

Bicosomes: bicelles encapsulated in liposomes and their application in diluted systems

CSIC has developed a new sort of liposomes containing bicelles, called bicosomes, in such a way that bicelle morphology is preserved in diluted environments. Bicosomes allow encapsulation and administration of drugs, dyes or pigments acting as carrier for substances of cosmetic, dermatological and pharmaceutical interest in diluted water solutions and as permeability enhancers of biological membranes.

An offer for Patent Licensing and/or R+D collaboration

Encapsulated bicelles acting as barrier modulators and improving delivery and permeabilization of drugs

Bicelles are small, biocompatible, discoidal lipidic nanostructures that can carry drugs and other substances such as markers or dyes and which are able to permeate or reinforce different biological barriers such as skin, gastric and intestinal mucosae or blood brain barrier. However, in diluted conditions simple bicelles transform into larger structures, thereby losing their properties and efficacy.

The new technology developed is based on the encapsulation of bicelles into liposomal vesicles which isolate and preserve them from environments with high water content such the blood, the eye or mucous membranes, without modifying its morphology. These encapsulated bicelles, called bicosomes, are able to reach different tissues and deliver their content or act as barrier modulators.

Main applications

Due to their characteristics, bicosomes can be useful as carriers and as permeator of either drugs for systemic application, diagnostic marker molecules or cosmetic compounds increasing their capacity to repair damaged tissues.

Moreover, bicosomes could be also applied for microencapsulation in the textile area, increasing absorption, penetration and diffusion of dyes into textile fibres or of other substances to manufacture smart textiles.

Main advantages

- Bicosomes combine some liposome features (stability to temperature changes and to highly diluted media) and of bicelles (permeability modulator), becoming a unique multifunctional nanostructure for modulation of biological barriers (permeability or reinforcement), i.e. a tool with huge potential for medical, cosmetic and chemical applications.
- Bicosomes are biocompatible and have an improved encapsulation capacity of different compounds because they contain higher proportion of lipidic bilayer as compared to liposomes.

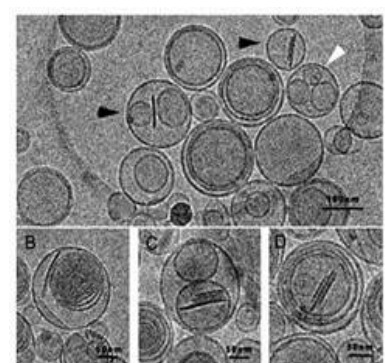


Image of bicelles encapsulated into liposomes (black arrowheads)

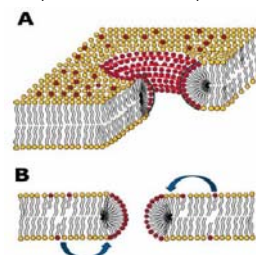


Image of the bicelle structure. A discoidal lipidic bilayer able to encapsulate different substances for delivery.

Patent Status

International PCT extension filed

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