

Supplementary Materials: Angled Insertion of Microneedles for Targeted Antigen Delivery to the Epidermis

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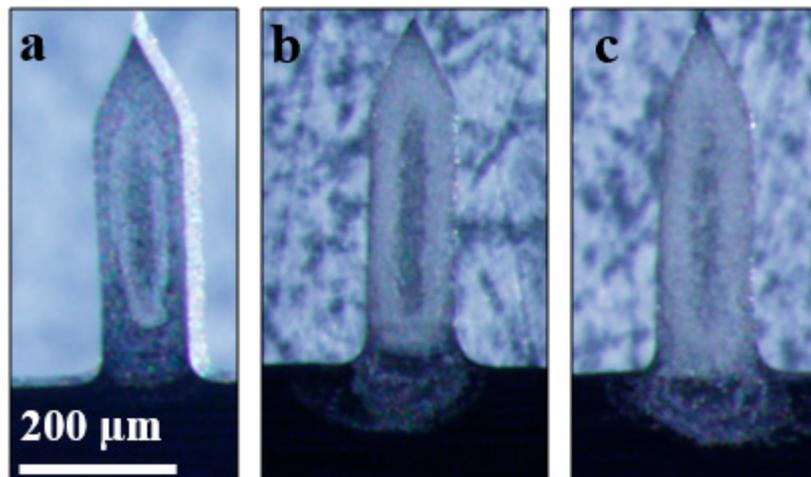


Figure S1. Representative images of MNs with coatings past the base of MNs. MNs measuring were coated using a formulation containing 1% (*w/v*) CMC, 0.5% (*w/v*) Pluronic F-68, 2% (*w/v*), and peanut antigen using (a) 5, (b) 10 or (c) 15 dip-coating cycles.

