

# THE TUREK CLINIC

## Testicular Germline Stem Cells

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**Objective:** Stem cells have the ability to both differentiate into other mature cell types and maintain an undifferentiated state by self-renewal. Currently, **embryonic stem cells** are the best studied stem cell type. Among adult stem cells, emerging research has focused on evaluating the pluripotency potential of **testis stem cells**. This review summarizes our current scientific understanding of the creation, assessment and clinical potential of testis-derived stem cells.

**Design:** Retrospective review of the published scientific literature that address the issue of embryonic and adult stem cell potential for use in cell based therapy with a particular focus on adult testicular stem cells.

**Results:** A discussion of the clinical potential of currently described stem cells, including embryonic stem cells and induced pluripotency stem cells, is provided. The benefits of avoiding embryos for developing stem cells for therapy are significant, both ethically and politically. The risks of induced pluripotency stem cells is unclear in terms of cancer development. The potential to create embryonic-like stem cells from testicular tissue has been demonstrated in both mice and humans by several independent research groups. These stem cells are patient specific, immunologically compatible and can be reprogrammed into pluripotency potential with minimal intervention that excludes viral transformation and nuclear transfer. In addition, the potential for testis stem cells to develop into multiple organs is high.

**Conclusion:** Testicular stem cells from adult men have very high potential to replace other embryonic and adult stem cell types in cell based clinical medicine in the future. The current limitations of developing stem cell lines from the testis are clear and represent evolutionary and not revolutionary issues to solve.

**Keywords:** testis, stem cells, male infertility, cell based therapy

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