

## Investigación

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### **Documented observations regarding the debate on the cryopreservation of the deceased human body. The right to live after death<sup>1</sup>**

Reflexiones documentadas en torno al debate de la criogenización del cuerpo humano fallecido. El derecho a vivir después de la muerte

Reflexões documentadas em torno do debate sobre a criogenização do corpo humano falecido. O direito de viver após a morte

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#### **Resumen:**

El estudio jurídico que se nos presenta en este trabajo es una reflexión sobre la vida humana y una reflexión (entre la fantasía y la realidad) de las situaciones jurídicas que deberían abordarse si la “resucitación” fuera posible. ¿Es la misma persona? ¿Podría

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reconocerse personalidad, capacidad jurídica, un nuevo (y desconcertante) estado civil – ser criónico renacido? ¿Otras reflexiones jurídicas, como derechos de la persona “ex novo”? Pero no solo es una reflexión jurídica, sino también ética y filosófica sobre la finalidad de la vida humana, y el sentimiento de la propia proyección después de la muerte. Y una reflexión final ciertamente sobrecogedora es posible “vencer la muerte” y llegar a la inmortalidad. No se puede ignorar el sentimiento religioso y la “creencia en el espíritu”, al margen de consideraciones puramente materialistas, lo que no impide la reflexión jurídica de los autores, y los interrogantes que suscita la conservación del cuerpo para alargar la vida. Es un tema novedoso, inédito, y ahí radica el original planteamiento de las dudas y cuestiones socio-jurídicas que analizan los autores.

**Palabras clave:** criogenización, capacidad jurídica, cuerpo criogenizado fallecido, sociedad criogénica, herederos, muerte certificada, personalidad, registro civil.

**Abstract:**

The legal study presented to us in this paper is a reflection on human life and a reflection (between fantasy and reality) of the legal situations that should be addressed if "resuscitation" was possible. Is he the same person? Could he be recognized personality, legal capacity, a new (and bewildering) civil status, being reborn cryonic)? Other legal reflections, such as the rights of the "ex novo" person? But it is not only a legal reflection, but also an ethical and philosophical one on the purpose of human life and the feeling of one's own projection after death. And a truly overwhelming final reflection is possible to "overcome death" and come to immortality. Religious sentiment and "belief in the spirit" cannot be ignored, regardless of purely materialistic considerations, which do not prevent the legal reflection of the authors, and the questions raised by the preservation of the body to prolong the life. It is a novel subject, unpublished, and there is where the original approach to the doubts and socio-legal questions analysed by the authors lies.

**Keywords:** cryopreservation, legal capacity, dead cryopreserved body, cryogenic society, heirs, certified death, personality, Civil Registry.

**Sumário:**

O estudo jurídico que nos é apresentado neste trabalho é uma reflexão sobre a vida humana e uma reflexão (entre a fantasia e a realidade) das situações jurídicas que deveriam ser abordadas se a “ressuscitação” fosse possível. É a mesma pessoa? Poderia-lhe ser reconhecido personalidade, capacidade jurídica, um novo (e desconcertante) estado civil – ser criónico renascido? Outras reflexões jurídicas, como direitos da pessoa “ex novo”? Mas não é só uma reflexão jurídica, mas também ética e

filosófica sobre a finalidade da vida humana, e o sentimento da própria projeção depois da morte. E uma reflexão final certamente avassaladora é possível vencer a morte e chegar à imortalidade. Não se pode ignorar o sentimento religioso e a crença no espírito, à margem de considerações puramente materialistas. O que não impede a reflexão jurídica dos autores, e as interrogações que suscita a conservação do corpo para prolongar a vida. É um tema novo, inédito, e aí está o original enfoque das dúvidas e questões sociojurídicas que analisam os autores.

**Palavras chave:** criogenização, capacidade jurídica, corpo criogenizado falecido, sociedade criogênica, herdeiros, morte certificada, personalidade, registro civil.

**Summary:** The question as it currently stands: Between fantasy and reality. The matter of consent at the American Cryonics Society. Main aspects to be considered explained by the American Cryonics Society. Cryopreservation. Aporias and legal truths: the technical procedure and its consequences. Resumen del texto en español. Bibliografía.

## **The question as it currently stands: Between fantasy and reality**

The debate presents itself as intense, extensive and complex in terms of the legal and ethical questions that the problem poses to any alert observer of this arresting and moving social reality. All in all, it is a fascinating – albeit still theoretical – debate between bio-ethics and lawfulness. The issue is open to reflection, and all the while experimentation in relation to ‘regenerative medicine’ will keep on progressing in step with the advances in bio-technology research (which in this case we may suppose to be drawn out over a long period of time). Currently this technique is no more than a chimaera, and experts believe that it will be many years before this form of experimentation will be seen to offer a viable outcome.

