

Designed for
Perfection

EPN

Electroporation Needle System



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1. What is EPN?

EPN : Electroporation Needle system

EPN is the new generation of emerging technology with combining automatic needling (Auto Microneedle Therapy System, Auto MTS) and electroporation to effectively deliver a drug. EPN permits (by Auto MTS and electroporation) to effectively deliver a drug into different tissue depths within face or scalp.

By needling on the underlying skin tissue in shorter treatment times, it achieves more effective drug delivery through electrostimulating micro-pores that provides less discomfort to the patient.

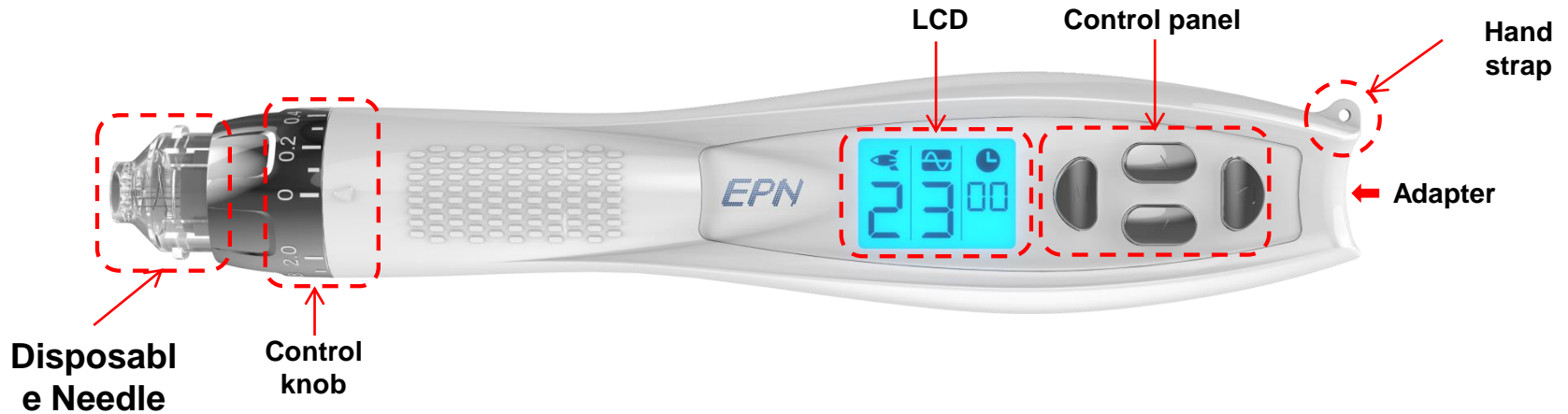
❖ Clinical Indication

- Hair regeneration
- Improving Surface scar & Deep scar
- Skin brightening
- Skin firming
- Pore contraction
- Improving wrinkle



1. What is EPN?

Device Description

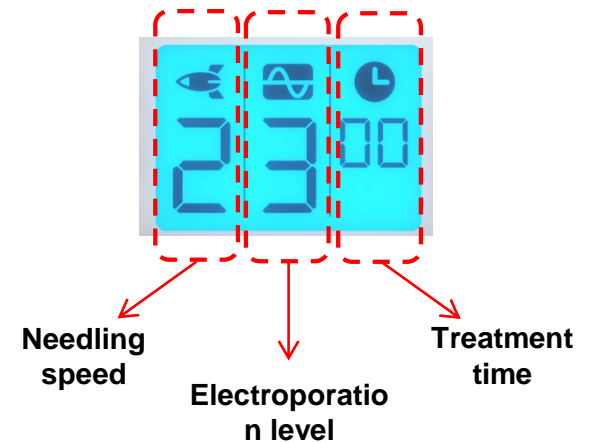


Disposable needle



- Disposable sterilized needle
- 33 gauge 9 pin
- Electrode needle
- Adjustable control of multiple needle penetration depths, up to 2.0 mm
- Separately packaging – 24PCS/Box

