

Cryopreservation Glossary of Terms

Biobank: A collection of biological samples like blood, tissue or DNA stored in freezers at low temperatures (ex: -80C) and/or data for use in research.

Cryobank: A collection of (generally) reproductive tissues (i.e. semen, oocytes) stored at ultra-low temperatures achieved by using liquid nitrogen (i.e. -196 C).

Cryopreservation: The process of cooling and storing tissue or cell samples at ultra-low temperatures (-196) in liquid nitrogen in such a way that viability is maintained (halts metabolic processes) and samples can be thawed for potential future uses. Preserved in a way that little or no water freezes within the cell, it can be thawed to avoid recrystallization and a cryoprotectant is administered at non-toxic levels, and not exceeding osmotic tolerance limits.

Cryoprotectant agent (CPA): a substance added to a biological sample to protect it from damage from the freezing process in cryopreservation. There are many types of cryoprotectants, and it is important to identify most effective type, concentrations/ quantities for each species/ cell type.

Cell culture: the process where cells harvested from living tissue are grown in vitro (outside of their normal biological context) – can be expanded and maintained.

Cell line: A permanently established cell line, which will proliferate indefinitely when maintained under controlled conditions. May be cryopreserved using specific protocols and cryoprotectant agents.

Germplasm: The living genetic resources (genes from seeds or tissues) for an organism, which can be harvested and maintained for breeding or research purposes. Examples: Spermatozoa, Oocytes, Embryos.

Gonad: an organ that produces gametes (i.e. testis or ovary)

Gamete: male (spermatozoa) or female germ cell (oocyte) which, during sexual reproduction, fuses with another of the opposite sex to produce a new individual.

Semen: Fluid containing spermatozoa in suspension, secreted from the male gonads/ reproductive tract (also known as seminal fluid).

Epididymal sperm: Spermatozoa which is able to fertilize that is harvested directly from the epididymis, the tubular system attached to the testis. Spermatozoa are produced in the testicles and mature within the epididymis.

Oocyte (immature and mature): the female germ cell found in the follicles of the ovarian cortex

Lyophilization (cryodesiccation): a method of low-temperature dehydration in which water is removed via freezing, pressure reduction and application of heat to sublimate the water out of the sample. Lyophilized samples may be stored at room temperatures.

Vitrification: a method of cryopreservation which involves ultra-rapid rates of cooling to produce solidification of cells and the solution in which they are in without the formation of ice crystals.