

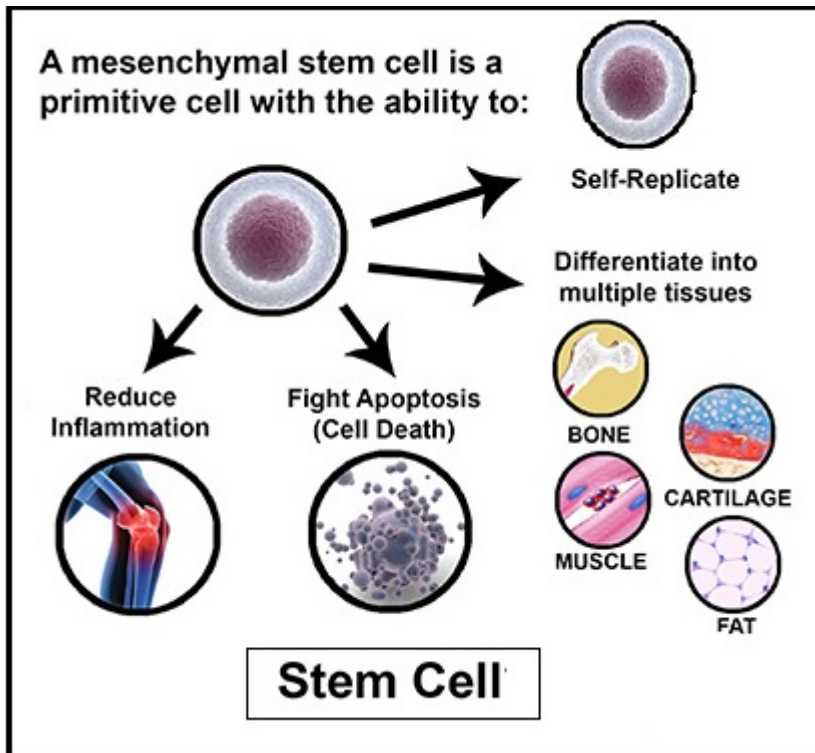
## Stem Cell Therapy for Autism

### Why in news?

Recently, the Delhi High Court has permitted two children with autism spectrum disorder (ASD) to undergo stem cell therapy for treatment of their condition.

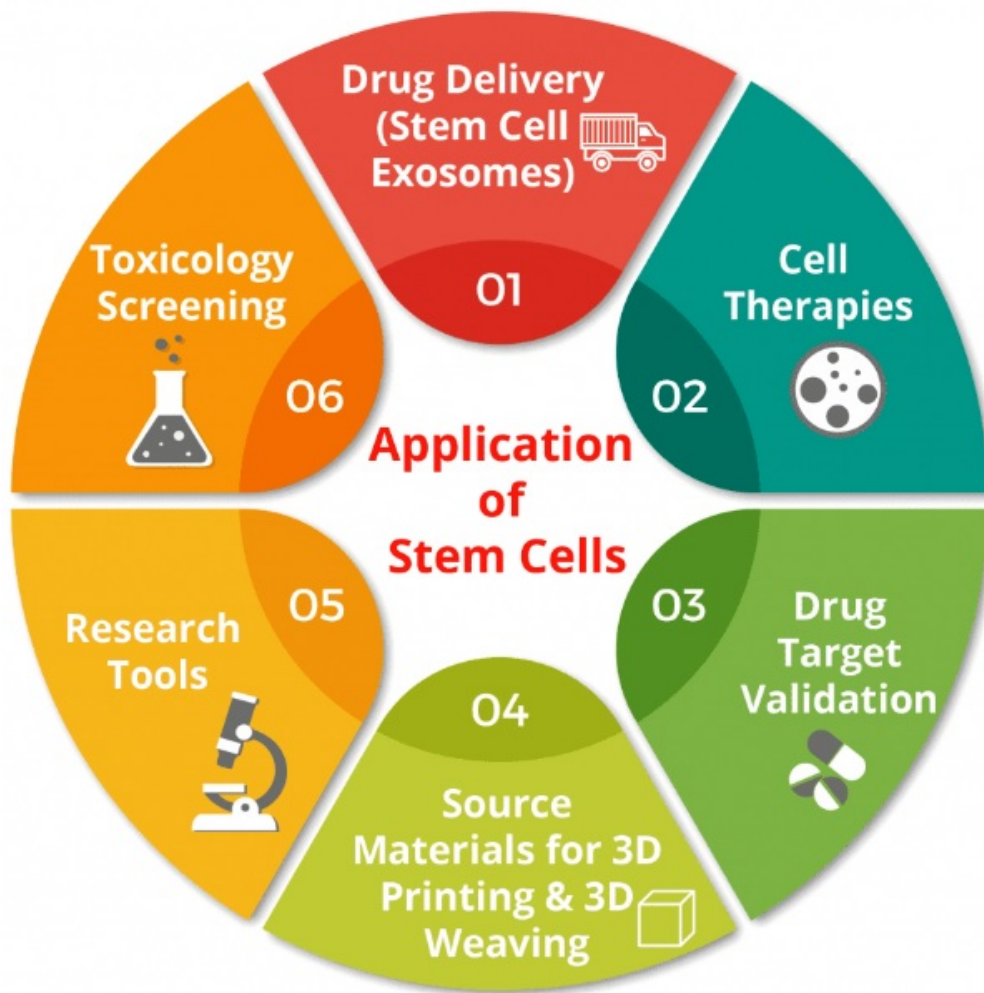
### What is stem cell therapy?

