

# FUNCTIONALIZED LIPOSOMES USEFUL FOR THE DELIVERY OF BIOACTIVE COMPOUNDS

## ABSTRACT

The present invention is related to a new kind of functionalized liposome, for the selective delivery of active agents. This liposome carries a conjugate, by means of functionalizing the sterol present in its lipid bi-layer with a polymer, linked by a no-carbamate bond (differing from the state of the art). Besides, the polymer is also functionalized with a guiding ligand. This conjugate improves the physical-chemical properties of its carrying vesicles, making these more stable and homogeneous. A procedure for their preparation, a pharmaceutical composition containing these liposomes, and their therapeutic use are described as well.

It was developed by researchers belonging to the Spanish National Research Council (CSIC); the Barcelona Science Park (PCB); the Biomedical Research Networking Center in Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN); University Hospital Vall d'Hebrón - Institute for Research Foundation (VHIR); Autonomous University of Barcelona (UAB); the Barcelona Institute for Research in Biomedicine (IRB); and the University of Barcelona (UB).

## DESCRIPTION

A first aspect of the present invention is a conjugate comprising: i) a sterol; ii) a polymer bond to the sterol by means of a no-carbamate bond; iii) a guiding ligand, capable of selectively binding to receptors present in a target cell. This ligand is covalently bond to the polymer. A preferred embodiment is that where the sterol is cholesterol.

Other aspects of this invention are: a liposome comprising a conjugate as previously defined; liposome comprising a therapeutic agent; the use of the liposome as a delivery system for therapeutic agents; the use of the liposome as medicament; a pharmaceutical composition comprising an effective amount of liposome together with excipient or acceptable pharmaceutical carriers; and procedures to prepare the conjugate and the liposome. In a preferred embodiment, the invention comprises the use of the liposome to prepare a medicament for the treatment of Fabry disease, as well as its administration method.

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## APPLICATIONS

Therapy and cosmetics  
Delivery system for therapeutic agents  
Medicaments  
Treatment of Fabry disease

## DEVELOPMENT STATUS

Developed

## IP STATUS

Patents granted in USA, Japan and Europe (validated in Spain, Italy, Switzerland, Germany, France and UK)  
Brazil patent pending

## AVAILABLE FOR

- Exclusive license agreement
- Non-exclusive license agreement

## TECHNOLOGICAL OFFER

### INNOVATIVE ASPECTS AND ADVANTAGES

Liposome, with this kind of conjugates, improves the physical-chemical properties of the vesicles, regarding those in the state of the art.

They are more stable, with a slower sedimentation speed in suspension, and they are more homogeneous in size than liposome particles with carbamate bonds

These better properties, related to size homogeneity and stability in suspension, may be beneficial for the use of these functionalized liposomes as therapeutic agents in clinic.

### INDUSTRIAL PROPERTY

EP2866839B1  
US9744247B2  
JP 6368304B2

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