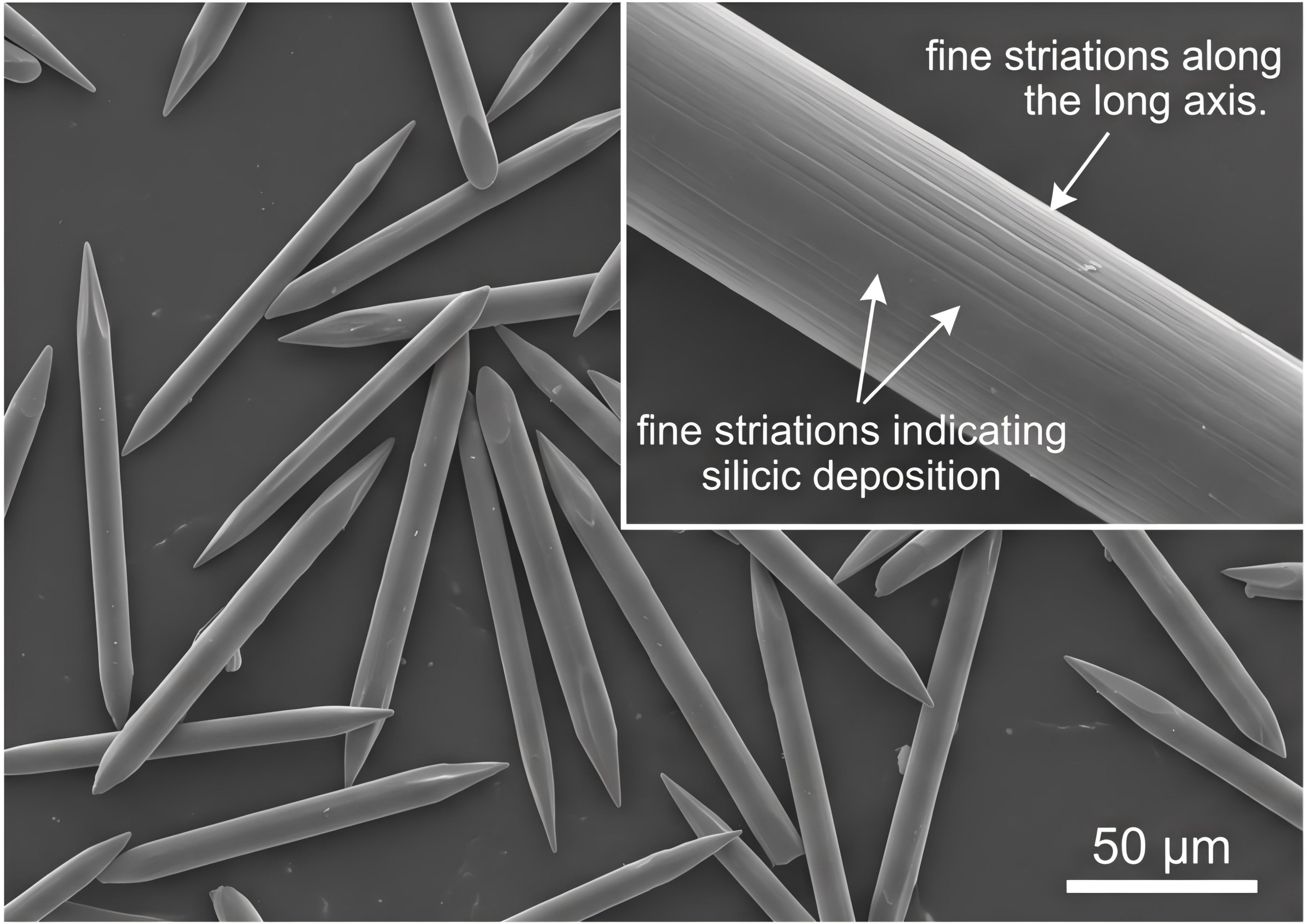
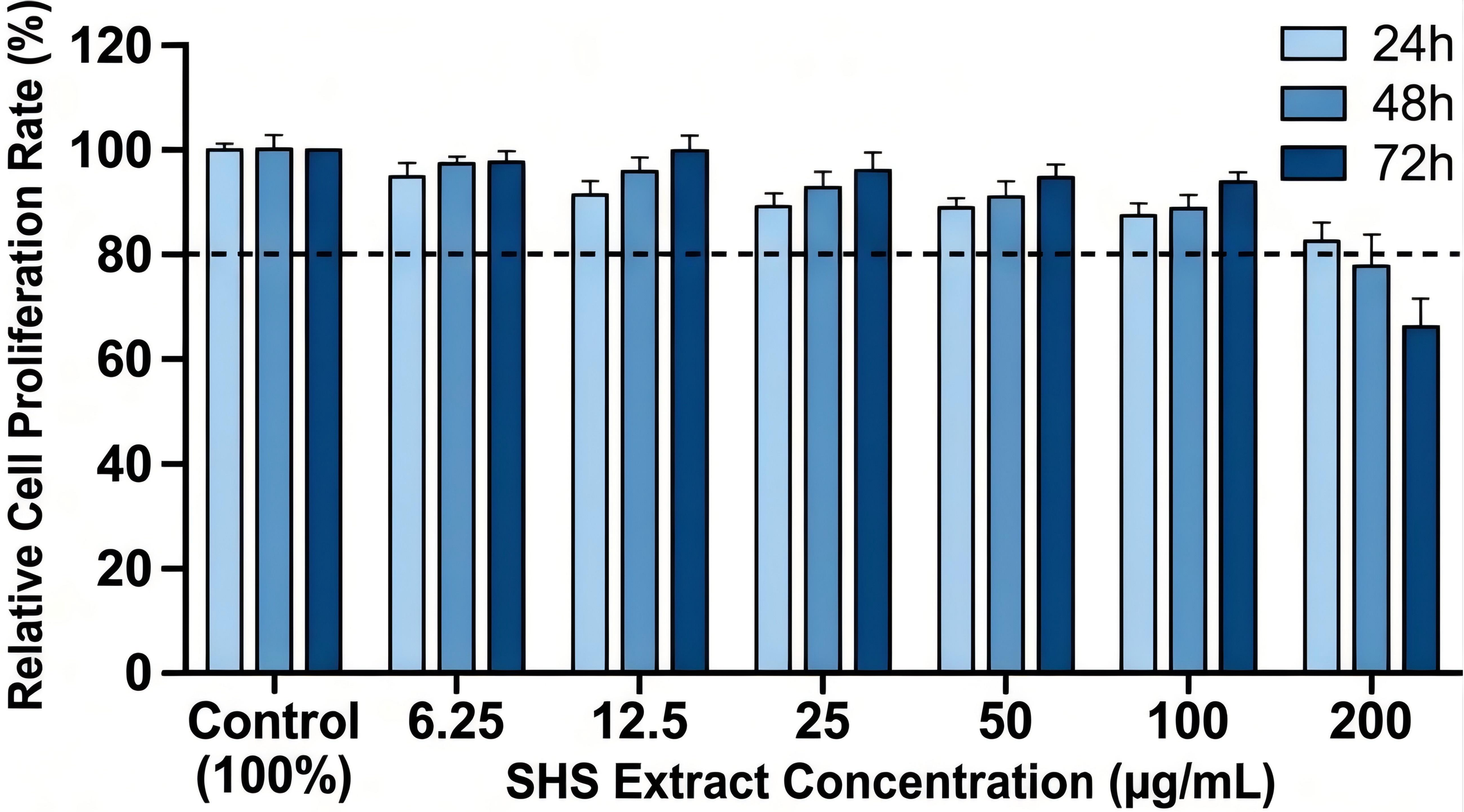
