SUPPRESSION OF INTEGRIN α10 IN GLIOBLASTOMA CELLS BY siRNA LOADED WITH PLGA NANOPARTICLES

SUMMARY

Cancer is a disease that is one of the leading causes of death in the world and has many varieties. The type of cancer that may be included in the most dangerous class of cancer is glioblastoma cancer, and it is the most common and deadly tumor that can spread around the brain. Glioblastoma, histologically defined by necrosis and endothelial proliferation, is the most common and aggressive primary brain tumor seen in adult individuals. There are many difficulties in diagnosis and treatment. In order to minimize these negativities, controlled and targeted delivery of the drug has started to be made possible with nano carrier systems. In addition, studies in which these genes are therapeutic targets have increased with the knowledge of overexpressed genes and their products in cancer cells, and accordingly, studies aimed at silencing overexpressed genes in tumor sites have become a focus today. Antisense oligonucleotides, which can selectively target RNA, and antisense technology provide important agents in this field. With siRNA, one of these therapeutic agents, it has become possible to break down the targeted messenger RNA. In this way, cancer treatment can be performed by silencing the protein that causes the development of the cancer cell. Integrins are heterodimeric cell surface receptors consisting of a and β chains and bind the extracellular matrix to the cytoskeleton. It has also been reported that the interactions between the extracellular matrix and integrin receptors on tumor cells play an important role in tumor cell processes such as cell migration and proliferation. In particular, the high expression of the ITGA10 gene, which expresses the integrin α10 protein, has been shown to be associated with a worse overall survival probability in glioma patients.

In our study, we aimed to examine the transport of siRNA targeting the therapeutic substance integrin α10 to glioblastoma cells with poly lactic co glikolic asid (PLGA)

nanoparticles, as it is a biocompatible, biodegradable polymer approved for use on humans by the FDA, and ultimately the change in the cancer cell. Thus, the efficiency of siRNA transport with PLGA nanoparticles, the efficacy of PLGA nanoparticle-mediated siRNA to suppress integrin α10 in glioblastoma cells and the change in cancer cells by suppression of integrin α10 will be examined. In conclusion, it can be suggested that siRNA carried by PLGA nanoparticles could be a possible therapeutic approach for glioblastoma cancer by targeting integrin α10 in glioblastoma cells.
Keywords: gene therapy, PLGA, nano-carrier, si-RNA, integrin, glioblastoma cancer