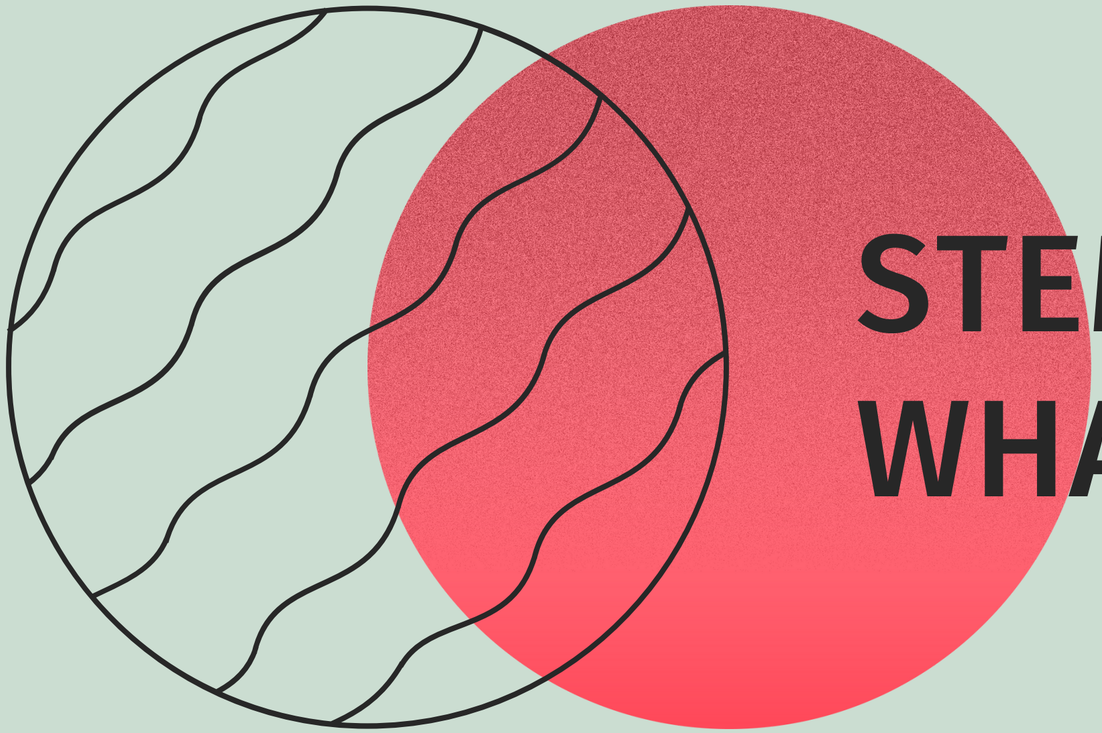
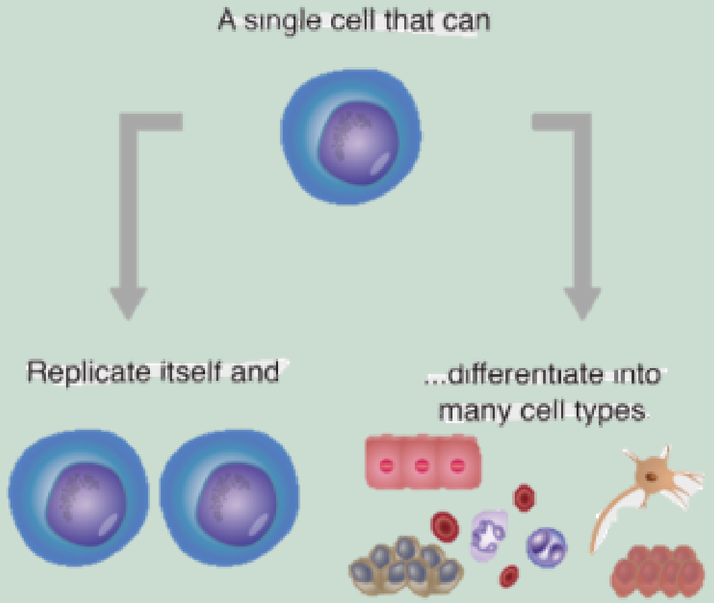
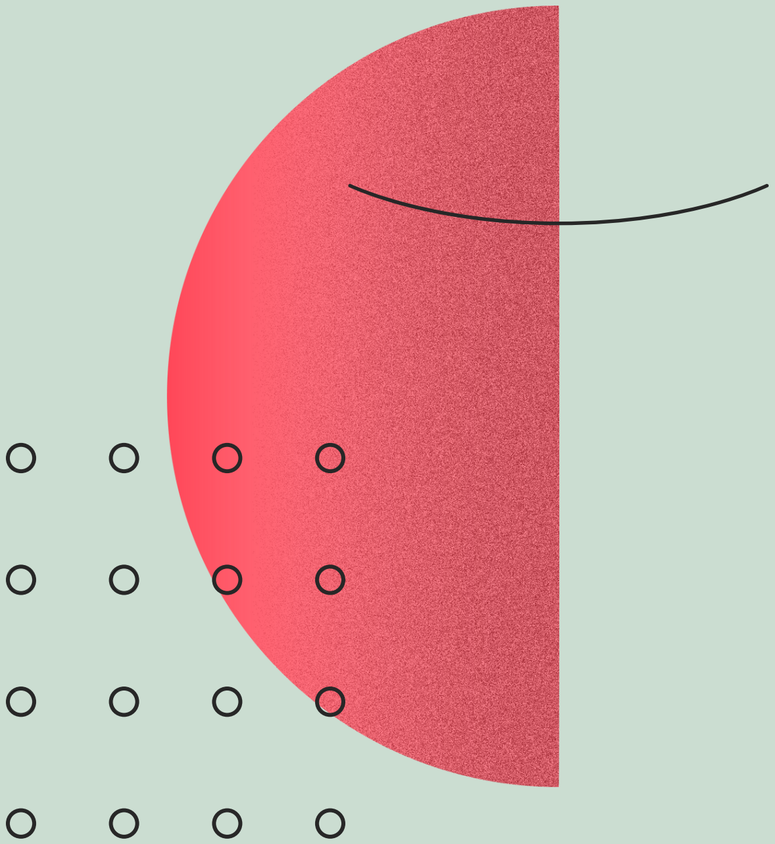


