TECHNOLOGY OFFER

MEDICAL UNIVERSITY OF VIENNA

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Novel Gene Therapy Approach to cancer treatment

A hyper-active thymidine kinase mutant locally administered into the solid tumor via viral transfection drives tumour cells into cell cycle arrest and subsequent cell death. The effect requires very low to physiological substrate concentrations, which is expected to keep side effects at bay due to very low to no systemic exposure.

REFERENCE:
587.15

KEYWORDS:
- Oncology
- Biologic
- Glioblastoma

AVAILABLE FOR:
- Development partnership
- Licence

DEVELOPMENT STATUS:
In vitro proof of concept

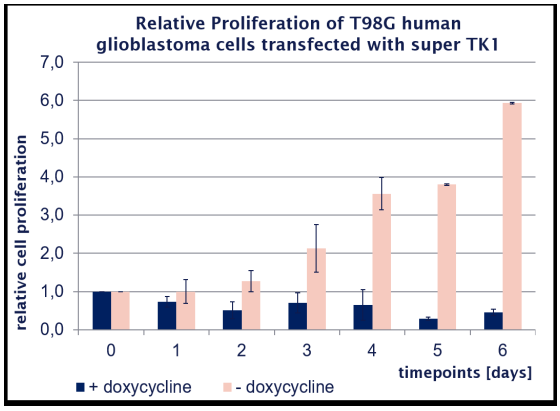
IPR: US 16/633,610
EP 18742524.4

BACKGROUND

The cytosolic thymidine kinase 1 is a very well characterized enzyme essential for the provision of nucleotides for DNA synthesis. Whenever eukaryotic cells are exposed to higher levels of the substrate deoxythymidine, a cell cycle arrest occurs resulting in an inhibition of cell growth and proliferation. This is an elementary checkpoint in all mammalian cells, including cancer cells. Earlier attempts to use this effect to inhibit tumor growth were only partially successful as the required substrate concentrations also affected healthy cells. Despite recent advances in cancer therapy, for some tumours (e.g. gliobalstoma) there is still a very high medical need for new therapeutic approaches.

TECHNOLOGY

A super active human thymidinkinase 1 enzyme (superTK1), is locally administered to tumor cells by AAV (adeno associated virus) infection. Cytostatic as well as cytotoxic effects on tumor cells can be induced and maintained by very low deoxythymidine serum levels (> 0,01 mM). This avoids systemic exposure of high inhibitor concentrations to healthy cells and thus hardly entails any side effects. Post-surgery administration is envisaged for glioblastoma. Combination treatment with conventional cytostatics is possible and expected to significantly reduce concentrations of chemotherapeutics in a similar manner. Therefore lower side effects without diminishing treatment efficacy can be expected.



BENEFITS

- AAV-based transfer affects all tumor cells equally
- very low systemic exposure
- cytostatic and -toxic effects on normal cells very limited
- no discrimination between tumor cell types
- only local proliferating cells are targeted and harmed
- novel therapeutic approach

APPLICATIONS

- glioblastoma
- other solid tumors of any kind of origin and location
- local administration into tumor after surgical tumour removal
- combination therapy with proven cytostatics facilitated
- repeated therapy regimens are easily possible

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