Parkinson’s disease

Parkinson's disease is a neurological disorder caused by the inefficiency conversion of l-Dopa into dopamine. Dopamine is a crucial production in the brain as it helps in the control of muscular movement. Patients suffering from Parkinson's disease start to lose control of their movement and have trouble speaking.

Parkinson's disease lacks an effective treatment; the treatments available are of two types. These treatments though are not efficient and results into adverse side effects. The first treatment involves the administration of the L-Dopa, which losses its effectiveness with time, therefore, requiring increases in the levels of administration. The side effects from this treatment include vomiting, seizures and even hallucinations. The second treatment involves stimulation of the brain through surgery, which may be risky and may cause hemorrhage in the cranium.

Research has shown that gene therapy can be helpful and effective in the treatment of Parkinson's disease. Researchers have also shown considerable interest in developing of genetic therapy in the curing of the disease. The use of the AAV-AADC vector has proven through research that it can treat Parkinson's disease. Trials in animals have resulted in the increase of conversion of L-Dopa into dopamine and restoring up to 50% normal levels. The test gets conducted on primates, where it showed favorable results and minimal side effects (Fitzsimons 2010). Upon trying the treatment on patients, there was a positive effect. AAV-GAD vector has also been found to be effective therapy treatment with minimal side effects.

The main objective of the study is to come up with a new and a more effective treatment of Parkinson's disease. On the other hand, another objective is to design and clone a new vector that gets accepted for research. The hypothesis of the study is that the cloning of AADC and GAD into an AVV vector, this vector will be effective in the treatment of Parkinso's disease. The aims of this study are to study whether it is possible to clone the AADC and GAD into an AVV gene. Second aim is to establish whether the gene will be functional and lastly if it can treat Parkinson's disease.

In cloning of AADC and GAD, the study proposes to use IRES to connect the sequences from the two genes. The experiment will also use cytomegalovirus to enhance the attachment of the genes to cells. The functionality of the vector in the study is to be confirmed by the use of mice. As for the vector being effective in the treatment of Parkinson's disease, the study will use locomotor activity and position bias among others.

The proposal suggests that the likelihood of cloning the AADC and GAD are high and successful as the AAV and AADC were successful with the help of IRES. Also, there has been research that if we injected the AADC-GAD-AAV vector into rats and the results showed that it would be effective in treating the Parkinson's disease. The use of the vector on rats with Parkinson's disease demonstrated that it caused changes in phenotypical behavior and biochemical pathways in neurons, proving that it would be effective for treating Parkinson's.

The first constraint of the study is the size of the vector, therefore, necessitating it to be administered in small quantities. The study may also

take time and the mice may not behave as expected. The conclusion of the proposal is that if the vector is successful it can be used in the treatment. Its future direction is that if it is successful in mice it can be tested in non-human primates and clinical trials. The success of this in patients will prove that gene therapy is effective in treating the Parkinson's disease. If the study is successful, it can broadly contribute to the molecular biology study (Fitzsimons & Riban, 2010).

The overview was somehow effective as it gave background information about Parkinson's disease and the current treatment. Itt also gave a background on the effectiveness of gene therapy but lacked to show its use and success in the real world of today. The objectives of the study were not appropriate as per the overview. The study should provide a brief overview of research on gene therapy and the effects it has had on the medical scenery. Also, it should probably give an overview that shows the use of gene therapy to cure other diseases other than form Parkinson's disease.

The study states the hypothesis poorly, and it lacks the SMART attributes. The aims of the study though supported the main hypothesis as the study first showed how it was going to clone the genes, then test their functionality and their effectiveness in curing the Parkinson's disease. The experiments proposed were also effective. Alternative experiments for the aims should be mentioned to support the main experiments in case they did not work.

The outcomes for the aims were appropriate and well demonstrated in the proposal. As for the setbacks, the information was not adequately provided for each aim. The study provides setback in the first aim where the size of

the genes gets addressed. The conclusions that the study draw are not appropriate. This is because the effectiveness of the vector has not yet been proven, and the experiments have not yet been conducted. If the study provided for other previous research that has been successful, then the conclusions would have been appropriate.

The future directions of the study are appropriate because if the study were successful then it would be tested in non-human primates, then in clinical tests. As for the intellectual conclusion of the study, they were appropriate as the reaction in the mice would probably be the same in non- human primates and humans. The use of gene therapy in treatment and the study contributing to the molecular biology was also appropriate. As its success would be a significant contribution to treating the Parkinson's disease.