

ENGAGE: Engineered bacteria for protein injection into target cells

CSIC has developed ENGAGE, engineered bacteria with cell adhesion specificity and programmed delivery of therapeutic proteins into the cytoplasm of target mammalian cells

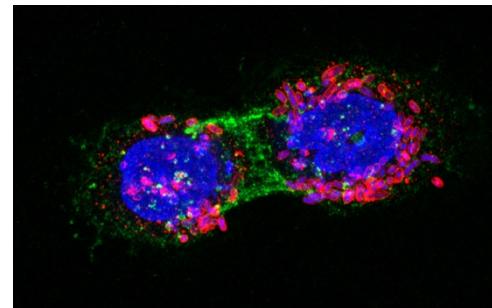
Industrial partners from the ophthalmic or pharmaceutical industry are being sought to collaborate through a patent licence agreement. (formato = Gill Sans MT 11 negrita, alineación = justificado)

An offer for Patent Licensing

These engineered bacteria strains present high potential for the delivery of therapeutic proteins in human cells for multiple biomedical applications such as cancer therapy and the treatment of inflammatory, infectious and metabolic diseases.

CSIC researchers have demonstrated the therapeutic potential of the engineered bacterial strains to combat colorectal cancer in mouse tumor models, but this technology can be directly applied to other types of human tumors.

The technology modifies a non-pathogenic *E. coli* bacteria to be able to bind specifically to tumor cells and inject a therapeutic protein of interest.



Engineered *E. coli* bacteria (red fluorescence) targeting a tumor cell with a specific surface antigen (green fluorescence).

Main innovations and advantages

- Delivery of therapeutic proteins (e.g. cytotoxins, antibody fragments) into the cytoplasm of target mammalian cells, such as tumor cells, to induce tumor cell death, directly or through increase recognition by immune cells (immunotherapy).
- Delivery of proteins from pathogens (e.g., viruses, bacteria) into the cytoplasm of target mammalian cells, such as antigen-presenting cells, to enhance the immune response against the pathogen.
- Delivery of metabolic enzymes into the cytoplasm of target mammalian cells, such as enterocytes, to correct metabolic deficiencies.
- Delivery of therapeutic proteins (e.g. transcription factors, cell signalling proteins) into the cytoplasm of target mammalian cells, such as stem cells, to induce reprogramming of cell physiology and development.

Patent Status

PCT patent application filed

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