Winpact

2026 年第一屆南區醱酵技術研討會
2026 The 1st Southern Region Fermentation Technology Seminar



活動時間：
中華民國一一五年九月十八日星期五
上午九點至下午三點三十

活動地點：
地點：農業部農業科技園區管理中心3樓大型會議室
(908126屏東縣長治鄉德和村神農路一號)

INNOVATIVE CULTIVATION SOLUTIONS

研討會內容時間表　Agenda

時段	負責單位 / 講者 / 主題		主持人
09:00 – 10:00	報到		major science 邱仕華
10:00 - 10:20	貴賓致詞 / 大合照		
10:20 - 10:40	時段一	講題:　WP 產品介紹 - 醱酵、流體輸送、冷凍乾燥及實驗室基本應用	
10:40 - 11:00		講題：　海博特 - 滅菌釜在微生物培養應用與滅菌確效驗證	
11:00 - 11:10	休息		林欣平 博士 副教授
11:10 - 11:45	時段二	講題：醱酵製程與量產的實務分享 Fermentation Process Development and Large-Scale Production: Practical Insights 講者：　王明易 首席釀酒師，　海尼根釀造課 課長	
11:45 - 12:20	時段三	講題：質譜分析助攻醱酵量產：代謝體學在製程開發、放大與監控的應用 Mass Spectrometry Supporting Fermentation Scale-Up: Applications of Metabolomics in Process Development, Scale-Up, and Monitoring 講者：　鄭凱文 博士，　雷文虎克生物技術股份有限公司 副理	
12:20 - 13:20	午餐		
13:20 - 13:55	時段四	講題：從醱酵到機能：發泡性細菌纖維素複合材料於功能性包材與生醫敷材之跨域應用 From Fermentation to Function: A Cross-Domain Platform of Foamed Bacterial Cellulose Composites for Functional Packaging and Biomedical Dressing Applications 講者：　林欣平 博士，　台北醫學大學食品安全系 副教授	謝承哲 博士 助理教授
13:55 - 14:30	時段五	講題: 微生物醱酵生產機能性多酚磷酸酯之製程放大：　實務挑戰與對策 講者: 許宸 博士 國立台灣大學農業化學系 博士後研究員	
14:30 - 14:35	休息		major science 邱仕華
14:35 - 14:55	時段六	講題：　友和 - 食品中細菌快速檢測系統	
14:55 - 15:15		講題:　BenQ-From Membranes to Automation Integrated TFF Solution BenQ Qflow 切向流過濾產品介紹	

主辦單位保有最終修改、變更、活動解釋及取消本活動之權利，若有相關異動將會公告於官網，恕不另行通知。

目　錄　Table of Contents

主持人及主辦、協辦單位介紹		02
WP 產品介紹-醱酵、流體輸送、冷凍乾燥及實驗室基本應用	major science	07
滅菌釜在微生物培養應用與滅菌確效驗證	海博特	29
發酵製程與量產的實務分享 Fermentation Process Development and Large-Scale Production: Practical Insights	王明易 首席釀酒師 海尼根釀造課 課長	37
質譜分析助攻發酵量產：代謝體學在製程開發、放大與監控的應用 Mass Spectrometry Supporting Fermentation Scale-Up: Applications of Metabolomics in Process Development, Scale-Up, and Monitoring	鄭凱文 博士 / 副理 雷文虎克生物技術	38
從發酵到機能：發泡性細菌纖維素複合材料於功能性包材與生醫敷材之跨域應用 From Fermentation to Function: A Cross-Domain Platform of Foamed Bacterial Cellulose Composites for Functional Packaging and Biomedical Dressing Applications	林欣平 博士 / 副教授 台北醫學大學食品安全系	56
微生物醱酵生產機能性多酚磷酸酯之製程放大：實務挑戰與對策	許宸 博士 / 博士後研究員 國立台灣大學農業化學系	62
食品中細菌快速檢測系統	友和	77
From Membranes to Automation Integrated TFF Solution BenQ Qflow 切向流過濾產品介紹	BenQ	107

發酵研討會主持人



謝承哲 助理教授 (2024/08~)

國立高雄科技大學水產食品科學系 601 室

電話:07-3617141#23611

信箱:fstcch@nkust.edu.tw

學歷:

博士 國立臺灣大學生物科技研究所

碩士 國立臺灣海洋大學食品科學系

學士 國立高雄科技大學水產食品科學系

主要經歷:

台灣乳酸菌協會現任副秘書長

國際精準健康學會現任副秘書長

服務與榮譽:

高科大水食系系友會現任理事

第二十二屆國家新創獎學研新創獎獲獎人

114 年度學術類特殊優秀研究人才

第五屆正瀚生技創新獎獲獎人

斐陶斐榮譽會員

實驗室研究簡介:

(1) 臺灣在地農業資材高值化的研究與應用：

專注於臺灣在地農產的高值化，通過發酵技術將藜麥、薑黃及豆粕等本地作物轉化為具高附加值的功能性產品。在研究中，藜麥經發酵後的提取物被證實對抗氧化壓力具有顯著效果，並展示其在食品和保健品中的潛力。同時，發酵薑黃乳被證明在預防紫外線引起的人類纖維母細胞氧化損傷方面具有保護作用，而乳酸菌與枯草桿菌發酵黃豆粕產品則展現了降血糖和抗氧化的活性。這些研究成果不僅提升了臺灣原生作物的經濟價值，還促進其在功能性食品和保健品中的廣泛應用。相關研究成果發表於《Journal of Ethnopharmacology》 (為第一作者)、《Fermentation》 (為第一作者)和《Metabolites》 (非第一作者)。

(2) 多體學技術在天然資源功能性分析中的應用：

結合代謝體學、蛋白質體學、轉錄體學和基因體學技術，對臺灣在地作物藜麥及藥用真菌靈芝進行全方位的功能性分析。利用代謝體學技術，研究了發酵藜麥中的代謝產物，深入探討其在抗氧化和抗炎中的角色；同時透過蛋白質體學和轉錄體學技術，探索這些活性化合物在細胞層面上的信號傳導路徑和基因表達模式，從而顯示其在抗纖維化及促凋亡中的潛在機制。並且利用基因體學分析進一步確定活性成分對基因表達的調控作用，為開發新型功能性食品和藥物確立背後之分子生物機制。上述多體學研究結果發表於 《Journal of Ethnopharmacology》和《Food Research International》(皆為第一作者)。

(3) 發酵工程在功能性食品開發中的應用與優化：

利用我國天然在地素材進行的發酵研究。藉由精細控制發酵參數，如溫度、pH 值及菌種的選擇，成功提高這些天然資源中的生物活性成分的含量與功能性。如在藜麥發酵產物中，發現具有強抗氧化、抗炎和抗衰老功能的胜肽，這些成分在功能性食品開發具有應用潛力。顯示發酵技術在提升食品和藥物功能性中的核心價值。發酵帶來的好處包含提高生物活性物質的穩定性、增強功能性成分的生物可利用性以及減少抗營養因子的影響，這些技術優化促進功能性食品的創新開發。相關研究成果發表於《Journal of Food and Drug Analysis》 (為第一作者) 和《Food Bioscience》《Food Chemistry》 (非第一作者)。

