

## 領先科研

## Rock Solid Scientific Foundation

Nu Skin 自創辦以來一直在抗老化科學中扮演著領導者的角色。ageLOC®科學是一項革命 性的科研突破,超越針對老化表徵領域直擊老化根源。Nu Skin洞悉基因表達與維持青春之 間有重大關係。這革命性的發現是由 Nu Skin 獨家與全球頂尖的科學家合作,並以數百萬美 元資金,再結合多年於抗老化和遺傳學上的科學研究集結而成。ageLOC®技術的發展為市 場提供了更前瞻的科研配方及卓越的抗老產品,這些躍進亦有助促進及深化業界發展。我們 相信 ageLOC®科學是活出年輕的最終極方案。

In anti-aging science, Nu Skin is leading the way since inception. ageLOC® science is a scientific breakthrough that goes beyond the signs to target the ultimate sources of aging. Nu Skin has discovered how crucial gene expression is to retaining youth. This revolutionary discovery is based upon Nu Skin's exclusive collaborations with leading scientists around the globe, millions of dollars in development, and years of combined anti-aging and genetic research. The development of ageLOC® technology has resulted in more advanced scientific formulations and enhanced anti-aging products that will redefine the industry. We believe ageLOC® science is the answer to anti-aging.

# (の age**Loc®** 的科研動力 Science Engine





如新抗衰老科研中心 Nu Skin Enterprises Center for Anti-Aging Research

抗衰老科研顧問團 Anti-Aging Scientific Advisory Board

美國生命基因科技中心 LifeGen Technologies

美國史丹福大學 Stanford University

# 抗衰老科研顧問團

## Anti-Aging Scientific Advisory Board

作為全球首屈一指的抗衰老公司,我們已成立了 Nu Skin 抗衰老科研顧問團以專門研製抗衰老產品,當中包括營養補充品及肌膚護理產品。我們 相信抗衰老科研顧問團會加強我們所有獨有性的研究並產生長久而深遠的影響,帶領出更多的突破,更會成為我們於未來10年多項創新突破性 產品的最主要研發的渠道。

抗衰老科研顧問團匯集了最優秀的人才,他們增強了抗老化的研究和發展能力,當中涉及了護膚品、營養補充品、基因體學及生物信息學。通過 分享他們的知識、經驗和才能,確立了Nu Skin 的抗老化產品是走在產品研發的最尖端。透過這些科研合作發展,Nu Skin 將繼續為您提供獨有 的抗老化產品並助您活得更年輕、更優異。

With the commitment to become the world's premiere anti-aging company, we have the Nu Skin Anti-Aging Advisory Scientific Board to better reflect our anti-aging focus and competitive advantage in both nutrition and skin care. We believe this board will enhance our proprietary research and have a far-reaching impact, leading to more breakthroughs and a robust pipeline of new products for the next ten years.

We believe the Anti-Aging Scientific Advisory Board brings together the best minds in anti-aging research in the areas of skin care, nutrition, genomics and bioinformatics to enhance our research and development efforts at Nu Skin. By sharing their knowledge, experience and talent, these experts ensure that Nu Skin stays on the forefront of anti-aging product development. Through such scientific collaborations, Nu Skin continues to provide exclusive anti-aging products that demonstrate a real difference to help people live young.



力祺 博士 nael Jeffrey Balick, Ph.D.

H典烏普薩拉大學BCM製藥學院生藥學系教授

國史丹福大學化學系榮譽教授





美國史丹福大學生物進化及遺傳學教授

lexa Boer Kimball M.D. M.P.H.

美國哈佛大學醫學院皮膚研究實驗中心總監

比卡羅來納州威克森林大學醫學院 國肯薩斯大學化學系傑出教授



Prof. Koji Nakanishi, Ph.D.