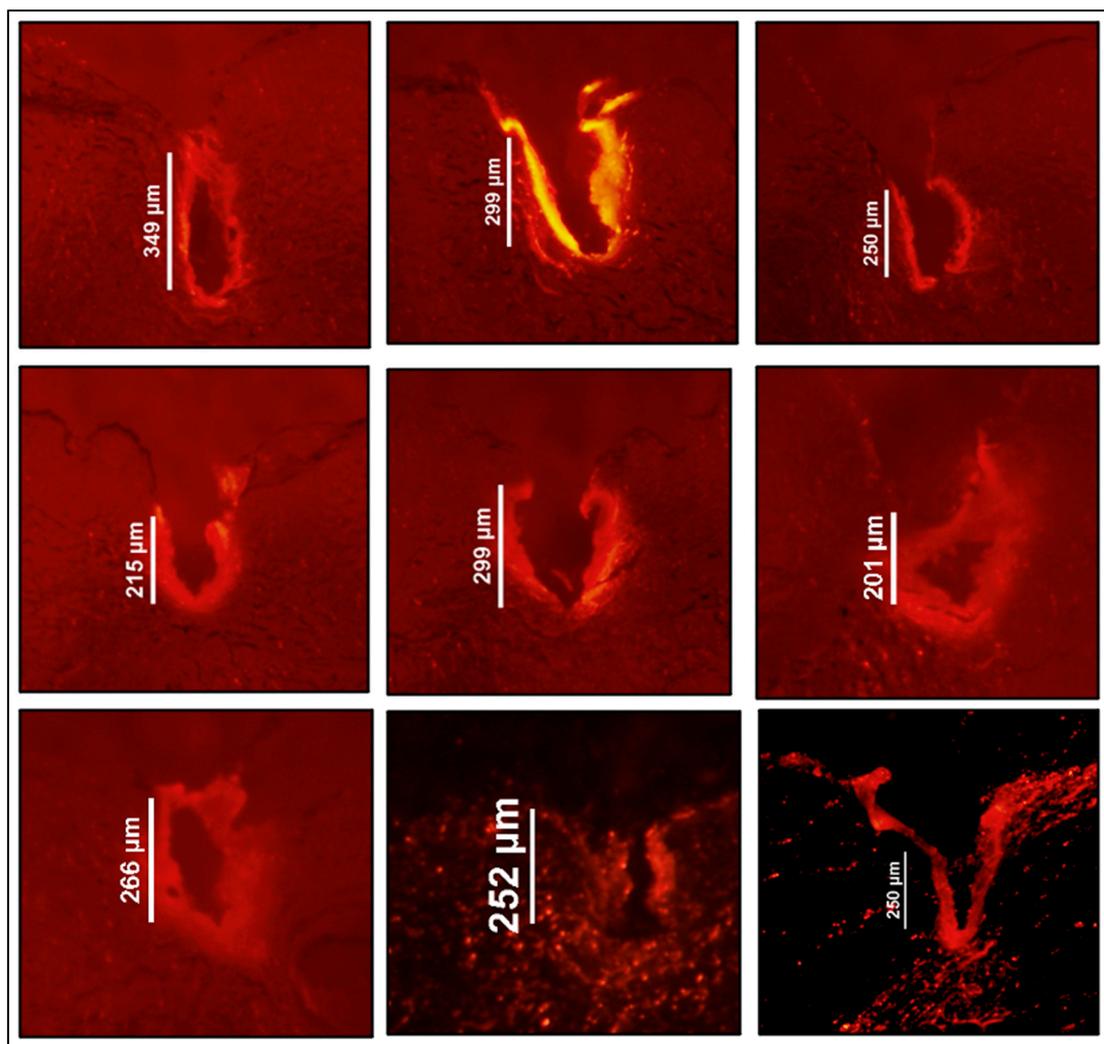


Figure S2. Images of histological skin sections after insertion of MNs coated with red-fluorescent sulforhodamine dye at an angle of 90° used to generated data presented in Figure 4.

