Nanoparticle Drug Targeting for Glioblastoma Multiforme-derived Cancer Stem Cells

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Technology description

Technical Summary

Researchers at Emory have invented novel nanoparticles to deliver drugs to GBM-CSCs via cell surface glycan biomarkers. Dr. Nash's group has previously determined that lectins such as GS2 and DBA can bind to the glycan epitopes N-acetyl galactosamine (GalNAc) and N-acetyl glucosamine (GlcNAc) which are specifically elevated on the surface of undifferentiated human GBM-CSCs. The investigators now show that these lectins can be conjugated to PEG/PLGA nanoparticles that target the GalNAc- and GlcNAc -expressing CSCs.

Unlike GalNAc and GlyNAc, cell surface markers currently used to define or target human GBM-CSCs such as CD133 and alcohol dehydrogenase are limiting because they do not unambiguously define the stem cell state which is required for effective targeting of the CSCs. On the other hand, the lectin-nanoparticles defined in this invention can specifically deliver therapies in glycan-expressing CSCs that cause glioblastoma tumors.

Potential indications :GBM and other cancers that express the GalNAc and GlcNAc biomarkers (possibly colon and prostate cancers).

Application area

Novel drug delivery system for Glioblastoma Multiforme-derived Cancer Stem Cells.

Advantages

Reliable cell surface glycan markers identified for Glioblastoma Multiforme-derived Cancer Stem Cells (GBM-CSCs).

Lectin-conjugated nanoparticles target these glycan epitopes for delivering drugs to GBM-CSCs.

Institution

Emory University

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