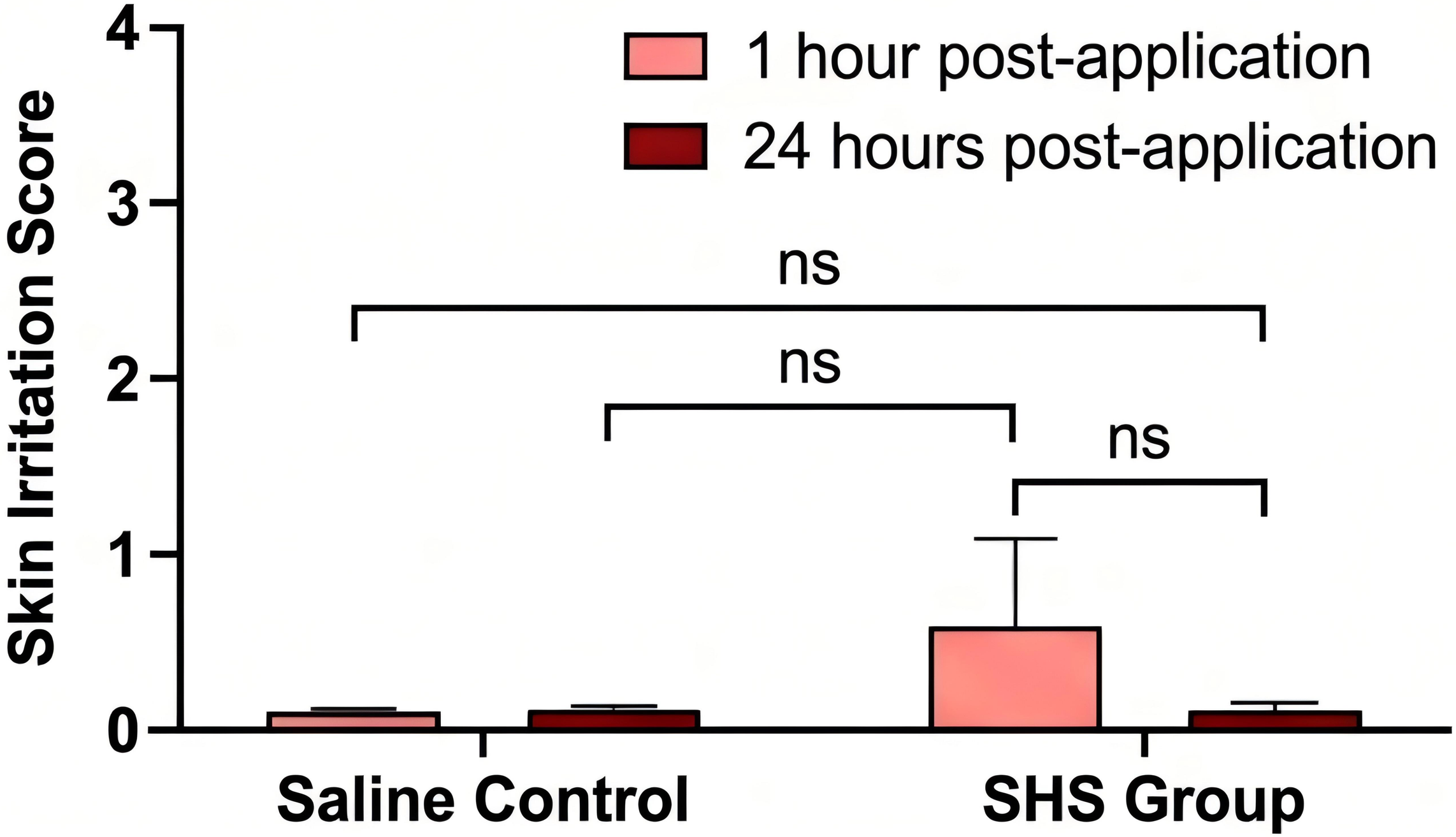
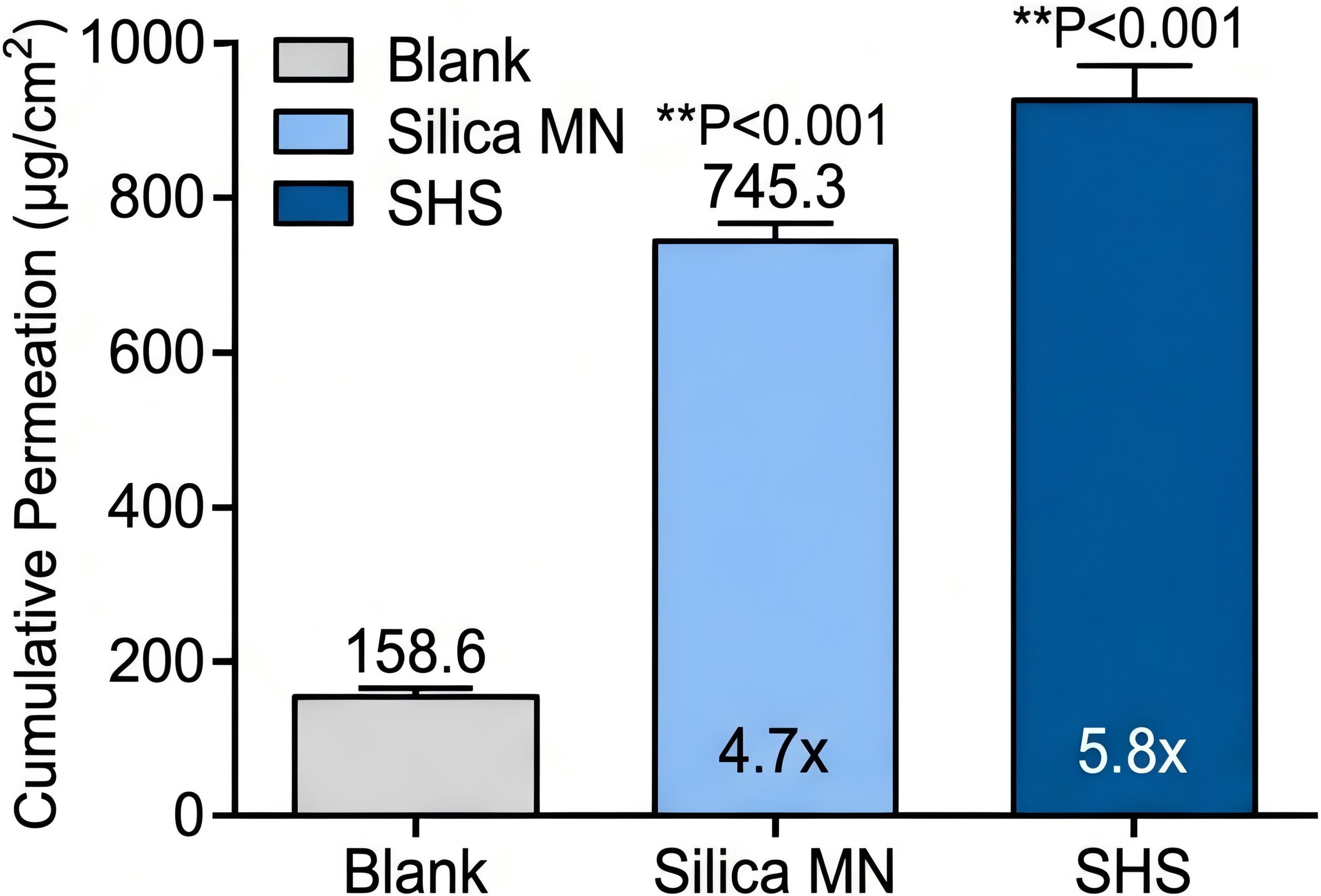