(4) A.I. 技術在活性化合物機制研究中的應用：

將 A.I. 技術成功應用於分子對接和分子動力學分析，以系統性地探討靈芝和藜麥芽芽中活性化合物的分子機制。通過 A.I. 輔助的分子對接分析，預測檢測出之化合物與特定目標蛋白質的結合位點和親和力，顯示在抗黑色素生成、抗氧化和抗發炎反應中的潛在作用。進一步的分子動力學模擬則幫助確定這些結合在動態條件下的穩定性和相

互作用力。例如，針對靈芝中的芳香化合物，A.I. 技術不僅顯示其抑制黑色素生成的分子機制，還通過動力學模擬證實其在抑制相關酵素活性中的穩定性。同樣，對於藜麥中的抗氧化成分，A.I.分析展示這些化合物與自由基的交互作用及其在細胞抗氧化反應中的具體作用路徑。上述研究不僅為保健素材的開發提供精確的分子機制支持，還有效提升活性化合物的應用潛力。相關成果發表於《npj Science of Food》、《Journal of Food and Drug Analysis》、《Molecular Nutrition & Food Research》、《Journal of Ethnopharmacology》。

國立高雄科技大學水產食品科學系

國立高雄科技大學
水產食品科學系
National Kaohsiung University of Science and Technology
Department of Seafood Science

本系宗旨

教授食品科學之技術、理論與實作
獨力研究與邏輯思考養成爲教學導向
培育食品產業各領域之技術、研究、管理人才



水產食品科學系成立於民國 37 年，現設有學士班 2 班、進修部學士班、碩士班、碩士在職專班及博士班，具備完善的師資陣容及教學設備，提供學生在各個食品科技領域上充實的知識及技能，教學課程規劃分為食品安全、食品檢驗分析、食品加工與開發、保健食品功能性評估四大方向，大學部之教學採基礎理論與實務並重為主，研究所則以獨立研究與邏輯思考成為教學導向，培養食品產業各領域之技術、研究、管理人才。

本系課程與實習係以水產食品為基礎，教學採理論與實務並重，培養學生在食品加工、冷凍冷藏、衛生安全檢驗、生物和化學分析，食品生物技術以及食品運銷與經營的最新理論和實務技術，並設計多元的選修課程，提供學生依其性向和興趣來選修，以培養食品加工、研究開發、品管檢驗、經營管理及行銷物流之專業人才。隨著世界潮流之演變和國家之發展趨勢，本系之課程標準及教學內容將朝分組多元化之方式進行，課程內容除了原有的食品加工技術、品管檢驗外，也加入「生物技術」、「機電整合」、「產業自動化」、「食品衛生安全自主性管理」(如ＨＡＣＣＰ)與「第二外國語」等相關課程；另外，本系秉持既有的服務精神，利用已經設立之「水產檢驗服務中心」和「水產加工服務中心」，繼續與食品業界合作，進行推廣輔導及建教合作工作，發揮本系與業界結合之特長。





本系有各項全套之加工設備，例如製罐工廠、冷凍工廠、乾製品工廠、魚漿製造及其他類型實習工廠；而且有分光光度儀、色差儀、氣相色層分析儀、原子吸收光譜儀、高效能色層分析儀、離子層析儀、超高速冷凍離心機、高性能顯微鏡、電子顯微鏡、食品物性測定計、超音波粉碎機、食品流變儀、分段集液器等食品科技與生物技術相關之儀器。

本系老師積極參與研究及各項學術活動，同時舉辦有關食品檢驗之各項訓練，以及ＨＡＣＣＰ講習班，以協助水產加工業者建立食品衛生安全之品質管理制度。本系並積極推介學生到產業界服務，協助高屏地區水產業者及食品加工業者之發展，共同為水產食品業之未來發展一齊努力。

教育部教學實踐計畫

教育部教學實踐研究計畫
MOE TEACHING PRACTICE RESEARCH PROGRAM

計畫簡介
INTRODUCTION

106學年度起，教育部規劃推動「大學校院教師教學研究支持系統方案」，希望透過「教學實踐研究計畫」，補助個別教師，建立持續性的同儕審閱與輔導模式，推動專屬社群之建立與對話，累積教學研究案件之成果，建置成果發表平台及專業人才庫。透過不同任務之同步推展，積極鼓勵大專校院投入資源，協助大學教師增進教學能力，經由完整且優良之教案在課堂上的正式實施，提升教學品質，幫助學生增進知識學習的相關成效。

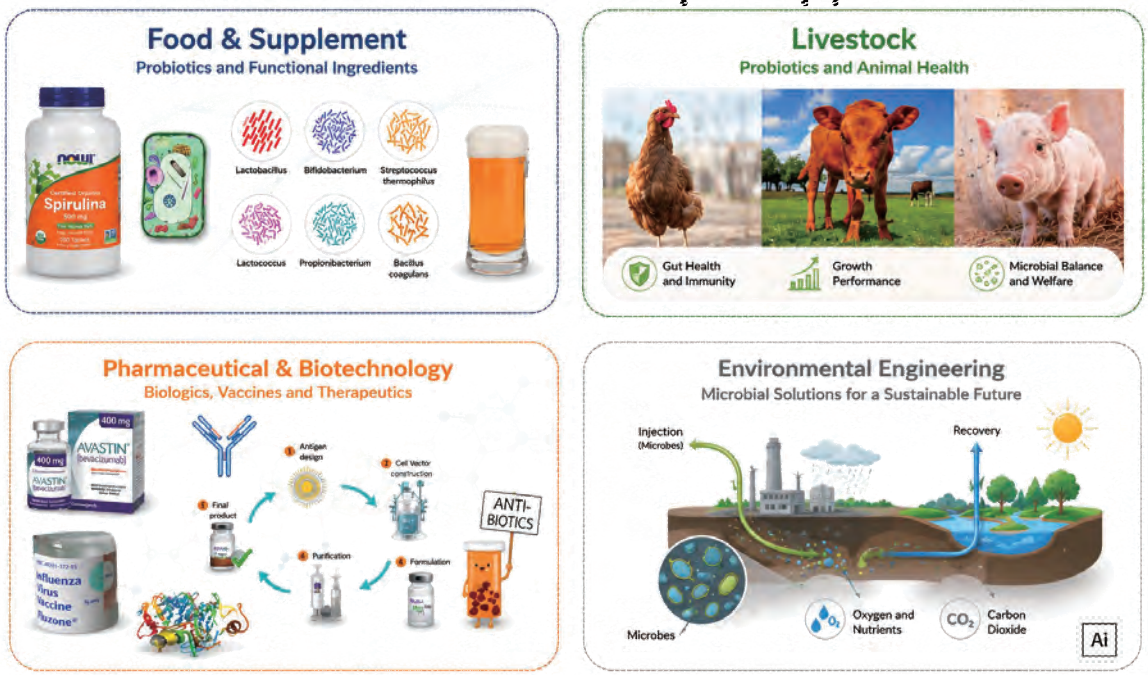
The Program aims to improve the teaching quality for teachers and realize the school management mission for schools; with supplementing effects, it combines with the Higher Education Sprout Project, prompting schools to focus on the development of school affairs and invest resources in the teaching scene; therefore, to efficiently connect teachers' individual research and students' learning cultivation, schools shall review the program proposed by teachers in the schools regarding the research program and course planning, and whether the direction for student cultivation is in line with the direction of the development of school affairs. Where necessary, the schools shall provide comprehensive teaching resources to support teachers' research, and in turn realize the transformation of teaching scene.