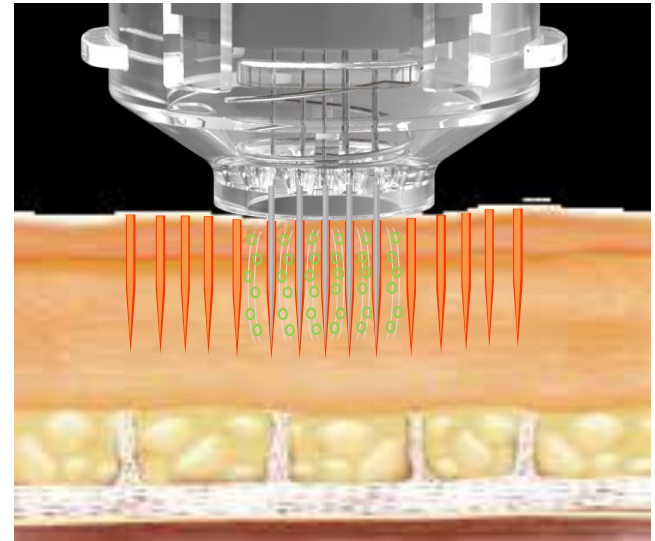
LCD display



2. EPN Principle

2.1. Automatic needling (Auto MTS)

- ❖ Induces an effective drug delivery stimulating tissue by micro-needling and drug to permeate into the tissue
- ❖ Induces a drug with the high molecular weight to permeate into the dermal layer
- ❖ Induces skin tissue on scar tissue to regenerate throughout micro-pores

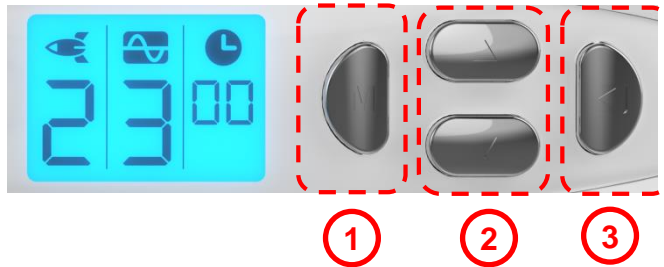


2.2. Microneedle electroporation

- ❖ Can be activated by microneedles penetrated into the dermal layer
- ❖ Makes micro-pores instantly on dermal fibroblast membranes
- ❖ Induces a drug with the high molecular weight to permeate into the fibroblasts

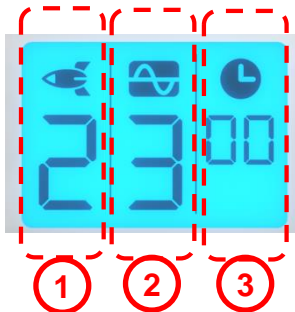
3. Mechanism of Action

Control panel



No	Description
1	Mode select button
2	Level decrease / increase button
3	Start / Stop

LCD



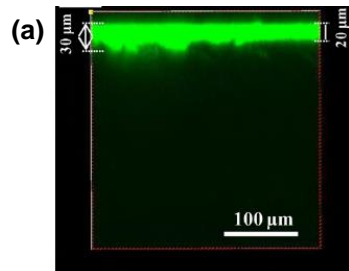
No	Description
1	Needling speed display
2	Electroporation level display
3	Treatment time display

4. Device Feature & Technology

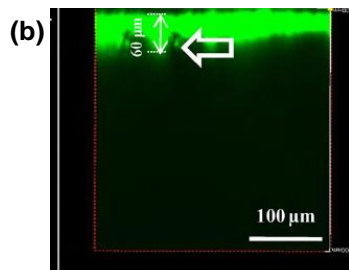
Microneedle + electroporation

❖ Synergy effects of drug penetration

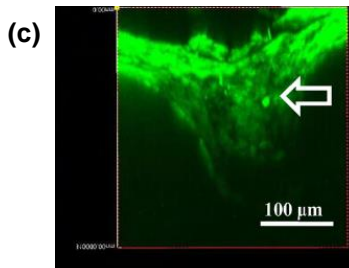
Result



(a) Intact skin – penetration depth 30 μm



(b) Microneedle only – penetration depth 60 μm

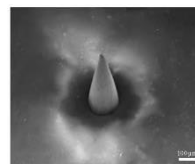


(c) IN-SKIN EP (200 V, 10 ms, 10 pulses)

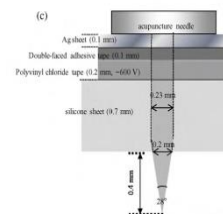
Materials and methods

- Animal: Male hairless rats (Abdomen)
- Chemical: FD-4 (Fluorescein isothiocyanate (FITC)-dextran. Molecular weight 4.3 kDa)
- Observation: Fluorescence confocal laser scanning
- Electroporation: 200V / 10ms / 10 pulse
- Microneedle

IN-SKIN EP



- Microneedle penetration depth: 0.4 mm



Reference

Yan K, Todo H, Sugibayashi K. Transdermal drug delivery by in-skin electroporation using a microneedle array. Int J Pharm. 2010 Sep 15;397(1-2):77-83.