美國哥倫比亞大學化學系資深教授 Centennial Professor of Chemistry,

E. Lester A. Mitscher, Ph.D.



美國加州大學柏克萊分校分子藥理學及



美國生命基因科技中心創辦人, 美國威斯康辛大學遺傳學及醫學遺傳學教授



德國慕尼克Ludwig Maximilians 大學 製藥學研究中心製藥學研究所榮譽退休教授



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# 如新抗衰老科研中心

# Nu Skin Enterprises Center for Anti-Aging Research

如新抗衰老科研中心位於普羅沃市,是全球3個研究中心其中之一, 約有50位科學家及擁有一百七十五萬美元的設備。Nu Skin 擁有高品 質的肌膚護理產品及營養補充品,於市場上定位成一家首屈一指的抗 老化公司。

The Nu Skin Enterprises Center for Anti-Aging Research in downtown Provo is one of three global research centers and houses nearly 50 scientists and \$1.75 million of equipment. With top-rated skin care and nutritional products, Nu Skin is positioned as a premier anti-aging company.





# 美國生命基因科技中心

作為策略夥伴,Nu Skin與美國生命基因科技中心擁有獨家合作協議,可利用其公司獨有的抗老化技術來分析影響老化的基因的表達方式及途徑。美國生命基因科技中心的宗旨是探究基因體的老化過程藉以達致延伸人類健康壽命的最終目標。美國生命基因科技中心由美國威斯康辛大學老人學及遺傳學專家魏德理教授及彭樂濤教授成立。魏德理教授及彭樂濤教授曾出版超過200多份關於老化和限制攝取熱量的科學論文及書籍,讓我們能認識影響人體老化的青春啟動因標。這些研究長達30年之久,為我們提供保持青春的重要關鍵。美國生命基因科技中心的前瞻性研究成果已獲得多項專利,而我們預期現正與他們合作進行的多項研究將會帶來進一步的重要突破及知識產權。

Nu Skin 's collaboration with LifeGen in an exclusive agreement by leveraging LifeGen's proprietary methods regarding gene expression profiling and pathways affected by aging. The mission of LifeGen Technologies is to discover the genetic basis of the aging process with the ultimate goal of increasing a healthy life span. LifeGen was co-founded by Richard Weindruch, Ph.D., and Tomas Prolla, Ph.D., professors at the University of Wisconsin-Madison and leaders in the fields of gerontology and genetics. Dr. Weindruch and Dr. Prolla have published over 200 scientific papers and books on aging and caloric restriction, which now allows us to understand the arsupermarkers of aging. These studies, based on 30 years of research, have given us a key to the preservation of youth. LifeGen's pioneering research has resulted in several pending patents, and ongoing research undertaken in collaboration with Nu Skin is expected to yield further important intellectual property.



學術地位: 於權威科學期刊《Science》上 發表的文章

Landmark: Science Publications

限制攝取熱量能延長恆河猴的發病和死亡率 Caloric restriction delays disease onset and mortality in rhesus monkeys

科學期刊 Science. 2009; 325(5937): 201-4 魏德理等著

老化基因表達圖譜及其熱量限制 Gene expression profile of aging and its retardation by caloric restriction

科學期刊 Science. 1999; 285(5432): 1390-3 魏德理、彭樂濤等著

\* 有關研究獲國際媒體爭相報導,包括紐約時報、洛杉磯時報、 倫敦時報、英國廣播公司、華爾街日報、 CNN、美國哥倫比 亞廣播公司等等

> I he study had been reported in all international newspapers including New York Times, LA Times, London Times, BBC, Wall Street Journal, CNN, CBS

# 美國史丹福大學

## Stanford University

美國史丹福大學研究人員集中分析人類發展及老化時的基因表達方式,同時也探索基因如何控制 皮膚老化的最新模式。Nu Skin與美國史丹福大學之間的協議目的在增加了解人體老化的基礎途徑, 並透過基本科學再應用到人類身上。這項協議更包括Nu Skin能使用美國史丹福大學於皮膚科臨床試 驗的專長。

re also explored novel modes of gene control in aging skin. Nu Skin's agreement with Stanford aims to increase understanding of fundamental aging mechanisms in humans by translating insights from basic science in man application. The agreement also includes access to Stanford's expertise in dermatological clinical trials.

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只有Nu Skin能夠辨識抗老關鍵的青春啟動因標 - 青春基因群組(YGCs)。
Only Nu Skin can IDENTIFY critical arSuperMarkers called Youth Gene Clusters (YGCs).

