

## Supplementary information on excipients

### Labrafil®

Lipid phases used in this work are based mainly on polyoxylglycerides (or macroglycerides).

They were supplied as gift samples from Gattefossé S.A. (Saint-Priest, France).

Among transesterified ethoxylated vegetable oils with the trade name Labrafil, we used Labrafil® M1944CS (Oleoyl polyoxyl-6 glycerides), obtained from partial hydrolysis and esterification of kernel oil, and Labrafil® M2125CS (Linoleoyl polyoxyl-6 glycerides), obtained from corn oil. Both of them contain a mean of 6 ethoxy units. Table S1 summarizes the fatty acid composition of both products (data from the supplier). Table S2 gives the schematic structure of the main compounds.

**Table S1.** Fatty acid composition of Labrafil® M1944CS and Labrafil® M2125CS

Properties	Labrafil® M1944CS	Labrafil® M2125CS
Composition		
Palmitic acid (C16)	4.0 to 9.0 %	4 to 20%
Stearic acid (C18)	≤ 6.0 %	≤ 6.0 %
Oleic acid (C18:1)	58.0 to 80.0 %	20.0 to 35.0%
Linoleic acid (C18:2)	15.0 to 35.0 %	50.0 to 65.0%
Linolenic acid (C18:3)	≤ 2.0 %	≤ 2.0 %
Arachidic acid (C20)	≤ 2.0 %	≤ 1.0 %
Eicosenoic acid (C20:1)	≤ 2.0 %	≤ 1.0 %

**Table S2.** Main components of the glyceridic and PEG300 esters fractions of both Labrafil®. In Labrafil® M1944CS, R=C18:1 and in Labrafil® M2125CS, R=C18:2.

	Schematic structures
<b>Glyceridic fraction</b> Tri-, Di-, Mono-glycerides	
<b>PEG<sub>300</sub> ester fraction</b>	

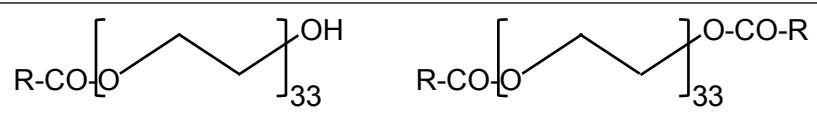
### Labrafac® CC (new name: Labrafac lipophile WL 1349)

Labrafac® CC, supplied from Gattefossé S.A. (Saint-Priest, France), was used in some experiences. It is a mixture of medium chain Triglycerides, mainly from caprylic (C8) and capric (C10) acids. From vegetal origin and liquid at room temperature, this excipient is generally used to formulate emulsions and nanoemulsions.

### Gelucire® 50/13

Gelucire® 50/13 was kindly gift from Gattefossé S.A. (Saint-Priest, France). This excipient composes primarily a mixture of poly(ethyleneglycol) (PEG) 1500 mono- and diesters with palmitic (C16) and stearic (C18) acid with a mean HLB value about 13. It is adaptable to a variety of formulation process and can be used, among others, for the development of solid dispersions of hydrophobic drugs in order to improve their oral bioavailability. Table S3 gives the schematic structure of the main compounds.

**Table S3.** Main components of Gelucire® 50/13. R=C16 or C18

	Schematic structures
PEG1500 esters	

### Phospholipon® 90G

Phospholipon® 90G was received as a gift sample from Phospholipid GmbH (Nattermannalle, Germany). This is a purified, de-oiled, and granulated soy lecithin with a high phosphatidylcholine content (94-100%), lysophosphatidylcholine (max. 4%) and tocopherol (0.3%) as anti-oxidant. It is used as raw material forming of liposomes and mixed micelles, moisturizer, emulsifier for pharmaceutical dermatology, cosmetics and personal care products. It is also used as a solubilizer for drugs and encapsulation of active compounds

## Supplementary results

### Formulation study: stearyl macroglycerides to phospholipids ratio

**Figure S1:** Summary of the formulation studies depending on the proportion of stabilizers and the lipid phase composition. (●): successful formulations; (○): unsuccessful formulations. Successful attributes have been defined as mean diameter comprised between 100 and 200 nm and stable during at least three months. The concentration of the lipid phase was 20% of the total suspension (w/w).