In practical terms, cryonics consists of preserving a body by freezing it, with the aim of resuscitation at a later date. Legally, it must be carried out immediately after someone is pronounced dead so as to avoid injury to the brain which will occur rapidly after five to ten minutes following death. The aim is to suspend life when it is threatened by an

incurable disease until such time as it becomes curable. Cryopreservation must be carried out after someone has been pronounced dead, although the cessation of a heartbeat and breathing is not the same as biological death. Legally, someone is pronounced dead when brain death has occurred, determined by a lack of brain activity established by way of an EEG<sup>2</sup>.

Once the heartbeat and breathing have both stopped (clinical basis for death on which legal death is generally established), there will probably be a delay lasting for minutes or even hours (depending on the specific individual circumstances) during which there will be no or insufficient blood circulation. Interruptions to the functioning and structures of cells and tissues, which are considered to be irreversible according to current medical doctrine and which may remain irreversible, may occur during this interval despite the efforts of the ACS and its provider of cryopreservation services to prevent, minimize, or reverse this harm.

Currently, the medically accepted time limits on reviving human beings from circulatory stoppage at normal body temperature and without any neurological deficits range from 4 to 6 minutes. In practice nowadays, even under optimum conditions, it is likely that the patient will undergo an ischaemic period of at least 6 to 10 minutes before the stabilization procedures designed to halt or reverse the ischaemic harm can begin. Furthermore, the effectiveness of these stabilization procedures is unknown for each patient. Currently, the harm that ischaemia can cause includes the following (depending on the duration):

But critical and permissive voices are already being heard, whose reflections range from the ‘utilitarian’ achievements of the technique to the ethical and legal debate. In other words, between science and conscience. Thus, we think that not even the most advanced regenerative medicine can allow us to dream, now, of systems for the storage of information that could be copied and transmitted to the cryopreserved body. To put it another way, there is talk of the possibility of there being replicas or back-up copies of a human being: is this a future being with rights? And we must consider whether this supervening biological being that has been ‘revived’ has legal capacity.<sup>3</sup>

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<sup>2</sup> Francisco Leandro Loiácono (2000), *Criogenia. Cuerpos congelados en espera de avances tecnológicos*, <http://www.alfinal.com/monografias/criogenia.php>

<sup>3</sup> American Cryonics Society. *Consent for Cryopreservation*. P.O. Box 1509, Cupertino, California 95015. <http://americancryonics.org/Forms/99ConsentforCryopreservation.pdf>

Loiácono is right where he says that cryopreservation, which would occur once there is ‘certified death’, would be *a priori* incompatible with the aim of maintaining ‘vital functions in suspension’ in order to revive the person with both conscience and personality intact in the future.<sup>4</sup>

First, in our opinion it is only possible to speak of a ‘suspension of vital functions’ if death has not occurred. Unless, as this author explains, the ‘dead person’ is deemed to be a ‘cryopreserved patient’. In this regard, it is pointed out that cell damage (which occurs with cryopreservation) is not the same as cell destruction (which occurs with death).

Anyway, having established this, cryopreservation can only be said to occur where this can repair the cell damage. This explains the immediate cryopreservation of the dead body at a temperature of -196°. And therefore, Loiácono rightly concludes that the ‘resuscitation of a cryopreserved patient ought to be preceded by the discovery of the technology necessary in order to resolve the harm and also the incurable disease that was the reason for the cryopreservation’<sup>5</sup>.

In our opinion, this is nothing more than a chimaera, a scientific utopia, which currently means that cryopreservation is classified as an ‘impossible service’ (art. 1272 of the Civil Code), under the category of absolute/relative impossibility. In our case, at the current time, we may conclude that it would be absolute; the possibility does not exist at the current time, and nor is it expected to be resolved in the future. It may be said that the object does not exist. Consider a hypothetical contract for the deposit of a thing – a dead cryopreserved body – (which we will discuss later).

What we believe to be impossible (as we shall examine below), as indicated by Loiácono, is that the person will be revived with his/her conscience and personality intact. We say that it is impossible because the person died and ceased to hold rights, and this was established by the death certificate. In truth, under the hypothesis, purely that of a ‘legal chimaera’, of the possibility of resurrection – we say this with all reservations – the Law would need to regulate what kind of personality *ex novo* this would be, because what it was in the past ceased to be upon death, and the recording of the death established the death of the person along with the date, the time, and the place where this occurred (art. 81 of the Civil Registry Law and arts. 274 - 281 of the Civil Registry Regulations).

