know I am losing [wasting] my time. People believe what they want to believe and not what is logical.

It is criminal to keep freezing people for personal reasons without proper facilities. Everybody who desires to be frozen should donate a yearly sum (according to age) to a non-profit organization instead of paying for insurance. According to my computation and my methods to provide storage and all other facilities for 100 people it would cost $33,000 the first year and $20,000 the following years. This would cover all costs. (A heart-lung machine can be built for less than $5000). The cost for each suspended animation can be reduced to 3000$ and the cost of simple perpetual cosmetic preservation to $1500. I am not crazy! This naturally implies the use of multiple places [for] refrigerators. I carefully examined the problem.

All the material I am sending you is confidential. Its public release could hurt my plans for research in this field. None of the material I am sending is for public release. L.A. Oct. 18, 1967.

Yours,
Dante Brunol

.....

Further comments. In the above I've corrected spelling and punctuation errors and done a few other minor edits but otherwise tried to keep the text as written. As for Brunol, he is clearly disappointed that research funding he hoped would be raised was not forthcoming. Meanwhile the two cryonics cases (Bedford, Sweet) he participated in did not go as he had hoped and there he also vents disappointment and frustration, along with pessimism that either patient's memories can be "repristinated" someday, which would be necessary for successful resuscitation. These two cases would be his last, as far as I can determine. (For the record: Bedford is still being maintained by Alcor and has stayed frozen since his original freezing; Sweet was sadly among the patients lost at Chatsworth when Nelson's operation failed.) The article that would have just appeared in *True* magazine was also upsetting with Ettinger's do-it-yourself perfusion method. Brunol notes he will not be attending the forthcoming conference of the Life Extension Society (the cryonics-promotional organization founded by Evan Cooper based in Washington, D.C.) In fact

the conference, which had been scheduled for Oct. 28, was called off on very short notice, ironically partly due to friction within the small cryonics community over the freezing of Ms. Sweet.[13]

Overall, however, Brunol at this point is still optimistic, at least assuming his own methods of cryoprotection are followed. On one hand he notes that he has "greatly simplified" his procedure, on the other, that there is nonetheless some irreducible complexity that "your mother-in-law" probably could not manage (or yourself!). Brunol is rashly optimistic that suspended animation might be perfected "in only a few years" in contrast with the "more than twenty years" estimated by the "most pessimistic." He is also boldly optimistic about the cost involved, to the point of suggesting that spending $20,000 (about $140,000 in 2015) is "wasting your money" when $5,000 (about $35,000 in 2015)[14] should cover everything, including resuscitation. (It is interesting, in this regard, that Alcor today charges $200,000 and the Cryonics Institute at their lowest charges $28,000 for whole-body cryopreservation which was the only variety offered in the 1960s.) On the other hand, he seems grimly pessimistic about "repristination" where the tissues did not receive cryoprotection. (Nanotechnology, not much considered in his day, has made some of us since then more optimistic, spurred by Drexler's 1986 book, *Engines of Creation*.[15])

"Dante Brunol... is mainly remembered in cryonics for devising the first protocol for cryopreserving a human being with the hope of eventual resuscitation."

Barely ten years after Brunol was penning his letter and other material, he was dead and, as far as I know, there was no thought of cryopreserving him. He had returned to his native Italy, and it appears, turned his back on his cryonics work in the United States; evidently he had hardened his position into "research now, freeze later," as suggested in a letter published early in 1968.[16] ■

SOURCES:

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CR. *Cryonics Reports* Jan. 1967, 1; Feb. 1967, 1-3; Sep. 1967, Cover, 1. (Freezing of Bedford and Sweet, role of Dante Brunol).

DB (original documents on which this article is based). https://mega.co.nz/#!AJlHBTzB!gIxYIJ5Q_YZ-VUCvb-U81iNk76OUG_AMNQ-A9ICFL6A, accessed 30 Mar. 2015; courtesy Alcor archives.

DB2. Dante Brunol, letter, *Freeze-Wait-Reanimate*, Jan. 1968, 3-4.

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Is Suspended Animation A Crazy Dream?

By Dante Brunol, about October 1967

Many people asked me this question orally or by mail. This is my answer.

Through research, little by little, cryobiologists have learned how to freeze and revive, even after years of storage, living organisms composed of only one or a few cells. If suspended animation is possible for single cells, it must also be possible for multicellular organisms (as humans are) *as long as the proper method is used*. There is no theoretical impossibility! That is why most cryobiologists agree that suspended animation will become a reality. But they disagree about the time when, *methods of revival*, suitable not only for animals but also humans, are found. According to the most pessimistic it will take more than twenty years to achieve suspended animation. In my opinion a few years will be sufficient to find a method of revival. History teaches that pessimistic scientists have always been wrong. Modern technology achieved far more than forecast by the most optimistic scientists of the past. Jenner, Pasteur, Einstein, Marconi and the most part of famous scientists had a very hard time before their theories were accepted by the conservative nearsighted scientific community.

Lord Rutherford, who discovered the transmutation of elements, stated it was *foolish* to dream about the possibility of exploiting atomic energy. A few years were sufficient to prove that his unscientific statement was *foolish*. Scientists of the past stated airplanes would never fly. Fortunately, the Wright Brothers were not scientists. Professor Oberth, a *real* scientist, lost his position at the University 40 years ago for having publicized his projects for space travel. Scientists of the past stated it was theoretically impossible to transform lead into gold. Now we know that it is possible, but far too expensive.

Famous scientists such as Dr. Jean Rostand, Dr. Lillehei (one of America's leading heart surgeons), Dr. Raymond J. Hock of the University of California and others, believe that suspended animation will become a reality. Even the American government believes in the possibility of suspended animation. Before the war in Vietnam the government financed research in suspended animation as a means for permitting long distance space travel. Personally the more I study this problem of suspended animation the more I become optimistic about its realization.

The history of the past teaches that if a scientist does not want to make a fool of himself, he must be very careful in deciding *now* what *future generations* will be able to do. We can presume, not decide, about the future.

