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Phytantriol cubosomes flexibility and malleability evidenced by extrusion: a new method for drug encapsulation

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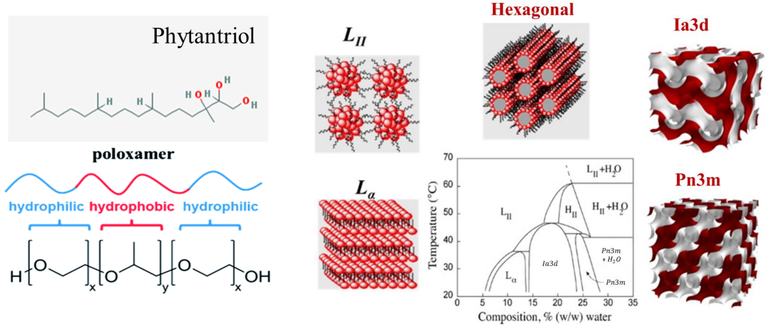
Objectives

In the present study, we produced and systematically characterized phytantriol (PHY) based cubosomes in terms of structure, morphology, particle size and concentration under the influence of extrusion. Using small angle x-ray scattering (SAXS), dynamic light scattering (DLS) and nanoparticle tracking analysis (NTA), we were able to evidence particle malleability and flexibility. In addition, two different aqueous media (ultrapure water or PBS buffer) were studied in order to see if the present salts influence the nanoparticle structure under the extrusion process.

Methods



Phytantriol + ethanol

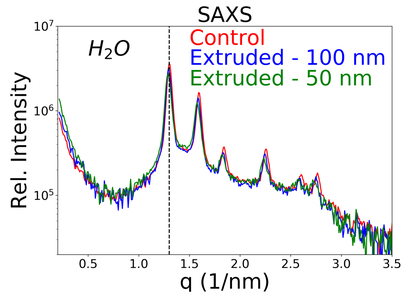
Polymer + water/buffer

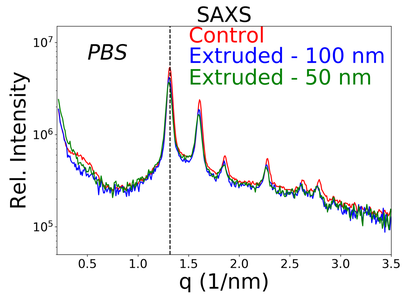
→ Dropwise + Stirring →

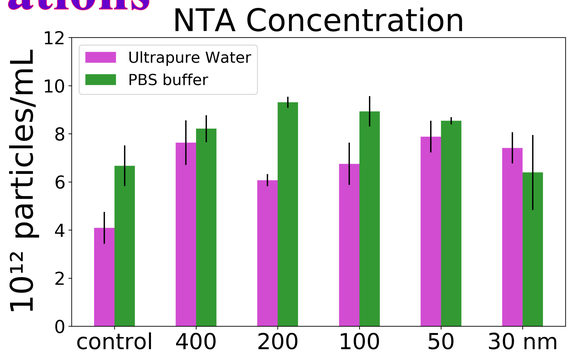
Rotary evaporator → volume < 5 mL

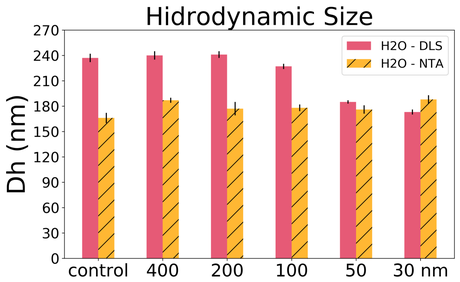
Extrusion → 400, 200, 100, 50 and 30 nm pore filters

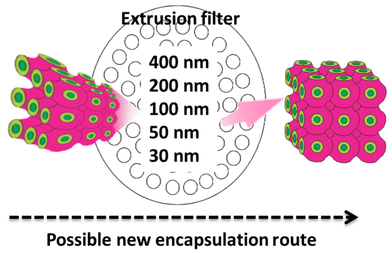
Results and Observations

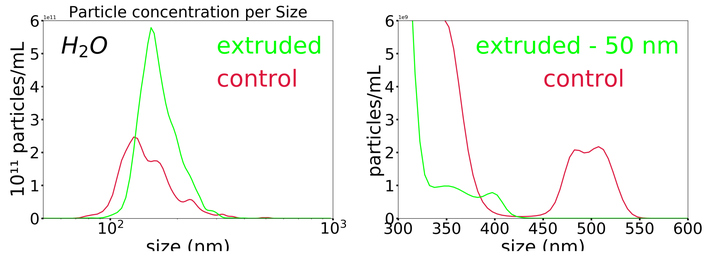


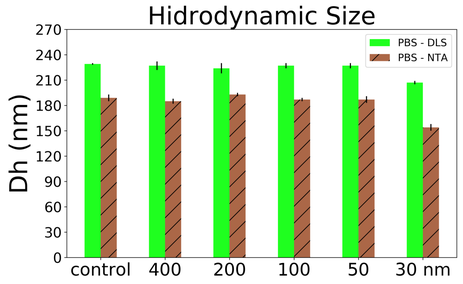


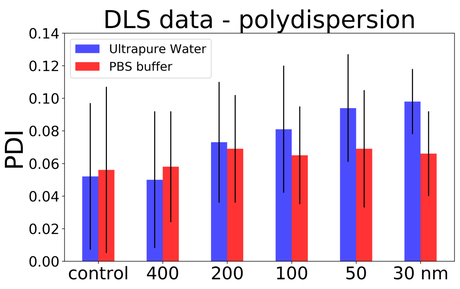


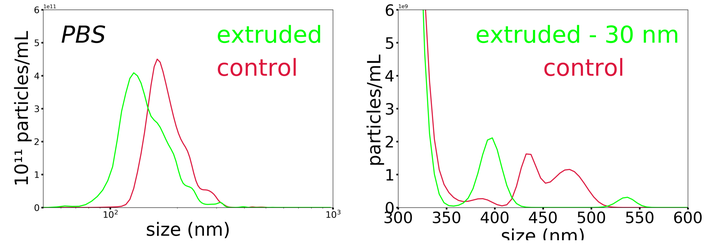












Conclusions:

Extrusion does not affect morphology of cubosomes → it evidences its malleability and a possible new route for encapsulation of molecules in the nanoparticle matrix

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