

DRY CRYOPRESERVATION OF CELLS ON NANOFIBER SCAFFOLD

Field of the Invention

This invention relates to a nanofiber scaffold for use as a cryopreservation platform to
5 freeze/cryopreserve target cells in dry condition with cryopreservation agent and a
method of producing the same. The nanofiber scaffold is shown to be able to protect
target cells against sub-zero condition and allow target cells to have a relatively faster
thawing time after cryopreservation.

10 Background

For a long time, bio preservation technique that maintains ex-vivo cells, including
hepatocytes/HepG2 and other cell lines, viability and functioning is one of the most
important research aspects of modern tissue engineering and pharmacokinetic in cell
15 culture. The ability to preserve the integrity of cells (such as hepatocytes/HepG2)
outside the native environment while maintaining a high biological activities for an
extended period of time not only will save time and effort in primary culture, it may also
be possible to establish a ready-to-use cells platform to support the fast pace
pharmacological and toxicological testing that is required when out-break arises. Such
20 a ready-to-use cells platform would support the implementation of routine
cryopreservation practices during preparation of even engineered cells and tissues for
the clinical applications when needed.

Other limitation to cryopreservation is the use of Dimethyl Sulfoxide (DMSO). DMSO is
25 frequently used in cell banking applications as a cryoprotectant. When added to a
media, DMSO prevents intracellular and extracellular crystals from forming in the cells
during the freezing process. Without a cryoprotectant, these crystals cause cell death,
thus rendering the cells useless for transplant and research studies. However, the