Naturally, it is logical to presume that only a God could revive a human whose body has been destroyed by burial or cremation. But nobody with a scientific mind can decide *now* whether *future generations* will be able to revive humans frozen with my method. Only research can give an answer, since my method is a theoretical improvement of Suda's method.

I try to be open minded but often I accepted without sufficient analysis the opinion of the pessimistic scientists. For example, because I was studying supercooling I passively accepted the general opinion that slow freezing of mammals would produce irreparable damage. I changed my mind after careful analysis of Professor Suda's results. He revived a cat brain after six months of storage in a frozen state.

Prof. Jankovski, a Russian, using a method of revival similar to mine, succeeded in reviving without any loss of memory a dog whose brain had been left at *normal temperature* without oxygen for 30 minutes (no blood circulation). Using other methods of revival complete loss of memory resulted even after a few minutes of arrested circulation. This is because, according to Jankovski, the damage takes place during revival and is due to abnormal chemicals produced by the anoxia. These chemicals, which become toxic when blood circulation is reestablished, must be removed by specific methods of detoxification. This gave me confidence my method of revival will be sufficient to detoxify the animal from the chemicals used for supercooling or freezing.

Jankovski's experiment proves wrong the assumption generally accepted that 5 minutes is the maximum time the brain can stay without oxygen at body temperature. Therefore the external cardiac massage must not necessarily start 5 minutes after death as stated in my method for freezing humans.

Scientists were so sure of their assumptions that they did not believe in Suda's theory. Suda revived a cat brain after 6 months of storage in a frozen state at -20°C. Suda claimed the brain to be as resistant as other tissues. Suda proved that freezing does not cause, as predicted by many scientists, a complete disruption of the cellular structure. This damage was produced by the improper methods used by the scientists of the past. Scientists have a tendency to believe impossible what they did not succeed in doing.

EXPERIMENTS ON ANIMALS

Fish survived complete freezing of the water in their aquarium. With warm

blooded animals special techniques had to be developed. Trained mice survived a partial freezing (60% of the body water). They did not suffer any brain damage even though for some weeks they did not show any sexual appetite. Even small monkeys survived partial freezing. These methods are inexpensive, being based on simple external cooling of the skin. Naturally for this reason they could not be applied to large animals, since the volume of the body is too large in comparison with the skin surface. An expensive heart-lung machine was supposed to be used to cool the blood outside the body. This is the reason the experiments stopped. Finally Prof. Suda of Japan with a small heart lung machine froze a cat brain and revived it after 6 months of storage at 20°C below the freezing point. The electroencephalogram, which is one of the best indices of cerebral damage, was almost normal. This is good evidence that the brain, the most delicate organ, can survive freezing. The revival was not absolute. But the results of Dr. Suda are amazing considering that he used a very rough pioneering method. The damage had been probably caused by the formation of small ice crystals inside the cells. There are no reasons why Suda's experiment could not be repeated on the body of a cat as long as a more expensive heart-lung machine is available.

I greatly perfected Suda's method and at least theoretically my procedure minimizes all possible sources of damage (see my "Method for Freezing Humans"). But only experiments on animals can prove whether my methods are safe. At present I do not have the $3,000 necessary to initiate experiments on freezing. With the help of Dr. Armand Karow, Prof. of Pharmacology, Toxicology and Cryobiology at the University of Mississippi; and the financing from Mr. Harlan Lane of Spring, Texas, I am now doing research on supercooling of dogs. Mr. Lane and Dr. Karow are the only people who did not express sympathy for my research only with nice letters.

EXPERIMENTS ON HUMANS

Humans have been cooled to 10°C. At this temperature, heart and lungs were not working and the blood circulation was stopped completely for 45 minutes, the time necessary for open heart surgery. These humans revived after more than 45 minutes of clinical death. Children have been cooled to 5°C and they revived after more than one hour of clinical death.

WHAT'S THE PURPOSE OF SUSPENDED ANIMATION ?

1. Most gerontologists agree that the life-span of humans will be increased to 200 years in the near future. Organs damaged by senility or disease will be substituted. Most gerontologists agree rejuvenation of old people will be possible.
2. Humans in suspended animation will be revived when
   a) a method for revival of humans is available,
   b) a cure for their disease is found.

WHY WILL PEOPLE ACCEPT SUSPENDED ANIMATION?

1. Many hate to have their bodies destroyed by putrefaction. They would like their body to be preserved and seen by their descendants.
2. Many hope that future generations will be able to revive their body, even if some damage occurred during freezing.
3. Many, when near to death, need to believe that there is still a chance of survival by means of suspended animation.
4. The most important religions are not against suspended animation. God is not in a hurry to judge us.

WHEN WILL SUSPENDED ANIMATION BE ACCEPTED BY THE MAJORITY OF PEOPLE?

1. When the facilities are easily available.
2. When some amazing experiment will impress the people.
3. When intelligent advertisement takes advantage of the human compulsions.
4. When a sufficient number of people will be frozen. The others will follow, as it always happens with new fashions or new customs.

Are there chances of survival for people who choose to be frozen?

If the body is destroyed by burial there are no chances of survival.

If you are frozen with an improper method such as that described in *True* magazine, October, 1967, you have very few chances. I cannot exclude a revival but it is improbable since the DMSO cannot reach the cells in sufficient quantity and a disruption of cells should be inevitable.

If you are frozen with the last of my methods (with a heart lung machine) in *theory* you have good chances. Anyway, only experiments on animals can tell whether my method is safe and how to improve it.

When I find financing, a few experiments will be sufficient to improve the method and make the chances of survival much better.

What to do if you want to be frozen.

1. Do not wait for the last week. Decide now. Dr. Bedford, the first man who has been frozen, has few chances of revival. I only had a few days to prepare the equipment for the freezing. Therefore, in my opinion, the method used for Dr. Bedford was very far from being satisfactory.