STEM CELLS
WHAT ARE THEY?

WHAT ARE STEM CELLS?

- Cells that can differentiate into different, specialised cell types.
- Cells that can self-renew and replicate while maintaining it’s stem cell state.
- Contribute to the body's ability to renew and repair its tissues.





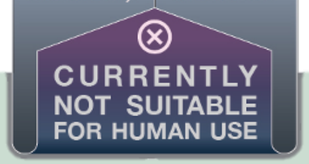
STEM CELL TYPES

EMBRYONIC STEM CELLS (ESCS)

ESCs are derived from the inner cell mass of an embryo that has been fertilized in vitro and donated for research purposes following informed consent. ESCs are not derived from eggs fertilized in a woman's body.

Embryonic stem cells are unfeasible due to ethical issues.

	AMPC	ESC	iPSC	HSC	MSC
How powerful are the stem cells?	**Multilineage potential—** strong differentiation ability.	**Pluripotent—** strong differentiation ability.	**Pluripotent—** strong differentiation ability	**Multipotent—** restricted to differentiating into blood cells.	**Multipotent—** restricted to differentiating into bone, skin, cartilage, and fat cells.
Is it ethical?	**Yes**	**No** Issues with embryonic destruction.	**Yes**	**Yes**	**Yes**
Is there a cancer risk?	**No**	Irrelevant due to infeasibility.	Stem cell culture process may cause cancerous mutations.	Possibly minimally mutagenic due to genetic expansion.	Possibly minimally mutagenic due to genetic expansion.
Does it require surgery?	**No** Only intravenous blood collections and injections.	Irrelevant due to infeasibility.	Irrelevant due to cancer risk.	**Yes** Transplant surgeries.	**Yes** Transplant surgeries and liposuction.
Will it require a donor?	**No**	Irrelevant due to infeasibility.	Irrelevant due to cancer risk.	**Yes**	**Yes** Alternatively, autologous adipose cells may be used.
How many stem cells can be obtained?	Up to 10e8	Irrelevant due to infeasibility.	Irrelevant due to cancer risk.	1 x 10e6	50 to 150 x 10e6



HEMATOPOIETIC STEM CELLS (HSC)

Hematopoietic stem cells (HSC) can transform into blood cells for post-chemo treatments.

The production of blood cells depends on hematopoietic stem cells (HSC) and their ability to self-renew and to differentiate into all blood lineages.

Blood-forming (or hematopoietic) stem cells in the bone marrow can give rise to red blood cells, white blood cells and platelets.

