

Bio-electrosprayed mammalian sperm remain viable

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Bio-electrospray (BES) is a very attractive technique for depositing desired biomolecules or solutions containing various cell types and other targets through the principle of applying a high voltage to a conducting needle accommodating the flow of a target containing' suspension. The research presented explores the effectiveness and safety of BES in handling one of the most specialized cell in the body, the mammalian sperm.

In this work, bovine and human sperm are handled using BES technology with diagnostic sperm assessment before and after application of laminin, a major extracellular glycoprotein, with known important roles in cell differentiation, migration and adhesion. Compared to current storage methods of sperm using slow freezing or vitrification where a large proportion of motile spermatozoa become immotile, we demonstrate that BES technology results with very low loss of sperm motility and morphokinetic parameters. This preservation is controlled by the capacity for spermatozoa to be compartmentalized which would allow them to be frozen and thawed without inflicting any negative aspects on those encapsulates. Further work into functional survival of sperm cells will also be discussed in terms of fertilization and embryo development.

BES therefore seems to be a promising method for encapsulating and storing spermatozoa to use later, which will be helpful in application where there is a low number of motile spermatozoa available such as in patients with oligozoospermia, or in agriculture and aquaculture industries for animal species of high genetic merits.