Cancer

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Gene therapy is a therapeutic method of utilizing genes for treatment of cancer and other diseases. It is currently widely used in attempt to provide a remedy for the proliferation of tumor cells in the body of a host. Moreover, gene therapy has several alternative methods and each are tested until now to assess the most accurate and effective procedure having the quickest desired results among cancer patients.

In this paper, several articles regarding the advantages and disadvantages of gene therapy will be reviewed and discussed for the purpose of evaluating and determining whether the therapeutic practice of gene therapy is to be recommended for cancer treatment. Several reviews of related studies and literature are still encouraged at present for further investigation of the accuracy of this method.

Review of Related Literature

As reviewed from six articles relatively discussing the topic on gene therapy, it was generalized that gene therapy could be an advantage in medicine to eliminate cancer cells and treat other diseases; yet, it could also have disadvantages or inaccuracies in result to some of its methods. To start with the advantages, 1) gene therapy was emphasized as having guaranteed desirable effects upon treating cancer and other diseases like atherosclerosis (disease in the arteries), restenosis, which is the re-contraction of the blood vessel, Parkinson’s, lung cancer, ischemia (disease of the heart), and similar illnesses.

Further, cyclic plaeidgiel is found to have an efficient and useful purpose in mediating gene transfer into ? 9? 1 integrin-displaying cells (Schneider,

Harbottle, Yokosaki, Jost, Coutelle, 1999). 2) Similarly, another article describes the purpose of the method using a chitosan, which works with the catalyst nucleic acids to aid in cancer treatment. Chitosan nanoparticles combined with DNAzyme and siRNA is emphasized to result in effectiveness of therapeutic drug transfers among cancer hosts, and through the method of nanotechnology.

Moreover, the combination of such substances was found to most likely stop and decrease the proliferation of cancer cells. This study then would be significant to reinforce the execution of trials among the two different kinds of pathways and thus, experiment on which could achieve the desired result of treating the tumor cells and reducing their size. 3) On the other hand, another article proposes an explanation on the newly found positive effects of viruses as they are now used in gene therapies by being injected in drugs or medicines for cancer therapy (Havert, 2007).

Further, the Food and Drug Administration (FDA) continues to work with Investigational New Drug (IND) to regulate the distribution of new drugs invented and to examine the effects of the newly created drug in attempt to cure Parkinson’s and other cancer related diseases (Havert, 2007). 4) The main objective another reviewed article is to promote the use of the so-called novel treatment modalities in gene therapy. One example of these treatment modalities in gene therapy is the Gene Directed Enzyme Prodrug Therapy or (GDEPT) (Atlaner, 2008).

Similar with the chemotherapeutic method, using such drug therapy is for the same purpose of killing the number of tumor cells in the host; however, it differs from chemotherapy in a way that the drug is directed towards the

target tumor cells in two pathways and that it has better promising effects than the chemotherapy which is likely to weaken the strength and life expectancy or duration of the cells (Atlaner, 2008).

Furthermore, the drug itself operates by concentrating itself in the tumor zone and start eliminating the neighboring cancerous cells (Atlaner, 2008). This article then, purports to examine the potentiality of Gene Directed Enzyme Produg Therapy (GDEPT) to focus on its function for cancer treatment, to apply the proper and standard method of executing the prodrug therapy, and to address and recommend its future outcome in attempt to eliminate cancer (Atlaner, 2008).

GDEPT, comprising of two steps is carried out in such step by step procedure: first, using a selective vector, the exogenous enzyme carboxypeptidase or G2 (CPG2) tracks and targets the tumor or cancer cells; second step is preceded by the mediation of the selective prodrug which is stimulated by the said exogenous enzyme (Atlaner, 2008). In two pathways: intracellular and extrocellualar, the tumor cell is targeted to bring about gene expression and further, cell elimination.

Thus, the latter stages of several cancer diseases in the colon, prostate, pancreas, glioblastoma, and melanoma are best treated with the prodrug (GDEPT) therapy (Atlaner, 2008). Moving with the disadvantages or limitation upon using such various methods of gene therapy however, Findings show that there are several impediments that are possible to be encountered through the gene therapy which may include the ff. : immunity of the viral target cells, deficiency of normal tissues in the host, proneness to

perpetuating tumor cells and tissues, and increase production of virus in the host.

In so doing, several precautions have to be considered and multiple trials are also reinforced to assess the effectiveness of this procedure in attempt to eliminate and heal cancer (Zhao & Lee, 2004). Results and Discussion This research is significant for the present practitioners of medicine. Findings show that gene therapy has promising effects in cancer treatment. However, further tests and assessment to evaluate the accuracy and desired effects of drug and target tracking gene therapy to validate its reliability ad accuracy.

First of all, gene therapy is executed in different methods: 1) by transferring hereditary gene substance into tumor or target cells to achieve desirable results in correcting the transformation of existing cancer cells (Zhao & Lee, 2004); 2) executed from both inner and outer vascular pathways; transporting the genetic materials could be tried for the organs like the liver and the muscle. Several assessment of the enzyme transfer (VEGF) procedure was viewed to have positive outcome.

In addition, Nitric Oxide Synthase (NOS) and Vascular Endothelial Growth Factor (VEGF) were utilized to decrease the production of tumor cells and to prevent restenosis, which is the re-contraction of the blood vessel (Turunen, Hiltunen, Yla-Herttuala, 1999); 3) gene transfer vectors using adenoviruses, plasmid DNA, extravascular gene delivery, endothelium transfer using VEGF and smooth muscle cells promise the best positive therapeutic effect (Turunen, Hiltunen, Yla-Herttuala, 1999); 4) cyclic PLAEIDGIEL accompanied by peptide-containing PLAEIDGIEL receptor in DNA into? 1 integrin-displaying cells (Schneider, Harbottle, Yokosaki, Jost, Coutelle, 1999); 5) Chitosan

nanoparticles combined with DNAzyme and siRNA is emphasized to result in effectiveness of therapeutic drug transfers among cancer hosts, and through the method of nanotechnology (Tan et. al. , 2009); 6) desired immuno-viral effects of viruses are now used in gene therapies by being injected in drugs or medicines for cancer therapy.

The method is executed through biotechnology in which the inactive viruses were controlled to be inactive agents to immunize patients with Parkinson’s or other cancer diseases (Havert, 2007); 7) GDEPT, comprising of two steps is carried out in such step by step procedure: first, using a selective vector, the exogenous enzyme carboxypeptidase or G2 (CPG2) tracks and targets the tumor or cancer cells; second step is preceded by the mediation of the selective prodrug which is stimulated by the said exogenous enzyme (Atlaner, 2008).

In two pathways: intracellular and extrocellualar, the tumor cell is targeted to bring about gene expression and further, cell elimination. Thus, the latter stages of several cancer diseases in the colon, prostate, pancreas, glioblastoma, and melanoma are best treated with the prodrug (GDEPT) therapy (Atlaner, 2008). This review essay as an account of the benefits and disadvantages of using gene therapy is appropriate and significant to study the different ways of executing the gene therapy.

Conclusion Gene therapy purports to kill cancer cells from proliferating. Moreover, the therapy is also purposeful in healing other forms of human diseases. Further, several approaches like immunotherapy, chemo, radiology, nanotechnology, biotechnology also poses desired results. Indeed,

there is a need for further research and investigation before promoting the intensive use of gene therapy as a method to fight and treat cancer cells.