Winpact Product Introduction : Fermentation, Fluid Transfer, Lyophilization, and Essential Lab Applications

Speaker: Leo Lin
Date: Aug. 18, 2026

major science- WP 產品介紹 - 醱酵、流體輸送、冷凍乾燥及實驗室基本應用

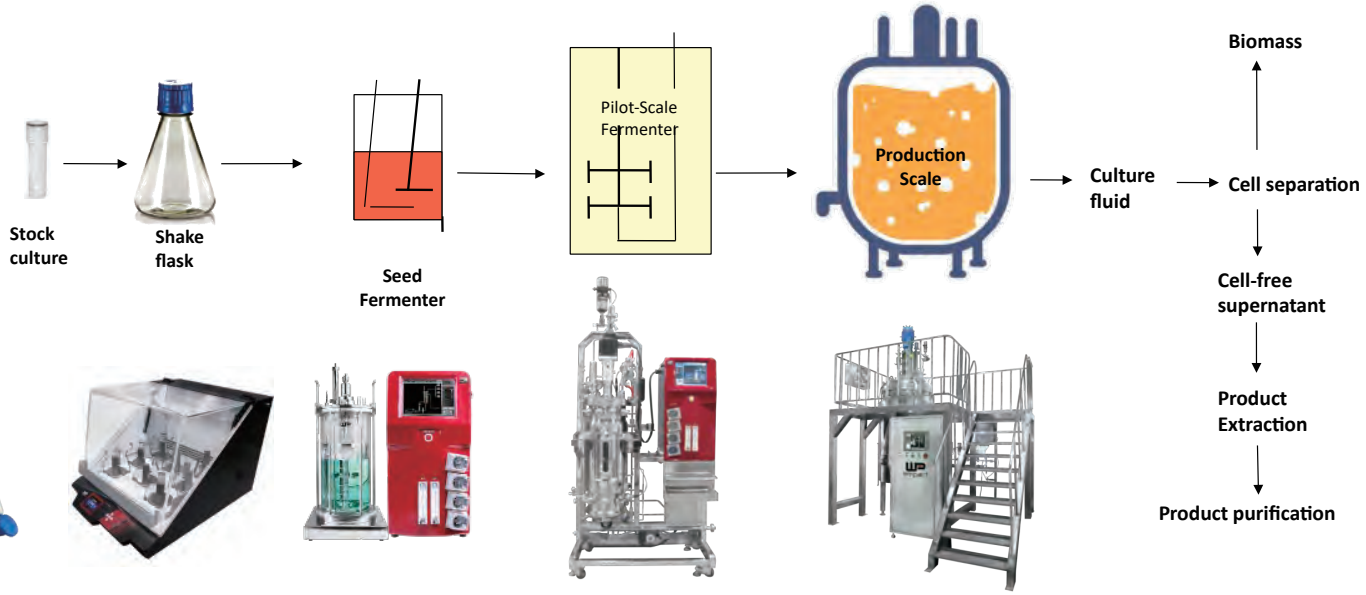
Fermentation – Versatility & Application



major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Scaling Up of a Commercially Organism





Shaker Flasks

Shaking incubator

Benchtop

Pilot scale

Production scale

Downstream Processing

2026/09/18

3

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

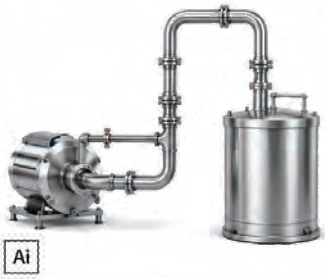
Fermentation, Fluid Transfer, Lyophilization

1 Winpact Fermentation



- Microbial/Cell culture growth
- Controlled environment (temperature, pH, DO, agitation)
- Broth containing biomass and product

2 Fluid Transfer



- Aseptic, closed system transfer
- Maintains product integrity and sterility
- Transfers clarified broth or harvest to next unit operation

3 Lyophilization



- Freezes and removes moisture under vacuum (sublimation)
- Preserves product stability and potency
- Produces dry, stable lyophilized product

2026/09/18

4

Fermentation – Parameters Selection

Choosing process parameters

- pH
- Temperature
- Aeration
- Agitation
- Nutrient medium composition
- Feeding strategy (batch, fed-batch, continuous)
- **Optimal condition**
- **No contamination**

Fermentation – Parameters Selection with small scale

Item
Name
Cat. No.
Speed
Stirring Positions
Top Plate Material
Capacity
Controller
Mode
Voltage





It has many advance features **idual control setting**, **stainless steel material, CO2**

https://www.majorsci.com/ec99/rwd1661/product.asp?prodid=a131

Fermentation – Parameters Selection with small scale

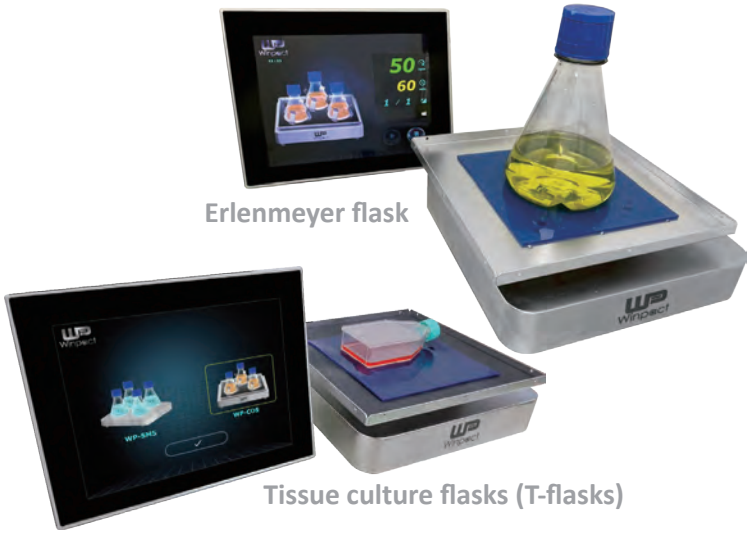
- 12" touch screen for user-friendly observation.
- Hermetically SUS316L housing is easy to clean and resistant to exposure to CO_2 environments.
- Smooth and even stirring at speeds as low as 1 rpm.
- Four independent stirring positions, each capable of handling up to 1 L of culture volume simultaneously.
- Each stirrer can be operated individually, allowing flexible and separate control across all positions.
- A Continuons / Timing / Programmable stirring mode is available.



major science- WP 產品介紹 - 醱酵、流體輸送、冷凍乾燥及實驗室基本應用

Fermentation – Parameters Selection with small scale

Item	Specification
Name	CO2 resistant orbital shaker
Cat. No.	WP-COS
Speed	0, 1 to 300 rpm (1 rpm step)
Motor	Brushless motor
Top Plate Material	SUS316L
Capacity	Max. 5.2kg
Controller	12" Colorful Touch panel
Mode	Continuons / Timing / Programmable
Voltage	AC 100-240V, 50/60Hz



