景岳生物科技(股)公司

功能性益生菌領導品牌

GenMont Biotech Incorporation

The leading brand of functional probiotics

葉天佑 協理

Alvin Yeh Senior Manager

益生菌市場前景
Probiotics market outlook

- **全球益生菌市場正在快速成長**

  The global probiotics market is growing rapidly.

  其成長的主要原因是消費者對於預防保健的意識提升

  The major factor boosting the market growth is increasing concerns of consumers on preventive healthcare.

- **後疫情時代來臨，人們更積極尋求維持健康的方法**

  Beyond the pandemic, people have more conscious about their health and are taking proactive measures to help maintain their well-being.

  隨著COVID-19疫情蔓延，消費者對機能性食品的長期需求增加

  As the COVID-19 pandemic wears on, it increased the long-term demand for functional food/beverages and supplements in the daily behavior of consumers.

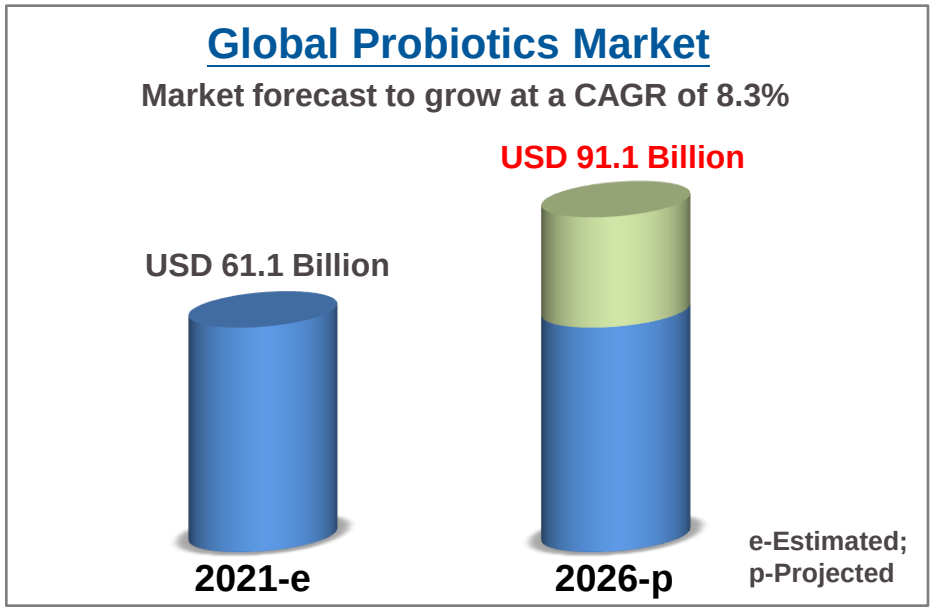
資料來源： Functional Food & Beverage 2020 Report Highlights from the Hartman Group

全球益生菌市場快速發展

Global probiotics market is growing rapidly

全球市場分析報告顯示，預計2026年全球益生菌市場約為911億美元。

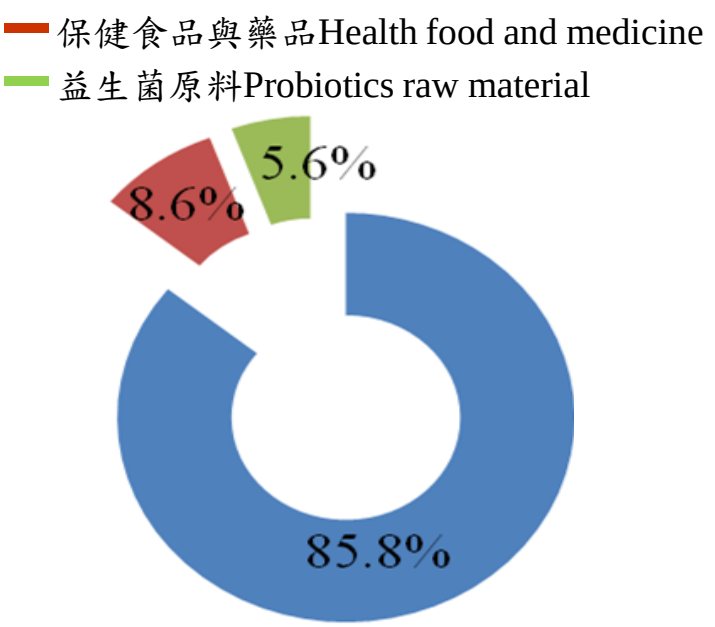
The global market analysis report shows that the global probiotic market is expected to be about 91.1 billion US dollars in 2026.



