APPENDIX A: GLOSSARY[1]

Blastocyst: the developing preimplantation embryo, beginning about 4 days after fertilization. The blastocyst consists of a sphere of cells made up of an outer layer of support cells, a fluid-filled cavity, and a cluster of cells on the interior (the inner cell mass, ICM).

Blastomere: each of the cells produced when the fertilized egg cleaves into 2, then 4, 8, and 16 cells.

Blastomere separation: a technique by which a jelly-like substance is removed from around a two-to eight-cell embryo, or morula, and the embryo is incubated in a special solution so that the blastomeres separate and fall apart. The blastomeres are then cultured separately.

Cellular cloning: the process by which cells derived from the soma, or body, and are grown in tissue culture in a laboratory. The genetic makeup of the resulting cloned cells, or cell line, is identical to that of the original cell.

Chromosomes: nucleic acid-protein structures in the nucleus of a cell. Chromosomes are composed chiefly of DNA, the carrier of hereditary information. Chromosomes contain genes, working subunits of DNA that carry the genetic code for specific proteins, interspersed with large amounts of DNA of unknown function. A normal human somatic cell contains 46 chromosomes; a normal human germ cell contains 23 chromosomes.

Clone: A precise copy of a molecule, cell, or individual plant or animal.

Cytoplasm: the contents of a cell other than the nucleus. Cytoplasm consists of a fluid containing numerous structures that carry out essential cell functions.

Differentiation: the process whereby an unspecialized early embryonic cell acquires the features of a specialized cell such as a heart, liver, or muscle cell.

Diploid: a cell such as a somatic cell having two chromosome sets, as opposed to the haploid situation of eggs and sperm which have only one chromosome set.

[1]Many of the definitions were excerpted from the National Institutes of Health *Report of The Human Embryo Research Panel* (Washington, DC: U.S. Government Printing Office, 1994).

DNA: Deoxyribonucleic acid, found primarily in the nucleus of cells (some DNA is also found in the mitochondrion). DNA carries the instructions for making all the structures and materials the body needs to function.

Egg: the mature female germ cell; also called ovum, or oocyte.

Embryo: the developing organism from the time of fertilization until significant differentiation has occurred, when the organism becomes known as a fetus.

Embryo transfer: the introduction of a preimplantation embryo into the uterus for growth and development.

Embryonic stem (ES) cells: primitive undifferentiated cells from the embryo that have the potential to give rise to a wide variety of specialized cell types.

Enucleated egg: an egg from which the nucleus has been removed.

Fertilization: the process whereby male and female gametes unite; it begins when a sperm contacts the outside of the egg and ends with the formation of the zygote.

Gamete: a mature sperm or egg cell.

Gene: a working subunit of DNA. Each of the body's 100,000 genes carries the instructions that allow the cell to make one specific product such as a protein.

Gene targeting: Generating a precise replacement of one gene for a different or altered gene.

Genome: the complete genetic makeup of a cell or organism.

Genetic imprinting: a process that determines, for specific genes, which one of the pair of genes, the mother's or the father's, will be active in a given individual.

Germ cell: a sperm or egg (all other body cells are known as somatic cells).

Inner cell mass (ICM): the cluster of cells inside the blastocyst, which gives rise to the embryo and ultimately the fetus.

***In vitro* fertilization (IVF):** an assisted reproduction technique in which fertilization is accomplished outside the body.

Mitochondrion: A cellular organelle that provides energy to the cell. The mitochondrion contains some of its own genes.

Molecular cloning: the process whereby identical fragments of DNA are produced by insertion of a DNA fragment into a host vector followed by amplification to produce many thousands of copies in a host cell, usually a bacterium.

Mutation: a change in DNA that alters a gene and thus the gene's product, leading in some cases to deformity or disease. Mutations can occur spontaneously during cell division or can be triggered by environmental stresses such as sunlight, radiation, and chemicals.

Nuclear transplantation cloning: a type of cloning in which the nucleus from a diploid cell is fused with an egg from which the nucleus has been removed. The DNA of the transplanted nucleus thus directs the development of the resulting embryo.

Nucleus: the cell structure that houses the chromosomes, and thus the genes.

Oocyte: the mature female germ cell; the egg.

Somatic cells: any cell other than a germ cell.

Sperm: mature male reproductive cells.

Totipotent: having unlimited developmental capacity. The totipotent cells of the very early embryo have the capacity to differentiate into extraembryonic membranes and tissues, the embryo, and all postembryonic tissues and organs.

Zygote: the single-celled, fertilized egg.

APPENDIX B: SPEAKERS

INVITED SPEAKERS

March 13-14, 1997
Lisa Cahill, Ph.D. - Boston College, Department of Theology
Rabbi Elliot Dorff, Ph.D. - University of Judaism, Los Angeles
Nancy Duff, Ph.D. - Princeton Theological Seminary
Leon R. Kass, M.D., Ph.D. - University of Chicago
Ruth Macklin, Ph.D. - Albert Einstein College of Medicine
Gilbert C. Meilaender, Jr., Ph.D. - Valparaiso University
Father Albert S. Moraczewski - National Conference of Catholic Bishops
James L. Nelson, Ph.D. - University of Tennessee
Professor John Robertson, J.D. - University of Texas Law School
Abdulaziz Sachedina, Ph.D. - University of Virginia
Rabbi Moshe Tendler, Ph.D. - Yeshiva University
Shirley Tilghman, Ph.D. - Princeton University

April 13, 1997
Stuart H. Orkin, M.D. - Dana Farber Cancer Institute
Janet Rossant, Ph.D. - Samuel Lunenfield Research Institute - Mount Sinai Hospital

May 2, 1997
Elisa Eiseman, Ph.D. - Critical Technologies Institute, RAND Corporation

PUBLIC TESTIMONY

March 13-14, 1997
Nancy Reame
Judith Lamb-Lion
Robert Weise
Michelle Theiman
Daniel B. McGee
Gladys White
Claire Nader
John Cavanaugh-O'Keefe
Dan Crow
J. D. Hanson

April 13, 1997
John Cavanaugh-O'Keefe

May 2, 1997
Mary Lyman Jackson
Paulette Roseboro
Sheena Talbot
Lisa Tennant
Audria Williams

May 17, 1997
Gail Youness
John Cavanaugh-O'Keefe

June 7, 1997
Randolfe Wicker
Alan Grayson

APPENDIX C: COMMISSIONED PAPERS

"The Current and Future Legal Status of Cloning" by Lori B. Andrews, J.D., Chicago-Kent College of Law

"Cloning Human Beings: An Assessment of the Ethical Issues Pro and Con" by Dan W. Brock, Ph.D., Brown University

"Religious Perspectives on Human Cloning" by Courtney S. Campbell, Ph.D., Oregon State University

"Do Research Moratoria Work? A Review of Fetal Research, Gene Therapy, and Recombinant DNA Research" by Robert Mullan Cook-Deegan, M.D.

"Views of Scientific Societies and Professional Associations on Human Nuclear Transfer Cloning Research" by Elisa Eiseman, Ph.D., RAND Corporation

"Cloning: An International Comparative Overview" by Bartha Maria Knoppers, J.D., University of Montreal

"Animal Cloning and Related Embryo Research: Implications for Medicine" by Stuart H. Orkin, M.D., Dana Farber Cancer Institute

"The Science of Animal Cloning" by Janet Roussant, Ph.D., Samuel Lunenfield Research Institute - Mount Sinai Hospital