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Embryonic Stem Cells in the Political Arena & the Media's Eye

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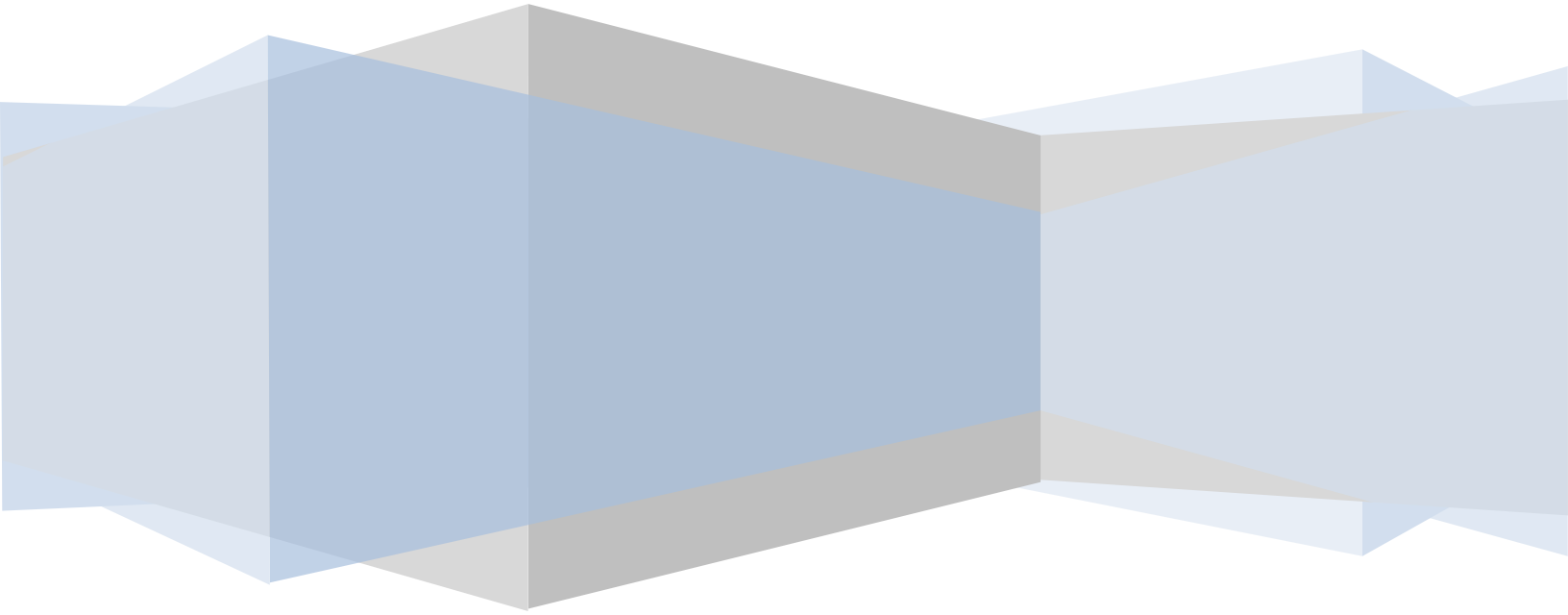

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Executive Summary

During the last two presidential elections, embryonic stem cells (ESCs) have been a major issue that voters have had to consider. In anticipation of it continuing to be a significant issue in the 2008 presidential election, this project's purpose was to explain the basic biology of ESCs, how they relate to the political and ethical issues surrounding their use, and the misconceptions that make it necessary to explain them more clearly.

An overview of the basic biology is provided to allow voters to examine the political debates more thoroughly and develop their own opinions. Alternatives to ESCs are also explained such as induced pluripotent stem cells, multipotent adult progenitor cells, and hematopoietic stem cells, although some of these alternatives may present drawbacks such as being tumorigenic. Since the political debate is mostly based upon ethics, voters should know the facts to apply them to their own ethical standards, not just those of each political party. With voters able to decide their stance on the stem cell issue, they will also be able to choose a candidate that best fits their views on this specific issue. The traditional stances of the major political parties cannot be applied to their respective candidates in this presidential election. In researching voting records of each presidential candidate, it was found that of the bills that have passed through the Senate, both Senator McCain and Senator Obama share a similar stance. Each supports funding for ESC research with limited ethical clauses such as no monetary gain and necessity of consent from donors. This is one of the most important findings in our research, since it significantly limited the potential of a focus point for voters to decide upon a candidate.

Knowing the background of stem cells helps only if it can be applied to the advancements of the issue. To allow voters to accurately interpret the media's reports on stem cell developments, reports were analyzed and compared to scientific journal reports on the same issues. While the media can deliver valuable information, it acts as a filter for medical journals and delivers only certain information. Stories are frequently embellished and make promises which have not come to fruition to date. This analysis allows voters to keep track of the debate through easily accessible and widely distributed forms of media such as newspapers without having the facts become skewed by the way a newspaper presents them.

The end result of this project is the simplification of the ESC debate for voters to quickly become educated and decide which candidate best fits their stance on the issue of ESCs in the 2008 presidential election.

Introduction

"Stem cells" is a household phrase and people around the world are continuing to gain awareness both of the potential scientific achievements and the moral disputes associated with the research. The potential use of embryonic stem cells (ESCs) to treat many diseases is extremely attractive, but the cost of destroying embryos may be too large of a moral price for many Americans to pay. As the presidential elections near, it is important for voters to understand the realistic applications of stem cells, current scientific expectations of stem cell research, and whether the candidates are for or against stem cell research, which is not always consistent with the Democratic or Republican Party's general stances.

For the past decade, the magnitude of the potential of stem cell research has been a focus of interest for science and a large source of debate for the general public. This issue was first focused on in the late 1990s when human ESCs were cultured for the first time. It was found that these cells possess the unique property of being able to self-renew and differentiate to become any other type of cell in the human body.

Although this immediately opened up the possibility of treating certain medical conditions that are due to the loss of a specific cell-type by replacing them with those created from ESCs, the subject became a political issue of ethics versus science. Opponents of ESC research argue that when embryos are destroyed, a necessity for acquiring ESCs, a human being is killed.

Opponents also argue that other sources of cells are available. Recently, there have been breakthroughs that allow pluripotent stem cells to be induced using adult cells, which do not require the destruction of embryos. On the other side of the argument, problems that cannot be overlooked exist with using induced pluripotent stem cells as alternatives; therefore ESCs are still considered the gold standard, offering important advantages as far as medical applications are concerned. One goal of this report is to help people who do not closely follow the scientific research literature understand the basics of stem cells, including the different types, the medical applications, and the possible alternatives.

Since this issue became a political topic, funding for ESC research has been limited by the federal government in the U.S. While some proposals for stem cell research funding have been approved by Congress, others have been voted against or set aside before a decision could be made. Since this issue is so prevalent in politics and the presidential election has put some of its focus on support or opposition by the candidates and their running mates, one purpose of this report is to make the general public aware of the candidates' stances on the issue. Observations will be made based upon not only what they have said and what they cite as reasons, but also how they have voted in the Senate to determine consistency between their positions and their voting records. This information was also used to predict the future of stem cell legislation, once the outcome of the presidential election is decided.

Stem cell research has been reported on frequently by the popular press. Unfortunately, because of widespread circulation, there is more exposure for most people to mainstream media such as newspapers rather than reports by scientists doing the actual research.[4] Another purpose of this report

is to make voters aware of the true present potential of stem cell research, pointing out the common dramatizations and presumptuous exaggerations made by the media.

The primary outcome of this report is the summary of results. The results are arranged in a user-friendly pamphlet (Appendix 1), which simplifies the complicated scientific, media, and political issues of stem cells. The pamphlet was distributed throughout the WPI campus a week before voting day (November 4, 2008) at spots designated for usual popular press distribution such as newspapers.

Methodology

To accomplish the goals of this project, slightly different methodologies were employed for each section. The different sections where methodology varied were the compiling of scientific knowledge, politically-related information, and media and journals.

The scientific knowledge was the first area of the project that we gathered sources for. We used textbooks to gather general knowledge of stem cells. The information from textbooks was very particular in the sense that it explained how stem cells can be applied, but it gave little to no timeline regarding discovery of applications. To explain stem cells in slightly more detail, we found several medical journals on the subject. We used original articles from when ESCs were first discovered and documented. Newer journals were used only from the times adult stem cells were being discovered and/or investigated.

Next we focused on gathering information for the political section. Most of our data came from the Government Press Office. From here we gathered the 2004 and 2008 party platforms, voting records, and bills affecting stem cell research and its funding. This information, combined with any press releases and speeches made by the candidates, allowed us to fully explain and support the candidates' apparent stances on the stem cell issue.

The final major segment of the report was the compilation and analysis of the media's reports to assess the accuracy of the information and whether or not it was appropriately conveyed when compared to the scientific journals upon which the articles were based. When searching for newspaper articles, the ones chosen for this project were the local ones. Several from the Boston Globe and New York Times were selected because of their wide distribution in Massachusetts and at WPI. A second criterion for the media articles was that they were spanned the past 10 years. Older articles were compared to more recent reports to allow analysis of the media's portrayal of stem cell research over the years.

These three major sections of the project were for the most part developed independently of each other since they each serve to accomplish a different objective. Compiling all three allows the one overall goal of the project to be accomplished. That one main goal is to allow voters to make informed judgments about the stem cell issue when they gain knowledge about the scientific aspect of ESC research, the political agendas and stances of each party and candidate, and can properly interpret the media's reports on updates about the issue.

Scientific Background

Embryonic Stem Cells (ESCs) are a special class of cells derived from 5-day-old blastocysts with age zero being the fertilization of the egg by the sperm.[5] These cells belong to a larger class of cells known as stem cells. Stem cells possess some very unique characteristics not found in other mammalian tissue cells: they have the ability to constantly self-renew. Most cells found in mammals do not divide, unless signaled by external chemical cues, and are lost through natural processes such as shedding of skin cells. These cells are replaced by either stem cells or cells derived from stem cells.

Self-renewal, in the context of cell biology, describes the ability of cells to replenish the population of cells lost in an organism. Stem cells, like most single-celled organisms, go through a process known as mitosis to produce more cells. The parent cell – the original cell – gives rise to two identical daughter cells, the products of mitosis. (Figure 1) The life-cycle of a cell is referred to as the cell-cycle and is comprised of distinct events in a determined order. The events of the cell cycle, which include both interphase and mitosis, are very strictly controlled through internal chemical signals. Most single-celled organisms and stem cells use this process to produce copies of themselves.[6] Unlike most single-celled organisms, most cells in mammals, such as heart cells and skin cells, do not follow the circular pathway shown in Figure 1. These cells during the G_1 phase leave the circular pathway and enter the G_0 phase. During this phase, the cells will go through all normal metabolic processes, except those necessary to prepare for mitosis. These cells will exit this quiescent phase if they are signaled by external chemical signals known as growth factors.[6] Stem cells, unlike all other cells in mammals, do not enter the G_0 phase and proceed with the cell cycle. The self-renewing stem cells, besides replenishing the stem-cell supply, constantly compensate for loss of other cell types and growth of the organism.[6] A great example of this is epithelial cells such as skin cells. Skin cells are constantly replaced by descendants of stem cells. This conversion of stem cells, which have the ability to self-renew, to specific types of cells such as skin cells, is known as differentiation.