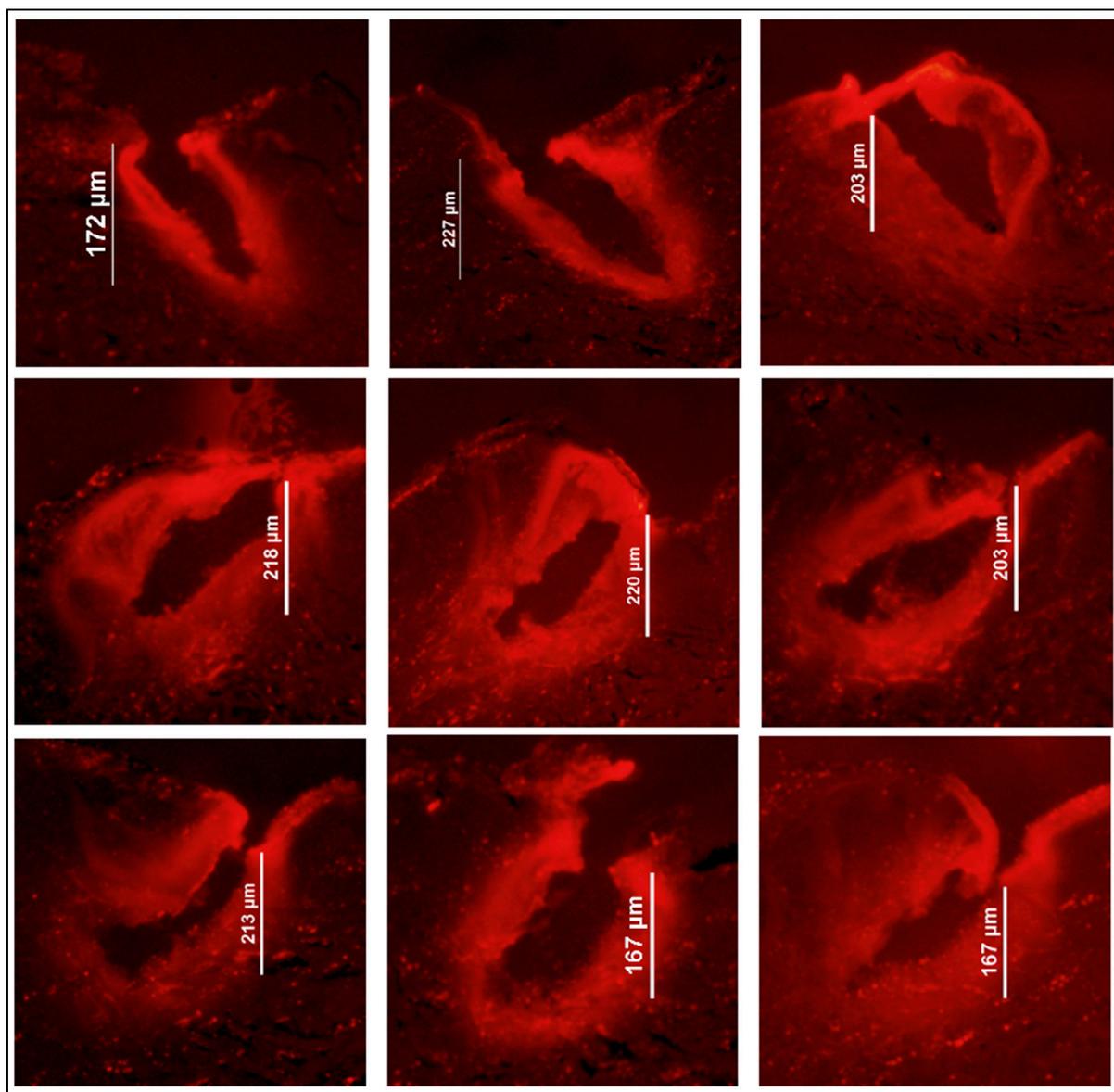


Figure S3. Images of histological skin sections after insertion of MNs coated with red-fluorescent sulforhodamine dye at an angle of 45° used to generated data presented in Figure 4.

