

Biology slides on stem cell research for liver cancer essay



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The liver performs many other important functions, such as removing toxins and other chemical waste reduces from the blood and readying them for excretion. There are many types of liver diseases . Liver cancer is one of them. Liver cancer, also known as hepatic cancer which is a cancer that starts in the liver, and not from another organ which eventually migrates to the liver.

The liver can be affected by primary liver cancer, which arises in the liver, or by cancer which forms in other sites and then spreads to the liver. Primary liver cancer, which starts in the liver, accounts for about 2% of cancers in the U. S but up to half of all cancers in some undeveloped countries. In the U.

S primary liver cancer strikes ; ice as many men as women, at an average age of 67(Web liver cancer is secondary or metastasis, meaning it started elsewhere in the body. Cancers that originate elsewhere and eventually reach the liver are known as liver metastasis or secondary liver cancer. (indiscriminately, 2009). The liver is made up of several different types of cells, several types of tumors can form in the liver. Some of these are benign (announcers), and some are cancerous and can spread to other parts of the body (metastasis).

These tumors have different causes and are treated differently. Human Embryonic Stem Cells Differentiating into Liver Cells, California Institute of Regenerative Medicine Liver failure is a growing health problem and one of the main causes of death worldwide. Discovery of stem cells reveals that they are capable of differentiating into specialized cell types, including the hypotheses, by utilizing these hypotheses damaged liver can be re-

generated Scientists have paid their attention to the field of stem cells, which has helped to understand the pathogenesis of liver disease.

Liver like cells derived from bone marrow and embryonic stem cells, results in better understanding of the biochemical compounds that are essential in liver development. Patients with advanced liver disease can be treated with stem cells taken from their own skin or blood in a breakthrough that could save thousands of lives. Stem cells are a class of undifferentiated cells that are able to differentiate into specialized cell types.

Stem Cell Therapy is the process of injecting undifferentiated cells into an organism in the hopes that the cells will differentiate into the same type of cell as the damaged cells and replace them. These undifferentiated cells, called stem cells, have the potential to reduce any kind of cells in the body and have the capacity for self- renewal. Stem cell research has proven tautology's adipose stem cell therapy from a patients own harvested stem cells to be more effective that other, stem cell therapies such as embryonic stem cell therapy. (Global stem cell network)(n. D.).

Live Cell Therapy aims to awaken dormant cells within the human body, thereby stimulating the growth and function of existing tissues and repairing or regenerating old and malfunctioning cells. Image above shows liver cells (red with nuclei in blue) in the early damaged liver with liver stem cells in green migrating to the damaged areas. In the healthy liver, the liver Stem cells are only found surrounding the bile ducts close to the blood vessels (black area, on right with some red blood cells in Background Of Medical Technology Cell Therapy, also called Cell Therapy, was first invented in an

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injection form by Swiss physician Dr. Paul Insane in 1931. Cell Therapy is actually the forefather of the better-known Human Stem Cell Therapy, which was invented in the asses based on the principle of Cell Therapy. Because of their extreme health and beauty benefits but very high cost, Cell Therapy injections have long been a celebrity secret in preserving a youthful appearance and prolonging vital health. Pope Pius XII was so pleased with the treatment that he inducted Dr.

Dr. Paul Insane, the founder of Cell Therapy, into the Papal Academy of Science, making him the successor to the late Sir Alexander Fleming, the discoverer of penicillin. (Stem cell therapy of Switzerland)(n. D.). Again stem cells have an interesting history that has been somewhat tainted with debate and controversy-As per some people in the early 1950s, it was discovered that some cells had the ability to generate blood cells. In 1968, the first bone marrow transplant was performed to successfully treat two siblings with severe combined immunodeficiency. Other key events in stem cell research include: 1978: Stem cells were discovered in human cord blood 1981 First in vitro stem cell line developed from mice 1988: Embryonic stem cell lines created from a hamster 1995: First embryonic stem cell line derived from a primate 1997: Cloned lamb from stem cells 1997: Leukemia origin found as homeopathic stem cell, indicating possible proof of cancer stem cells Embryonic stem cells and fetal liver stem cells used to treat liver cancer: Embryonic Stem Cells and their derivatives might constitute an easily available source to obtain a large number of transplantable cells for regenerative treatments.

