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# Collab protein X

**April, 2024**

1. Corporate Vision and Mission
2. Patented Technology
3. Characteristics of Peptide Action
4. Product Introduction & Testimonials
5. Market Analysis

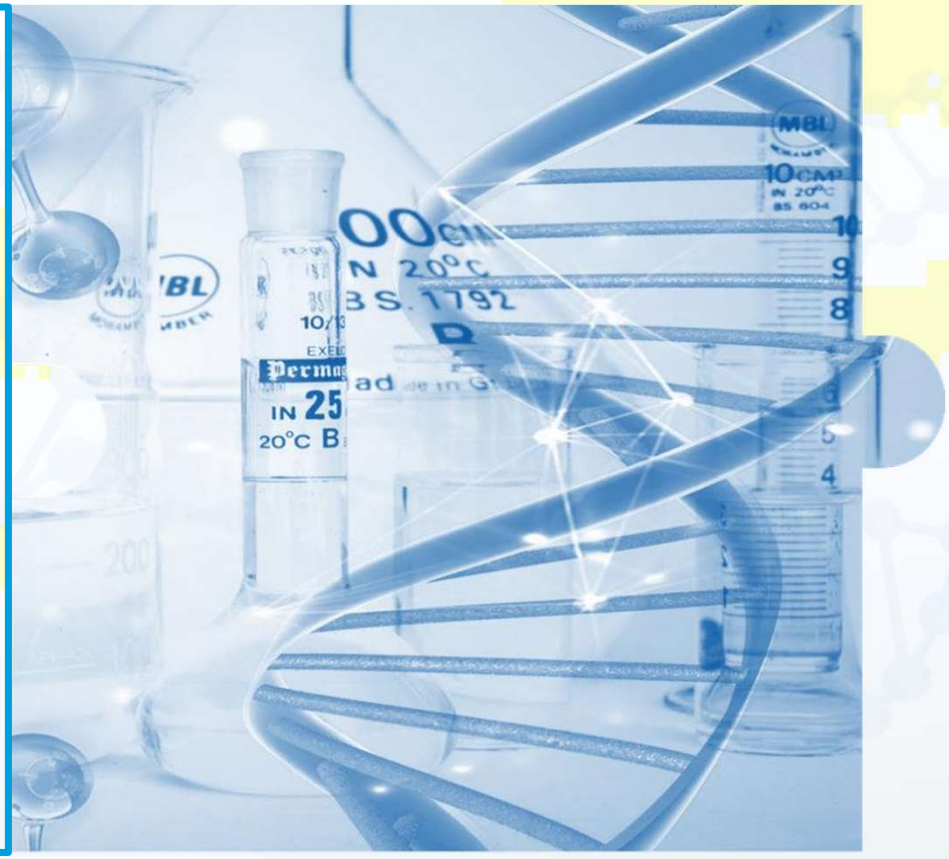
# Corporate Vision and Mission

## Vision

Become the world's leading peptide development and manufacturing group, providing customized services and bulk raw materials to global enterprises.

## Mission

Harnessing our proprietary peptide technologies to collaborate with industries across sectors and benefit society.



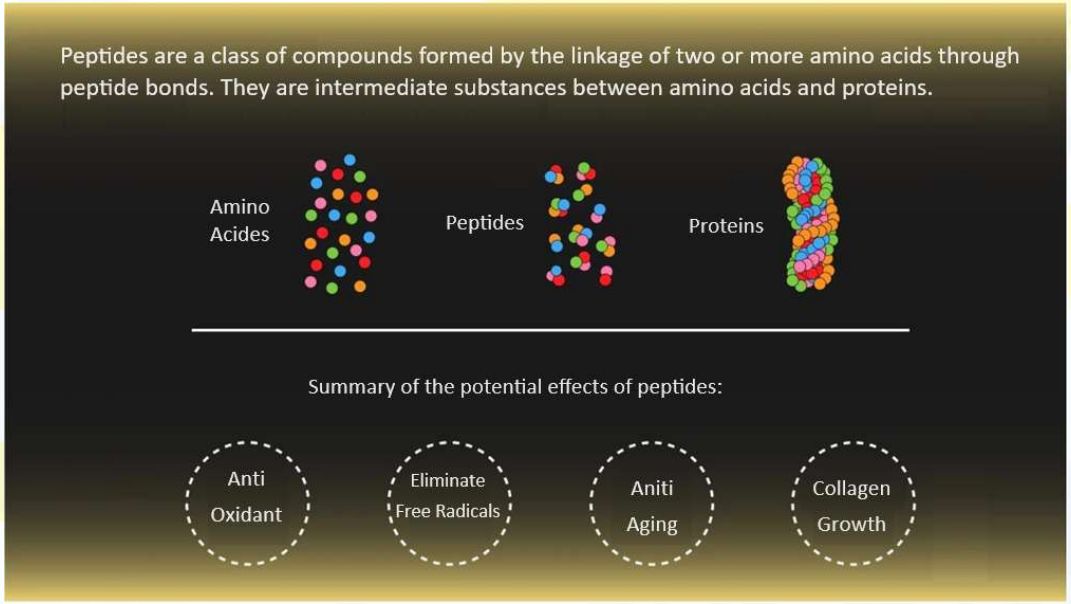
# What are peptides?

Proven by a century of scientific researches

**Peptides, the most important functional regulators of the human body**

- ✓ Peptides are a class of compounds formed by the linkage of two or more amino acids through peptide bonds. They are intermediate substances between amino acids and proteins.
- ✓ Peptides are the building blocks of proteins and serve as their structural and functional units. They form the active sites of proteins that enable their biological functions.
- ✓ Peptides serve as cellular messengers, regulating cellular expression, replication, and repair.

**All life processes in the human body, including growth, development, reproduction, metabolism, and behavior, are inseparable from peptides.**

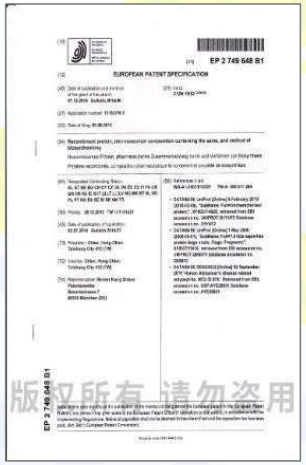



Thousands of peptides exist in living organisms, encompassing hormones, nerves, cell growth, reproduction, tumorigenesis, neurohormone transmitters, and immune regulation, extensively participating in and regulating the functional activities of various systems, organs, and cells within the body.

