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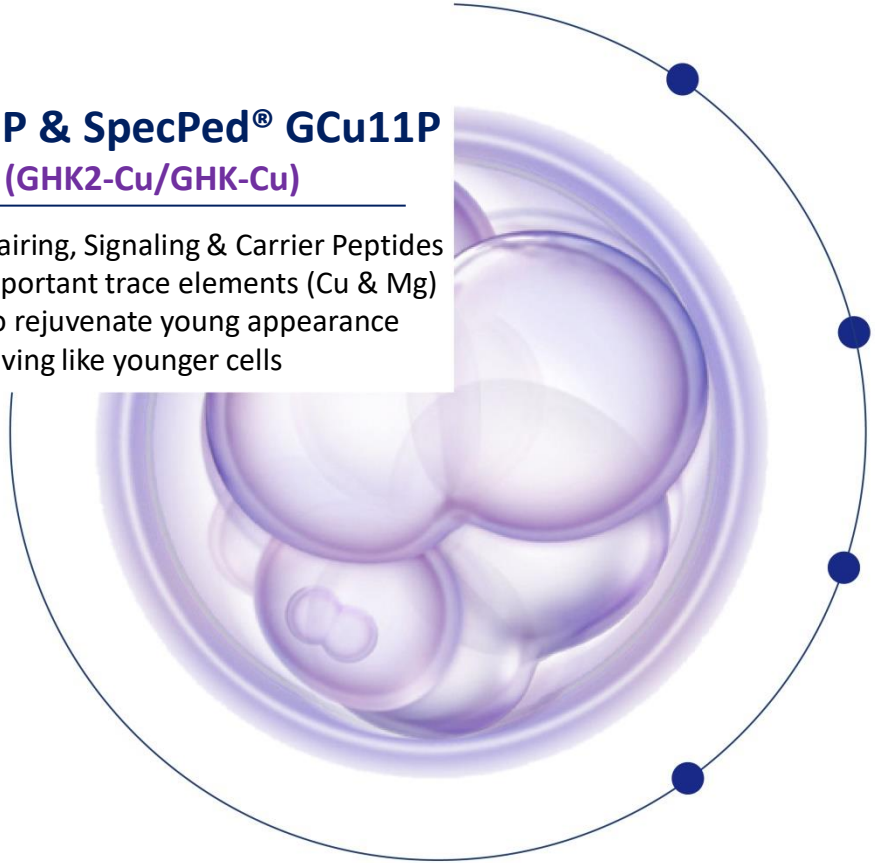
Good Quality Comes
From Qualified Materials

SpecPed® GCu21P & SpecPed® GCu11P

—Copper Tripeptides (GHK2-Cu/GHK-Cu)

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



(For Customer Only)
Spec Chem Group
Mar.26 2021

Contents

1 GHK Overview

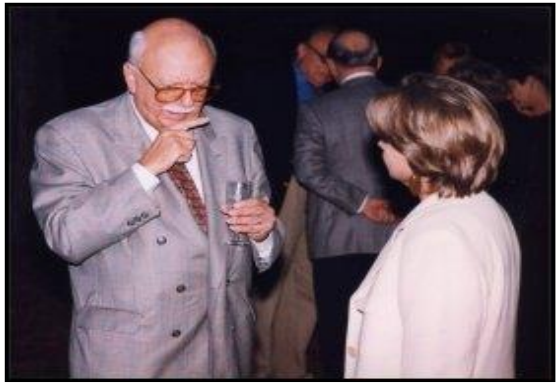
What is GHK?

- Glycyl-L-Histidyl-L-Lysine (GHK) was originally isolated from human plasma in 1973 by Pickart and Thaler. It is a tripeptide possessing **a high affinity for copper ions**. This peptide was first described as **a growth factor** for a variety of differentiated cells.
- In 1985 ,GHK **wound repair properties** were observed by Maquart et al. In 1999, Maquart et al. concluded that **GHK or its Cu complex** functioned as **an activator of tissue remodeling**.

What's the function of Copper ion in human?

- **Copper** is utilized by essentially every cell and organ, resulting in the formation of important **copper-dependent enzymes**, including cytochrome C oxidase (energy production), superoxide dismutase(antioxidation) and lysyl oxidase (cross-linking of elastin and collagen in skin).
- **Copper** is essential to vital **cellular and enzyme processes** required for human health. It plays a key role in many human essential enzyme systems needed for tissue repair, like **skin & hair growth (Specped® ACu21/11P, Specped® AHK2-Cu, AHK-Cu)** and other **biological responses**. Research has shown that copper, delivered in the form of **copper peptides**, stimulates many actions.

1 GHK Overview

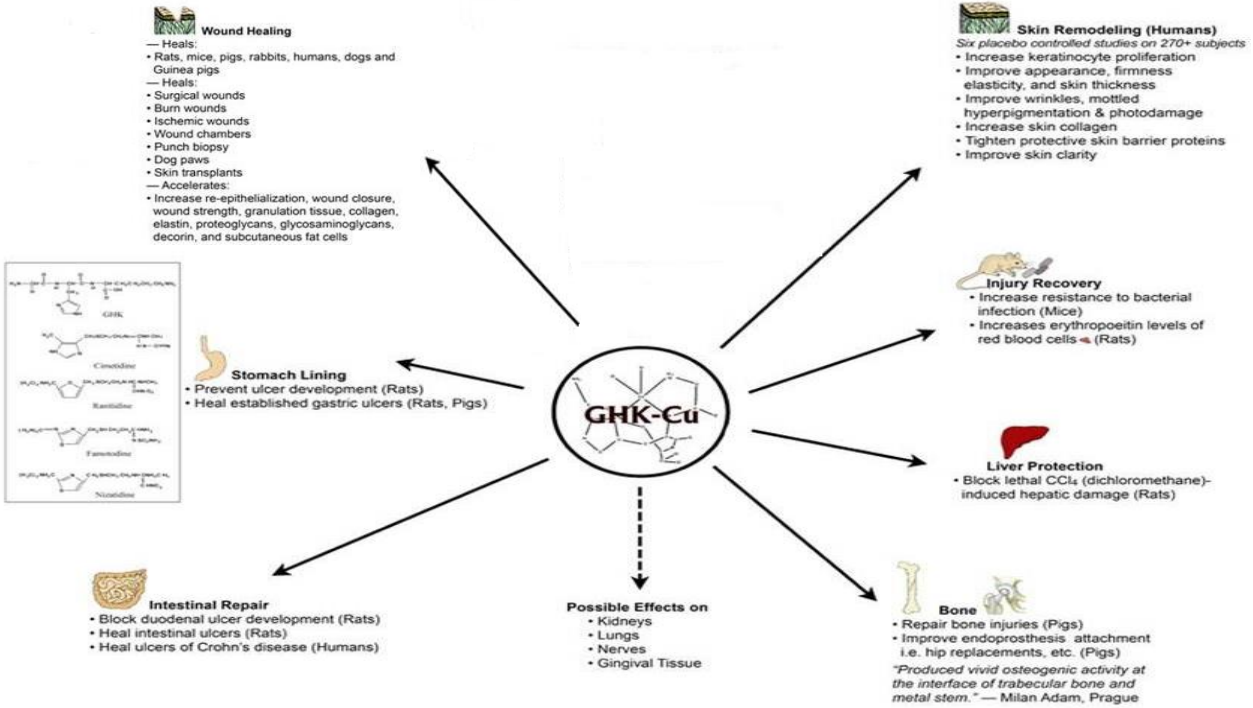


Prof. Jacque Paul Borel, (Universite de Reims) whose team, later headed by Francois Maquart, was the first the suggest that GHK-Cu stimulates skin remodeling.

Photograph: Second from left - Prof. Francois Maquart, (Universite de Reims), whose research team first classified GHK-Cu as a tissue remodeling signal.