Embryonic stem cells and fetal liver stem cells give rise to new cells and thus possess the capacity to regenerate new liver cells. Induced pluripotent stem cells used to treat liver cancer: Induced pluripotent stem cells (iPSCs) are embryonic like Stem Cells derived from somatic cells which theoretically, iPSCs could be obtained from the same patient and used for tissue replacement. Placental and Umbilical cord blood stem cells used to treat liver cancer: Placental cells and Umbilical cord blood cells have higher proliferation and differentiation potential than Adipose derived Stem Cells . Several studies indicated that umbilical cord and umbilical cord blood, placenta and amniotic fluid are an easily accessible source of pluripotent Stem Cells. Adult stem cells used to treat liver cancer: Adult stem cell treatments have been used for many years to successfully treat liver cancers. The adult stem cells undergo rapid proliferation when it needs to regenerate the specialized tissues. As the production of adult stem cells does not require any kind of embryonic destructions their use in research and therapy is not considered as controversial when compared to embryonic stem cells .

In common with embryonic stem cells, adult stem cells have the ability to differentiate into more than one cell type, but they are often restricted to certain types or " lineages". Adult stem cells are more capable of transdifferentiation than other cells. Liver regeneration is mainly an endogenous process, driven by hypotheses and resident hepatic stem/progenitor cells . It has been observed that certain populations of extrahepatic Adult Stem Cells can migrate into the liver and contribute to its repopulating and turnover . A particularly high degree of plasticity has been shown by bone marrow stem cells (BMCs), which can give rise to a wide

range of phenotypes, including hepatic like cells. Medical Technique Adult stem cell therapy starts with taking chic of blood and chic of fat. The fat is harvested through liposuction.

Then a phosphoric is added to the fat to make the fat release the stem cells. Meanwhile, the blood is centrifuged to make Platelet Rich Plasma (PR). PR is like a food for the stem cells and notation many chemicals that induce your stem cells to mobile their healing capacity- Stern cell therapy is approximately a four hour Outpatient procedure involving the follows Eng: ; Harvest: Using a proprietary but simple procedure similar to tumescent liposuction, cuss's of adipose tissue is harvested from the patient ; Breakdown: The adipose tissue is then broken down using a phosphoric solution, and a proprietary Cell Preparation Medium. Separate: Using standard techniques, the Stroll Vascular Fraction (SF) which contains mechanical stem cells (MACS) is separated from the fat cells. Isolate: mechanical stem cells and other progenitor cells are then isolated from the SF using standard techniques. ; Wash: The stem cells are then triple-washed with saline to remove any traces of the phosphoric solution and cell preparation medium.

; Activate: The isolated Macs are then suspended in the person's own platelet-rich-plasma (PR) growth factors and activated with a red/yellow/green laser. This ' awakens' or activates the dormant mechanical stem cells ; Infuse: The cells are then administered back to the patient through one or more of the following modes of administration: 1 .

Intravenous: The mechanical stem cells are administered through a standard intravenous drip. 2.

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Fat Transfer: The mechanical stem cells are mixed with the fat filler-biomedical mix before reintroduction. 3. Topical: The mechanical stem cells are administered directly onto a localized area different from their tissue of origin. (Global stem cell network)(n. D.

). (sebaceous. Et) Again before stem cell therapy a conditioning treatment is done to prepare the body of the patient. After the conditioning treatment, the patient will be given a couple of days to rest before getting the stem cells. They will be given wrought your IV catheter, much like a blood transfusion.

If the stem cells were frozen, the patient might get some drugs before the stem cells are given. This is done to reduce the risk of reacting to the preservatives that are used in freezing the cells. If the stem cells were frozen, they are thawed in warm water then given right away. For allegiance or genetics transplants, the donor cells may be harvested (removed) in an operating room, and then processed in the lab. Once they are ready, the cells are brought in and infused (given to you).

The length of time it takes to get all the stem cells depends on how much fluid the tem cells are in. The patient will be awake for this process, and it doesn't hurt. This is a big step and often has great meaning for recipients and their families. Many people consider this their rebirth or chance at a second life.

They may celebrate this day as they would their actual birthday. Social Issues The stem cell-research is an example of the, sometimes difficult, cost-benefit analysis in ethics which scientists need to do. Even though many <https://assignbuster.com/biology-slides-on-stem-cell-research-for-liver-cancer-essay/>

issues regarding the ethics of stem cell research have now been solved, it serves as a valuable example of ethical cost-benefit analysis. Again The benefits of stem cell research have such a great outcome that they outweigh the ethical issues. " Adult stem cells would not be that interesting because they do not have the same properties as stem cells from a fetus.

The research would give great insights about the basics of the body-critics against stem cell therapy argue the ethical issues of scientific work on aborted fetus did not justify the possible benefits. " A life is a life and that should never be compromised. A fertilized egg should be valued as a human life even if it is in its very first weeks.

Destroying human life in the hopes of saving human life is not ethical. We should (and will) develop more ethical methods (such as using adult stem cells) which will enable us to research ethically.