全球益生菌市場應用

Global probiotics market by product application

*市場分布 MARKET SHARE



資料來源：

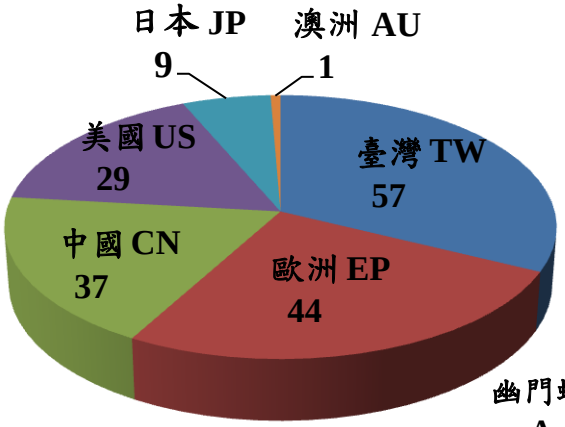
https://www.reportlinker.com/p05129364/Probiotics-Market-by-Application-Dietary-Supplements-Animal-Feed-Source-Form-End-User-And-Region-Forecast-to.html?utm_source=GNW;
https://www.researchandmarkets.com/reports/5370159/global-probiotics-market-by-application

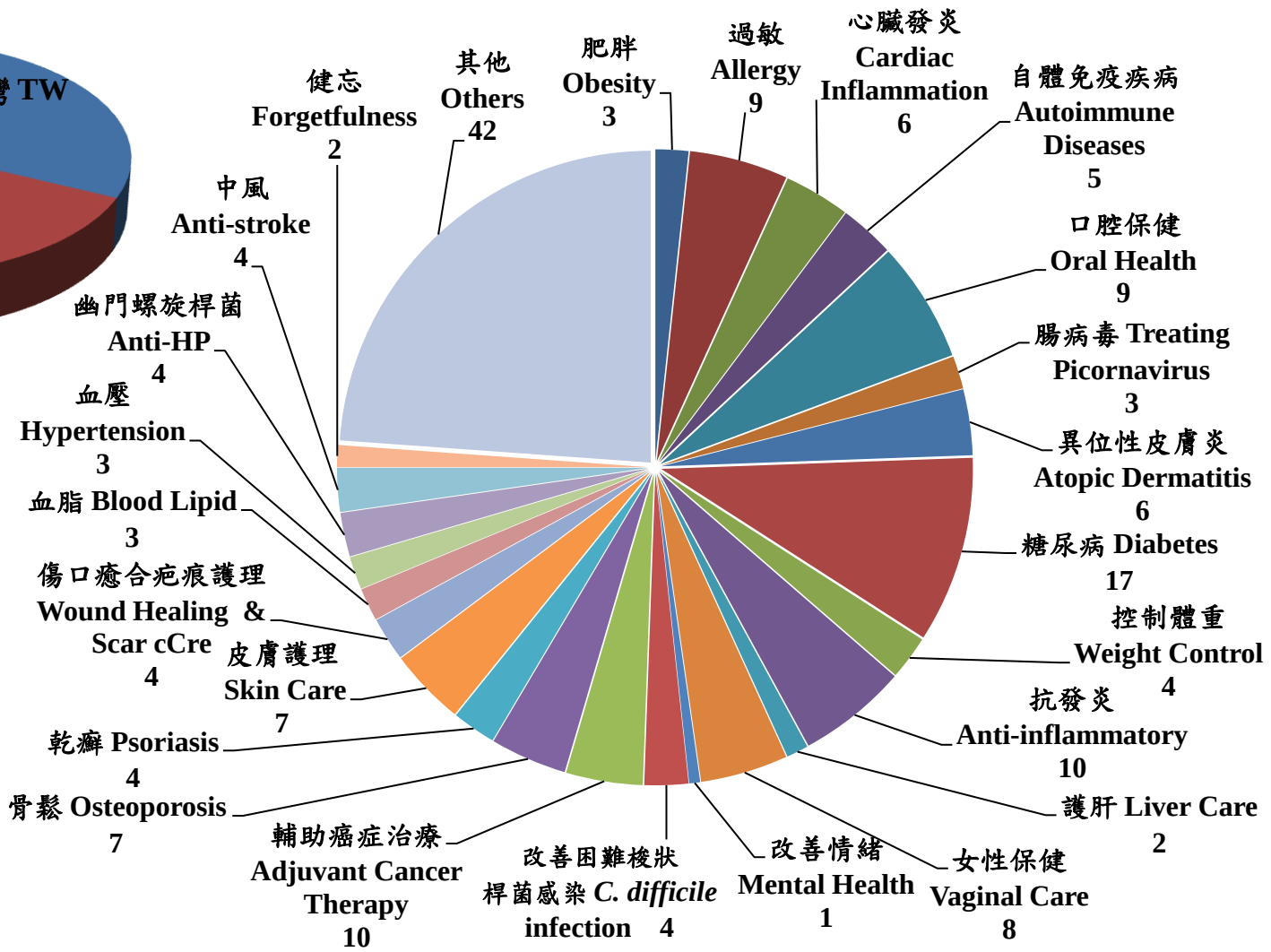
2023年度研究成果介紹

The Annual Research Presentation 2023

177項研發專利

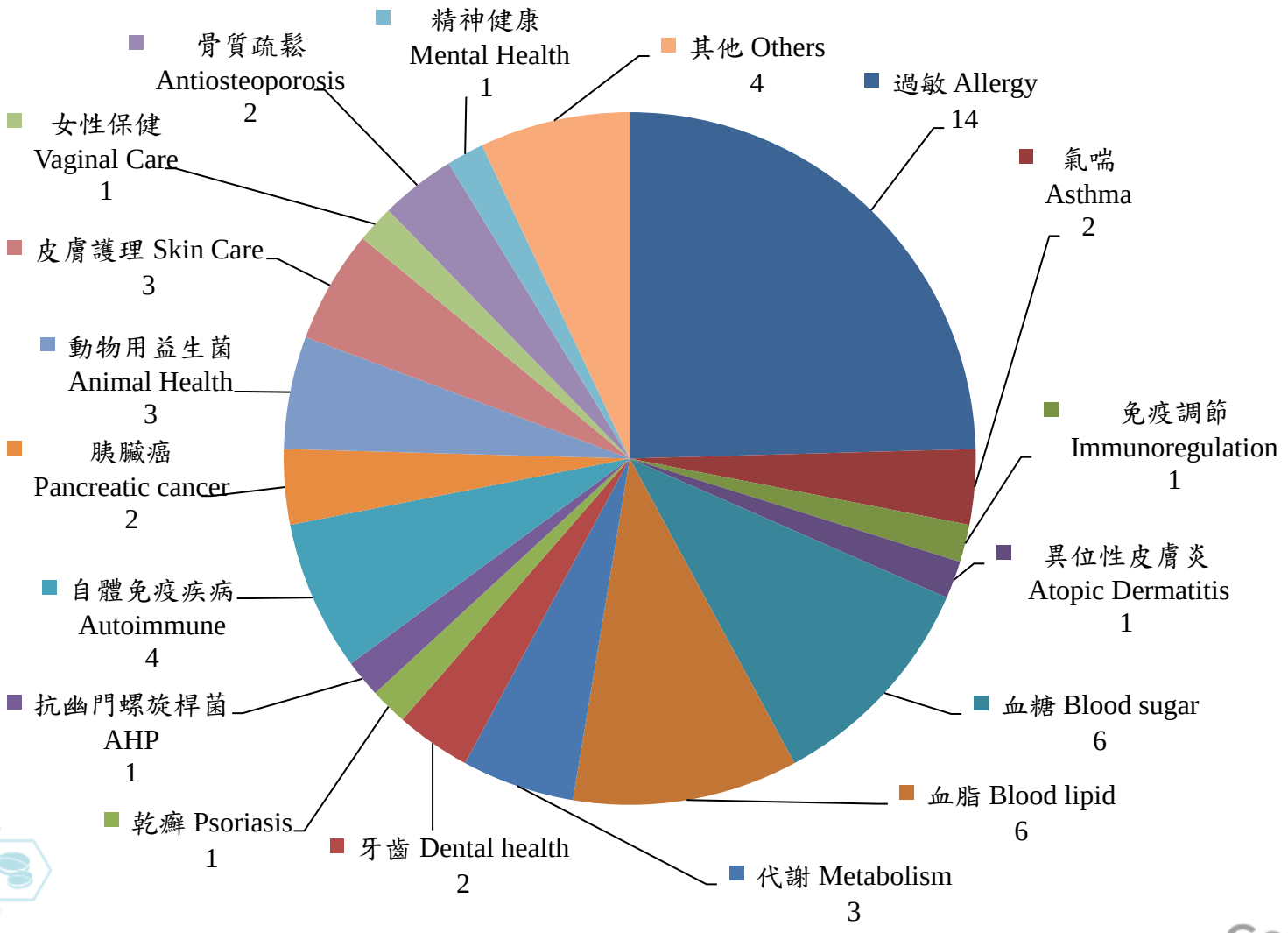
Patents over the world





57篇文獻發表

Published Papers



乳酸桿菌功效研究

Efficacy studies of *Lactobacillus*

nutrients MDPI

Article

Probiotics' Efficacy in Preventing Asthmatic Allergic Reaction Induced by Air Particles: An Animal Study

