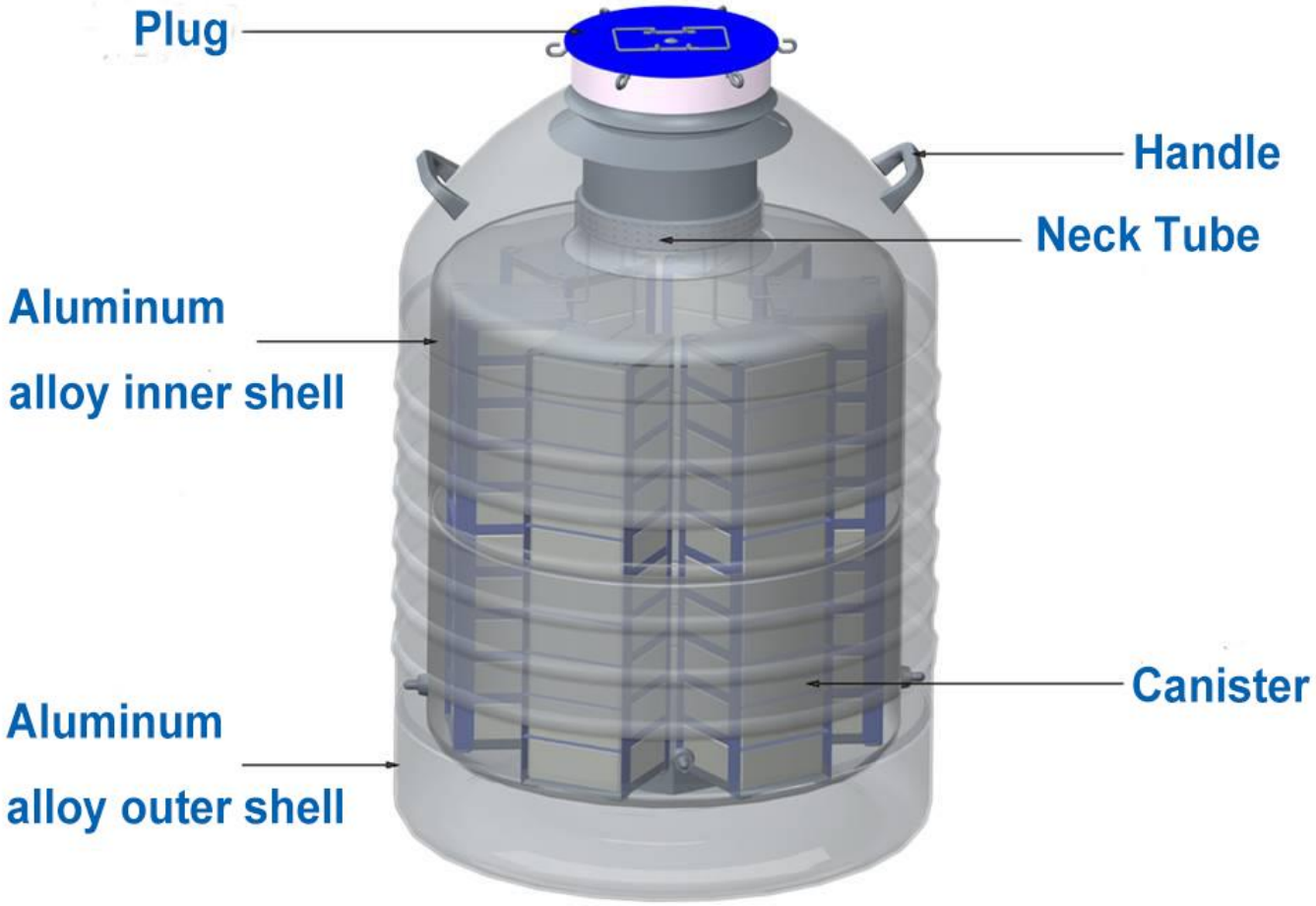
Cryogenic tank for biological samples

Tanvi Gupte

16.11.2019

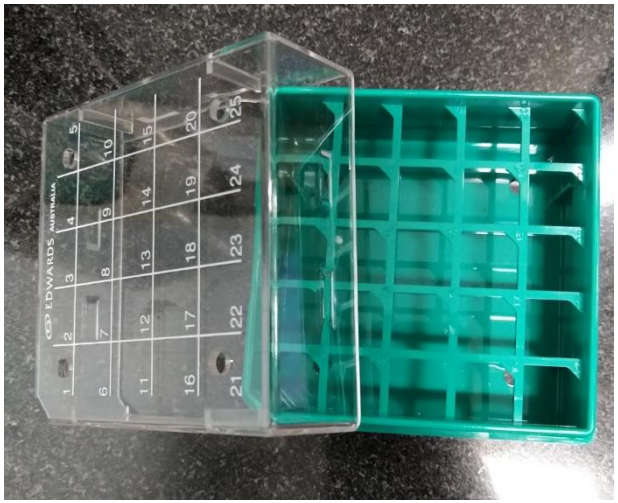
Introduction

- **Cryotank** or **cryogenic tank** is a tank that is used to store frozen biological material.
- It is a large thermos-like container with either racks or sleeves that hold cryogenic vials.
- Samples stored in nitrogen can be placed above the liquid in a cold vapor phase or in the liquid nitrogen
- **Cryo-preservation** or **cryo-conservation** is a process where cells, tissues, extracellular matrix, organs, or any other biological constructs are preserved by cooling to very low temperatures (typically −196 °C using liquid nitrogen).
- At low enough temperatures, any enzymatic or chemical activity which might cause damage to the biological material is effectively stopped.
- Cryopreservation methods seek to reach low temperatures without causing additional damage caused by the formation of ice crystals during freezing.


Plug
Handle
Neck Tube
Aluminum
alloy inner shell
Canister
Aluminum
alloy outer shell

Taylor Wharton LS750 specifications

- Static Holding Days: 130
- Evaporation Rate: 0.27 liters per day
- Liquid Nitrogen Capacity: 35 liters
- Weight Empty: 39 lbs. / 17.7 kg
- Weight Full: 101.3 lbs. / 46.0 kg
- No. of Racks: 6
- Rack Material: stainless steel
- No. of Shelves/Rack: 5
- 2ml Vial Capacity(5): 750
- Box Size:
  - Shape: square
  - Size: 2" standard mini boxes
  - Vials per box: 25



Advantages

- Once successfully frozen and stored, cell cultures require little time and effort for their maintenance.
- The limited expense (maintaining liquid nitrogen) compares very favourably with the effort and substantial cost of the media and supplies necessary for maintaining actively growing cultures, or for the cost of obtaining a new culture from a repository.
- Frozen cultures provide an important backup supply for replenishing occasional losses due to contamination or accidents.
- Cryogenically preserved cultures do not undergo any detectable cellular changes once they are stored below -130°C.

Limitations

- Samples stored in vapor phase can experience wide temperature fluctuations (i.e., -120 to -195°C), which can be potentially damaging to cells.
- Capped vials submersed in the liquid can leak and pick up contaminants and also pose a risk of exploding when removed from the liquid

Cryonics fact:

The first human body to be frozen with the hope of future revival was James Bedford's, a few hours after his cancer-caused death in 1967.

Thank you!