   Mrs. Sweet also has few chances. She was frozen three days after death. Too late, in my opinion, even considering the new view deriving from Jankowski's experiment.
2. If you want I can perform the freezing. But you should pass your last days here in Los Angeles, where you could have proper care and the equipment could be kept ready. If you want I could perform the freezing anywhere but in this case your chances would not be so good since I could not bring all the equipment with me.
3. Some organizations asked even $20,000 for freezing and perpetual preservation. Do not waste your money. They do not have any know-how. $5,000 are more than sufficient for covering even the expenses of revival.
4. If your doctor is willing to perform the freezing I will be happy to give him all possible information.
5. I repeat: make all arrangements, right now. ■

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Oregon Cryonics:
An Introduction and Interview with Jordan Sparks

By Carrie Wong

There are two main cryonics organizations in the United States: Alcor Life Extension Foundation and the Cryonics Institute (CI). Both were founded in the 1970s as non-profit organizations. Over the years, there have been a number of small-scale attempts at forming cryonics-providing organizations, but none have resulted in the wide-scale adoption that Alcor and CI have established over the years. Having said that, any new venture within the field of cryonics is at least interesting. The majority of the cryonicists I have encountered have a fairly progressive attitude toward new start-ups and ventures in general, but cryonics is another matter. Cryonics veterans are cautious due to the disasters that have happened in our history although I am optimistic about our progress.

"Oregon Cryonics is licensed as a Non-transplant Anatomical Research Recovery Organization (NARRO)..."

Oregon Cryonics is a non-profit health care facility founded by Jordan Sparks in 2008. Specifically, Oregon Cryonics is licensed as a Non-transplant Anatomical Research Recovery Organization (NARRO) which is authorized by the State of Oregon to accept bodies donated under the Uniform Anatomical Gift Act (UAGA). Jordan Sparks signed up for cryonics over 20 years ago while he was still in dentistry school. He has been an active member of the cryonics community and was on the board of CI as a director for six years. Jordan's motivation eventually went even further than being a director of CI and he started collecting and fabricating his own cryonics equipment for a number of years before he started Oregon Cryonics. Although he had been a practicing dentist for a decade, he got his big financial break in the software company he created: Open Dental. Open Dental has doubled in size since 2003 and in 2014 it brought in an annual revenue of over $5 million with over 50 employees. His dental software company's success has allowed him to fully dedicate his time and resources to Oregon Cryonics.

The current facility for Oregon Cryonics which occupies 5,000 out of 7,000 square feet of the total two-story complex. On the left is the white box truck which Jordan plans on outfitting as a customized transport vehicle

I visited Jordan at Oregon Cryonics late 2014 and I was struck by his energy and conviction to further understand, improve and take control of the process of cryonics. Like most of us, Jordan was struggling with the shortcomings of transport for timely cryopreservation. As a Canadian cryonicist living in British Columbia with the anti-cryonics law still on the books, the reality of our legal situation keeps us constantly thinking about transportation. It would be ideal if there was a permanent cryonics facility in each city with its own full-time and professional staff on standby in case of emergency, but we are not there yet. Jordan wants to make this possible in his lifetime so he created his own company. His goal is to establish several permanent physical branches in major cities in the USA and attract medical doctors to specialize in cryonics procedures. This is a very costly endeavor, so to make it possible, Jordan has presented a unique financial plan.

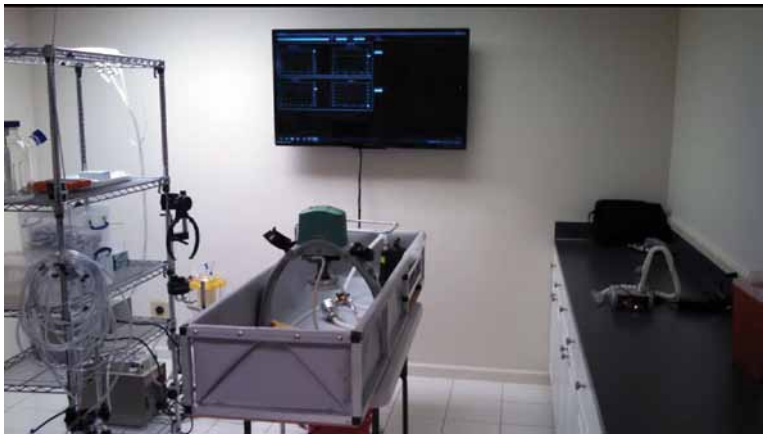
Oregon Cryonics lab space that Advanced Neural Biosciences used to use. This will also serve as a temporary operating room while Jordan continues to work on building his new cryonics facilities.

Currently, Oregon Cryonics is being funded directly from Jordan with after-tax donations. Because of his personal tax burden of 50%, it costs him twice as much to pay an employee at Oregon Cryonics as it does for an employee of Open Dental. In a nutshell, all his facilities will start as Open Dental offices and he will have employees from Open Dental working as software support staff and also looking after cryonics equipment. This way, the facility wages and expenses will be paid for with before-tax dollars rather than after-tax. Jordan is assured this strategy is legally sound until he actually starts using the space for cryonics. At that later stage, the space would have to be subleased to Oregon Cryonics with the intention of finding wealthy local patrons to help cover those costs. The main benefit for his local patrons would be having closer access and more control over their cryopreservation process. The financial situation of Oregon Cryonics clearly hinges on Jordan's business continuing to be as successful as it is and in the interview section, I asked Jordan to answer some concerns one might have. In terms of the cost of cryopreservation, Oregon Cryonics is more affordable than both CI and Alcor. There is no initial or annual membership fee and the procedures are as follows:

"The financial situation of Oregon Cryonics clearly hinges on Jordan's business continuing to be as successful as it is..."

