



## PAKISTAN BIOMEDICAL JOURNAL

<https://www.pakistanbmj.com/journal/index.php/pbmj/index>

ISSN (P): 2709-2798, (E): 2709-278X

Volume 7, Issue 9 (September 2024)



## The Future of Regenerative Medicine: Stem Cell Research in Pakistan

Anna Maria Lavezzi<sup>1</sup><sup>1</sup>Lino Rossi Research Center-Department of Biomedical, Surgical & Dental Sciences, University of Milan, Milan, Italy[anna.lavezzi@unimi.it](mailto:anna.lavezzi@unimi.it)

## ARTICLE INFO

**How to Cite:**

Lavezzi, A. M. (2024). The Future of Regenerative Medicine: Stem Cell Research in Pakistan. *Pakistan BioMedical Journal*, 7(09). <https://doi.org/10.54393/pbmj.v7i09.1143>

The landscape of medicine is being revolutionized by the recent breakthroughs in stem cell research that offer new possibilities for treating diseases that were once deemed degenerative, incurable, or irreversible. In low and middle-income countries like Pakistan stem cell therapy holds promise for cost-effective solutions to non-communicable diseases. However, these advancements are hindered by ongoing debates, legal challenges, and public controversies.

Stem cells can differentiate into various cell types and self-renew themselves, making them appealing for regenerative medicine. Unlike traditional therapies, regenerative medicine focuses on the restoration of optimal functioning of the damaged tissues and organs. Stem cells can be categorized as embryonic and adult stem cells. Adult stem cells such as mesenchymal stem cells can differentiate into various cell types. These can be obtained from bone marrow, adipose tissue, umbilical cord tissue, and amniotic fluid.

Research shows that stem cells have the potential to treat cancers and advance regenerative medicine. Genetically modified stem cells can act as delivering systems for the treatment of genetic disorders and the development of therapeutic agents directly targeted to organs. Successful differentiation of stem cells into neurons, cardiomyocytes, insulin-producing cell clusters, hepatocytes, and hematopoietic precursors. These achievements are powerful tools that can help in combating human diseases.

In Pakistan, while the potential of stem cell therapy has generated significant excitement, the progress is hindered by regulatory and infrastructure challenges. Addressing these concerns and fostering a supportive research environment is essential for advancing stem cell and regenerative medicine in the country. According to the WHO International Clinical Trials Registry, there are over 3000 trials on adult stem cells in progress [1]. These trials are essential in advancing the knowledge of stem cell therapies and for the establishment of realistic expectations for their outcomes. The transplantation of stem cells into non-native environments can pose risks, including tumor formation and other complications. These risks underscore the importance of rigorous evaluation and monitoring to ensure that these promising therapies are both safe and effective before they become widely available.

In conclusion, stem cell research has great potential to revolutionize healthcare in Pakistan, but ethical, regulatory, and infrastructure challenges must be overcome before its benefits can be fully realized in regenerative medicine. An environment that is supportive and safe is imperative for clinical trials and research to ensure safe and effective therapies in the future.

## REFERENCES

- [1] Aly RM. Current State of Stem Cell-Based Therapies: An Overview. *Stem Cell Investigation*. 2020;7.