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Abstract: Global air pollution and diesel exhaust particles (DEPs) generated by intratracheal instillation aggravate asthma. In this study, we evaluated the effect of probiotics via tracheal- or oral-route administration on allergies or asthma. We continuously perfused rats daily, using the oral and tracheal routes, with approximately 10^6–10^8 CFU probiotics, for 4 weeks. During this period, we used OVA-sensitized rats to build the asthma models. We orally or intratracheally administered *Lactobacillus paracasei* 33 (LP33) to the rats, which reduced the number of total inflammatory cells, lymphocytes, and eosinophils in the bronchoalveolar-lavage fluid, the IgE concentration, and the cytokine levels of TH2 cells, but we found no significant difference in the cytokine levels of TH1 cells. LP33 can be used to prevent asthmatic allergic reactions induced by aerosol particles. Nevertheless, the dosage form or use of LP33 needs to be adjusted to reduce the irritation of lung tissues, which may produce lesions of the trachea. We observed that DEP dosage can alleviate emphysema, and that LP33 has a substantial effect on improving or slowing allergic asthma.

Keywords: diesel exhaust particles; asthma; ovalbumin; probiotics; allergic disease

check for updates

Citation: Yang, C.-Y.; Zhang, F.-Y.; Wang, I.-J. Probiotics' Efficacy in Preventing Asthmatic Allergic Reaction Induced by Air Particles: An Animal Study. *Nutrients* **2022**, *14*, 5219. https://doi.org/10.3390/nu14245219

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1. Introduction

Asthma is a chronic pulmonary-inflammatory disease characterized by a large amount of eosinophilic bulb-infiltration and inflammatory reactions in the bronchus, excessive mucus secretion, and obstruction of airflow in the respiratory tract [1]. Various factors aggregate asthma, such as severe air pollution from the diesel exhaust particulates (DEPs) produced by the combustion of diesel fuel [2]. In Taiwan, the main source of suspended particulates is DEPs, which are produced from large vehicles such as buses and trucks. Epidemiological studies have noted an association between exposure to traffic-derived pollutants and lung function in the asthmatic population [3].

DEPs are composed of elemental carbon, polycyclic aromatic hydrocarbons, acidic aerosols, volatile organic compounds, etc. After being inhaled by the respiratory system, DEPs penetrate deep into the alveoli and even into the microvessels of the alveoli, and freely penetrate the cells and tissues of the human body, causing systemic effects, especially a substantial increase in the number of lung and bronchial diseases [4].

Numerous researchers have assessed the effect of particulate pollutants, and particularly of DEPs, on the respiratory system in animal models. In a study of the effect of house-dust extract (HDE) on BALB/c mice, the results showed that DEPs increased HDE-induced airway inflammation, airway mucus-production, oxidative response, and inflammatory-cell infiltration, as well as CXC chemokines at bronchoalveolar-lavage concentrations and airway hyperresponsiveness (AHR) [5]. The variation in exposure to DEPs (low dose: 100 μg/m^3 DEPs, high dose: 3 mg/m^3 DEPs) for 1 h per day, 5 days per week, for

題目:益生菌預防空氣微粒誘發氣喘過敏反應的功效

Article: Probiotics' Efficacy in Preventing Asthmatic Allergic Reaction Induced by Air Particles: An Animal Study. *Nutrients*. 2022 Dec 7;14(24) :5219.

摘要: 作者以卵白蛋白(ovalbumin, OVA) 誘發大鼠產生過敏性氣喘的動物模式，連續4周、每天以氣管及口服途徑分別給予約10^6~10^8 CFU之益生菌，來評估益生菌對於過敏或氣喘的改善效果。實驗結果顯示，LP33可用來預防由氣溶膠微粒誘發的氣喘過敏反應，且具改善或減緩過敏性氣喘的實質性作用。

Abstract:

In this study, we evaluated the effect of probiotics via tracheal- or oral-route administration on allergies or asthma. We continuously perfused rats daily, using the oral and tracheal routes, with approximately 10^6–10^8 CFU probiotics, for 4 weeks. We observed that LP33 has a substantial effect on improving or slowing allergic asthma.