fine striations along
the long axis.
fine striations indicating
silicic deposition
50 µm

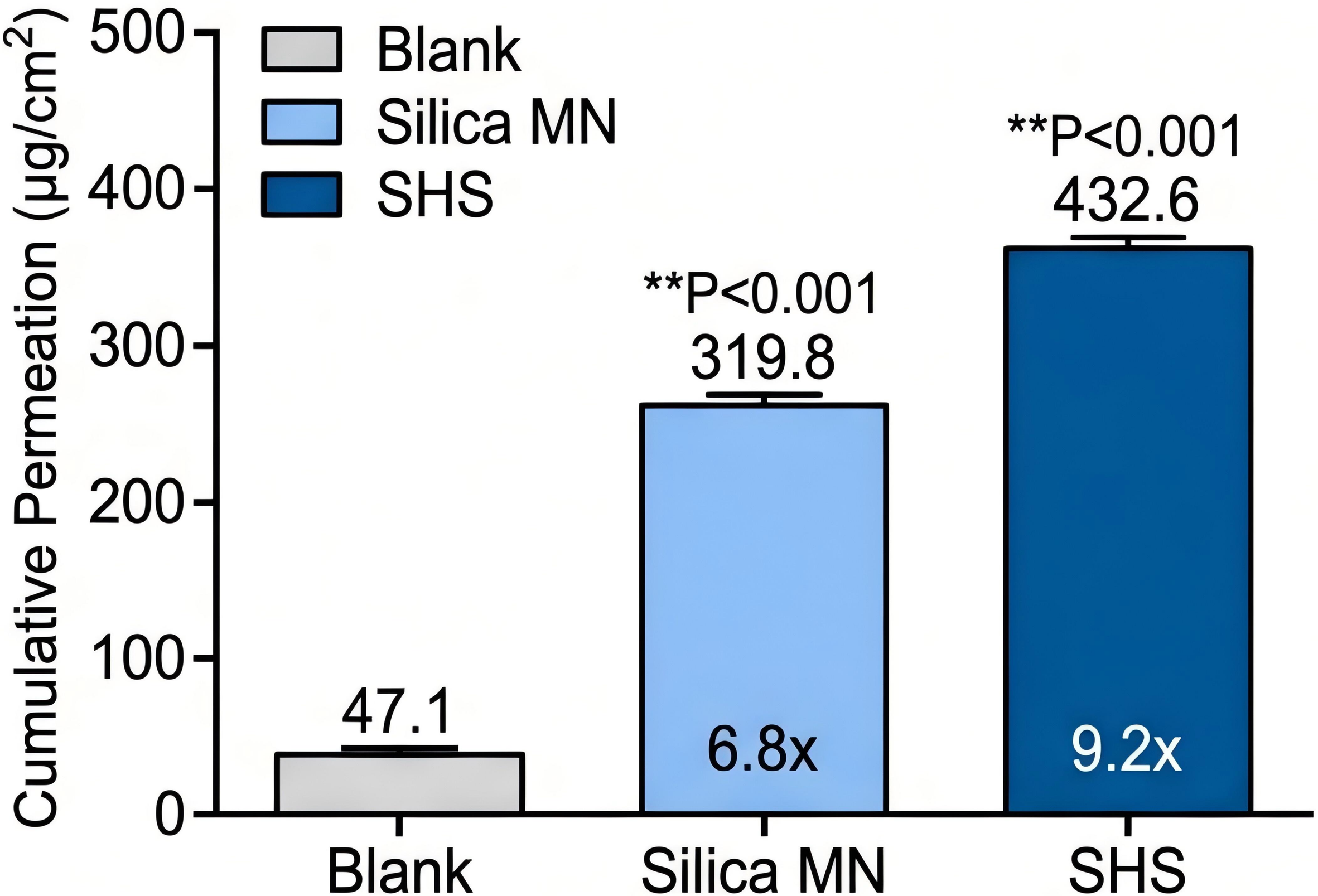

Relative Cell Proliferation Rate (%)
120
100
80
60
40
20
0
24h
48h
72h
Control (100%)
6.25
12.5
25
50
100
200
SHS Extract Concentration (μg/mL)


1 hour post-application
24 hours post-application
Skin Irritation Score
4
3
2
1
0
ns
ns
ns
Saline Control
SHS Group