It has many advance features including a 12” colorful touch screen, CO2 resistant, low speed, stainless steel material, CO2 resistant .

https://www.majorsci.com/ec99/rwd1661/product.asp?prodid=a136

major science
Innovative Life Sciences Tools
Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fermentation – Parameters Selection with incubator

Application	For Microbial	For Cell		
Model	SI-910	SI-960	SI-950	SI-970
Platform size(LxW)	91 × 50 cm			
Platform Type	Slide Out			
Platform Material	SUS316L			
Display Mode	10" LCD (Capacitive Touch Screen)			
Timer	9999mins (or 9999hrs)			
Speed Range	0, 10~300 rpm	0, 10~180 rpm		
Motor	Servo motor			
Orbit Diameter	25mm(diameter)	50mm(diameter)		
Temperature Control Range	4~60°C (in 23~25°C)	Ambient~60°C (in 23~26°C)		
Temperature Uniformity	±0.5°C (at 37°C)			
CO2 Control Range	No	0.1~20%		
CO2 Accuracy		±0.1%		
CO2 Stability		±0.5%		
CO2 Sensor		Infrared (IR)		
Relative Humidity		50~95%RH		
Illumination	Yes			
Air Circulation	Forced convection, internal circulation			
Sterilization Method	UV Sterilization	UV Sterilization	Moist Heat Sterilization (90°C)	Dry Heat Sterilization (180°C)
Door Opening	Glide Up			
Construction	Iron case with powder coating			
Inner Chamber Material	SUS316L			



https://www.majorsci.com/ec99/rwd1661/product.asp?prodid=a137

major science
Innovative Life Sciences Tools
Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fermentation – Parameters Selection with Multiple Selection

Novel bioreactors enhance production efficiency and reduce energy consumption





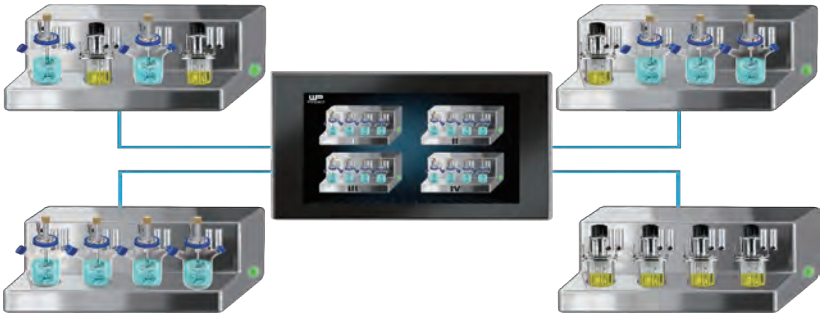
https://www.majorsci.com/ec99/rwd1661/product.asp?prodid=a138

Item	Specification
Model	FS-MPF series
Display	15" colorful touch screen
Vessel Size	Working volume : 250ml/500ml/1000ml
Modular unit	4 vessels in 1 modular unit, individual control
Number of Modular unit	Max is 4 units(total : 16 vessels)
Materials	Borosilicate glass and SUS316L stainless steel
Sterilization	Autoclave glass vessel
Exhaust control	Peltier Exhaust Condenser
Agitation	Top drive, brushless motor, 30-1500rpm/1rpm
Peristaltic Pump	x4, 0-100rpm, speed adjustable
Charting	CSV file, USB output
Language	Multi-language: Chinese/English
Connection	RS485
Power	100-240V, 50-60 Hz

major science- WP 產品介紹 - 醱酵、流體輸送、冷凍乾燥及實驗室基本應用

Item	Specification
pH control	PID control, control range : -12 pH/0.1pH, manual and programable
DO control	PID control, control range : 0-100%/0.1%, manual and programable
Aeration	sparger with rotameter
Antifoam	Control with peristaltic pump
Temperature control	PID control, 5°C (41°F) above coolant up to 60°C (140°F)
Exhaust control	Peltier Exhaust Condenser
optional	ORP, TCD, Optical DO, off-gas analyzer, Gas Mixing, MFC







Fermentation – Winpact Bench-top Fermentation System

FS-05



FS-06



FS-07



https://www.majorsci.com/ec99/rwd1661/category.asp?category_id=22

Fermentation – Winpact Fermentation System

Temperature



5℃-60
with coolant ±0.2 ℃

Agitation



30 – 1800 ±1 rpm

Dissolved Oxygen (DO)



HAMILTON
METTLER TOLEDO

0 – 100 ± 0.1%

pH



pH: 0- 14 ±0.01

Peristaltic Pump





Dual direction
Manual or 15-step
sequence control

1 – 65 ±1 rpm

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fermentation – Winpact Bench-top Fermentation System

Vessel Application

Application \ Vessel	FS-V-A series Double Jacketed Dish Bottom Vessel	FS-V-B series Single Wall Dish Bottom Vessel	FS-V-C series Air Lifter Vessel	FS-V-B series Single Wall Dish Bottom Vessel with Heating Blanket	FS-V-D series Single Wall Plain Bottom Vessel with Heating Base Unit	FS-V-SA series Solid State
Mammalian cell culture	●●	●○	○○	●○	○○	○○
Aerobic microorganism culture (Note 1)	●●	●●	●●	●●	●●	○○
Micro-aerobic microorganism culture (Note 2)	●●	●●	○○	●●	●●	○○
Anaerobic microorganism culture (Note 3)	●●	●●	○○	●●	●●	○○
Fragile cell culture (Note 4)	●●	●○	●●	●○	○○	○○
Photosynthesis cell culture (Note 5)	●○	●●	●●	○○	●○	○○
Plant cell culture	●○	●○	●●	○○	○○	○○
Insect cell culture	●●	●○	○○	●○	○○	○○
Solid state / semi-solid state	○○	○○	○○	○○	○○	●●

●● Excellent ●○ Good ○○ Not recommended

Note:
1. Some bacteria; yeast; fungi
2. Facultative culture (For example, some Lactobacillus; ethanol production)
3. Same as Note 2
4. This vessel is excellent for fragile cells that are easily sheared by any type of mechanical impeller
5. Plant; algae; cyanobacteria (blue-green algae)

https://www.majorsci.com/ec99/rwd1661/category.asp?category_id=23

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fermentation – Winpact Bench-top Fermentation System



Jacket vessel (Dish bottom)



Single wall (Dish bottom)



Single wall with blanket (Dish bottom)



Air lifter



Single wall with heat base unit (Plain bottom)



Solid state (Dish bottom)

https://www.majorsci.com/ec99/rwd1661/category.asp?category_id=23

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fermentation – Winpact Bench-top Fermentation System