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<sup>4</sup> Loiácono (2000). Criogenia ..., <http://www.alfinal.com/monografias/criogenia.php>

<sup>5</sup> Loiácono (2000). Criogenia ..., <http://www.alfinal.com/monografias/criogenia.php>

On a different level, we should not forget how a ‘cryopreserved body’ would be classified. Would it belong to the *extracomercium* or *intracomercium* order of things? (art. 1272 of the Civil Code.); in fact, in our opinion, it would be classified under the order of an ‘impossible service’ as described in the said provision. It is clear that the procurement of things (cryopreserved bodies) *would* be something *extracomercium*. Although, in contrast, considering the provisions of art. 3 of the Civil Code (sociological interpretation of the rules) and the fact that there is no criminal-law provision that penalizes arranging the fate of cryopreserved bodies on the grounds of this being contrary to public order or unlawful or contrary to human trade, we may conclude that it is lawful and that it is possible to apply to this, by analogy (*mutatis mutandi*), the provisions of a will for when a body is left for scientific or research purposes.

Although it seems like a minor conceptual question, it should be pointed out that those who research, or practise cryonics refer to the bodies they cryopreserve as ‘patients’. As is explained by the scientists themselves, the definition of patients results from the fact that cryopreserved persons are considered to be persons who are temporarily undergoing treatment, as a prior step before coming back to life in the indeterminate future (v. [criogenizacion.net](http://criogenizacion.net)). We cannot support this reflection, from a legal point of view, given that it is not possible to speak of a person when that being is dead, his/her personality was extinguished, and as such has no rights, as there is no being, not even an ‘arguable subjective right over the remains’.

The fact is that corpses in a situation of ‘biological death’ are being cryopreserved<sup>6</sup>. According to the opinion of the scientist De Grey, death is a gradual process, and what is being sought with ‘cryonics’ is to act at the very last moment when no one is in a position to assert with absolute certainty that we are truly dead (in terms of cells, we might add). The question we might ask ourselves is as follows: Is it possible to freeze a dead body with the hope of reviving it when a cure for cancer has been discovered or when ageing can be reversed?<sup>7</sup>

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<sup>6</sup> Esther Paniagua, Qué debo hacer para “congelarme” como Walt Disney, *El País* (agosto 2017) [https://elpais.com/elpais/2017/08/07/buenavida/1502094841\\_101544.html](https://elpais.com/elpais/2017/08/07/buenavida/1502094841_101544.html)

<sup>7</sup> Nuño Domínguez, La criogenia humana es “como congelar un filete putrefacto”, *El País* (mayo 2017). [https://elpais.com/elpais/2017/05/25/ciencia/1495742774\\_221269.html](https://elpais.com/elpais/2017/05/25/ciencia/1495742774_221269.html)

## The matter of consent at the American Cryonics Society<sup>8</sup>

At the American Cryonics Society, the consent given for cryopreservation is a genuine ‘blank cheque’. It refers to consent to transfer the human remains in the hope (a real condition precedent) that medical science will be able to achieve cryopreservation and ‘rebirth’ (it remains to be decided what new ‘civil status’ and personality this cryotic being would have). There is reference not just to ‘rebirth’, but also to something more utopian and fantastical in the form of a transposed identity. But this would not be the same, given that the former biological identity disappears with the death of the subject (now a cryopreserved corpse).

Consent for preservation extends to any procedure (cardiopulmonary resuscitation, anaesthetic, various pathologies, transfusions, organ transplants in full or in a ‘host body’). We can see how a utopian reality is stranger than fiction (for example, the original series ‘Altered Carbon’ worryingly shows us this enigmatic future).

It is curious that the document used by the American Cryonics Society does not contain any ‘term’, with the additional problem that this financial burden represents for the heirs of the cryopreserved body, which in most cases would exceed what was anticipated by the subject – the potential cryotic being – even where he/she has procured, while still alive, some form of ‘death’ insurance (*Ocaso Plus Mortem*), or even where he/she has set aside some money in the will in the form of a ‘trust’ in order to pay for something that still remains an impossible ‘service’ (art. 1272 of the Civil Code).

