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SPEAKER: KEN TAYMORE

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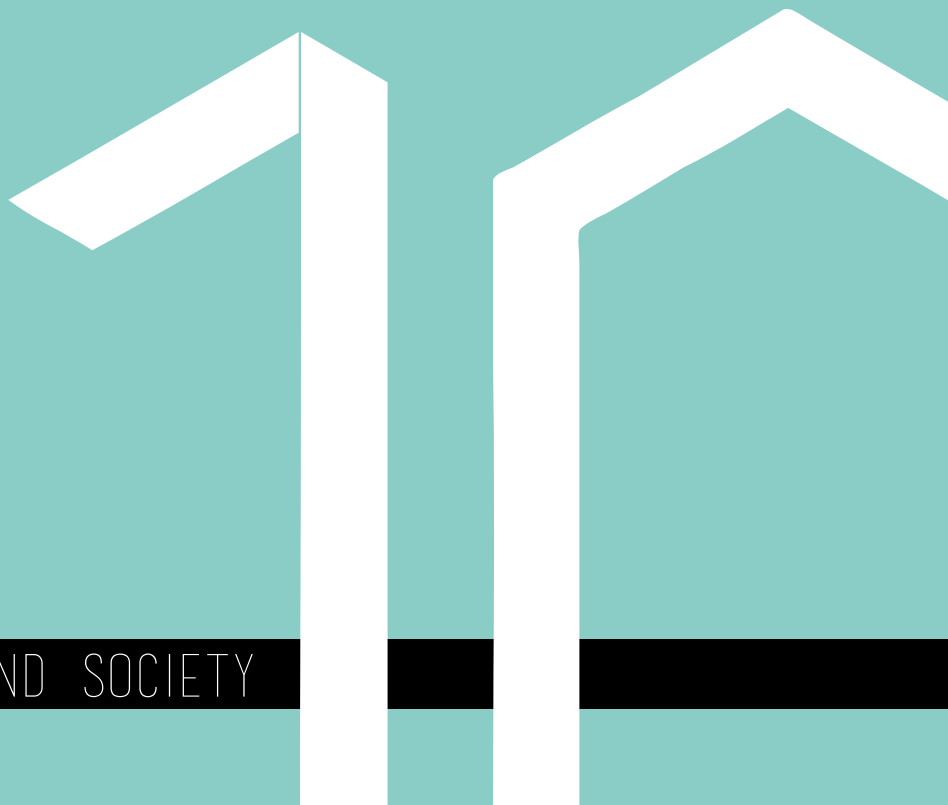
PATENTS & CIRM



STEM CELLS: SCIENCE AND SOCIETY


Mike Keefe the DenverPost 1-18-07
SO THIS IS WHERE THEY'VE KEPT YOU ALL THESE YEARS.
GITMO
SCIENCE

STEM CELL POLICY TIMELINE

1993 - As per the National Institutes of Health Revitalization Act, Congress and President Bill Clinton give the NIH direct authority to fund human embryo research for the first time.[27]

1995 - The U.S. Congress passes an appropriations bill attached to which is a rider, the Dickey Amendment which prohibited federally appropriated funds to be used for research where human embryos would be either created or destroyed. President Clinton signs the bill into law. This predates the creation of the first human embryonic stem cell lines.

1999 - After the creation of the first human embryonic stem cell lines in 1998 by James Thomson of the University of Wisconsin, Harriet Rabb, the top lawyer at the Department of Health and Human Services, releases a legal opinion that would set the course for Clinton Administration policy. Federal funds, obviously, could not be used to derive stem cell lines (because derivation involves embryo destruction). However, she concludes that because human embryonic stem cells "are not a human embryo within the statutory definition," the Dickey-Wicker Amendment does not apply to them. The NIH was therefore free to give federal funding to experiments involving the cells themselves. President Clinton strongly endorses the new guidelines, noting that human embryonic stem cell research promised "potentially staggering benefits." And with the guidelines in place, the NIH begins accepting grant proposals from scientists.[27]

2001–2006 - U.S. President George W. Bush signs an executive order which restricts federally-funded stem cell research on embryonic stem cells to the already derived cell lines. He supports federal funding for embryonic stem cell research on the already existing lines of approximately $100 million and $250 million for research on adult and animal stem cells.

2 November 2004 - California voters approve Proposition 71, which provides $3 billion in state funds over ten years to human embryonic stem cell research.

