

عنوان مقاله:

USE OF NANOTECHNOLOGY AS A NEW APPROACH TO ENHANCE THE EFFICIENCY OF
CRYOPRESERVATION: A REVIEW

محل انتشار:

اولین همایش بین المللی علوم و فناوری نانو (سال: 1399)

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نویسندگان:

Alireza Sarkar Lotfabadi - MSc, Department of Biotechnology, Shahid Beheshti University, Tehran, Iran

Mohammadreza Ghalamboran - Phd, Department of Biotechnology, Shahid Beheshti University, Tehran, Iran

Rouhollah Fathi - Phd, Department of Embryology, Royan Institute, Tehran, Iran

خلاصه مقاله:

Now a days, freezing of gametes and embryos is becoming more common, as it allows the individual to maintain his or her fertility. A common way to store cells at -196°C for a long-time is cryopreservation. There are some limitations with cryopreservation method, such as the formation of intracellular and extracellular ice crystals that cause rupture of cell membrane and osmotic shock to the cell. Therefore, cryoprotectants (CPAs) are used to prevent damages to the cells during freezing process, but the noticeable point is their toxicity for cells. Nanotechnology, which has led to major revolutions in many fields of science in recent decades, is being introduced as a new approach to use in cryopreservation for increasing its quality and efficiency. Nanoparticles are particles smaller than 100 nm that exhibit special roles in comparison to bulk materials. There are different approaches to apply nanomaterials' specific properties in the field of cryopreservation. Nanoparticles can enhance heat and energy transfer, which leads to improvement in performance of CPAs solution, prevent nucleation and formation of ice crystals and prevent DNA damage or reactive oxygen species production. This paper collects and reviews the results of recent studies on the application of nanotechnology in cryopreservation technique.

کلمات کلیدی:

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