Furthermore, and continuing with the problem of cryopreservation, it would have to be the designated successors (e.g. a cryonics society) that would decide when, – supposing such an unusual situation ever arises – with the active participation of the cryonics society

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In this same article, the observation made by the researcher and renowned scientist Juan Carlos Ispizua is considered, for whom this kind of research is at a very preliminary stage. Reference is made to the difficulty of freezing cells, and all the more so (in his opinion) when it comes to organs, and he gives the following metaphorical example: if you freeze a rotten steak, when you defrost it will still be rotten.

<sup>8</sup> American Cryonics Society, *Consent for Cryopreservation*.

(the depository of the cryopreserved mortal remains), that would determine the best time for revival and/or resuscitation.

Furthermore, it would be necessary to establish the possibility of re-attempting the procedure, in the event that the attempt failed, and deciding – where the patient’s resources allow this – upon a new ‘cryopreservation’, or deciding on the definitive natural final resting place of the cryopreserved body, which would be burial and/or incineration. The American Cryonics Society’s document states that if cryonics as a concept were to be discarded at some future time, the cryopreserved body would have the right that we refer to above. Furthermore, the cryopreserved patient authorizes and consents to the procedure being discarded (and this is stipulated in the general consent form for cryopreservation). There is no guarantee that this procedure will be successful, or any guaranty that ‘life, identity, and health will be restored’.

It is made quite plain in the document that the ACS (American Cryonics Society) is a non-profit organization, with limited aims or resources, and that the ineffectiveness of the procedure, resulting in the impossibility of the overall objective because of harm incurred leading to irreparable damage to the cryopreserved body (to its molecules, cells, tissues, or organs), must be accepted, and the possible supervening harm or contingencies are stated in an open-ended list of situations that are not limited to ischaemic harm, or to any harm caused by the ‘cryoprotectants’ sent into the brain or other organs of the body, but to the actual biochemical / biophysical harm resulting from freezing. And above all, the major problem of ‘vitrification’ and the mechanical harm to tissues, resulting in the formation of ice. All these provisions without the right under any circumstances to file any claim for medical liability deriving from malpractice. All in all, a futile gesture.

Likewise, it will not be just physical harm that will be excluded, under all circumstances, from any claims: mental harm is also excluded. As such there is a ‘safeguard’ clause (the first time I have seen one in my long professional experience) to avoid claims by the heirs and/or third parties designated in the contract. Could the reborn being make a claim, if he/she is no longer who he/she was? Anyway, any such psychological harm, unlikely and difficult to assess, would include, inter alia and for the purpose of example, total or partial memory loss. In a word, ‘personal identity’; neurological deficits that may give rise to ‘depersonalization’, pain, loneliness, social maladjustment as a result of permanent separation from and/or loss of loved ones, friends, employment, or social status, cultural shock, having to re-adjust socially, a situation of poverty (where no pertinent trust clause was included in the will).



And in this descriptive list of situations envisaged in the standard-form document from the American Cryonics Society, it is also necessary for the ‘consented’ possibility of not proceeding to ‘reactivation’ – and/or resuscitation – to also be envisaged. Yes, but what the said provision leaves unresolved and in a situation of legal uncertainty is how long he/she can remain ‘cryopreserved’, because this process, as we can see, might be as unreal as you like, but it is obvious that it is expensive, very expensive...

The ACS consent form also envisages the possibility of ‘neuropreservation’, i.e. just using the ‘head or brain’, depending in this case on cellular reprogramming, cloning, for implant in a ‘host body’ and/or recipient (following the line in the fictional series *Altered Carbon*). In other words, it would appear that the science of molecular engineering is progressing in this direction, i.e. using just the brain with a ‘prosthetic body’ or a life-support system.

The other possibility is the option of cryopreservation for the whole body, which entails higher storage, conservation, and – where pertinent – ‘defrosting’ and/or ‘resuscitation’ costs (how bizarre! I can’t believe what I’m writing!)

Or to consent to allowing the cryonics centre to have the authority to decide on the option of neuropreservation and/or cryopreservation of the whole body.

The document concludes with the subject consenting to the cryopreservation of his/her bodily remains after death, and the attempt to restore life, identity, and health in the future.

## **Main aspects to be considered explained by the American Cryonics Society<sup>9</sup>**

Having established the foregoing, it would be appropriate to consider now which documents are required as a standard for cryopreservation, and for this purpose we refer to the documentary information from the American Cryonics Society.

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<sup>9</sup> American Cryonics Society. *Cryonics Suspension Forms*.

<http://www.americancryonics.org/>

In our opinion, the main problem that arises with the cryopreservation of human beings is that there is no prior experimental evidence that can in any way guarantee the success of this practice.