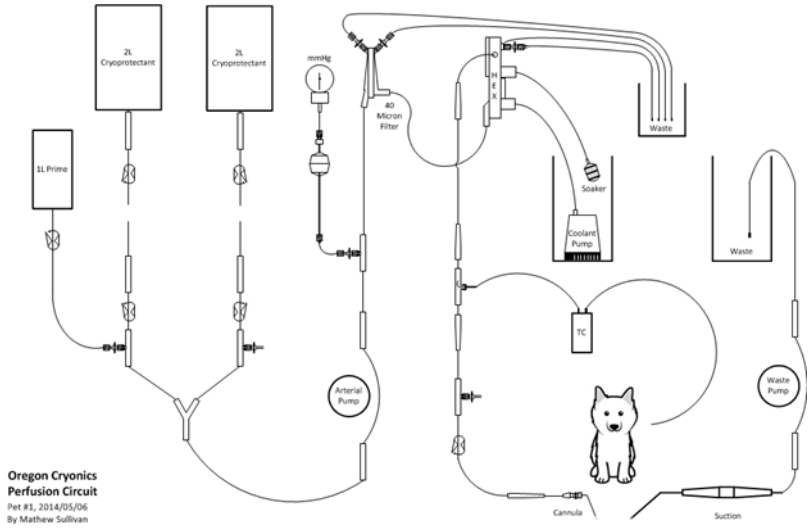
- $25,000 neuro-preservation (the brain enclosed in the head)
- $14,000 brain-only preservation
- $ 2,500 brain chemical preservation (low cost option)

In the following interview section, I ask Jordan to explain how the brain-only preservation is so much cheaper than the traditional neuro-preservation. It was also intriguing to see the chemo-preservation option which I could imagine could be used for a mind-uploading scenario. Oregon Cryonics currently offers a slightly modified version of the CI protocol of stepped VM-1 open circuit perfusion (5 steps instead of 3) but is working towards offering the Alcor protocol of ramped M22 closed-circuit perfusion. Jordan hopes to offer both procedures depending on the client's level of funding.



An ice-bath and thumper at Oregon Cryonics.

The operating room under construction.



Perfusion Circuit on their first pet case. More information can be found at www.oregoncryo.com/caseReportPet1.html

There are currently four people on staff at Oregon Cryonics. Luke Parrish is the Office Administrator. He answers the phone, places orders, handles bookkeeping, etc. He also works one or two days a week at Open Dental Software. It is an important part of Jordan's strategy to have employees be able to go back and forth between his two companies until Oregon Cryonics becomes more established. Another advantage of sharing facilities is that if a cryonics case is going down, he can pull Open Dental staff for assistance. Mathew Sullivan is the Facility Manager and has had a great deal of experience working within the field of cryonics. Mathew worked at Alcor for 9 years and then at Suspended Animation for 6 years. Jordan relies on him to help develop equipment and procedures for Oregon Cryonics. Mathew also works at Open Dental when he's not putting together or testing equipment at Oregon Cryonics. Young cryonicist Matthew Deutsch also works at Oregon Cryonics as the groundskeeper. He does general maintenance and handyman-type work. Jordan is a very hands-on entrepreneur so he has spent a great deal of time figuring out the optimal ways of fabricating and testing all his equipment.

"His goal is to establish several permanent physical branches in major cities in the USA and attract medical doctors to specialize in cryonics procedures."

In terms of the medical and surgical team, Jordan has worked with Chana Phaedra and Aschwin de Wolf at Advanced Neural Biosciences on an animal case. This team successfully cryo-preserved Matthew Deutsch's dog Cupcake, using stepped open-circuit perfusion with M22. Temperature, line pressure and arterial flow rate was monitored during this procedure. They have a detailed account of the procedure on their website, with perfusion schematic and timeline. As a dental surgeon, Jordan hopes to gain more surgical training and experience to handle cases himself.

Overall, Oregon Cryonics is a legitimate cryonics organization with potential. I have thought critically about Oregon Cryonics and sent some interview questions to Jordan to help clarify some of the concerns a cryonicist might have. I am an Alcor member and I will probably continue to be an Alcor member. Oregon Cryonics has a ways to go before it feels like one of the established options. However, I think there are clear advantages to having a local facility and more options. Perhaps I am naïve, but as a community, I don't think we would ever allow something like the Chatsworth Disaster to happen again. We have advanced past that. The major cryonics organizations recognize the bad press from a disaster like that would harm cryonics as a whole. I believe this field is too small for major rivalries though they obviously exist. Every couple of years, cryonicists have come together in solidarity to raise the money to make a charity case. Cryonics is affordable for the average person, but the reality is that it isn't affordable to everyone. Oregon Cryonics is providing more affordable options for people who would otherwise be out of luck.

As of writing, Oregon Cryonics has currently two patients: a cryopreserved dog brain and a chemically preserved human brain. ■

Interview with Jordan Sparks.....

1. At the present time, Oregon Cryonics is sustainable as long as Open Dental is profitable. In a previous presentation, you mentioned that you put your plans for the development of Oregon Cryonics on hold because of the 2008 recession. Would you consider charging membership dues in the future as a failsafe against Open Dental becoming less profitable? Or are you more focused on finding wealthy clients to work with?

First of all, I'm really impressed by the willingness of Alcor to even have this discussion. I feel a bit embarrassed to be taking up space in their magazine.

Now, about your question, storage should be paid for by a Patient Care Fund/Trust; we all know this. One reason to charge dues might be for local response capability, but dues cannot cover those costs without economies of scale. For example, if we have 20 members in Salem, and we charge them each $50/month, that would generate $12,000 per year, far short of what's needed to sustain any local response services in Salem. I am a Salem resident who happens to be willing to pay the full cost of local response because it's a service I want. I didn't suddenly decide to pay this, but instead worked up to this level over the course of a decade. Others who live in Salem may take advantage of those same services even though they really can't help pay for them. It's the same for any city, including for example, Vancouver, BC. The only way you will get meaningful services in Vancouver is if someone wealthy is motivated to pay for them. Everyone else who lives in Vancouver will tag along for the ride. There just isn't any other way to pay for it. We don't plan to charge dues for local response capabilities until we get a fair number of people in a given city, at least dozens. Once we get thousands of members in a city, dues can be phased out and ordinary fee-for-service can take over.

Another reason to charge dues might be to pay for the costs of managing memberships. We're not dealing with those costs yet, and we hope to largely avoid them. But I can see us introducing dues at some point to cover this expense.

2. What is the timeline for the development of the new buildings on the Marietta property including the Patient Care Bay, the Laboratory and the call centre for Open Dental? Do you plan to have an underground patient storage facility?

The underground patient care vault is in the permitting phase. It will be easy to build because it's so small and needs no plumbing. The 4000 sf building is about a year from starting because we're waiting for some infrastructure such as sewer and water. The big call center needs even more infrastructure, so it's a few years further out.

