TECHNOLOGICAL OFFER

NEW DELIVERY SYSTEM OF THERAPEUTICS TO COLORECTAL CANCER CELLS

ABSTRACT

A new drug delivery system for the selective treatment of colorectal tumor cells has been developed. So far, *in vivo* delivery tests have been successful, showing specific and receptor mediated cell internalization of payload vehicles in tumor and metastasis tissues at low doses. Furthermore, carriers have shown high stability into the animal, without apparent toxicity.

It was developed by researchers belonging to the Autonomous University of Barcelona (UAB), Research Institute of the Hospital de la Santa Cruz y San Pablo (IR-HUSCSP) and the Biomedical Research Networking Center in Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN).

APPLICATIONS

- Treatment of colorectal cancer
- Treatment of other types of cancer

DESCRIPTION

We have developed modular single chain polypeptides obtained by recombinant DNA procedures, capable of self-assembling as nanoparticles, and able to recognize specific cell-surface markers and deliver therapeutic proteins, DNA or RNA to specific cell types involved in the development and progression of colorectal cancer.

As shown by tagged ones, our peptide nanoparticles are able to internalize desired therapeutic molecules into the cytoplasm or even the nucleus of cultured tumor cells. We are currently assessing the ability of the system to kill tumor cells by expressing therapeutic molecules *in vivo*.

These nanoparticles, improve the performance of metal nanoparticles, since they are highly customizable, can bind a wide range of therapeutic molecules such as nucleic acids (shRNA, siRNA) or therapeutic proteins and show no toxicity in animals. This permits for an individualized and selective therapy scenario.

The surface receptor to which our tag binds to is overexpressed in aggressive tumors and metastasis. So far, we have focused on the treatment of CRC. In the near future, we are planning to target other tumor types, such as glioblastoma or hematological neoplasias.

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ciber-bbn Biomedical Research Networking Center Bioengineering, Biomaterials, Nanomedicine

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

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DEVELOPMENT STATUS

Developed
Laboratory tested

IP STATUS

Patent pending

INDUSTRIAL PROPERTY

European Patent Application **EP2011382005.4** filed on January 13, 2011

International Patent Application **PCT/EP2012/050513** filed on January 13, 2012

National Phases in Europe, USA, China, Australia, Israel, and India

INNOVATIVE ASPECTS AND ADVANTAGES

- Highly targeted drug delivery system
- Precise adjustment of the dosage regimen, with low product amounts
- Considerably important reduction of side effects
- This system allows for personalizing colorectal cancer therapy
- Much more efficient treatment of colorectal cancer than that achieved with conventional drugs.
- These peptide nanoparticles can bind to and transport a wide range of therapeutic molecules such as DNA, siRNA, proteins, etc.
- No toxicity

AVAILABLE FOR

- Exclusive license agreement
- Non-exclusive license agreement
- Further research or development

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