5 May 2006 - Senator Rick Santorum introduces bill number S. 2754, or the Alternative Pluripotent Stem Cell Therapies Enhancement Act, into the U.S. Senate.

18 July 2006 - The U.S. Senate passes the Stem Cell Research Enhancement Act H.R. 810 and votes down Senator Santorum's S. 2754.

19 July 2006 - President George W. Bush vetoes House Resolution 810 Stem Cell Research Enhancement Act, a bill that would have reversed the Dickey Amendment which made it illegal for federal money to be used for research where stem cells are derived from the destruction of an embryo.

7 November 2006 - The people of the U.S. state of Missouri passed Amendment 2, which allows usage of any stem cell research and therapy allowed under federal law, but prohibits human reproductive cloning. [28]

16 February 2007 – The California Institute for Regenerative Medicine became the biggest financial backer of human embryonic stem cell research in the United States when they awarded nearly $45 million in research grants.[29]

4 November 2008 - The people of the U.S. state of Michigan passed Proposal 08-2, allowing Michigan researchers to make embryonic stem cell cultures from excess embryos donated from fertility treatments. [30]

23 January 2009 - The United States Food and Drug Administration approves clinical trials for human embryonic stem cell therapy.[31]

9 March 2009 - President Barack Obama signs an executive order reversing federal opposition to embryonic Stem Cell research.[32]

August 2010 - Judge Royce Lamberth of the U.S. District Court for the District of Columbia issued a temporary injunction blocking the federal government from implementing the current NIH guidelines "... ruling that experiments with such cells fall under an "unambiguous" 1996 law by Congress that prohibits federal funding of research that destroys human embryos." This new injunction would not block new funding but it would also interfere with the research allowed under the Bush administration.

April 2011 - See Dickey-Wicker Amendment, "In the 2-1 opinion of April 29, 2011, the appeals panel said that the Dickey-Wicker Amendment was "ambiguous" and that the National Institutes of Health had "reasonably concluded" that although federal funds could not be used to directly destroy an embryo, the amendment does not prohibit funding a research project using embryonic stem cells. This is an important distinction under the law, because for federal funds to be used directly to support the destruction of embryos."

http://en.wikipedia.org/wiki/Stem_cell_laws_and_policy_in_the_United_States

THE EUROPEAN COURT OF JUSTICE BARS STEM CELL PATENTS IN LANDMARK DECISION*

Posted on January 5, 2012 by Claudia Langer

***Not Required Reading**

The European Court of Justice in Luxemburg ruled on October 18, 2011 in a landmark decision in the case C-34/10 Oliver Bruestle v Greenpeace e.V. and barred embryonic stem cell patents in Europe.

In its ruling, the Court said that "a process which involves removal of a stem cell from a human embryo at the blastocyst stage, entailing the destruction of that embryo, cannot be patented. The use of human embryos for therapeutic or diagnostic purposes which are applied to the human embryo and are useful to it is patentable, but their use for purposes of scientific research is not patentable."

Case Background

Professor Bruestle, a German neurology professor and one of the leading stem cell research pioneers, is the holder of the disputed German patent. The patent, filed on December 19th 1997, concerns isolated and purified neural precursor cells, methods for the production of such neural precursor cells from embryonic stem cells, and the use of such neural precursor cells for the treatment of neural defects such as Parkinson or Alzheimer. The patent seeks to resolve the technical problem of using embryonic stem cells to produce an almost unlimited quantity of isolated and purified precursor cells having neural or glial properties. Professor Brustle's patent was issued in Germany as DE 19756864 in 1999.

Greenpeace e.V. sought a fundamental decision on how the protection of human embryos is to be laid out under EU (patent) law, and therefore chose to oppose Professor Bruestle's patent. Greenpeace wanted the patent to be declared invalid for moral reasons ("ordre public"), in light of ethical objections to the commercialization of human life. In its view, § 2 II 2 of the German Patent Act ("PatG") and the German Stem Cell Act would not allow patent DE 19756864. On application by Greenpeace e.V., the Bundespatentgericht (Federal Patent Court, Germany) ruled on December 5th, 2006 that Prof. Bruestle's patent was invalid in so far as it covers processes for obtaining precursor cells from human embryonic stem cells. Professor Bruestle appealed the Federal Patent Court's decision to the Bundesgerichtshof (Federal Court of Justice, Germany).

