

INTRODUCTION

Regenerative medicine is an expanding field based on the replacement or regeneration of damaged tissues to restore their original function. In veterinary medicine, the use of stem cells is focused in searching effective therapies for canine and feline diseases. Recent clinical studies in dogs and cats using either allogenic or autologous (patient-derived) stem cells from bone marrow or adipose tissue have shown promising results (Quimby 2019).

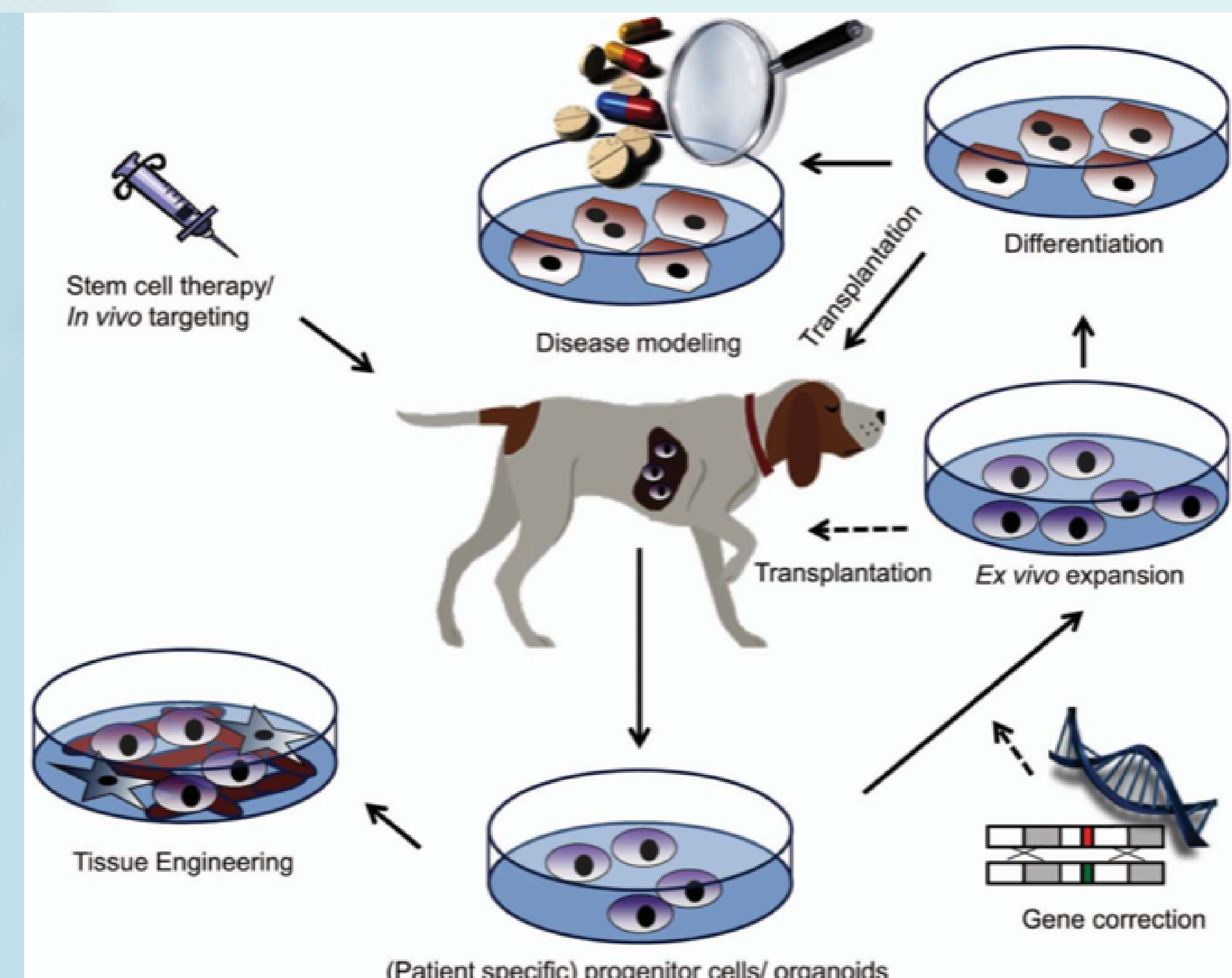
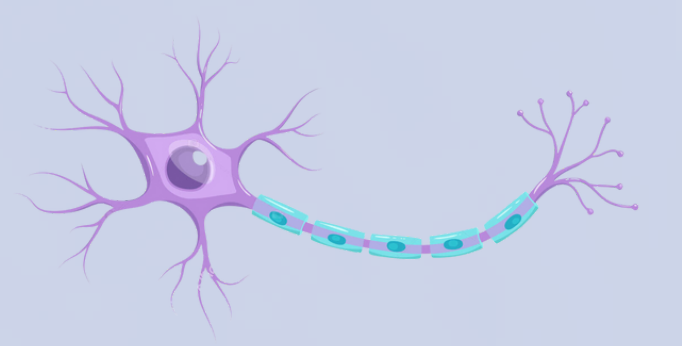
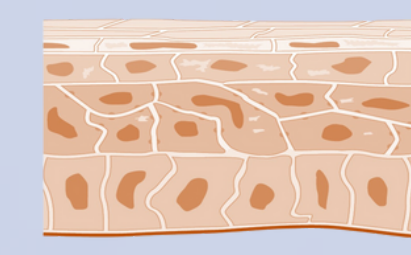


