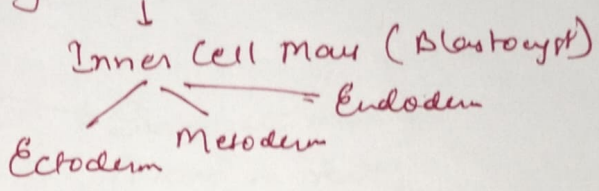


# Adult Stem Cells

Totipotent → Zygote / Initial cells by cell division

Pluripotent Stem Cells → Embryonic Stem cells



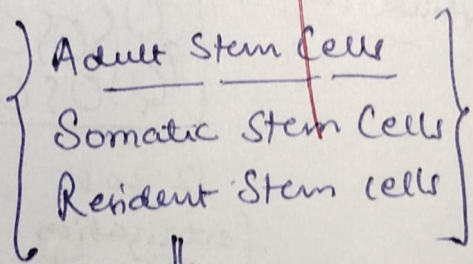
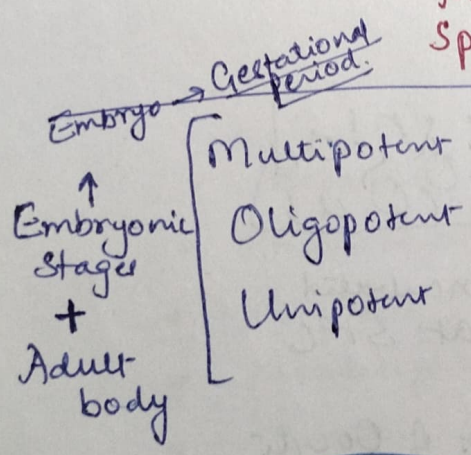
Multipotent Stem Cell → Restricted potency  
lineage specific / present in diff. organs / parts of the body

Oligopotent → progenitors  
↓  
Potency is further restricted

Unipotent → Single potency  
Follicular Cell  
Spermatogenesis

Initial Embryonic Stage

Totipotent stem cell  
Pluripotent



rare population of undifferentiated cells

localized within differentiated organ

in a specialized region called as "Niche"

Niche → maintains the micro environment that regulates cell growth & development

- Adult Stem Cells
- \* Self renewing
  - \* Clonogenic
  - \* Multipotent in nature (Potency)
- ↓
- Capable of giving rise to cells of its own lineage



Function: Maintain the tissue homeostasis

Tissue → cells → limited life span → die

ASCs

↓  
Regeneration and maintenance of Adult tissue/cells

{ → If cells keep on dying  
→ New cells are not formed }

Aging / Senescence death.

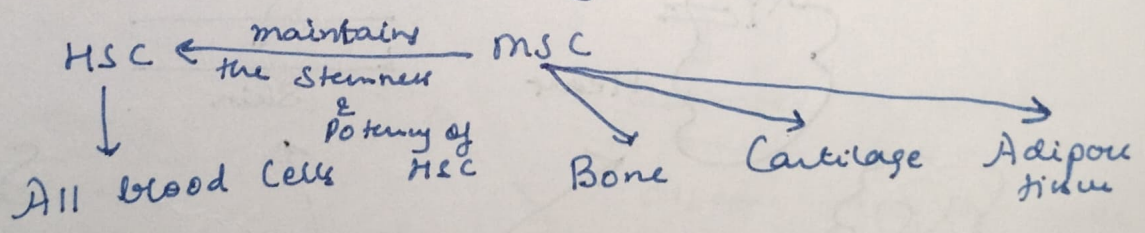
Signals received → ASCs → Activated → proliferate  
↓  
differentiate into required cell types.

Upon loss of cells / Injury to the tissue

ASCs → blood; Intestine; Skin; muscle; brain; heart → all organ systems.