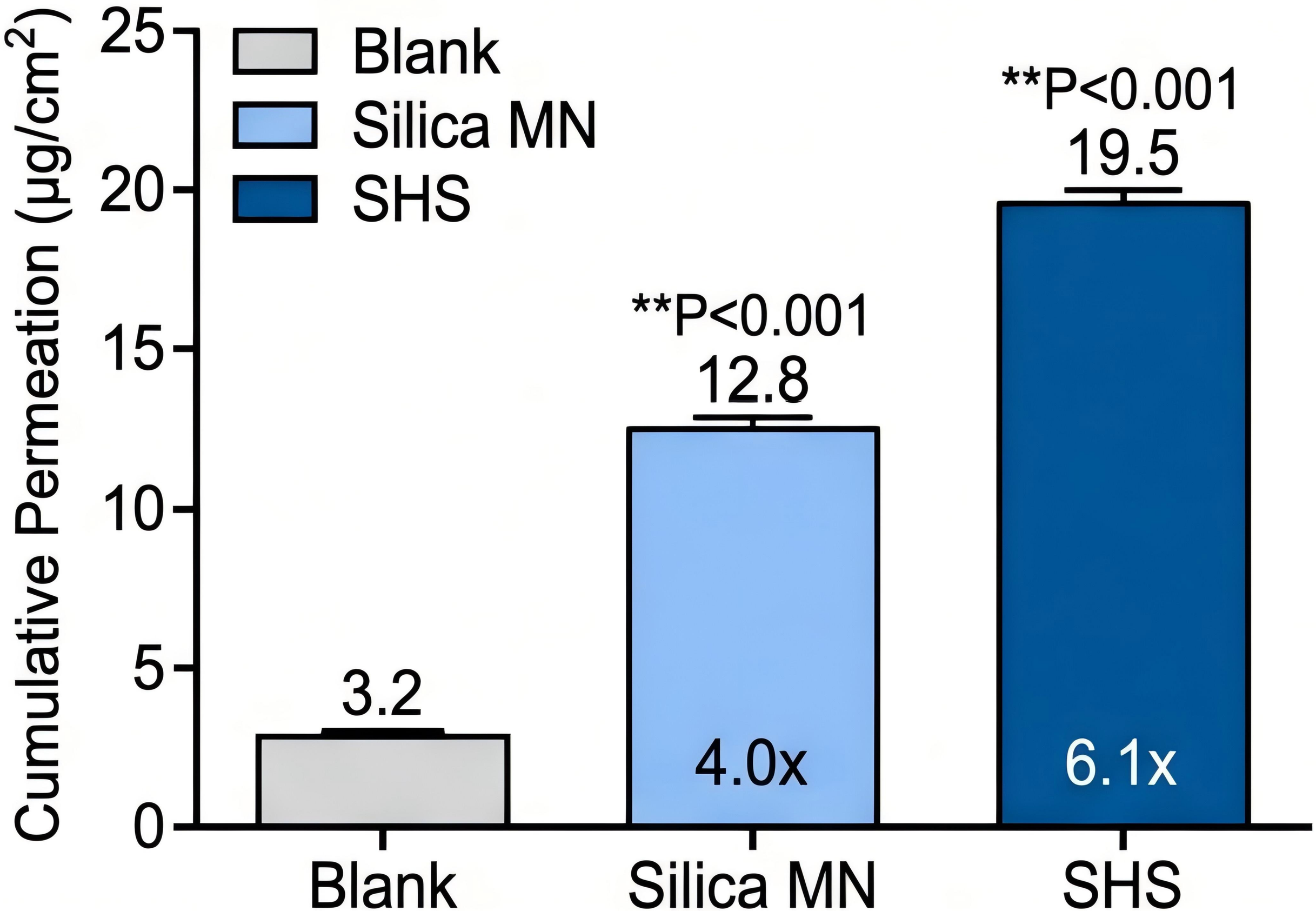
(A) Lidocaine hydrochloride



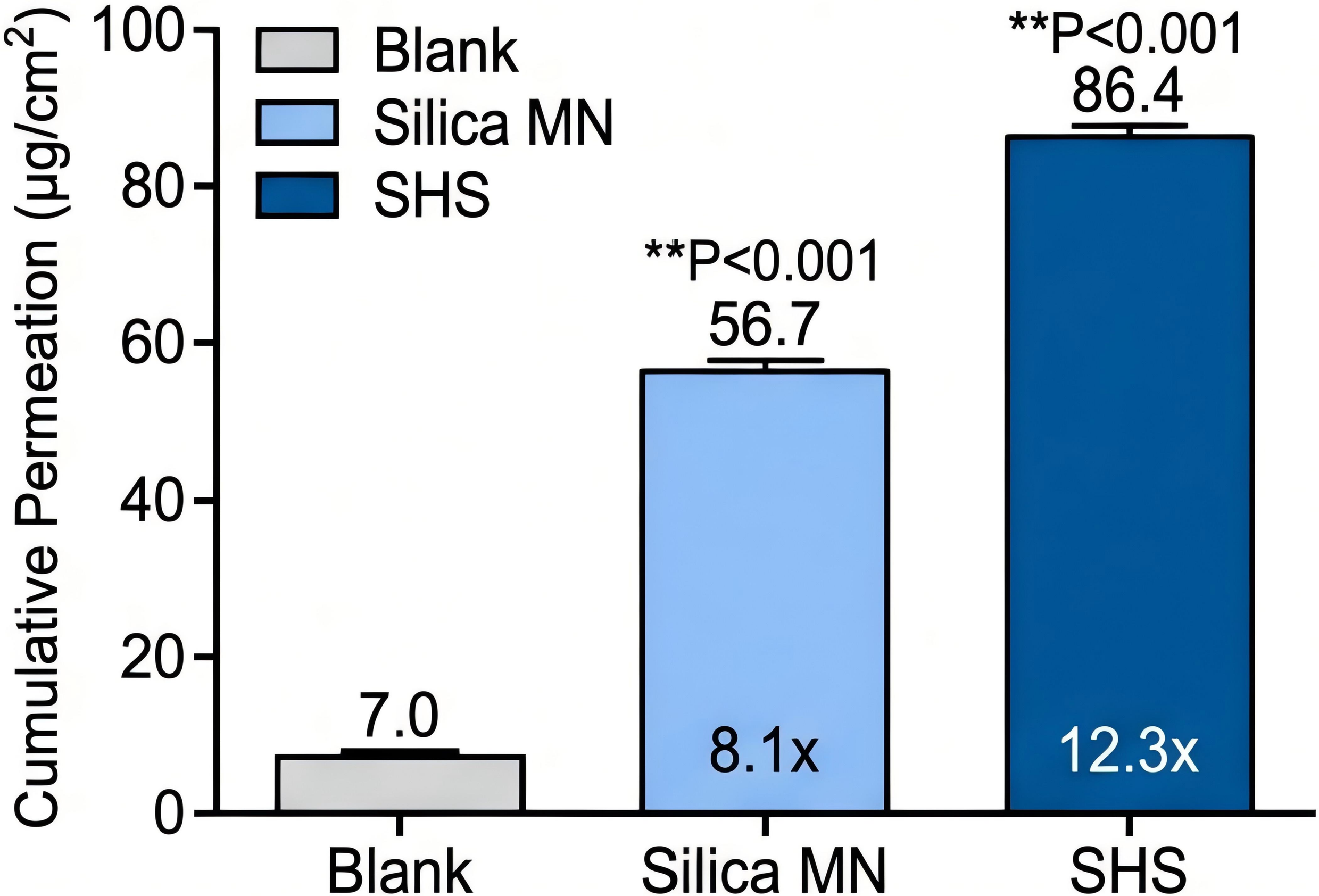
(B) Fluorescein sodium



(C) Bovine serum albumin

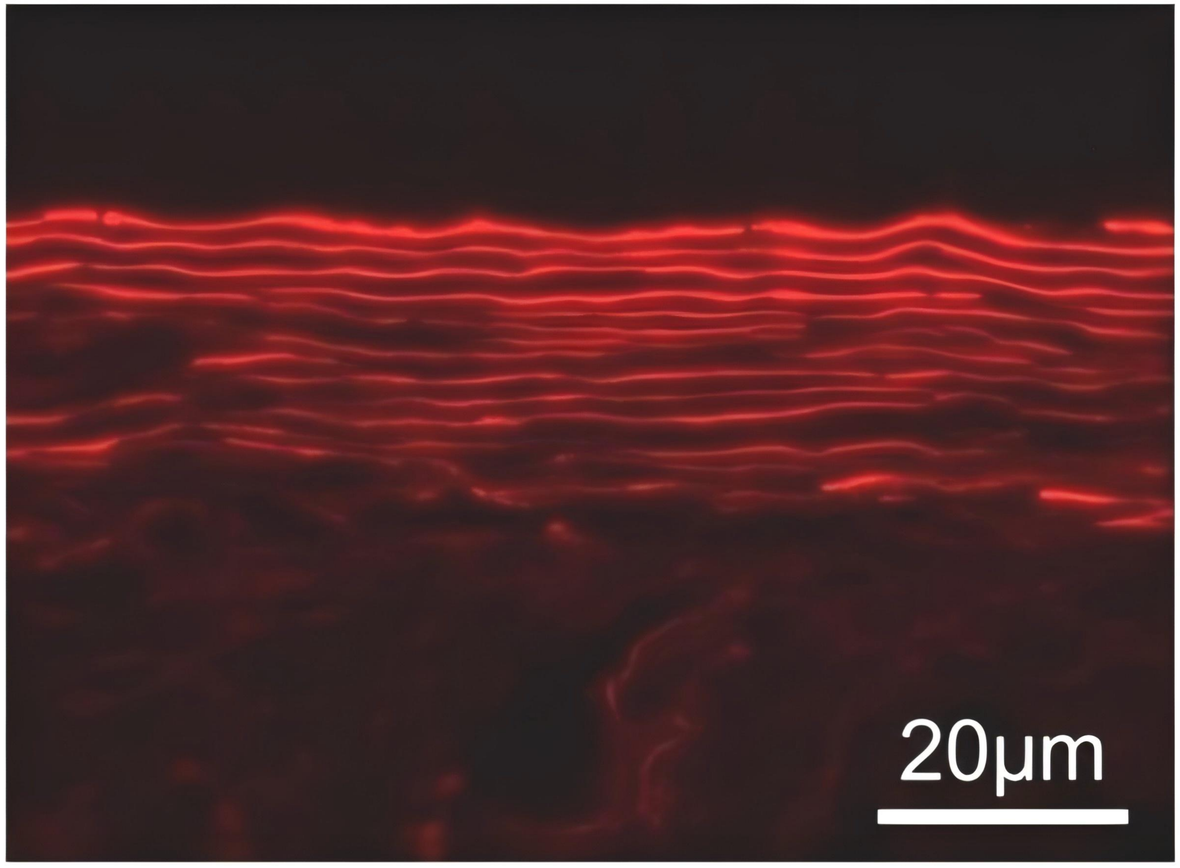


(D) Protoporphyrin IX

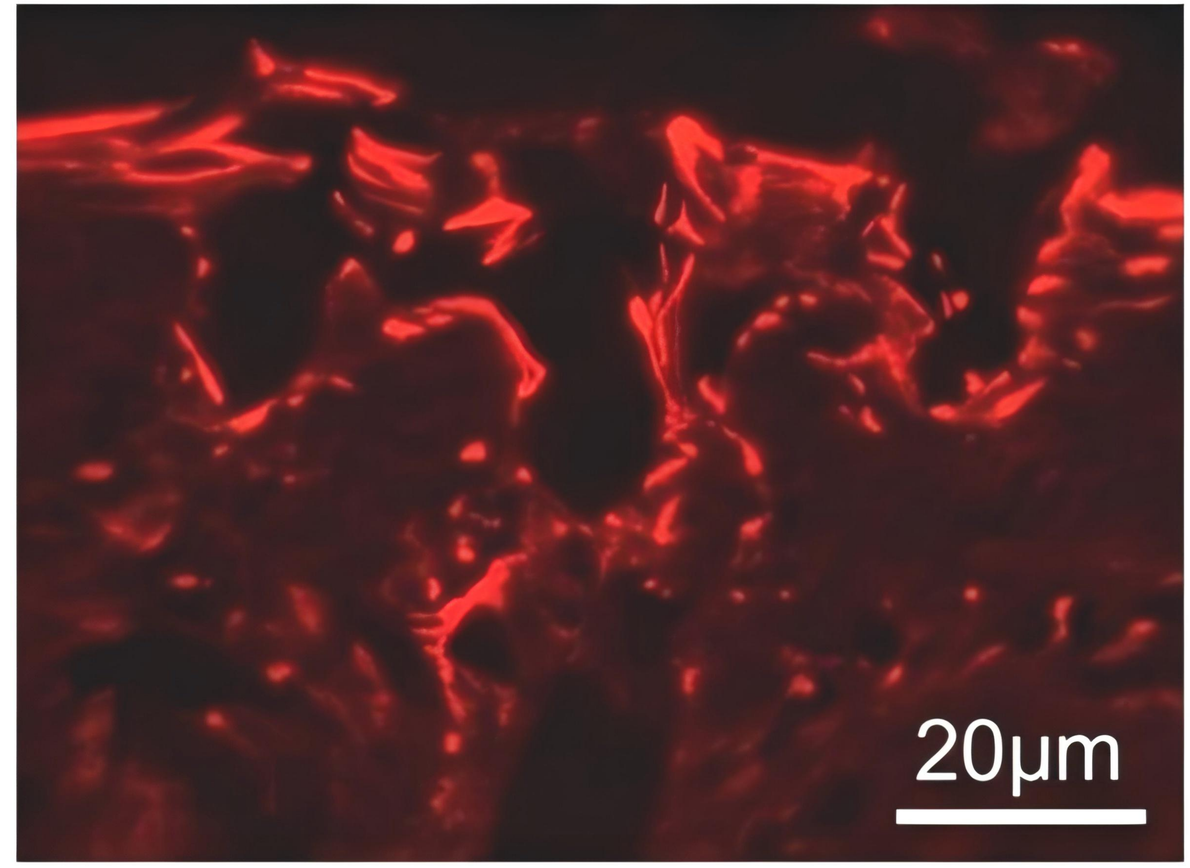


Normal Rat Skin
30 min SHS Treatment
Silica Microneedle
50μm