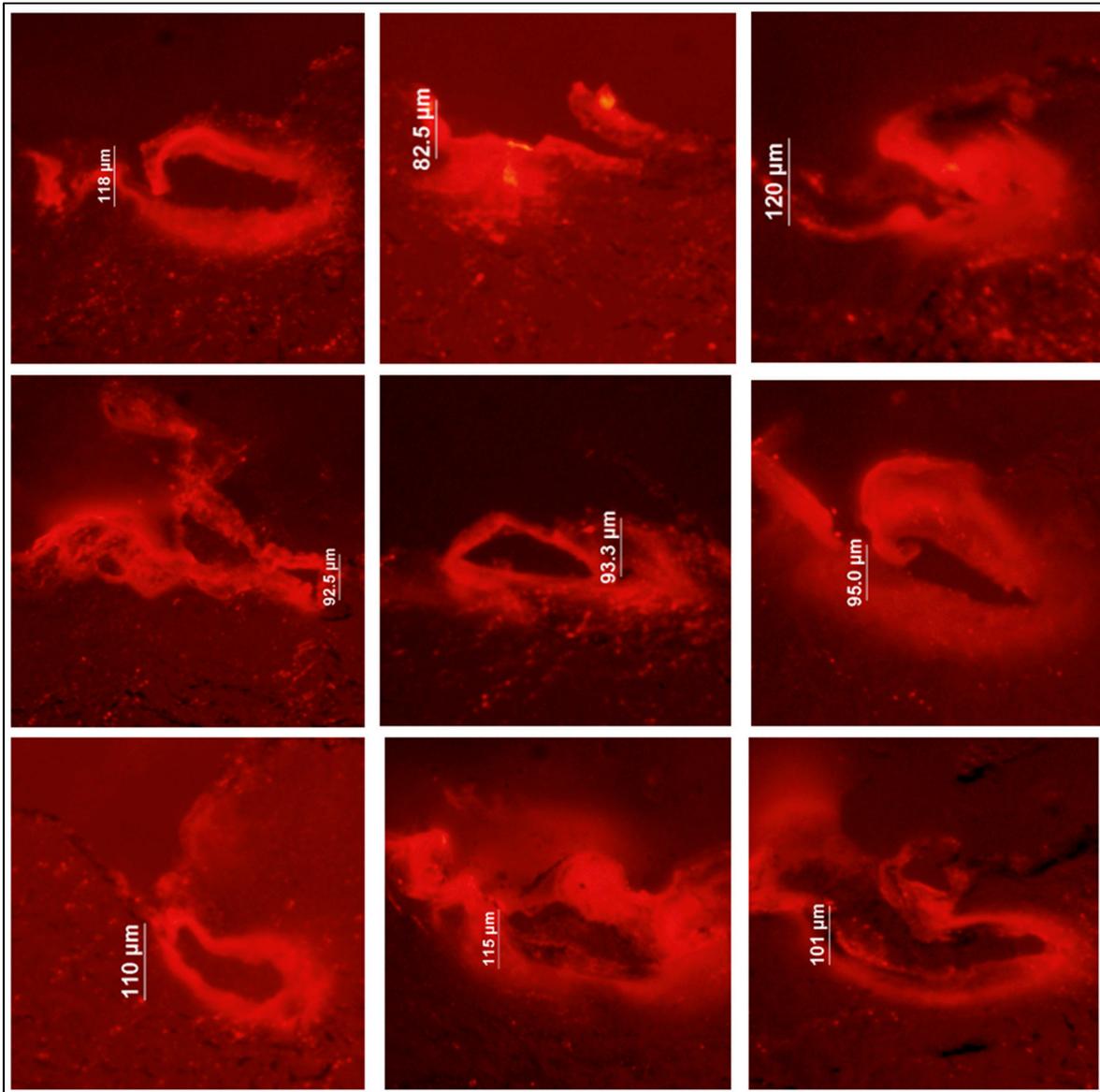


Figure S4. Images of histological skin sections after insertion of MNs coated with red-fluorescent sulforhodamine dye at an angle of 20° used to generated data presented in Figure 4.

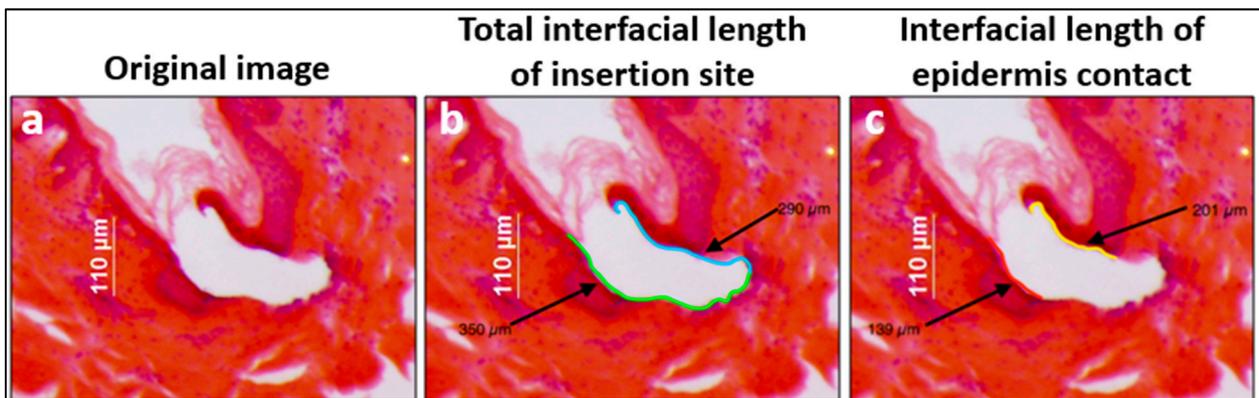


Figure 5. Representative H&E-stained images of 250 µm-long MNs inserted at 20° illustrating the method to calculate epidermis percent localization: (a) original insertion site image; (b) total interfacial length of the insertion site (640 µm); (c) interfacial epidermis contact length of the insertion site (340 µm).