1 GHK Overview

Effect of GHK-Cu in Mammals:



2 Product Info. of Spec Chem's Copper Tripeptide-1

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

Product No.: 130003
Trade Name: SpecPed® GCu21P
INCI name: Bis(Tripeptide-1) Copper Acetate
Sequence: (Gly-His-Lys)2.Cu
CAS No.: 130120-57-9
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: 10g, 50g, 100g, or Customization

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

2 Product Info. of Spec Chem's Copper Tripeptide-1

SpecPed® GHK2-Cu (1.0%) *(Tripeptide:Cu=2:1, GCu21P Solution)*

Product No.: 135006-2
Trade Name: SpecPed® GHK2-Cu (1.0%)
INCI name: Bis(Tripeptide-1) Copper Acetate, Glycerin, Aqua, Caprylyl Glycol &Ethylhexylglycerin
CAS No.: 130120-57-9, 56-81-5, 7732-18-5, 1117-86-8 & 70445-33-9
Application: Anti-wrinkle, anti-aging, skin & hair repairing, wound healing and etc.
Dosage: 0. 5-20.0%
Storage: Storage in cool,dry place,protect from light.Long storage at 2～ 8℃.
Shelf life: 2 years
Package: Customization

Items	Specification
Appearance	Clear blue solution
Odor	Characteristic
Peptide content(GHK)	≥1%
Heavy metals (as Pb)	Not more than 10 ppm
Arsenic (as AS2O3)	Not more than 2 ppm
Aerobic plate	≤100 cfu/ml
Yeast & mold	≤100 cfu/ml
Escherichia coli	Negative
Salmonella	Negative

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2 Product Info. of Spec Chem's Copper Tripeptide-1

SpecPed® GHK2-Cu (0.1%) *(Tripeptide:Cu=2:1, GCu21P Solution)*

Product No.: 135006-1
Trade Name: SpecPed® GHK2-Cu (0.1%)
INCI name: Bis(Tripeptide-1) Copper Acetate, Glycerin, Aqua, Caprylyl Glycol &Ethylhexylglycerin
CAS No.: 130120-57-9, 56-81-5, 7732-18-5, 1117-86-8 & 70445-33-9
Application: Anti-wrinkle, anti-aging, skin & hair repairing, wound healing and etc.
Dosage: 5-50.0%
Storage: Storage in cool,dry place,protect from light.Long storage at 2～ 8℃.
Shelf life: 2 years
Package: Customization

Items	Specification
Appearance	Clear blue solution
Odor	Characteristic
Peptide content(GHK)	≥1%
Heavy metals (as Pb)	Not more than 10 ppm
Arsenic (as AS2O3)	Not more than 2 ppm
Aerobic plate	≤100 cfu/ml
Yeast & mold	≤100 cfu/ml
Escherichia coli	Negative
Salmonella	Negative

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2 Product Info. of Spec Chem's Copper Tripeptide-1

SpecPed® GHK2-Cu (0.05%) *(Tripeptide:Cu=2:1, GCu21P Solution)*

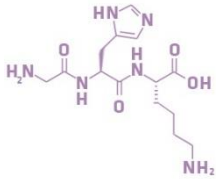
Product No.: 135006-7
Trade Name: SpecPed® GHK2-Cu (0.05%)
INCI name: Bis(Tripeptide-1) Copper Acetate, Glycerin, Aqua, Caprylyl Glycol &Ethylhexylglycerin
CAS No.: 130120-57-9, 56-81-5, 7732-18-5, 1117-86-8 &70445-33-9
Application: Anti-wrinkle, anti-aging, skin & hair repairing, wound healing and etc.
Dosage: 10-100%
Storage: Storage in cool,dry place,protect from light.Long storage at 2～ 8℃.
Shelf life: 2 years
Package: Customization

Items	Specification
Appearance	Clear blue solution
Odor	Characteristic
Peptide content(GHK)	≥0.05%
Heavy metals (as Pb)	Not more than 10 ppm
Arsenic (as AS2O3)	Not more than 2 ppm
Aerobic plate	≤100 cfu/ml
Yeast & mold	≤100 cfu/ml
Escherichia coli	Negative
Salmonella	Negative

2 Product Info. of Spec Chem's Copper Tripeptide-1

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

Product No.: 130004
Trade 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



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

2 Product Info. of Spec Chem's Copper Tripeptide-1

SpecPed® GHK-Cu (1.0%) *(Tripeptide:Cu=1:1, GCu11P Solution)*

Product No.: 135006-3
Trade Name: SpecPed® GHK-Cu (1.0%)
INCI name: Copper tripeptide-1, Glycerin, Aqua, Caprylyl Glycol &Ethylhexylglycerin
CAS No.: 89030-95-5, 56-81-5, 7732-18-5, 1117-86-8 & 70445-33-9
Application: Anti-wrinkle, anti-aging, skin & hair repairing, wound healing and etc.
Dosage: 0.5-20.0%.
Storage: Storage in cool,dry place,protect from light.Long storage at 2～ 8℃.
Shelf life: 2 years
Package: Customization

Items	Specification
Appearance	Clear blue solution
Odor	Characteristic
Peptide content(GHK)	≥1%
Heavy metals (as Pb)	Not more than 10 ppm
Arsenic (as AS2O3)	Not more than 2 ppm
Aerobic plate	≤100 cfu/ml
Yeast & mold	≤100 cfu/ml
Escherichia coli	Negative
Salmonella	Negative

2 Product Info. of Spec Chem's Copper Tripeptide-1

SpecPed® GHK-Cu (0.1%) *(Tripeptide:Cu=1:1, GCu11P Solution)*

Product No.: 135006-8
Trade Name: SpecPed® GHK-Cu (1.0%)
INCI name: Copper tripeptide-1, Glycerin, Aqua, Caprylyl Glycol &Ethylhexylglycerin
CAS No.: 89030-95-5, 56-81-5, 7732-18-5, 1117-86-8 & 70445-33-9
Application: Anti-wrinkle, anti-aging, skin & hair repairing, wound healing and etc.
Dosage: 5.0-50.0%
Storage: Storage in cool,dry place,protect from light.Long storage at 2～ 8℃.
Shelf life: 2 years
Package: Customization

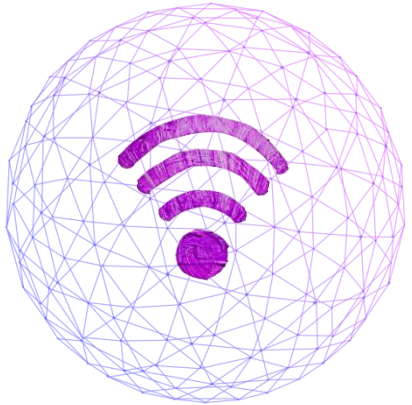
Items	Specification
Appearance	Clear blue solution
Odor	Characteristic
Peptide content(GHK)	≥1%
Heavy metals (as Pb)	Not more than 10 ppm
Arsenic (as AS2O3)	Not more than 2 ppm
Aerobic plate	≤100 cfu/ml
Yeast & mold	≤100 cfu/ml
Escherichia coli	Negative
Salmonella	Negative

3 Efficacy of Spec Chem's Copper Tripeptide

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/ SpecPed® GCu21P / SpecPed® GHK2-Cu/ SpecPed® GHK-Cu**) 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.