Vessel Specification

	Vessel type	Double Jacketed Dish Bottom Vessel (FS-V-A series)				
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings (H:D ratio: 2:1)				
	Working volume **	500ml	1L	3L	5L	10L
	Total volume Δ	1L	1.5L	3.8L	6.8L	12.5L
	Vessel type	Single Wall Dish Bottom Vessel (FS-V-B series)				
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings (H:D ratio: 2:1)				
	Working volume **	1L	3L	5L	10L	
	Total volume Δ	1.5L	3.8L	6.8L	12.5L	
	Vessel type	Air Lifter Vessel (FS-V-C series)				
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings (H:D ratio: 3:1)				
	Working volume **	5L single wall		5L double jacketed		
	Total volume Δ	7L				
	Vessel type	Single Wall Dish Bottom Vessel With Heating Blanket (FS-V-B series)					
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings (H:D ratio: 2:1)					
	Working volume **	1L	3L	5L	10L	15L	20L
	Total volume Δ	1.5L	3.8L	6.8L	12.5L	18.7L	23.7L
	Vessel type	Single Wall Plain Bottom Vessel With Heating Base Unit (FS-V-D series)			
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings (H:D ratio: 2:1)			
	Working volume **	3L		5L	10L
	Total volume Δ	3.7L		6.7L	13.1L
	Vessel type	Solid State (FS-V-SA series)			
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings			
	Working volume **	3L		5L	10L
	Total volume Δ	3.8L		6.8L	12.5L

https://www.majorsci.com/ec99/rwd1661/category.asp?category_id=23

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

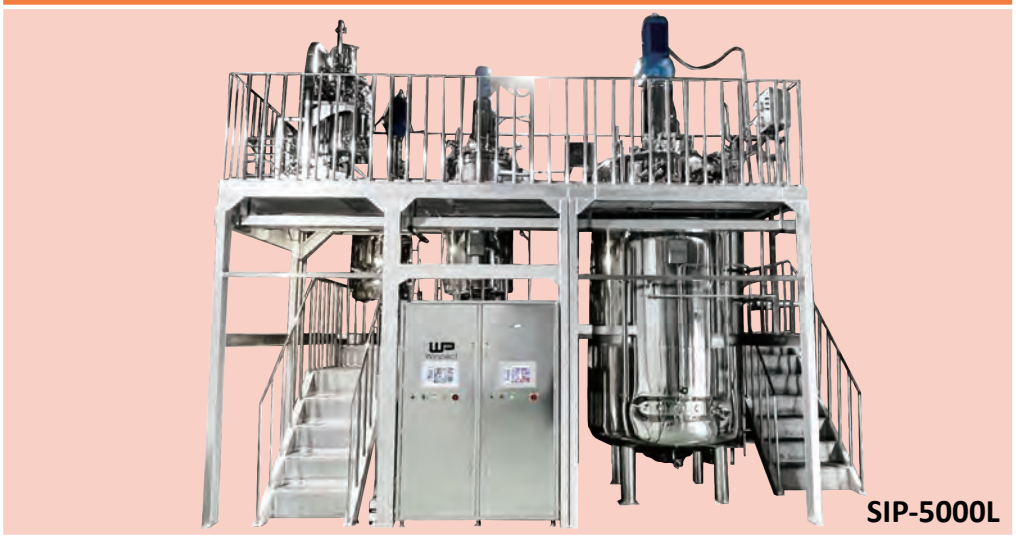
Fermentation – Winpact SIP Fermentation System

Pilot Scale	Production Scale			
				
SIP-30/50L	SIP-100L	SIP-200L	SIP-500L	SIP-1000L and above

https://www.majorsci.com/ec99/rwd1661/category.asp?category_id=10

Fermentation – Winpact SIP Fermentation System

Production Scale



2026/09/18

https://www.majorsci.com/ec99/rwd1661/product.asp?prodid=a08

19

major science- WP 產品介紹 - 醱酵、流體輸送、冷凍乾燥及實驗室基本應用

Fermentation – Parameter Control

Sensors, monitor and optimize fermentation processes in real-time.



2026/09/18

https://www.majorsci.com/ec99/rwd1661/category.asp?category_id=11

20

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fermentation – Parameter Control

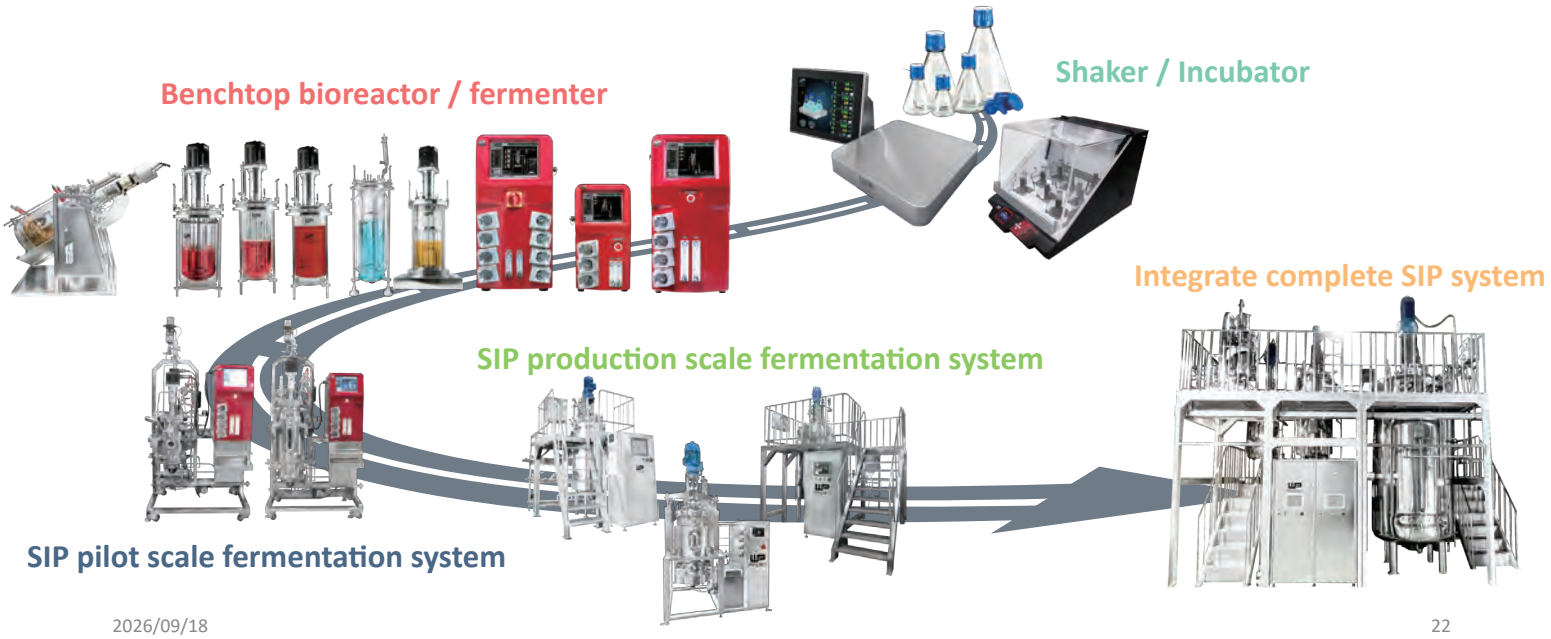
Applications of Common Bioprocess & Analytical Probes

Probe	Main Measurement	Typical Applications
pH	Acidity / alkalinity	Fermentation, cell culture
DO	Dissolved oxygen	Aerobic bioprocess
Optical DO	Optical dissolved oxygen measurement	Long-term bioprocess & cell culture
dCO2	Dissolved carbon dioxide	Mammalian cell culture
TCD	Total cell density	Fermentation monitoring
VCD	Living cell concentration	Biopharma cell culture
ORP	Oxidation/reduction state	Anaerobic process, water treatment
Conductivity	Ion concentration	Water purification, CIP/SIP
Glucose	Nutrient concentration	Fed-batch & cell culture