乳酸桿菌功效研究

Efficacy studies of *Lactobacillus*

cells

MDPI

Article

Lacticaseibacillus paracasei GM-080 Ameliorates Allergic Airway Inflammation in Children with Allergic Rhinitis: From an Animal Model to a Double-Blind, Randomized, Placebo-Controlled Trial

En-Kwang Lin [1,2,†], Wen-Wei Chang [3,4,†], Jhih-Hua Jhong [5], Wan-Hua Tsai [6], Chia-Hsuan Chou [6] and I-Jen Wang [7,8,9,*,‡]

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Citation: Lin, E.-K.; Chang, W.-W.; Jhong, J.-H.; Tsai, W.-H.; Chou, C.-H.; Wang, I.-J. *Lacticaseibacillus paracasei* GM-080 Ameliorates Allergic Airway Inflammation in Children with Allergic Rhinitis: From an Animal Model to a Double-Blind, Randomized, Placebo-Controlled Trial. *Cells* **2023**, *12*, 768. https://doi.org/10.3390/cells12050768

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Abstract: *Background:* Probiotics may facilitate the clinical management of allergic diseases. However, their effects on allergic rhinitis (AR) remain unclear. We examined the efficacy and safety of *Lacticaseibacillus paracasei* GM-080 in a mouse model of airway hyper-responsiveness (AHR) and in children with perennial AR (PAR) by using a double-blind, prospective, randomized, placebo-controlled design. *Methods:* The production of interferon (IFN)-γ and interleukin (IL)-12 was measured by using an enzyme-linked immunosorbent assay. GM-080 safety was evaluated via the whole-genome sequencing (WGS) of virulence genes. An ovalbumin (OVA)-induced AHR mouse model was constructed, and lung inflammation was evaluated by measuring the infiltrating leukocyte content of bronchoalveolar lavage fluid. A clinical trial was conducted with 122 children with PAR who were randomized to receive different doses of GM-080 or the placebo for 3 months, and their AHR symptom severity scores, total nasal symptom scores (TNSSs), and Investigator Global Assessment Scale scores were examined. *Results:* Among the tested *L. paracasei* strains, GM-080 induced the highest IFN-γ and IL-12 levels in mouse splenocytes. WGS analysis revealed the absence of virulence factors or antibiotic-resistance genes in GM-080. The oral administration of GM-080 at 1×10^7 colony forming units (CFU)/mouse/day for 8 weeks alleviated OVA-induced AHR and reduced airway inflammation in mice. In children with PAR, the oral consumption of GM-080 at 2×10^9 CFU/day for 3 months ameliorated sneezing and improved Investigator Global Assessment Scale scores significantly. GM-080 consumption led to a nonsignificant decrease in TNSS and also nonsignificantly reduced IgE but increased INF-γ levels. *Conclusion:* GM-080 may be used as a nutrient supplement to alleviate airway allergic inflammation.

Keywords: allergic airway inflammation; animal model; allergic rhinitis; clinical trial; probiotics

題目：從動物實驗到隨機、雙盲、安慰劑對照的臨床試驗，探討副乾酪乳桿菌GM-080改善過敏性鼻炎兒童的過敏性呼吸道發炎作用.

Article: *Lacticaseibacillus paracasei* GM-080 Ameliorates Allergic Airway Inflammation in Children with Allergic Rhinitis From an Animal Model to a Double-Blind, Randomized, Placebo-Controlled Trial. Cells. 2023 Feb 28;12 (5):768.

摘要： 從動物實驗發現，持續8周每天口服給予口服劑量 1×10^7 CFU 的GM-080，可減輕小鼠因OVA誘導的呼吸道過度反應及降低呼吸道發炎現象。而人體臨床試驗結果顯示，常年性過敏性鼻炎的兒童每天攝取2×10^9 CFU的GM-080持續3個月，將能顯著地改善打噴嚏的情形且提升施測者整體評估量表之分數及γ干擾素的含量。因此，補充GM-080有助於緩和呼吸道過敏性發炎反應。

Abstract:

The oral administration of GM-080 at 1×10^7 colony forming units (CFU)/mouse/day for 8 weeks alleviated OVA-induced AHR and reduced airway inflammation in mice. In children with PAR, the oral consumption of GM-080 at 2×10^9 CFU/day for 3 months ameliorated sneezing and improved Investigator Global Assessment Scale scores significantly. In summary, GM-080 may be used as a nutrient supplement to alleviate airway allergic inflammation.