Relevant Aspects of EU and German National Law

The Bundesgerichtshof, hearing Prof. Bruestle's appeal, decided to refer several questions to the European Court of Justice ("ECJ") for a preliminary ruling. Referral to the ECJ was necessary as the patentability of Bruestle's patent under the PatG, depended on the definition of certain terms under the EU directive on which the pertinent part of the PatG was based. According to Article 267 of the Treaty on the Functioning of the European Union, a national court shall bring the interpretation of acts of the institutions of the Union (Directive 98/44/EC in this case) in a pending case in front of the ECJ. In its role as the highest European Court, the ECJ decides questions concerning the interpretation of EU Law in order to guarantee a common understanding within the European Union. The need for a uniform application of the European

Union law requires that the terms of a provision of European Union law, which makes no express reference to the law of the Member States for the purpose of determining its meaning and scope, must normally be given an independent and uniform interpretation throughout the EU. Thus the national law, the German Patent Act, has to be in accordance with the Directive.

Specifically, the outcome of the application for annulment by Greenpeace depended on the interpretation of the concept of 'human embryo' as used in the EU Directive (98/44/EC) on the Legal Protection of Biotechnological Inventions. This so-called EU Biotechnology Directive rules out patentability for certain inventions, including "uses of human embryos for industrial or commercial purposes."

On a fundamental level, the issue was whether the technical teaching of Brustle's patent was excluded from patentability under § 2 II 1 No. 3, of the German Patent Act, which states: "patents shall not be granted in respect of the uses of human embryos for industrial or commercial purposes." The answer to this question, in turn, depended on the interpretation that should be given to Article 6 (2) (c) of the EU Biotechnology Directive 98/44/EC, which states: "inventions shall be considered unpatentable where their commercial exploitation would be contrary to ordre public or morality . . . in particular uses of human embryos for industrial or commercial purposes . . . shall be considered unpatentable."

§ 2 II 1 No. 3, of the German Patent Act is derived from this EU Directive. EU Directives harmonize law within the EU, and the Member States have to implement the legal meaning of the Directive into their national statutes – in this case into the German Patent Act – a process that leaves space for interpretation, legal uncertainties and disputes such as this one.

Article 6 (2) (c) of the Directive does not allow the Member States any discretion regarding the fact that the processes and uses listed therein are not patentable. In other words, § 2 II of the German Patent Act – in particular the concept of embryo which it uses – cannot be interpreted differently from that of the corresponding concept in Article 6 (2) (c) of the Directive.

Holding

One of the questions that the Bundesgerichtshof asked the ECJ to address was the meaning of the term "human embryos." The EU Directive itself, as the primary legal source, does not define the term "human embryo." The ECJ underlined that an autonomous concept of European Union law must be applied when looking for the definition for the purposes of a uniform interpretation of law within the EU: "The lack of a uniform definition of the concept of human embryo would create a risk for the authors of certain biotechnological inventions being tempted to seek their patentability in the Member States which have the narrowest concept of human embryo and are accordingly the most liberal as regards possible patentability, because those inventions would not be patentable in the other Member States." ECJ Judgment at ¶ 28. This result would create an obstacle to inter-Community trade and thus be contra-productive for the Internal Market, one of the major goals of the European Union (as laid out in Article 26 of the Treaty on the Functioning of the European Union).

Thus the Court sought the definition within the EU law and concluded that "the concept of 'human embryo' has to be understood in a wide way" because "the European Union legislature intended to exclude any possibility of patentability where respect for human dignity could be thereby affected." Id. at ¶ 34. "[Al]though [the EU] seeks to promote investment in the field of biotechnology, use of biological material originating from humans must be consistent with regard for fundamental rights and, in particular, the dignity of the person." Id. at ¶ 32. Therefore "any human ovum after fertilization, any non-fertilized human ovum into which the cell nucleus from a mature human cell has been transplanted and any non-

Outlook

After having received clarification regarding the interpretation of EU law, the Bundesgerichtshof must now decide on Bruestle's appeal on the annulment of his patent. As the ECJ pointed out, "[a]s regards stem cells obtained from a human embryo at the blastocyst stage, it is for the [Federal Court of Justice] to ascertain . . . whether they are capable of commencing the process of development of a human being and, therefore, are included within the concept of 'human embryo.'" Id. at ¶ 37. Given Germany's broad understanding of the beginning and end of "human life" for historical and ethical reasons, it seems very likely that Bruestle's appeal will not be successful, and his patent will remain invalid.