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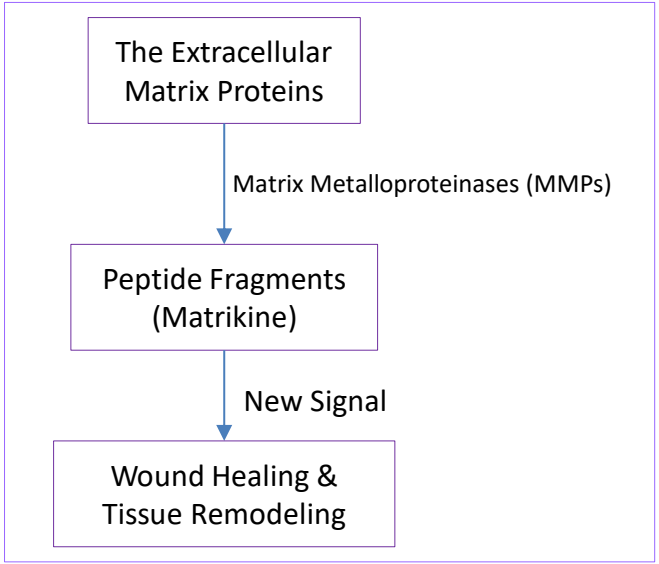
3 Efficacy of Spec Chem's Copper Tripeptide

Action Mechanism of Remolding of Copper Tripeptide:



Copper Tripeptide- (1) Signal Peptide

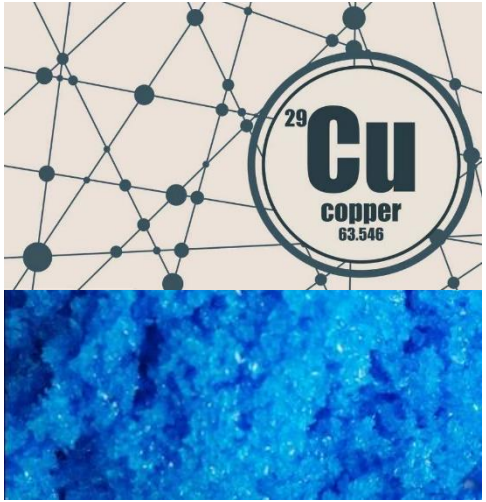
- Copper Tripeptide is a signal peptide
- Promote the synthesis of regular collagen in normal skin, like the production of elastin, proteoglycans and glycosaminoglycans.
- Adjusts the growth rate and migration of different types of cells
- Helps in anti-inflammatory and antioxidant responses
- Promote degradation of supersized collagen in scars

3 Efficacy of Spec Chem's Copper Tripeptide

Action Mechanism of Remolding of Copper Tripeptide:

Copper Tripeptide- (2) Carrier Peptide

- GHK is primarily known as carrier peptides, an important trace element necessary for **wound healing** & serveal **enzymatic processes**.
- Deliver important **healing cofactors** into target position, **superoxide dismutase** acts as an important antioxidant and requires copper as a cofactor**. Lysyl oxidase enzyme** in collagen and elastin production is also depend on copper. The same as **cytochrome-c oxidase** and **tyrosinase**.
- Helps to **stabilize/faciliate and deliver copper** uptake by cells. Copper spontaneously complexes with tripeptide, which itself is found in many proteins of extracellular matrix and is believed to be released during normal tissue repair.



3 Efficacy of Spec Chem's Copper Tripeptide

The features of Spec Chem's Copper Tripeptides:

- ✓ 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

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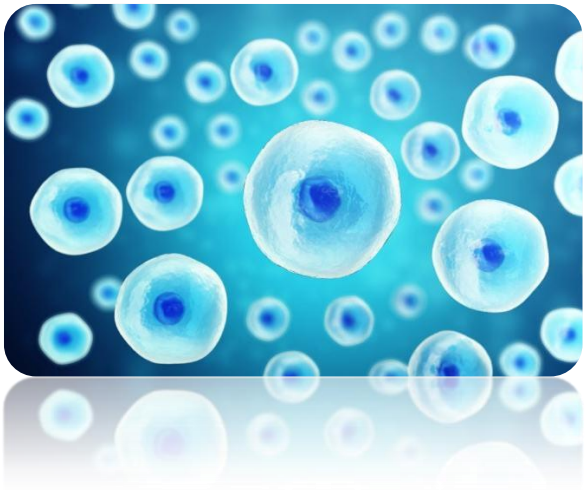
3 Efficacy of Spec Chem's Copper Tripeptide

Acute Toxicity of Kerationocyte Cytotoxicity, in vitro (SpecPed® GCu21P)

Commission Test by CALT-BIO

Table.1 The IC_{50} and LD_{50}

	Positive control(X±SD)	Sample(X±SD)
IC_{50}	0.28±0.03mM	35.47±7.61mg/mL
LD_{50}	678.16±258.48mg/kg	5206.53±2936.81mg/kg



Conclusion: Under the conditions of this test, the IC_{50} of sample-"SpecPed® GCu21P(GHK2-Cu)" is 35.47±7.61mg/mL, the estimated LD_{50} is 5206.53±2936.81mg/kg. **No toxicity or inhibition was found.**

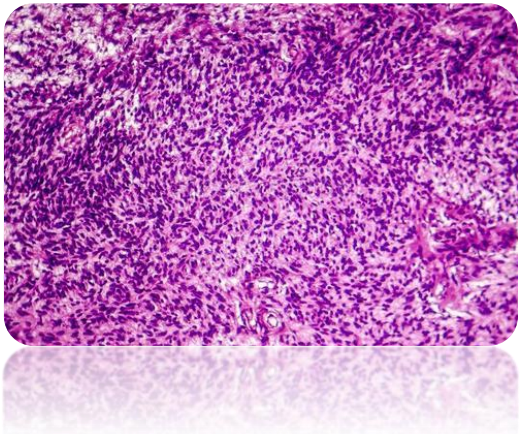
3 Efficacy of Spec Chem's Copper Tripeptide

Original generation of fibroblasts cytotoxicity, in vitro (SpecPed® GCu21P)

Commission Test by CALT-BIO

Table 2. The IC_{50} and LD_{50}

	Positive control(X±SD)	Sample(X±SD)
IC_{50}	0.28±0.01mM	56.40±8.91mg/mL
LD_{50}	689.08±159.58mg/kg	6186.94±3114.26mg/kg



Conclusion: Under the conditions of this test, the IC50 of sample "SpecPed® GCu21P(GHK2-Cu)" is 56.40±8.91mg/mL, the estimated LD50 is 6186.94±3114.26mg/kg. **No toxicity or inhibition was found.**

3 Efficacy of Spec Chem's Copper Tripeptide

In-Vitro test of SpecPed® GHK2- Cu—Cell Scratch Test (Wound-healing/Skin-repairing Ability)

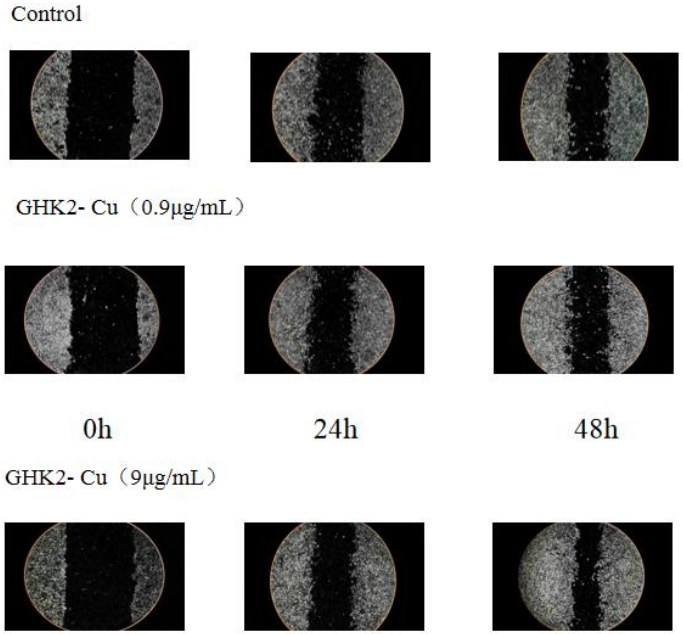


Figure 3 the diagram of relative mobility of cell scratches in SpecPed® GHK2- Cu

Summary：compared with the control group, the migration rates of *SpecPed*® GHK2-Cu at concentrations of 9μg/mL and 0.9μg/mL are all significant at 24h. It shows extremely significant and has a difference at 48h. Therefore, GHK2-Cu has a significant effect on the relative migration rate of fibroblasts. It also shows a concentration dependent trend.

Effectual skin-repairing & wound-healing ability!

