**Stem Cells**

**Key Term: Differentiation**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Genetic Flexibility of Stem Cells:

 Totipotent cells can give rise to \_\_\_\_\_\_\_\_ cell type in an adult. Human embryo cells are totipotent until the \_\_\_\_\_ cell stage.

 A pluripotent stem cell can generate cells from \_\_\_\_ of the \_\_\_\_ germ layers.

 Differentiation is cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ measures the ability of one tissue type to generate other tissue types.

Stem Cells

 Are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Able to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ without differentiating.

 Can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into specialized cells

 Two types, from different sources, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Embryonic stem cells

 Embryonic stem cells are harvested from the inner cell mass of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which is an unimplanted pre-embryo that is approximately 5-6 days old.

Adult stem cells

 Can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Can give rise to specific types of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Embryonic Stem Cells Can Become \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Germ Layers

 Humans and most animals are triploblastic, meaning they develop from three embryonic cell layers:

|  |  |
| --- | --- |
| Germ Cell Layer | Differentiates into |
| Ectoderm |  |
|  | Muscle, heart, kidneys |
| Endoderm |  |

What Diseases Might Stem Cells Treat?