

Characteristics

1. Divide by mitosis to produce more cells.
2. Differentiate into different types of specialized cells.

NOTE: Mitosis is the process in which the nucleus and its contents divide. It contains four stages: Prophase - Metaphase - Anaphase - Telophase.

Risks of Usage In Medicine

Risk 1: Virus Transmission

Risk 2: Tumor development

NOTE: The virus may have already been in the donor stem cell or the cell might have gotten infected in the lab. A tumor may occur since there is a chance that the cells may get out of control once transplanted.

Main types of Stem Cells

Embryonic Stem Cells: Differentiate into **any type of specialized cells**

Adult Stem Cells: Differentiate into different types of **blood cells**

NOTE: Embryonic stem cells can become ANY type of specialized cell including types of blood cells which is the only types of cells an adult cell can differentiate into. Thus, embryonic stem cells can be used to cure more sicknesses than adult stem cells.

The Ethical Objection

The Ethical Objection to using **embryonic stem cells** resolves around the fact that embryonic stem cells have the **potential for human life** making some people object their use in research and others to think the benefits of curing **existing people** who are suffering is more important than **the right of embryos**.

Drawbacks of using Embryonic Cells

1. Requires **ONLY Embryonic cells** which has a **limited supply** and is the only type of stem cell that can **differentiate into any type of specialized cell**.
2. Is sometimes **rejected by the patients immune system** and attempts to destroy the cells since it **identifies it as "foreign"**.

NOTE: The risk of this happening can be reduced by giving the patient medications; however, it does not always work.

Why the Immune System Accepts Adult Stem Cells?

NOTE: The ability for Adult stem cells to be taken straight from the patient is an advantage because this way the immune system will accept the cells unlike the embryonic cells being considered "foreign".

Advantages and Disadvantages of Adult Stem Cells

Advantages: Adult stem cells are a **great alternative** and have the ability of **being taken straight from the patient** so that they will not cause rejection.

Disadvantages: Adult stem cells can only differentiate into different types of **blood cells**.

Information Resource + Video Link

The information provided in this cheat sheet is from "Cognito" on YouTube. You can watch it here.