# Patents

**China**
**CPO2495722B**

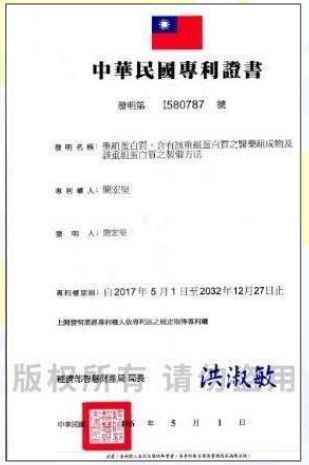

**EU**
**EPO2749648B1**




**Japan**
**JPO5916692**


**US**
**USPTO923 3999B2A**

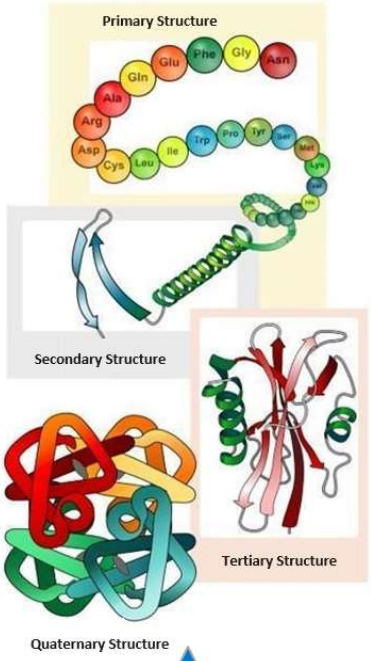

**Taiwan**
**TPOI580787**




**Taiwan**
**TPOI454576**

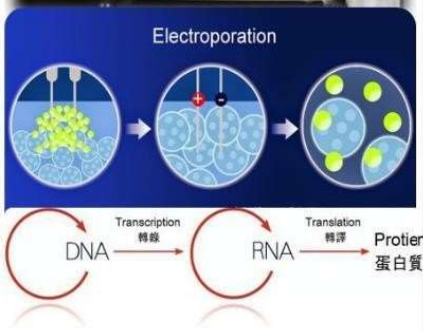

Several other key new patents are under development and approval.

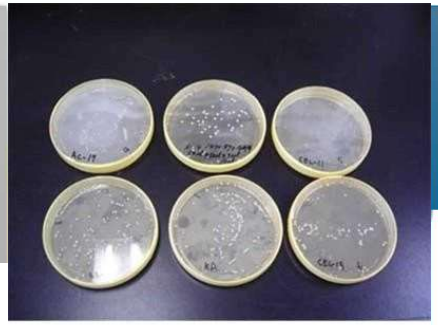
# Key Technology




## Amino Acid Sequence Analysis

## Peptide Gene Synthesis Transgenic Production Process



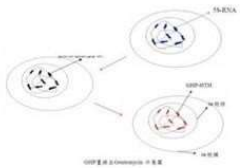
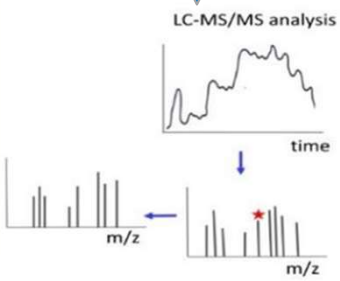


圖 11.轉入酵母菌示意圖

## Cultivation of Yeast Strains Peptide Gene Expression

## Peptide Amino Acid Sequence Determination



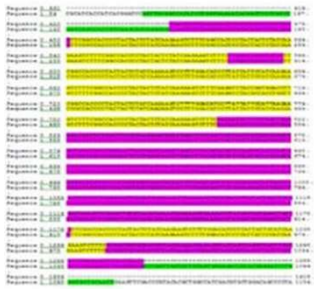



圖 8.送生技公司定序結果

## Natural Small Molecule High-Precision Quantification

# Multi-peptide Expression System

## Animal Breeding & Growth

## Skin Care

## Metal Peptide for Mining

## Health & Recovery

## Food Additive & Flavoring Peptides

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# Technical Core Value

**Orally Effective Protection Design Alternative to Injection**

Addressing the Challenge of Oral Delivery for Peptide Drugs

**100% Amino Acid Sequence Accuracy**

Achieving 100% accuracy for both long and short peptides, overcoming the limitations of low accuracy in chemical synthesis, and leading to more powerful functionalities.

**High Concentration + Combination Innovation**

Concentration can reach 50% or even higher, and multiple different peptides can be combined at the same time for stronger functionality.