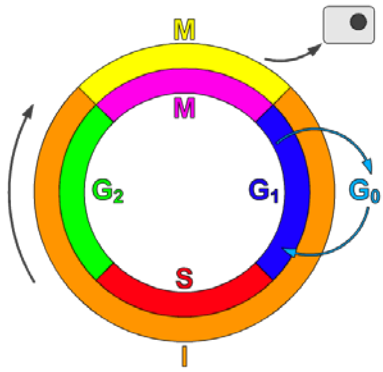

Figure 1: Cell Life Cycle.
The outer ring: Orange is interphase and the yellow is Mitosis. The inner ring: G1 (Blue) is the first growth phase, S (Red) is the DNA synthesis phase, and G2 (Green) is preparation of mitosis. G_0 phase (Turquoise) is the phase in which most mammalian cells reside.[3]

The process of differentiation allows stem cells to convert into all the other cell types found in the body. The transformation of stem cells to tissue-specific cells proceeds through intermediate steps in the form of different cell types, each becoming closer in structure and function to the final cell-type (Figure 2). A feature to notice of the expanding table is the lack of self-renewal except for the hematopoietic stem cell. Hematopoietic stem cells are one of the types of multipotent stem cells found in the human body. They give rise to all the different components of blood. The hematopoietic stem cell after mitosis produces a hematopoietic stem cell and either a myeloid or lymphoid cell. The myeloid and the lymphoid cells do not produce copies of themselves as they proceed through the cell cycle. Instead, they

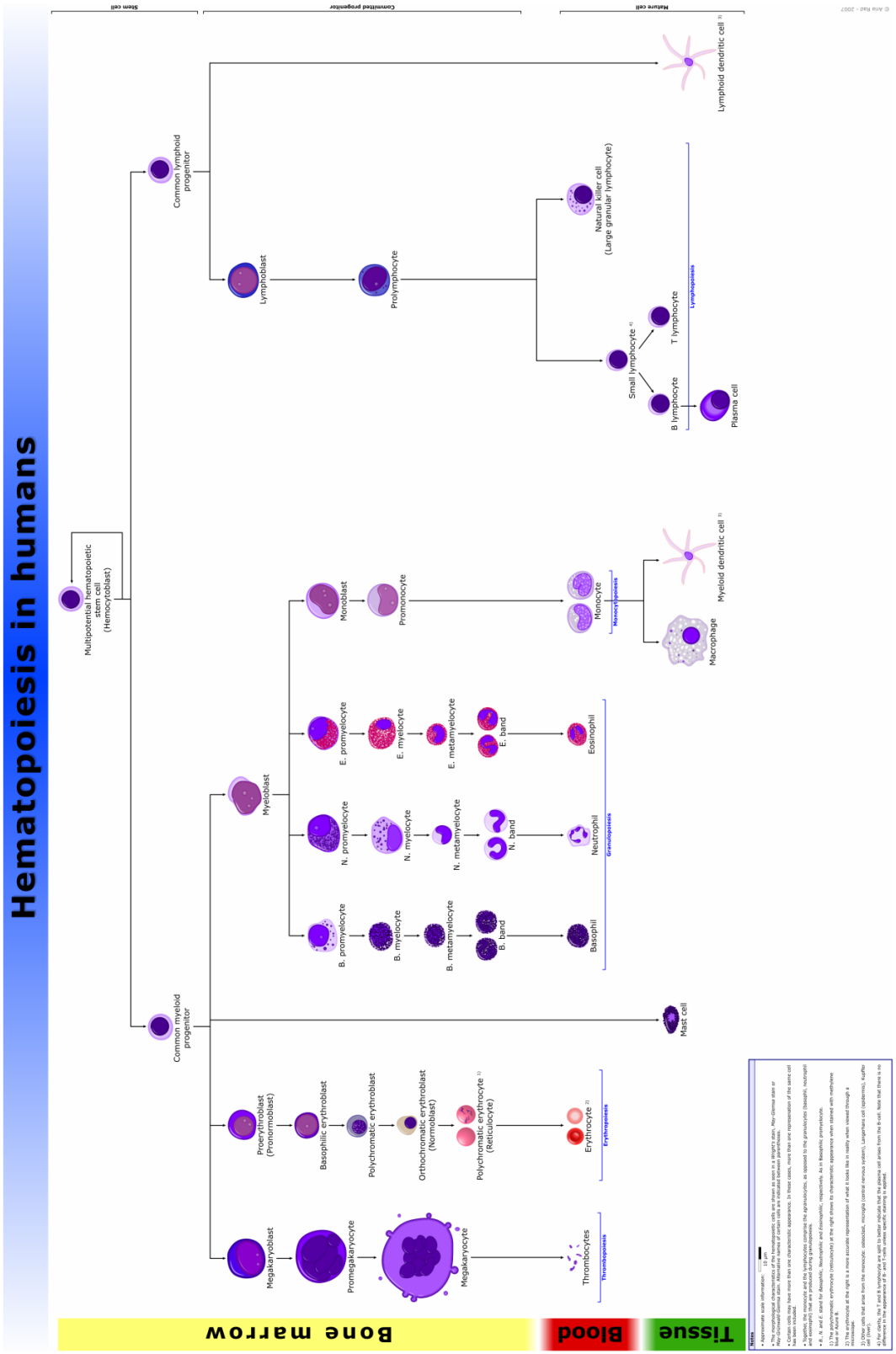

Figure 2: Hematopoietic Stem Cell Differentiation[1]

give rise to different cell types. This cascade continues until terminal cell differentiation is reached. In Figure 2, these would be erythrocytes, macrophages, platelets, granulocytes and lymphocytes.6 Another unique feature of the cascade is the increase in number of cells after each subsequent division. All the mitotic divisions, except for the mitotic division of hematopoietic stem cells, cause an increase in cell number. This exponential increase in the cell number has a very significant consequence. It allows one stem cell to give rise to many tissue cells such as red blood or platelets, and theoretically to an entire organism, if the stem cell is capable of dividing into all the different cell types necessary to produce an organism.

Stem cells with the ability to divide into any tissue in an organism are classified as pluripotent stem cells (Figure 3). These stem cells, during the development of an embryo, give rise to all three germ layers: endoderm, ectoderm, and mesoderm. The germ layers are layers of cells found in the growing embryo and have the ability to give rise to different organ tissues (Figure 3). These cells are considered to be stem cells, because they can give rise to different types of tissue cells; however, a particular germ-layer cell can only give rise to limited types of organ tissues. Pluripotent stem cells, during normal embryo development, arise from totipotent stem cells, which arise directly from the fertilization of an egg by a sperm. After the fertilization event the zygote or fertilized egg divides to give rise to a blastocyst. It is possible, through modern techniques pioneered by James Thomson, to extract ESCs from a blastocyst.[7] In the paper published by Thomson in 1998, embryos from in-vitro fertilization clinics were used to derive the cells. These embryos were obtained through donations from individuals with informed consent with the oversight of the institutional review board. In the paper, Thomson reported the derivation and culture of stable cell lines with characteristics very similar to stem cells from other primates. The derived stem cells also showed a normal karyotype.[7] A karyotype is a visual depiction of the chromosome structure of a cell achieved through the use of dyes. A karyotype analysis is important, to determine whether the expected number of chromosomes, 46 for human beings, is present within the cell. The karyotype also shows any abnormalities, such as missing pieces, in each of the chromosomes. Cells with abnormal karyotypes, especially aneuploid cells (cells with extra or missing chromosomes), can give rise to syndromes such as Down syndrome.

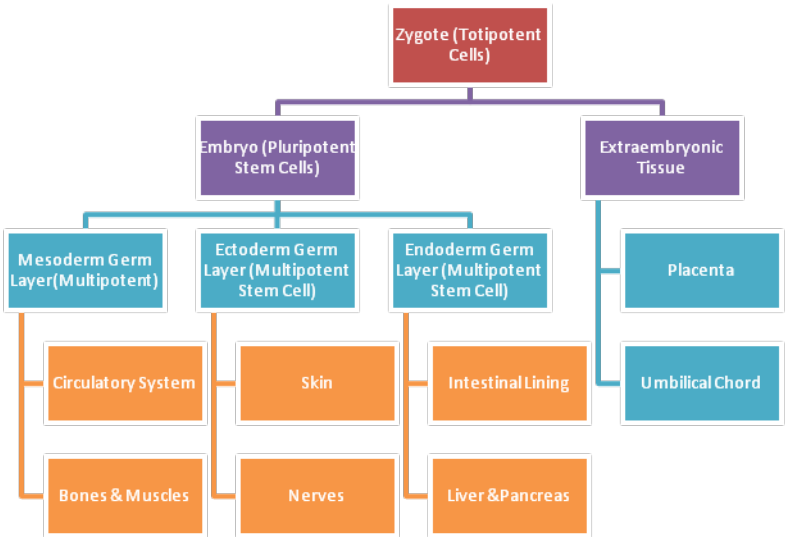

Figure 3: Cell Differentiation Hierarchy
The cells in similar color boxes can be considered to be on the same level in the hierarchy. The orange boxes are just a representative of the many different cell types which develop from the germ layers.

The derived stem cell line also showed high telomerase activity. Telomerases are enzymes involved with replacing the DNA lost from the ends of the chromosomes (known as telomeres) during the S-phase of cell cycle. High telomerase activity within a cell implies the ability to go through mitosis, because telomeres are necessary for cell division. During each cycle of DNA replication, which is performed during the S phase, cells lose pieces of telomeres unless they are replaced. The loss of telomeres can cause cell death or cell senescence. Senescence of cells refers to the loss of the ability to divide through mitosis, and cell senescence prevents cells from giving rise to other cells.[6] During the process of DNA replication, the replication machinery needs a starting point. These starting points, also known as primers, are composed of RNA. The primers attach to the DNA and the replication machinery replicates DNA in one direction. The replication machinery can replicate in only one direction; the chemical reasoning for this is beyond the scope of this paper. Due to the directional constraint on the replication, it is not possible for the replication machinery to replace the RNA primers with DNA and results in the loss of some DNA with the primer, resulting in shortening of the telomeres. This replenishing of the telomeres by telomerase allows cells to divide indefinitely; therefore, a high-level of telomerase activity indicates ability to divide indefinitely, a characteristic of stem cells.[6]

Thomsen's successful development of ESCs from blastocysts and the ability of ESCs to develop into many different tissues in the body provide many different potential therapeutic applications for ESCs. Although ESCs can theoretically provide treatments for different pathologies, the source of ESCs has caused controversy. Thomsen and his team used blastocysts donated from In-Vitro Fertilization (IVF) clinics to derive the cells. In-vitro fertilization, a medical procedure, involves the fertilization of an egg from the mother by the sperm from the father outside of the human body, essentially "in a test tube." Due to the complex nature of the process, many eggs are fertilized simultaneously to assure a few healthy and viable zygotes. The zygotes are allowed to develop for approximately 5 days and gauged for their health.[5] At this point, the cell mass develops into two different cell layers. The inner layer develops into the embryo. The outer cell layer is responsible for giving rise to all the structures necessary for supporting the embryo, later called a fetus, through the pregnancy (Figure 4). At this stage of development no prominent features such as germ layer cells or rudimentary organs are present, and the blastocyst must successfully attach to the uterus to continue developing. The blastocyst, from a scientific point of view, is a ball of cells with two distinct layers.[8] Depending on the health of the blastocysts and the number of children the couple would like, a fixed number of blastocysts are placed in the womb of the mother. The remaining, which are either deemed as extra or not healthy enough for transplantation into the womb, are either discarded as medical waste or frozen

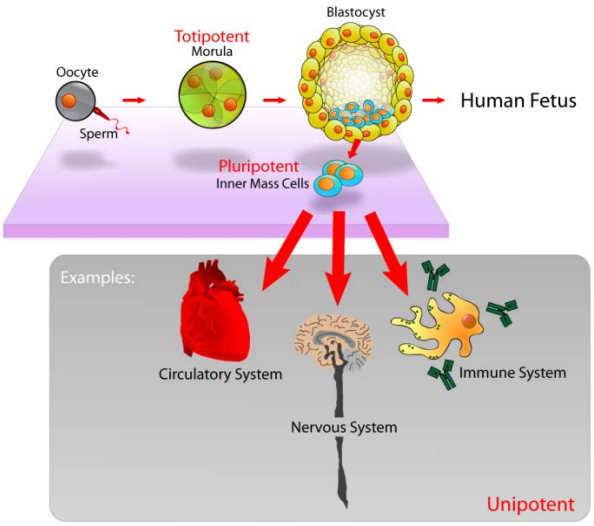

Figure 4: Schematic drawing of blastocyst development
The fertilized egg develops into a blastocyst (yellow ball) from which all human cells are created. The inner cell mass was used by Thomsen to create human ESCs.[2]

for later use.[5] When blastocysts are used for creating ESC lines by extracting cells from the inner cell mass, they are destroyed in the process.