3. What are some technical or social innovations that can distinguish your organization from the major cryonics organizations?

Every company is different from others in many thousands of little ways. We're not necessarily trying to distinguish ourselves; we're just trying to do a good job and build trust. So it's lots of little things. The things I've noticed are probably the same things others have noticed. Because of my background, we are very strong in computer software and in surgery. Because of Mathew Sullivan, we have a good supply chain, strong vendor relationships, and an organized workspace.

"We seem to be the only cryonics organization interested in providing chemical preservation."

We seem to be the only cryonics organization interested in providing chemical preservation. That's very important for us, because it helps a lot with the ethical dilemma of having to deny services to someone just because they don't have funding. We don't have to deny services, but can instead downgrade them to something they can afford. One more area where we would like to be innovative is in managing memberships. I think we can get better results if we automate it so that it's more of a self-serve web app. You would just get online to keep your info up-to-date, including emergency contacts, proof of funding, medical conditions, and so on.

4. Why do you offer two different kinds of low-temperature neuropreservation?

You charge $25,000 for the standard neuro, but only $14,000 for brain-only. Why is there such a large price discrepancy between the two? Is the procedure for brain-only cryopreservation less complex and resource intensive? When I asked you about this, you mostly talked about storage costs being much lower for brain-only.

The funding levels listed are primarily intended to cover liquid nitrogen and storage costs, so the difference is due to the amount of tissue being stored. I think people forget that the brain is less than 1/4 the size of an entire head. Let's say we spend $10,000 in both cases on the surgery and cooldown. That leaves $15,000 for the Patient Care Fund (PCF) for a standard neuro, and $4000 for brain-only. That's approximately 1/4, so that's an appropriate ratio per pound of tissue. The mass of tissue is what increases the cost of liquid nitrogen and the capital investments in dewars and building space.

The brain-only cryopreservation is not something that anyone should choose if they can afford better, and it's listed on a "Low Cost" page on our website, not on our standard services page. Right now, it takes a long time to remove the brain, and that causes additional damage, so we discourage it.

To make the pricing even more complicated, the cost of VM-1 is very low. Once we start offering M22, you will see our M22 neuropreservation service priced even higher than the current options. We'll end up with quite a range of services.

5. What are your plans for standby? Alcor is planning on deploying field cryoprotection, do you have plans to do so?

Our plans for standby are focused right now on Oregon and the surrounding region, including the Bay Area. We are pushing hard for fixed facilities and vehicles that could cover that area and allow high quality cryopreservation without significant waiting or transport times. Patients that are more remote are always challenging. Suspended Animation seems to be handling most of those at the moment.

As for field cryoprotection, Alcor has not deployed it in the US. There are many technical, personnel, financial, and political hurdles standing in the way. Those same obstacles stand in our way. There are simply no easy answers for the remote cases. Trying to take limited equipment on a commercial airline and then transporting the patient back as cargo is just not good treatment no matter what protocol you use. The real solution is to move equipment into place ahead of time somehow. I would love to see a few small branch facilities across the US where full cryopreservation could be performed.

6. Do you plan on having any agreements with any other cryonics providers or Suspended Animation? If not, why?

Yes, we would like to someday have an agreement with Suspended Animation. I was a bit hasty at the Venturist Laughlin Convention (Nov. 2014) when Ben asked me this question and I said "no" regarding the other organizations. I think the more correct answer is that we are open to any agreements, but that I'm just not sure what they might be other than using SA to provide remote standby services.

7. What is the current status of your response team? Would you be working with Chana and Aschwin to do the necessary surgery and perfusion if you were to get a patient at this time? What is your plan for recruiting MDs, would they be in house or contractors?

"The main criterion for any employee or contractor should be how deeply they are involved in cryonics on a daily basis."

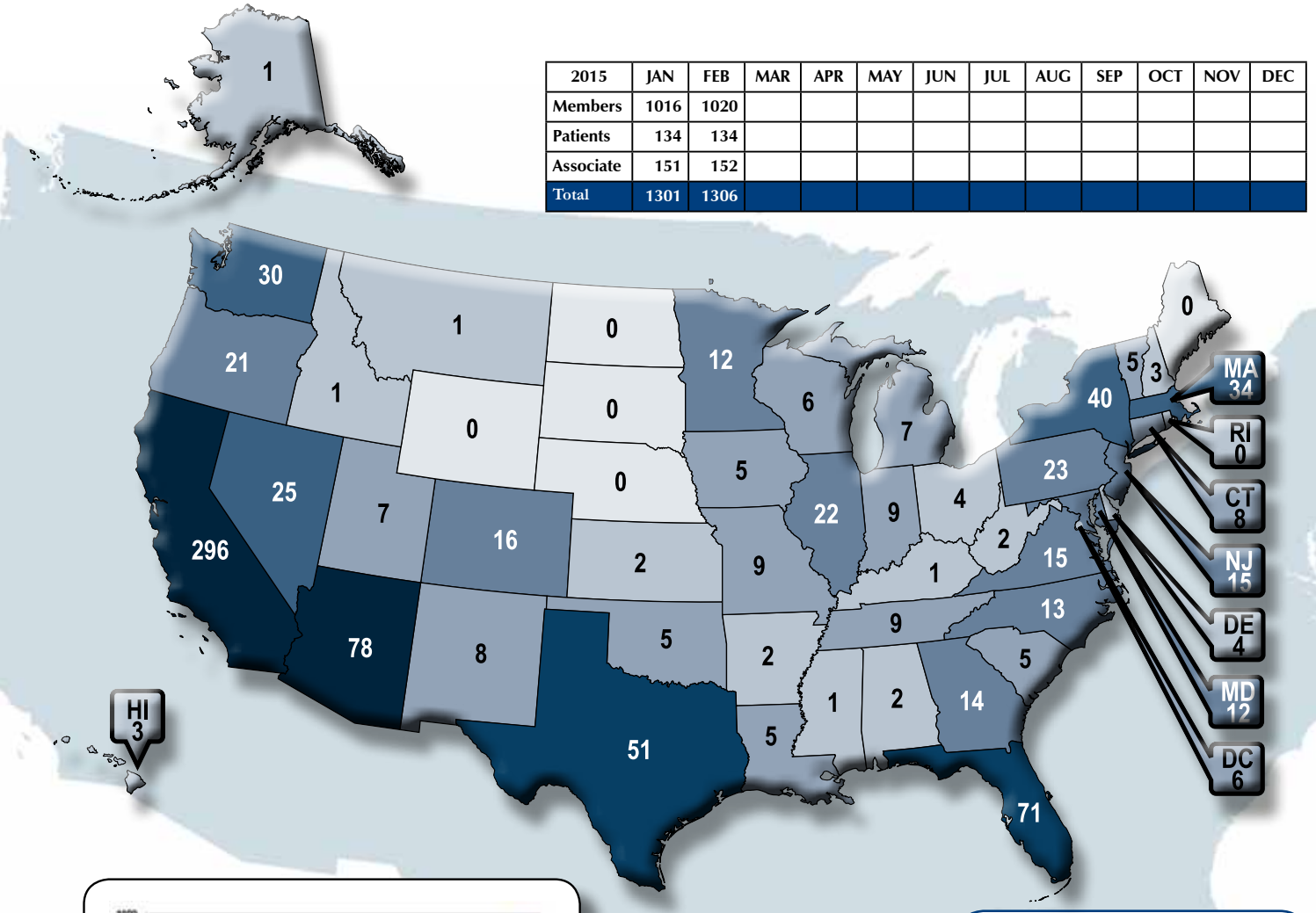
I am the core of the response team. I will be performing the surgeries and managing the perfusions. We may hire Chana and Aschwin as independent contractors for cases if they are available. The main criterion for any employee or contractor should be how deeply they are involved in cryonics on a daily basis. The passion and commitment is what we're looking for in recruiting. We're not very interested in hiring external contractors who are not cryonicists because they frequently just go through the motions without caring and without understanding why.