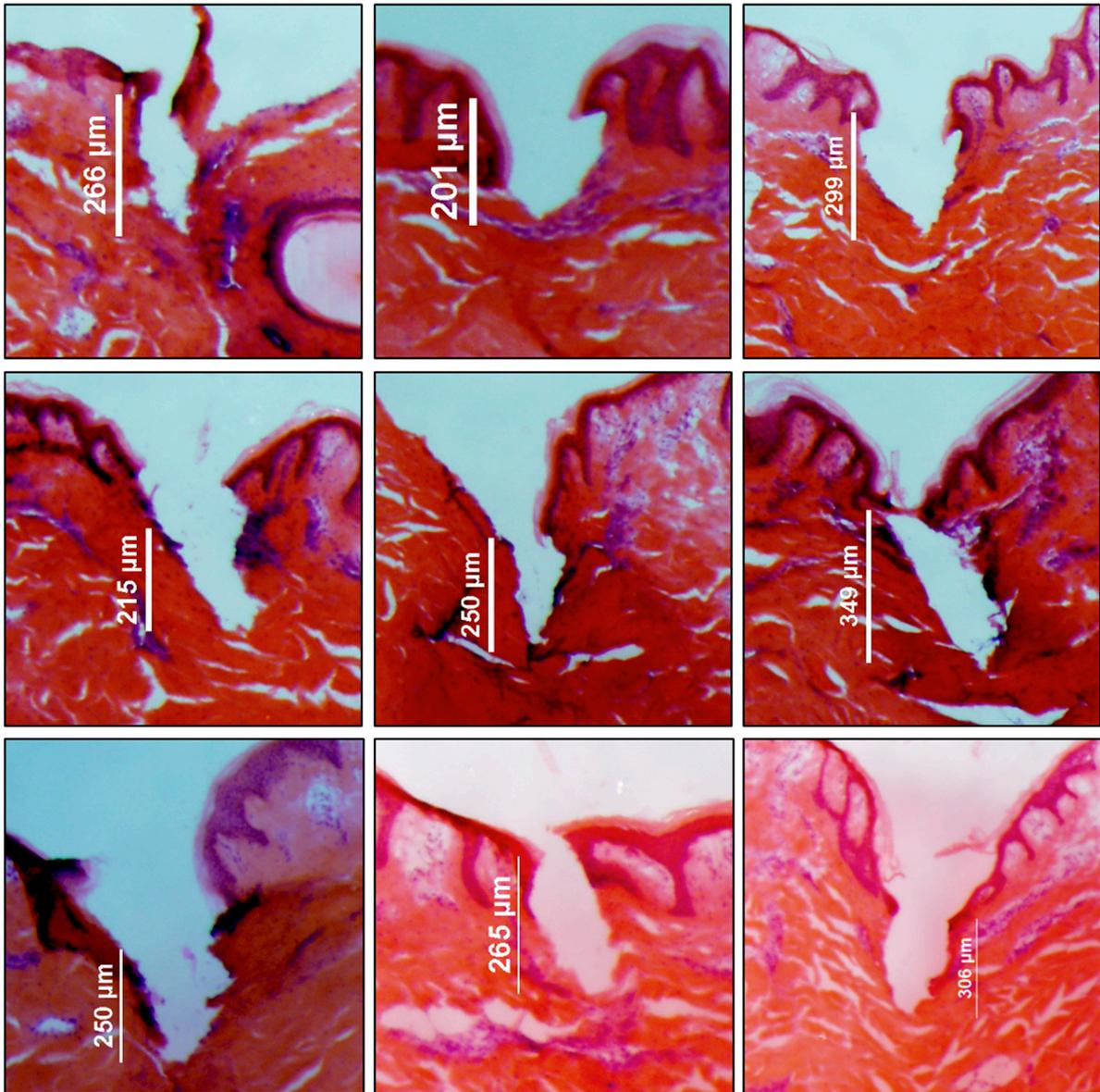


Figure S6. Images of histological skin sections stained with H&E after insertion of MNs at an angle of 90° used to generated data presented in Figure 5.