3 Efficacy of Spec Chem's Copper Tripeptide

In-Vitro test of SpecPed®GCu21P—Cell Scratch Test (Wound-healing/Skin-repairing Ability)

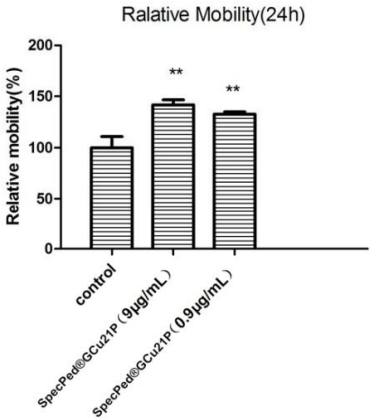


*Figure 1 At 24h, the histogram of relative mobility of cell scratches in SpecPed® GCu21P（** indicates a significant difference compared with the control group, P＜0.01）*

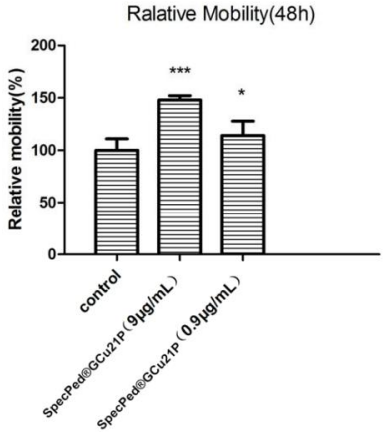


Figure 2 At 48h, the histogram of relative mobility of cell scratches in SpecPed® GCu21P（、*** respectively express a difference and extremely significant difference compared with control group, P＜0.05 and 0.001, respectively）*

3 Efficacy of Spec Chem's Copper Tripeptide

In vitro-Cell Scratch (repairing) of SpecPed®GCu11P on Fibroblasts

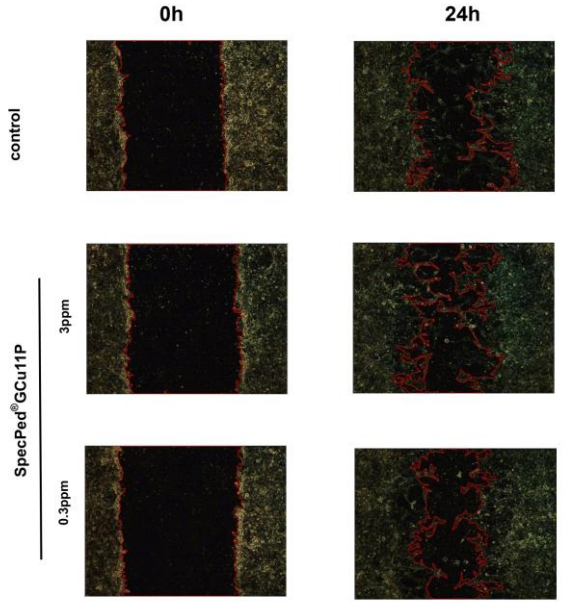


Fig. 1 The images of mobility of NIH/3T3 cells(The black areas are the cell scratches, the light yellow parts are cells, and the red lines are cell edges)

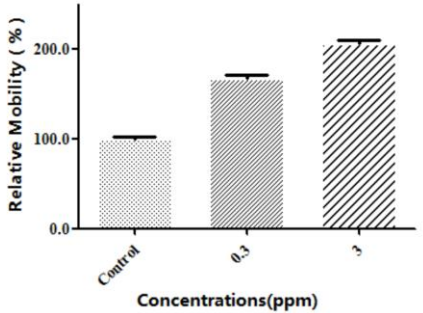


Fig.2 Relative mobility of different concentrations of SpecPed®GCu11P

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.

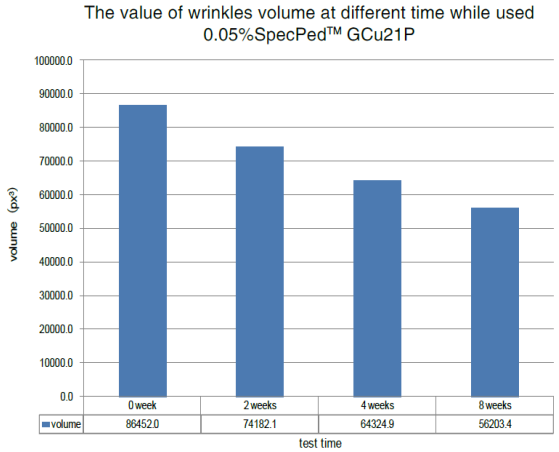
3 Efficacy of Spec Chem's Copper Tripeptide

In-Vivo test of SpecPed®GCu21P —Anti-wrinkle

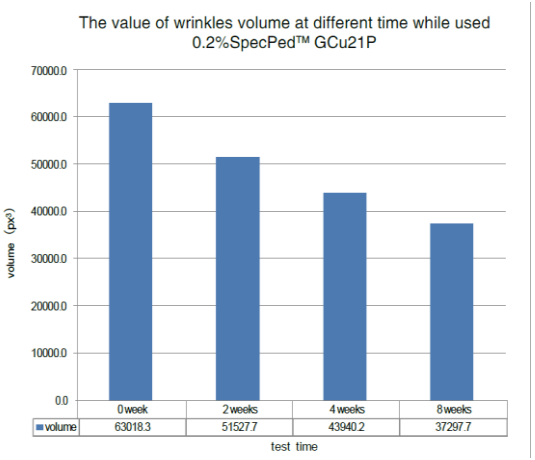
Test product：	0.05% SpecPed®GCu21P and 0.2% SpecPed ® GCu21P Anti-wrinkle Gel
Device Model：	VisioFace 1000D
Subjects：	0.05% SpecPed®GCu21P -16 females;
	0.2% SpecPed®GCu21P-17 females
Average age：	25-55 years old
Test Site：	Face
Test Period	8 weeks
Application Frequency：	Twice a day after cleaning face in the morning and evening
Test Parameters ：	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.

3 Efficacy of Spec Chem's Copper Tripeptide

In-Vivo test of SpecPed®GCu21P —Anti-wrinkle (wrinkles volume)



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 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 treatment.

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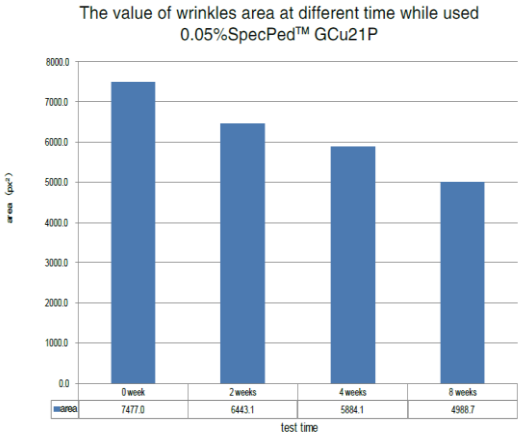
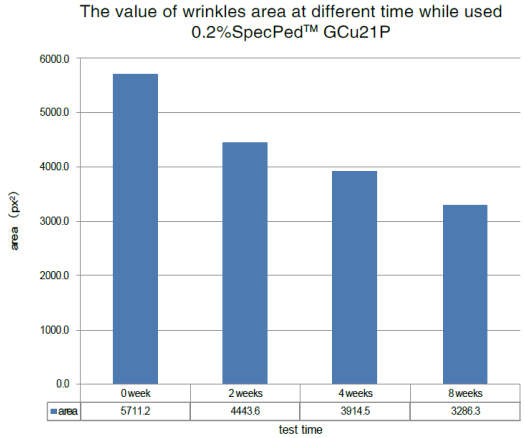
3 Efficacy of Spec Chem's Copper Tripeptide

In-Vivo test of SpecPed®GCu21P —Anti-wrinkle (wrinkles area)



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.



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.