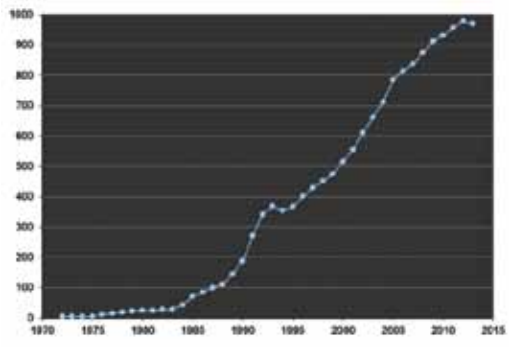
8. What is your long-term vision for Oregon Cryonics?

I have a lot of long-term visions that range from ridiculously optimistic to completely static flat growth. I'm planning for all of them simultaneously. Because there are so many different ways it could work out, I'm not sure it makes sense to talk about them. I can say that over the next few years, I would like very much to see a hardened patient care vault in place, some sort of mini-bulk LN2 system installed, and the ability to respond quickly and effectively to any regional case. That's a lot to keep us busy. Years from now, in vague terms, I know I have to pass the torch on to others. It will take a long time to put the systems in place that I think will carry the organization into the future. I also know that my chances of survival are very low unless I can train at least a few cryonics clinicians who will take care of me when my time comes. In other words, I know what direction to move in, but I really have no idea how fast we will go, and it depends on a lot of other people. ■

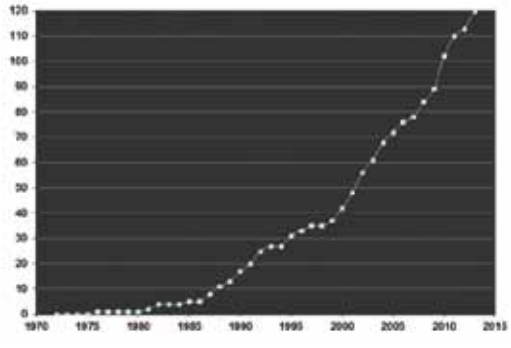
Membership Statistics

2015	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Members	1016	1020										
Patients	134	134										
Associate	151	152										
Total	1301	1306										





Number of Alcor members



Number of Alcor patients

- 0 Members
- 1–4 Members
- 5–9 Members
- 10–24 Members
- 25–49 Members
- 50–74 Members
- 75+ Members

International

Country	Members	Patients
Australia	10	3
Canada	43	2
Germany	5	0
Hong Kong	1	0
Israel	1	1
Italy	3	0
Japan	3	0
Mexico	4	0
Monaco	1	0
Netherlands	2	0
New Zealand	2	0
Norway	1	0
Portugal	4	0
Singapore	1	0
Spain	3	1
Thailand	3	1
United Arab Emirates	1	0
United Kingdom	22	2
TOTAL	**110**	**10**

ARE YOU GETTING Curcumin's BENEFITS?

Curcumin is the health-promoting trace compound derived from the Indian spice **turmeric**. But not all turmeric is alike.

The curcumin found in the vast majority of dietary supplements is derived from turmeric that is **nutritionally inferior**.

Why? Almost all growers harvest turmeric at the point when the turmeric root turns its signature yellow color, but *before* it has fully matured.

The turmeric root requires more time in the ground for highly beneficial phytonutrients called ***curcuminoids*** and ***sesquiterpenoids*** to attain peak concentrations.

Life Extension®'s Super Bio-Curcumin® derives from turmeric that is grown with organic practices, cultivated to maturity, then specially transported and processed to preserve and deliver the root's most complete nutritional profile.

In recent studies comparing the effects of standard curcumin against turmeric extracts comparable to **Super Bio-Curcumin®**, researchers observed:[1,2]

- Nearly twice the support for **immune** health.
- Approximately twice the support for **inflammatory** issues.
- Almost double the **antioxidant** support.

A separate study indicated that an antioxidant-rich curcumin extract[3] provided powerful support for heart health.

Unrivaled Potency and Absorbability with BCM-95®

Curcumin is neither absorbed nor *retained* well in the blood, which is another challenge facing those who wish to maximize its benefits.

