

# **Copper Tripeptide**

GHK<sub>2</sub>-Cu/GHK-Cu

**SpecPed® GCu21P &**

*Bis(Tripeptide-1) Copper Acetate*

**SpecPed® GCu11P**

*Copper Tripeptide-1*

· Anti-wrinkle · Skin & Hair repairing · Anti-aging · Wound healing

Wound-healing, Skin-Repairing, Signaling & Carrier Peptides  
Facilitator to transport important trace elements (Cu & Mg)  
Skin Remodeling Factor to rejuvenate young appearance  
The old cells started behaving like younger cells

## The features of Spec Chem's Copper Tripeptide

- ✓ Comply with Cosmetic Regulations, VEGAN certificated 
- ✓ List in the Inventory of Existing Cosmetic Ingredients in China 2021
  - Copper tripeptide-1 is listed (max:8.0% in leave-on) while Bis(Tripeptide-1) Copper Acetate is not
  - Comply with EU regulation-Cosmetics Regulation (EC) No 1223/2009, both listed in CosIng
  - Repair and remodel skin, remodeling is very active in young skin but declining rapidly as age over 20
- ✓ Remove oversized proteins and older cells and helps further removing scars, lesions and wrinkles, smoothening skin.
- ✓ Rejuvenate skin and endow a biologically younger appearance
- ✓ Clinical approved, suitable for anti-wrinkle & anti-aging & skin repairing application
- ✓ Water-soluble, easy to use



## Action Mechanism of Copper Tripeptide

Table 1. Cosmeceutical Peptides

Type	In Vitro Action	Expected In Vivo Clinical Benefit
Signal peptides	Triggers wound-healing mechanisms that activate fibroblasts in response to fragmented chains of elastin, collagen	Increased collagen production to improve skin appearance
Carrier peptides	To deliver copper into skin, resulting in activation of enzymatic wound-healing pathways	Enhanced collagen production, resulting in smoother skin
Neurotransmitter-inhibiting peptides	Interferes with stabilization step in neurotransmitter release	Decreases muscle movement

Copper peptides (including SpecPed® GCu21P/ SpecPed® GCu11P) is the signal and carrier peptide.

Acetyl Hexapeptide-8 (SpecPed® AH8P) is the neurotransmitter-inhibiting peptide.

For anti-wrinkle application, suggest combine above Copper Peptide with Acetyl Hexapeptide-8 (SpecPed® AH8P) synergistically.

## SpecPed® GCu21P (Tripeptide:Cu=2:1, Powder)

### Product information

<b>Product Name</b>	SpecPed® GCu21P
<b>INCI name</b>	Bis(Tripeptide-1) Copper Acetate
<b>Sequence</b>	(Gly-His-Lys)2.Cu
<b>CAS No.</b>	130120-57-9
<b>Application</b>	Anti-wrinkle, anti-aging, skin & hair repairing, wound healing and etc.
<b>Dosage</b>	0.05-1.0%.
<b>Storage</b>	Cool and dry place, protect from light, 2-8 °C for common storage, -20 °C for long time storage.
<b>Shelf life</b>	2 years
<b>Package</b>	10g, 50g, 100g, or Customization

### Specification

<b>Appearance</b>	Blue powder
<b>ESI-MASS(GHK)</b>	340.4±1
<b>Purity (HPLC)</b>	≥95.0 %
<b>Water (K.F.)</b>	≤8.0 %
<b>Copper (Cu) content</b>	4-8%
<b>Acetic Acid(HPLC)</b>	≤15.0%

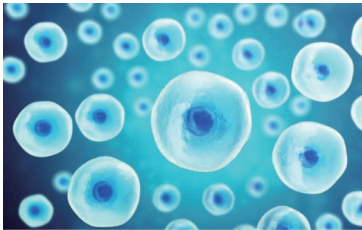


Acute Toxicity of Kerationocyte Cytotoxicity, in vitro

Commission Test by CALT-BIO

Table 1. The IC<sub>50</sub> and LD<sub>50</sub>

	Positive control(X±SD)	Sample(X±SD)
IC <sub>50</sub>	0.28±0.03mM	35.47±7.61mg/mL
LD <sub>50</sub>	678.16±258.48mg/kg	5206.53±2936.81mg/kg



Conclusion:

Under the conditions of this test, the IC<sub>50</sub> of sample-“SpecPed® GCu21P” is 35.47±7.61mg/mL, the estimated LD<sub>50</sub> is 5206.53±2936.81mg/kg.