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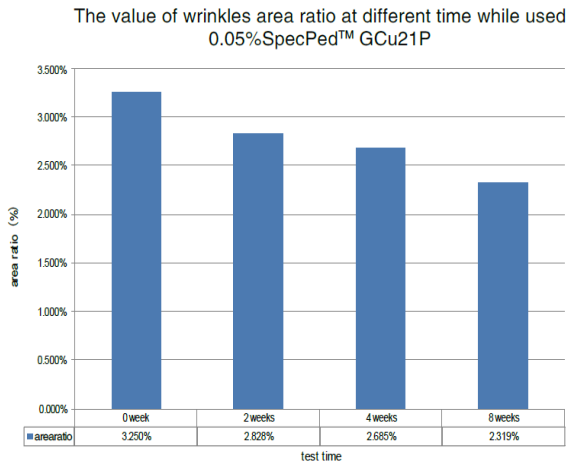
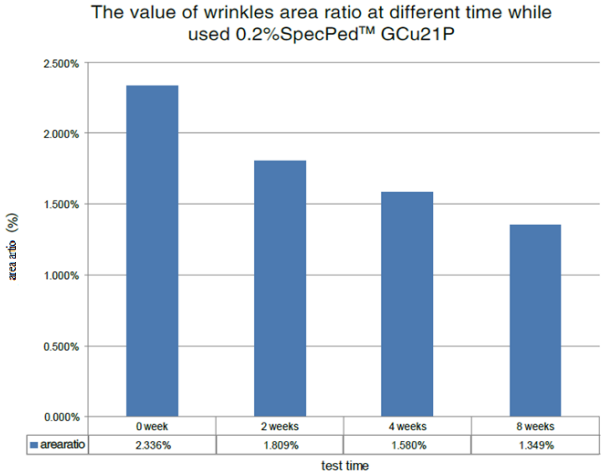
3 Efficacy of Spec Chem's Copper Tripeptide

In-Vivo test of SpecPed®GCu21P —Anti-wrinkle (wrinkles area ratio)



Comparing with the pre-treated, wrinkles area ratio reduced by 12.93% after 2 weeks, reduced by 17.38% after 4 weeks and reduce d by 28.63% after 8 weeks under 0.05%SpecPed ® GCu21P treatment.



Comparing with the pre-treated, wrinkles area ratio reduced by 22.55% after 2 weeks, reduced by 32.35% after 4 weeks, reduced by 42.25% after 8 weeks under 0.2%SpecPed ® GCu21P treatment.

