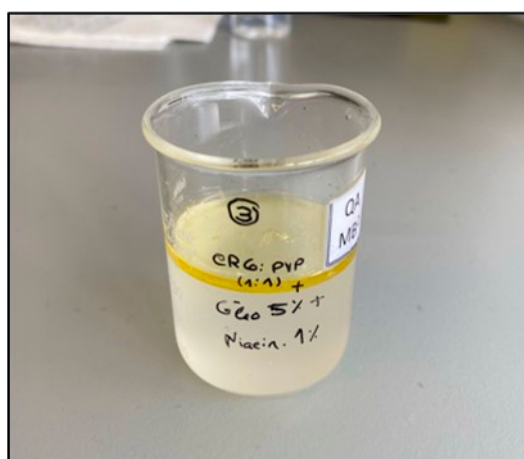


# Supplementary Materials: Topical Delivery of Niacinamide to Skin Using Hybrid Nanogels Enhances Photoprotection Effect

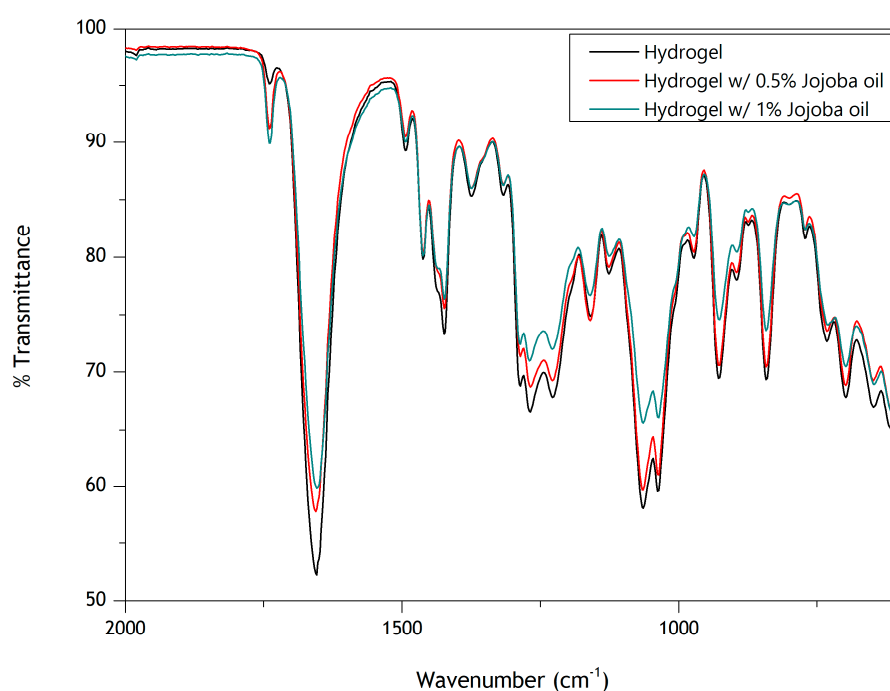
Renata Basto, Raquel Andrade, Cláudia Nunes, Sofia Lima \* and Salette Reis



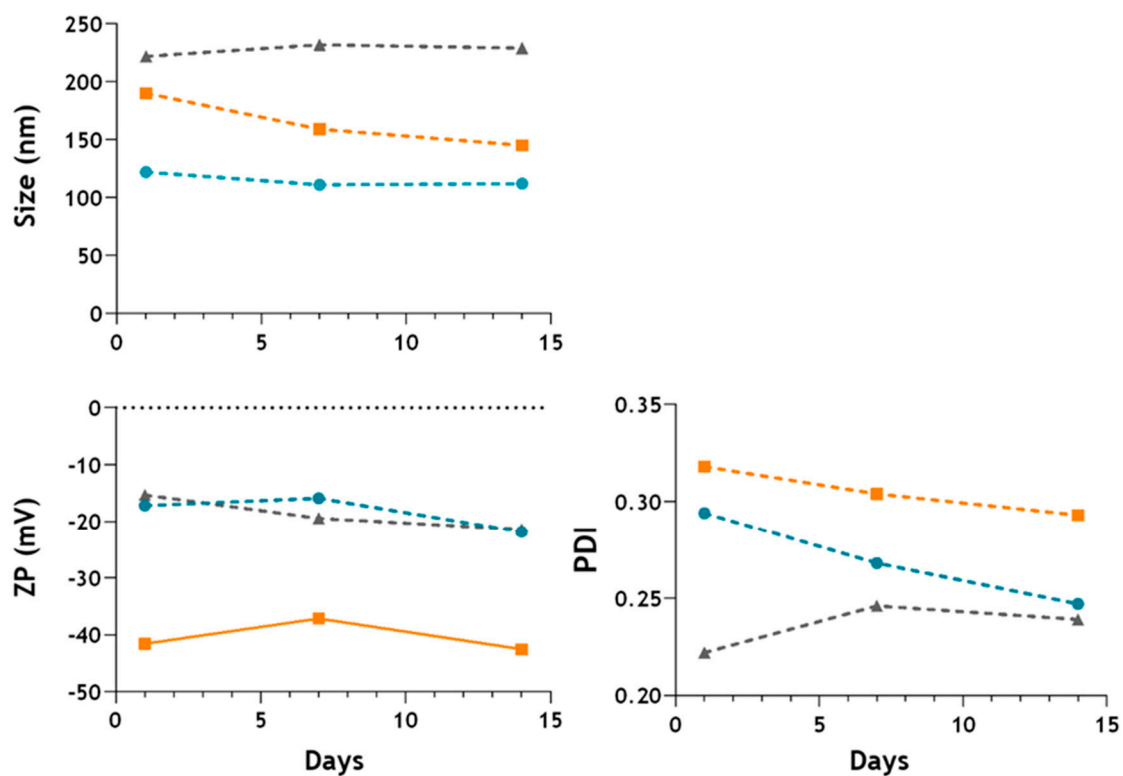
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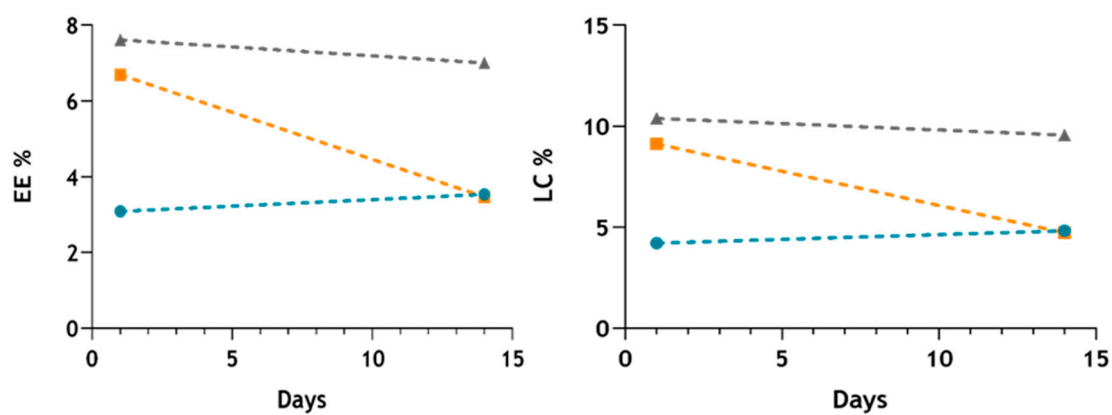
**Figure S1.** Photograph of one of the optimized hydrogel combinations (CRG-PVP (1:1) + NIA 1% (w/w) + jojoba oil 5%).