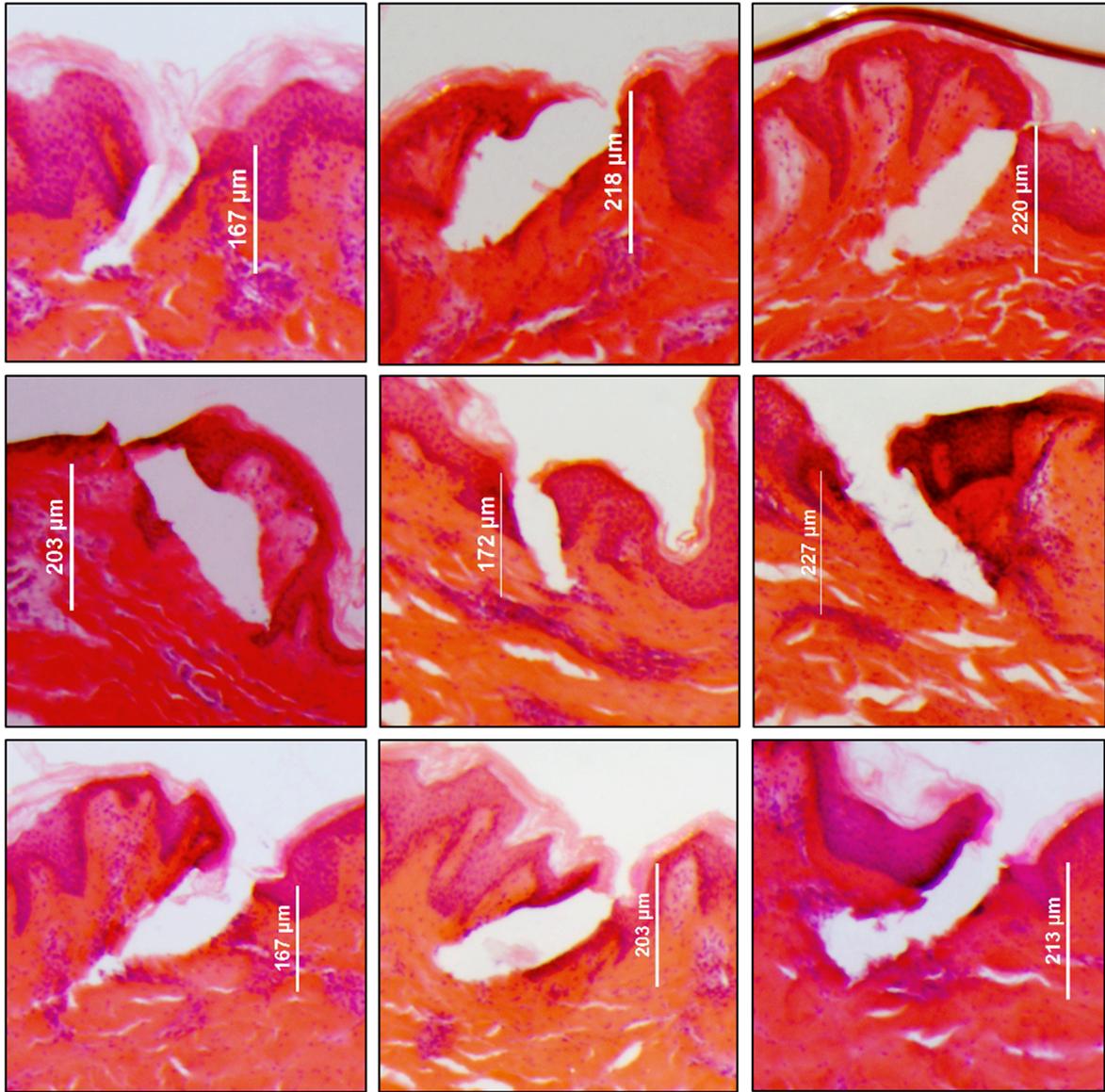


Figure S7. Images of histological skin sections stained with H&E after insertion of MNs at an angle of 45° used to generated data presented in Figure 5.