3 Efficacy of Spec Chem's Copper Tripeptide

0.05% SpecPed®GCu21P Anti-wrinkle Gel subject

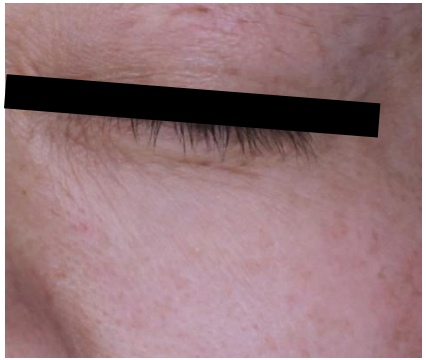


Fig.1 0 week

Fig.1 2 week

Fig.1 4 week

Fig.1 8 week

3 Efficacy of Spec Chem's Copper Tripeptide

0.05% SpecPed®GCu21P Anti-wrinkle Gel subject 3D

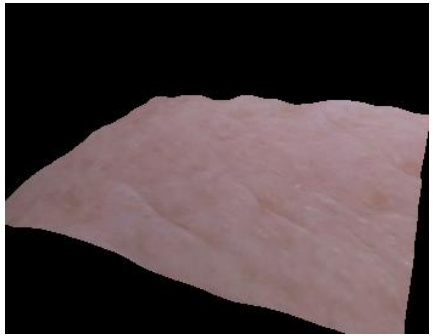


Fig.1 0 week

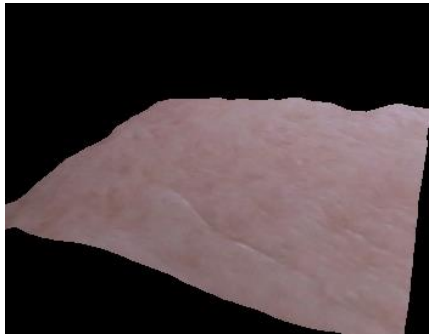


Fig.1 2 week

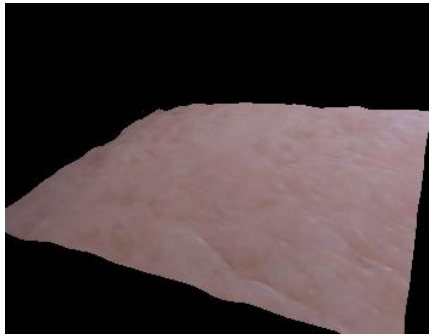


Fig.1 4 week

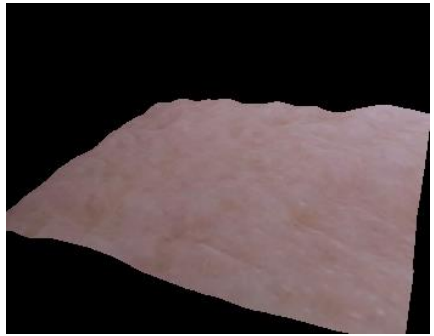


Fig.1 8 week

3 Efficacy of Spec Chem's Copper Tripeptide

0.2% SpecPed®GCu21P Anti-wrinkle Gel subject

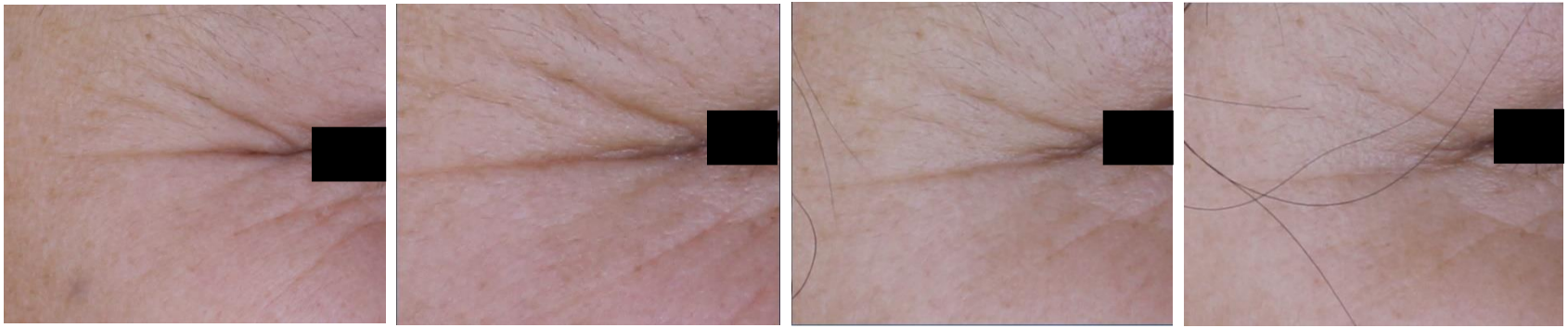


Fig.1 0 week *Fig.1 2 week* *Fig.1 4 week* *Fig.1 8 week*

3 Efficacy of Spec Chem's Copper Tripeptide

0.2% SpecPed®GCu21P Anti-wrinkle Gel subject 3D

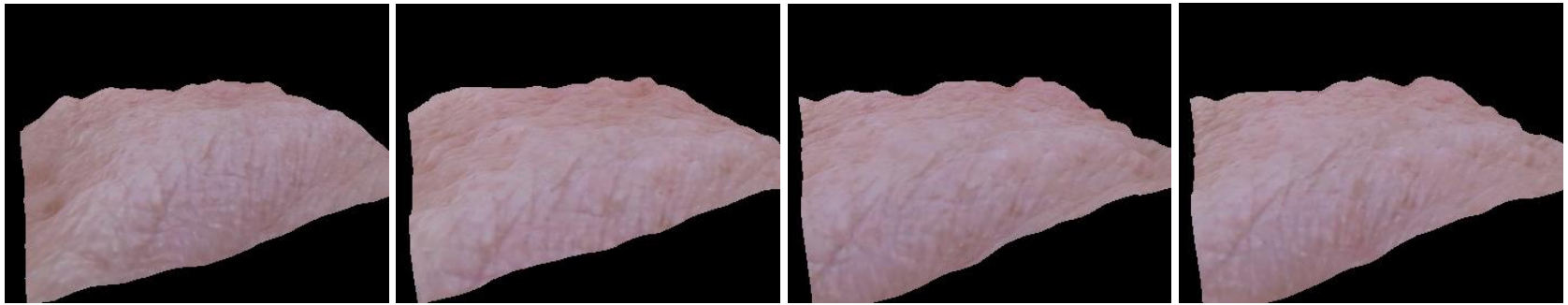


Fig.1 0 week *Fig.1 2 week* *Fig.1 4 week* *Fig.1 8 week*

3 Efficacy of Spec Chem's Copper Tripeptide

In-Vivo test of SpecPed®GCu11P —Anti-wrinkle & Elasticity test

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

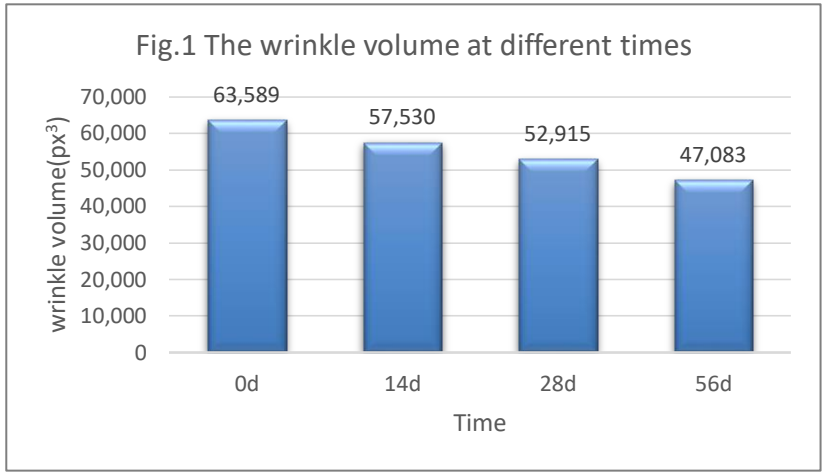
Volume ： used to indicate the size and depth of wrinkles

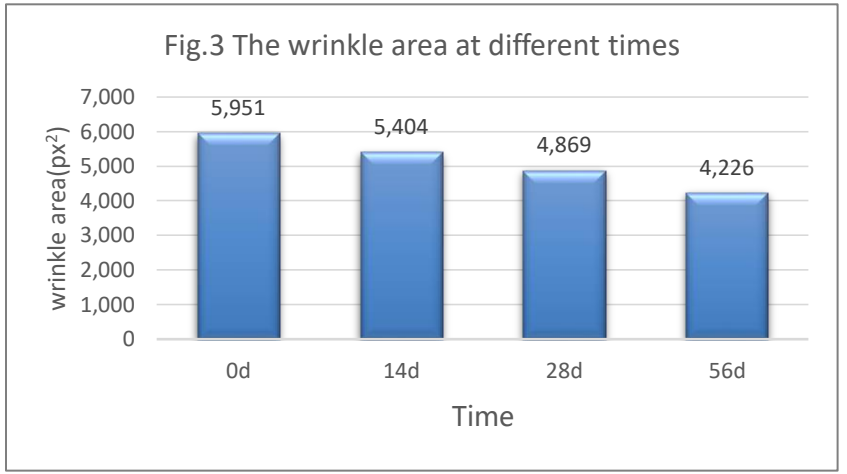
Area ： used to indicate width and length of wrinkles;

Area ratio： Used to indicate the ratio of wrinkles.

3 Efficacy of Spec Chem's Copper Tripeptide

In-Vivo test of SpecPed®GCu11P —Anti-wrinkle (Decreasing volume and area)

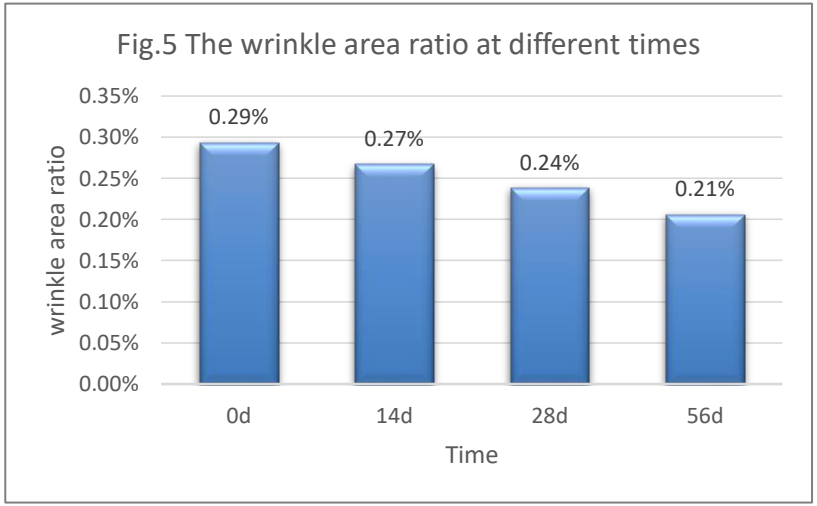


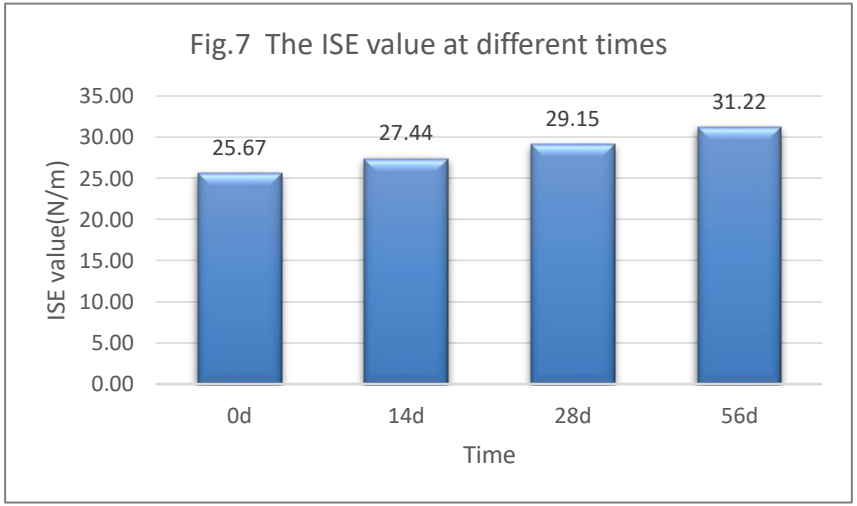


Comparing with the pre-treated, wrinkle volume decreased by 9.53%, winkle area decreased by 9.19%, and winkle area ratio decreased by 9.15% after 14 days of use.
Comparing with the pre-treated, wrinkle volume decreased by 16.79%, winkle area decreased by 18.18%, and winkle area ratio decreased by 18.99% after 28 days of use.
Comparing with the pre-treated, wrinkle volume decreased by 25.96%, winkle area decreased by 28.98%, and winkle area ratio decreased by 30.04% after 56 days of use.
(The results of wrinkle area ratio is to be continued in next slide.)

3 Efficacy of Spec Chem's Copper Tripeptide

In-Vivo test of SpecPed®GCu11P —Anti-wrinkle (decressing area ratio) & Elasticity test (increasing ISE)





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

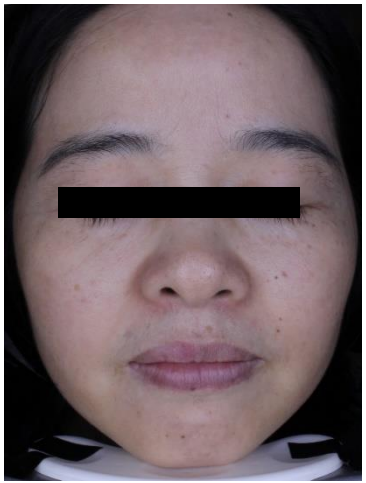
3 Efficacy of Spec Chem's Copper Tripeptide

In-Vivo test of SpecPed®GCu11P —Anti-wrinkle & Elasticity test

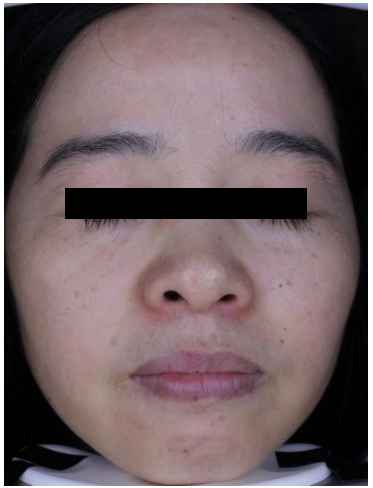
Picture of subject

0 day

14 days



28 days



56 days

4 Application Guide of Spec Chem's Copper Tripeptide

Formulation Example1: SpecPed® GCu21P anti-aging gel

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

Procedure:

1.Disperse SCB21 in hot water(about 85℃). Mix at 85℃ 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℃;
3. Mix A part and heat to 85℃; Mix A and B, homogenize for 5min.
4.Cool to 60℃, add C, cool to 45℃, add D, cool to room temperature.