乳酸桿菌功效研究

Efficacy studies of *Lactobacillus*

biomedicines

MDPI

Article

Suppressive Effects of *Lactobacillus* on Depression through Regulating the Gut Microbiota and Metabolites in C57BL/6J Mice Induced by Ampicillin

Wan-Hua Tsai [1], Wen-Ling Yeh [1], Chia-Hsuan Chou [1], Chia-Lin Wu [2], Chih-Ho Lai [3,4,5], Yao-Tsung Yeh [6], Chorng-An Liao [6] and Chih-Chung Wu [7,*]

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3 Department of Microbiology and Immunology, College of Medicine, Chang Gung University, Taoyuan 33302, Taiwan
4 Department of Nursing, Asia University, Taichung 413305, Taiwan
5 Department of Medical Research, School of Medicine, China Medical University and Hospital, Taichung 404333, Taiwan
6 Aging and Diseases Prevention Research Center, Fooyin University, Kaohsiung 83102, Taiwan
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Abstract: Depression is a medical and social problem. Multiple metabolites and neuroinflammation regulate it. Modifying the gut microbiota with probiotics to reduce depression through the gut-brain axis is a potential treatment strategy. In this study, three anti-depressive potentials of *Lactobacillus* spp. (LAB), including *L. rhamnosus* GMNL-74, *L. acidophilus* GMNL-185 and *L. plantarum* GMNL-141, which combined to produce low dosage LAB (1.6×10^8 CFU/mouse, LABL) and high dosage LAB (4.8×10^8 CFU/mouse, LABH), were administered to C57BL/6 mice induced depression by ampicillin (Amp). A behavioral test of depression, 16S ribosomal RNA gene amplicon sequencing, bioinformatic analysis, and short-chain fatty acid (SCFA) content measurement were executed to investigate the gut microbiota composition, activation of nutrient metabolism pathways, levels of inflammatory factors, gut-derived 5-HT biosynthesis genes, and SCFA levels in C57BL/6 mice. Results showed that after mice were induced by Amp, both LAB groups recovered from depressive behaviors, decreased the abundance of *Firmicutes*, and increased the abundance of *Actinobacteria* and *Bacteroidetes* in the mouse ileum. The prediction of metabolism pathways of microbes revealed the activation of arginine and proline metabolism, cyanoamino acid metabolism, and nicotinate and nicotinamide metabolism were increased, and fatty acid synthesis was decreased in both LAB groups. The LABH groups showed increased levels of acetic acid, propanoic acid, and iso-butyric acid and decreased butyric acid levels in the cecum. LABH treatment increased claudin-5 and reduced IL-6 mRNA expression. Both LAB groups also reduced monoamine oxidase, and the LABH group increased vascular endothelial growth factor mRNA expression. These results showed that the composite of three LAB exerts antidepressant effects by regulating the gut microbiota and modifying the levels of depression-related metabolites in C57BL/6J Amp-treated mice.

Keywords: *Lactobacillus*; gut microbiota; depression-related metabolites; C57BL/6J mice

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Citation: Tsai, W.-H.; Yeh, W.-L.; Chou, C.-H.; Wu, C.-L.; Lai, C.-H.; Yeh, Y.-T.; Liao, C.-A.; Wu, C.-C. Suppressive Effects of *Lactobacillus* on Depression through Regulating the Gut Microbiota and Metabolites in C57BL/6J Mice Induced by Ampicillin. *Biomedicines* **2023**, *11*, 1068. https://doi.org/10.3390/biomedicines11041068

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1. Introduction

There are almost 100 trillion bacteria living in the human intestine [1]. Previous studies showed that gut microbiota has many physiological effects that include improvement in the treatment of different CVDs [2], regulate body weight change [3], and modulate the immune response [4], especially in intestinal inflammation [5]. The diverse gut microbiota predominantly comprises bacteria from three important phyla: *Firmicutes*, *Bacteroidetes*,

題目：乳酸菌透過調節腸道菌相及代謝產物，對抗生素致小鼠憂鬱情形的改善效果

Article: Suppressive Effects of Lactobacillus on Depression through Regulating the Gut Microbiota and Metabolites in C57BL/6J Mice Induced by Ampicillin. Biomedicines. 2023 Apr 1;11(4):1068.

