Inhibiting SLC43A3: A Novel Approach for Treating Cancer through Purine Nucleobase Transport Interference

Prof. MD. Ohad Birk, Faculty of Health Sciences, Ben-Gurion University of the Negev, Israel.

Technology

The presented invention offers inhibiting of purine nucleobase transporter SLC (SLC43A3) as novel way for treating various cancers. SLC43A3 is a transmembrane protein previously demonstrated to have a role in purine nucleobase transport across the plasma membrane. Nucleosides and their related nucleotides (nucleobase attached to ribose or deoxyribose and phosphate) are the key building blocks of DNA and RNA. Purines are synthesized *de novo* from amino acids and bicarbonate, and/or salvaged via the salvage pathway that utilizes nucleobases from the degradation of nucleosides and nucleotides to assemble newly synthesized nucleotides. By inhibiting the expression of the protein SLC43A3, the present invention can used for treatment of cancerous diseases by mediating the transfer of purine nucleobases, particularly, but not exclusively by interfering with the transcription, expression, localization and/or function of the purine nucleobase transporter SLC43A3. The role of SLC43A3 in tumor progression was *in vivo* examined using orthotopic models of glioblastoma multiforme (GBM) and multiple myeloma (MM) in NOD-SCID-Gamma (NSG) mice. The researchers designed and generated several short hairpin RNA (shRNA) constructs. Induction of shRNA expression was mediated by doxycycline in the drinking water. Mice that received doxycycline showed a markedly reduced tumor burden as evaluated by MRI. These mice further showed extended survival.

Application

SLC43A3 serves as target for anti-cancer treatment including GBM and MM. The designed shRNA can serve as therapeutic agents for that purpose. Moreover, SLC43A3 be a prognostic factor in these cancers.

Advantages

- Novel therapeutic agent
- Novel biomarker and prognostic factor
- Novel target for treatment of cancer
- Relevant for different types of cancers

Patent

Patent covering the following invention was filed