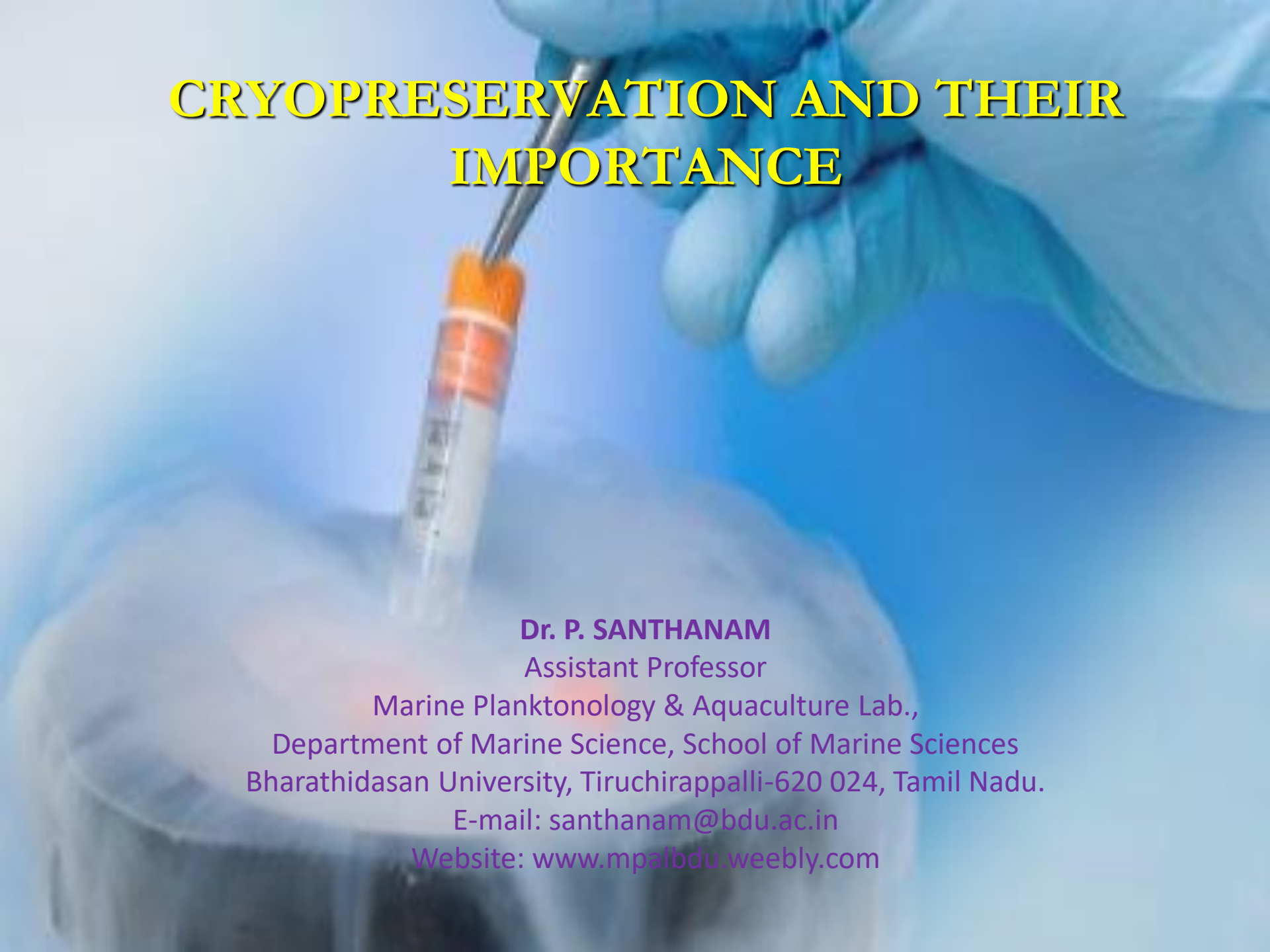


# CRYOPRESERVATION AND THEIR IMPORTANCE

A close-up photograph of a person wearing blue nitrile gloves and a blue lab coat. The person is holding a small, clear glass vial with an orange cap. The vial contains a white, frosty substance, likely cryopreserved cells or tissues. The background is a soft, out-of-focus blue.

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# CRYOPRESERVATION AND THEIR IMPORTANCE

Cryopreservation is a process where cells or whole tissues are preserved by cooling to low sub-zero temperatures such as  $-196^{\circ}\text{C}$  (the boiling point of liquid nitrogen).

Cryopreservation is used in infertility programs mainly to freeze and store sperm or to freeze embryos from an in vitro fertilization cycle.

In 1972, mammalian embryos were successfully cryopreserved.

# CRYOPRESERVATION AND THEIR IMPORTANCE

- At low temperatures, any biological activity including and biochemical reactions is effectively stopped.
- Cryopreservation which can cause damage to cells during cryopreservation. when tissues are cooled slowly, water migrates out of cells and ice forms in the extracellular space, too much extracellular ice can cause mechanical damage due to crushing and stresses associated with cellular dehydration can cause damage directly.

# CRYOPRESERVATION AND THEIR IMPORTANCE

- But some organisms and tissues can tolerate some extracellular ice, any appreciable intracellular ice.
- To avoid such problem cryoprotectants are used to reduce damages.
- Cryoprotectants like, dimethyl sulfoxide (DMSO), methanol, ethylene glycol, propylene glycol and glycerine were used, this may protect cells interacting with membranes as they change from a pliable to a rigid state.

# CRYOPRESERVATION AND THEIR IMPORTANCE

- Cryopreservation method was very time consuming slow cooling (1 degree / min or less) to about  $-80^{\circ}\text{C}$ .
- The embryos were then placed in liquid nitrogen.
- Embryos needed to be thawed slowly.
- In general cryopreservation is easier for thin samples and small clumps of individual cells, because these can be cooled more quickly and so require lower doses of toxic cryoprotectants.

# CRYOPRESERVATION AND THEIR IMPORTANCE

- Cryopreservation is a convenient and effective technique to maintain and conserve the endangered or threatened species.
- Even live feed organisms like rotifer, *Artemia*, algae and copepod eggs also cryopreserved and used to rearing of marine fish larvae.



# Liquid nitrogen container