Ethical Concerns

For many critics, destruction of a blastocyst is the destruction of innocent human life. The use of blastocysts from IVF clinics also gives rise to issues such as human cloning and embryo farming, which are considered unethical by both the proponents and the critics of ESC research. Embryo farming refers to a practice of intentionally fertilizing eggs to extract cells or organs from the fetus with no intention of bringing the embryos to term. The critics of ESC research also bring about the ethical arguments regarding possible inception and growth of embryos for the sole purpose of providing ESCs for therapeutic uses, because it would translate to the destruction of one human life for the benefit of another. The critics also argue for the use of alternatives. These alternatives are adult cells which have been shown to have similar properties as embryonic stem cells.

Non-Embryonic Stem Cell Sources

IPS Cells

One of the obstacles facing therapeutic research with ESCs is the low number of cell lines and the lack of federal funding for the creation or use of any new stem cell lines. The lack of funding and scarcity of cell lines has increased research in possible alternatives to ESCs. The research in this field has boomed lately due to the discovery of procedures allowing the reversal of the differentiation process, essentially allowing differentiated, tissue-specific cells to enter an embryonic stem cell-like state. These cells are referred to as induced pluripotent stem cells. (iPS cells)

The induction of an ESC-like state in differentiated cells requires a significant disruption in the normal cell cycle pathway in the form of introduction of four genes, *Oct3/4, Sox-2, c-Myc,* and *Klf-4*, through the use of a retro-virus.[9] According to an article, describing the conversion of adult human cells into pluripotent stem cells, published in the journal Cell in 2007, *Oct3/4 and Sox-2* are transcription factors and increase the expression of genes that give cells stem-cell like characteristics, whereas the *Klf-4* allows the *Oct3/4 and Sox-2* to interact with DNA.[10] Transcription factors are proteins that bind to DNA and regulate gene expression in a cell. Gene expression is extremely important, because changes in gene expression have consequences on all the different processes occurring in a cell. The difference in these processes provides for the diversity amongst all the cells found within the human body. The addition of the four genes affects the morphological characteristics of the cells – the physical structure of the cell –, especially the expression of certain genes and endows upon the cell the ability to self-renew. The gain of the self-renewal ability is one of the unique characteristics of stem cells. These cells were also shown to differentiate into neural and cardiac cells.[10] The transcriptions factors used, especially *c-Myc*, are known to induce tumors in normal mammalian cells. Tumor generation was observed in approximately 20 percent of the cells, a risk too high for therapeutic use.[9] It is important to note that generation of a specific type of tumor (known as a teratoma) in mice is one of the criteria for classification as stem cells. Therefore, the potential for tumorigenesis is not necessarily an undesirable feature. It is not known whether the cells continue to produce tumors after they have differentiated into a particular cell-type.

Hematopoietic Stem Cells

Aside from induced pluripotent cells, there are other alternatives to ESCs. One is the use of multipotent cells available in the patient's body. This includes hematopoietic stem cells found in the bone marrow of patients. There are key advantages to using a patient's own cells, including the elimination of tissue rejection. The varying amount of different multipotent cell populations available in the body can limit their therapeutic use, especially in areas where very few multipotent cells support a large population of

differentiated cells. The most promising results are seen with hematopoietic cells partly due to the extensive knowledge of the pathologies concerning these cells and their presence all around the body. One study showed the use of hematopoietic stem cells for retinal rod regeneration in mice. The data published in the same paper also showed the positive effects to the nerves near the rod.[11]

Multipotent Adult Progenitor Cells

An alternative similar to hematopoietic stem cells that showed some positive results, at least in mice, is the use of multipotent adult progenitor cells. An article published in the journal Nature in 2002 showed differentiation of mesenchymal cells into representatives of all three germ layers: mesoderm, endoderm, and ectoderm. Mesenchymal cells are derived from the mesoderm and give rise to various different kinds of connective tissue within the body. These cells, when injected into blastocysts, contributed to most of the different somatic cell types. Somatic cells are cells that are present in an organism but do not give rise to a sperm or an egg. This data shows the ability of these cells to differentiate into all different types of cells. The paper also reports the expression of mouse ESC markers on these cells, indicating that these cells may behave like mouse ESCs in response to external messages from other cells in the body. These cells were also shown to lack teratoma formation in mice. The lack of teratoma formation combined with other data such as the presence of certain markers and differentiation observation show possible therapeutic potential. There are key advantages to using cells found within an individual. One of the greatest impediments in organ or cell therapy is the rejection of organs or cells.[12] It is possible to avoid rejection of the therapy by using the patient's own cells, because the body will recognize them as part of it rather than an external entity. These cells, according to the Nature 2002 article, can be used as model for therapeutics for diseases such as muscular dystrophy.[12]

Although hematopoietic stem cells and multipotent adult progenitor stem cells do show potential as an alternative to ESCs in certain areas, there are still conditions for which ESC therapeutics are the only cellular therapies possible. Many of the conditions dealing with the nervous system such as Alzheimer's and Parkinson's disease have only shown successful pre-clinical (mouse studies) results in studies with ESCs.

Stem Cells in National Legislation

Ethical Dilemma

Currently embryonic stem cells are derived from unused blastocysts acquired from IVF clinics. The source of the embryonic stem cells causes an ethical dilemna. This ethical dilemna is usually a deciding factor from many who wish to take a stance on whether to support or oppose ESC research. ESC research in the past has been a very heavily debated issue (Figure 5), and it brings in arguments from the political and religious realms. Like many national issues, the two major political parties have differing views on the subject of ESC research. The Democratic Party supports expansion of stem cell research, whereas the majority of the Republican Party does not support the expansion of ESC research. (Table 1) Before proceeding with the discussion of the difference in arguments between the supporters and the critics, it is very important to delineate between different types of stem cell research projects and initiatives. It is very common to group all research pertaining to different kinds of stem cells under a generic umbrella term; however there are significant differences between the groups. This delineation, mainly between adult stem cell research and ESC research, is important to understand the political and ethical arguments on the subject. The definitions vary depending on the use of the cells and the source of the cells. For the context of this report, ESCs are cells that use the blastocyst as the source of the cells. As mentioned in the background section, these cells are pluripotent and give rise to all three germ layers. Multipotent cells (such as hematopoietic stem cells) show properties of stem cells but do not give rise to all different types of tissues in the body. Many critics of ESCs are proponents of adult stem cell research. This includes research to find therapeutic uses and alternative sources, like those mentioned earlier, to ESCs. Many members of the Republican Party, who do not support funding of new ESC lines, support the funding of research aimed towards finding alternative sources of stem cells.

Supporters of embryonic stem cell research say...	Opponents of embryonic stem cell research say...
• Stem cells may be useful to treat many diseases.* • The embryos for experiments would otherwise be discarded as medical waste or frozen for storage in IVF clinics. • Alternative stem cell sources have more limited therapeutic potential	• Obtaining the stem cells requires the destruction of embryos. • The destruction of one human embryo is too high of a price to pay for the benefit of another. • Many alternatives are available with therapeutic uses (i.e. adult stem cells from skin, blood, or bone marrow).

* A unique characteristic of embryonic stem cells is that they have the ability to become any cell type in the human body.

Figure 5: Key Statements in the Embryonic Stem Cell Debate.

The critics of ESC research – both Democrats and Republicans – have one common opposition: the destruction of human life in the process of creating stem cell lines. Many critics of ESC research consider the fertilization event – the meeting of the sperm and the egg – as the beginning of human life. According to the critics, the blastocyst is considered to be a human being rather than just a body of cells, and the destruction of the blastocysts is the destruction of innocent human life.[13] This argument, at its root, is very similar to the controversy regarding abortion. This does not imply that there is any

correlation between the stance of an individual on the issues of abortion and embryonic stem cell research. However, the supporters of ESC research do not consider the fertilization event to be the beginning of human life. According to the supporters, the destruction of blastocysts used for creating the ESCs are not human fetuses, and the destruction of blastocysts is considered to be different from the destruction of a human being. Although the supporters of ESC research do not consider the destruction of a blastocyst equivalent to the destruction of innocent human life, many supporters still do not support the creation of blastocyst for the sole purpose of its destruction to produce ESC lines. The controversy may disappear, if it was possible to scientifically show the loss of one cell from the blastocyst is not detrimental to the blastocyst. Although the experiments to prove this would be unethical, some scientists have observed under control settings the growth of blastocysts used to derive embryonic stem cells. These blastocysts were stopped very early in the growth process.[14]

Stem Cell Legislation

Four pieces of legislation were analyzed to study the views of Senator Barack Obama and Senator John McCain. The voting record on the issue is short not due to a lack of bills and initiatives; rather many relevant bills have been introduced and have been given to committees. Many of these bills have been in committee for 5-6 years. These bills may never be discussed or are being superseded by more pressing issues such as economic conditions. The four pieces of legislation, which were voted upon by the Senate, included two bills which were very similar to each other: Senate 5 (S 5; Appendix 4) and House of Representatives 810 (HR 810; Appendix 2). Both of these bills were Stem Research Enhancement Acts with the goal of allowing further creation of stem cell lines with ethical clauses. These bills were intended to remove the ban introduced by President Bush at the start of his first term on the funding of newly created ESC lines. The bills provided necessary checks to prevent unethical use of blastocysts such as producing an annual report for Congress regarding all of the activities performed through federal funding.

S 5, the Stem Cell Research Enhancement Act of 2007, also supported the creation of funding for alternative stem cells sources. These alternative sources, as discussed above, do not require the destruction of embryos, while providing cells with all the necessary characteristics for therapeutic use. Another bill supporting alternative pluripotent stem cell derivation is Senate 2754. Senate 2754, also known as the Alternative Pluripotent Stem Cell Therapies Enhancement Act, provided for more funding into ESC alternatives. This act also promoted a priority system for near-completion therapeutics to accelerate this research rather than new and exploratory research.

The last relevant piece of legislation also provides the only voting disparity between the two Senators. Senate 30, also known as the HOPE Act, has many of the same clauses as the previously discussed pieces of legislations with one exception: it specifically requires that scientists not alter any timing mechanism of blastocysts to derive human ESCs. This prevents the derivation of ESCs from blastocysts. At the roll-call vote for this particular legislation, Senator Barack Obama voted against the bill, whereas Senator

John McCain voted for the bill. Both candidates voted along party lines; however Senator McCain had previously voted against his party on the Stem Cell Research Enhancement Acts (Table 1).

Impact in the Legislation

Table 1: Senate Votes on Key Stem Cell Bills

	Obama	McCain	Biden	Republican Party	Democratic Party
Passage of H.R. 810 Stem Cell Research Enhancement Act of 2005 (Appendix 2)[1]	Yea	Yea	Yea	Nay	Yea
Passage of S. 2754 Alternative Pluripotent Stem Cell Therapies Enhancement Act (Appendix 3)[2]	Yea	Yea	Yea	Yea	Yea
Passage of S. 5 Stem Cell Research Enhancement Act of 2007 (Appendix 4)[3]	Yea	Yea	Yea	Nay	Yea
Passage of S. 30 Hope Offered through the Principled and Ethical Stem Cell Research Act (HOPE Act) (Appendix 5)[4]	Nay	Yea	Yea	Yea	Nay

Notes:
[1] HR 810 provides funding for embryonic stem cell research. (See Appendix 2 for full text)
[2] S 2754 supports alternatives to embryonic stem cell research and supports research of treatments. (See Appendix 3 for full text)
[3] S 5 provides funding for embryonic stem cell research as well as alternatives. (See Appendix 5 for full text)
[4] S 30 would put more funding into alternatives to embryonic stem cell research, but saying yea does not necessarily mean the candidate opposes embryonic stem cell research. (See Appendix 6 for full text)

The ethical dilemmas have shaped the legislation, and the effect is seen very clearly in the bills passed by the Senate and the House regarding ESC research. The bills pertinent to this issue have one common thread: the ethical clauses put on the sources of the embryos. Both The Stem Cell Research Enhancement Act of 2005 (HR 810; Appendix 2) and the Stem Cell Research Enhancement Act of 2007 (S 5; Appendix 4) address the issue of federal funding for the establishment of new ESC lines. The bills consisted of ethical clauses limiting the source of ESCs and the procurement of these sources. The most common source of ESCs cited in the congressional bills is blastocysts from in-vitro fertilization clinics.