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Bioprocessing – Winpact Product Line



major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fermentation utilities – Manual Lifter



Manual Lifter
2026/09/18



Lift the vessel up



Stainless Steel Cart



place it into the autoclave

23

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fermentation utilities – Water Control

Model	WCC-201
Temperature Control Range (No-load)	-10℃ ~ 100℃
Cooling Capacity	Maximum is 1800W （1.8kW）
Temperature display resolution	0.01℃
Temperature Stability	±0.05℃
External Circulation Flow Rate	13L/min
Pump Head (Max.)	Maximum Head: 3 m
Pump Pressure (Max.)	approx. 0.29 bar
Refrigerant Type	R513A
Refrigerant Filling weight	220g
Tank Volume	20L
Tank Material	SUS304
Tank Depth （mm）	280
Tank Opening Size （mm）	235x160
Overall Dimensions （mm）	L380xW410xH990
Input Power	220VAC, 50/60Hz
Rated Power	2500W （2.5kW）
Working Medium	Pure Water or Anhydrous Ethanol
IP Code	IP43
Sound pressure level dbA	20
External Circulation Port Size	G1/2 male thread with optional barbed connectors for 8, 10, 12 mm outer diameter hose
Net Weight	Approx. 45kg



WCC-100/101



24

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fermentation utilities – Water Control (Premium mode)

Model	VALEGRO 1801	VALEGRO 2503
Temperature Control Range (No-load)	-20℃ ~ 40℃	-20℃ ~ 40℃
Cooling Capacity	1.8 kW @20°C	2.5 kW @20°C
Temperature display resolution	0.1℃	
Temperature Stability	±0.3℃	±0.3℃
External Circulation Flow Rate	15-23L/min	15-40L/min
Pump Head (Max.)	Approx. 11 m	Approx. 35 m
Pump Pressure (Max.)	0.5-1.1 bar	0.5-3.5 bar
Refrigerant Type	R290	
Refrigerant Filling weight	80g	99g
Tank Volume	4-7L	3-8L
Tank Material	Stainless steel	
Overall Dimensions （mm）	L365xW525xH610	L430xW560xH430
Input Power	100-230VAC, 50/60Hz	220VAC, 50/60Hz
Working Medium	Pure Water or Anhydrous Ethanol	Pure Water or Anhydrous Ethanol
IP Code	IP21	IP21
Sound pressure level dbA	42~56	46~62
External Circulation Port Size	M16x1 male	M24x1.5 male
Net Weight	Approx. 43kg	Approx. 60kg

Julabo
THE TEMPERATURE CONTROL COMPANY



major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS



Fluid Transfer

A. Seed transfer (scale-up stages)

Moving culture from:

- Shake flask → seed fermenter → production bioreactor
- Purpose:
- Gradually scale up biomass while maintaining healthy cells

B. In-process transfer between vessels

For example:

- Fermenter → holding tank
- Fermenter → downstream processing (DSP)
- Bioreactor → centrifuge / filtration / harvest tank

C. Media transfer

- Sterile transfer of culture media into bioreactor before inoculation
- Feeding sterile nutrients during fed-batch fermentation

2026/09/18

26

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fluid Transfer – Pumping with Multiple Pumps

Cat. No.	WP-2DP	WP-4DP
Display	12" Color Touch Panel	
Voltage	100V~240V, 50/60Hz	
Number Of pump head	2	4
Number Of Rollers	4	
Controller	Digital microprocess control	
Pump Speed / Increment	5-250rpm / 1rpm	
Max. Pump Speed	250rpm	
Flow Range	0.3 - 1,026ml/min	
Program	2-step Program (running & ceasing)	
Operating temperature	Ambient to 40°C	



- Digital microprocessor control for precise speed control
- **12" Color Touch Panel** shows temperature and timer simultaneously
- Compact size provides high portability
- High quality Masterflex easy load pump head
- Reversible for purging purposes
- Flow rate range from 1.2 to 1,140ml/min
- **Multiple programmable** operation mode available
- **Constant speed** and **constant volume** are available.

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fluid Transfer – Pumping with Hight Capacity

Cat. No.	WP-D01
Display	4.3" Color Touch Panel
Voltage	100V~240V, 50/60Hz
Motor	Servo Motor
Number Of Rollers	4
Controller	Digital microprocess control
Pump Speed / Increment	5-250rpm / 1rpm
Max. Pump Speed	300rpm, variable flow
Flow Range	10 - 13000ml/min
Mode	Continuons / Timing / Programmable
Calibration	Flow rate calibration



- Flow rates up to **13 L**/min.
- High-torque **brushless motor**.
- Both **continuous run** and **programmable dispensing** modes available.
- Stainless steel housing.

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fluid Transfer - Piping



Key requirements in fermentation fluid transfer

- SIP (Sterilization-In-Place)
- Aseptic connections (steam barriers, sterile filters, sanitary diaphragm valves)
- CIP (Clean-In-Place)

Poorly designed fluid transfer can cause:

- Contamination
- Batch failure
- Loss of productivity

Good design ensures:

- Smooth scale-up from lab → pilot → production
- Reproducible fermentation results
- Compliance with GMP standards

2026/09/18 29

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fluid Transfer – Piping for 100L to 1000L



2026/09/18 30

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fluid Transfer - Laboratory-Scale Microfiltration System

Name	WP-MF
Filtration	Microfiltration (MF)
Operating Mode	Cross-flow / Tangential Flow Filtration
Pump Type	Peristaltic Pump
Flow Rate Range	20 – 500 mL/min
Tubing Material	316L Stainless Steel
Membrane Holder	316L Sanitary Stainless Steel
Connection Type	Sanitary quick-clamp fittings
Valve Type	diaphragm valves
Pressure Monitoring	X2, diaphragm pressure gauges
Pressure Range	0 – 4 bar
Membrane Format	Cassette / Flat Sheet
Effective Membrane Area	0.1 m^2
Installation Type	Removable cassette structure
Flow Pattern	Cross-flow
Supported Processes	MF / UF



2026/09/18

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

3

Lyophilization



- Freezes and removes moisture under vacuum (sublimation)
- Preserves product stability and potency
- Produces dry, stable lyophilized product

Lyophilization

- **Preserves Thermolabile Substances**: Low-temperature processing prevents the denaturation of heat-sensitive biological materials like proteins, enzymes, and vaccines.
- **Maintains Structural Integrity**: Because ice sublimates directly without turning into liquid water, the product retains its original shape, volume, and porous structure without shrinkage.
- **Instant Reconstitution (High Solubility)**: The resulting porous matrix allows the dried product to rapidly dissolve and return to its original state when a solvent is added.
- **Extended Shelf Life**: Removing water inhibits chemical reactions and microbial growth, allowing long-term storage at room temperature.