Science progresses, and what today is a utopia will soon cease to be fantasy and will become a viable reality. Indeed, there is a large – significant – number of cryopreserved ‘patients’. The scientific community is aware of the technical difficulties of ‘returning’ the cryopreserved patient ‘to life’, be it the same or some other cryopreserved life. It is clear that, cryopreserving a human body is not against the Law.

We ought to emphasize that the process of cryopreservation begins once the person’s death has been certified. And the cryopreservation process must be carried out immediately afterwards, such that a delay of over 15 minutes following death makes the process impossible. If we are operating within this time margin, the body must be placed in ice (as we have explained above) and, in medical terms, ‘chemical products that prevent the blood from coagulating must be injected’. This is the explanation from a scientific perspective as to why the moment the person is dead and the cryonics company is informed, it sends a team with the intention of keeping the blood flowing through the body, which is wrapped in ice (as we have explained above) and cryoprotectants are injected so as to avoid ischaemia and coagulation<sup>10</sup>.

Another problem that needs to be made perfectly clear in the will, a public notarial document, advanced directives, etc., is the maximum time the ‘cryopreservation’ is to last, given that this cannot be left indeterminate, irrespective of any supervening contingencies at the depositary company.

And having established a maximum *term*, if at that time the service becomes impossible, the way of disposing of the preserved cryonized material would be as stated in the will or other similar document (burial, incineration...).

Naturally another supervening problem would be that perhaps there will be no heirs and/or successors within that ‘timeframe’. As such, it would be the cryonic company, on a subsidiary basis, that would have to take charge if there were any ‘funds left in the account’.

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[http://www.bbc.com/mundo/noticias/2013/09/130822\\_criogenia\\_congelamiento\\_muerte\\_cch\\_finde](http://www.bbc.com/mundo/noticias/2013/09/130822_criogenia_congelamiento_muerte_cch_finde).

It is said, and rightly so, that if ‘scientists one day manage to work out how to cryopreserve a complete human body, there would still remain the matter of bringing it back to life.’<sup>11</sup>

## **Cryopreservation. Aporias and legal truths: the technical procedure and its consequences**

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<sup>11</sup> David Palacio, ¿Será posible devolver a la vida un cadáver criogenizado? (Diciembre 2016)

<https://www.nosabesnada.com/sociedad/sera-possible-devolver-a-la-vida-un-cadaver-criogenizado/>

In this regard it is argued that: ‘But there is another major obstacle for cryonics: not just repairing the damage caused by the freezing process, but also reversing the damage that caused death, and to do all this in such a way that the individual wakes up knowing who he/she is’.

[http://www.bbc.com/mundo/noticias/2013/09/130822\\_criogenia\\_congelamiento\\_muerte\\_cch\\_finde](http://www.bbc.com/mundo/noticias/2013/09/130822_criogenia_congelamiento_muerte_cch_finde) Thus it is stated that ‘When the heart stops beating, and the supply of oxygen and nutrients stored in the blood to the organism is suspended, the body’s cellular tissues lack the necessary energy, causing the death of these biological tissues and leading to a state of ischaemia’ (v. [criogenizacion.net](http://criogenizacion.net)). Therefore, when someone is pronounced dead, as we have said, the cryonics company must act swiftly, in order to keep the blood flowing through the body, which is wrapped in ice and subjected to cryoprotectants in order to avoid the aforementioned ischaemic processes, blood clots, or brain damage. Subsequently, when the body reaches the cryonics facility, it is cooled to a temperature above the freezing point of water, the blood is removed and replaced with a solution to preserve the organs, and the body is placed in a container submerged in a tank of liquid nitrogen at -198°C.

<http://www.cooperativa.cl/noticias/sociedad/ciencia/la-verdad-sobre-la-criogenia-la-vida-despues-de-la-muerte-congelada/2013-09-01/151318.html>.

As has been correctly and clearly observed by Cremades Nieves, the capacity to preserve cells in ‘suspended animation’ outside of the body has become a cornerstone in the development of the main modern clinical therapies, and in particular in reproductive medicine. The application of cryopreservation for the storage of gametes, embryos, and more recently, ovarian tissue. In fact, cryobiology and assisted-reproduction techniques have developed in parallel over the past 50 years<sup>12</sup>.

