Glossary

adult stem cell - An unspecialized or undifferentiated cell found among specialized cells in a tissue or organ, which can renew itself and differentiate into a specialized cell.
autoimmune disease – A disease where one's own body starts attacking itself and destroying its own cells.
ß-cell – A cell in the pancreas which is responsible for the production and regulation of insulin.
blastocyst – A preimplanted embryo of 30-150 cells that is 5-6 days-old.
cell-based therapies –Treatment in which stem cells are induced to differentiate into the specific cell type required to repair damaged or depleted adult cell populations or tissues.
characterizing stem cells – Determining how a cell grows, where the cell came from, how it was derived, and if there are any chromosomal abnormalities.
cloning – In biology, it is the act of producing an exact copy of a sequence of DNA, cell, tissue, or organism.
Department of Human and Health Services (DHHS) - The United States government's principal agency for protecting the health of all Americans. It provides essential human services, especially for those who are least able to help themselves.
deriving – The creation of a cell line from one original cell or set of cells.
differentiation – The process of unspecialized cells transforming into specialized cells.
embryo – In humans, the developing organism from the time of fertilization until the end of the eight week, when it become known as a fetus.
embryonic stem cell - An unspecialized or undifferentiated cell found in the inner cell mass of a blastocyst, which can renew itself and differentiate into a specialized cell.
fetus – A developing human from the eighth week after fertilization to birth.
gamete – a mature sexual reproductive cell (sperm or egg) having a single set of unpaired chromosomes.
hematopoetic stem cell – An adult stem cell from which all white and red blood cells evolve.
Human Fertilisation and Embryology Authority (HFEA) – The governmental authority in the United Kingdom that regulates in vitro fertilization and embryo research.
inner cell mass – A small group of about 30 cells in a blastocyst which will gives rise to the hundreds of highly specialized cells needed to make up an adult organism; embryonic stem cells are derived from this group.
insulin – A hormone in the body that balances blood sugar levels.
in vitro – From the Latin for "in glass"; in a laboratory dish, test tube, or artificial environment.
***in vitro* fertilization (IVF)** – An assisted reproduction technique in which fertilization is accomplished outside the body.
in vivo – In the living subject; the natural environment.
juvenile diabetes – Also known as type 1 diabetes, it is an autoimmune disease where the ß-cells in the pancreas are destroyed and therefore the individual loses some or all of his/her ability to regulate and produce insulin. If left untreated, it can have severe side effects such as kidney failure, blindness, stroke and even death.
National Bioethics Advisory Council (NBAC) - A committee of experts during the Clinton administration that was formed in 1995 to provide advice and make recommendation to appropriate government entities related to bioethical issues. Their charter expired in October 2001.
National Institutes of Health (NIH) – An agency of the Department of Human and Health Serves, its mission is the pursuit of knowledge about nature and behavior of living

systems. It provides leadership and direction to programs designed to improve the health by conducting and supporting research: in the causes, diagnosis, prevention, and cure of human diseases; in the processes of human growth and development; in the biological effects of environmental contaminants; in the understanding of mental, addictive and physical disorders; in directing programs for the collection, dissemination, and exchange of information in medicine and health, including the development and support of medical libraries and the training of medical librarians and other health information specialists.

nucleus – A structure within a living cell that contains the cell's DNA and controls it metabolism, growth, and reproduction.

oocytes – A female cell that develops into an ovum (egg) after meiosis; an egg before maturation.

ovum (plural is ova) – The female reproductive cell or egg.

pluripotent –The ability of a single cell to develop into many different cell types of the body.

President's Council on Bioethics (PCB) - A committee of experts during the Bush administration that was formed in 2001 (after the NBAC was disbanded) to provide the President with advice on bioethical issues that may emerge as a result of biomedical science and technology.

proliferation – Expansion of a population of cells by the continuous division of single cells into two identical cells.

quiescent – A cell that does not divide or replicate.

reproductive cloning - When an egg undergoes somatic cell nuclear transfer and the resulting cell is allowed to grow to an infant that is an exact copy of the donor.

signals – Internal and external factors that control the changes in cell structure and function.

somatic cell –Any cell of a plant or animal other than the germ (sperm or egg) cell.

somatic cell nuclear transfer (SCNT) - When the genetic material (nucleus) of an egg is removed and replaced with the genetic material of a normal cell.

stem cell - An unspecialized cell that can replicate itself for indefinite periods through cell division and under certain conditions become a specialized cell.

therapeutic cloning - When embryonic stem cells created by somatic cell nuclear transfer are studied *in vitro* and used for cell-based therapies, but never are implanted in a female or grown past 14 days.

undifferentiated cell – A primitive cell that does not have any tissue-specific structures that allows it to perform specialized functions. Not having changed to become a specialized cell.

zygote – The cell (and the organism that develops from the cell) resulting from the union of an ovum and spermatozoon (also referred to as a fertilized ovum).