### **SAXS pattern of the Janus nanoparticles**

**Figure S2:** SAXS profile at 20 °C of the nanodispersions containing linoleoyl polyoxylglycerides. Inset: log-log representation. Results acquired after 8 days of storage at 20 °C.

Figure S1

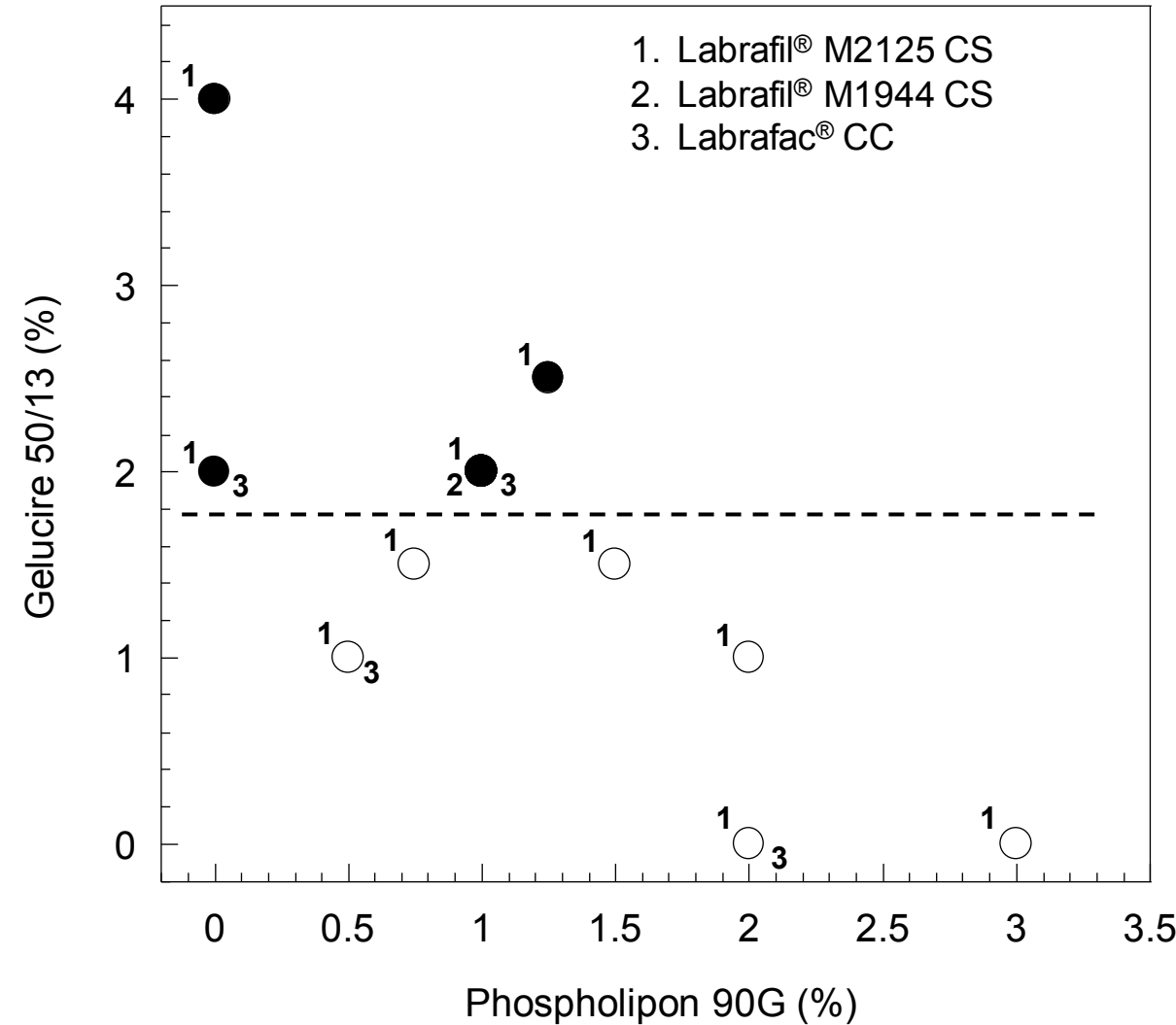


Figure S2