Original
Unique
Innovative
Mature

**Unlimited Production Scale**

Large-scale Production with Significant Cost Advantages

**Whole Process Without Chemical Additives**

Greener, Safer, More Secure

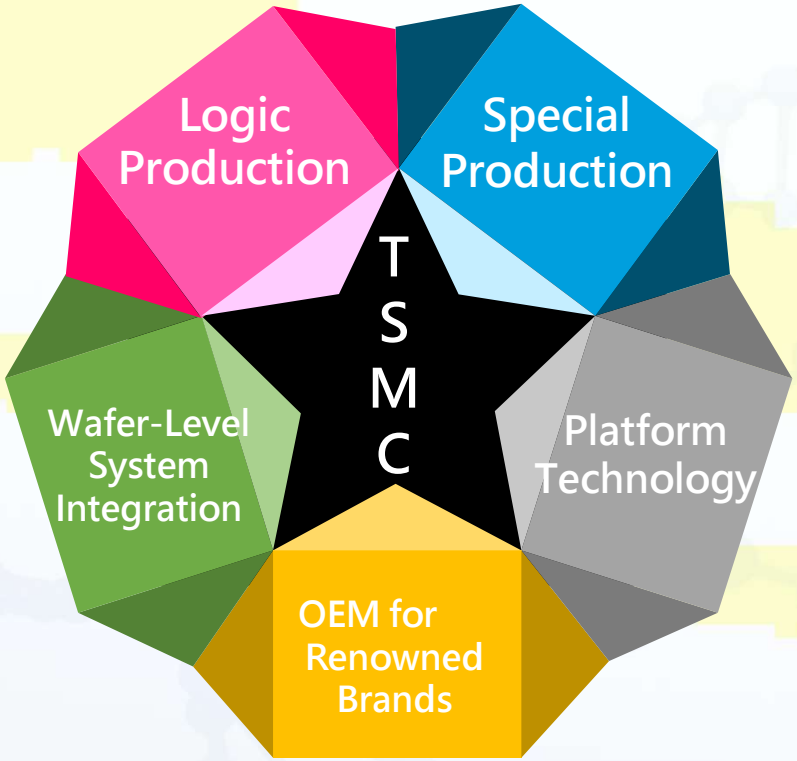
**Wide Range of Applications**

Biopharmaceuticals/Cosmetics

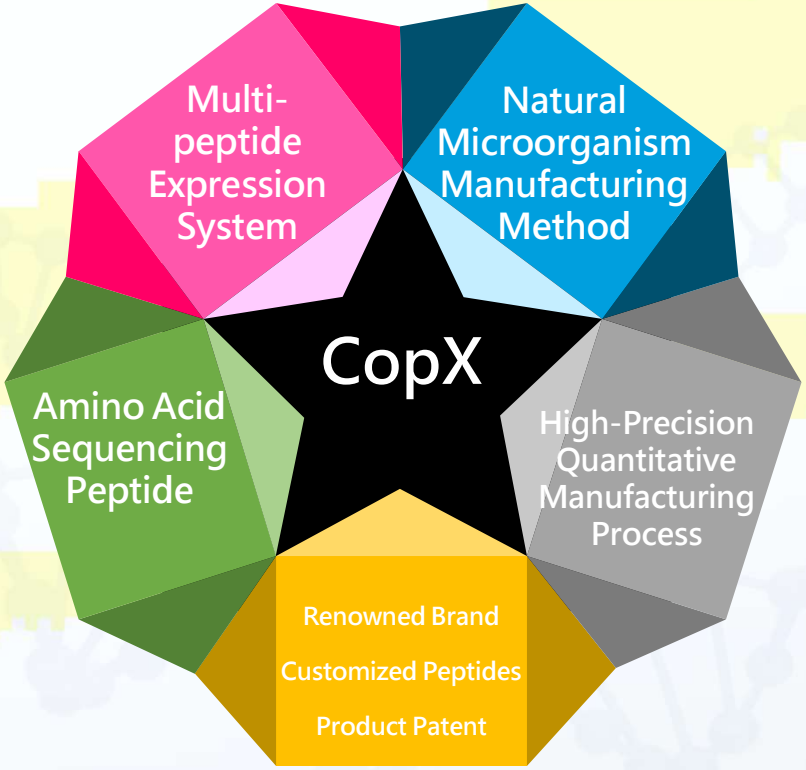
Functional foods/Dietary supplements

Agriculture, fishery, and animal husbandry

# TSMC of Peptides




VS




**TSMC's Unique Global Patented Processes: High Yield, High Technology, High Output**

The Foundation of Global Semiconductor Innovation

**CopX offers a range of high-quality, high-tech, and high-yield peptide services to clients worldwide.**

A Pioneer in Global Peptide Manufacturing Technology

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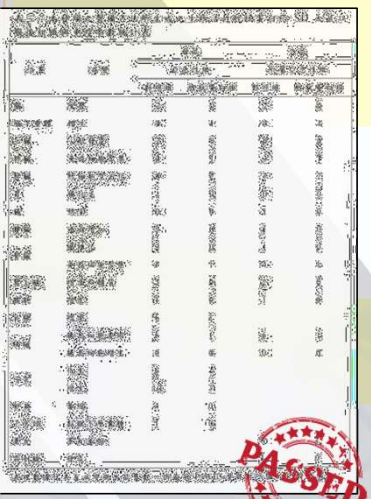
# SGS Analysis Report




- Non-toxicity Test Results


- Eight Essential Nutrients Report


- Microbiological & Heavy Metal Testing Report


- Plasticizer Testing Report


- Multi-Pesticide Residue Detection Report


- No Western Medicine Detection Test Report

# Product Liability

Insurance policy covers all ingredients for global marketing

國泰世紀產物保險股份有限公司
Cathay Century Insurance Co., Ltd.

## CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YY) 03/28/2023

PRODUCER
Cathay Century Insurance Ltd.
TEL : 886-2-27551299 FAX : 886-2-27557420

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOEDNOT AMEND, EXTENDOR ALTER THE COVERAGE AFFORDED BY THE POLICY BELOW.

INSURERS AFFORDING COVERAGE

INSURED
美商二維有限公司台灣分公司

INSURER A: Cathay Century Insurance Co., Ltd.
INSURER B:
INSURER C:
INSURER D:
INSURER E:

COVERAGERS

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIRMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDEDBY THE POLICIES DECSRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSION AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

| INSR LTR | TYPE OF INSURANCE | POLICY NUMBER | POLICY EFFECTIVE DATE(MM/DD/YY) | POLICY EXPIRATION DATE(MM/DD/YY) | LIMITS | |
|---|---|---|---|---|---|---|
| A | GENERAL LIABILITY | 150112PD01220 | Mar. 27th , 2023 | Mar. 27th, 2024 | EACH OCCURRENCE | US$340,000 |
| | CLAIMS MADE / OCCUR | | | | MED EXP(Any one person) | N/A |
| | X PRODUCTS LIABILITY | | | | Personal & adv injury | N/A |
| | CLAIMS MADE / X OCCUR | | | | GENERAL AGGREGATE | N/A |
| | GEN'L AGGREGATE LIMIT APPLIES PER: POLICY / PRO JECT / OC | | | | PRODUCTS LIABILITY AGG | US$340,000 |
| | AUTOMOBILE LIABILITY | | | | COMBINED SINGLE LIMIT (Ea accident) | $ |
| | ANY AUTO | | | | BODILY INJURY (Per person) | $ |
| | ALL OWNED AUTOS | | | | BODILY INJURY (Per accident) | $ |
| | SCHEDULED AUTOS | | | | PROPERTY DAMAGE (Per accident) | $ |
| | HIRED AUTOS | | | | | |
| | NON-OWNED AUTOS | | | | | |
| | GARAGE LIABILITY | | | | AUTO ONLY – ACCIDENT | $ |
| | ANY AUTO | | | | OTHER THAN AUTO ONLY: EA ACC | $ |
| | | | | | AGG | $ |
| | EXCESS LIABILITY | | | | EACH OCCURRENCE | $ |
| | OCCUR / CLAIMS MADE | | | | AGGREGATE | $ |
| | DEDUCTIBLE | | | | | $ |
| | RETENTION | | | | | $ |
| | WORKS COMPENSATION AND EMPLOYERS' LIABILITY | | | | WC STATU-TORY LIMITS / OTH-ER | |
| | | | | | E.L. EACH ACCIDENT | $ |
| | | | | | E.L.DISEASE-EA EMPLOYEE | $ |
| | | | | | E.L. DISEASE- POLICY LIMIT | $ |

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS
Lowe's Companies, Inc. and any and all subsidiaries are additional insured on the General Liability policy where required by written contract.
A waiver of subrogation is required on all policies where required by written contract.

