APPLICATION OF THE BIODEGRADABLE POLYMER LAYERS CARRYING THE CHEMOTHERAPEUTIC AGENTS APPLICABLE FOR THE TREATMENT OF GLIOBLASTOMA

Alaverdyan M.A.[1], Danielyan K.E.[1]*, Chailyan S.G.[1], Harutyunyan L.R.[2]

[1] *H. Buniatian Institute of Biochemistry, NAS, Yerevan, Armenia.*
[2] *National Center of Oncology named after V. A. Fanarjian, Yerevan, Armenia.*
Krisitne_danielyan@biochem.sci.am

Targeted delivery of the medicines is the most modern direction in pharmacology, because of the elimination of the negative side effects of the applicable medicines. Polyethylene glycol (PEG) is biodegradable compounds, which is approved for the utilization in the clinical settings. In our work we have used the PEG as well as the polyvinyl butyral as well as polyvinyl acetate, polyvinyl alcohol for the local treatment of the glioblastoma. One of the thin layers of the polymers were synthetized by simultaneous mixing with the methotrexate. The thin adsorbing layers were consisted from the 2 parts: the layer adhering on the brain matter and the layer carrying the chemotherapeutic medicine.

The polymerization was initiated with the following reagents: ethyl alcohol (96%), water, dodecyl phthalate (95%, ACROS ORGANIC, USA). The homogeneity of the layers was checked with the light microscope. Before the preliminary utility the polymer layers they were checked in vivo to clarify the intensity of the adhesion. The layers were sterilized by the evaporated gases of peroxide, as well as gentamicin, glutaraldehyde, formaldehyde, iodine alcohol solutions.

The best brain tissue adhering agent was the polyvinyl acetate, which was carrying the methotrexate. The polyvinyl alcohol was protecting the entire layers composition from the organic fluids and preserving the medicine from the fast degradation.

We were able to synthetize the polymers, which were carrying 1 mg of the methotrexate on the unit of the layer's surface. The final version of the layers was sterilized with the gases of the peroxide (10 %) and gentamycin.

Key words: glioblastoma, polyethylene glycol, methotrexate. polyvinyl acetate, polyvinyl alcohol.

EPIGENETIC CELL REPROGRAMMING APPROACH FOR NEURAL CELL GENERATION

Alexanian A.R.

Cell Reprogramming & Therapeutics LLC, Milwaukee, WI

aalexan@cellrtherapeutics.com

Advances in cell reprogramming technologies to generate patient-specific cells of a desired type will revolutionize the field of regenerative medicine. Over the last decade, several cell reprogramming methods such as nuclear transfer, cell fusion and transfection or transduction with pluripotent factors have been developed. However, the majority of these technologies require the exposure of cell nuclei to large reprogramming molecules via transfection, transduction, cell fusion, or nuclear transfer. These methods raise several technical, safety, and ethical issues. Chemical genetics is an alternative approach to cell reprogramming that uses small, cell membrane penetrable substances to regulate multiple cellular processes, including cell plasticity. Recently, using a chemical genetics approach (a combination of small molecule modulators of epigenetic target enzymes and neural inducing factors) we have been able to turn human mesenchymal stem cells (hMSCs) directly into neuronal progenitors that have the potential to generate different neuronal subtypes, such as dopaminergic, cholinergic, and GABAergic cells when further grown in appropriate neuronal differentiation media. The therapeutic effects of these cells on several neurological disorders have been demonstrated.