The highly popular **Super Bio-Curcumin®** uses **BCM-95®**, a patented, *bioenhanced* preparation of curcumin. It has been shown to reach up to **7 times higher concentration** in the blood than standard curcumin.[4]

The graphs on this page illustrate that one **400 mg** vegetarian capsule per day of **Super Bio-Curcumin®** supplies the equivalent of **2,500 mg** of commercial curcumin supplements.

A bottle containing 60 vegetarian capsules of **Super Bio-Curcumin®** retails for $38. If a member buys four bottles, the price is reduced to only **$26.25** per bottle.

Item # 00407

References

1. *Int J Pharmacol.* 2009;5(6):333-45.
2. *J Food Nutr Res.* 2009;48(3):148-52.
3. *Arch Gerontol Geriatr.* 2002;34:37-46.
4. *Indian J Pharm Sci.* 2008 Jul-Aug;70(4):445-9.
5. Bioavailability study of BCM-95® in rats. Orcas International Inc. 2006.

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, consult your healthcare provider before taking this product.

To order Super Bio-Curcumin®
call 1-800-544-4440
or visit www.LifeExtension.com

How Much Curcumin Are You Absorbing?

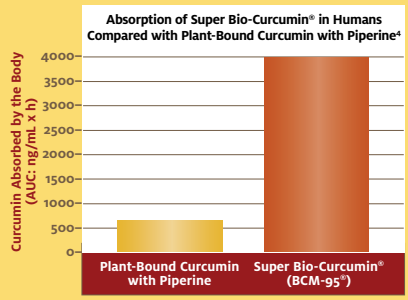


Chart 1. Super Bio-Curcumin® (BCM-95®) showed 6.3 times greater bioavailability (absorption and sustainability over 8 hours) in humans compared with plant-bound curcumin with piperine (as measured by the area under the curve [AUC] in a plot of blood levels against time, that is, the total amount of curcumin absorbed by the body over 8 hours).

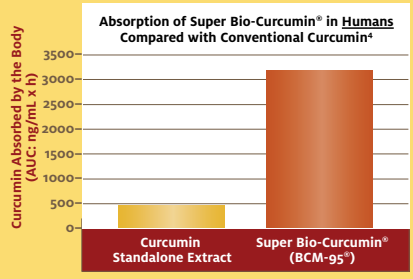


Chart 2. Super Bio-Curcumin® (BCM-95®) showed 6.9 times greater bioavailability (absorption and sustainability over 8 hours) in humans compared with conventional curcumin (as measured by the area under the curve [AUC] in a plot of blood levels against time, that is, the total amount of curcumin absorbed by the body over 8 hours).

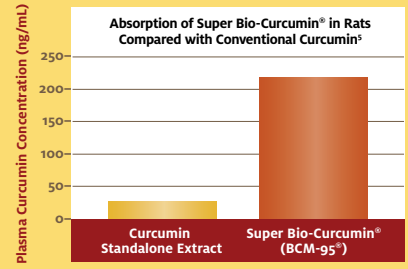


Chart 3. Bioavailability in rats fed with BCM-95® is 7.8 times higher than conventional curcumin.

Growing Functioning Brain Tissue in 3D

Researchers at the RIKEN Center for Developmental Biology in Japan have succeeded in inducing human embryonic stem cells to self-organize into a three-dimensional structure similar to the cerebellum, providing tantalizing clues in the quest to recreate neural structures in the laboratory. One of the primary goals of stem-cell research is to be able to replace damaged body parts with tissues grown from undifferentiated stem cells. For the nervous system, this is a particular challenge because not only do specific neurons need to be generated, but they must also be coaxed into connecting to each other in very specific ways. RIKEN researchers have taken up this challenge, and the work published in *Cell Reports* details how sequentially applying several signaling molecules to three-dimensional cultures of human embryonic stem cells prompts the cells to differentiate into functioning cerebellar neurons that self-organize to form the proper dorsal/ventral patterning and multi-layer structure found in the natural developing cerebellum.

RIKEN
30 Jan. 2015
http://www.riken.jp/en/pr/press/2015/20150130_1/

Human Genome Analyzed in Hours

Investigators at Nationwide Children's Hospital have developed an analysis "pipeline" called "Churchill" that slashes the time it takes to search a person's genome for disease-causing variations from weeks to hours. An article describing the ultra-fast, highly scalable software was published in the Jan. 20 issue of *Genome Biology*. "It took around 13 years and $3 billion to sequence the first human genome," says Peter White, PhD, principal investigator and director of the Biomedical Genomics Core at Nationwide Children's and the study's senior author. "Now, even the smallest research groups can complete genomic sequencing in a matter of days. However, once you've generated all that data, that's the point where many groups hit a wall. After a genome is sequenced, scientists are left with billions of data points to analyze before any truly useful information can be gleaned for use in research and clinical settings." By using novel computational techniques, Churchill allows efficient analysis of a whole genome sample in as little as 90 minutes.

Nationwide Children's Hospital
30 Jan. 2015
http://www.nationwidechildrens.org/news-room-articles/new-software-analyzes-human-genomes-faster-than-other-available-technologies-empowering-population-scale-genomic-analysis?contentid=137732

Synthetic Skin to Test Cancer-Detecting Nanoparticles

Last October, Google announced that it was working on magnetic nanoparticles that would seek out cancer cells in the bloodstream and report back to a smart wristband. Now the search giant is also using synthetic skin to develop the technology. When Google first announced the project they didn't discuss *how* the nanoparticles would relay their findings. But, in a video from *The Atlantic*, employees explain that they'll be using light signals to talk to the wristband through the superficial veins on the underside of the wrist. Of course, shining lights through the skin means factoring in a range of skin types and colors, and so Google's scientists have built fake arms with "the same autofluoresecence and biochemical components of real arms." Thus the fake skin. Andrew Conrad, the head of Google's Life Sciences department, also has a good response to those who might object that it's weird having nanoparticles floating through your body constantly tracking you. "It's way weirder," says Conrad, "to have cancer cells floating through your body that are constantly trying to kill you."