The ethical clauses found within HR 810 and S 5 consisted of clauses to prevent intentional creation of blastocysts for the purpose of ESC line development or the commercialization of the blastocyst donation process. Each bill put forth explicit requirements regarding the source of the blastocyst. For federal funding of the research, the bills require the blastocyst to be created for fertility treatment and to be in excess of the need of the fertility treatment. The bills also prohibit any monetary compensation for the individuals who decide to donate the blastocysts to prevent all and any motivations for the intentional productions of the blastocysts. The bill further requires only those blastocysts that would never be placed in a woman's womb be used for the creation of embryonic stem cell lines. This clause is necessary due to the Snowflake Program, which gives the individuals who donated the egg and sperm the option of donating the blastocysts to other individuals. The Snowflake Program is not a government supported program rather it is a program which is supported through a private organization: Nightlight Christian Adoption. The Snowflake Program, like any other adoption agency, provides matching service for biological parents and adopting parents; however unlike other adoptions, an embryo adoption is given birth by the adopting mother rather than the biological mother: egg-donor.[15]

Presidential Candidate Stance

Figure 6: Graphic depicting the views of the two Presidential Candidates on the issue of ESC research.

The two stem cell research enhancement acts discussed above were approved by the Senate and the House. The votes in the Senate on the two bills show an interesting trend between the two candidates. Senator McCain, the Republican Presidential candidate, Senator Obama, the Democratic Presidential Candidate, and Senator Biden, the Democratic Vice-Presidential Candidate, all voted "yea" on this bill (Table 1; Figure 6). The votes of Senator Obama and Senator Biden can be expected, because they are in agreement with the Democratic Party line of supporting ESC (Cartoon 1).[16,17,18] Senator McCain's vote for the passage of both HR 810 and S 5 are not in accordance with the Republican Party line. The voting records indicate a similarity in opinion between the two Presidential candidates and the Vice-Presidential candidate. This similarity is further extended in the statements made by Senator McCain and Senator Obama on the issue of ESC research, in particular the funding of new cell-line creation. Both Senators McCain and Obama addressed the importance of creating new cell lines in a regulated and ethical manner. Both addressed the issue of "embryo-

Cartoon 1: This political cartoon mocks the Democratic Party for their united support for stem cell research. Used with the permission of Grimmy, Inc. and the Cartoonist Group. All rights reserved.

harvesting." Both senators, in their floor statements, implored the Senate to approve the bill due to the possible therapeutic uses of stem cells. They both consider ESC research to be a necessity and believe the ethical concerns can be addressed through proper regulation and control of the research. Both Senators also acknowledge the need for legislation due to the highly unregulated research occurring in the private industry.[19,20]

Political Party Stance

Unlike the shared opinions of the Presidential candidates, Senator Obama and Senator McCain, there is a clear difference in the stance of the two political parties on the issue. The Democratic Party, as seen in Table 1, supports the expansion of embryonic stem cell research and the lifting of the current bans on federal funding of newly created stem cell lines.[17] The current push for lifting the bans is especially evident in the voting record of Senator Obama, who rejected the passage of Senate 30. Senate 30 proposes allocation of funding for alternative sources, which Senator Obama supports, but the bill also puts stringent restriction on the funding available to new stem cell lines. These restrictions, in most cases, render the creation of new federally-funded embryonic stem cell lines impossible.

The Republican Party, unlike the Democratic Party, does not support the expansion of embryonic stem cell research. The arguments used by the Republican Party are similar to the arguments used by the critics of embryonic stem cell research: the destruction of human embryos. The Republican Party, as seen in Table 1, does support the funding of alternatives and many members of the Republican Party are proponents of non-embryonic stem cell research. The views of the Republican Party, at least in the party platforms, have changed from the 2004 Presidential Election to the 2008 Presidential Election. In the 2004 Party Platform, the Republican Party provided a very thorough explanation defending the party stance on the issue.[21] In the 2008 Party Platform, the issue of embryonic stem cell research is mentioned and the party stance is stated, but unlike the 2004 stance, the 2008 stance is written in a less strongly-worded manner.[22]

Future of Stem Cells in Legislation

Cartoon 2: A political cartoon mocking the Bush embryonic stem cell policies.
Used with the permission of Grimmy, Inc. and the Cartoonist Group. All rights reserved.

The election of the Democratic Party presidential candidate, Barack Obama, will change the course of stem cell legislation. President Bush, the incumbent President, severely opposed ESC research requiring the further destruction of human embryos and creation of new ESCs (Cartoon 2). President Bush vetoed both HR 810 and S 5; HR 810 (Appendix 6) was the first presidential veto used by President Bush during his 8-year presidency. On the other hand, President-Elect Obama's voting record in the Senate shows a clear and strong support for the advancement of all aspects of ESCs, including the development of new ESC lines and new alternative ESC sources. While Barack Obama's current Senate voting record would indicate he would sign bills advancing ESC into law, Barack Obama is a strong advocate for ethical research. Barack Obama cites the lack of ethical limitations in legislation of other foreign nations and the lack of ethical limitations in the private sector as a reason for the further expansion of government-supported ESC research in the US.[19] ESC bills during the Obama Presidency must contain clauses establishing ethical guidelines for research. These may include clauses establishing no intentional creation of embryos for cell line derivation and establishing conditions preventing any financial gain from occurring for the production of these embryos. Both of these clauses along with other more restrictive clauses were found in both S 5 and HR 810. The control on financial gain from the production of embryos is necessary to pursue ethical and humane research, but a constant supply of embryos would be necessary to provide new cell lines as ESC lines were established from cells derived from blastocysts.[7] The lack of financial gain from the production of a steady supply may deter industries within the private sector from providing a supply. The derivation of new stem cell lines from blastocysts poses another issue: storage of blastocysts. Blastocysts need to be stored in liquid nitrogen or cold gaseous nitrogen for long term storage, which is expensive.[23] Currently, due to the ban on federal funding for the creation of new stem cell lines, blastocysts are only stored for IVF patients, and the cost of this is incurred by the donors of the egg and the sperm.[5] With the possible use of blastocysts to create ESC lines, possible legislation would need to include clauses establishing procedure for transfer of ownership and whether the parents are provided by the research organization with the cost incurred by the parents in the storage of embryos A clause establishing the burden of payment during any transfer of ownership, if such term is appropriate, would also violate the current clause prohibiting any money transfer for the procurement of blastocysts to prevent embryo farming. Due to the complex economic issues posed, any legislation would need to establish clear boundaries regarding any costs incurred during the development of ESC lines, as well as who is to incur the cost.

Although a Democratic Congress and a Democratic President would further the progress of embryonic stem cell research legislation, the issue of stem cells is many times overshadowed by other issues, especially economic issues. During the Bush Presidency, only two stem-cell related bills introduced in either the Senate or the House reached the President's desk: S 5 and HR 810. This number can be contrasted with the approximately 2000 bills which have been enrolled by the Senate and the House and sent to the President's desk during the Bush Presidency. Aside from S 5 and HR 810 other stem cell bills have been introduced into the Senate and the House, but these bills have yet to leave committees or be passed by both the Senate and House, and many are being postponed for other issues.[i] This may change once President Obama takes office. According to his Chief of Staff, Rahm Emanuel, embryonic stem cell legislation change is on the Obama priority list, second only to child health-care.[24] This may be a sign for a prosperous and active future for embryonic stem cell research legislation.

[i] A search of the legislative database THOMAS at Library of Congress with Keywords "Embryonic Stem Cell Research" yields many different bills and most these bills are on committee calendars.

Media and Journals

Late 1990s

Originally, ESCs were covered by the media because of their novelty. The focus of new articles in the late 1990s was on stem cells in general, because lay audiences were not yet familiar with them to any extent. On the other hand, scientists were also not yet very familiar with them, either, and as a result, were not sure how easily they could be manipulated and used for clinical treatments. Articles reporting on early stem cell research sometimes made claims that seemed too good to be true and in most cases were, but this was not always the case since there were no high expectations of stem cells like there are today.

One such article, "Engineering body parts from scratch," appeared in the November 11, 1999 issue of The Boston Globe. The article explores the potential of constructing parts of the body using stem cells in order to renew a person's soft tissues, cartilage, ligaments, and bone. It reports that these replacements are "not far off, scientists say."[25]

The article presents these predictions, but does not report any actual advances regarding the research of stem cells. The only information it has about stem cell research that has been completed is that scientists isolated them for the first time less than a year before the article was published. It never suggests any reasons why manipulating stem cells should be a simple scientific feat, nor does it provide any research results that scientists are actually near completing construction of "body parts from scratch" other than scientists saying they are.[25]

Another article, written and published around the same time, is less misleading when discussing the medical advances using stem cells, demonstrating an inconsistency in overall media reporting regarding stem cells. The article, "Boy cured using experimental blood transfusion" was released by the Associated Press on December 13, 1999. It reports on an operation which had been performed a year prior. A 13-year-old boy had umbilical cord blood stem cells transplanted to replace his bone marrow, and he was declared cured one year later. At the end of the article, it very plainly states that the success rate of such an operation is estimated to be 50-50 so it does not mislead readers into thinking the operation is flawless.[26]

Although no medical journal articles were referenced or cited, one had been published in 1998 reporting results of the first 50 patients undergoing the transplantation in Belgium. It more than validates the newspaper article, actually reporting survival rates from the transplantations at over 80%.[27]

From these two articles, no conclusion can be made about the consistency of exaggerated claims when stem cells were first reported on. It should be noted that neither article cites any scientific journal article, which makes it difficult for the reader to determine the validity of claims.

Early 2000s

As years passed, the media focused less on explaining basic principles than they did when stem cells were first discovered. In the early 2000s, ethical issues were more frequently the focus of news articles. One article that demonstrates this is "'Politically Correct' Stem Cell is Licensed to Biotech Concern," even mentioning the political agenda in the title.[28] The article does not go into much detail about the actual science of stem cells; instead, it focuses on the companies that are researching them and which stem cells they are researching specifically.

The type of stem cell, whether embryonic or adult, is the focus of the political controversy, as it still is today. The article only focuses on the politics and business aspects of the situation because the scientific aspects in this case are controversial in the sense that no real evidence has been published that the adult stem cells they use are actually as versatile as ESCs.

Published around the same time as the newspaper article were three science journal articles, co-authored by Dr. Catherine M. Verfaillie, who was credited with the discovery of multipotent adult progenitor cells in the newspaper article. In each of these journal articles however, it clearly states that the cells discovered are multipotent, rather than the more versatile pluripotent ESCs.[12, 29, 30] The newspaper mentions that they are multipotent, but at the same time claims that they are no less capable of differentiating as totipotent ESCs are.[28]

There is one medical prediction made in the article, and it is not until the very end. After only discussing rights to the research, the article ends by making the prediction that the company conducting the research, Athersys, hopes "to start the first clinical trial using the cells, probably to treat a rare genetic disorder, in two years."[28] Based only on this information, it is impossible for the reader to gather any further information about the type of genetic disorder, whether or not the scientists think it will be successful, whether or not these new types of cells will actually live up to expectations, or whether or not any genetic disorder can reasonably be expected to be cured in a matter of a few years.

