

Uses of stem cells in Veterinary Medicine

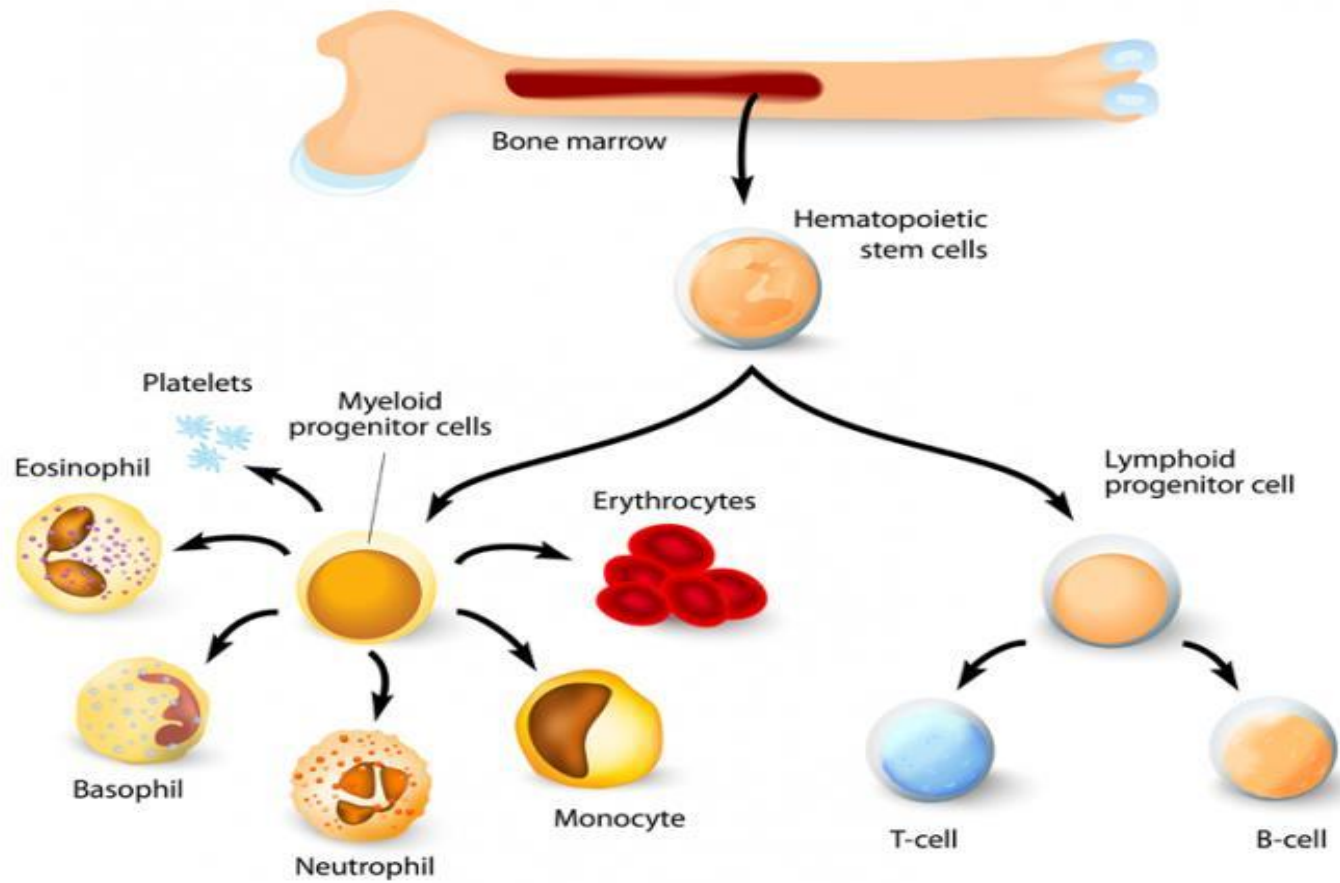
Assist. Prof.Dr. Oday Kareem Luaibi

-Stem cells meaning as a source of new cells to grow or replace specialized tissues.

-To perform this function, these cells must divide to renew themselves, while some of their progenies eventually differentiate to build up new tissues.

IN Vet. Med. APPL.

- HST
- MSCs
- ESTCs



❖ MSCs

- Differential into the other cells
- In many studies consider more efficiency of the types of STCs

❖ ESTCs

Scientists and academic centers for stem cell research are using MSCs and ESCs

- MSCs have been used in veterinary medicine to treat
- Tendinitis,
- Osteoarthritis,
- Dermatitis,
- Cutaneous wounds
- D.M.
- C.M.D
- there are on going investigations to determine the potential benefit of MSCs to treat numerous other diseases.

