**SUPPLEMENTARY MATERIAL**

**Table S1.** Proportions of mucin and nanoparticles used to mucin interaction test.

|  |  |  |  |
| --- | --- | --- | --- |
| Sample | Mucin dispersion (mL) | SLN (mL) | Acid buffer or Phosphate buffer (mL) |
| Blank SLN | – | 0.5 | 4.5 |
| SLN-C | – | 0.5 | 4.5 |
| Blank SLN + mucin | 1.25 | 0.5 | 3.25 |
| SLN-C + mucin | 1.25 | 0.5 | 3.25 |

Abbreviations: SLN = solid lipid nanoparticles. SLN-C = solid lipid nanoparticles with curcumin.

**Table S2.** Tested mathematical models and R² values of release rate constant.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **SLN-C** | | |
| **Model** | **R² value** | **k (mg/mL. h−1)** | **n** |
| First-order | 0.9164 | 0.0404 | - |
| Higuchi | 0.7641 | 11.0335 | - |
| Korsmeyer-Peppas | 0.9939 | 0.9585 | 1.38 |
| Hixson-Crowell | 0.9357 | 0.0123 | - |

Abbreviations: SLN-C = solid lipid nanoparticles with curcumin.

**Table S3.** Melting temperature and enthalpy variation obtained by DSC technique.

|  |  |  |
| --- | --- | --- |
| Sample | Melting Point (°C) | ΔH (Jg-1) |
| Murumuru butter | - | - |
| Compritol ATO 888 | 73 | 99 |
| Curcumin | 169 | 93 |
| Blank SLN | 102.36 | 1846 |
| SLN-C | 88.73 | 6542 |

Abbreviations: SLN = solid lipid nanoparticles. SLN-C = solid lipid nanoparticles with curcumin. DSC = differential scanning calorimetry.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table S4.** FTIR spectra of Compritol® ATO 888, Span® 20, Tween® 80, murumuru butter, curcumin, SLN, physical mixture and SLN-C | | | | | | | |  |
| **Compritol®** | **Span**® **20** | **Tween**® **80** | **Murumuru butter** | **Curcumin** | **SLN** | **Physical Mixture** | **SLN-C** | **Assignment** |
| 3398 | 3398 | 3493 | 3464 | 3507 | 3450 | 3433 | 3456 | νOH |
| 2914 | 2922 | 2922 | 2957, 2920 | 2972, 2945 | 2916 | 2953, 2922 | 2953, 2916 | νasCH |
| 2849 | 2852 | 2856 | 2852 | 2845 | 2851 | 2852 | 2851 | νsCH |
| 1736 | 1738 | 1736 | 1742, 1728 | - | 1740 | 1740 | 1742 | νC=O |
| - | - | 1641 | - | - | 1693 | - | - | νC=O |
| - | - | - | - | 1626 | - | 1636 | 1641 | νC=O + νC=C |
| - | - | - | - | 1600 | - | 1600 | 1590 | νC-C aromatic |
| - | - | - | - | 1508 | - | 1514 | 1515 | νC=O + CCC + C=O in-plane |
| 1466 | 1466 | 1458, 1350, 1248 | 1466 | 1456 | 1464 | 1464 | 1464 | CH (CH2 alkane) |
| - | - | - | - | 1273 | - | 1236 | 1240 | νCO (aromatic) |
| 1175 | 1169 | - | 1173 | - | - | 1173 | 1175 | νCO |
| - | - | 1094 | 1105 | 1027 | 1101 | 1105 | 1101 | νCOC |
| - | - | - | - | 962 | - | 943 | 947 | νC=O + in-plane CCH |
| 719 | 721 | 723 | 721 | 729 |  | - | - | *Rocking* CH2 |
| - | - | - | - | 714 | 719 | 721 | 721 |  in-*plane skeletal*- CCH and CCH aromatic + νC=C |

Abbreviations: FTIR = Fourier-transform infrared spectroscopy. SLN = solid lipid nanoparticles. SLN-C = solid lipid nanoparticles with curcumin.