References and Further Suggested Readings

Introduction to Stem Cells

(1) International Society for Stem Cell Research: http://www.isscr.org
(2) NIH, Stem Cell Basics: http://stemcells.nih.gov/info/basics/
(3) National Research Council and Institute of Medicine. (2002) Stem Cells and the Future of Regenerative Medicine. Washington D.C.: National Academy Press: http://www.nap.edu.
(4) Embryonic Stem Cell Research at the University of Wisconsin-Madison: http://www.news.wisc.edu/packages/stemcells/facts.html#1
(5) National Parkinson Foundation: http://www.parkinson.org.
(6) Juvenile Diabetes Research Foundation: http://www.jdrf.org.
(7) Wilmut, I., et. al. (1997) Viable Offspring Derived from Fetal and Adult Mammalian Cells. Nature 385:810-13.

American Politics and Policies

(1) Thomas, Legislative Information on the Internet: http://thomas.loc.gov
(2) American Association for the Advancement of Science. (2003) Regulating Human Cloning. Washington D.C.: AAAS: http://www.aaas.org/spp/cstc/briefs/cloning/index.shtml
(3) California Institute for Regenerative Medicine: http://www.cirm.ca.gov/.
(4) National Research Council and Institute of Medicine. (2002) Stem Cells and the Future of Regenerative Medicine. Washington D.C.: National Academy Press: http://www.nap.edu.
(5) National Research Council and Institute of Medicine. (2002) Scientific and Medical Aspects of Human Reproductive Cloning. Washington D.C.: National Academy Press: http://www.nap.edu.
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(7) President's Council on Bioethics. (2004), *Monitoring Stem Cell Research*: http://www.bioethics.gov/reports/stemcell/index.html
(8) Bonnicksen, A.L. (2002) Crafting a Cloning Policy, From Dolly to Stem Cells. Washington D.C.: Georgetown University Press.
(9) Thomson, J.A. et. al. (1998) Embryonic Stem Cell Lines Derived from Human Blastocysts. Science 282:1145-7.Wilmut, I., et. al. (1997) Viable Offspring Derived from Fetal and Adult Mammalian Cells. Nature 385:810-13.

State Legislation

(1) National Conference of State Legislatures: http://www.ncsl.org/programs/health/genetics/rt-shcl.htm, http://www.ncsl.org/programs/health/genetics/embfet.htm and http://www.ncsl.org/programs/health/genetics/geneticsDB.cfm
(2) California Institute for Regenerative Medicine: http://www.cirm.ca.gov/
(3) Connecticut Legislature: www.cga.ct.gov/2005/BA/2005SB-00934-R01-BA.htm.
(4) Maryland Legislature: http://mlis.state.md.us/2006rs/bills/sb/sb0144t.pdf.
(5) Illinois Governor's Office: www.illinois.gov/gov/execorder.cfm?eorder=39.
(6) State of New Jersey: www.state.nj.us/scitech/stemcell/.

World Human Cloning Policies

(1) The Database of Global Policies on Human Cloning and Germ-line Engineering: http://www.glphr.org/genetic/genetic.htm
(2) Global Lawyers and Physician for Human Rights: http://www.glphr.org
(3) Stem Cell Policy: World Stem Cell Map: www.mbbnet.umn.edu/scmap.html
(4) European Commission, Directorate General – Research: Survey on opinions from National Ethics Committees or similar bodies, public debate, and national legislation in relation to human embryonic stem cell research and use. Volume I: EU Member States, July 2004: http://www.europa.eu.int/comm/research/biosociety/bioethics/documents_en.htm, Volume II: Countries associated to FP6 and Third Countries, July 2004: http://www.europa.eu.int/comm/research/biosociety/bioethics/documents_en.htm
(5) UNESCO (United Nations Educational, Scientific, and Cultural Organization). National Legislation Concerning Human Reproductive and Therapeutic Cloning, July 2004: http://unesdoc.unesco.org/images/0013/001342/134277e.pdf
(6) The Hinxton Group Consensus Statement, March 2006: http://www.hopkinsmedicine.org/bioethics/finalsc.doc.
(7) The Phoebe R. Berman Bioethics Institute. (March 2006) International Policy Trends: Embryonic Stem Cell Research.

Advocacy Organizations

(1) Texans for Advancement of Medical Research: http://www.txamr.org
(2) Coalition for the Advancement of Medical Research (National Coalition): http://www.camradvocacy.org
(3) National Parkinson Foundation: http://www.parkinson.org
(4) Juvenile Diabetes Research Foundation: http://www.jdrf.org
(5) Research!America: http://www.researchamerica.org
(6) Genetic Policy Institute: http://www.genpol.org.

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