

Importance of cryobanking in aquatic species conservation and aquaculture

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Successful cryopreservation and cryobanking of reproductive cells of aquatic species offers many benefits to the fields of aquaculture, conservation of biodiversity and biomedicine. Global growth of intensive aquaculture has increased the needs for efficient and effective means, such as cryobanks, of conserving reproductive cells for greater flexibility in broodstock management, genetic improvement programs and preservation of genetic diversity. According to the Red List of the International Union for Conservation of Nature and Natural Resources, over 5000 aquatic animal species worldwide are threatened, including fishes, molluscs, crustaceans and corals. This has also led to an increased interest in the creation of cryobanks for conservation purposes. Cryopreservation of many different cellular types has been studied, including egg, sperm, oocytes, embryos, somatic cells and primordial germ cells or early spermatogonia. Cryobanks have been established for a range of aquatic species worldwide including Europe, USA, Brazil, Australia and New Zealand. The management of these banks requires expertise and technical capacity in genetics, reproductive physiology, cryobiology and data management. Cryopreservation protocols need to be carefully designed for each species and each type of cells to ensure optimal survival. The discussion will be focused on cryobanking in aquatic species, including freshwater and marine fish species as well as invertebrates.