

Improved non-viral gene delivery nanoparticles for cell transfection

CSIC, CIBER-BBN, URL and Sagetis Biotech SL have developed novel multicomponent nanoparticles capable to perform non-viral gene delivery for transfecting host cells. These nanoparticles increase transfection efficiency and allow cell separation.

Industrial partners from the pharmaceutical industry are being sought to collaborate through a patent license agreement.

An offer for Patent Licensing

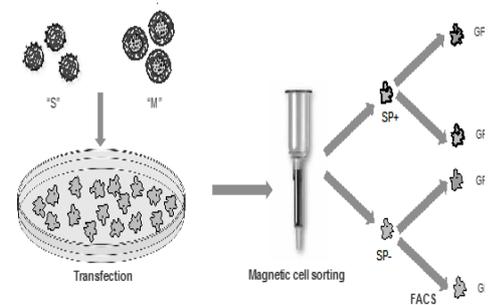
Multicomponent magnetic particles

Gene therapy has arisen as a pioneering technique to treat or improve the health condition of the patient by modifying patient's cells genetically.

The major historical problem is to develop efficient and safe systems for the delivery of therapeutic genes into the target cells. Currently, there are two main categories of methods for gene delivery, viral and non-viral vectors. Non-viral gene delivery systems are less toxic and immunogenic, compared to viral vectors. However, its transfection efficiency is much lower than viral vectors.

Advances in efficiency, specificity and safety have led to an increased number of non-viral vector products entering clinical trials. Unfortunately, none of the currently available non-viral vectors fulfils ideal vector properties.

A new non-viral vector based on multicomponent nanoparticles has been developed. The specific structure and composition of the nanoparticles, made of a superparamagnetic metallic oxide, a modified poly(β -aminoester) polymer and a polynucleotide, promotes particle endocytosis for delivery of the genetic material to modify eukaryotic cells and allows a massive separation of cells containing the particles improving both efficiency and safety.



Process of magnetic cells sorting

Main innovations and advantages

- The multicomponent particles presented enhance the transfection efficiency of non-viral gene delivery systems on different cell types.
- Their magnetic feature allows the rapid separation of particle-containing cells by application of a strong magnetic field.
- The system may also be used as a magnetic resonance contrast for magnetic resonance imaging and tracking of labelled cells, when said cells are used for clinical or animal research.

Patent Status

Spanish patent application filed

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