Jargon-Free Glossary

In stem cell research there is a lot of scientific jargon that can be baffling—especially if your scientific expertise is limited. Armed with our "Jargon-Free Glossary," we'll help you demystify that language, giving you easy-to-understand alternatives to use when talking about this research.

Stem Cell Term	Definitiion
Pluripotent Cells	Cells that have the capacity to become any type of cell in the body, such as stem cells.
Differentiate	The process by which a cell transforms from a stem cell into a more mature, specialized cell, such as a brain or liver cell.
Autologous Cells	"Your own cells;" refers to cells that come from someone's own tissue. It also refers to a therapy using a person's own tissue
Allogenic Cells	"Cells from another," refers to cells that come from someone else's tissue, like that of a donor. Also refers to the type of therapy that uses a tissue or cells that come from another person.
Human Embryonic Stem Cells (also called hESCs or just ESCs)	These are cells produced in the first few days after the sperm fertilizes the egg. They are 'pluripotent' cells, and are therefore capable of transforming into every type cell or tissue in the body. The ESCs scientists use are obtained from embryos that are left over after a couple goes through IVF treatment in order to have a baby. During IVF treatment, doctors produce many more embryos than are needed and so they are faced with three options: destroying them, giving them to other couples (extremely low demand) or donating to science.
Induced Pluripotent Stem Cells (also called iPSCs or iPS cells)	A type of stem cell created by taking an adult cell, such as a skin cell, and reprogramming it into a cell that closely resembles an embryonic stem cell. This so-called iPS cells can then be changed into virtually any other cell in the body Find out more about how iPSCs differ from embryonic stem cells in our Stem Cell FAQs.
Viral Vector	A virus that is used for the sole purpose of carrying a gene into a cell in order to change the way the cell functions.
Regenerative Medicine	A new approach in medicine. Instead of treating symptoms, regenerative medicine focuses on rebuilding damaged or diseased organs and tissues, and thus restoring them back to health.
Phenotype	An individual's physical characteristics, which are the result of a combination of their genetic makeup and environmental influences.
Efficacy	A measure of how well something works; its effectiveness.
Translational	The concept of moving research from the laboratory into the clinic and, ultimately, towards medical treatment and therapies.
Alpha Stem Cell Clinic	A new way of delivering stem cell-based therapies to patients; brings together services and resources with therapies through clinical testing and accelerates them into routine use.

What's the Difference between Embryonic Stem Cells and Induced Pluripotent Stem Cells?

Because some people believe that life begins as soon as a sperm fertilizes an egg they question why we need to continue using human embryonic stem cells (hESC) now that we have induced pluripotent stem cells (iPSC), given that iPSC's are similar to hESCs in their ability to become any cell or tissue in the body. Since iPSCs can be derived directly from adult tissues, they not only bypass the need for embryos, but also can be made in a patient-matched manner, which means that each individual could have their own pluripotent stem cell line.

Here's why researchers still want and need to use hESCs:

Scientists have been working with hESCs far longer than with iPSCs—they are more familiar with them and how they work. For that reason they are still considered the "gold standard" for stem cell research;

- iPSCs are 'man made' and while they look very similar to embryonic cells, we don't yet know if they behave completely the same;
- Because making iPSCs requires an extraordinary amount of manipulation, we do not know yet if there are abnormalities associated with iPSCs, which would create barriers to their widespread use;
- Both hESCs and iPSCs may be effective in different areas—and until we know which is best for which use, we need to explore all options. **Good example** to explain why: It's comparable to the efforts to rescue the Chilean miners who were trapped deep underground. The rescuers were digging three different tunnels simultaneously, each using different methods, because they didn't know which would work.
- With so many lives at stake they didn't want to choose just one method and take the gamble that it would work. We don't yet know the strengths and weaknesses of each cell type – this is a new field and it would be premature to commit to one cell type until we know how they all compare;
- iPSCs are created from adult cells, such as skin or blood cells, compared to hESCs and the burden of age and environmental exposures may have an impact on their genes;
- iPSCs are like used cars, while hESCs are new, unused cars. You can get some really good used cars but you can also get some lemons—and right now we don't know how to tell the difference. Until we know how to do that we need to use all types of stem cells.

What is the Difference between Regenerative Medicine and Stem Cell Biology?

Regenerative medicine is a branch of medicine focused on replacing or engineering human cells, tissues or organs to restore or replace those damaged by injury, age or disease. This field holds the promise of regenerating damaged tissues and organs by stimulating the body's own repair mechanisms, and promises to functionally heal previously irreparably damaged tissues or organs. Stem cell biology is subset of that field but is not as all encompassing as regenerative medicine.

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