50μm
50μm

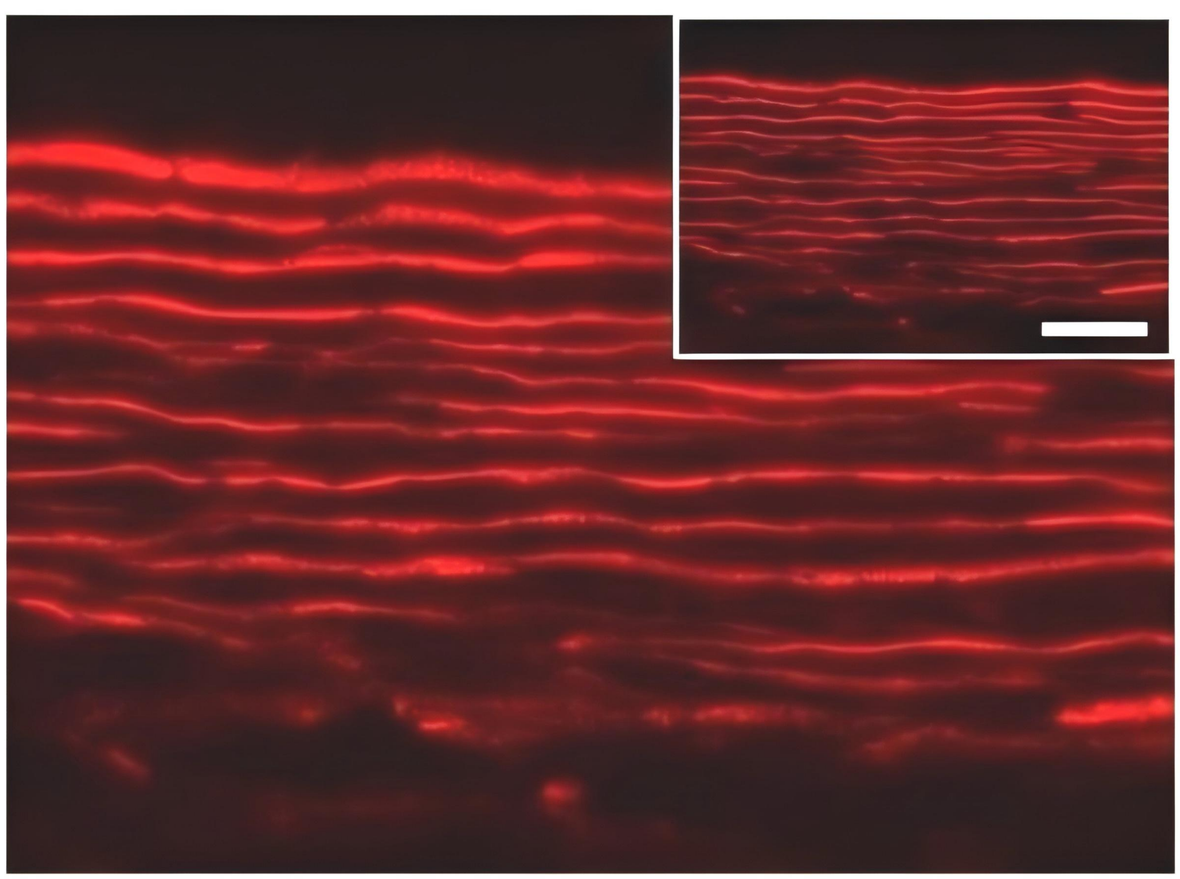
Control



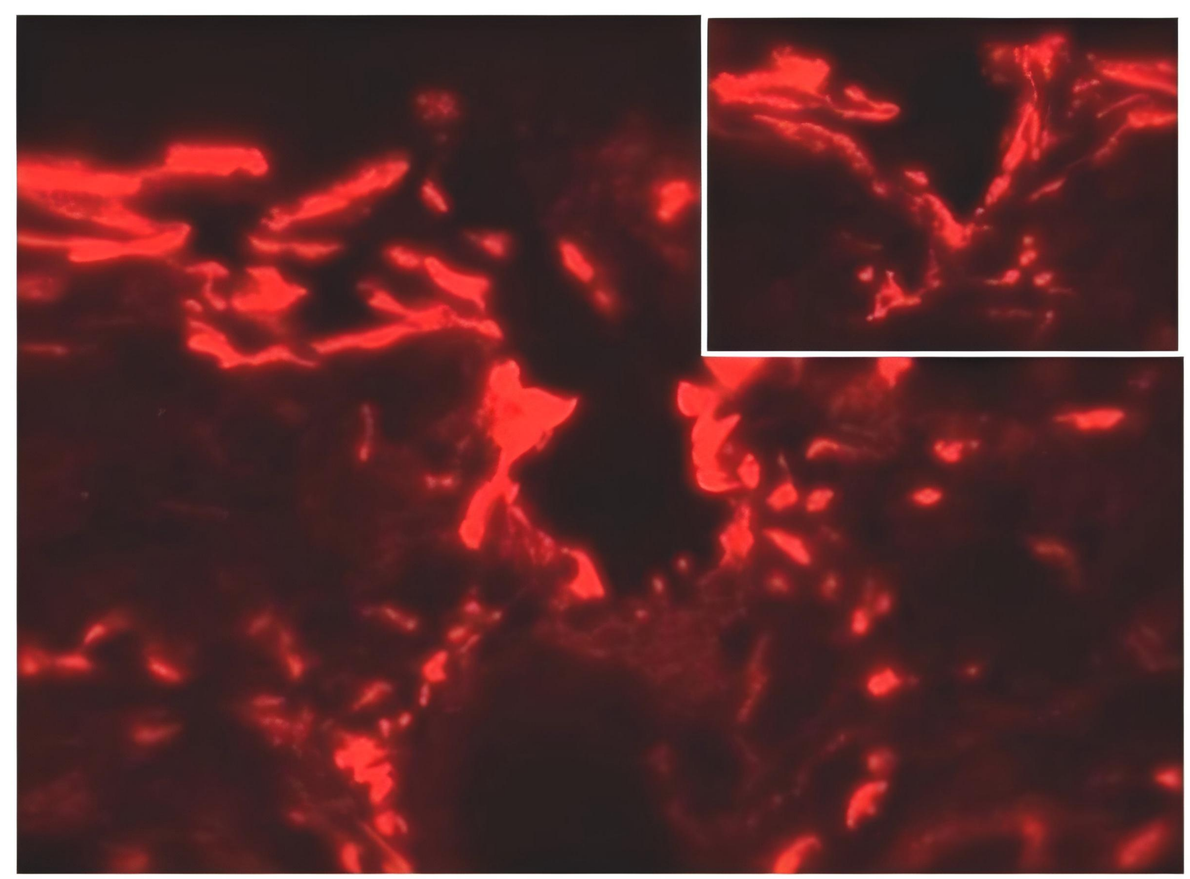
SHS treated

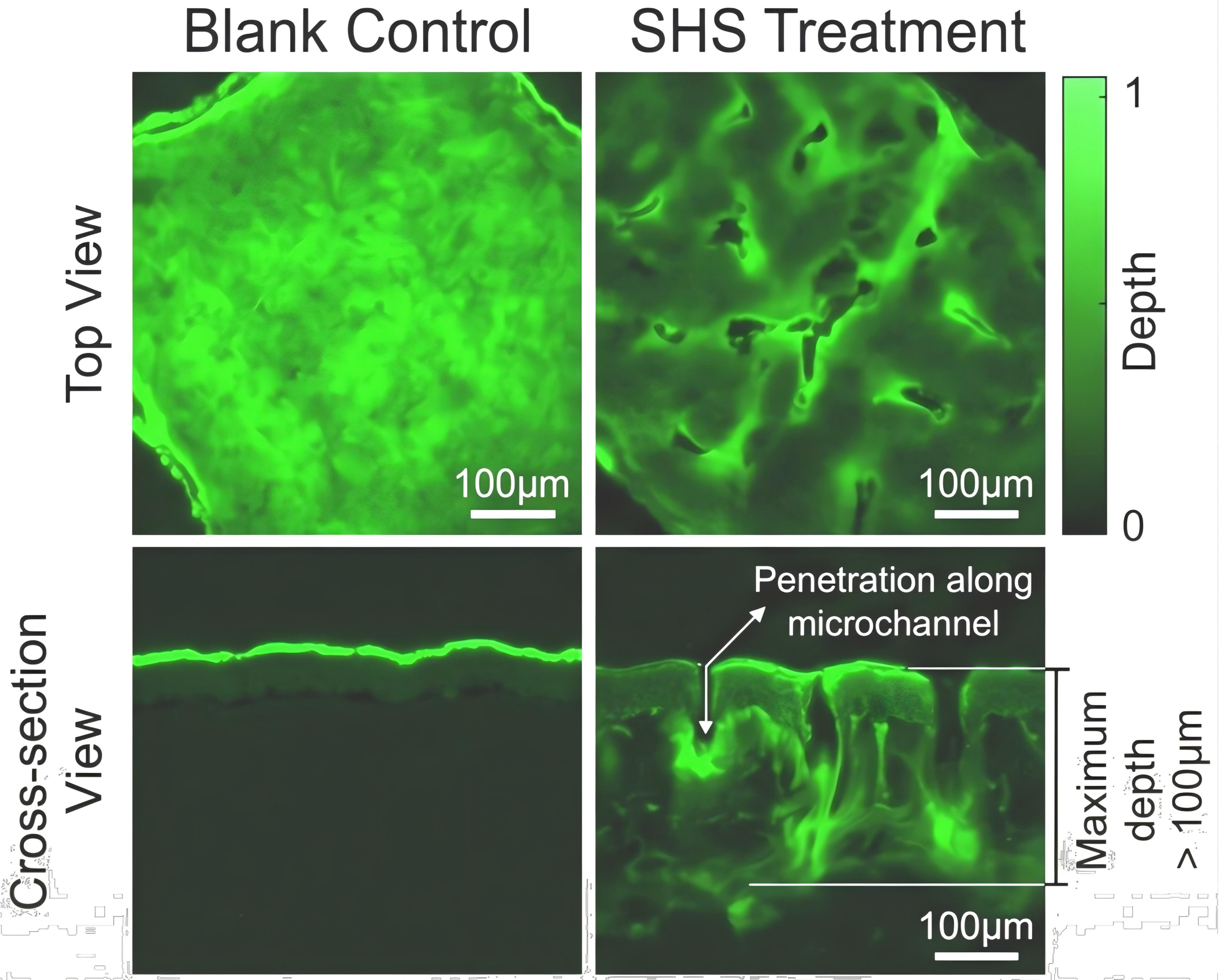


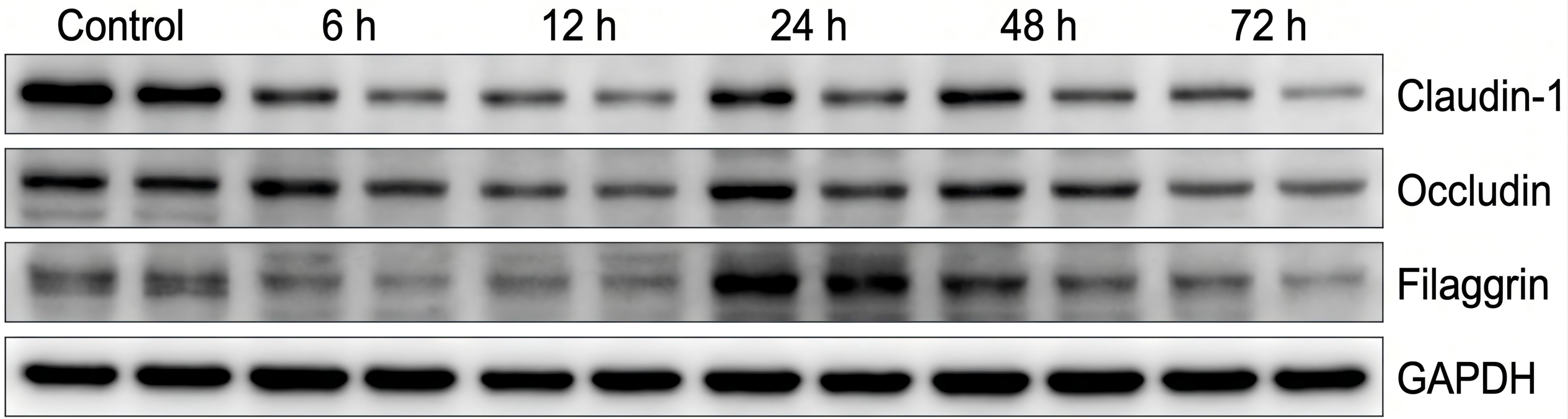
Zoomed-in Normal

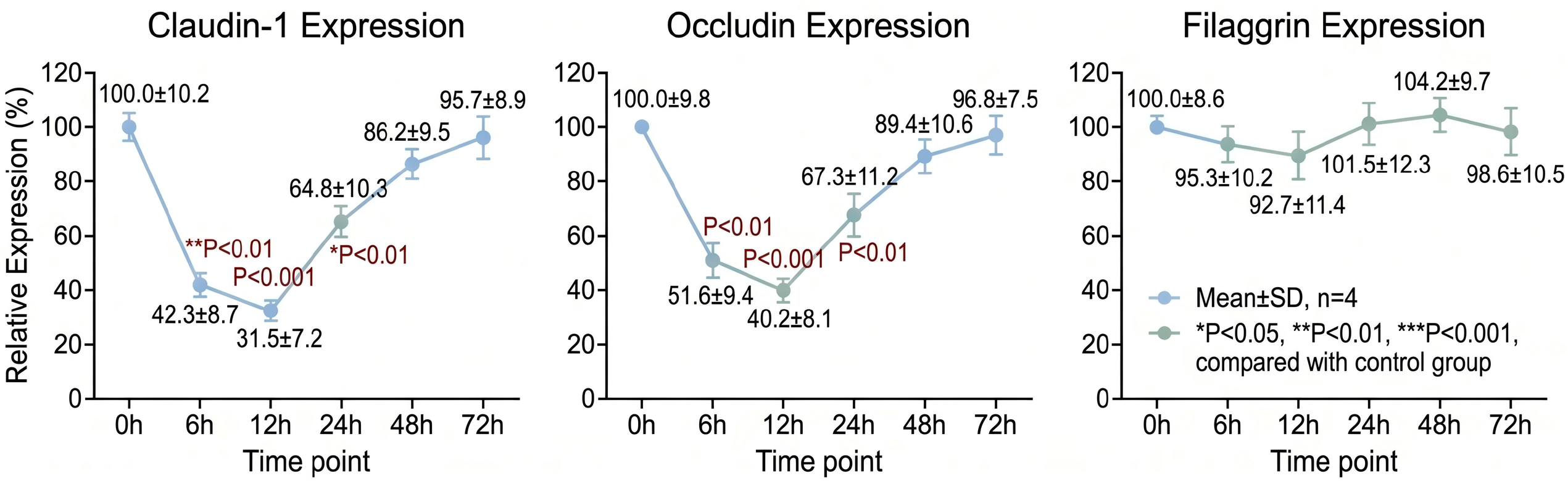


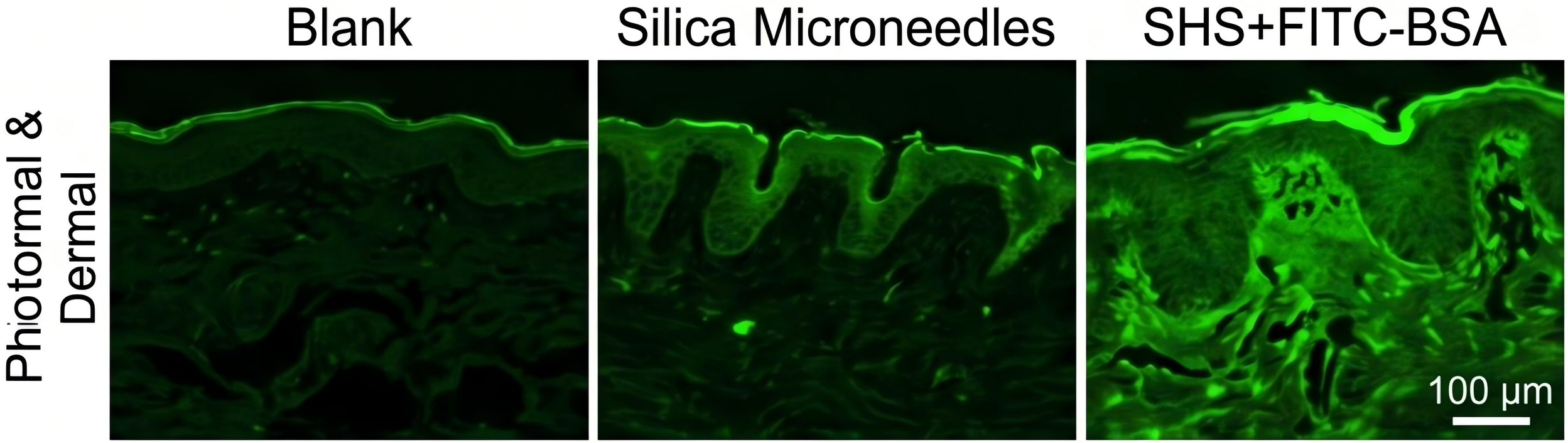
Zoomed-in SHS