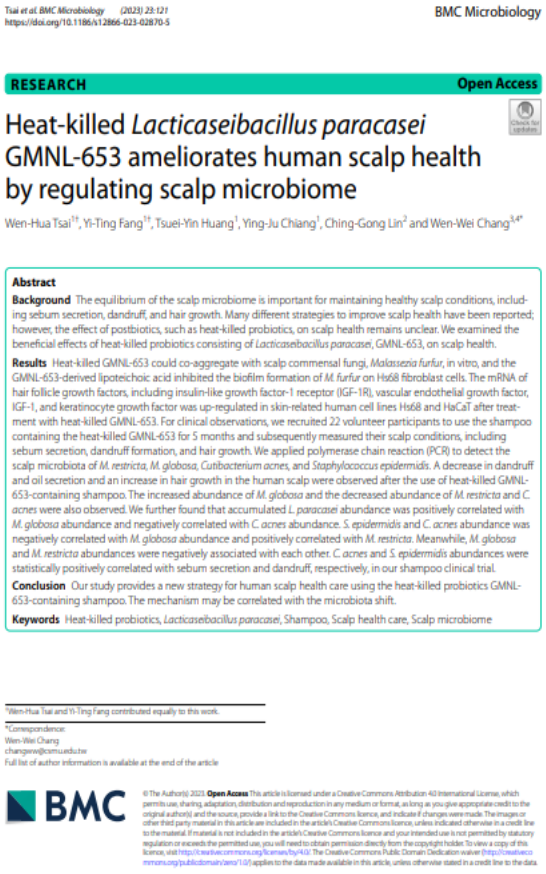
摘要： 憂鬱症受多種代謝產物和神經發炎反應調控，而利用益生菌來恢復腸道菌相，並經腸腦軸線來減少憂鬱情形的發生是一種有潛力的治療策略。從抗生素致憂鬱小鼠模型結果顯示，*L. rhamnosus* GMNL-74、*L. acidophilus* GMNL-185 和 *L. plantarum* GMNL-141三株乳酸桿菌的組合能藉由調節抗生素致憂鬱小鼠的腸道菌相及憂鬱相關的代謝物含量，來發揮**抗憂鬱**的效果。

Abstract:

Depression is modulated by multiple metabolites and neuroinflammation. Modifying the gut microbiota with probiotics to reduce depression through the gut-brain axis is a potential treatment strategy. These results showed that the composite of three LAB exerts antidepressant effects by regulating the gut microbiota and modifying the levels of depression-related metabolites in C57BL/6J Amp-treated mice.

乳酸桿菌功效研究

Efficacy studies of *Lactobacillus*



Tsai et al. BMC Microbiology (2023) 23:121
https://doi.org/10.1186/s12866-023-02870-5

BMC Microbiology

RESEARCH Open Access

Heat-killed *Lacticaseibacillus paracasei* GMNL-653 ameliorates human scalp health by regulating scalp microbiome

Wen-Hua Tsai[†], Yi-Ting Fang[†], Tsuei-Yin Huang[1], Ying-Ju Chiang[1], Ching-Gong Lin[2] and Wen-Wei Chang[3,4*]

Abstract

Background The equilibrium of the scalp microbiome is important for maintaining healthy scalp conditions, including sebum secretion, dandruff, and hair growth. Many different strategies to improve scalp health have been reported; however, the effect of postbiotics, such as heat-killed probiotics, on scalp health remains unclear. We examined the beneficial effects of heat-killed probiotics consisting of *Lacticaseibacillus paracasei*, GMNL-653, on scalp health.

Results Heat-killed GMNL-653 could co-aggregate with scalp commensal fungi, *Malassezia furfur*, in vitro, and the GMNL-653-derived lipoteichoic acid inhibited the biofilm formation of *M. furfur* on Hs68 fibroblast cells. The mRNA of hair follicle growth factors, including insulin-like growth factor-1 receptor (IGF-1R), vascular endothelial growth factor, IGF-1, and keratinocyte growth factor was up-regulated in skin-related human cell lines Hs68 and HaCaT after treatment with heat-killed GMNL-653. For clinical observations, we recruited 22 volunteer participants to use the shampoo containing the heat-killed GMNL-653 for 5 months and subsequently measured their scalp conditions, including sebum secretion, dandruff formation, and hair growth. We applied polymerase chain reaction (PCR) to detect the scalp microbiota of *M. restricta*, *M. globosa*, *Cutibacterium acnes*, and *Staphylococcus epidermidis*. A decrease in dandruff and oil secretion and an increase in hair growth in the human scalp were observed after the use of heat-killed GMNL-653-containing shampoo. The increased abundance of *M. globosa* and the decreased abundance of *M. restricta* and *C. acnes* were also observed. We further found that accumulated *L. paracasei* abundance was positively correlated with *M. globosa* abundance and negatively correlated with *C. acnes* abundance. *S. epidermidis* and *C. acnes* abundance was negatively correlated with *M. globosa* abundance and positively correlated with *M. restricta*. Meanwhile, *M. globosa* and *M. restricta* abundances were negatively associated with each other. *C. acnes* and *S. epidermidis* abundances were statistically positively correlated with sebum secretion and dandruff, respectively, in our shampoo clinical trial.