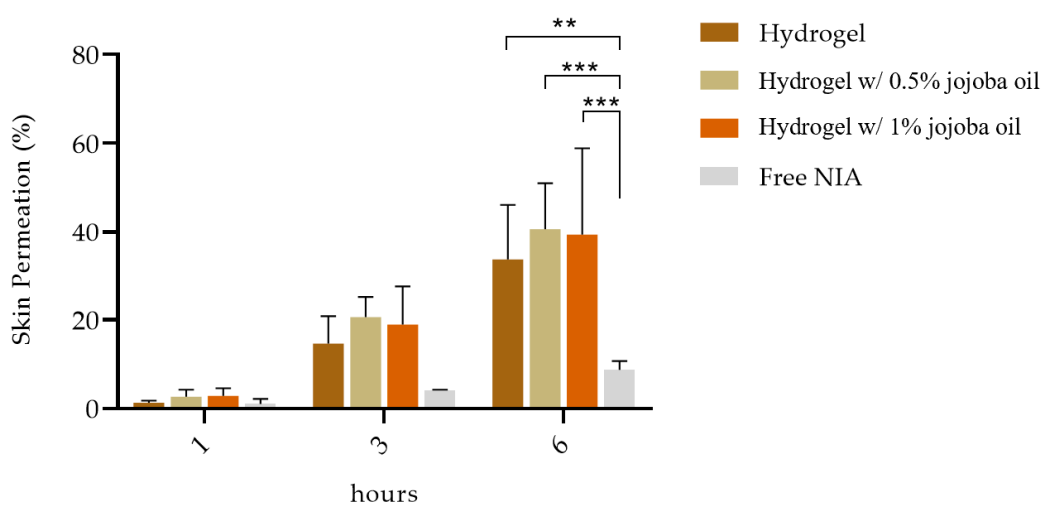
**Figure S2.** Evaluation of jojoba oil effect on NIA-loaded hydrogel's chemical nature through FTIR.



**Figure S3.** Storage stability of NIA-loaded TEs tween 80 (blue), oleic acid (orange) and jojoba oil (grey) at 4 °C over 2 weeks. Size, zeta potential and polydispersity index values displayed (Size: SD < 2%; ZP: SD < 5%; PDI: SD < 3%).



**Figure S4.** Storage stability of NIA-loaded TEs tween 80 (blue), oleic acid (orange) and jojoba oil (grey) at 4 °C over 8 weeks. EE% and LC% values displayed.



**Figure S5.** In vitro skin permeation results of free NIA, and NIA-loaded developed hydrogels, from four independent experiments ( $n = 4$ ). Asterisks indicate statistical significance (\*,  $p \leq 0.05$ ; \*\*,  $p \leq 0.01$ ; \*\*\*,  $p \leq 0.001$ ; \*\*\*\*,  $p \leq 0.0001$ ). No asterisks indicate no statistical significance ( $p > 0.05$ ).

**Table S1.** Characterization of non-loaded TEs.

	PS (nm)	PDI	ZP (mV)
tween 80	$132 \pm 1$	$0.290 \pm 0.002$	$-15 \pm 3$
oleic acid	$320 \pm 27$	$0.316 \pm 0.011$	$-31 \pm 1$
jojoba oil	$249 \pm 4$	$0.250 \pm 0.011$	$-19 \pm 1$

Each value represents the mean  $\pm$  SD of 3 independent measurements ( $n = 3$ ). PS—particular size; PDI—polydispersity index; ZP—zeta potential; LC—loading capacity.