Novel Integrase Based Cancer Treatment Technology (Ramot)

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We have developed a new gene therapy technology for specific cancer cells killing and validated both efficacy and safety superiority of the proposed system over the conventional one in lung cancer mice model. The proposed system offers advantages over already known counterparts and may therefore be developed into a safer and efficient human cancer treatment technology.

UNMET NEED

Cancer encompasses a large group of diseases characterized by the unregulated proliferation and/or metastasis of cancer cells, definitely represents a one of the major healthcare problems. Thus, there is a strong unmet medical requirement for the development of novel therapies that provide improved clinical efficiency and longer survival time period in patients suffering with the different cancer types. For cancer therapies to be increasingly successful, however, the major obstacle that must be overcome is the safety efficacy of the cancer treatment technologies.

OUR SOLUTION

A new cancer gene therapy technology for specific cancer cells killing is based on a site-specific recombination reaction catalyzed Integrase (Int) that will activate the expression of Diphtheria toxin A (DTA) specifically in cancerous cells without affecting neighboring normal cells. DTA carries out the cancer cell death by activating the apoptotic signal transduction. Unique singularity of Int-based binary system in the proposed technology insures the high efficacy safety level in toxin based cancer therapy technology.

OUR PRODUCT

Therapy attributes: DNA plasmid expressing Int and DNA plasmid with silent toxic DTA gene complexed with the DNA delivery agent in vivo-jet PEI (Polyplus) or other.

DIFFERENTIATION

The proposed binary approach proved highly safety and more efficiency compared with a mono system in survival experiments using lung cancer mice model.
It was proved that the reason for the higher activity and safety of the proposed system compared to the mono system is due to a transcription down regulation of mono system by several transcription inhibitor factors with the weak activity of Int. It was confirmed that the proposed Int-based binary system may be used for breast, pancreatic and prostate cancer treatments.

PATENTS

Patent application WO2013018096A1 titled “Use of integrase for targeted gene expression”

REFERENCES

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