

DEVELOPMENT OF A MAGNETIC 3D SPHEROIDS FROM TUMOR CELL LINES

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Abstract

Multicellular spheroids are ordinary and widely used 3D cell culture systems. Various approach have been used to generate 3D spheroids today, we applied the method of hanging drops. This methodology could be applied in tissue engineering, drug screening and in nanomedicine. An important achievement is the use of various nanomaterials, mainly nanoparticles in medical research. Magnetic nanoparticles were used in our investigation. Magnetic nanoparticles were synthesized from iron oxide magnetic nanoparticles and stabilized with PAHThree following human cell lines were used in our study: Human cervical carcinoma (HeLa), Human lung adenocarcinoma epithelial (A549), Human hepatocyte carcinoma (Hep3B). Spheroids were formed from all type of cells. We showed the evolution of spheroids within seven days from cell lines, which were covered by magnet nanoparticles. Under the gravitation force in the hanging drops the multicultural aggregates were formed after 24 hours and thecompact spheroids structures were formed after 48 hours. Using images,which were obtained by light and confocal microscopy, we can conclude thatMNPs-PAH have not a negative effect on the survival of cells andformation of spheroids from this cultures. The viability of the MNPs-modified cells into spheroid was tested using fluorescein diacetate, while the use of magnetic nanoparticles increases the possibility of spheroids manipulation. Modified by magnetic nanoparticles spheroids showed ability to move under the influence of a constant magnetic field.

Keywords: Multicellular spheroids, magnetic nanoparticles, human cell lines

ACKNOWLEDGEMENTS

This work was funded by the Russian Government Program of Competitive Growth of Kazan Federal University among World's Leading Academic Centres.

Author did not supply full text of the paper/poster.