(It's warranted that all products insured are complied with mandatory and/or voluntary safety standards of importing countries)
GEOGRAPHICAL LIMIT & JURISDICTION: Worldwide including USA/Canada
The certificate holder is named as an additional insured vendor per the vendors endorsement attached to the above referenced policy.

CERTIFICATE HOLDER | ADDITIONAL INSURED; INSURER LETTER: ___

CANCELLATION

Which named insured

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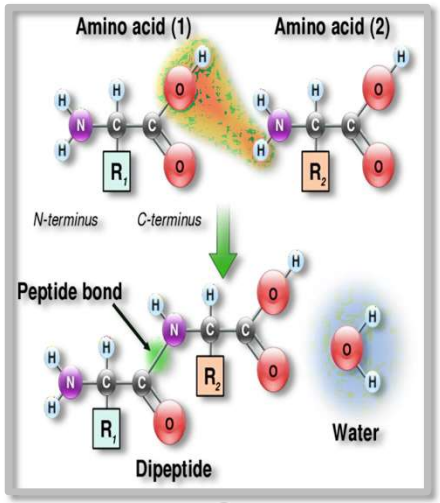
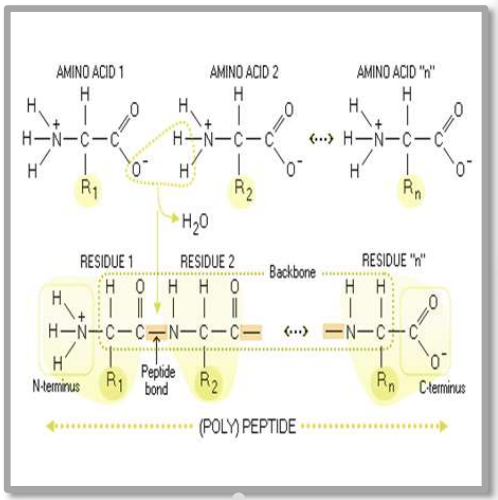
AUTHORIZED REPRESENTATIVE

Senior Vice President
CASUALTY DEPARTMENT (N2)

# Pioneering and Leading Global R&D and Manufacturing Processes




100% Accurate Amino Acid Sequence




Multi-peptide Expression System


Natural Microbial Manufacturing Method

Peptide Chain Protection to Prevent Degradation

High-Precision Quantitative Production Process for Natural Small Molecule Peptides

# Comparative Analysis of Different Peptide Technologies

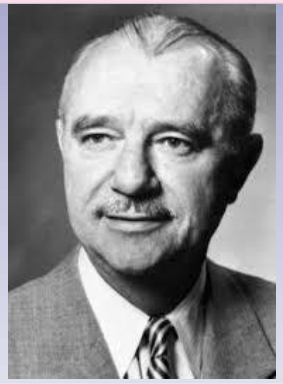
| Key Metrics | CopX Fermented | Chemical Synthesis | Gene Synthesis | Enzyme-Catalyzed Hydrolysis |
|---|---|---|---|---|
| Taken Orally? | Yes | No | No | Yes but cleaved |
| Administration Method | orally/injected | 75% injected | | No |
| Amino Acid Accuracy | 100% | High | Middle | Low |
| Peptide Concentration | High(60%) | High | Middle | Low |
| End Product Peptide Concentration | Very High (10mg/g) | High | Middle | Low |
| Functionality | Very Strong | Strong | Middle | Week |
| Amino Acid Synthesis Length | Unlimited | 10-100aa | Long | No order |
| Single Product Output | Tonnage | Kilograms | Kilograms | 100 Kilograms |
| Applications | Drugs<br>Food<br>Cosmetics | Drugs<br>Cosmetics | Drugs<br>Cosmetics | Food |

# Miraculous Peptide Nobel Evidence

Hermann Emil Fischer won the Nobel Prize for the world's first peptide in 1902

Sir Frederick Grant Banting
1923 Nobel Prize in Medicine

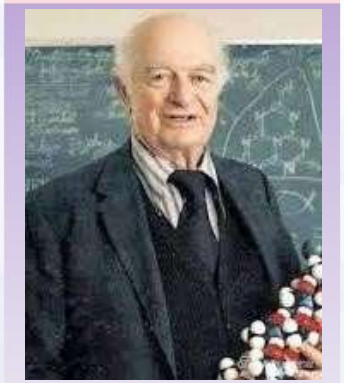
Vincent du Vigneaud
1955 Nobel Prize in Chemistry



Herber Boyer 1958
Nobel Prize in Biology

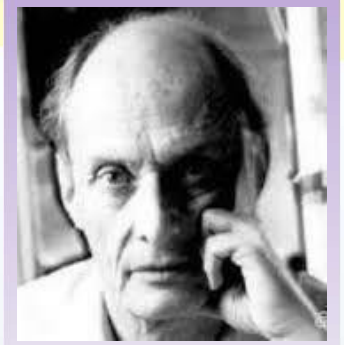
Rosalyn Sussman Yalow
1977 Nobel Prize in Physiology or Medicine