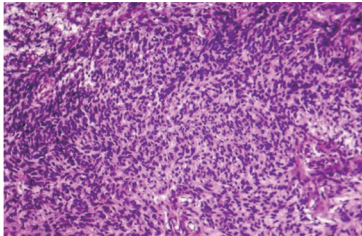
No toxicity or inhibition was found.

Original generation of fibroblasts cytotoxicity, in vitro

Commission Test by CALT-BIO

Table 2. The IC<sub>50</sub> and LD<sub>50</sub>

	Positive control(X±SD)	Sample(X±SD)
IC <sub>50</sub>	0.28±0.01mM	56.40±8.91mg/mL
LD <sub>50</sub>	689.08±159.58mg/kg	6186.94±3114.26mg/kg



Conclusion:

Under the conditions of this test, the IC<sub>50</sub> of sample “SpecPed® GCu21P” is 56.40±8.91mg/mL, the estimated LD<sub>50</sub> is 6186.94±3114.26mg/kg.

No toxicity or inhibition was found.

In-Vitro test

Cell Scratch Test (Wound-healing/Skin-repairing Ability)

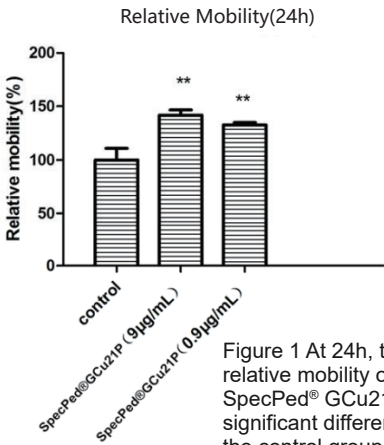


Figure 1 At 24h, the histogram of relative mobility of cell scratches in SpecPed® GCu21P (\*\* indicates a significant difference compared with the control group, P<0.01)

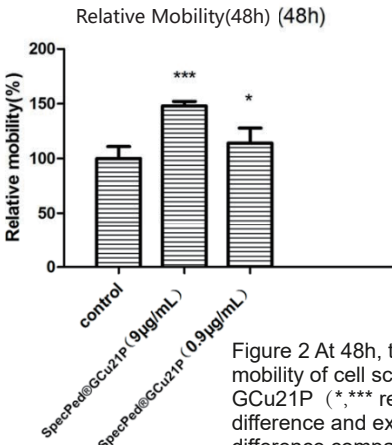
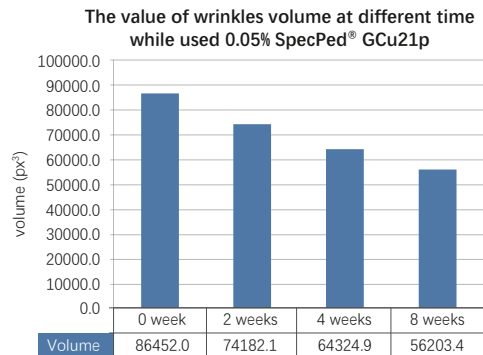


Figure 2 At 48h, the histogram of relative mobility of cell scratches in SpecPed® GCu21P (\*,\*\*\* respectively express a difference and extremely significant difference compared with control group, P<0.05 and 0.001, respectively)

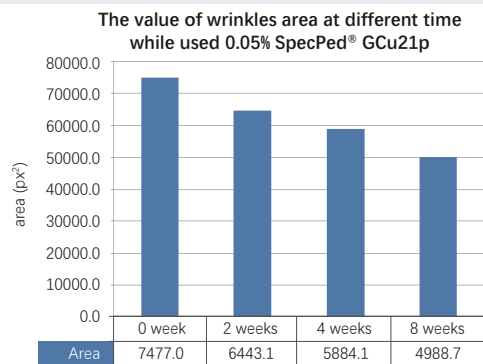
# Anti-wrinkle test

<b>Test product</b>	0.05% SpecPed® GCu21P and 0.2% SpecPed® GCu21P Anti-wrinkle Gel
<b>Device Model</b>	VisioFace 1000D
<b>Subjects</b>	0.05% SpecPed® GCu21P -16 females; 0.2% SpecPed® GCu21P-17 females
<b>Average age</b>	25-55 years old
<b>Test Site</b>	Face
<b>Test Period</b>	8 weeks
<b>Application Frequency</b>	Twice a day after cleaning face in the morning and evening
<b>Test Parameters</b>	Determination of skin wrinkle difference is expressed in volume, area; Volume: Used to indicate the size and depth of wrinkles; Area: Used to indicate width and length of wrinkles.