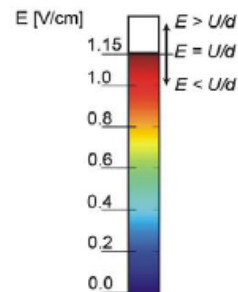
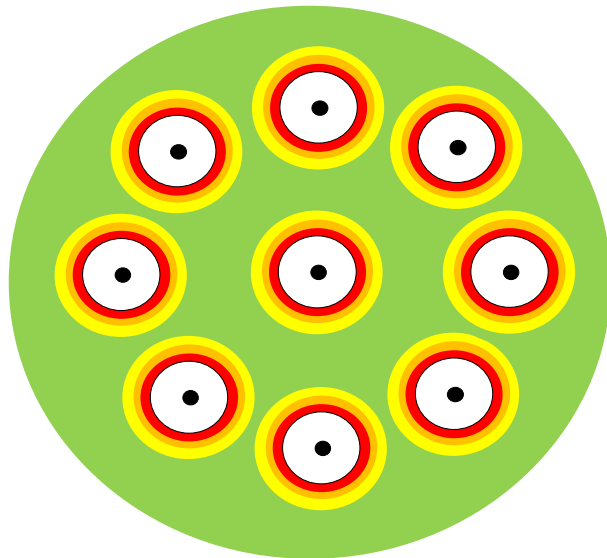
※ Microneedle with electroporation can effectively deliver high molecular and hydrophilic drugs.

4. Device Feature & Technology

Electroporation

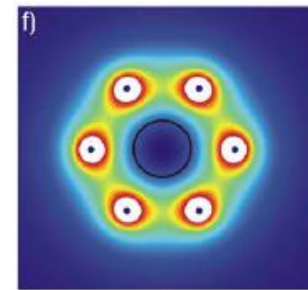
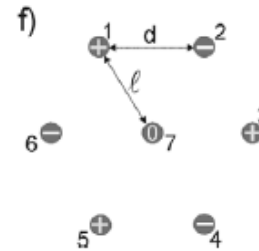
- ❖ Nine needle electrodes placed in a circle
 - 8 electrodes circular placement + single electrode central placement
- ❖ (+), (-) Cross-placement

Electric field of
EPN electrodes configuration



Reference

Corović S, Pavlin M, Miklavcic D. Analytical and numerical quantification and comparison of the local electric field in the tissue for different electrode configurations. Biomed Eng Online. 2007 Oct 15;6:37.



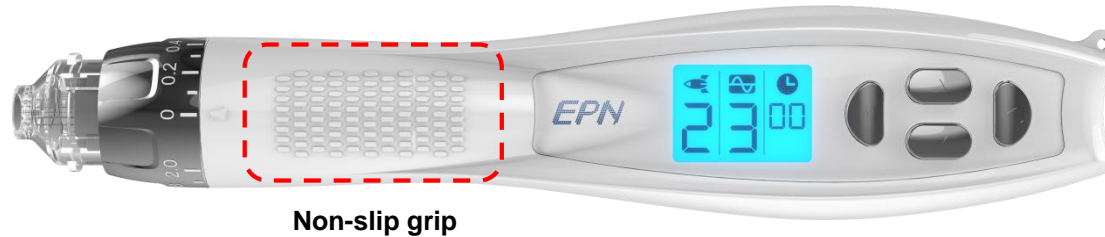
(+), (-) Cross-placement
→ Constant electric field

※ EPN provide constant electric field to all the tissue between the electrodes.