Robert Bruce Merrifield
1984 Nobel Prize in Chemistry

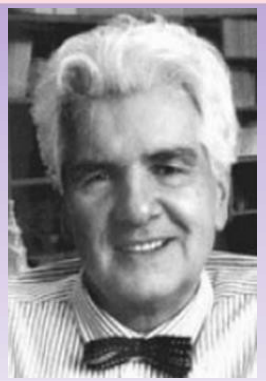


Stanley Cohen and Rita Levi-Montalcini
1986 Nobel Prize in Medicine

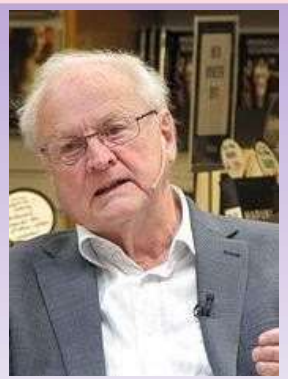

Alan Sieber
1993 Nobel Prize



Gunter Blobel 1999
Nobel Prize in Biomedicine

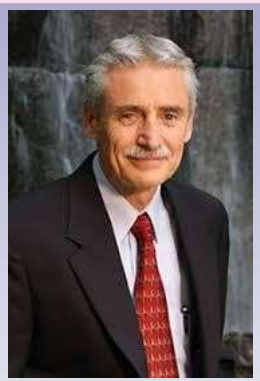


Arvid Carlsson
Nobel Prize in Chemistry 2000

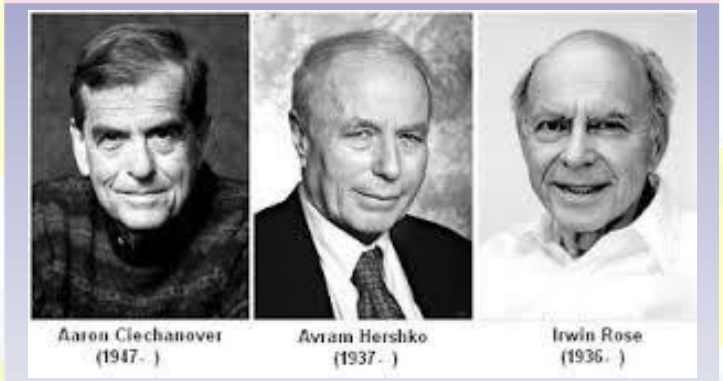


# Miraculous Peptide Nobel Evidence

Leland Hartwell 2001 Nobel Prize in Chemistry

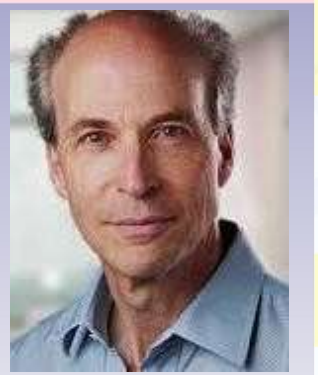


Aaron Ciechanover, Avram Hershko and Irwin Rose 2004 Nobel Prize in Chemistry




Andrew Z. Fire, Craig C. Mello 2006 Nobel Prize in Physiology or Medicine

Roger D. Kornberg 2006 Nobel Prize in Chemistry



Jack W.Szostak, Carol W.Greider, Elizabeth H.Blackburn 2009 Nobel Prize in Physiology or Medicine


Aziz Sancar, Tomas Lindahl and Paul Modrich 2015 Nobel Prize in Chemistry

Frances H. Arnold, George P. Smith and Gregory P. Winter 2018 Nobel Prize in Chemistry

# CopX Products

| Ranking | Health products: suitable for a variety of animals | Skin Care | Others |
|---|---|---|---|
| 1 | Longevity I, Longevity II | Whitening | Sugar Protein (Brazzein etc.) |
| 2 | Bone & Muscle | Sun Protection | Endotoxin Neutralizer |
| 3 | Sleep Well | Anti Wrinkle | (Chicken, duck, beef, pig, puffer fish, etc.) flavor peptides |
| 4 | Anti Allergy | Anti Allergy | (coffee, cocoa, chocolate, etc.) food peptides |
| 5 | Lower Sugar Level | Eye Bag Remover | (Precious metals, rare earths, lithium, cobalt, etc.) metal mining peptides |
| 6 | Growth Protein | Anti Hair Loss | (Anti moisture, dust, odor) textile peptides |
| 7 | Healthy Organ Protein | Black/Red Hair | |
| 8 | Healthy Bones | | |
| 9 | Better Slim | | |
| 10 | 6 in 1 (Lower blood pressure + blood sugar + blood lipids + cholesterol + gout + allergies) | | |

Note: Some products are still under trial and development

Note: Peptide Biotech has developed more than 30 products in Taiwan over the past 20 years. Each product includes 1-25 peptides, with a total of more than 500 peptides.

# Longevity Product

BIOGERONTOLOGY

## Peptide Promotes Overcoming of the Division Limit in Human Somatic Cell

V. Kh. Khavinson, I. E. Bondarev, A. A. Butyugov, and T. D. Smirnova

Translated from *Byulleten' Eksperimental'noi Biologii i Meditsiny*, Vol. 137, No. 5, pp. 573-577, May, 2004
Original article submitted January 24, 2004

Biogerontology (2010) 11:139–149
DOI 10.1007/s10522-009-9249-8

RESEARCH ARTICLE

## Peptide bioregulation of aging: results and prospects

Ann. N.Y. Acad. Sci. ISSN 0077-8923

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES
Issue: *Thymosins in Health and Disease*

## Thymosin β4: structure, function, and biological properties supporting current and future clinical applications

David Crockford, Nabila Turjman, Christian Allan, and Janet Angel
RegeneRx Biopharmaceuticals Inc., Rockville, Maryland, USA
Address for correspondence: David Crockford, RegeneRx Biopharmaceuticals Inc., 15245 Shady Grove Road, Suite 470, Rockville, MD 20850, USA. dcrockford@regenerx.com

Published studies have described a number of physiological properties and cellular functions of thymosin β4 (Tβ4), the major G-actin-sequestering molecule in mammalian cells. Those activities include the promotion of cell migration, blood vessel formation, cell survival, stem cell differentiation, the modulation of cytokines, chemokines, and specific

*The FASEB Journal* • Review

## Biological activities of thymosin $\beta_4$ defined by active sites in short peptide sequences

**Gabriel Sosne,*,[1] Ping Qiu,[†] Allan L. Goldstein,[†] and Michelle Wheater[‡]**
*Department of Opthalmology and Anatomy/Cell Biology, Wayne State University School of Medicine, Detroit, Michigan, USA; [†]The George Washington University School of Medicine and Health Sciences, Washington, District of Columbia, USA; and [‡]University of Detroit Mercy School of Dentistry, Detroit, Michigan, USA

Review

## From lab to bedside: emerging :linical applications of thymosin $\alpha_1$

llan L Goldstein[†] & Adam L Goldstein[*]
*'he George Washington University School of Medicine and Health Sciences, Washington DC, USA*
*Medical School for International Health at Ben-Gurion University of the Negev, Be'er Sheva, Israel*

# Bone & Muscle Product

The Eurasian Journal of Medici

Eurasian J Med. 2016 Jun; 48(2): 95–101.
doi: 10.5152/eurasianjmed.2015.15030

## Effects of Native Type II Collagen Treatment (
## Randomized Controlled Trial

Fulya Bakilan,[1] Onur Armagan,[2] Merih Ozgen,[2] Funda Tascioglu,[2] Ozge Bolluk,[3] and Ozkan Alatas[4]

Author information ▸ Article notes ▸ Copyright and License information Disclaimer

Int J Med Sci. 2009; 6(6): 312–321.
Published online 2009 Oct 9. doi: 10.7150/ijms.6.312

PMCID: PMC2764342
PMID: 19847319

## Safety and efficacy of undenatured type II collagen in the treatment of osteoarthritis of the knee: a clinical trial

David C. Crowley,[1] Francis C. Lau,[2] Prachi Sharma,[1] Malkanthi Evans,[1] Najla Guthrie,[1] Manashi Bagchi,[2] Debasis Bagchi,[2,3] Dipak K. Dey,[4] and Siba P. Raychaudhuri[5,6]✉

Author information ▸ Article notes ▸ Copyright and License information Disclaimer

Int J Food Sci Nutr. 2010 Feb;61(1):52-60. doi: 10.3109/09637480903257711.