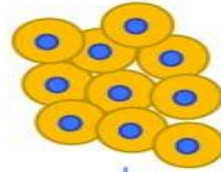
BONE MARROW AND THE HAEMATOPOIESIS

Bone Marrow Evaluation

Adequate evaluation of bone marrow aspirates requires knowledge with **normal blood cell development** and knowledge of the patient's current **complete blood count (CBC)** data. Knowledge with normal blood cell development is necessary to distinguish **abnormalities** in blood cell maturation and morphology, as well as detect **abnormal** cell populations in a bone marrow aspirate. Knowledge of current CBC data is necessary to **interpret bone marrow response in various disease states**.

For example, an increased **myeloid/erythroid (M/E)** ratio in the presence of non-regenerative anemia and a normal leukogram suggests **erythroid hypoplasia**, whereas an increased M/E ratio in the presence of neutrophilia and a normal packed cell volume suggests granulocytic hyperplasia.

Human embryonic stem cells

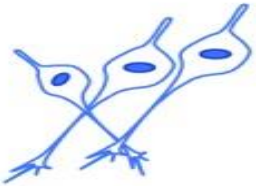


Differentiation

Ectoderm

Mesoderm

Endoderm



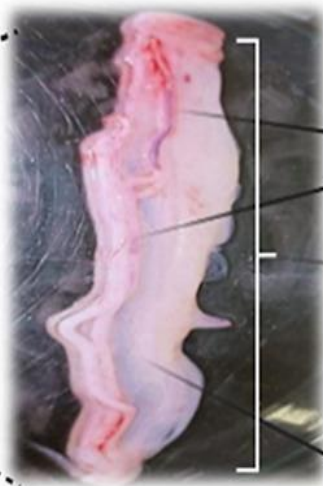
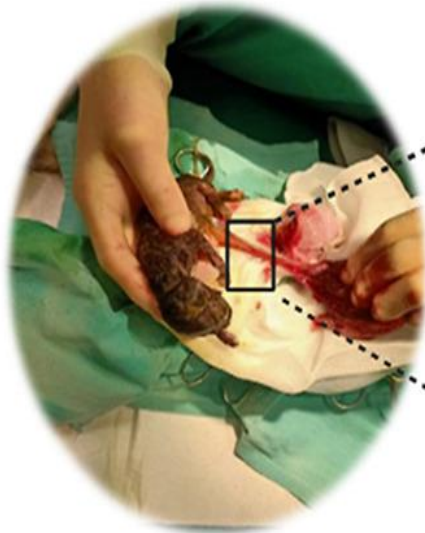
Neurons