Nu Skin以ageLOC®核心科技鎖定青春基因群組(YGCs)。

Nu Skin TARGETS Youth Gene Clusters (YGCs) with proprietary ageLOC® technology.

ageLOC®擁有獨家科技藉由重設青春基因群組 (YGCs),來逆轉老化現象並維持年輕。

ageLOC® delivers proprietary solutions that RESET your Youth Gene Clusters (YGCs) to reverse the signs of aging and preserve youth.

# 直擊及辨識老化根源 Target and Identify the Ultimate Sources of Aging

Nu Skin 以全新的抗老化科學從基因層面採究人類老化的成因及歷程。科學界較早前已對人類基因體有進一步瞭解,然而 Nu Skin 突破性的ageLOC®科學將對人類基因體起著更有意義的詮釋方式。Nu Skin與抗老化及遺傳學專家共同合作,辨識出重要的青春啟動因標,稱青春基因群組(YGCs),亦是在我們的基因體中能影響我們老化過程的重要群組。我們相信只要找出及辨識到這些基因群組,就能針對地處理老化的最終根源。

Nu Skin is taking the science of anti-aging to a completely new level by studying the genetic origins of how and why we age. The scientific community has access to the Human Genome, but Nu Skin's breakthrough ageLOC® science gives us the ability to interpret it in a meaningful way. Nu Skin, in collaboration with anti-aging and genetics experts, has identified critical arSuperMarkers called Youth Gene Clusters (YGCs) which are key groups or functional clusters of genes that help influence how we age. Nu Skin believes that finding and identifying these functional groups of genes is the key to addressing aging at the source.

青春啟動因標 - 又稱為"與老化有關的青春啟動因標", 乃Nu Skin專有用詞,形容身體內影響我們老化的化學物,亦是人體老化的根源。

**arSuperMarkers** - known as "Age-related super markers", is a proprietary Nu Skin term to describe components of body chemistry that influence how we age. arSuperMarkers are the ultimate sources of aging in the body.

青春基因群組 (YGCs) - Nu Skin專有用詞,形容一些影響老化過程的基因群組。 青春基因群組 (YGCs) 是否處於最佳活躍水平將影響我們老化過程時表現的特質及整體外觀。

**Youth Gene Clusters (YGCs)** – a proprietary Nu Skin name for a functional group of genes that affect the aging process. Youth Gene Clusters (YGCs) functioning at optimal activity patterns can affect how we look and feel as we age.

ageLOC®直擊老化的徵狀 及其根源

ageLOC® attacks the Signs and Sources of Aging

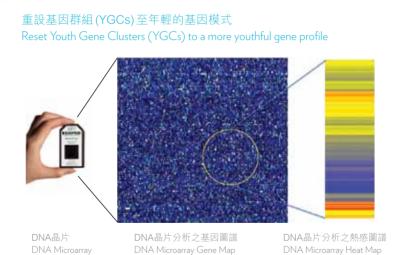


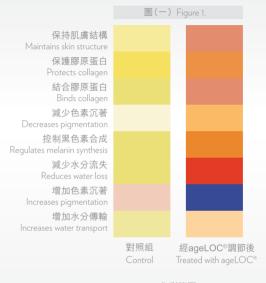
# 重設到平衡狀態

## Reset the Balance

我們一旦辨識到這些青春基因群組(YGCs),那重設他們以反映年 輕的皮膚及身體狀態是十分重要的。將青春基因群組 (YGCs)重設 是一項精細的平衡技術 — 這不只是簡單的「開啟」或「關閉」模式, 而是某些於群組內的基因活躍度需要「調高」, 而某些需要「下調」。 Nu Skin 專有的 ageLOC®科學技術能準確地重設基因群組(YGCs) 以達致平衡,使其回復到年輕時的活動模式。

Once we identify these Youth Gene Clusters, it's important to reset them to reflect a more youthful skin profile. Resetting Youth Gene Clusters (YGCs) is a subtle balancing process – it's not as simple as turning them on and off. Some genes within the cluster may need to be turned up while others may need to be turned down. Nu Skin's proprietary ageLOC® science resets Youth Gene Clusters (YGCs) to create a youthful balance within each cluster – returning them to their youthful patterns of activity.