## Hydroxyproline-containing dipeptides and tripeptides quantified at high concentration in human blood after oral administration of gelatin hydrolysate

Satomi Ichikawa [1], Masashi Morifuji, Hiroki Ohara, Hitoshi Matsumoto, Yasuo Takeuchi, Kenji Sato

Full text links
Mary Ann Liebert

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Similar articles
Indoleamine 2,3-dioxygenase-expressing dendritic cells are involv [Arthritis Res Ther. 2008]
Review An overview of a novel, water-soluble undenatured type II collage [J Am Coll Nutr. 2015]
CTLA4-Ig modifies dendritic cells from mice with collagen-induced arthritis to [J Autoimmun. 2010]
Kirenol exerts a potent anti-arthritic effect in collagen-induced arthritis i [Phytomedicine. 2012]
Review Type II collagen oral tolerance, mechanism and role in cc [Mod Rheumatol. 2009]

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# Momordica Charantia Peptide

J Agric Food Chem. 2017 Oct 25;65(42):9266-9274. doi: 10.1021/acs.jafc.7b03583. Epub 2017 Oct 17.

## Gastro-Resistant Insulin Receptor-Binding Peptide from Momordica charantia Improved the Glucose Tolerance in Streptozotocin-Induced Diabetic Mice via Insulin Receptor Signaling Pathway

Hsin-Yi Lo, Chia-Cheng Li, Feng-Yuan Chen, Jaw-Chyun Chen [1], Chien-Yun Hsiang, Tin-Yun Ho [2]

Affiliations + expand

PMID: 28994284 DOI: 10.1021/acs.jafc.7b03583

to in Glucose Tolerance in Streptozotocin-Induced Diabetic Mice via Insulin Receptor Signaling Pathway

J Clin Diagn Res. 2016 Apr;10(4):BF01-4. doi: 10.7860/JCDR/2016/18161.7653. Epub 2016 Apr 1.

## Evaluation of Protein Kinase Cβ and PPARγ Activity in Diabetic Rats Supplemented with Momordica charantia

Swetha Chandru [1], Prashant Vishwanath [2], Devananda Devegowda [3], Suresha Nagaraja Ramasamudra [4], Akila Prashant [2], Basavanagowdappa Hathur [5]

Affiliations + expand

PMID: 27190792 PMCID: PMC4866090 DOI: 10.7860/JCDR/2016/18161.7653

Free PMC article

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Food Chem. 2008 Nov 15;111(2):415-20. doi: 10.1016/j.foodchem.2008.04.006. Epub 2008 Apr 9.

## Purification and characterisation of a hypoglycemic peptide from Momordica Charantia L. Var. abbreviat Ser

Xiaoqing Yuan [1], Xiaohong Gu [2], Jian Tang [3]

Affiliations + expand

PMID: 26047444 DOI: 10.1016/j.foodchem.2008.04.006

KEYWORDS: Momordica charantia; diabetes; gastro-resistant peptide; hypoglycemia; insulin receptor

Food Chem. 2016 Aug 1;204:298-305. doi: 10.1016/j.foodchem.2016.02.135. Epub 2016 Feb 24.

## Identification of the bioactive and consensus peptide motif from Momordica charantia insulin receptor-binding protein

Hsin-Yi Lo [1], Chia-Cheng Li [1], Tin-Yun Ho [2], Chien-Yun Hsiang [3]

Affiliations + expand

PMID: 26988505 DOI: 10.1016/j.foodchem.2016.02.135

cornucopia of health: a revie [Curr Mol Med. 2011]

# Anti Allergy Product

> Biochemistry. 2001 Aug 21;40(33):9828-35. doi: 10.1021/bi010936(

## A novel family of hairpin peptides tl activity by binding to the high-affin

G R Nakamura [1], M A Starovasnik, M E Reynolds, H B Lowman

Affiliations + expand

PMID: 11502176 DOI: 10.1021/bi0109360

Review > Allergy. 1997 Dec;52(12):1155-69. doi: 10.1111/j.1398-9995.1997.tb02518.x.

## Peptide blocking of IgE/receptor interaction: possibilities and pitfalls

B A Helm [1], A C Spivey, E A Padlan

Affiliations + expand

PMID: 9450133 DOI: 10.1111/j.1398-9995.1997.tb02518.x

> Mol Biosyst. 2013 Nov;9(11):2853-9. doi: 10.1039/c3mb70286c.

## An IgE receptor mimetic peptide (PepE) protects mice from IgE mediated anaphylaxis

Joseph S Zhou [1], Annamaria Sandomenico, Valeria Severino, Oliver T Oettgen, Menotti Ruvo

Affiliations + expand

PMID: 24056872 PMCID: PMC3820499 DOI: 10.1039/c3mb70286c

> J Biol Chem. 2010 May 14;285(20):15314-23. doi: 10.1074/jbc.M110.104281. Epub 2010 Mar 19.

## The signal peptide of the IgE receptor alpha-chain prevents surface expression of an immunoreceptor tyrosine-based activation motif-free receptor pool

Barbara Platzer [1], Edda Fiebiger

Affiliations + expand

PMID: 20304923 PMCID: PMC2865261 DOI: 10.1074/jbc.M110.104281

# Chunpu Resveratrol Literature

> Experientia. 1987 Oct 15;43(10):1110-1. doi: 10.1007/BF01956052.