## 0.05% SpecPed® GCu21P

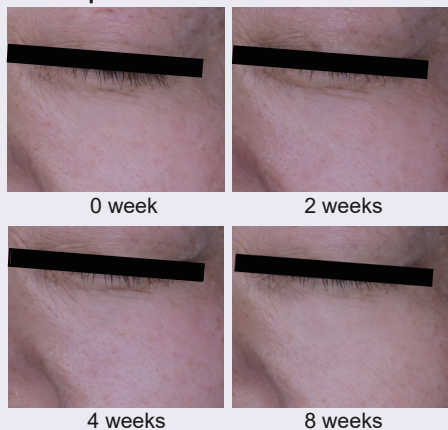


Comparing with the pre-treated skin, wrinkles volume reduced by 14.19% after 2 weeks, reduced by 25.59% after 4 weeks and reduced by 34.99% after 8 weeks under 0.05% SpecPed® GCu21P treatment.

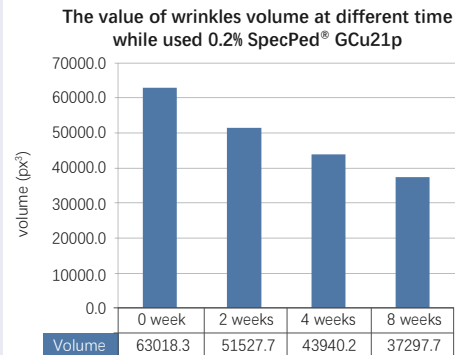


Comparing with the pre-treated, wrinkles area reduced by 13.83% after 2 weeks, reduced by 21.30% after 4 weeks and reduced by 33.28% after 8 weeks under 0.05% SpecPed® GCu21P treatment.

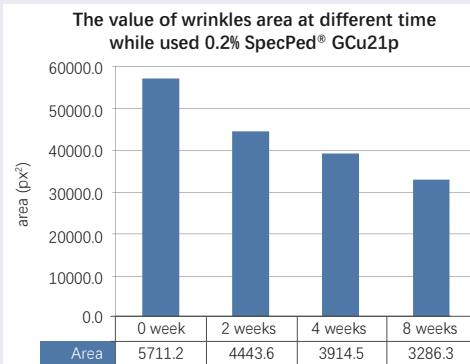
### 0.05% SpecPed® GCu21P Anti-wrinkle Gel subject



## 0.2% SpecPed® GCu21P



Comparing with the pre-treated skin, wrinkles volume reduced by 18.23% after 2 weeks; reduced by 30.27% after 4 weeks and reduced by 40.81% after 8 weeks under the treatment of 0.2% SpecPed® GCu21P.



Comparing with the pre-treated, wrinkles area reduced by 22.19% after 2 weeks, reduced by 31.46% after 4 weeks, reduced by 42.46% after 8 weeks under 0.2% SpecPed® GCu21P treatment.

### 0.2% SpecPed® GCu21P Anti-wrinkle Gel subject





# SpecPed® GCu11P (Tripeptide:Cu=1:1, Powder)

## Product information

Product Name	SpecPed® GCu11P
INCI name	Copper tripeptide-1
CAS No.	89030-95-5
Application	Anti-wrinkle, anti-aging, skin & hair repairing, wound healing and etc.
Dosage	0.05-1.0%.
Storage	Cool and dry place, protect from light, 2-8℃ for common storage, -20℃ for long time storage.
Shelf life	2 years
Package	1g, 5g or Customization

## Specification

Appearance	Blue powder
ESI-MASS(GHK)	340.37±1
Purity (HPLC)	≥95.0 %
Water (K.F.)	≤8.0 %
Copper (Cu) content	8-16%