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

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4 Application Guide of Spec Chem's Copper Tripeptide

Formulation Example2: SpecPed® GCu11P anti-aging gel

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

Procedure:

1.Disperse SCB21 in hot water(about 85℃). Mix at 85℃ 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℃;
3. Mix A part and heat to 85℃; Mix A and B, homogenize for 5min.
4.Cool to 60℃, add C, cool to 45℃, add D, cool to room temperature.

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

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4 Application Guide of Spec Chem's Copper Tripeptide

Commercial Product (me too ingredient-SpecPed® GCu21P)

Revolution Skincare Copper Peptide Serum
Revolution Skincare
Copper Peptide Serum
This antioxidant serum helps to restore skin's firmness. Formulated with Copper (helps maintain healthy skin), multi-peptides (helps to improve skins texture), and Glycerin (to moisturise).

Ingredients overview

Aqua (Water, Eau), Propanediol, Glycerin, Butylene Glycol, Xanthan Gum, Sodium Benzoate, Potassium Sorbate, Disodium EDTA, Carbomer, Polysorbate 20, Dipeptide Diaminobutyroyl Benzylamide Diacetate, Caprylyl Glycol, **Bis(Tripeptide-1) Copper Acetate**, Ethylhexylglycerin, Palmitoyl Tripeptide-1, Palmitoyl Tetrapeptide-7

4 Application Guide of Spec Chem's Copper Tripeptide

Commercial Product (me too ingredient-SpecPed® GCu21P)

MD Skinical
Soothing Hydropeptide Serum
Treatment with Vitamin B3 & B5 and Peptides

Ingredients overview

Water, **Palmitoyl Oligopeptide, Palmitoyl Tetrapeptide-3, Palmitoyl Tripeptide-5, Acetyl Hexapeptide-8, Hexapeptide-19, Palmitoyl Tripeptide-37**, **Prezatide Copper Acetate**, Vitamin B3, Vitamin B5, Malachite Extract, Chamomile Extract, Cucumber Extract, Aloe Vera Juice, Glycerin, Butylene Glycol, Menthol, Phenoxyethanol

4 Application Guide of Spec Chem's Copper Tripeptide

Commercial Product (me too ingredient-SpecPed® GCu21P)

QMS Medicosmetics

Day Collagen

An advanced day serum developed to hydrate, protect and help strengthen the skin's defences against free radicals.

Ingredients overview

Aqua (Water), Aloe Barbadensis Leaf Juice, Glycerin, Pentylene Glycol, Propylene Glycol, Polyglyceryl-4 Caprate, Atelocollagen, Sodium Hyaluronate, Tocopheryl Acetate, Panthenol, **Bis (Tripeptide-1) Copper Acetate**, Glycoproteins, Caprylyl Glycol, Phenoxyethanol, Citric Acid, Butylene Glycol, Dipropylene Glycol, Carrageenan, Glyceryl Caprylate, Tetrasodium Glutamate Diacetate, Sodium Phytate, Arginine, Sodium Lactate, Xanthan Gum, Carbomer, Coco-Glucoside, Hexyl Cinnamal, Glycine, Parfum (Fragrance), Proline, Sorbitol, Potassium Sorbate, Linalool, Benzyl Benzoate, Sodium Hydroxide, Sodium Benzoate, Dipotassium Phosphate, Alcohol, **Palmitoyl Tripeptide-1**, Hydrolyzed Soy Protein, **Palmitoyl Tetrapeptide-7**

4 Application Guide of Spec Chem's Copper Tripeptide

Commercial Product (me too ingredient-SpecPed® GCu21P)

Neova

Night Therapy

Neova Night Therapy penetrates deeply to protect and nourish your skin with an advanced blend of active botanical and clinical ingredients. GHK Copper Peptide technology supports collagen and elastin production as it neutralizes free radicals and repairs environmental damage. Omega fatty acids maintain skin's moisture levels and promote elasticity so that you awaken to a revitalized complexion.

Ingredients overview

Water (Aqua), Cetyl Alcohol, Sodium Stearoyl Lactylate, Glyceryl Stearate, C12-15 Alkyl Benzoate, Cyclopentasiloxane, Octyldodecyl Neopentanoate, PEG-100 Stearate, Palmitic Acid, Dimethicone, Stearic Acid, Ethylhexyl Stearate, Propylene Glycol Isoceteth-3 Acetate, **Bis(Tripeptide-1) Copper Acetate**, Micrococcus Lysate, Ceramide EOP, Ceramide NP, Ceramide AP, Sodium Hyaluronate, Sodium Lauroyl Lactylate, Caprylyl Glycol, Camellia Sinensis (Green Tea) Leaf Extract, Vitis Vinifera Seed Extract, Lecithin, Sodium Carboxymethyl Beta-Glucan, Hexylene Glycol, Prunus Amygdalus Dulcis (Sweet Almond) Oil, Glycerin, Hydroxyethylcellulose, Squalane, Phytosphingosine, Cholesterol, Phenoxyethanol, Xanthan Gum, Carbomer, Ethylhexylglycerin, Tocopheryl Acetate

4 Application Guide of Spec Chem's Copper Tripeptide

Commercial Product (me too ingredient-SpecPed® GCu11P)

Skin Biology

3% GHK VIP Luxury Serum

The strongest concentration of GHK-Cu in an oil-free formulation! Dr. Pickart's exclusive VIP Serum contains triple the amount of original GHK-Copper (the first skin rejuvenative copper peptide tested and proven to generate real results). This luxury serum contains the original skin-beauty-improving copper peptide, perfected in our lab for VIP Skin Care, at a concentration much higher than competing products. 15 mL or 50 mL.

Ingredients overview

Purified Water, **Copper Tripeptide-1 (Ghk-Cu),** Glycerin, Phenoxyethanol, Polysorbate 20, Hydroxyethyl Cellulose, Allantoin, Butylene Glycol, Glycine, Aloe Barbadensis (Aloe Vera) Gel, Polysorbate 80, Tocophersolan (Vitamin E), Fragrance (Herbal Mask)

4 Application Guide of Spec Chem's Copper Tripeptide

Commercial Product (me too ingredient-SpecPed® GCu11P)

The Ordinary Buffet + Copper Peptides 1%

The Ordinary

Buffet + Copper Peptides 1%

Multi-technology Peptide Serum

Ingredients overview

Aqua (Water), Glycerin, Lactococcus Ferment Lysate, **Copper Tripeptide-1**, **Acetyl Hexapeptide-8, Pentapeptide-18, Palmitoyl Tripeptide-1, Palmitoyl Tetrapeptide-7, Palmitoyl Tripeptide-38,** Dipeptide Diaminobutyroyl Benzylamide Diacetate, Acetylarginyltryptophyl Diphenylglycine, Sodium Hyaluronate Crosspolymer, Sodium Hyaluronate, Allantoin, Glycine, Alanine, Serine, Valine, Isoleucine, Proline, Threonine, Histidine, Phenylalanine, Arginine, Aspartic Acid, Trehalose, Fructose, Glucose, Maltose, Urea, Sodium Pca, Pca, Sodium Lactate, Citric Acid, Hydroxypropyl Cyclodextrin, Sodium Chloride, Sodium Hydroxide, Butylene Glycol, Pentylene Glycol, Acacia Senegal Gum, Xanthan Gum, Carbomer, Polysorbate 20, Dimethyl Isosorbide, Sodium Benzoate, Caprylyl Glycol, Ethylhexylglycerin, Phenoxyethanol, Chlorphenesin

4 Application Guide of Spec Chem's Copper Tripeptide

Commercial Product (me too ingredient-SpecPed® GCu11P)

Cosmedix

Cell Id Nutritive Defense Serum

Cell ID helps to stop signs of aging – including fine lines, wrinkles and dark spots – before they start. With oligopeptide and mitochondrial complex tripeptide, this serum helps boost the skin's natural rejuvenation process to keep it looking fresh, young and healthy. Use Cell ID at the first signs of changing skin texture due to aging to bring vitality back to the skin.