## A novel fibrinolytic enzyme (nattokinase) in the vegetable cheese Natto; a typical and popula soybean food in the Japanese diet

H Sumi [1], H Hamada, H Tsushima, H Mihara, H Muraki

Affiliations + expand

PMID: 3478223 DOI: 10.1007/BF01956052

Randomized Controlled Trial > Sci Rep. 2015 Jun 25;5:11601. doi: 10.1038/srep11

## A single-dose of oral nattokinase potentiates thrombolysis and anti-coagulation profiles

Yuko Kurosawa [1], Shinsuke Nirengi [1], Toshiyuki Homma [1], Kazuki Esaki [2], Mitsuhiro Ohta [3], Joseph F Clark [4], Takafumi Hamaoka [1]

Affiliations + expand

PMID: 26109079 PMCID: PMC4479826 DOI: 10.1038/srep11601

PMID: 28315071 DOI: 10.1007/164_2017_7


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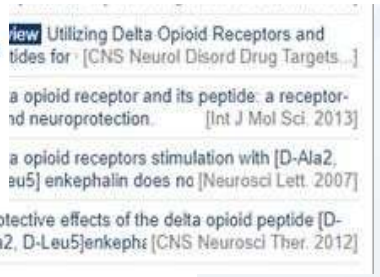
Food and Chemical Toxicology

Volume 61, November 2013, Pages 215-226

## Antioxidant effects of resveratrol in cardiovascular, cerebral and metabolic diseases

Albino Carrizzo [a], Maurizio Forte [b], Antonio Damato [a], Valentina Trimarco [c], Francesco Salzano [d], Michelangelo Bartolo [e], Anna Maciag [f], Annibale A. Puca [f, g], Carmine Vecchione [a, g]



# Anti-gout Peptides

Arthritis Res Ther. 2009;11(5):R151. doi: 10.1186/ar2827. Epub 2009 Oct 8.

## Melanocortin peptides inhibit urate crystal–induced activation of phagocytic cells

Franco Capsoni [1], Anna Maria Ongari, Eva Reali, Anna Catania

Affiliations + expand

PMID: 19814819 PMCID: PMC2787256 DOI: 10.1186/ar2827

Free PMC article

### Abstract

**Introduction:** The melanocortin peptides have marked anti-inflammatory potential, primarily through inhibition of proinflammatory cytokine production and action on phagocytic cell functions. Gout is an acute form of arthritis caused by the deposition of urate crystals, in which phagocytic cells and cytokines play a major pathogenic role. We examined whether alpha-melanocyte-stimulating hormone (alpha-MSH) and its synthetic derivative (CKPV)2 influence urate crystal-induced monocyte

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REVIEW

## Peptide-based therapies for arthritis

*Marina Ali &*
*Nicholas Manolios†*

*†Author for correspondence*
*University of Sydney,*
*Rheumatology Dept,*
*Westmead Hospital,*
*Westmead 2145, Sydney,*
*Australia*
*Tel.: +61 298 458 099;*
*Fax: +61 298 458 317;*
*nickm@westgate.wh.usyd.edu.au*

In this review we focus on peptide and peptidomimetic-based approaches in the treatment of inflammatory arthritis and outline what is in the pipeline for future therapeutic possibilities. Since immunomodulation is the key process influencing an inflammatory response, this review highlights strategies aimed at interfering with the immune synapse. Peptides used to block cytokines, and newer promising therapies on the horizon for arthritis are discussed. Finally, we review the mechanistic-based strategy used to develop transmembrane peptides and outline their potential use in arthritis and other fields of medicine.

To date, therapeutic drugs used in arthritis have largely consisted of the use of small molecules

stability and the high costs involved with manufacturing. However, trends are changing and

# Lipid-lowering Peptides

JCI The Journal of Clinical Investigation

## Effect of gastric inhibitory polypeptide on plasma levels of chylomicron triglycerides in dogs.

T Wasada, … , B Howard, R H Unger

*J Clin Invest.* 1981;68(4):1106-1107. https://doi.org/10.1172/JCI110335.

Research Article

To determine whether gastric inhibitory polypeptide (GIP) promotes the clearance of chylomicron triglycerides (TG) from the circulation in dogs, chyle collected from donor dogs via a thoracic duct fistula was infused at a rate of 2 ml/min i.v. into normal recipient dogs during an infusion of either porcine GIP (1 microgram/kg per h) or saline as a control. In the GIP-infused dogs the rise in plasma TG was significantly below that of the control animals [mean peak of 36 +/- 4 mg/dl vs. 82 +/- 18 mg/dl (P less than 0.05)]. It is concluded that GIP exerts an effect upon the removal of chylomicron TG from the blood. The results suggest that GIP may play a physiologic role in the disposition of ingested fat.

Cyp7a1$^{-/-}$ mice. Current studies suggest that increased Cyp7a1 expression and bile acid synthesis am
activation of FXR, whereas reduced bile acid synthesis aggravates MCD diet-induced hepatic inflamma
and cholesterol homeostasis is important for protecting against liver injury and nonalcoholic fatty liver d



KEYWORDS: Takeda G protein-coupled receptor 5; bile acid; farnesoid X receptor; nuclear receptor

American Diabetes Association. diabetes

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Section V: The Incretin Pathway

## Gastric Inhibitory Polypeptide and Glucagon-Like Peptide-1 in the Pathogenesis of Type 2 Diabetes

Michael A. Nauck1, Birgit Baller2 and Juris J. Meier23

Author Affiliations

Address correspondence and reprint requests to Prof. Dr. med. Michael Nauck, Diabeteszentrum Bad

Diabetes. 1979 Dec;28(12):1141-2. doi: 10.2337/diab.28.12.1141.

## Gastric inhibitory polypeptide enhanced lipoprotein lipase activity in cultured preadipocytes

R H Eckel, W Y Fujimoto, J D Brunzell

PMID: 510813 DOI: 10.2337/diab.28.12.1141

### Abstract

Fat feeding stimulated the release of gastric inhibitory polypeptide (GIP) without concomitant insulin secretion. Since antilipolytic effects of GIP have been demonstrated and the uptake of triglyceride fatty acid by adipose tissue postprandially is a process reciprocally regulated with lipolysis, a stimulatory role of GIP on adipose tissue lipoprotein lipase activity may be present. After cultured preadipocytes were incubated for 2 h with GIP, the release of lipoprotein lipase activity into the culture medium and the total cellular activity present in acetone-ether powders of cells were measured. GIP stimulated significant increases in the lipoprotein lipase activity released into the culture medium and in cells. A dose response relationship was strongest for the effect of GIP on the enzyme activity in extracts of acetone-ether powders of the cells. The increased lipoprotein lipase activity produced by GIP could provide a mechanisms for clearance of chylomicron triglyceride after

# Amyloidin Literature

› Int J Biol Macromol. 2020 Aug 1;156:938-948. doi: 10.1016/j.ijbiomac.2020.03.085.
Epub 2020 Mar 12.

