

Method for producing a composition comprising archaeal lipids from a *Sulfolobus* cell culture

key words: archaeal lipids | archaeosome | oral administration | drug formulation

Many people are afraid of needles. In America 23% of the whole population refuses going to the doctor to get medical treatment because of needle phobia. Our technology allows oral delivery of drugs by pills, which currently have to be injected. We encapsulate the drugs in special and very stable lipids. Thus, the drug can safely travel through the stomach and is efficiently taken up in the colon.

Background

Drug substances are currently administered in various forms. A prominent example is the packing of drugs in lipid vesicles - so-called "Liposomes". Conventional Liposomes, which protect the drug and deliver it specifically to a certain tissue, are made of phospholipid-esters. Despite the vast applications of these Liposomes, with a current market value of 2.2 Billion Euros, their greatest disadvantage is their instability towards acidic pH values and enzymes, preventing their use in oral drug delivery.

Technology

We developed a novel technology to produce super-stable tailor-made lipids in an extremophilic microorganism according to quality by design guidelines. Packing drugs in vesicles made of these special "tetra-ether-lipids" allows the transport through the stomach and the targeted release and uptake of the drug in the colon.

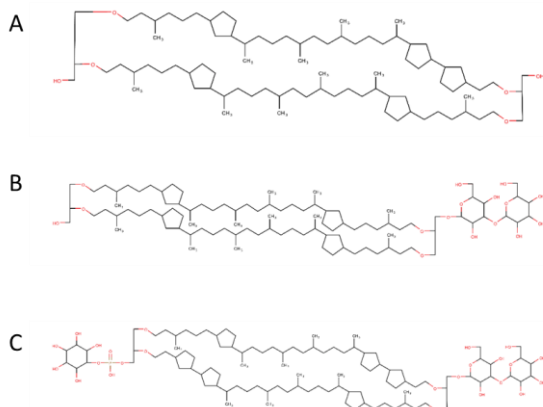


Fig 1: Structures of a selection of lipids, needed for encapsulation of drugs for oral drug delivery

Advantages

- The chemical coatings of current gastrointestinal formulations will become obsolete and the patient does not need to take up unwanted chemicals any more.
- Current retard formulations contain a lot of packing material and only little drug. With our novel technology more drug can be packed per dose making oral drug delivery much more efficient
- Our technology enables an efficient oral delivery of drugs, which currently have to be injected with a syringe.

Possible Applications

Additionally to the pharmaceutical market, our lipids are highly demanded in the following industries:

- Cosmetics
- Food and beverages
- Agriculture
- Coatings
- Biosensors

Current status

Proof of principle in lab scale

IPR

European patent application submitted.

Inventors

DI Julian Quehenberger
Assoc. Prof. Dr. Oliver Spadiut
DI Dr. David Wurm