熱感圖利用DNA (脱氧核糖核酸)微陣排列數據,説明每一行均代表一個獨立的基因以 顯示基因表達活動狀態的差異。這是辨識基因中的青春基因群組(YGCs)例子。圖(一) 使用反轉錄PCR顯示基因表達活性的差異,每一行均代表一個單獨基因,即是一種特 定的老化肌膚屬性。結果顯示基因會因調節而向上調升和/或向下調節。

Heatmap using DNA microarray data illustrating the differences in gene expression activity with each Figure 1 using data from RT PCR illustrating the differences in gene expression activity with each line representing a single gene for a given skin aging attribute. Results indicate up regulation and/or down

line representing a single gene. Examples of genes identified as Youth Gene Clusters (YGCs). regulation of genes.

13 ( ) age**Loc**® 14 (f) ageLoc® (f) age**Loc**® 15

# の ageLoc®市場潛力 Market Potential

全球約4.5 億人口出生於1946至1964年間的生育高峰期。

如今·50歲以上的人已成為全球人口增長最快的一群·預計他們的壽命也是歷史性新高。

Born between 1946 and 1964, there are approximately 450 million baby boomers worldwide. The over-50 segment is the fastest growing global population and predicted life expectancies are historically high.

(資料來源 Source: 麻省理工學院老化實驗室 MIT AgeLab)

中國人口老齡化趨勢嚴重,每年以超過3%的比率增長。在中國,抗衰老市場的消費人群越來越年輕化,

更多的人從20歲開始使用抗衰老產品。

The aging population in China is getting serious, it grows by more than 3% annually. In China, the age group that using anti-aging products is becoming younger, people even start using the anti-aging products since 20-year-old.

而香港亦預計於2033年有超過25%的人口將為長者,大約兩名就業成人就要供養一名65歲或以上的長者。

In Hong Kong, it is expected that more than 25% of the population will become the elderly group in 2033. By that time, about every 2 employed adults will have to support an elder aged 65 or older.

(資料來源Source: 強制性公積金計劃管理局Mandatory Provident Fund Schemes Authority)



## <sub>產品將涵蓋</sub>肌膚護理產品₁營養補充品。

ageLOC® offers a sustainable and significant competitive advantage that we believe will allow us to innovate completely revolutionary products for at least the next 10 years. The products will bridge across both skin care and nutrition product categories.



每個人都想活出年輕,至2015年亞太區抗老產業增長率預估達82%,為全球之冠。

Everyone wants to live young. In 2015, the Anti-aging industry will grow by 82% in the Asia Pacific which is the highest globally.

(資料來源 Source: Global Industry Analysis Mar 08)

## 「抗老化」市場產值預估約有一千億美元:

並會在下一個十年以8-10%的複合年增長率增加。亞太、北美地區會是最大的成長區塊。

The 'Anti-Aging' market is estimated at approximately \$100 billion; growing at a CAGR between 8 and 10% over the next decade. Asia-Pacific and North America represent the largest growth geographies.

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## Nu Skin及其合作夥伴對ageLOC®進行的科學研究 Scientific Research on ageLOC® Conducted by Nu Skin and Its Partners

11一項與老化有關的細胞表面NADH 氧化酵素 (arNOX) 產生的超氧化物 並受到輔酶Q抑制

An Aging-related Cell Surface NADH Oxidase (arNOX) generates super oxide and is inhibited by Coenzyme Q

Mol Cell Biochem. 2003 Dec; 254(1-2):101-9.

美國印第安納州西拉法葉市普渡大學食物 及營養學系

2 | 輔酶Q的特異性對於抑制與老化有 關的細胞 NADH氧化酵素 (ECTO-NOX)產生的超氧化物 Specificity of Coenzyme Q inhibition of an aging-related cell surface NADH Oxidase (ECTO-NOX) that generates superoxide

Morre DM Morre DJ 美國印第安納州西拉法葉市普渡大學食物 及營養學系 Purdue University, West Lafavette, IN 47907, USA.