Other media articles around this time start delving into the science behind stem cells more than in the past. One article published in the New York Times, "Progress Is Reported on Parkinson's Disease," specifically mentions chemicals and genes used in the experiments. It describes experiments in which Parkinson's-like symptoms were induced by chemicals in mice so that they could be cured by ESCs.[31]

The results are presented, but can be misleading to the reader. The article is set up so that the more promising aspects of the research are mentioned first, and the scientists that are quoted are much more optimistic at first. Even the title sounds promising, as well as the pull-quote in the middle of the page. Near the end of the article however, the scientists still say that "a lot of work is needed to straighten out the kinks." This does not stop them from predicting clinical trials to begin in about four years.[31]

The medical journal article that the newspaper article is based on provides much of the same hope for potential treatment of Parkinson's disease, but it also points out the drawbacks which the newspaper failed to mention. This treatment may result in the formation of tumors if the cells continue to divide in

vivo. Also, there is potential for schizophrenia, which is related to the dopamine and serotonin neurons. These potential flaws alone require much more long-term research.[32]

Although the newspaper articles from the early 2000s are more scientifically involved, based on scientific journal publications, and even point out some of the pessimisms that come with stem cell research, they tend to exaggerate the results or present them in a misleading way.

Late 2000s

In the past, the political implications of supporting or opposing ESC research have been apparent, but were not as significant as recently. Even around election times, it was a matter of ethics without emphasis on alternatives. With the recent breakthrough of being able to induce pluripotent cells from adult stem cells rather than using cells from human embryos, as well as the upcoming election, the political debate has been reinvigorated.

There have been several articles in the past year that have reported on this new form of stem cells, and they all focus on discussing the political implications of the achievement. One article, published in The Boston Globe in November 2007, describes the new cells and how they are pluripotent just like ESCs. It does not make it through the first paragraph without introducing the theory of ending the stem cell controversy "avoiding the controversial creation and destruction of embryos."[33]

One hailed aspect of the new embryonic-like cells is the fact that they are not exempt from receiving federal funding. There is a clear difference in opinion between scientists and religious activists shown. The scientists believe it is good that funding may be made available to research this alternative to ESCs, but they make it clear that "this is early stage research, and we should not abandon other areas of stem cell research." On the other hand, religious activists are fully ready to completely support the move from embryonic cells to induced pluripotent cells.[33]

When new stem cell discoveries are made, such as the original stem cell research or induced pluripotent stem cells, the media tends to pay more attention to and have a lot of hope about these endeavors. Once more research is done and obstacles are discovered, articles in the last year or so tend to be more based upon the political debate in the sense that they present facts from both sides of supporting and opposing ESCs and/or moving to induced pluripotent stem cell research only.

An article published several months after the initial repot of induced pluripotent stem cells being created, "Stem-Cell Researchers Claim Embryo Labs Are Still a Necessity," points out that there are shortcomings in the new techniques. Scientists in the article point out that until the differences of induced pluripotent stem cells are remedied, "Human ESCs will be better, even if they are more complicated politically."[34]

A medical journal article published six days later confirmed that there were still significant problems to overcome before induced pluripotent stem cells can justifiably be able to replace embryonic research. There are still unknowns about how induced pluripotent cells are actually created. Scientists are not sure exactly what the four genes used to induce pluripotency do to a cell; there may be other ways to reach the same end result.[35] Also, as it said in the newspaper article, the risk of teratomas forming is potentially greater than with ESCs.[34]

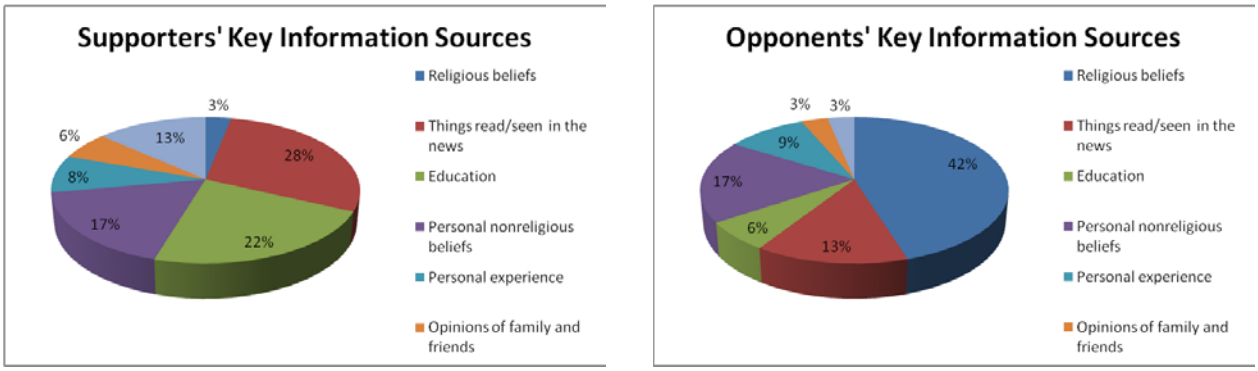

Figure 7: Key Information Source for Supporters and Opponents of Stem Cell Research

An article published in The Boston Globe three months later once again focuses on the therapeutic uses, but is more realistic about the immediate potential of the research than newspapers in previous years. The article describes advances made by alleviating the symptoms of Parkinson's disease in mice using induced pluripotent stem cells. MIT scientist Rudolph Jaenisch is quoted saying that "These cells are more readily available and much less controversial than ESCs. But they seem to have identical potential."[36]

The medical journal referenced justifies the article, coming to the same conclusions as the newspaper. It describes the potential of induced pluripotent stem cells and is relatively optimistic, even while pointing out the obstacles still standing in the way of full confidence.[37]

This is the point that the media has arrived at in the face of the presidential election. Rather than exaggerating much like what had been done in the past, both sides of arguments are usually realistically presented to show that the political argument is alive.

Conclusion

The main argument against ESC research is the fact that destruction of embryos is necessary for the research to continue. Political rivals of ESC research point out that there are several equal alternatives. Although these alternatives to ESCs, such as iPS cells, MAPCs, and hematopoietic stem cells, show characteristics similar to ESCs, the current data does not conclusively show that these alternatives can effectively replace ESCs as therapeutics.

The media has played a large part in informing the public about stem cell research, its developments, and its disputes (Table 2; Figure 7). There are some false perceptions of the capabilities of stem cells because of early exaggerations made by the media. It is important for the general public to understand that although embryonic stem cell research provides the potential for cures of certain diseases, they are very far off. More recently, newspaper articles have been specifically based on reports in medical journals and tend to deliver more accurate information. Also, influenced by the political and ethical rivalry, the media tends to present both sides of every argument, which is more beneficial for readers (Figure 8).

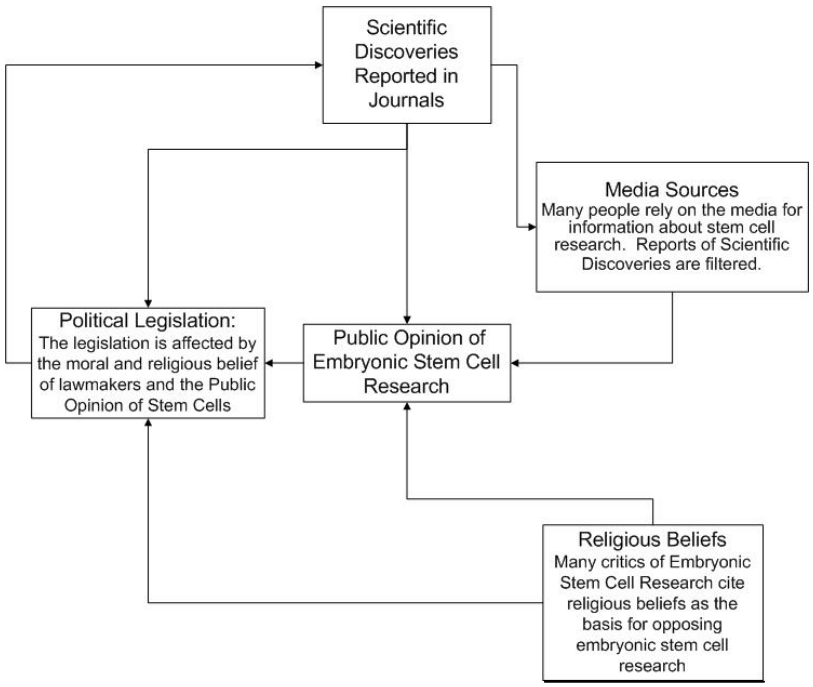

Figure 8: Schematic representation of the interactions between different groups that affect embryonic stem cell research.

With the proper interpretations of the popular press, readers should be able to make more informed decisions about their stances on stem cell research and choose an appropriate presidential candidate. This is where the past legislation becomes important. The most important finding of this report shows

that Obama and McCain have similar views on stem cells, in contrast to the opposing stances of their respective political parties (Table 1; Figure 6).

This means that choosing either candidate to be the next President would be likely to yield the same potential for stem cell bills to be signed into laws. Since Obama was elected President, it is expected that more bills will be passed through the Senate and House. This will happen because it is less likely that the bills will be vetoed such as the two that reached President Bush's desk. Also expected is the content and restrictions that will come along with the bills. Obama will be more willing to pass bills which outline specific ethical restrictions such as no creation of embryos for the purpose of destroying them for research. The enactment of any further embryonic stem cell legislation will add to the relatively brief, but still very eventful history of embryonic stem cell research (Figure 9).

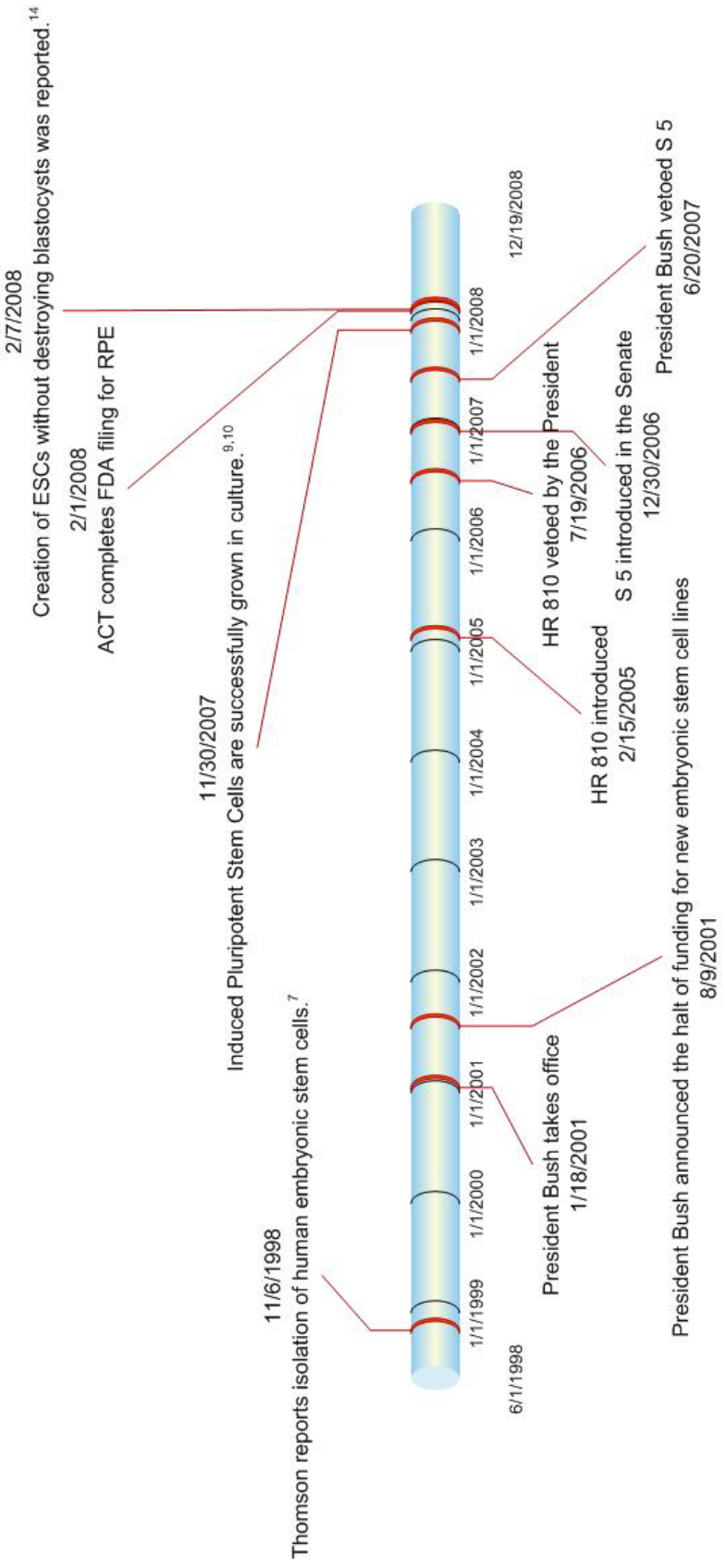

Figure 9: Timeline of Relevant Events in the 2000's.

