A klinefelter syndrome patient's induced fibroblasts produced pluripotent stem cells with aberrant gene expression profiles.

Suchitra Ujhelly*

Department of Molecular Animal Biotechnology ,Szent István University, Hungary

Introduction

Induced Pluripotent Stem Cells (iPSCs), a ground-breaking scientific discovery, have paved the way for significant developments in the fields of regenerative medicine and biomedical research. Due to their extraordinary capacity to differentiate into a variety of specialized cell types, stem cells have long captured the attention of researchers. This ability holds great promise for the regeneration of damaged tissues and the treatment of a wide range of disorders. The widespread use of embryonic stem cells was hampered by the ethical dilemmas and the scarcity of these cells. Enter iPSCs, a ground-breaking innovation that got around these obstacles and changed the course of modern medicine [1].

Males who have Klinefelter Syndrome (KS), a chromosomal disease, will have an additional X chromosome (XXY) instead of the typical XY chromosomal sequence. Numerous difficulties with the body, the mind, and the hormones result from this genetic abnormality. Recent developments in stem cell research have given new light on the subtleties of the illness while the molecular pathways behind Klinefelter Syndrome have been widely investigated [2].

Induced pluripotent stem cells (iPSCs), a cutting-edge method that enables the reprogramming of mature cells into a pluripotent state, have made significant progress in the scientific community. These iPSCs have the exceptional capacity to differentiate into numerous cell types, such as neurons, muscle cells, and blood cells, opening up previously unimaginable possibilities for disease modeling and regenerative treatment. Among the most compelling applications of iPSCs is the ability to generate patient-specific stem cells, enabling researchers to study diseases at the cellular level in a personalized context. In the case of Klinefelter Syndrome, this breakthrough has opened up new avenues to explore the genetic and epigenetic factors that contribute to the disorder's manifestation and progression[3].

The discovery of induced pluripotent stem cells with aberrant gene expression profiles derived from a Klinefelter Syndrome patient's fibroblasts marks a significant milestone in the field of regenerative medicine and genetic research. This groundbreaking study has illuminated the intricate interplay between genetic anomalies and stem cell reprogramming, shedding new light on the complexities of Klinefelter Syndrome's molecular mechanisms [4].

The discovery of abnormal gene expression in these generated pluripotent stem cells has significant ramifications for possible therapeutic strategies in addition to improving our understanding of the disease at the cellular level. Researchers may discover fresh targets for intervention by investigating the exact genes and biochemical pathways impacted by Klinefelter Syndrome in the setting of iPSCs, providing hope for future therapies that are customized to the genetic profiles of individual patients [5].

References

1. Álvarez-Nava F, Lanes R. Epigenetics in turner syndrome. Clin Epigenetics. 2018;10:1-20.
2. D'Aurora M, Ferlin A, Garolla A, et al. Testis transcriptome modulation in klinefelter patients with hypospermatogenesis. Sci Rep.2017;7(1):45729.
3. Zhang X, Hong D, Ma S, et al. Integrated functional genomic analyses of klinefelter and turner syndromes reveal global network effects of altered X chromosome dosage. Proc Natl Acad Sci. 2020;117(9):4864-73.
4. Tang Y, Zhou T, Yu X, et al. The role of long non-coding RNAs in rheumatic diseases. Nat Rev Rheumatol. 2017;13(11):657-69.
5. De Jong J, Looijenga LH. Stem cell marker OCT3/4 in tumor biology and germ cell tumor diagnostics: History and future. Crit Rev. 2006;12(3-4).

***Correspondence to:** Suchitra Ujhelly, Department of Molecular Animal Biotechnology ,Szent István University, Hungary, Email: suchitra@ujhelly.hu

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