Implications

The ECJ's decision only ruled upon the unpatentability, but not the research with stem cells itself. Prof. Bruestle commented on the ruling that "[i]t means that fundamental research can take place in Europe, but that developments that follow from that cannot be implemented in Europe. It means European researchers can prepare these things, but others will pick the fruits in the US or Asia. That is very regrettable."

Paradoxically, stem cell research has been broadly funded by the European Union in recent years. Consequently, many pharmaceutical and biotechnological companies locate their research headquarters in Europe – often next to very good universities or national laboratories where the necessary highly qualified and specialized human resources can be found. Therefore, the decision might not directly affect European stem cell research in the way Professor Bruestle fears. In fact, the pharmaceutical and biotechnology industry's reaction towards the decision in various newspaper statements has not been that negative. The industry will simply have to patent its inventions in the rest of the world.

by Claudia Langer, Attorney at Law admitted to the German Bar, Ph.D. Researcher and Visiting Scholar at UC Berkeley Law School

Claudia Langer, The European Court of Justice Bars Stem Cell Patents In Landmark Decision, Berkeley Tech. L.J. Bolt (January 5, 2012), http://btlj.org/?p=1646.

CALIFORNIA'S STEM CELL AGENCY PONDERS ITS FUTURE

AP Science Writer / March 18, 2012

LOS ANGELES—The creation of California's stem cell agency in 2004 was greeted by scientists and patients as a turning point in a field mired in debates about the destruction of embryos and hampered by federal research restrictions.

The taxpayer-funded institute wielded the extraordinary power to dole out $3 billion in bond proceeds to fund embryonic stem cell work with an eye toward treatments for a host of crippling diseases. Midway through its mission, with several high-tech labs constructed, but little to show on the medicine front beyond basic research, the California Institute for Regenerative Medicine faces an uncertain future.

Is it still relevant nearly eight years later? And will it still exist when the money dries up?

The answers could depend once again on voters and whether they're willing to extend the life of the agency.

Several camps that support stem cell research think taxpayers should not pay another cent given the state's budget woes.

"It would be so wrong to ask Californians to pony up more money," said Marcy Darnovsky of the Center for Genetics and Society, a pro-stem cell research group that opposed Proposition 71, the state ballot initiative that formed CIRM.

Last December, CIRM's former chairman, Robert Klein, who used his fortune and political connections to create Prop 71, floated the possibility of another referendum.

CIRM leaders have shelved the idea of going back to voters for now, but may consider it down the road. The institute recently submitted a transition plan to Gov. Jerry Brown and the Legislature that assumes it will no longer be taxpayer-supported after the bond money runs out. CIRM is exploring creating a nonprofit version of itself and tapping other players to carry on its work.

"The goal is to keep the momentum going," board Chairman Jonathan Thomas said in an interview.

So far, CIRM has spent some $1.3 billion on infrastructure and research. At the current pace, it will earmark the last grants in 2016 or 2017. Since most are multi-year awards, it is expected to stay in business until 2021.

So what have Californians received for their money so far?

The most visible investment is the opening of sleek buildings and gleaming labs at a dozen private and public universities built with matching funds. Two years ago, Stanford University unveiled the nation's largest space dedicated to stem cell research - 200,000 square feet that can hold 550 researchers.

There are no cures yet in the pipeline and CIRM has shifted focus, channeling money to projects with the most promise of yielding near-term results. Most of the money early on was funneled toward learning the basics and recruiting scientists.

One researcher lured to California was Paul Knoepfler, a stem cell and cancer expert who was deciding between positions at University of California, Davis and an East Coast school.

"I was getting more interested in embryonic stem cells and I knew California would be a more friendly climate for that," said Knoepfler, whose work focuses on why some embryonic stem cells trigger tumor growths.

Knoepfler favors another bond measure to keep CIRM afloat, but recognizes the average Californian may disagree.

Scientists have prized embryonic stem cells since their discovery over a decade ago because of their potential to transform into any cell of the body. If researchers could harness these flexible cells, they might create replacement tissues to treat diabetes, spinal cord injury and other debilitating conditions.

For all the medical promise that embryonic stem cells hold, the payoff will take years and it's not surprising that there are still no treatments on the market. Their use has been debated because human embryos from fertility clinic leftovers have to be destroyed to harvest the cells.

When Prop 71 was approved, there were limits on federal spending to a small number of cell lines made before 2001. The restrictions, enacted by the Bush administration, were lifted eight years later by President Barack Obama in 2009 - a move that expanded the number of stem cell lines available for government funding. With that hurdle gone, some question whether California should stay in the stem cell business once funding ends.