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Appendices

Appendix 1: Voter's Pamphlet

Appendix 2: House of Representatives 810

Appendix 3: Senate 2754

Appendix 4: Senate 5

Appendix 5: Senate 30

Appendix 6: House Document 109-127: Veto to HR 810

Appendix 7: Senate Congressional Record S8060-S8061: Veto to S 5

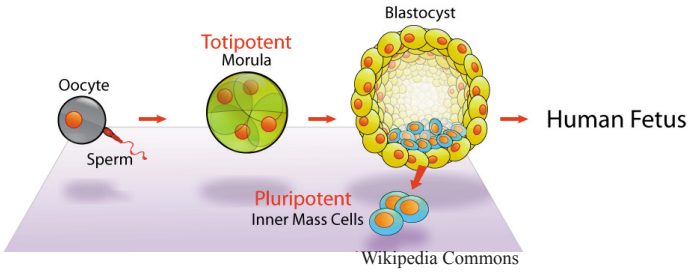
Appendix 1: Voter's Pamphlet

Embryonic Stem Cells in the Political Arena: Fact vs. Fiction

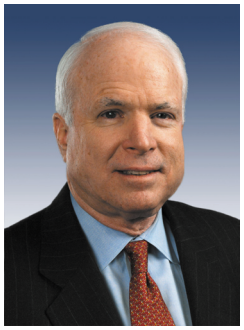
A voter's guide to the issue of stem cells in the Presidential Election.

In this guide:

- Stem cell debate



- Pros/cons of embryonic stem cell research



- Presidential candidates' voting records on stem cell legislation

Stem Cell Politics

Why the debate?

Supporters of embryonic stem cell research say...

- Stem cells may be useful to treat many diseases.*
- The embryos for experiments would otherwise be discarded as medical waste or frozen for storage in IVF clinics.
- Alternative stem cell sources have more limited therapeutic potential

Opponents of embryonic stem cell research say...

- Obtaining the stem cells requires the destruction of embryos.
- The destruction of one human embryo is too high of a price to pay for the benefit of another.
- Many alternatives are available with therapeutic uses (i.e. adult stem cells from skin, blood, or bone marrow).

* A unique characteristic of embryonic stem cells is that they have the ability to become any cell type in the human body.

Presidential candidates' voting records

	Obama	McCain	Biden	Republican Party	Democratic Party
Passage of H.R. 810 Stem Cell Research Enhancement Act of 2005 [1]	Yea	Yea	Yea	Nay	Yea
Passage of S. 2754 Alternative Pluripotent Stem Cell Therapies Enhancement Act [2]	Yea	Yea	Yea	Yea	Yea
Passage of S. 5 Stem Cell Research Enhancement Act of 2007 [3]	Yea	Yea	Yea	Nay	Yea
Passage of S. 30 Hope Offered through the Principled and Ethical Stem Cell Research Act (HOPE Act) [4]	Nay	Yea	Yea	Yea	Nay

All candidates with voting records have the same amount of support for embryonic stem cells. They all require ethical limitations on the research such as:

1. no creation of embryos for the sole purpose of destruction for cultivation of stem cells.
2. all cells must come from embryos that will never be placed in a woman's womb and would otherwise be discarded as medical waste.
3. no monetary compensation may be given to donors of the embryos.
4. written consent from the donor must be present for any embryo to be accepted as a stem cell source.

For more information about embryonic stem cells, visit stemcells.nih.gov

[1] H.R. 810 provides funding for embryonic stem cell research.
[2] S. 2754 supports alternatives to embryonic stem cell research and supports research of treatments.
[3] S. 5 provides funding for embryonic stem cell research as well as alternatives.
[4] S. 30 would put more funding into alternatives to embryonic stem cells, but saying yea does not necessarily mean the candidate opposes embryonic stem cells.

Appendix 2: HR 810[38]

One Hundred Ninth Congress of the United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Tuesday, the third day of January, two thousand and six

An Act

To amend the Public Health Service Act to provide for human embryonic stem cell research.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Stem Cell Research Enhancement Act of 2005".

SEC. 2. HUMAN EMBRYONIC STEM CELL RESEARCH.

Part H of title IV of the Public Health Service Act (42 U.S.C. 289 et seq.) is amended by inserting after section 498C the following:

"SEC. 498D. HUMAN EMBRYONIC STEM CELL RESEARCH.

"(a) IN GENERAL.—Notwithstanding any other provision of law (including any regulation or guidance), the Secretary shall conduct and support research that utilizes human embryonic stem cells in accordance with this section (regardless of the date on which the stem cells were derived from a human embryo).

"(b) ETHICAL REQUIREMENTS.—Human embryonic stem cells shall be eligible for use in any research conducted or supported by the Secretary if the cells meet each of the following:

"(1) The stem cells were derived from human embryos that have been donated from in vitro fertilization clinics, were created for the purposes of fertility treatment, and were in excess of the clinical need of the individuals seeking such treatment.

"(2) Prior to the consideration of embryo donation and through consultation with the individuals seeking fertility treatment, it was determined that the embryos would never be implanted in a woman and would otherwise be discarded.

"(3) The individuals seeking fertility treatment donated the embryos with written informed consent and without receiving any financial or other inducements to make the donation.

"(c) GUIDELINES.—Not later than 60 days after the date of the enactment of this section, the Secretary, in consultation with the Director of NIH, shall issue final guidelines to carry out this section.

"(d) REPORTING REQUIREMENTS.—The Secretary shall annually prepare and submit to the appropriate committees of the Congress a report describing the activities carried out under this section during the preceding fiscal year, and including a description of

whether and to what extent research under subsection (a) has been conducted in accordance with this section.".

Speaker of the House of Representatives.

Vice President of the United States and
President of the Senate.

Appendix 3: S 2754[39]

109TH CONGRESS
2D SESSION

S. 2754

AN ACT

To derive human pluripotent stem cell lines using techniques that do not knowingly harm embryos.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Alternative Pluripotent Stem Cell Therapies Enhancement Act''.

SEC. 2. PURPOSES.

It is the purpose of this Act to—

(1) intensify research that may result in improved understanding of or treatments for diseases and other adverse health conditions; and

(2) promote the derivation of pluripotent stem cell lines, including from postnatal sources, without creating human embryos for research purposes or discarding, destroying, or knowingly harming a human embryo or fetus.

SEC. 3. ALTERNATIVE HUMAN PLURIPOTENT STEM CELL RESEARCH.

Part B of title IV of the Public Health Service Act (42 U.S.C. 284 et seq.) is amended by inserting after section 498C the following:

"SEC. 409J. ALTERNATIVE HUMAN PLURIPOTENT STEM CELL RESEARCH.

''(a) IN GENERAL.—In accordance with section 492, the Secretary shall conduct and support basic and applied research to develop techniques for the isolation, derivation, production, or testing of stem cells that, like embryonic stem cells, are capable of producing all or almost all of the cell types of the developing body and may result in improved understanding of or treatments for diseases and other adverse health conditions, but are not derived from a human embryo.

''(b) GUIDELINES.—Not later than 90 days after the date of the enactment of this section, the Secretary, after consultation with the Director, shall issue final guidelines to implement subsection (a), that—

''(1) provide guidance concerning the next steps required for additional research, which shall include a determination of the extent to which specific techniques may require additional basic or animal research to ensure that any research involving human cells using these techniques would clearly be consistent with the standards established under this section;

''(2) prioritize research with the greatest potential for near-term clinical benefit; and

''(3) consistent with subsection (a), take into account techniques outlined by the President's Council on Bioethics and any other appropriate techniques and research.

''(c) REPORTING REQUIREMENTS.—Not later than January 1 of each year, the Secretary shall prepare and submit to the appropriate committees of the Congress a report describing the activities carried out under this section during the fiscal year, including a description of the research conducted under this section.

''(d) RULE OF CONSTRUCTION.—Nothing in this section shall be construed to affect any policy, guideline, or regulation regarding embryonic stem cell research, human cloning by somatic cell nuclear transfer, or any other research not specifically authorized by this section.

''(e) DEFINITION.—

''(1) IN GENERAL.—In this section, the term 'human embryo' shall have the meaning given such term in the applicable appropriations Act.

''(2) APPLICABLE ACT.—For purposes of paragraph (1), the term 'applicable appropriations Act' means, with respect to the fiscal year in which research is to be conducted or supported under this section, the Act making appropriations for the Department of Health and Human Services for such fiscal year, except that if the Act for such fiscal year does not contain the term referred to in paragraph (1), the Act for the previous fiscal year shall be deemed to be the applicable appropriations Act.

''(f) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated such sums as may be nec-

essary for each of fiscal years 2007 through 2009, to carry out this section.''.

Passed the Senate July 18, 2006.

Attest:

Secretary.

109TH CONGRESS
2D SESSION

S. 2754

AN ACT

To derive human pluripotent stem cell lines using techniques that do not knowingly harm embryos.

Appendix 4: S 5[40]

S. 5

One Hundred Tenth Congress of the United States of America

AT THE FIRST SESSION

Begun and held at the City of Washington on Thursday, the fourth day of January, two thousand and seven

An Act

To amend the Public Health Service Act to provide for human embryonic stem cell research.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Stem Cell Research Enhancement Act of 2007".

SEC. 2. HUMAN EMBRYONIC STEM CELL RESEARCH.

Part H of title IV of the Public Health Service Act (42 U.S.C. 289 et seq.) is amended by inserting after section 498C the following:

"SEC. 498D. HUMAN EMBRYONIC STEM CELL RESEARCH.

"(a) IN GENERAL.—Notwithstanding any other provision of law (including any regulation or guidance), the Secretary shall conduct and support research that utilizes human embryonic stem cells in accordance with this section (regardless of the date on which the stem cells were derived from a human embryo).

"(b) ETHICAL REQUIREMENTS.—Human embryonic stem cells shall be eligible for use in any research conducted or supported by the Secretary if the cells meet each of the following:

"(1) The stem cells were derived from human embryos that have been donated from in vitro fertilization clinics, were created for the purposes of fertility treatment, and were in excess of the clinical need of the individuals seeking such treatment.

"(2) Prior to the consideration of embryo donation and through consultation with the individuals seeking fertility treatment, it was determined that the embryos would never be implanted in a woman and would otherwise be discarded.

"(3) The individuals seeking fertility treatment donated the embryos with written informed consent and without receiving any financial or other inducements to make the donation.

"(c) GUIDELINES.—Not later than 60 days after the date of the enactment of this section, the Secretary, in consultation with the Director of NIH, shall issue final guidelines to carry out this section.

"(d) REPORTING REQUIREMENTS.—The Secretary shall annually prepare and submit to the appropriate committees of the Congress a report describing the activities carried out under this section during the preceding fiscal year, and including a description of

whether and to what extent research under subsection (a) has been conducted in accordance with this section.".

SEC. 3. ALTERNATIVE HUMAN PLURIPOTENT STEM CELL RESEARCH.

Part H of title IV of the Public Health Service Act (42 U.S.C. 284 et seq.), as amended by section 2, is further amended by inserting after section 498D the following:

"SEC. 498E. ALTERNATIVE HUMAN PLURIPOTENT STEM CELL RESEARCH.

"(a) IN GENERAL.—In accordance with section 492, the Secretary shall conduct and support basic and applied research to develop techniques for the isolation, derivation, production, or testing of stem cells that, like embryonic stem cells, are capable of producing all or almost all of the cell types of the developing body and may result in improved understanding of or treatments for diseases and other adverse health conditions, but are not derived from a human embryo.