2026/09/18

32

Version: 1.0 This material is only for internal training only

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Lyophilization - Product Freezer

Name	Shelf Type Vacuum Freeze Dryer
Shelf temperature range	-55°C to +50°C
Condenser temperature	-65°C to 75°C (depending on load)
CFC-free refrigerants	R507 / R23
Cooling	Air-cooled
Inner chamber material	US304 / optional SUS316L with mirror polishing.
Loading Capacity	Individual Tray Area: 500 mm × 340 mm =170,000=0.17m² Total Shelf Area (3 Trays): 0.17m² × 30mm =0.51 m²
Tray number	3 flat trays
Vacuum system	10L Oil vacuum pump
Vacuum (no-load)	8.0 × 10-³ Torr (≈1.07Pa)
Control	PLC + HMI with temperature & vacuum control
Power consumption	10 kW
Rated Voltage	3Φ, AC220V/AC380V, 60Hz



2026/09/18

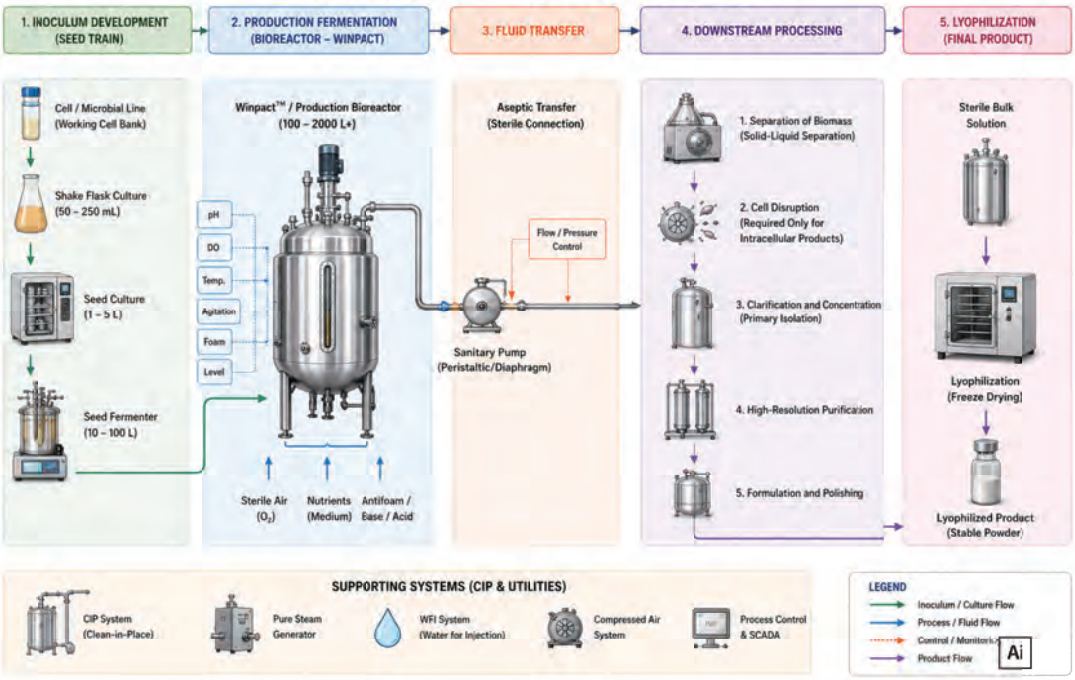
https://www.majorsci.com/ec99/rwd1661/product.asp?prodid=a153

33

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

FERMENTATION PROCESS FLOWCHART



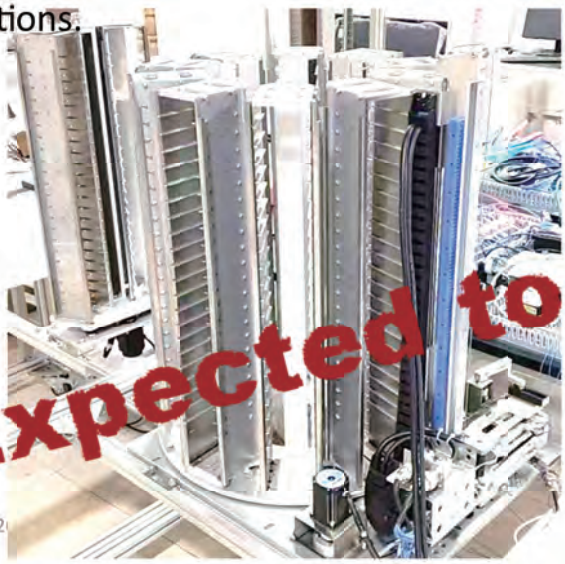
2026/09/18

34

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

New Develpoment – Automated Incubation System

Automated incubators are robotic-accessible systems designed to store, incubate, and manage biological samples or microplates under highly controlled environmental conditions.





Expected to launch in 2027

202 35

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

New Develpoment – Automated Incubation System

- Equipped with an automated door control system and transfer ports for seamless integration with robotic arms and automated workstations.
- Enables direct robotic access and automated handling of microplates or sample racks.
- Provides precise control of temperature, CO_2 concentration, and humidity to maintain stable and reproducible incubation conditions.
- Integrated barcode reader records each access and transfer event for sample traceability and data management.



Expected to launch in 2027

2026/09/18

Winpact INNOVATIVE CULTIVATION SOLUTIONS

New Develpoment – Automated Incubation System



major science Innovative Life Sciences Tools

Winpact INNOVATIVE CULTIVATION SOLUTIONS

Winpact Knowledge Base

Application Note

Application Note

No.	Title
1	Development of High-Glucosinolate-Retaining Lactic-Acid-Bacteria-Co-Fermented Cabbage Products
2	Glycine-rich peptides from fermented Chenopodium formosanum sprout as an antioxidant to modulate the oxidative stress
3	Peptide from jeotgal-like fermented Chenopodium formosanum counters senescence while enhancing antioxidant ability in non-replicative aging
4	Production and analysis of metabolites from solid-state fermentation of Chenopodium formosanum (Djulis) sprouts in a bioreactor
5	Increased production of isobutanol from xylose through metabolic engineering of Saccharomyces cerevisiae overexpressing transcription factor Znf1 and exogenous genes
6	Scaling-up strategies for controllable biosynthetic ZnO NPs using cell free-extract of endophytic Streptomyces albus: characterization, statistical optimization, and biomedical activities evaluation
7	Aromatic compounds and organic acids identified from Ganoderma formosanum exhibit synergistic anti-melanogenic effects
8	Sodium Fluoride Exposure Leads to ATP Depletion and Altered RNA Decay in Escherichia coli under Anaerobic Conditions
9	Comprehensive analysis of repetitive extragenic palindrome sequences identified in bacteria and archaea using a new web-based tool, RepRanger
10	Combined Transcriptomic and Proteomic Profiling of E. coli under Microaerobic versus Aerobic Conditions: The Multifaceted Roles of Noncoding Small RNAs and Oxygen-Dependent Sensing in Global Gene Expression Control
11	Evaluation of Metabolic Engineering Strategies on 2-Ketoisovalerate Production by Escherichia coli
12	Enhancement of β-Alanine Biosynthesis in Escherichia coli Based on Multivariate Modular Metabolic Engineering
13	Lack of Acute Toxicity and Mutagenicity from Recombinant Epinephelus lanceolatus Piscidin Expressed in Pichia pastoris