- They are body's raw materials, cells from which all other cells with *specialized functions* are generated.
- **Differentiation**- Under right conditions in the body or a laboratory, stem cells divide to form more cells called daughter cells.
- These daughter cells become either new stem cells or specialized cells (differentiation) with a more specific function, such as blood cells, brain cells, heart muscle cells or bone cells.
- **Categories**-
  - **Pluripotent stem cells**- They have the ability to differentiate into all of the cells of the adult body.
  - **Adult stem cells**- They are *tissue or organ-specific* and regenerate to form cells only of that particular organ.
- **Induced pluripotent stem cells** - Pluripotent stem cells are naturally found *only in embryos*.
- But, in 2006, researchers identified condition that would allow some mature human adult stem cells to be reprogrammed into embryonic stem cell called as induced pluripotent stem cells.



### Why is stem cell therapy so significant?

- **Disease modelling-** By observing stem cells mature into cells in bones, heart muscle, nerves, and other organs and tissue, researchers may better understand how diseases develop.
- **Regenerative medicine** - It helps to generate healthy cells to replace cells affected by disease.
- **Disease diagnosis-** The regenerative properties of stem cells is used to treat diseases such as
  - Spinal cord injuries
  - Life style disease-Type 1 diabetes, heart disease, cancer etc.,
  - Neurogenerative disorder-Parkinson's disease, Alzheimer disease
  - Blood cancers
- **Drug testing-** It helps to test new drugs for safety and effectiveness.
- **Drug discovery-** Nerve cells could be generated to test a new drug for a nerve disease.



## What is Autism Spectrum Disorder?

*As per World Health Organisation (WHO), about 1 in 100 children have autism.*

- **ASD** - It is a *neurodevelopmental condition* where people experience social, communication and behavioural difficulties along with complicated sensory processing.
- ASD characteristics usually develop earlier during infancy.
- **Cause** - It is a developmental disability caused by differences in the brain.
- It has environmental and genetic causes.
- **Fragile X Syndrome (FXS)** is the leading inherited cause of autism in 4% of the global population.
- **Transmission** -It is transmitted genetically for some people.
- **Treatment**- Currently, there is *no cure* for ASD. Treatments and therapies are geared towards managing the symptoms.
- Conventional therapies include social skills training, early intensive behaviour therapy, applied behaviour analysis, speech therapy, and occupational therapy.
- Evidence-based psychosocial interventions can improve communication and social skills.
- **Support systems**- Care for people with autism needs to be accompanied by actions at *community and societal levels* for greater accessibility, inclusivity and support.

## Can stem cell treatment be used to treat ASD?

- **Experimental stage**- Stem cell therapy is *not typically used for treating ASD* yet. The treatment is very much in an experimental stage and there is simply *not enough data* to make definitive claims.
- **Research evidence**- Intravenously given stem cells, can improve the overall regulation of the immune system and the neural connectivity in the brain.
- **Limited understanding**- There is also limited understanding of its long term effects and as pointed out by doctors representing the EMRB, there is no established protocol for its use to treat autism.
- **Ethics and Medical Registration Board (EMRB)**- EMRB, an autonomous body under National Medical Commission is against the use of stem cell treatment for ASD due to lack of data.
- **Predatory marketing**- EMRM's recommendation of stem cell therapy is due to false hope to parents and caregivers regarding the possibility of "curing" ASD.
- **High court ruling**- It does not give opinion on the general validity of using stem cell therapies for ASD, but in the cases filed it allows ongoing treatment to continue.
- The High Court said that NMC is permitted to take a final view on the recommendation as per provisions of the NMC Act.

### National Medical Commission

- It has been constituted by an act of Parliament known as *National Medical Commission Act, 2019*
- **Aim**- To improve access to quality and affordable medical education.
- **Functions**
  - To ensure availability of adequate and high quality medical professionals in all parts of the country
  - To promote equitable and universal healthcare services
  - To encourage medical professionals to adopt latest medical research in their work and to contribute to research
  - To objectively assess medical institutions periodically in a transparent manner
  - To maintain a medical register for India
  - To enforce high ethical standards in all aspects of medical services
  - To have an effective grievance redressal mechanism
- **Autonomous Boards**-
  - UG Medical Education Board
  - PG Medical Education Board
  - Medical Assessment and Rating Board
  - Ethics and Medical Registration Board

## References

1. [Indian Express- Stem cell therapy autism](#)
2. [WHO- Details about ASD](#)



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