"(b) GUIDELINES.—Not later than 90 days after the date of the enactment of this section, the Secretary, after consultation with the Director, shall issue final guidelines to implement subsection (a), that—

"(1) provide guidance concerning the next steps required for additional research, which shall include a determination of the extent to which specific techniques may require additional basic or animal research to ensure that any research involving human cells using these techniques would clearly be consistent with the standards established under this section;

"(2) prioritize research with the greatest potential for near-term clinical benefit; and

"(3) consistent with subsection (a), take into account techniques outlined by the President's Council on Bioethics and any other appropriate techniques and research.

"(c) REPORTING REQUIREMENTS.—Not later than January 1 of each year, the Secretary shall prepare and submit to the appropriate committees of the Congress a report describing the activities carried out under this section during the fiscal year, including a description of the research conducted under this section.

"(d) RULE OF CONSTRUCTION.—Nothing in this section shall be construed to affect any policy, guideline, or regulation regarding embryonic stem cell research, human cloning by somatic cell nuclear transfer, or any other research not specifically authorized by this section.

"(e) DEFINITION.—

"(1) IN GENERAL.—In this section, the term 'human embryo' shall have the meaning given such term in the applicable appropriations Act.

"(2) APPLICABLE ACT.—For purposes of paragraph (1), the term 'applicable appropriations Act' means, with respect to the fiscal year in which research is to be conducted or supported under this section, the Act making appropriations for the Department of Health and Human Services for such fiscal year, except that if the Act for such fiscal year does not contain the term referred to in paragraph (1), the Act for the previous fiscal year shall be deemed to be the applicable appropriations Act.

"(f) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated such sums as may be necessary for each of fiscal years 2008 through 2010, to carry out this section.".

Speaker of the House of Representatives.

Vice President of the United States and
President of the Senate.

Appendix 5: S 30[41]

110TH CONGRESS
1ST SESSION

S. 30

AN ACT

To intensify research to derive human pluripotent stem cell lines.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Hope Offered through Principled and Ethical Stem Cell Research Act'' or the ''HOPE Act''.

SEC. 2. PURPOSES.

It is the purpose of this Act to—

(1) intensify research that may result in improved understanding of or treatments for diseases and other adverse health conditions; and

(2) promote the derivation of pluripotent stem cell lines without the creation of human embryos for research purposes and without the destruction or discarding of, or risk of injury to, a human embryo or embryos other than those that are naturally dead.

SEC. 3. HUMAN PLURIPOTENT STEM CELL RESEARCH.

Part H of title IV of the Public Health Service Act (42 U.S.C. 289 et seq.) is amended by inserting after section 498C the following:

"SEC. 498D. HUMAN PLURIPOTENT STEM CELL RESEARCH.

''(a) IN GENERAL.—The Secretary shall conduct and support basic and applied research to develop techniques for the isolation, derivation, production, or testing of stem cells, including pluripotent stem cells that have the flexibility of embryonic stem cells (whether or not they have an embryonic source), that may result in improved understanding of or treatments for diseases and other adverse health conditions, provided that the isolation, derivation, production, or testing of such cells will not involve—

''(1) the creation of a human embryo or embryos for research purposes; or

''(2) the destruction or discarding of, or risk of injury to, a human embryo or embryos other than those that are naturally dead.

''(b) GUIDELINES.—Not later than 90 days after the date of the enactment of this section, the Secretary, after consultation with the Director of NIH, shall issue final guidelines that—

''(1) provide guidance concerning the next steps required for additional research, which shall include a determination of the extent to which specific techniques may require additional animal research to ensure that any research involving human cells using these techniques would clearly be consistent with the standards established under subsection (a);

''(2) prioritize research with the greatest potential for near-term clinical benefit;

''(3) consistent with standards established under subsection (a), take into account techniques outlined by the President's Council on Bioethics and any other appropriate techniques and research; and

''(4) in the case of research involving stem cells from a naturally dead embryo, require assurances from grant applicants that no alteration of the timing, methods, or procedures used to create, maintain, or intervene in the development of a human

embryo was made solely for the purpose of deriving the stem cells.

''(c) REPORTING REQUIREMENTS.—Not later than January 1 of each year, the Secretary shall prepare and submit to the appropriate committees of the Congress a report describing the activities carried out under this section during the fiscal year, including a description of the research conducted under this section.

''(d) RULE OF CONSTRUCTION.—Nothing in this section shall be construed as altering the policy in effect on the date of enactment of this section regarding the eligibility of stem cell lines for funding by the National Institutes of Health.

''(e) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated such sums as may be necessary to carry out this section.

''(f) DEFINITIONS.—In this section:

''(1) NATURALLY DEAD.—The term 'naturally dead' means having naturally and irreversibly lost the capacity for integrated cellular division, growth, and differentiation that is characteristic of an organism, even if some cells of the former organism may be alive in a disorganized state.

''(2) HUMAN EMBRYO OR EMBRYOS.—The term 'human embryo or embryos' includes any organism,

not protected as a human subject under part 46 of title 45, Code of Federal Regulations, as of the date of enactment of this section, that is derived by fertilization, parthenogenesis, cloning, or any other means from one or more human gametes or human diploid cells.

''(3) RISK OF INJURY.—The term 'risk of injury' means subjecting a human embryo or embryos to risk of injury or death greater than that allowed for research on fetuses in utero under section 46.204(b) of title 45, Code of Federal Regulations, and section 498(b) of this Act.''.

SEC. 4. NATIONAL AMNIOTIC AND PLACENTAL STEM CELL BANK.

(a) IN GENERAL.—The Secretary of Health and Human Services shall enter into a contract with the Institute of Medicine for the conduct of a study to recommend an optimal structure for an amniotic and placental stem cell bank program and to address pertinent issues to maximize the potential of such technology, including collection, storage, standards setting, information sharing, distribution, reimbursement, research, and outcome measures. In conducting such study, the Institute should receive input from relevant experts including the existing operators of

federal tissue bank programs and the biomedical research programs within the Department of Defense.

(b) REPORT.—Not later than 180 days after the date of enactment of this Act, the Institute of Medicine shall complete the study under subsection (a) and submit to the Secretary of Health and Human Services and the appropriate committees of Congress a report on the results of such study.

Passed the Senate April 11, 2007.

Attest:

Secretary.

110TH CONGRESS
1ST SESSION

S. 30

AN ACT

To intensify research to derive human pluripotent stem cell lines.

Appendix 6: House Document 109-127: Veto to HR 810[42]

109th Congress, 2d Session – – – – – – – – – – – – House Document 109–127

VETO MESSAGE ON H.R. 810

MESSAGE

FROM

THE PRESIDENT OF THE UNITED STATES

TRANSMITTING

HIS VETO OF H.R. 810, THE STEM CELL RESEARCH ENHANCEMENT ACT OF 2005

JULY 20, 2006.—Message and accompanying papers referred to the Committee on Energy and Commerce and ordered to be printed

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U.S. GOVERNMENT PRINTING OFFICE

49–011 WASHINGTON : 2006

To the House of Representatives:

I am returning herewith without my approval H.R. 810, the "Stem Cell Research Enhancement Act of 2005."

Like all Americans, I believe our Nation must vigorously pursue the tremendous possibilities that science offers to cure disease and improve the lives of millions. Yet, as science brings us ever closer to unlocking the secrets of human biology, it also offers temptations to manipulate human life and violate human dignity. Our conscience and history as a Nation demand that we resist this temptation. With the right scientific techniques and the right policies, we can achieve scientific progress while living up to our ethical responsibilities.

In 2001, I set forth a new policy on stem cell research that struck a balance between the needs of science and the demands of conscience. When I took office, there was no Federal funding for human embryonic stem cell research. Under the policy I announced 5 years ago, my Administration became the first to make Federal funds available for this research, but only on embryonic stem cell lines derived from embryos that had already been destroyed. My Administration has made available more than $90 million for research of these lines. This policy has allowed important research to go forward and has allowed America to continue to lead the world in embryonic stem cell research without encouraging the further destruction of living human embryos.

H.R. 810 would overturn my Administration's balanced policy on embryonic stem cell research. If this bill were to become law, American taxpayers for the first time in our history would be compelled to fund the deliberate destruction of human embryos. Crossing this line would be a grave mistake and would needlessly encourage a conflict between science and ethics that can only do damage to both and harm our Nation as a whole.

Advances in research show that stem cell science can progress in an ethical way. Since I announced my policy in 2001, my Administration has expanded funding of research into stem cells that can be drawn from children, adults, and the blood in umbilical cords with no harm to the donor, and these stem cells are currently being used in medical treatments. Science also offers the hope that we may one day enjoy the potential benefits of embryonic stem cells without destroying human life. Researchers are investigating new techniques that might allow doctors and scientists to produce stem cells just as versatile as those derived from human embryos without harming life. We must continue to explore these hopeful alternatives, so we can advance the cause of scientific research while staying true to the ideals of a decent and humane society.

I hold to the principle that we can harness the promise of technology without becoming slaves to technology and ensure that science serves the cause of humanity. If we are to find the right

ways to advance ethical medical research, we must also be willing when necessary to reject the wrong ways. For that reason, I must veto this bill

GEORGE W. BUSH.

THE WHITE HOUSE, *July 19, 2006.*

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Appendix 7: Senate Congressional Record S8060-S8061: Veto to S 5[43]

I am proud to also recognize the many accomplishments of Glazer elementary students, which is undoubtedly the direct result of the hard work and dedication of its students, faculty and staff. Glazer was recently selected as a Leadership School by the Schools of the 21st Century and enjoys the distinction of being awarded the $100,000 Skillman Improvement Grant, the highest award among six elementary schools included in the 2007 high performing category out of 300 Detroit elementary schools. This grant is expected to help fund several worthwhile initiatives, including a GED certificate program and the purchase of additional computers to assist parents of Glazer students who have not completed high school.

The principal of B. Benedict Glazer Elementary School, Florene McMurtry, has served the Detroit Public School system in various positions for 35 years. Her passion for education is illustrated by the many notable successes she has enjoyed throughout her career as an educator. An example of her innovative approach to education was the partnership she helped form between Glazer Elementary School and Temple Beth El in 1998 to provide financial resources and tutors for students through the Glazer Elementary Ada S. and Rabbi B. Benedict Glazer Memorial Fund. Mrs. McMurtry also established the tradition of presenting dictionaries as the Glazer Memorial Prize to honor the most outstanding boy and girl student for Class Day. In 2001, Mrs. McMurtry established the InsideOut Literary Arts Project at Glazer with a writer-in-residence who integrates creative writing and drama in the school curriculum and publishes the students' work. To date, seven poetry books have been written and published.

Mrs. McMurtry has proven herself to be a devoted educator. Through her dedicated leadership and the many programs she has initiated and led, she has managed to increase parental involvement in school, student access to resources, and has served as a liaison between the students and the community. In addition, Mrs. McMurtry has received many accolades over the years in recognition of her outstanding service, including the Principal of the Year Art Award in 1996 and 2001, the Distinguished Service Award, City of Detroit in 1985 and she was a finalist for Michigan Teacher of the Year in 1984–1985.

I know my colleagues in the Senate join me in recognizing B. Benedict Glazer Elementary School on its 40th anniversary and its principal, Florene McMurtry, on her impressive record of service to the Detroit Public School system.●

HONORING GEIGER BROTHERS

● Ms. SNOWE. Mr. President, today I recognize an outstanding, family-owned small business from my home State of Maine that recently received the Gannett Family Business of the Year Award from the University of Southern Maine's Institute for Family-Owned Business. A promotional products distributor, Geiger Brothers of Lewiston has been in operation since 1878. Incredibly, the Geiger family has been in charge of the business for the entire time—a total of four generation.

Geiger Brothers was originally founded in Newark, NJ, with a staff of four, two of whom were Geiger brothers. Since then, Geiger Brothers has undergone dramatic transformations, moving to Maine over half a century ago, and expanding to 500 employees between the Lewiston office and several field offices. While the Geiger name may not jump out at people from outside of Maine, the name ''Farmers' Almanac'' is universally known. Published yearly, the ''Farmers' Almanac'' is famous for its weather forecasts, gardening tips, and recipe suggestions. It is a source of great pride for my home State of Maine that Geiger Brothers publishes the ''Farmers' Almanac.''