## In-Vitro test

### Cell Scratch (repairing) of SpecPed® GCu11P on Fibroblasts

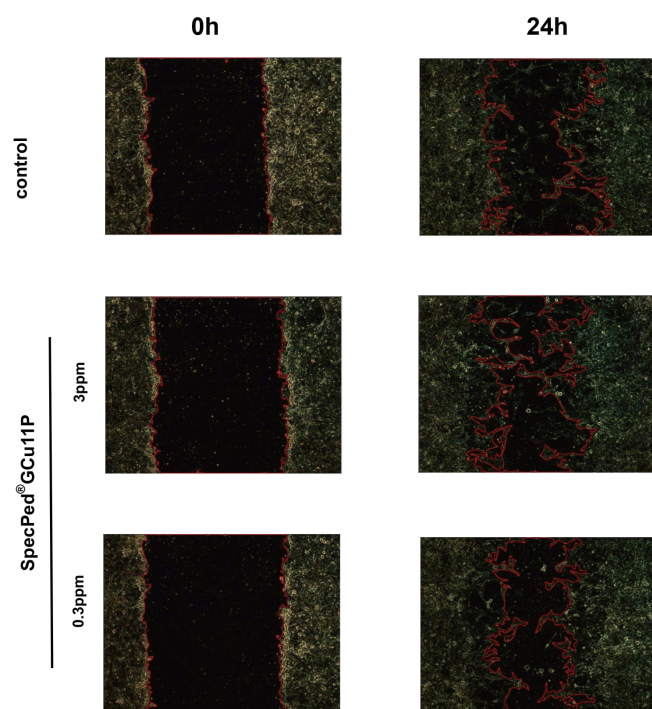


Fig. 1 The images of mobility of NIH/3T3 cells (The black areas are the cell scratches, the light yellow parts are cells, and the red lines are cell edges)

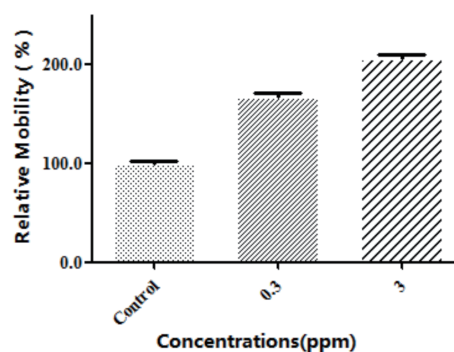


Fig. 2 Relative mobility of different concentrations of SpecPed® GCu11P

SpecPed® GCu11P at 3ppm and 0.3ppm increased cell mobility by 105% and 67%, respectively, compared with the control.

Therefore, SpecPed® GCu11P has a significant effect on the mobility of fibroblasts. It also shows a concentration-dependent trend.

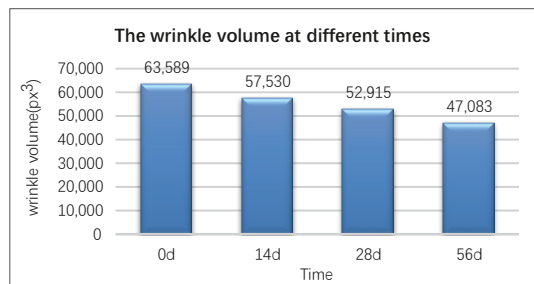
Thus SpecPed® GCu11P shows excellent skin repairing property as well.



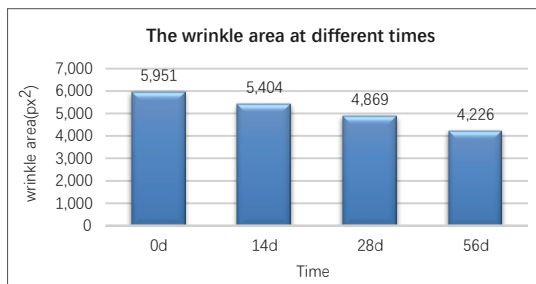
## Anti-wrinkle & Elasticity test

<b>Test product</b>	Anti-aging Gel containing 0.2% SpecPed® GCu11P
<b>Device Model</b>	VisioFace 1000D; ElastiMeter (ELM1128)
<b>Subjects</b>	32 females;
<b>Average age</b>	25-55 years old
<b>Test Site</b>	Face
<b>Test Period</b>	56 days
<b>Application Frequency</b>	Twice a day after cleaning face in the morning and evening
<b>Test condition</b>	Temperature: 20- 25 °C ; Humidity: 40% - 60%;
<b>Test Parameters</b>	Determination of skin wrinkle difference is expressed in volume, area and area ratio Volume: Used to indicate the size and depth of wrinkles Area: Used to indicate width and length of wrinkles Area ratio: Used to indicate the ratio of wrinkles

### Anti-wrinkle (Decreasing volume and area)

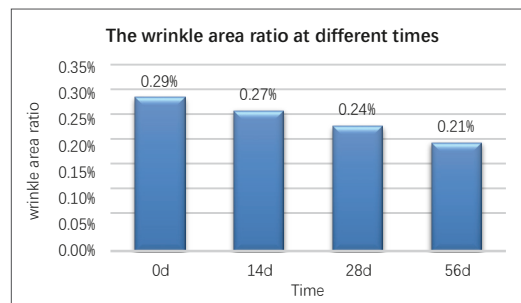


Comparing with the pre-treated, wrinkle volume decreased by 9.53%, 16.79%, 25.96% after 14, 28 and 56 days of use, respectively.