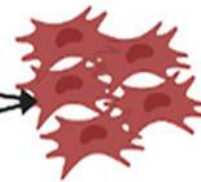
Muscle cells



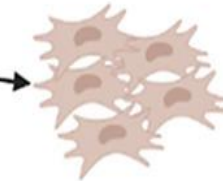
Thyroid cells



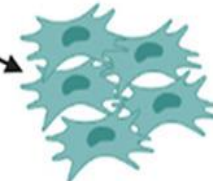
UCV-MSCs



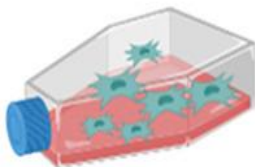
WUC-MSCs



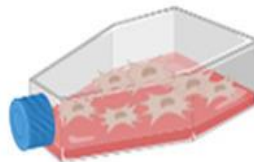
WJ-MSCs



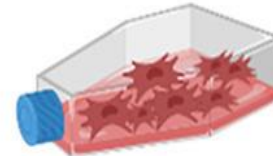
WJ-MSCs



WUC-MSCs



UCV-MSCs



Fibroblast and Spindle-like morphology

Expansion capacity

Tri-lineage differentiation

Adipocytes +++
Chondrocytes +++
Osteoblasts +++

Immunophenotyping

CD44+, CD90+, CD34-, MHC II-

Pluripotency markers expression
SOX2+++ , OCT4+++ , NANOG+++

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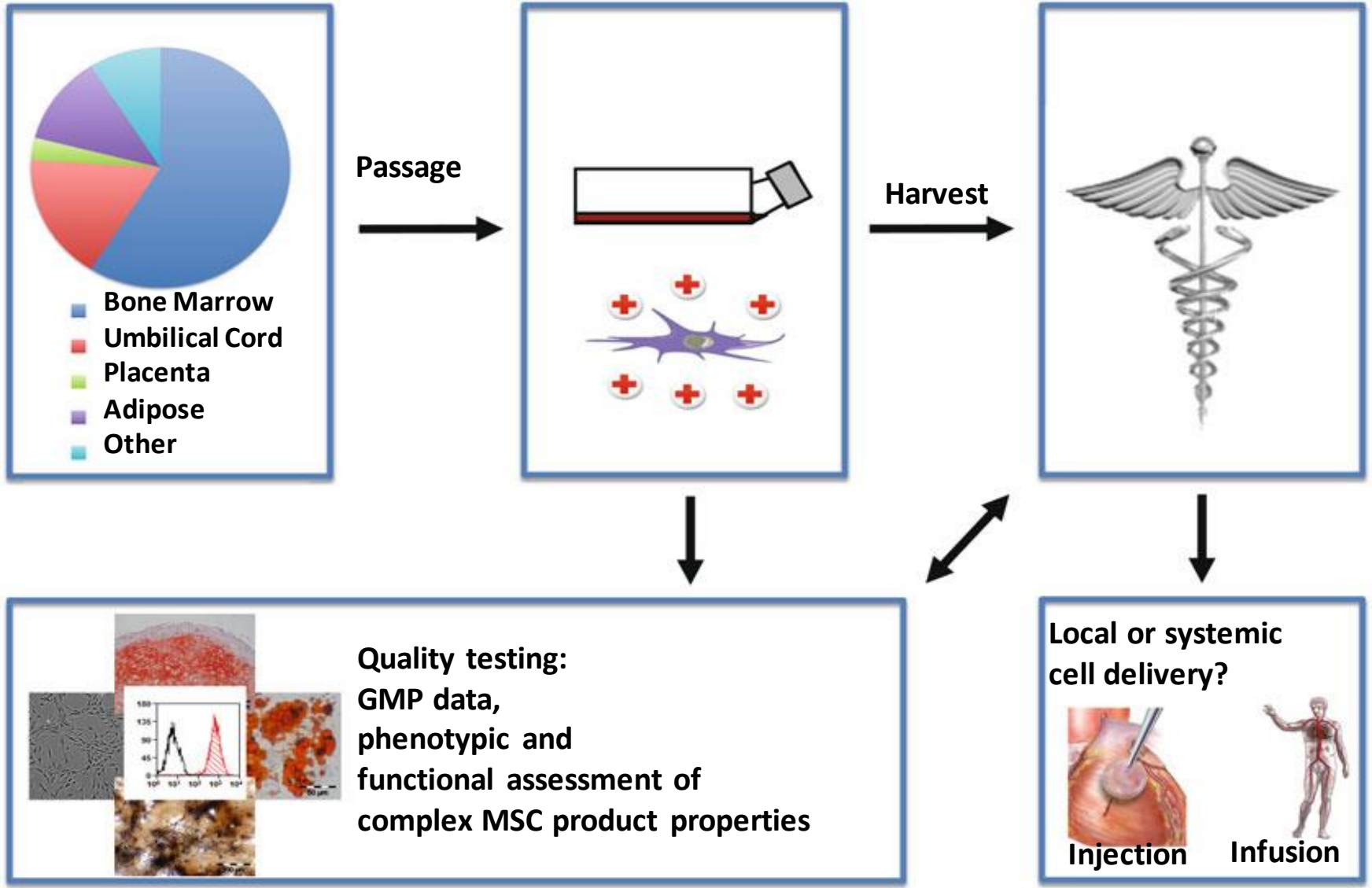
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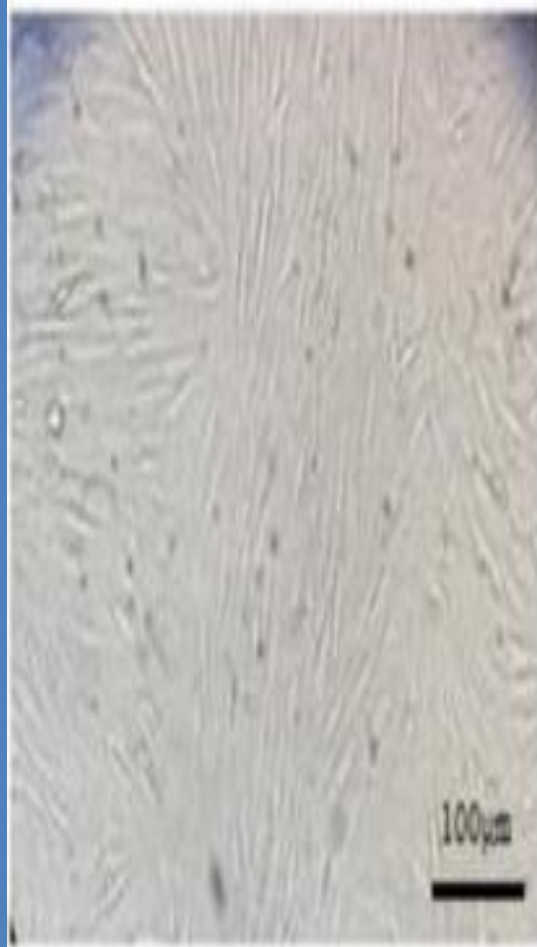
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a



b



c