It is no surprise that Geiger Brothers has won the Gannett Family Business of the Year Award. In fact, there is no lack of accomplishment or recognition in Geiger's history. The recipient of the Margaret Chase Smith Maine Quality Award, the FedEx Gold Level Supplier, and the Maine State Chamber of Commerce Maine Investors Award, Geiger's list of commendations recently grew to include the Advertising Specialty Institute's Family Business of the Year and a 2006 Best Places To Work In Maine award.

In addition to publishing the world-renowned ''Farmers' Almanac,'' Geiger Brothers has consistently lived by a philosophy of community service. When, in 1988, the company ''adopted'' the Montello Elementary School in Lewiston, then-President George H.W. Bush awarded them with a ''Point of Light'' in celebration of their service and volunteerism. Since then, Geiger Brothers has continued to organize similar partnerships across Maine, and the company's employees have donated their time to worthwhile causes all across the Lewiston-Auburn area. In addition, employees live by ''The Geiger Way,'' a set of values focused on respect for all involved in the business, from employees to clients and everyone in between. The generous and benevolent spirit of Geiger Brothers is assuredly a shining example to all small businesses.

Congratulations to Gene Geiger, CEO and president; to Peter Geiger, executive vice president; and to all of Geiger Brothers' accomplished employees on their most recent honor, and all of the awards they have received. It is no wonder that Geiger Brothers has been recognized so consistently throughout the years with their dedication and willingness to serve. I wish them continued success and many more editions of the ''Farmers' Almanac.''●

REPORT OF THE VETO OF S. 5, THE STEM CELL RESEARCH ENHANCEMENT ACT OF 2007—PM 18

The PRESIDING OFFICER laid before the Senate the following message from the President of the United States, together with an accompanying report; which was ordered to be held at the desk:

To the Senate of the United States:

I am returning herewith without my approval S. 5, the ''Stem Cell Research Enhancement Act of 2007.''

Once again, the Congress has sent me legislation that would compel American taxpayers, for the first time in our history, to support the deliberate destruction of human embryos.

In 2001, I announced a policy to advance stem cell research in a way that is ambitious, ethical, and effective. I became the first President to make Federal funds available for embryonic stem cell research, and my policy did this in ways that would not encourage the destruction of embryos. Since then, my Administration has made more than $130 million available for research on stem cell lines derived from embryos that had already been destroyed. We have also provided more than $3 billion for research on all forms of stem cells, including those from adult and other non-embryonic sources.

This careful approach is producing results. It has contributed to proven therapeutic treatments in thousands of patients with many different diseases. And it is opening the prospect of new discoveries that could transform lives. Researchers are now developing promising new techniques that offer the potential to produce pluripotent stem cells, without having to destroy human life—for example, by reprogramming adult cells to make them function like stem cells.

Technical innovation in this difficult area is opening up new possibilities for progress without conflict or ethical controversy. Researchers pursuing these kinds of ethically responsible advances deserve support, and there is legislation in the Congress to give them that support. Bills supporting alternative research methods achieved majority support last year in both the House and the Senate. Earlier this spring another bill supporting alternative research won overwhelming majority support in the Senate, and I call on House leaders to pass similar legislation that would authorize additional funds for ethical stem cell research. We cannot lose the opportunity to conduct research that would give hope to those suffering from terrible diseases and help move our Nation beyond the controversies over embryo destruction. I invite policymakers and scientists to come together to solve medical problems without compromising either the high aims of science or the sanctity of human life.

S. 5, like the bill I vetoed last year, would overturn today's carefully balanced policy on stem cell research.

Compelling American taxpayers to support the deliberate destruction of human embryos would be a grave mistake. I will not allow our Nation to cross this moral line. For that reason, I must veto this bill.

GEORGE W. BUSH.

THE WHITE HOUSE, *June 20, 2007*.

MESSAGE FROM THE HOUSE

ENROLLED BILLS SIGNED

The President Pro Tempore (Mr. BYRD) announced that on today, June 20, 2007, he had signed the following enrolled bills, which were previously signed by the Speaker of the House:

H.R. 57. An act to repeal certain sections of the Act of May 26, 1936, pertaining to the Virgin Islands.

H.R. 692. An act to amend title 4, United States Code, to authorize the Governor of a State, territory, or possession of the United States to order that the National flag be flown at half-staff in that State, territory, or possession in the event of the death of a member of the Armed Forces from that State, territory, or possession who dies while serving on active duty.

MEASURES READ THE FIRST TIME

The following bill was read the first time:

H.R. 2366. An act to reauthorize the veterans entrepreneurial development programs of the Small Business Administration, and for other purposes.

REPORTS OF COMMITTEES

The following reports of committees were submitted:

By Mr. LIEBERMAN, from the Committee on Homeland Security and Governmental Affairs, without amendment:

H.R. 1255. A bill to amend chapter 22 of title 44, United States Code, popularly known as the Presidential Records Act, to establish procedures for the consideration of claims of constitutionally based privilege against disclosure of Presidential records.

By Mr. LEAHY, from the Committee on the Judiciary, with an amendment in the nature of a substitute and an amendment to the title:

S. 535. A bill to establish an Unsolved Crimes Section in the Civil Rights Division of the Department of Justice, and an Unsolved Civil Rights Crime Investigative Office in the Civil Rights Unit of the Federal Bureau of Investigation, and for other purposes.

By Mr. LIEBERMAN, from the Committee on Homeland Security and Governmental Affairs, without amendment:

S. 886. A bill to amend chapter 22 of title 44, United States Code, popularly known as the Presidential Records Act, to establish procedures for the consideration of claims of constitutionally based privilege against disclosure of Presidential records.

EXECUTIVE REPORTS OF COMMITTEES

The following executive reports of nominations were submitted:

By Mr. KENNEDY for the Committee on Health, Education, Labor, and Pensions.

*Marylyn Andrea Howe, of Massachusetts, to be a Member of the National Council on Disability for a term expiring September 17, 2008.

*Lonnie C. Moore, of Kansas, to be a Member of the National Council on Disability for a term expiring September 17, 2008.

*Kerri Layne Briggs, of Virginia, to be Assistant Secretary for Elementary and Secondary Education, Department of Education.

*Jerome F. Kever, of Illinois, to be a Member of the Railroad Retirement Board for a term expiring August 28, 2008.

*Michael Schwartz, of Illinois to be a Member of the Railroad Retirement Board for a term expiring August 28, 2012.

*Virgil M. Speakman, Jr., of Ohio, to be a Member of the Railroad Retirement Board for a term expiring August 28, 2009.

*Nomination was reported with recommendation that it be confirmed subject to the nominee's commitment to respond to requests to appear and testify before any duly constituted committee of the Senate.

INTRODUCTION OF BILLS AND JOINT RESOLUTIONS

The following bills and joint resolutions were introduced, read the first and second times by unanimous consent, and referred as indicated:

By Mr. FEINGOLD (for himself, Mr. KOHL, Mr. KENNEDY, and Mr. BROWN):

S. 1664. A bill to require the Secretary of the Treasury to mint coins in commemoration of Robert M. La Follette, Sr., in recognition of his important contributions to the Progressive movement, the State of Wisconsin, and the United States; to the Committee on Banking, Housing, and Urban Affairs.

By Mr. FEINGOLD (for himself, Mr. KOHL, Mr. KENNEDY, and Mr. BROWN):

S. 1665. A bill to authorize the President to posthumously award a gold medal on behalf of Congress to Robert M. La Follette, Sr., in recognition of his important contributions to the Progressive movement, the State of Wisconsin, and the United States; to the Committee on Banking, Housing, and Urban Affairs.

By Mr. BAUCUS (for himself and Mr. GRASSLEY):

S. 1666. A bill to amend title II of the Social Security Act to improve the process for congressional consideration of international social security agreements; to the Committee on Finance.

By Mr. CARPER (for himself and Mr. COBURN):

S. 1667. A bill to establish a pilot program for the expedited disposal of Federal real property; to the Committee on Homeland Security and Governmental Affairs.

By Mr. DODD (for himself and Ms. LANDRIEU):

S. 1668. A bill to assist in providing affordable housing to those affected by the 2005 hurricanes; to the Committee on Banking, Housing, and Urban Affairs.

By Ms. STABENOW (for herself, Mr. BINGAMAN, Mr. LEVIN, Mr. SALAZAR, Mr. DURBIN, Mr. OBAMA, and Mr. KERRY):

S. 1669. A bill to amend titles XIX and XXI of the Social Security Act to ensure payment under Medicaid and the State Children's Health Insurance Program (SCHIP) for covered items and services furnished by school-based health clinics; to the Committee on Finance.

By Ms. SNOWE:

S. 1670. A bill to amend title 10, United States Code, to improve the management of medical care for members of the Armed Forces, to improve the speed and efficiency of the physical disability evaluation system of the Department of Defense, and for other purposes; to the Committee on Armed Services.

By Mr. KERRY (for himself and Ms. SNOWE):

S. 1671. A bill to reauthorize and improve the entrepreneurial development programs of the Small Business Administration, and for other purposes; to the Committee on Small Business and Entrepreneurship.

SUBMISSION OF CONCURRENT AND SENATE RESOLUTIONS

The following concurrent resolutions and Senate resolutions were read, and referred (or acted upon), as indicated:

By Mr. SMITH (for himself and Mr. CONRAD):

S. Res. 240. A resolution designating October 21 through October 27, 2007, as ''National Save for Retirement Week''; to the Committee on the Judiciary.

By Mr. BROWN:

S. Res. 241. A resolution expressing the sense of the Senate that the United States should reaffirm the commitments of the United States to the 2001 Doha Declaration on the TRIPS Agreement and Public Health and to pursuing trade policies that promote access to affordable medicines; to the Committee on Finance.

By Mrs. MURRAY (for herself, Mr. STEVENS, Ms. SNOWE, Ms. MIKULSKI, Ms. CANTWELL, Mr. OBAMA, Mr. KENNEDY, Ms. STABENOW, Mr. KERRY, Mr. DODD, Mr. DURBIN, Mr. FEINGOLD, Mr. BAYH, Mr. MENENDEZ, Mrs. CLINTON, Mrs. FEINSTEIN, Mr. INOUYE, Mr. BAUCUS, Mr. AKAKA, Mr. SMITH, and Mrs. BOXER):

S. Res. 242. A resolution celebrating the accomplishments of title IX of the Education Amendments of 1972, also known as the Patsy Takemoto Mink Equal Opportunity in Education Act, and recognizing the need to continue pursuing the goal of educational opportunities for women and girls; considered and agreed to.

By Mr. LAUTENBERG (for himself, Mr. MARTINEZ, Mr. LIEBERMAN, Mrs. DOLE, Ms. STABENOW, Mr. STEVENS, Mr. BIDEN, Mr. BURR, Mr. LEVIN, Ms. MURKOWSKI, Mr. KERRY, Ms. SNOWE, Ms. LANDRIEU, Mr. LOTT, Mr. MENENDEZ, Mr. DURBIN, Mr. WYDEN, Mr. FEINGOLD, Mr. CARDIN, Mr. CARPER, and Ms. CANTWELL):

S. Res. 243. A resolution supporting the goals and ideals of National Clean Beaches Week and the considerable value of beaches and their role in American culture; considered and agreed to.

By Mr. PRYOR (for himself, Mr. SUNUNU, Mrs. DOLE, Mr. LUGAR, Ms. LANDRIEU, Ms. MURKOWSKI, and Mr. ISAKSON):

S. Res. 244. A resolution designating June 2007 as National Safety Month; considered and agreed to.

By Mr. KYL (for himself and Mr. MCCAIN):

S. Res. 245. A resolution congratulating the University of Arizona Wildcats for winning the 2007 NCAA Division I Softball Championship; considered and agreed to.

By Mrs. HUTCHISON (for herself and Mr. CORNYN):

S. Res. 246. A resolution congratulating the San Antonio Spurs for winning the National Basketball Association Championship; considered and agreed to.

By Ms. CANTWELL (for herself and Mrs. MURRAY):