CONCLUSIONS
• In this ex vivo analysis, pretreatment with low-power 1440-nm or 1927-nm non-ablative fractional diode lasers not only increased overall uptake of mineral eye serum but also achieved more rapid absorption after application compared to untreated controls
• Pretreatment with the 1927-nm wavelength at low power (0.6 W) showed similar uptake enhancement to 1440-nm laser pretreatment at 3 W relative to untreated control (~1.6 vs 2 times)
• 1927-nm pretreatment at 1 W enhanced uptake of mineral eye serum by ~2.7 times relative to untreated control (~1.6 vs 2 times)
• These results provide a foundation for guidance on the use of non-ablative lasers in clinical studies on topical uptake enhancement

RESULTS

Uptake
• Pretreatment with the 1440-nm laser increased uptake of mineral eye serum at 24 hours posttreatment by almost 2 times compared to untreated controls (47.1 vs 23.7 mg/cm²)
• Pretreatment with the 1927-nm laser with lower power and energy settings (0.6 W, 4.5 mJ) enhanced uptake of mineral eye serum by ~1.6 times compared to untreated controls (39.0 vs 23.7 mg/cm²)
• Higher power and energy settings (1 W, 7.5 mJ) with the 1927-nm laser enhanced uptake of eye serum by ~2.7 times compared to untreated controls (63.6 vs 23.7 mg/cm²)

Permeation
• Permeation was increased by ~2 times with 1440-nm laser pretreatment compared to untreated controls (39.7 vs 19.4 mg/cm²; Figure 2)
• Low-power 1927-nm pretreatment (0.6 W) increased permeation by 1.5 times compared to untreated controls (29.4 vs 19.4 mg/cm²)
• Higher-power 1927-nm pretreatment (1 W) increased permeation by almost 3 times compared to untreated controls (57.6 vs 19.4 mg/cm²)

Laser-treated samples showed enhanced uptake within 15 minutes of application, whereas untreated controls did not demonstrate permeation until 2 hours

Figure 2. Cumulative permeation of mineral eye serum after laser pretreatment.