3 | 與老化有關的ENOX蛋白質 (arNOX)活性表現與長者氧化性皮 膚受損相關

Age related ENOX Protein (arNOX) activity correlated with oxidative skin damage in the elderly

美國印第安納州西拉法葉市普渡大學食物及營養學系

#### 4 | 老化的新源頭

### A new source of aging

Helen Knaggs 美國猶他州普羅沃市如新集團全球研究及開發部 Global Research and Development. Nu Skin Enterprises, Provo, UT 84601, USA.

美國猫他州普羅沃市如新集團全球研究及開發部 美國印第安納州西拉法耶普渡大學食物及營養學系 Global Research and Development.

5 | 從源頭 | 控制活性氧以減緩皮膚的 6 l arNOX酵素:內因性老化的含意

Controlling reactive oxygen species at their source to reduce skin aging

Reiuvenation Research - In Press Jan 2010.

Purdue University, West Lafayette, IN 47907, USA.

The arNOX Enzyme: Implications for Intrinsic aging

Cosmetics and Toiletries. 2009; 124: 48-52

Helen Knaggs 美國猶他州普羅沃市如新集團全球研究及開發部 Gobal Research and Development. Nu Skin Enterprises, Provo, UT84601, USA,

7 | 健康的受試者攝取輔酶Q10營養補 充品能降低其與老化有關的(ar) NOX水平

Supplement with CoQ10 lowers age-related (ar) NOX levels in healthy

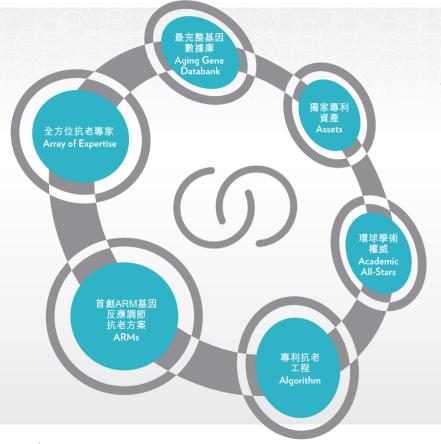
Morre DM. Morre D.J. Rehmus W. Kern D. 美國印第安納州西拉法葉市普渡大學食物及營養學系 81 發現白柳皮萃取物對皮膚的新功效 New skin benefits identified for White Willow Bark Extract

Presented at the Society of Cosmetic Chemists Technology Showcase, Dec. 2009

Remona Gopaul, Anna Langerveld, Jan Lephart, Helen Knaggs

美國猶他州普羅沃市如新集團全球研究及開發部 Nu Skin Enterprises, Provo, UT84601, USA.

18 (f) ageLoc®



# ageLOC®的6A優勢 The "6A" Advantage

### ● 最完整基因數據庫 Aging Gene Databank

擁有最完整的龐大抗衰老基因數據庫 全面鎖定青春基因群組(YGCs) Targets Youth Gene Clusters (YGCs) with the most comprehensive Anti-Aging Gene Databank

#### • 獨家專利資產 Assets

獨家擁有14項專利技術,並在持續增加中 14 patents and counting

#### • 環球學術權威 Academic All-Stars

獨家與全球頂尖學術專家合作,包括抗衰 老科學顧問團、美國生命基因科技中心及 美國史丹福大學

Exclusive collaboration with Anti-Aging Scientific Advisory Board, LifeGen Technologies and Stanford University

#### • 專利抗老工程 Algorithm

ageLOC<sup>®</sup>專利演算系統(辨識、鎖定、重設),直擊老化根源 Targets the ultimate sources of aging with exclusive ageLOC<sup>®</sup> Algorithm (Identify, Target and Reset)

#### ● 首創ARM基因反應調節抗老方案 ARMs

最先進、最完善由內至外的抗衰老方案 The most advanced and comprehensive anti-aging approach from the Inside-Out

#### • 全方位抗老專家 Array of Expertise

擁有各個學術領域的頂尖科研團隊 Array of experts from different fields of study

