Outline the advantages of cells differentiating to carry out specific functions.

1. All cells in a living organism carry the same genetic information.
	1. Define *stem cell*.
	2. Define the following types of stem cells.

*Pluripotent*

*Multipotent*

*Nullipotent*

* 1. List two types of stem cell that can come from liver stem cells.
1. Outline the process of cell differentiation that leads from an uncommitted stem cell to a specialized cell, including the role of gene expression. A flow chart might help.
2. Outline the relationship between structure and function in three types of specialized cells.

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| --- | --- |
| **Specialized cell** | **Structure vs function** |
| *Sperm cell* | *Very small, low energy to produce. Hydrodynamic head with digestive enzymes to aid fertilization of the egg. Rotor section and tail to aid swimming.*  |
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|  |  |

1. Complete the table below to explain two ways in which stem cells can be used in medicine.

|  |  |  |
| --- | --- | --- |
|  | **Therapeutic cloning** | **Stem cell transplants** |
| **Used to treat** |  |  |
| **Brief method:**  |  |  |
| **Ethical considerations** |  |  |