In conclusion, cryopreservation (from a scientific perspective) is explained as consisting of a medical process that freezes the body with liquid hydrogen at -196°C and which replaces the blood with anti-freeze compounds. The aim is to avoid the cells of the body from deteriorating, so that science may, at some future time, defrost the bodies, cure the diseases that led to death, and return the patient to life. Currently there are two major organizations that carry out this delicate process: Alcor, located in Arizona, U.S.A., and the Cryonics Institute, in Detroit, U.S.A. The process must start once the body has been legally pronounced dead, with all procedures commencing within two minutes of the heartbeat stopping, and treatment may not commence more than 15 minutes later. The body must be wrapped in ice and injected with the required chemical products to reduce coagulation of the blood. Once in this condition it is transferred to the cryonic facility, where the patient is cooled to just above 0°C and the blood is replaced by a specific solution to preserve the organs. Then the body is once again subjected to another chemical process with the intention of halting the crystallization process affecting the organs and tissues, which is inherent to freezing. The body is then cooled to -130°C when it is finally inserted into a tank of liquid nitrogen at -196°C<sup>13</sup>.

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<sup>12</sup> Nieves Cremades, “Comentario al art. 11 crioconservación de gametos y preembriones” *Comentarios científico-jurídicos a la Ley sobre Técnicas de Reproducción Humana Asistida, Ley 14/2006 de 26 de mayo*. Dirs. Lledó Yagüe, F - Ochoa Marieta (Madrid: Dykinson, 2007), 168-170.

<sup>13</sup><https://tendencias.com/life/criogenizacion-criopreservacion-y-vitrificacion-estado-del-arte-organizaciones-y-viabilidad/>. V. also ALCOR LIFE EXTENSION FOUNDATION A Non-Profit Organization ‘Cryopreservation of Kim Suozzi’ in *Cryonics*, March 2014. Volume 35:3, pp. 15 to 20. Also ALCOR LIFE EXTENSION FOUNDATION. WOK, BRYAN ‘The Death of Death in Cryonics’ in *Cryonics*, June 1988. <http://www.alcor.org/Library/html/deathofdeath.html>, pp. 1-4.

However, there is also mention of ‘vitrification’, which consists of any procedure that results in the formation of glass, the transformation of a liquid into a solid in the absence of crystallization. In other words, ice must not form on the vitrified cells, and the process needs to be carried out quickly<sup>14</sup>.

In effect, ‘ice-formation is the enemy because it destructures the tissues’ and this is why it is argued that the organ must be solidified, preventing the creation of crystals<sup>15</sup>.

The problem is ‘defrosting’. How should it be done? It is argued that the body ought to be warmed up using ‘nanomagnetic’ particles which would be added to the anti-freeze injected into the organism prior to cryopreservation<sup>16</sup>.

The process of cryopreservation – as we have been saying – is the reduction of the temperature to very low levels, e.g. -196°C, which is the temperature of liquid nitrogen. The main principle of cryopreservation is therefore to reduce the harm caused by the formation of intra-cellular ice. In order to achieve this aim, it is important to consider (explained from a purely scientific perspective) the behaviour of the intra-cellular water at below-zero temperatures as one of the fundamental principles of cryobiology. This knowledge has led us to understand that components such as cryoprotectants assist in the process of cellular dehydration and thus protect the cell during freezing. Cryopreservation of the biological material includes six steps: initial exposure to the cryoprotectant, cooling (slow/fast) to below-zero temperatures, storage, defrosting (warming), dilution and elimination of the cryoprotectant, and restoring the biological material to its physiological environment (e.g. Cremades Nieves)<sup>17</sup>.

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<sup>14</sup> Paniagua. “Qué debo hacer para “congelarme...”

<sup>15</sup> <https://www.elindependiente.com/futuro/2017/05/19/llega-la-criogenizacion/>, May 19, 2017.

<sup>16</sup> Francisco Rego, “El cerebro criogenizado del difunto Javier”, *El Mundo* (enero 2017) <https://www.elmundo.es/cronica/2017/01/27/5882425222601d475e8b4682.html>

<sup>17</sup> Cremades, Comentarios al art. 11... pp. 168-170. At the said temperature of -196°C, no molecular reactions are possible. Also, Víctor Méndez Baiges at <http://enciclopedia-bioderecho.com/voces/85>. ‘Cryonics, i.e. the practice of freezing dead human bodies in the hope of reviving them after a long period of having their vital functions suspended, thanks to the future progress of medical technology’.

Cryopreservation puts someone (in truth, someone who is dead) into a state of hypothermia in order to avoid cellular harm, to be ‘defrosted’ at a later time. As is

In other words, the application of very low temperatures in order to keep cells and tissues alive and structurally intact<sup>18</sup>.