## A bioactive polypeptide from sugarcane selectively inhibits intestinal sucrase

Shaik Abduldileep [1], Raja Narayanasamy [1], Dandamudi Usharani [1], Ajeet Singh [2], Ram Rajasekhara [3]

Affiliations + expand

PMID: 32173443 DOI: 10.1016/j.ijbiomac.2020.03.085

### Abstract

Human sucrase enzyme is a key therapeutic target for type 2 diabetes. While sugarcane sucrase inhibitor (sucinh) modulates invertase activity thereby accumulates sucrose. Molecular level understanding of sucinh towards mammalian α-glucosidases is scarce. The interaction of sucinh with human sucrase was identified and the association of these proteins was confirmed using co-

International Journal of *Molecular Sciences*

MDPI

*Article*

## Bioactive Peptides from Germinated Soybean with Anti-Diabetic Potential by Inhibition of Dipeptidyl Peptidase-IV, α-Amylase, and α-Glucosidase Enzymes

Marcela González-Montoya [1], Blanca Hernández-Ledesma [2], Rosalva Mora-Escobedo [1] and Cristina Martínez-Villaluenga [3,*]

JDI Journal of Diabetes Investigation
Official Journal of the Asian Association for the Study of Diabetes

Original Article | Open Access

## Peptide modulators of alpha-glucosidase

Irena Roskar, Peter Molek, Miha Vodnik, Mateja Stempelj, Borut Strukelj, Mojca Lunder

First published: 03 April 2015 | https://doi.org/10.1111/jdi.12358 | Citations: 12

# Sugar Protein Brazzein

**Properties of Brazzein**

**High Sweetness:** Brazzein is approximately 2000 times sweeter than sucrose (table sugar), providing a clean and sugar-like taste without lingering bitterness or aftertaste.

**Heat Stability:** Brazzein retains its sweetness even under high temperatures, making it suitable for baking and cooking applications.

**pH Stability:** Brazzein maintains its sweetness across a wide pH range, both in acidic and alkaline environments, allowing its use in acidic beverages and alkaline food products.

**Water Solubility:** Brazzein readily dissolves in water, facilitating its incorporation into liquid foods and beverages.

**Safety:** Brazzein has been granted Generally Recognized as Safe (GRAS) status by the U.S. Food and Drug Administration (FDA), affirming its safety as a food additive.

# Metal Peptides for Mining

## Direction

1. Produce iron particles, which are like fine iron powder on a tape, and then coat the iron particles with peptides to become peptide iron particles
2. Grind the ore into fine powder, expose the metal surface, and then add water
3. Add the peptide iron particles into the mineral powder water and stir for a few minutes. The metal will be tightly wrapped by the peptide, that is, it will be wrapped by the peptide iron particles.
4. Use an electrified electromagnet to adsorb and collect the peptide iron particles. Of course, the metal is also collected together.
5. The metal is separated from other minerals, that is, the metal and peptide iron particles are enriched
6. After decomposing the peptide with a special solution, the metal and iron particles are naturally separated.
7. Use the large electric magnet again to absorb the independent iron particles away, and the only thing left is the metal to be collected.

**The surface structure of each metal molecule is different. Based on this characteristic, we choose peptides with opposite shapes to bind to the metal. This can produce extremely strong adhesion and is used for metal mining.**

## Process Characteristics

- Can be used for precious metals, lithium, cobalt, rare earths, and other metals
- Mining recovery rate is high 90%-99%, existing tailings may be worth processing
- Does not pollute the environment. Only water is used for physical separation. There is no chemical reaction and no chemicals are used. Water and iron particles can be recycled.
- The reaction is fast, more direct and effective than fire method and chemical method.
- Metal specificity, easy separation of different metals
- Can effectively, easily and quickly remove heavy metal pollution in water or soil
- Iron peptide particles can be mass-produced at a reasonable price

# Metal Peptides for Mining

## Advantages

- Cost-Effective Peptide Synthesis and Expanding Applications
- Overcoming Cost Barriers in Peptide Production
- Simplified and Enhanced Peptide Iron Microparticle Coating
- Expanding Production Capabilities
- Global Market Reach

**CopX**'s cost-effective peptide synthesis technology, simplified production processes, and expanding product portfolio position the company at the forefront of peptide innovation. With its commitment to quality, sustainability, and global reach, **CopX** is poised to revolutionize various industries and address critical challenges in metal extraction and purification.

## Development Process

**CopX**'s metal peptide development process involves a series of carefully orchestrated steps to produce high-quality, cost-effective peptide-based solutions for metal extraction and purification.

1. Target Metal Selection and Yeast Engineering
2. Iron Microparticle Synthesis
3. Metal Peptide Coating and Testing
4. Scale-up and Industrialization
5. Continuous Improvement and Optimization
6. Iron Microparticle Recycling and Sustainability

Advanced recycling techniques are implemented to minimize waste generation, promote sustainability, and further reduce production costs.

# Endotoxin Removal Peptide Market Analysis

## Harnessing Endotoxin Peptides to Enhance Wine Marc Utilization in Feed: Unveiling Market Potential

Wine marc, a byproduct generated during wine production, is a rich source of protein, fat, and fiber. However, its substantial endotoxin content, particularly lipopolysaccharide (LPS) from Gram-negative bacteria, poses health risks to animals when used in feed.

The potential market advantages of utilizing endotoxin peptides to enhance wine marc utilization in feed are compelling:

- Improved Animal Health and Performance: Endotoxin peptides can counteract the negative effects of endotoxins on animal health, boosting their immune system, disease resistance, growth, and reproduction.
- Reduced Feed Costs: Wine marc, a relatively inexpensive feed ingredient, can lower overall feed costs when its inclusion rate is increased.
- Minimized Environmental Pollution: Improper disposal of wine marc can lead to environmental contamination. Many wineries incur costs associated with managing this substantial waste stream.

## Driving Factors for Adoption

- Supportive Government Policies: Governmental policies promoting feed safety and environmental protection can create a favorable environment for endotoxin peptide utilization.
- Feed Industry Recognition: Recognizing the potential value of endotoxin peptides, feed companies are actively developing and promoting these products.
- Growing Demand from Livestock Producers: Driven by the desire to enhance animal health, reduce feed costs, and minimize environmental impact, livestock producers are increasingly seeking endotoxin peptide solutions.

## Conclusion

The potential market for endotoxin peptides in enhancing wine marc utilization in feed is vast. As technology advances and market awareness grows, endotoxin peptides are poised to play a significant role in the feed industry and animal husbandry. By adding **CopX**'s Longevity and Growth proteins to the feed would further transforming a waste product into a valuable resource.

# Thank you

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