

HISTORICAL OVERVIEW OF REPRODUCTIVE AND GENETIC TECHNOLOGIES (RGTS)

1. KEY DEVELOPMENTS IN HUMAN BIOLOGY, GENETICS, ASSISTED HUMAN REPRODUCTION & CLONING

The progression of these various discoveries makes the inter-relationship across fields of study clearer. To some extent, this explains why this area of research is such a rapid and unpredictable field of endeavour. As one or more scientists come up with discoveries, progress in a related field becomes possible.

1900 – Rediscovery of Mendel's Laws to help re-establish science of genetics

1950 – First successful freezing of bull semen for transplant and later insemination into cows

1952 – First animal cloning (making frogs from tadpoles)

1953 – Identification of DNA (double helix) as the chemical basis of heredity

1977 – Methods of sequencing DNA discovered

1978 – Birth of first child conceived by in vitro fertilization (IVF) – Baby Louise

1980 – DNA markers used to map disease genes to chromosomal regions

1983 – Huntington gene mapped to chromosome 4

1983 – First human mother-to-mother embryo transfer

1985 – Private lab creates first transgenic livestock pig, a pig that produces human growth hormone

1990 – Human Genome Project begins as an international effort to map and sequence all the genes in the human genome

1993 – Human embryos cloned

1994 – Genetic and physical mapping

1996 – Birth of sheep cloned from embryonic cells, named Dolly

1998 – DNA sequencing begins on the human genome

2000 – Working draft of genetic sequencing complete

2001 – First DNA Map produced by private sector (Celera Genomics Corp) who beat out the publicly sponsored international human genome project and is charging for access to its gene map

2001 – First human stem cell cloned to a six-cell entity by private firm (Advanced Cell Technology)

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Canadian Nurses Association, 50 Driveway, Ottawa, Ontario K2P 1E2
Tel: (613) 237-2133 or 1-800-361-8404 Fax: (613) 237-3520
Web site: www.cna-nurses.ca E-mail: prr@cna-nurses.ca



2. FEDERAL GOVERNMENT INITIATIVES IN REPRODUCTIVE GENETIC TECHNOLOGIES

- 1989 – Federal government established the *Royal Commission on New Reproductive Technologies* to examine the social, medical, legal, ethical, economic and research implications of reproductive technologies and to recommend policies and safeguards in the use of these technologies.
- 1993 – Royal Commission report is released, followed by extensive consultation conducted by the federal government with stakeholders on the recommendations of its final report.
- 1995 – Interim moratorium on nine applications of new reproductive technologies was announced by the federal government as the first step toward establishing regulations.
- 1996 – The Advisory Committee on Reproductive and Genetic Technologies was formed in January 1996 to advise the Department of Health on emerging issues in reproductive and genetic technology (RGT).
- 1996 – *Bill C-47, Human Reproductive and Genetic Technologies Act*, was introduced addressing legislation on the prohibition of 13 applications of RGTs.
- 1997 – Bill C-47 dies on the order paper due to the 1997 federal election. When the bill was tabled, a document titled *New Reproductive and Genetic Technologies: Setting Boundaries, Enhancing Health* was released explaining the prohibitions and regulations proposed in Bill C-47.
- 1999 – Health Canada developed *The Working Group on Reproductive and Genetic Technologies* to coordinate the review of regulatory frameworks and to submit recommendations to Health Canada.
- 2000 – Health Canada officials met with provincial and territorial colleagues, as well as stakeholder groups, to discuss proposals for federal legislation outlined in *Workbook – Reproductive and Genetic Technologies*. In June, a feedback report was published.
- 2001 – The federal government released *Proposals for Legislation Governing Assisted Human Reproduction* in May. During the late summer and the fall, the Standing Committee on Health received submissions and presentations. The proposed act listed 12 prohibitions including cloning of human beings; germ-line genetic alterations; development of an embryo outside a woman's body beyond the accepted 14 day limit; creation of embryos solely for research purposes; creating an embryo from another embryo or fetus; transplanting reproductive material from animals to humans; use of human reproductive material previously transplanted to an animal; gender preference action; sale and purchase of human embryos; purchase, barter or exchange of human gametes (sperm or eggs); and commercial surrogacy arrangements.

In November, the Canadian Biotechnology Advisory Committee recommended to the federal cabinet that the legislation governing patents be amended to expressly forbid the patenting of human beings “at all stages of development.”

The Standing Committee on Health released its report titled *Assisted Human Reproduction: Building Families* in December. This report recommended prohibitions on cloning for reproductive and therapeutic purposes, germ-line genetic alteration, maintaining a human embryo outside a woman's body, creation of embryos for research purposes and all the other prohibitions recommended in May 2001, with clarification of the meaning for some of these activities. They also recommended that activities such as research on human embryos should be controlled.

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