↓  
Functional Capability → to regenerate the loss/damage

Bone marrow → Hematopoietic stem cells (HSC)  
Mesenchymal Stem Cells (MSC)



ASC → Quiescent State → receive signals  
↓  
activated to proliferate & differentiate

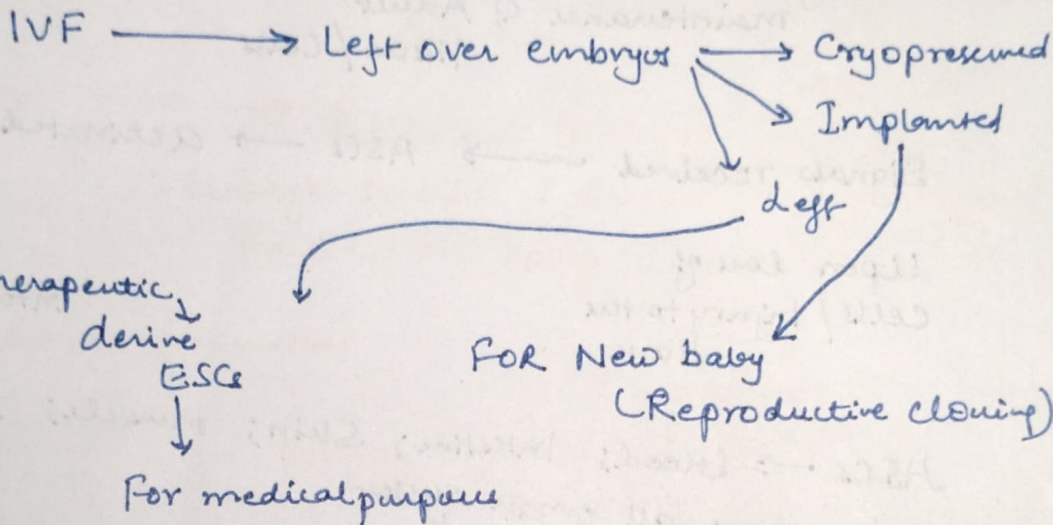
# REGENERATIVE MEDICINE

re-generati

↓  
damaged tissue/organs

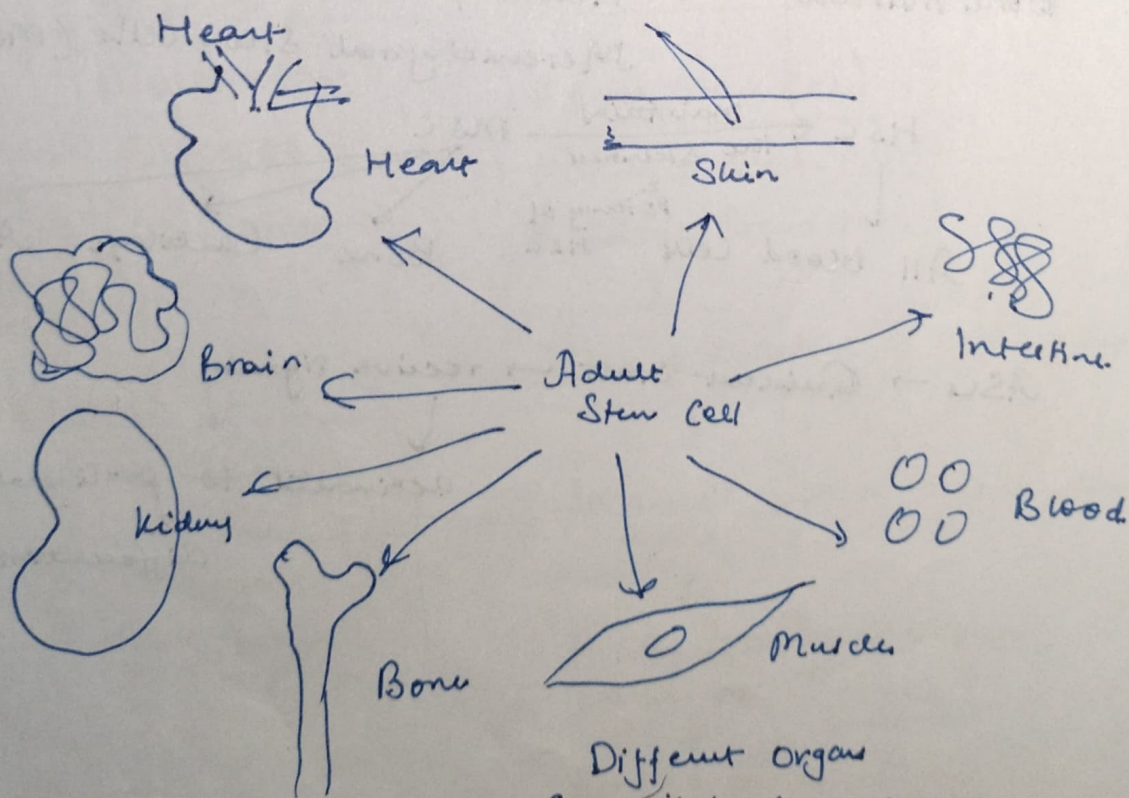
REPRODUCTIVE CLONING

THERAPEUTIC CLONING



~~ADSC~~ ASC

In all organs/tissues

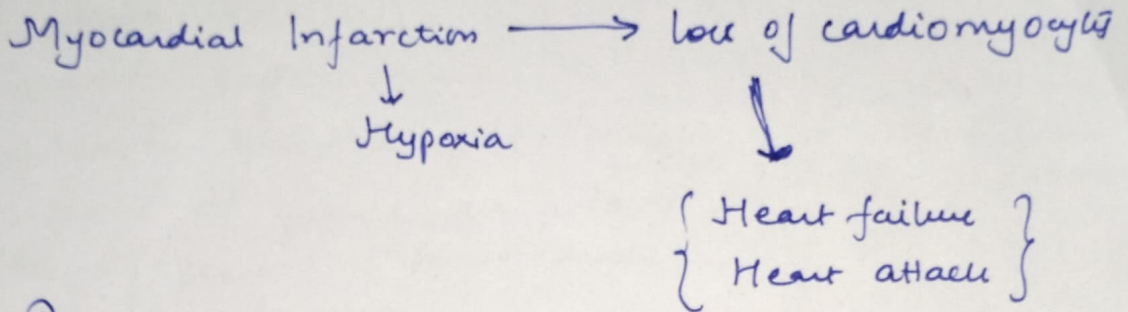


Different organs  
Capability for structural  
