SUPPLEMENTARY MATERIALS

Comparative Development and Characterization of Itraconazole-Loaded Solid Lipid Nanoparticles Incorporating Myristic Acid and Pluronic F127 for Oral Delivery

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Preparation of blank SLNs

Blank SLNs were prepared using the same microemulsion technique (described in Section 2.2.2 of the main text) for ITZ-loaded SLNs, except that the drug was omitted. The subsequent processing steps—stirring and the addition of cold water to the hot microemulsion—were carried out differently for the formulations, as detailed in the footnotes of Table S1.

Table S1. Composition of blank solid lipid nanoparticles formulations

Formula*	Stearic acid (g)	Tween 80 (ml)	Distilled water (ml)
F1	1	0.5	2.5
F2	1	0.5	2.5
F3	1	0.5	2.5
F4	1	0.5	2.5

*Notes:
F1: Prepared by adding cold water to the hot microemulsion without stirring, followed by homogenization at 9500 rpm for 15 minutes.
F2: Prepared by adding the hot microemulsion to cold water (2–3 °C), followed by homogenization at 9500 rpm for 15 minutes.
F3: Prepared by adding cold water portion by portion to the hot microemulsion with stirring, then homogenized at 9500 rpm for 15 minutes.
F4: Prepared from the hot microemulsion without the cold-water step; the formulation solidified at room temperature. A 20 mg portion of the solidified material was then dispersed in 2 mL of distilled water.

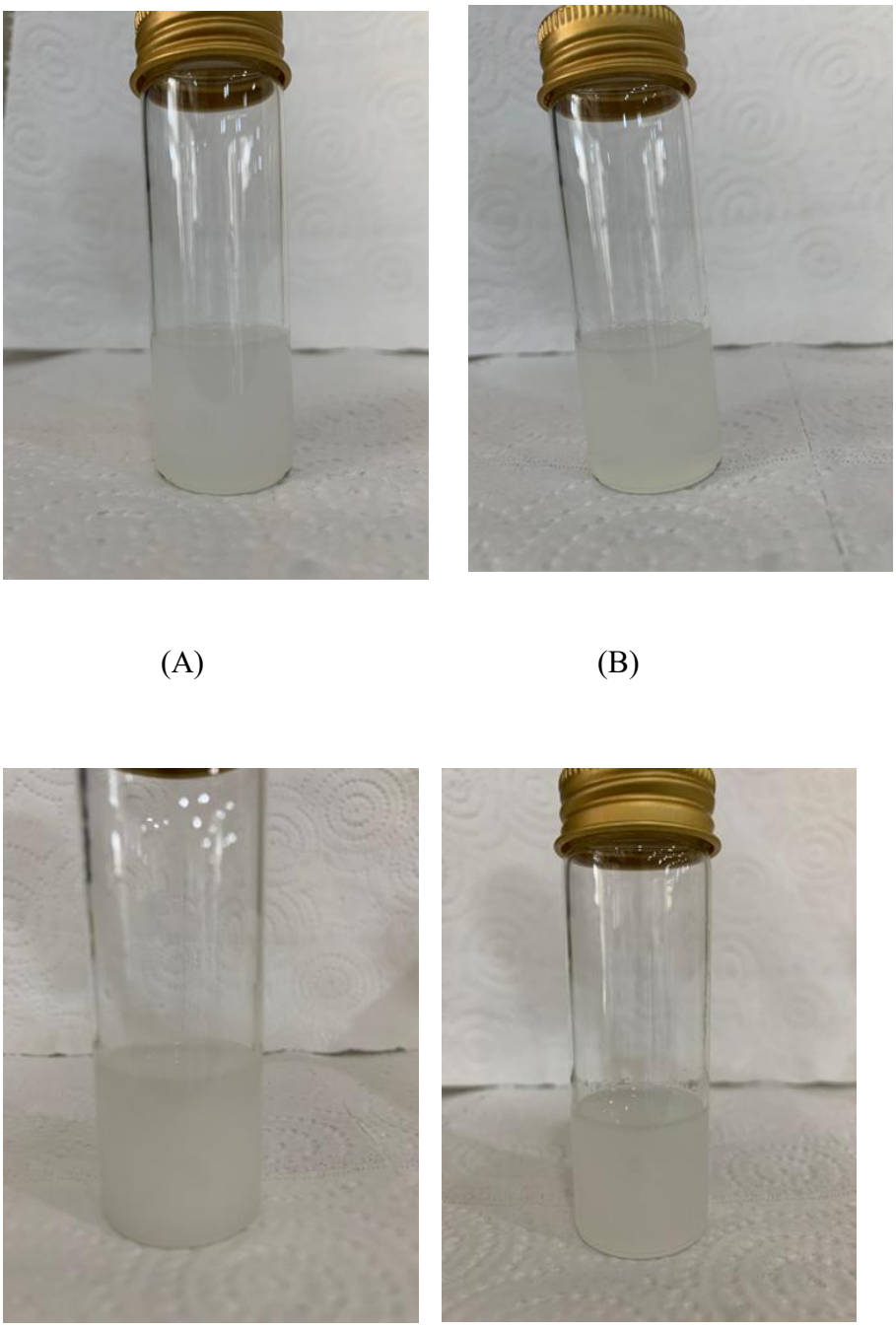
Table S2. Physicochemical properties of the prepared blank solid lipid nanoparticles. Data are expressed as mean ±SD, n=3.

Formulation	Size (Z-average, nm)	PDI	Zeta potential (mV)
F1	2665	0.379	-35.9
F2	2627	0.652	-20.3
F3	1687	0.914	-20.6
F4	1511	1	-31.4

As shown in Table S2, the different preparation conditions resulted in notable variations in the physicochemical properties of the blank SLNs. Formulations prepared using cold-water quenching (F1–F3) produced relatively larger particles (1687–2665 nm) compared with the formulation solidified at room temperature (F4), which exhibited the smallest particle size (1511 nm). PDI values increased from F1 to F4, indicating progressively broader size distributions, with F4 showing the highest heterogeneity (PDI = 1). The zeta potential values ranged from −20.3 to −35.9 mV, suggesting moderate electrostatic stability across all formulations. Overall, the data demonstrate that the choice of cooling and mixing method substantially influenced particle size and uniformity, while all formulations retained acceptable surface charge for colloidal stability.

Table S3. Comparison of particle size and PDI of freshly prepared optimized SLN3 and SLN9, and the same formulations after one month of storage at 25°C. Data are expressed as mean ±SD, n=3.

Optimized formula	**Parameters**	**Fresh sample**	**After 1 month**	**After 6 months**
SLN3	Size (nm)	550 ± 30	583 ± 41	835 ± 27
	PDI	0.61 ± 0.0367	0.533 ± 0.082	0.519 ± 0.081
SLN9	Size (nm)	664 ± 78	2741 ± 82	2856 ± 102
	PDI	0.634 ±0.069	1 ± 0	1 ± 0



(A) (B)

(C) (D)

Figure 1. Photographs of ITZ-loaded SLNs: (A) freshly prepared SLN3, (B) SLN3 after one month of storage at 25 °C, (C) freshly prepared SLN9, and (D) SLN9 after one month of storage at 25 °C.