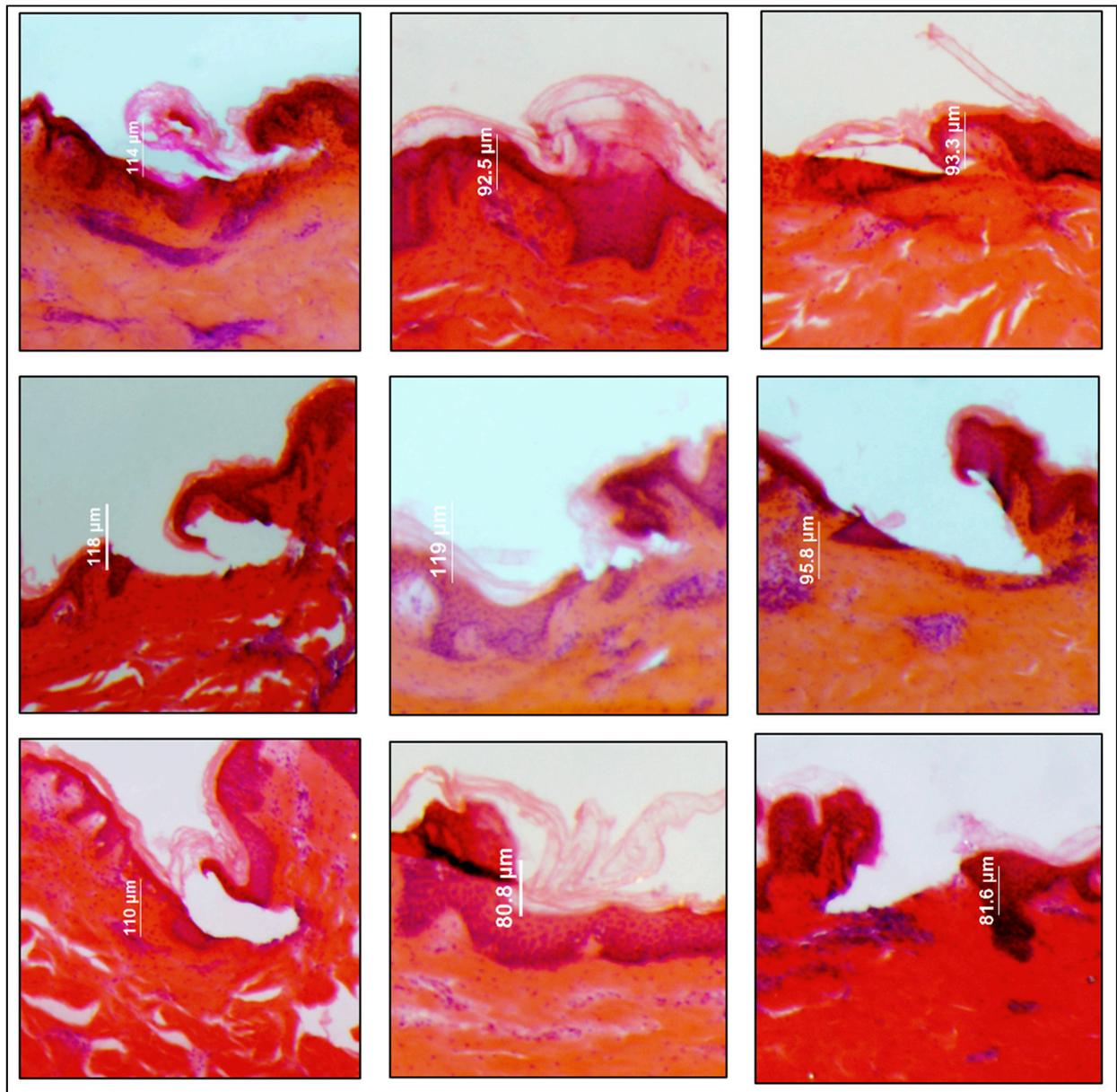


Figure S8. Images of histological skin sections stained with H&E after insertion of MNs at an angle of 20° used to generated data presented in Figure 5.

Table S1. Percent epidermal localization and associated statistics for each of the three insertion angles studied.

		Percent Epidermal Localization		
		Angle of Insertion		
		90°	45°	20°
Replicate	1	16.8%	52.6%	100.0%
	2	39.1%	46.9%	100.0%
	3	25.0%	18.9%	72.0%
	4	40.9%	34.9%	47.5%
	5	11.9%	26.5%	83.4%
	6	8.7%	44.0%	61.0%
	7	18.7%	61.4%	52.9%
	8	45.5%	44.0%	67.3%
	9	18.4%	53.8%	43.0%
Statistics	Mean	25.0%	42.6%	69.7%
	StDev	13.5%	13.6%	21.2%