Conclusion Our study provides a new strategy for human scalp health care using the heat-killed probiotics GMNL-653-containing shampoo. The mechanism may be correlated with the microbiota shift.

Keywords Heat-killed probiotics, *Lacticaseibacillus paracasei*, Shampoo, Scalp health care, Scalp microbiome

[†]Wen-Hua Tsai and Yi-Ting Fang contributed equally to this work.
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BMC

題目:熱滅活副乾酪乳桿菌GMNL-653藉由調節頭皮菌相改善頭皮健康

Article: Heat-killed *Lacticaseibacillus paracasei* GMNL-653 ameliorates human scalp health by regulating scalp microbiome. BMC Microbiol. 2023 Apr 29;23(1):121.

摘要: 經由臨床試驗案收入22名自願受試者使用添加熱滅活菌GMNL-653的洗髮精，長達5個月。結果顯示，使用熱滅活GMNL-653洗髮精後，**減少頭皮屑生成和出油情形且增加頭髮生長**，以及球形馬拉色菌的豐度增加、限制性馬拉色菌豐度減少，因此，可使用熱滅活GMNL-653洗髮精來維護頭皮健康。

Abstract:

We recruited 22 volunteer participants to use the shampoo containing the heat-killed GMNL-653 for 5 months. The results show that a decrease in dandruff and oil secretion and an increase in hair growth in the human scalp were observed after the use of heat-killed GMNL-653-containing shampoo. Therefore. our study provides a new strategy for human scalp health care using the heat-killed probiotics GMNL-653-containing shampoo.

財務狀況 Financial status

※母公司財報-景岳生技 Separate Financial Statements-GenMont

單位：千元 In Thousands of New Taiwan Dollars	109年母公司財報 (Year 2020 Single)	110年母公司財報 (Year 2021 Single)	111年母公司財報 (Year 2022 Single)
營業收入NET REVENUE	325,191	427,929	368,546
營業毛利GROSS PROFIT	215,390	299,326	258,019
營業費用OPERATING EXPENSES	(137,605)	(150,140)	(131,953)
營業利益INCOME(LOSS) FROM OPERATIONS	77,785	149,186	126,066
營業外損益NON-OPERATING INCOME AND EXPENSES	(269)	(6,231)	(50,291)
稅前淨利INCOME(LOSS) BEFORE INCOME TAX	77,516	142,955	75,775
稅後淨利NET INCOME(LOSS)	60,884	113,132	56,978

財務狀況 Financial status

※合併財報 Consolidated Financial Statements

單位：千元 In Thousands of New Taiwan Dollars	110年合併 (Year 2021 Consolidated)	111年合併 (Year 2022 Consolidated)	112前二季合併 (Year 2023 H1 Consolidated)
營業收入NET REVENUE	427,929	368,546	167,554
營業毛利GROSS PROFIT	299,326	256,717	108,841
營業費用OPERATING EXPENSES	(174,287)	(194,747)	(101,474)
營業利益INCOME(LOSS) FROM OPERATIONS	125,039	61,970	7,367
營業外損益NON-OPERATING INCOME AND EXPENSES	14,385	4,288	586
稅前淨利INCOME(LOSS) BEFORE INCOME TAX	139,424	66,258	7,953
稅後淨利NET INCOME(LOSS)	109,601	47,461	5,905
停業單位損益Income (Loss)from Discountinued Operations	0	0	0
本期淨利NET INCOME(LOSS)	109,601	47,461	5,905

風險評估 Risk Assessment

生技領域方面財務風險Financial risk in the biotech sector

- 研發期間長 Long R & D period
- 獲利回收晚 Late profit recovery

➡ 可能因此導致資金不足 Which may lead to insufficient funds

益生菌市場持續成長Probiotics market continues to grow

根據Precedence Research預估，2021年至2030年全球益生菌市場年平均複合成長率(CAGR)將可達8.7%，至2030年時其規模可達1,339億美元；其中食品飲料市場的規模最大(達75%以上)，動物飼料則成長最快速。目前市場以亞太地區為主，市場占比超過七成。

According to Precedence Research estimates, the global probiotics market will reach an average annual compound growth rate (CAGR) of 8.7% from 2021 to 2030, and its scale will reach US$133.9 billion by 2030; the food and beverage market is the largest (up to 75% or more), animal feed is the fastest growing. At present, the market is dominated by the Asia-Pacific region, accounting for more than 70% of the market.

資料來源:食品工業發展研究所/食品產業知識庫/市場資訊 (firdi.org.tw), 2022/02/28]

Thanks For Your Attention

Q & A