The Verge
30 Jan. 2015
http://www.theverge.com/2015/1/30/7950437/google-skin-cancer-detecting-nanoparticles

MPs Vote in Favor of "Three-Person Embryo" Law

MPs have voted in favor of making Britain the first country in the world to permit IVF babies to be created using biological material from three different people to help prevent serious genetic diseases. In a historic debate, the House of Commons voted by 382 to 128—a majority of 254—to allow mitochondrial donation through a controversial amendment to the 2008 Human Fertilisation and Embryology Act. They approved the regulation in spite of some critics warning it was a step towards creating "three-parent" designer babies. The regulations will now have to be approved in the House of Lords, where they are likely to be passed. Jane Ellison, the Conservative public health minister, told MPs the techniques provided in the regulations offered the only hope for some women who carried the disease to have "healthy, genetically-related children" who would not suffer from the "devastating and often fatal consequences" of mitochondrial disease.

The Guardian
3 Feb. 2015
http://www.theguardian.com/science/2015/feb/03/mps-vote-favour-three-person-embryo-law

❤ SWIVEL ❤

❤❤ *S*ingles *W*eek *I*n *V*egas for *E*xtended *L*ife *All* Ages Welcome ! ❤❤

8 Full Days, Saturday - Saturday, July 25 - August 1, 2015

To request your registration form & detailed flyer, please e-mail us at: SWIVELclub@aol.com

SWIVEL offers a $50 discount for WOMEN.

WHY A DISCOUNT FOR WOMEN ? ❤❤

SWIVEL would like to reach out to those women who share a serious interest in the *science* of extending life - *at any level*.

Our detailed flyer is being sent to relevant organizations. It is our hope that one or two from each will say, *"Yes, that's me."* All women receive a $50 discount. The regular price has been reduced to just $450 --- $400 for women. *A 3 day pass is available at half price.*

WHAT ARE THESE LEVELS OF LIFE EXTENSION ?

1) Squaring the Curve. ❤❤ The standard path is to be born, enjoy a vigorous, healthy period and then start to deteriorate until death. Those seeking to square the curve wish to take advantage of evidence based medical and technological science to *stay* healthy and vigorous right up until the end. It's called "Health Extension." This is the largest level.

2) Extend the Maximum Lifespan. ❤❤ Currently, the maximum human lifespan is about 120 years. Some individuals are going further and looking to evidence based science and technology to extend this period to 150 years or 200 years or...... Their goals vary. This is the next largest level.

3) Indefinite Lifespan. ❤ The smallest group seeks an indefinite lifespan. Some call themselves immortalists. They also look to evidence based science to conquer all diseases of aging. Some have made arrangements to be cryo-preserved should they de-animate (legal death) before mankind conquers death. ❤

PROGRAM ❤❤

Our program will run from 10 am to 6 pm each day and will break for a healthy buffet lunch from 1pm - 2 pm. This is Vegas and we know that you just might be up late.

Unstructured events alone do not actually lead to everyone getting to meet those with whom they might have a shared interest. Therefore, several getting acquainted exercises, introductions and breakout groups have been designed to maximize your chance of meeting the "right" date, friends and colleagues. Evenings are unstructured. We will provide announcements for those who wish to organize specific evening events. "Everyone who wants to.........meet here...... at .....pm."

SWIVEL ❤❤

a device joining two parts so that one, or both, can pivot freely

Come look around.

WHY A FULL 8 DAYS ? ❤❤

SWIVEL's goal is very specific. We want to reach those individuals who identify with maximizing their healthy life-span *at any level* and then help them to meet each other. Community support follows. ❤❤❤❤❤❤❤

SWIVEL wants more than brief introductions. We want *enough time* for you to ask *YOUR* questions in a no pressure environment. We want *YOU* to have *enough time* to actually get to know each other - *enough time* to decide if you wish to spend *more time* getting to know someone. We want to be *effective*.

Healthy lifespan enthusiasts generally want to find a like minded partner.

WHY VEGAS ? ❤❤

Easy to reach. Lodging to fit every budget.

LODGING ❤❤

Our event site, The Orleans, is offering these attractive rates for single or double occupancy until 6-24-15. Resort Fee = $12.99. Taxes = 12%.

Sunday through Thursday. $41
Friday and Saturday. $95
Search "Vegas lodging" for additional sites as low as $29.

❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤❤

To request your Registration Form, along with more detailed information, please e-mail us at: SWIVELclub@aol.com. ❤❤

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. Facility tours are held every Tuesday at 10:00 AM and Friday at 2:00 PM. For more information or to schedule a tour, call Marji Klima at (877) 462-5267 x101 or email marji@alcor.org.

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.

JAPAN

Cryonics meetings are held monthly in Tokyo. Send queries to grand88(at)yahoo.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

ALCOR
LIFE EXTENSION FOUNDATION
SINCE 1972

Call toll-free TODAY to start your application:

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

LifeExtension
Foundation for Longer Life®

You're going to great lengths to avoid death. Why not do something to prolong life.

Join the Life Extension Foundation® now so you can live a longer, healthier life. We'll give you all the support you need, starting with cutting-edge medical information.

You get it three ways. Through our monthly ***Life Extension*** **Magazine**®… filled with cutting-edge research findings and global medical breakthroughs even your doctors may not know about. Through our ***Disease Prevention and Treatment*** book, filled with breakthrough protocols on over 130 different diseases of aging. And with free phone access to our **knowledgeable Health Advisors** (naturopaths, nurses, nutritionists, even personal trainers). They're available every day of the year to address your health concerns and guide you in structuring a personal regimen of diet, exercise and nutritional supplements designed to extend your healthy life span.

As a Life Extension® member, you'll save far more than money with **preventive blood screening** to head off health problems … and **advanced nutritional supplements** that are light-years ahead of the commercial marketplace. These are formulas guaranteed for purity, potency and efficacy that you simply won't find anywhere else. All formulated to keep your body functioning youthfully for more years than you ever thought possible.

So while you're busy planning for the future, try spending a moment to prolong it. Call **1-866-820-4967** toll-free or visit **www.LifeExtension.com/PIM501X** to join the Life Extension Foundation now.

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Your $75 annual membership dues will fund innovative anti-aging research that will ultimately benefit you.

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