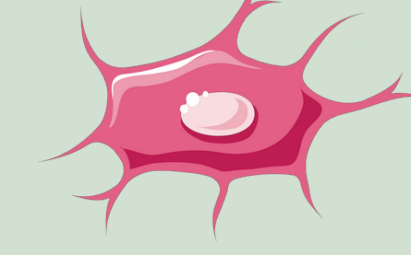



Figure 1. Different treatment modalities using regenerative medicine (organoids, gene therapy and stem cells) (Schotanus et al. 2013).

STUDIES IN DOGS AND CATS

Table 1. Most relevant studies in companion animals for different groups of diseases up to now. Within each group, the most studied pathology regarding stem cell therapy aid indicated.

Muskoloeskeletal	Neurological	Dermatology	Endocrinopathies	Immunomediated	Neoplasia	Miscellany
<ul style="list-style-type: none"> Osteoarthritis 	<ul style="list-style-type: none"> Spinal cord injury 	<ul style="list-style-type: none"> Skin wounds Atopic dermatitis 	<ul style="list-style-type: none"> Diabetes mellitus 	<ul style="list-style-type: none"> Rheumatoid arthritis Non-regenerative anemia 	<ul style="list-style-type: none"> Hemangiosarcoma Osteosarcoma 	<ul style="list-style-type: none"> Gastrointestinal Respiratory Cardiovascular Renal 

OBJECTIVES

- To analyse the viability of stem cell therapy and its clinical applicability in tissue restoration and immunomodulation by reviewing the properties of these cells and the evaluation of the studies conducted to date.
- To establish criteria for assessing the reliability of this therapy in preclinical and clinical studies.