Cryopreservation is commenced by causing the corpse to enter a hypothermic state so as to avoid cell damage. The corpse is deposited in an ‘ad hoc container’ and such cannulation procedures as may be required are carried out in order to exchange the blood for cryoprotectant solutions. Once the blood has been exchanged, it is best to carry out rapid cooling to below 0°, preferably with liquid nitrogen, which allows the temperature described above of -196°C to be reached. And the process concludes with the deposit of the ‘cryopreserved body’ in a cryostat for an indefinite period<sup>19</sup>.

In summary (as is explained by Cremades Nieves), it is very important to mention that each cell has its own optimal cooling rate, e.g. oocytes are cells with a higher propensity to damage than embryos or blastocysts. This should be taken into account, so as to try to find the optimum time for the exposure of each cell to cold. This means that the freezing protocols undergo modifications with regard to the concentration of the cryoprotectant, the speed of cooling and warming, with the aim of improving the chances of survival and viability<sup>20</sup>.

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explained by the Bioethical Observatory of the Catholic University of Valencia, currently there is no experimental evidence that can in any way guarantee the success of this practice.

<sup>18</sup> Paniagua. “Qué debo hacer para “congelarme” ...”

<sup>19</sup> Bioethical Observatory of the Catholic University of Valencia. “Crioconservación de individuos humanos. Técnica y valoración ética y moral”

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<sup>20</sup> Cremades, “Comentarios al art. 11.... V. also ALCOR LIFE EXTENSION FOUNDATION ‘The Thomas Donaldson Case’ Case background. Appellate Brief. Appellate Court Decision. Abstract from Journal of Contemporary Health Law and Policy. 1993 Spring; 9:589-603 ‘Donaldson v. Van de Kamp: cryonics, Assisted Suicide, and the Challenges of Medical Science’ at <http://www.alcor.org/Library/html/Donaldson-VanDeKampAbstract.html>. ALCOR LIFE EXTENSION FOUNDATION. ‘The Legal Status of Cryonics Patients. An Introduction’ By Stephen Bridge, Former President, Alcor Foundation. Revised, December 1994. At <http://www.alcor.org/Library/html/legalstatus.html>, pp 1-8. ALCOR

## Resumen del texto en castellano

El debate se nos manifiesta de actualidad, así como social y jurídicamente intenso, habida cuenta de los interrogantes jurídicos y éticos que el problema suscita y concita a cualquier atento observador de una realidad social tan fantástica, y hoy por hoy poco creíble. En fin, es un debate apasionante pero todavía teórico entre la Bioética y la legalidad, y otras ciencias y disciplinas conexas. La reflexión está abierta, y la experimentación en relación a la “medicina regenerativa” y el estudio de la reprogramación celular, y epigenética irá avanzando con la investigación biotecnológica. Hoy por hoy, esta técnica es una “quimera” y los expertos creen que pasarán muchos años antes que esta experimentación pueda vislumbrarse que obtenga una ejecución viable. Pensamos nosotros, que cuando se hablan de fechas como la del 2040 (en la doctrina científica, no es más que una premonición puramente interesada y difícil de creer con parámetros científicos.

La práctica de la criogenia consiste en preservar un cuerpo mediante su congelamiento con la finalidad de resucitarlo en el futuro. Legalmente, debe llevarse a cabo inmediatamente después que una persona ha sido declarada muerta para evitar así lesiones cerebrales que suceden rápidamente pasados los cinco a diez minutos aproximadamente luego de la muerte. El objetivo de esto es suspender la vida amenazada por una enfermedad incurable hasta tanto se logre obtener la cura a la misma. La criogenia debe ser llevada a cabo luego que una persona ha sido declarada muerta, sin embargo el cese de latidos y respiración no es equivalente a muerte biológica. Legalmente una persona es declarada muerta cuando ha ocurrido muerte cerebral diagnosticada por falta de actividad cerebral evidenciada mediante electroencefalograma. Pero ya desde ahora, se alzan “voces” críticas y permisivas pertenecientes al mundo del Derecho, de las Ciencias Sociales, Medicina, Ingeniería, etc. cuyas reflexiones pugnan entre los logros “utilitaristas” de la técnica, y el debate ético y jurídico entre lo que se puede hacer y lo que es lícito ejecutar. En fin, es así que pensamos que ni la medicina

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LIFE EXTENSION FOUNDATION ‘Alcor Life Extension Foundation Attempts to fulfil wishes of Colorado Springs.

