STEM CELLS Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Use the link: <http://learn.genetics.utah.edu/content/stemcells/>

As you view the *Nature of Stem Cells* slide show, answer the following questions.

1. What is a differentiated cell and how is it different from a stem cell?
2. What is differentiation and what causes it?
3. Life begins when a special type of stem cell forms. What is the name of this cell and what process produces this stem cell? What potential does this stem cell have?
4. How many different specialized cell types are found in the adult human body?
5. At 1 week a blastocyst forms. What is a blastocyst? Draw a diagram of it. Has differentiation occurred? What has happened to the potential of these cells?
6. At 2 weeks gastrulation occurs. What’s this all about? Draw a diagram of it. Has differentiation occurred? What has happened to the potential of these cells?
7. Compare and contrast embryonic and somatic stem cells?
8. What roles do embryonic stem cells and somatic stem cells?
9. What drawbacks are there to using/harvesting embryonic and somatic stem cells? How many different types of specialized cells

*Reversing Cell Differentiation*

1. Is it possible to undifferentiated cells? What does this mean and how does this change the cell?
2. How is specialization tied to epigenetics?
3. Is the DNA within stem cells loose or condensed when compared to the DNA of a specialized cell? Explain.
4. Distinguish between IPS cells and STAP cells. How are they generated and what can they do? (you may need to refer to *Stem Cell Quick Reference*)

*Stem Cell Quick Reference*

Complete the following table as you review the page “What are some different types of stem cells?”

|  |  |  |  |
| --- | --- | --- | --- |
| **Stem Cell Type** | **Source (where in body)** | **Potential (toti, pluri, multi)** | **Ethical issues?** |
| Embryonic |  |  |  |
| Somatic/Adult |  |  |  |
| Induced Pluripotent (IPS) |  |  |  |
| Therapeutic |  |  |  |

1. What is the goal of stem cell therapy?

2. Why are IPS cells preferred over the other types of stem cells for therapy?