& functional generation of organ

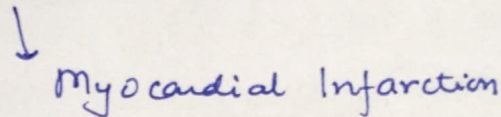


# Regenerative Medicine

## ADUs for Heart



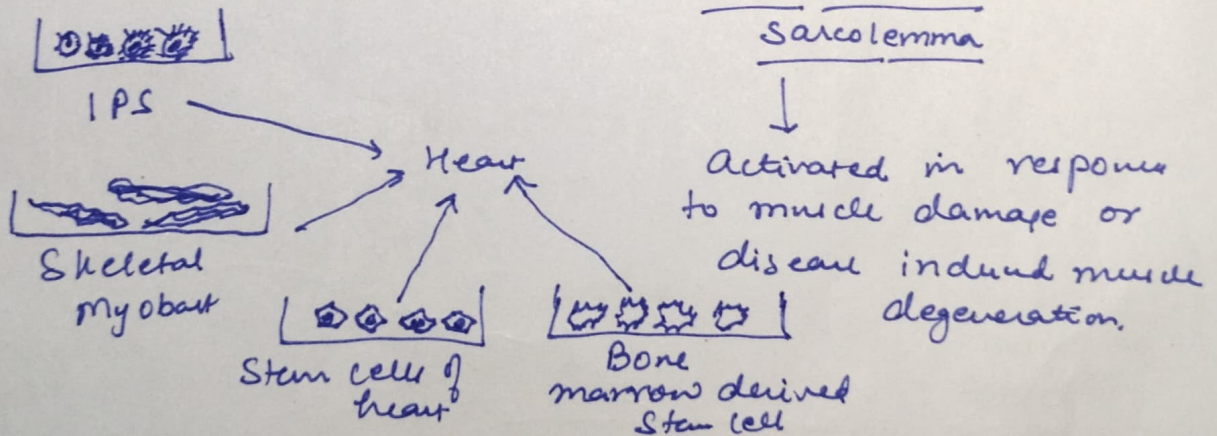
Regenerative ability of the heart?



Stem Cell therapy → formation of new contractile tissue.

Skeletal myoblasts → Cardiomyopathy / heart failure  
↓  
Progenitor Cell, located between

basal lamina &  
sarcolemma



## Bone Marrow derived Cells

Bone marrow → Niche Adult Stem Cell

Hematopoietic Stem Cell

Mesenchymal Stem Cell

Differentiated & Undifferentiated Cells.