Some observers say CIRM lost precious time because legal challenges prevented it from getting off the ground for nearly two years.

"The initial hope was that CIRM would give California a head start," and ramp up stem cell research, said Roger Noll, professor emeritus of economics at Stanford.

Despite the delay, Noll said CIRM's legacy has yet to be written.

"CIRM spent a lot of money and there's a lot of stuff going on, but it's too early to know whether it was worth it," Noll said.

While CIRM has found its stride, it is a victim of its early supporters' hype, said John Simpson of Consumer Watchdog.

"The impression you got was, if you just passed this bond measure, Christopher Reeve will be jumping out of his wheelchair and walking next week," said Simpson, referring to the late paralyzed actor who appeared in TV ads backing Prop 71. "They're having to live down the super high expectations that they raised."

Since handing out the first pot of money in late 2006, CIRM has been dogged by questions about its grant-awarding process with critics charging that many of the awards have gone to universities associated with the agency's board. CIRM says all proposals go through peer review and board members with a stake recuse themselves. The institute employs 50 people and has an operating budget of about $18 million.

CIRM suffered a blow last year when Geron Corp. abandoned the stem cell field to concentrate on its lucrative cancer therapies instead. CIRM had loaned the company $25 million to support its spinal cord injury trial, the first embryonic stem cell trial approved in the U.S.

Though Geron paid back the amount spent plus interest, the episode put increased pressure on CIRM to support work with more practical payoff.

David Jensen, who runs the blog California Stem Cell Report, said Californians have benefited, but whether it will be worth the $6 billion the state has to pay back remains unclear.

"The agency's responsibility is now to get the biggest bang for the buck, which is no easy task given the tentative nature of much of the science involved," he said in an email.

Some think CIRM has left a mark whether or not it will exist in the future.

Its "legacy will be felt in part by the stimulus that it has had on stem cell" research in California, said Fred Gage of the Salk Institute for Biological Studies.

By Alicia Chang

Chang, Alicia. "California's stem cell agency ponders its future." Boston Globe. 18 Mar. 2012. Web. 30 Mar. 2012. <http://www.boston.com/lifestyle/health/articles/2012/03/18/californias_stem_cell_agency_ponders_its_future/>

FREQUENTLY ASKED QUESTIONS ABOUT CIRM*

***Not Required Reading**

The California Institute for Regenerative Medicine (CIRM) will provide information on and respond to questions about the California Institute for Regenerative Medicine (CIRM), its organization and activities. The CIRM is unable to respond to questions regarding diagnosis, medical treatment or general science. Generally the CIRM will respond to each request for information within 10 working days. Please address all public records access (PRA) requests to prarequest@cirm.ca.gov. For further information, please review CIRM's public records access guidelines. The CIRM web site contains detailed information about up-coming and past meetings, events and activities, as well as CIRM grant programs. We encourage you to review this information and the information provided in links throughout the CIRM web site, before submitting requests for information. The following responds to frequently asked questions. You can learn more about stem cell research from our Stem Cell Basics Primer and through our stem cell videos.

What is the California Institute for Regenerative Medicine (CIRM)?

The California Institute for Regenerative Medicine ("The Institute" or "CIRM") is a state agency that was established through the passage of Proposition 71, the California Stem Cell Research and Cures Initiative. The statewide ballot measure, which provided $3 billion in funding for stem cell research at California universities and research institutions, was approved by California voters on November 2, 2004, and called for the establishment of a new state agency to make grants and provide loans for stem cell research, research facilities and other vital research opportunities.

What does the CIRM do?

The CIRM will use bond proceeds to fund basic and applied biomedical research focused on developing diagnostics and therapies and on other vital research opportunities that will lead to life-saving medical treatments. All proposals are peer-reviewed to support the most promising scientific research. Research grants are made only to California-based research institutions. You can learn more about stem cell research and how it can lead to new disease therapies through our Stem Cell Basics Primer.

What is the Independent Citizens' Oversight Committee (ICOC)?

The Independent Citizens Oversight Committee ("ICOC") is the 29-member governing board for the Institute. The ICOC members are public officials, appointed on the basis of their experience earned in California's leading public universities, non-profit academic and research institutions, patient advocacy groups and the biotechnology industry. A list of the members is available on the ICOC/ Governing Board page.

What is the responsibility of the ICOC?

