

Double and inducible suicide gene construct for gene therapy

CSIC has developed a double and inducible suicide gene construct that combines the cell death-inducing capacity of two suicide genes: HSV-TK/GCV and iCaspase9 in a single polycistronic cassette. The effect of the two genes is complementary, providing a safety mechanism endowed with a level of redundancy that makes it more effective and reliable than any other system available today.

Industrial partners from biotechnology industry are being sought to collaborate through a patent licence agreement.

An offer for Patent Licensing

Specific and directed cell death

Experiments performed to date with different suicide gene constructs have only been able to partially eliminate or slow down the proliferation of construct-bearing cells. The need remains for an improved suicide gene system able to selectively eliminate specific cell populations in the interior of an organism, when their presence poses a health risk for the recipient.

Our double gene construct has demonstrated its efficacy in *in vivo* experiments in mice. When both genes are simultaneously activated, their effect is clearly superior to the one achieved by each of these two genes separately. In particular, our system has been able to completely arrest the growth of very aggressive tumors transplanted into mice, while, at the same time, did not show any secondary effect on the recipients.



Genetic bioengineering to effectively kill all target cells

Main innovations and advantages

- It is the most adequate suicide gene system for clinical application of all those described to date.
- May be applied, but not limited to, cell or tissue transplants in regenerative medicine, including "Adoptive T-cell therapy" or adoptive T-lymphocyte therapy, and directly in endogenous tumor cells if the construct is introduced therein by means of specifically directed vectors.
- It is useful as a genetic safety mechanism under any circumstance in which it is necessary to eliminate a specific cell population in the interior of an organism at will, especially when direct physical intervention is not possible.

Patent Status

PCT patent application filed

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