4. Device Feature & Technology

Ergonomic design

- ❖ A non-slip grip
- ❖ Operator-friendly handle as a pen type, enabling fatigue-free procedures



- ❖ Direct access to mount and dismount



Needle connection



Needle depth control

5. Clinical report

- ❖ Patient: Androgenetic alopecia patient
- ❖ Treatment region: Scalp
- ❖ Treatment cycle: 1 time per week

◆ Patient 1: Early 30s, male



Before



3rd treatment



9th treatment



12th treatment

◆ Patient 2: Mid 30s, male



Before



4th treatment

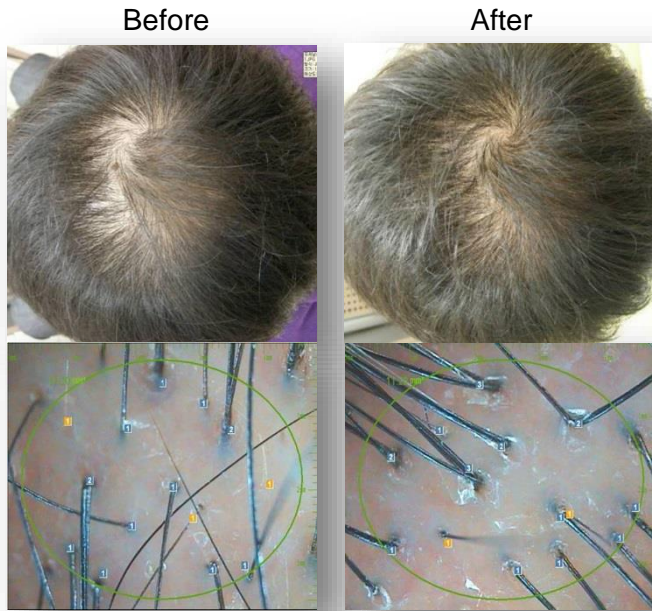


10th treatment

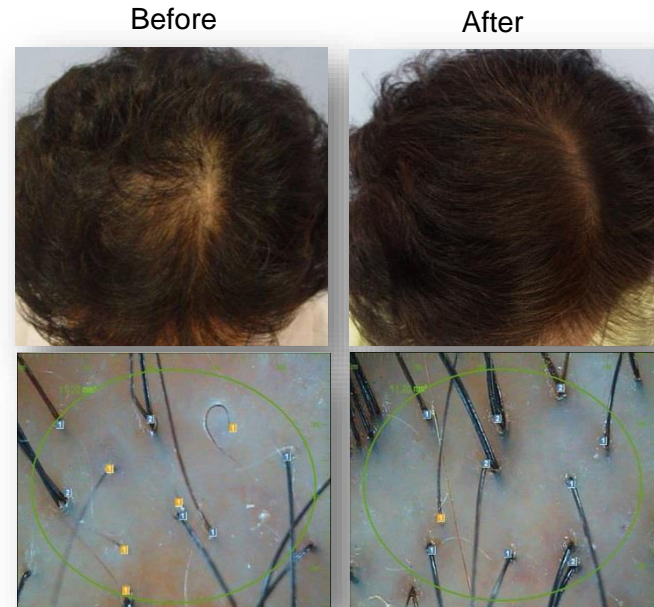
5. Clinical report

- ❖ Patient: alopecia patient
- ❖ Treatment region: Scalp (crown of the head)
- ❖ Treatment cycle: 1 time per week

◆ Patient 3: 40s, male



◆ Patient 4: 40s, female



5. Clinical report

- ❖ Patient: alopecia patient
- ❖ Treatment region: Scalp (crown of the head)
- ❖ Treatment cycle: 1 time per week

◆ Patient 5: 40s, male

Before



After



◆ Patient 6: 20s, male

Before



After



EPN (Electroporation Needle System)

[자료: 2017, EunSung Global Lab.]



[Before]



[After]

Sex / Age	Treatment
M / The latter of 50's	2 months later
	10 session

EPN (Electroporation Needle System)

[자료: 2017, EunSung Global Lab.]



[Before]



[After]

Sex / Age	Treatment
M / 33	4 months later
	10 session

EPN (Electroporation Needle System)

[자료: 2017, EunSung Global Lab.]



[Before]



[After]

Sex / Age	Treatment
M / 36	6 months later
	21 session

EPN (Electroporation Needle System)

[자료: 2017, EunSung Global Lab.]



[Before]



[After]

Sex / Age	Treatment
M / 34	2 session

5. Clinical report

- ❖ Treatment region: Face
- ❖ Treatment cycle: 1 time per week

◆ Patient 7: Early 20s, male

- Acne scar

Before

After



◆ Patient 8: 40s, female

- Nasolabial line

Before

After



Thank you

FOR FURTHER INFORMATION, PLEASE CONTACT US AT
info@prpmed.de