Ingredients overview

Aqua, Glycerin, Sorbitol, Phenyl T-Butylnitrone (Spin Trap), **SH-Oligopeptide-1**, **Copper Tripeptide-1**, Sodium Hyaluronate (L), Niacinamide, Thiamine Hcl, Pyridoxine Hcl, Ceramide 3, Cocos Nucifera (Coconut) Fruit Juice, Phospholipids, Carnitine (L), Squalane, Yeast (B Complex) Extract, Dunaliella Salina (Algae) Extract, Citrus Grandis (Grapefruit) Peel Oil, Lavandula Angustifolia (Lavender) Oil, Pogostemon Cablin (Patchouli) Oil, Butyrospermum Parkii (Shea) Butter, Zea Mays (Corn) Starch, Hydrolyzed Corn Starch, Hydrolyzed Corn Starch Octenylsuccinate, Polysorbate 80, Acetyl Carnitine Hcl (L), Thioctic (R-Lipoic) Acid, Ubiquinone (Coq10), Adenine, Gluconolactone, Phytic Acid, Manganese Chloride, Alcohol, Tocotrienols, Tocopherol (D-Alpha), Elaeis Guineensis (Palm) Oil, Glutathione (L), Selenium, Hydroxypropyl Cyclodextrin, Xanthan Gum, Phenethyl Alcohol, Caprylyl Glycol, Sodium Benzoate, Potassium Sorbate

4 Application Guide of Spec Chem's Copper Tripeptide

Commercial Product (me too ingredient-SpecPed® GCu11P)

Neogen Surmedic

Azulene Soothing Peptide Ampoule

This soothing ampoule contains blue capsules concentrated with 10 peptides & Azulene, and Ceramide capsules, which calm and revive a sensitive skin, helping to strengthen the skin's moisture barrier for a dewy and healthy looking skin.

Ingredients overview

Water, Dipropylene Glycol, Isopentyldiol, 1,2-Hexanediol, Polydecene, Adenosine, Guaiazulene(75Ppm), **Copper Tripeptide-1(30Ppb)**, **Tripeptide-1(1.5Ppb), Palmitoyl Tripeptide-1(1.5Ppb), Tripeptide-2(1.5Ppb), Hexapeptide-11(1.5Ppb), Acetyl Hexapeptide-8(1.5Ppb), Palmitoyl Tetrapeptide-7(1.5Ppb), Palmitoyl Pentapeptide-4(1.5Ppb), Hexapeptide-9(1.5Ppb), Nonapeptide-1(1.5Ppb), Ceramide NP(Ceramide 3)**, Betula Platyphylla Japonica Juice, Glycyrrhiza Glabra (Licorice) Root Extract, Camellia Sinensis Leaf Extract, Camellia Japonica Seed Extract, Centella Asiatica Extract, Camellia Japonica Flower Extract, Aloe Barbadensis Leaf Extract, Calendula Officinalis Extract, Chamomilla Recutita (Matricaria) Extract, Propolis Extract, Phellinus Linteus Extract, Oenothera Biennis (Evening Primrose) Oil, Simmondsia Chinensis (Jojoba) Seed Oil, Cupressus Sempervirens Oil, Zinc Oxide, Beta-Glucan, Asiaticoside, Madecassic Acid, Asiatic Acid, Lavandula Angustifolia (Lavender) Flower Extract, Madecassoside, Camellia Sinensis Seed Oil, Camellia Japonica Leaf Extract, Butyrospermum Parkii (Shea Butter), Persea Gratissima (Avocado) Oil, Allantoin, Mentha Rotundifolia Leaf Extract, Calamine, Melaleuca Alternifolia (Tea Tree) Leaf Oil, Panthenol, Artemisia Capillaris Extract, Alcohol Denat, Butylene Glycol, Octyldodeceth-16, Carbomer, Tromethamine, Cellulose Gum, Phenyl Trimethicone, Ethylhexylglycerin, Acacia Senegal Gum, Sodium Hyaluronate, Agar, Mannitol, Zea Mays (Corn) Starch, Lavandula Angustifolia (Lavender) Oil, Microcrystalline Cellulose, Disodium EDTA, Gardenia Florida Fruit Extract, Hydrogenated Lecithin, Maltodextrin, Glycerin, Caprylic/Capric Triglyceride, Lecithin, Polysorbate 20, Sodium Ascorbyl Phosphate, Hydrogen Dimethicone

4 Application Guide of Spec Chem's Copper Tripeptide

Commercial Product (me too ingredient-SpecPed® GCu11P)

LANEIGE

Time Freeze Eye Serum Ex

Eye serum that restores elasticity in skin around the eyes, alleviating the appearance of fine lines for a more youthful look.

Ingredients overview

Water/Aqua/Eau, Butylene Glycol, Dimethicone, Glycerin, Pca Dimethicone, Butyrospermum Parkii (Shea) Butter, Pentaerythrityl Tetraethylhexanoate, Glyceryl Stearate Citrate, Dimethicone/Vinyl Dimethicone Crosspolymer, Vinyl Dimethicone/Methicone Silsesquioxane Crosspolymer, Phenoxyethanol, Ammonium Acryloyldimethyltaurate/Vp Copolymer, Cetearyl Alcohol, Hydrogenated Vegetable Oil, Glyceryl Stearate, Polymethyl Methacrylate, Stearic Acid, Palmitic Acid, Acrylates/C10-30 Alkyl Acrylate Crosspolymer, Laminaria Ochroleuca Extract, Thymol Trimethoxycinnamate, Kaolin, Fragrance/Parfum, Tromethamine, Disodium EDTA, Propanediol, Ethylhexylglycerin, Adenosine, 1,2-Hexanediol, Tillandsia Usneoides Extract, Stearyl Behenate, Dipalmitoyl Hydroxyproline, Polyglyceryl-3 Methylglucose Distearate, Ceratonia Siliqua (Carob) Fruit Extract, Hydroxypropyl Bispalmitamide Mea, Inulin Lauryl Carbamate, Lysine, Arginine, Histidine, Polysorbate 20, Xylose, Glucose, Prunus Persica (Peach) Leaf Extract, Mannose, Sodium Chloride, Lecithin, Sodium Phosphate, **Copper Tripeptide-1**, Fucose, Potassium Chloride, Potassium Phosphate, Calcium Chloride, Magnesium Chloride, Hydrolyzed Millet

4 Application Guide of Spec Chem's Copper Tripeptide

Commercial Products:

A.H.C PRIVATE REAL EYE CREAM

The history of Whoo Bichup Self-Generating Anti-Aging Essence

JMsolution Honey Luminous Royal Propolis Mask

For Beloved One Hyaluronic Acid GHK-Cu Moisturizing Serum

5 Common Q&A, and Tips

Q&A

Q: Has free copper ions been measured in Copper Tripeptide ?

A: No, there should not be free copper ions in our products.

Q: Is copper tripeptide produced by excessive copper chelating peptides or excessive peptides chelating copper ?

A: SpecPed® GCu21P is two molecules of GHK for every molecule of copper ion, peptide is excessive. SpecPed® GCu11P is the crystallization of GHK with copper ions of equal mole, after crystallization there is no extra free copper ions.

Q: Is the copper peptide resistant to high temperature?

A: SC Lab has done the test of copper peptide solution at of 50℃ for 8hrs, its color and content are not change.

Tips

- Chelating agents such as EDTA-2Na should not be added to the formula.
- The formula should not contain fruit acids, including ionic plant extracts, such as aloe extract.
- The final PH value of the formula need to be controlled at 5.5-7.0 (round 6.5 is prefered).
- Add copper tripeptide at the last step of the process of formulation (＜40℃ is prefered), avoid high temperature.

Thank you for your attention!

Spec-Chem Group

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