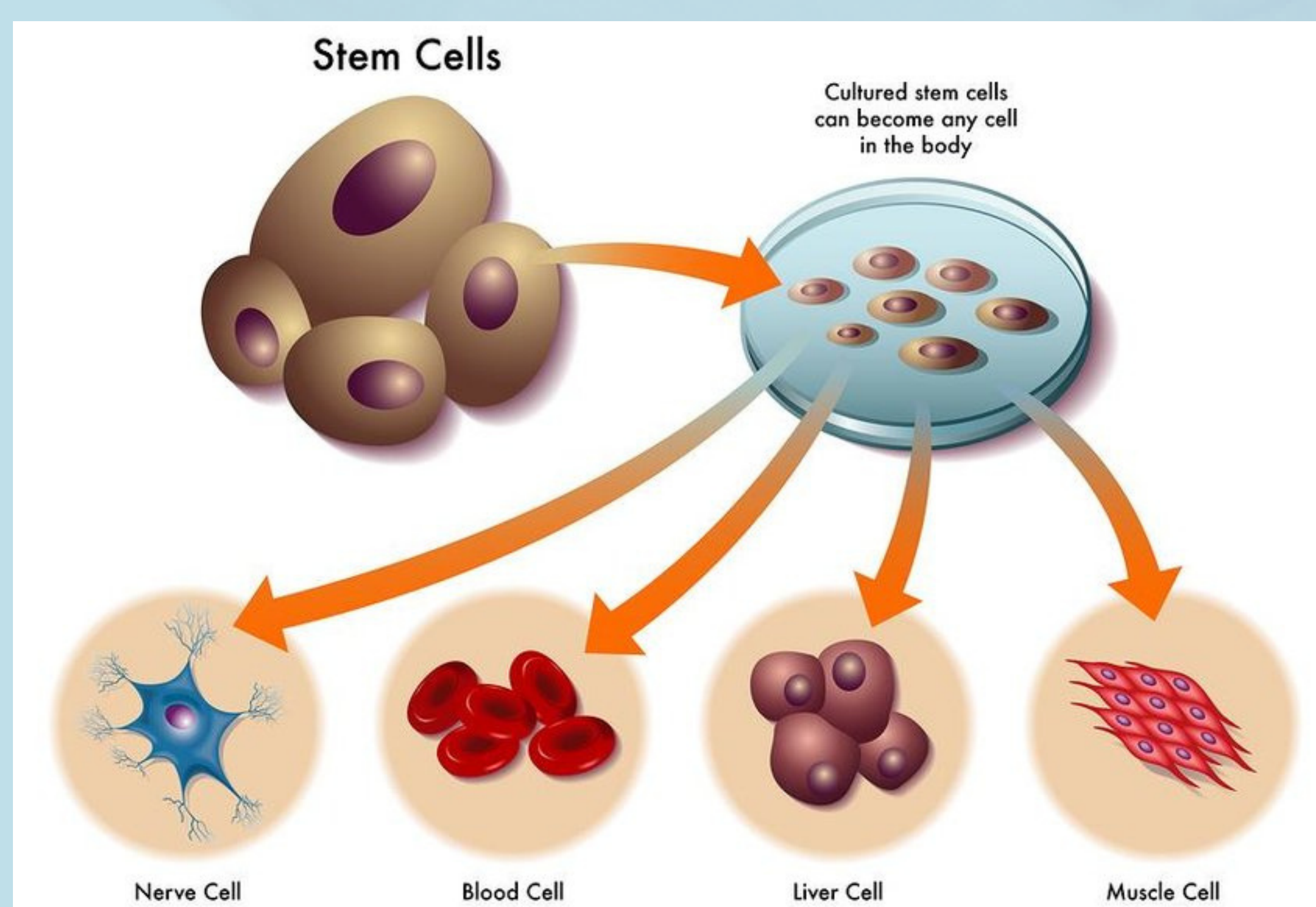


Figure 2. Stem cells can differentiate into any cell of the body (Jose 2017).

CONCLUSIONS

Concerning the first objective:

- Immunomodulation:** there is scientific evidence supporting the beneficial effects of stem cell therapy, particularly in the musculoskeletal disorders such as osteoarthritis. Further studies are required in other inflammatory diseases.
- Restoration:** except for spinal injuries, there is insufficient objective criteria to support its effectiveness. In dermatology, although initial positive results, additional research is required.

As for the second objective:

- A comprehensive understanding of **cell characteristics** is essential. Homogeneity in **therapeutic protocols** and use of sufficient animals and control groups are vital for study comparisons. The development of standardized **regulatory guidelines** is necessary to assess reliability.

REFERENCES

- Quimby JM. 2019. Stem Cell Therapy. *Vet Clin North Am Small Anim Pract* 49(2):223–231. doi:10.1016/j.cvsm.2018.10.001.
- Schotanus BA, Penning LC, Spee B. 2013. Potential of regenerative medicine techniques in canine hepatology. *Vet Q.* 33(4):207–216. doi:10.1080/01652176.2013.875240.
- Jose N. 2017. Stem Cell Therapy. *Int J Immunol Nursing.* doi: 0.37628/ijin.v3i2.438