regenerativa, y como hemos dicho, la epigenética, la clonación, etc. más avanzada permite soñar en la actualidad con sistemas de almacenamiento de información que pudiese ser copiada y transmitida al cuerpo crioconservado. Es decir, se habla de la posibilidad que el ser humano tuviera réplicas o copias de seguridad, ¿es este un futurible sujeto de derechos?, y que consideremos que esta sobrevenida entidad biológica “revivida” tuviese capacidad jurídica.... Hoy por hoy, no deja de ser una “quimera”, en un futuro de ser posible implicaría una revolución jurídica, tanto en cuanto habrúa que reconocer distintos estatutos de personalidad y capacidad jurídica, “a seres vivientes”, pero quizá no personas con todos los derechos inherentes a su personalidad.

En otro orden de cosas, no tenemos que olvidar cual sería la catalogación del “cuerpo crioconservado”, ¿pertenería a la planificación de cosas extracomercium o intracomercium? (art 1272 Cc.); más bien, a nuestro juicio entraría en la calificación de “servicio imposible” que literaliza el mentado precepto. Es evidente que la contratación de cosas (cuerpos crioconservados) sí estaría fuera de comercio. Aunque, por el contrario, considerando lo dispuesto en el art. 3 de Cc. (interpretación sociológica de las normas) y que no hay ningún precepto penal que condene por contrario al orden público o ilegal o ajeno al comercio humano, disponer del destino de los cuerpos crioconservados, pudiéramos concluir que sí es lícito y posible aplicarlo por analogía a lo dispuesto en testamento para cuando el cadáver tuviera una finalidad científica o investigadora (mutatis mutandi).

En la Asociación Americana para la criogenización el consentimiento que se da para la criopreservación es un auténtico “cheque en blanco”. Se habla de consentimiento para transferir los restos humanos con la esperanza (auténtica condición suspensiva) de que la ciencia médica sea capaz de llegar a la criogenización y al “renacimiento” (quedaría por dilucidar el nuevo “estado civil” y personalidad que tendría este sujeto criótico). Se habla no sólo de “renacimiento”, sino de algo más utópico y fantasioso como es la trasposición de la identidad. Pero, no sería la misma, ya que aquella identidad biológica desaparece con la muerte del sujeto (ahora cadáver criogenizado).

El consentimiento para la preservación implica cualquier procedimiento (resucitación cardiopulmonar, anestesia, patologías diversas, transfusiones, trasplantes de órganos en su totalidad o en “cuerpo anfitrión”). Vemos como la utópica realidad supera la ficción. Es curioso que el documento que utiliza la Asociación Americana de Criogenización no implica ningún “plazo”, con el problema añadido que supone para los herederos del cuerpo criogenizado el coste financiero; que superaría la mayoría de las veces las



previsiones del sujeto –potencial ser criótico-, aunque formalizase en vida un seguro “de muerte” (Ocaso Plus **Mortem**), ni aunque hubiese dispuesto de un dinero en el testamento a modo de “fideicomiso” para cubrir algo que no deja de ser un “servicio” imposible (art. 1272 Cc).

Naturalmente partiendo del hecho cierto de la extinción de la personalidad con la muerte cierta (inscripción de la defunción); en el supuesto ciertamente hipotético de una “descongelación” no estaríamos hablando de la persona que existió y falleció, y con ello se extinguieron las relaciones jurídicas (como las referidas *supra*). Después analizaremos qué estatuto jurídico tendría este “ser criónico renacido”; y así, en este sentido, no tendría lógica que hablásemos de un hipotético derecho de alimentos. Entiendo que ese estatuto jurídico sobre la “personalidad” del ser criónico tendría que definir, entre otras cuestiones, el “parentesco genético” (tal y como hemos visto con anterioridad). No creo que el pensamiento del legislador en el art. 143 Cc (alimentos entre parientes) esté pensado en el caso del “ascendiente criogenizado”. Piénsese que el concepto de parentesco lo es del pariente **vivo**, respecto al pariente fallecido (línea, grado, parentesco), pero en este caso tan peculiar hablamos del parentesco de la persona fallecida “y después resucitada” con respecto a los parientes genéticos o consanguíneamente comunes. ¿Seguirían siendo parientes del fallecido –ahora revivido-? ¿Es la misma persona que falleció? Si concluimos que no tiene la misma personalidad ¿le otorgaríamos la condición de “nuevo pariente consanguíneo”?

Contribución: Artículo original en español: 100% Lledó Yagüe. Traducción: 100 % Monje Balmaceda.

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