MESENCHYMAL STEM CELLS (MSC)

Mesenchymal stem cells (MSC) for joint/cartilage treatment in sports injuries.

The first MSCs were discovered in the bone marrow and were shown to be capable of making bone, cartilage and fat cells.

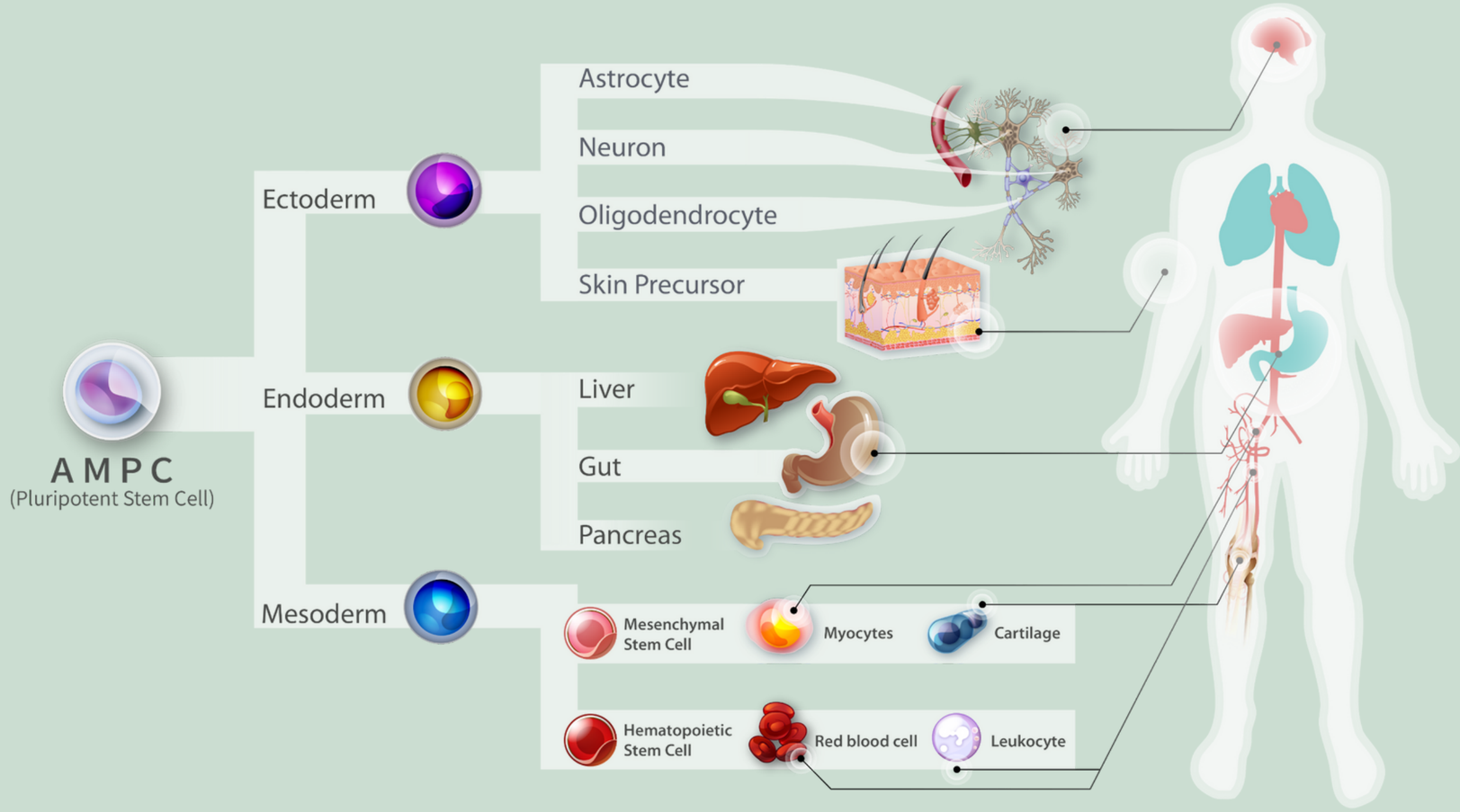
These cells can be ex vivo expanded and induced, either in vitro or in vivo, to terminally differentiate into osteoblasts, chondrocytes, adipocytes, tenocytes, myotubes, neural cells, and hematopoietic-supporting stroma.

INDUCED PLURIPOTENT STEM CELLS (IPS)

Induced pluripotent stem (iPS) cells are cells that have been engineered in the lab by converting tissue-specific cells, such as skin cells, into cells that behave like embryonic stem cells.

