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Investigation of the antibacterial activity of a composite based on halloysite nanotubes and silver nanoparticles

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Due to the ability of silver nanoparticles to damage the cytoplasmic membrane, respiratory enzymes of microorganisms and prevent the growth of gram-positive and gram-negative bacteria, fungi and viruses, they are widely used in pharmacy and medicine as an antibacterial component. Using ultrasound, the authors obtained a composite based on silver nanoparticles and halloysite nanotubes. The obtained nanocomposite was visualized using various types of microscopy (dark-field, transmission electron, and atomic-force) and its elemental composition was investigated, which contains oxygen, silver, silicon, and aluminum. Studies of the antibacterial activity of the nanocomposite have shown its effectiveness against bacteria *Serratia marcescens* (*S. marcescens*) at a concentration of 1.0 mg/ml and 1.5 mg/ml. Based on the data of the growth curve, it was found that the concentration of bacteria was reduced by more than two-fold compared to the control at a nanocomposite concentration of 1.0 mg/ml. The antibacterial effect of the obtained nanocomposite was observed from the first hours and did not decrease for 48 hours. At a nanocomposite concentration of 1.5 mg/ml, the death of bacteria was observed 2 hours after the start of the study.
The obtained nanocomposite has the ability to suppress the quorum sensing of S. marcescens bacteria, which is promising for medical applications.
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Hematopoietic stem cell gene therapy corrects lysosomal storage in CNS in murine model of GM1-gangliosidosis

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GM1 gangliosidosis (GM1) is progressive neurodegenerative glycoshingolipidosis due to a mutation in GLB1 gene, causing the deficiency of lysosomal enzyme β-galactosidase (β-gal), which leads to the abnormal accumulation of GM1 ganglioside primarily in the central nervous system (CNS).In this study, we evaluated the therapeutic efficacy of *ex vivo* lentiviral gene therapy on the GM1 mice. We constructed the recombinant lentivirus vector (LV) with the normal GLB1 cDNA or enhanced green fluorescent protein (eGFP). Bone marrow cells from GM1 mice were harvested, and transduced with LV and administered through the tail vein of 8 weeks-old mice(LV-GLB1 or LV-eGFP). Non-treated model mice (KO) and wild type mice (WT) were used as