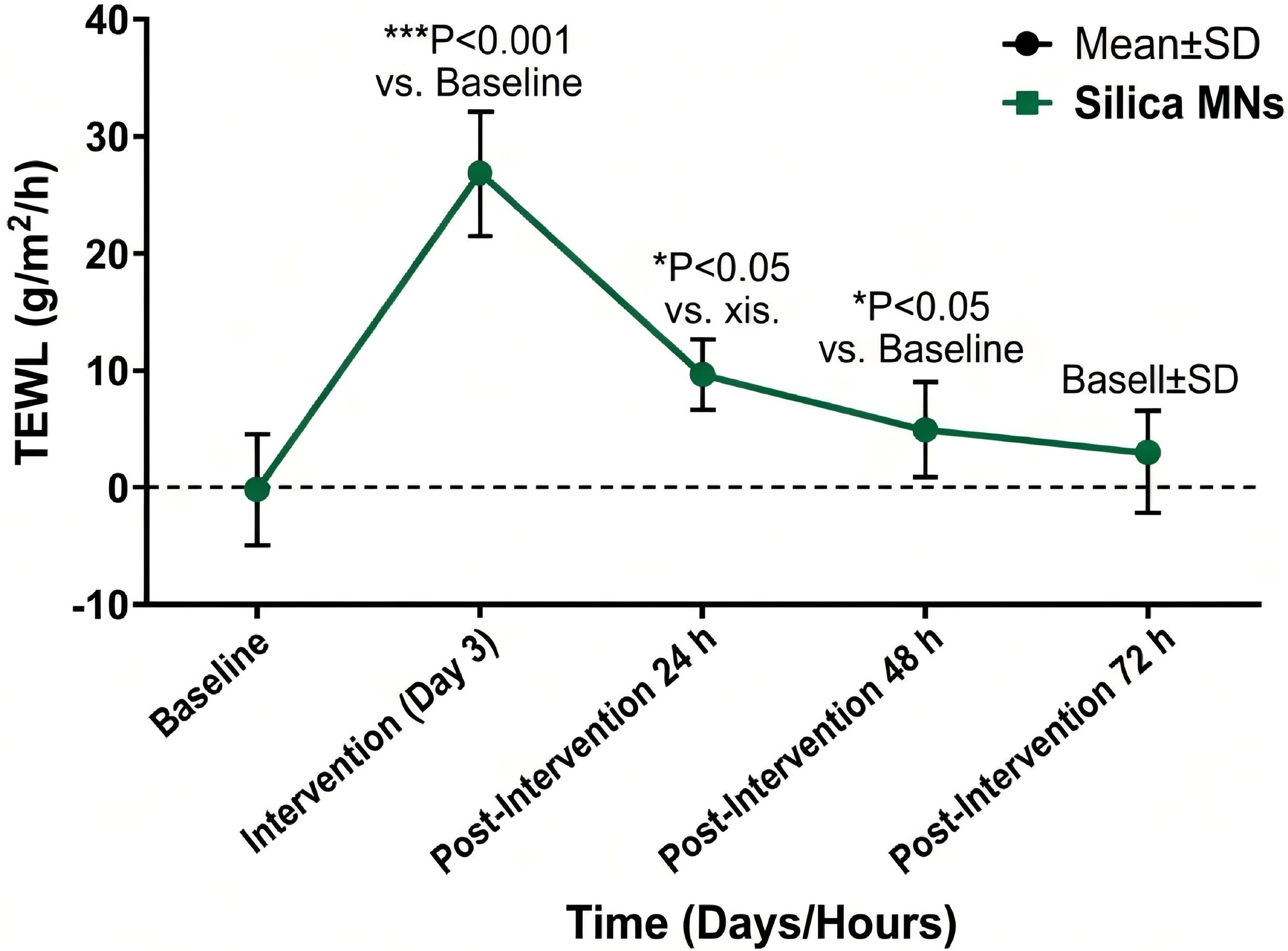

Blank Control
SHS Treatment
Top View
Cross-section View
100μm
100μm
100μm
Penetration along microchannel
Maximum depth > 100μm
Depth
1
0


Control
6 h
12 h
24 h
48 h
72 h
Claudin-1
Occludin
Filaggrin
GAPDH


Claudin-1 Expression
Relative Expression (%)
120
100
80
60
40
20
0
100.0±10.2
42.3±8.7
31.5±7.2
64.8±10.3
86.2±9.5
95.7±8.9
**P<0.01
P<0.001
*P<0.01
0h
6h
12h
24h
48h
72h
Time point
Occludin Expression
100.0±9.8
51.6±9.4
40.2±8.1
67.3±11.2
89.4±10.6
96.8±7.5
P<0.01
P<0.001
P<0.01
Time point
Filaggrin Expression
100.0±8.6
95.3±10.2
92.7±11.4
101.5±12.3
104.2±9.7
98.6±10.5
Mean±SD, n=4
*P<0.05, **P<0.01, ***P<0.001,
compared with control group
Time point



Fluorescence Integral Optical Density (IOD) Quantification


***P<0.001
vs. Baseline
Mean±SD
Silica MNs
*P<0.05
vs. xis.
*P<0.05
vs. Baseline
Basell±SD
TEWL (g/m2/h)
40
30
20
10
0
-10
Baseline
Intervention (Day 3)
Post-Intervention 24 h
Post-Intervention 48 h
Post-Intervention 72 h
Time (Days/Hours)