Patient-derived iPSCs have been shown to be useful for modelling diseases and screening drug candidate libraries.

AMPC


AMPC
(Pluripotent Stem Cell)
Ectoderm
Endoderm
Mesoderm
Astrocyte
Neuron
Oligodendrocyte
Skin Precursor
Liver
Gut
Pancreas
Mesenchymal Stem Cell
Myocytes
Cartilage
Hematopoietic Stem Cell
Red blood cell
Leukocyte

AUTOLOGOUS MULTILINEAGE POTENTIAL CELLS (AMPC)

- Self-renewing cells with multi-lineage differentiation potential: not confined to differentiating into only one cell group (such as blood cells).
- Dedifferentiated from adult white blood cells.

- A wide range of differentiation allows therapeutic effect for a large scope of degenerative diseases, including arthritis, leukaemia, cardiovascular disease, kidney or liver disease, and some autoimmune diseases.

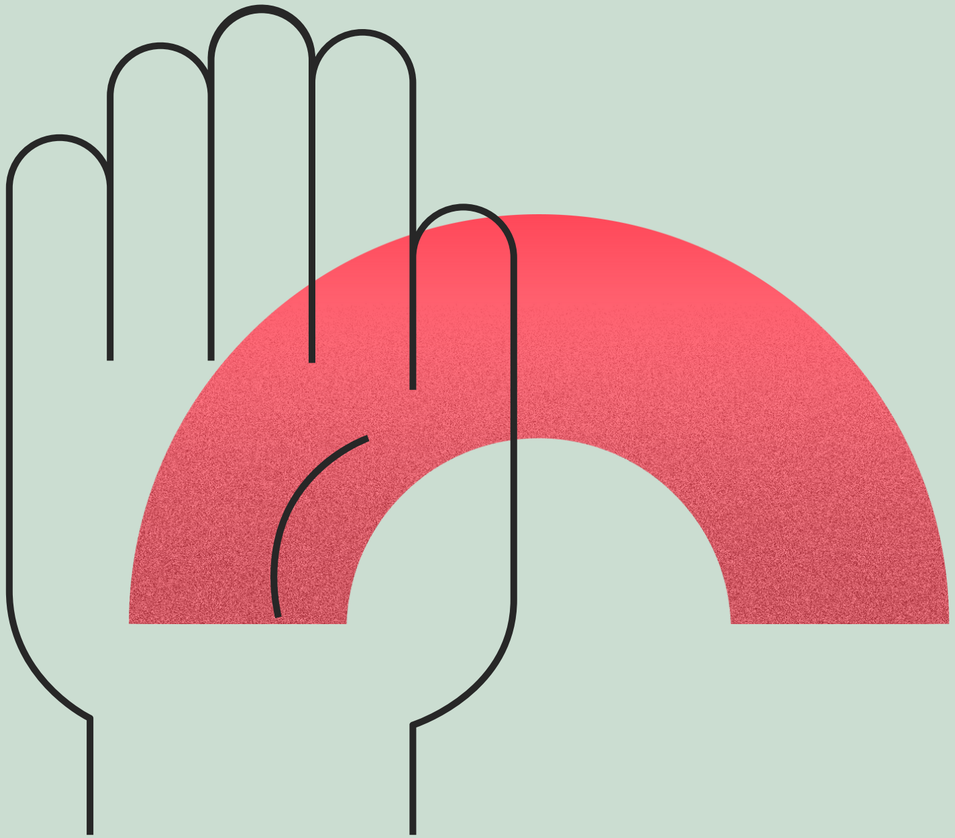
- Demonstrated ability to transform into neurons (ectoderm), osteoblasts (mesoderm), cardiac cells (mesoderm), and liver cells (endoderm).
- Receptive to the body's chemical signals, thus recognising sites that require stem cell regenerative effects for bodily repair (homing effect).

- Homing effect identifies priority sites for regenerative effects.

THE DIFFERENCE BETWEEN PLURIPOTENT AND MULTI-POTENT STEM CELLS

Pluripotent cells can give rise to all of the cell types that make up the body; embryonic stem cells are considered pluripotent.

Multi-potent cells can develop into more than one cell type, but are more limited than pluripotent cells; adult stem cells and cord blood stem cells are considered multipotent.



THANK YOU.

Cell Health Beauty Therapies (CHBT) Pty Ltd.

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