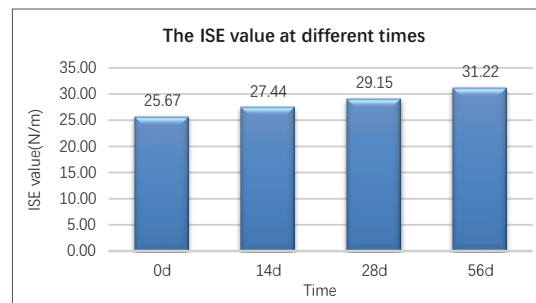


Comparing with the pre-treated, wrinkle area decreased by 9.19%, 18.18%, 28.98% after 14, 28 and 56 days of use, respectively.

### Anti-wrinkle (decreasing area ratio) & Elasticity test (increasing ISE)

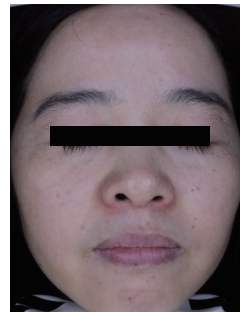
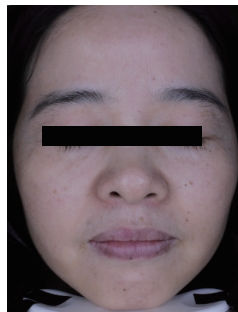
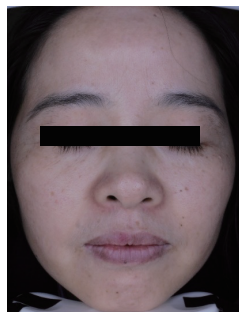
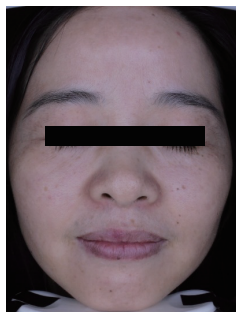


Comparing with the pre-treated, wrinkle area ratio decreased by 9.15%, 18.99%, 30.04% after 14, 28 and 56 days of use, respectively.



Comparing with the pre-treated, skin elasticity increased by 6.93%, 13.56%, 21.65% after 14, 28 and 56 days of use, respectively.

### Picture of subject





## Recommended formula

# Anti-aging Gel

SpecPed® GCu21p or SpecPed® GCu11p

**Efficacy:** Activate skin cells, repair damaged skin and anti-aging.

	Product Name	INCI Name	w/w%
<b>A</b>	EMT-10	Hydroxyethyl acrylate/sodium acryloyldimethyl taurate copolymer	1.2
	CC	Dicaprylyl Carbonate	2.0
	<b>SpecKare® 3GF</b>	Glyceryl linoleate&Glyceryl oleate&Glyceryl linolenate	1.0
	EH	Ethylhexyl Ethylhexanoate	2.0
	CDM3526	C26-28 Alkyl Dimethicone	0.2
	<b>SpecKare® VEA</b>	Tocopheryl Acetate	0.2
<b>B</b>	Glycerin	Glycerin	3.0
	EG-1	Glycereth-26	4.0
	<b>SpecThem® XTG200</b>	Xanthan Gum	0.18
	<b>SpecThem® SCB21</b>	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	0.15
	<b>SpecKare® ALLA</b>	Allantoin	0.1
	H-200	Glyceryl Polyacrylate	6.0
	Aqua	Aqua	To 100
	<b>SpecKare® HAL</b>	Sodium Hyaluronate (1% Liquid)	5.0
	<b>SpecKare® NMF50</b>	Betaine	2.0
<b>C</b>	TEA	Triethanolamine	0.13
<b>D</b>	<b>SpecKare® NK2</b>	Dipotassium Glycyrrhizate	0.1
	<b>ParbFree® PCG</b>	Caprylyl Glycol&Phenoxyethanol	0.7
	Fragrance	Fragrance	0.1
	<b>SpecPed® GCu21P or SpecPed® GCu11P</b>	Bis(Tripeptide-1) Copper Acetate or Copper Tripeptide-1	0.2

### Procedure:

1. Disperse SCB21 in hot water (about 85 °C). Mix at 85 °C until homogeneous;
2. Disperse XTG200 in EG-1, mix the rest of cool water until homogeneous, add the rest of B group and mix at 85 °C;
3. Mix A part and heat to 85 °C; Mix A and B, homogenize for 5 min;
4. Cool to 60 °C, add C, cool to 45 °C, add D, cool to room temperature.



Good Quality Comes From  
Qualified Materials



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