The responsibilities assigned to the ICOC are:

- *Oversee the operations of the CIRM*
- *Develop annual and long-term strategic research and financial plans for the institute*
- *Make final decisions on research standards and grant awards in California*
- *Ensure the completion of an annual financial*

audit of the institute's operation

» *Issue public reports on the activities of the institution*

» *Establish policies regarding intellectual property rights arising from research funded by the CIRM*

» *Establish rules and guidelines for the operation of the ICOC and its working groups*

» *Perform all other acts necessary or appropriate in the exercise of its power, authority, and jurisdiction*
over the institute

» *Select members of the working groups*

» *Adopt, amend, and rescind rules and regulations to carry out the purposed and provisions of this chapter, and to govern the procedures of the ICOC*

» *Adopt interim regulations as necessary which can remain in effect for 270 days or when final regulations are adopted*

» *Request the issuance of bonds from the stem Cell Research and Cures Finance Committee and loans from the Pooled Money Investment Board*

» *Modify its funding and finance programs to optimize the institute's ability to achieve the objective that its activities be revenue positive during its first five years of operation*

» *Accept additional revenue and real and personal property that may be used to supplement annual research grant funding and the operations of the CIRM.*

A complete description of the ICOC is given in Proposition 71.

What is the status of regulations and guidelines that the ICOC is to develop?

The status of all regulations and guidelines is included on the CIRM web site under CIRM Regulations.

How are the ICOC members selected?

Twenty-two members were appointed by elected state officials – the Governor, Lt. Governor, State Controller, State Treasurer, the State Senate Pro Tempore and the Speaker of the Assembly. The Chancellors of the University of California at San Francisco, Davis, Los Angeles, Irvine and San Diego each appointed an executive officer from his or her campus. The Chair and Vice-Chair were nominated by the Governor, Lt. Governor, the State Controller and the State Treasurer and elected by the 27-appointed members. A complete list of all current members and their backgrounds is on the CIRM web page.

How often does the ICOC meet?

A list of all upcoming meetings of the full ICOC, ICOC subcommittees and Working Groups is listed on the CIRMUpcoming Meetings page. Please note that listings about future meetings may only include a general location (e.g. UC Irvine) but the agenda and the specific location can be found on the CIRM web page under Upcoming Meetings at least 10 days prior to the meeting. The ICOC meetings and subcommittee meetings are conducted under California's Bagley-Keene open meetings laws.

Can the public make comments at these meetings?

Members of the public are welcome to make comments at the beginning of each ICOC meeting and subcommittee meeting, after each agenda item, and at the end of each meeting. Comments should be kept to three minutes. Comments made during an agenda item should be limited to that specific item. There is no need to request to speak in advance. The Chair of the ICOC will announce at the appropriate time when the members of the public can make comments.

Can I get updates on ICOC, CIRM and working group activities?

Yes. First, all updates are included on the CIRM web page. In addition, we can e-mail you notices of upcoming meetings of the ICOC and Working Groups and other CIRM work. Sign up for email alerts, press releases, or monthly digests by

creating a CIRM account and checking the appropriate email boxes.

What organizations are eligible to receive funding?

Any California-based profit or non-profit research institution may apply for funding. This page contains a complete list of all organizations funded by CIRM to carry out stem cell research. We also provide a searchable list of all stem cell grants awarded by CIRM.

What guidelines will be used for the award of grants?

Guidelines are adopted by the ICOC in the form of interim or final regulations. The status of all guidelines and regulations is included on the CIRM web site under CIRM Regulations.

Can the funding be used to fund research on human reproductive cloning?

No. Such research is specifically prohibited under Proposition 71.

Can I volunteer for the CIRM?

CIRM will consider all volunteer offers based on the business needs of the Institute and the qualifications of the applicant. If you are interested in a volunteer position at CIRM, please provide a cover letter and resume addressing your qualifications and interests and send electronically to jobs@cirm.ca.gov

Can I make donation to the CIRM?

Under Proposition 71, the ICOC is authorized to accept donations of "additional revenue and real and personal property [including cash], including, but not limited to gifts, royalties, interest, and appropriations that may be used to supplement annual research grant funding and the operations of the institute." To implement this section, the ICOC has adopted a policy and procedure on the acceptance of donated real and personally property.

"CIRM FAQ." California Institute for Regenerative Medicine. Web. 03 Nov. 2011. <http://www.cirm.ca.gov/cirm-faq>.