Journal Article

Journal Article

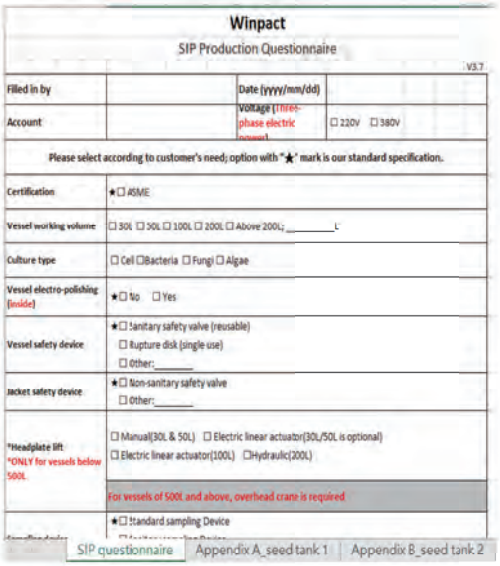
Winpact Benchtop Controller | Vessel

Title	Species
Enhanced reutilization value of shrimp-shell waste via fed-batch biodegradation with higher production of reducing	bacteria
Development of High-Glucosinolate Retaining Lactic-Acid-Bacteria-Co-Fermented Cabbage Products	bacteria
Scaling-up strategies for controllable biosynthetic ZnO NPs using cell free-extract of endophytic Streptomyces albus: characterization, statistical optimization, and biomedical activities evaluation	bacteria
Sodium Fluoride Exposure Leads to ATP Depletion and Altered RNA Decay in Escherichia coli under Anaerobic Conditions	bacteria
Combined Transcriptomic and Proteomic Profiling of E. coli under Microaerobic versus Aerobic Conditions: The Multifaceted Roles of Noncoding Small RNAs and Oxygen-Dependent Sensing in Global Gene Expression Control	bacteria
Evaluation of Metabolic Engineering Strategies on 2-Ketoisovalerate Production by Escherichia coli	bacteria
Enhancement of β-Alanine Biosynthesis in Escherichia coli Based on Multivariate Modular Metabolic Engineering	bacteria
Lack of Acute Toxicity and Mutagenicity from Recombinant Epinephelus lanceolatus Piscidin Expressed in Pichia pastoris	bacteria
Continuous fermentation of recombinant Pichia pastoris Mut+ producing HBsAg: Optimizing dilution rate and determining strain-specific parameters	bacteria
A systematic approach re-analyzing the effects of temperature disturbance on the microbial community of mesophilic anaerobic digestion	bacteria
Enhanced L-methionine production by genetically engineered Escherichia coli through fermentation optimization	bacteria
In vitro fermentation of copra meal hydrolysate by human fecal microbiota	bacteria
Highly Efficient Transfer of TTM Membrane Protein from Native Membrane to Covalently Circularized Nanodisc	bacteria

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Questionaries & Proposal of Winpact Fermentation System



Winpact

SIP Production Questionnaire

V3.7

Filled in by		Date (yyyy/mm/dd)	
Account		Voltage (Three-phase electric power)	☐ 220V ☐ 380V

Please select according to customer's need; option with "★" mark is our standard specification.

Certification	★☐ ASME
Vessel working volume	☐ 30L ☐ 50L ☐ 100L ☐ 200L ☐ Above 200L; _____ L
Culture type	☐ Cell ☐ Bacteria ☐ Fungi ☐ Algae
Vessel electro-polishing (inside)	★☐ No ☐ Yes
Vessel safety device	★☐ Sanitary safety valve (reusable) ☐ Rupture disk (single use) ☐ Other:_____
Jacket safety device	★☐ Non-sanitary safety valve ☐ Other:_____
*Headplate lift *ONLY for vessels below 500L	☐ Manual(30L & 50L) ☐ Electric linear actuator(30L/50L is optional) ☐ Electric linear actuator(100L) ☐ Hydraulic(200L)
	For vessels of 500L and above, overhead crane is required
	★☐ Standard sampling Device

SIP questionnaire | Appendix A_seed tank 1 | Appendix B_seed tank 2



Major Science

Bench-top Fermentation System Production Questionnaire

Please select according to customer's need; option with "★" mark is our standard specification.

V2.7

Country		
Company		
Name		
Email		
Date (yyyy/mm/dd)		

Select according to customer's need. For detailed specification about vessel, please refer to Appendix A

1. Cell Type	☐ Cell ☐ Bacteria ☐ Algae ☐ Fungi	
2. Cultivation Type	☐ Submerged ☐ Solid state	
3. Single or Dual Vesse	☐ Singel vessel control ☐ Dual vesel control(220V only)	
4. Vessel Type and Volume	A type : Double Jacketed Dish Bottom Vessel	☐ 500ml ☐ 1L ☐ 3L ☐ 5L ☐ 10L ; ___set
	B type : Single Wall Dish Bottom Vessel	☐ 1L ☐ 3L ☐ 5L ☐ 10L ☐ 15L ☐ 20L ; ___set
	C type : Air Lifter Vessel	☐ 3L ; ___set
	D type : Single Wall Plain Bottom Vessel with	☐ 3L ☐ 5L ☐ 10L ; ___set

Questionnaire | Appendix A



Sales Proposal

Winpact FS-50L SIP Fermentation System with Electrical Headplate Lifter

Prepared for:
[Name], [Receiving party, distributor]
[User name], [User institution Name]

Prepared by:
Bee Lin, major science Co., Ltd

Submitted on:
August 10th, 2025

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Fermentation OEM Service (only in Taiwan)

Fermentation OEM Service provide researchers and industries with specialized facilities, expertise, and equipment to conduct small-scale and pilot-scale fermentation studies.

- Professional Fermentation
- Pilot Batch Production
- Process Scale-up
- From R&D to Commercial-Scale Production
- Comprehensive Service Team



major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

BioSolutions Service



Engineering & Consulting

We provide customized engineering solutions for biotechnology, pharmaceutical, and food industries. From design and construction to project supervision, commissioning, and validation, our professional team supports your project while ensuring compliance with relevant industry standards and regulations.

Contact Us ›



Professional Product Sourcing

We help you identify and source suitable customized products, equipment, and systems for biotechnology-related applications.

Contact Us ›



Market Analysis & Strategic Partnerships

Looking to enter Taiwan's biotechnology market but unfamiliar with the local ecosystem? We support companies in understanding the market, identifying opportunities, and establishing strategic partnerships within Taiwan's biotechnology industry.

Contact Us ›



Marketing & Distribution Channel Development

Looking to market biotechnology products or find a local distributor in Taiwan? Through our established network of international brands, suppliers, and local partners, we can support market development, distribution channels, and product commercialization in Taiwan.

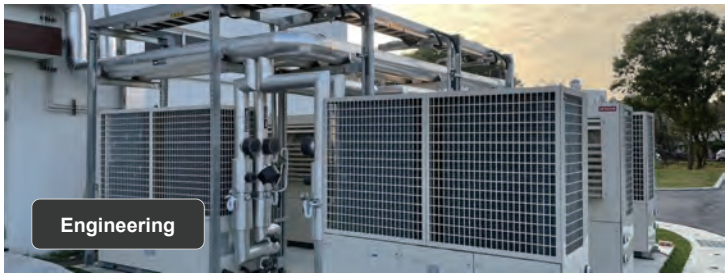
Contact Us ›

major science
Innovative Life Sciences Tools

Winpact
INNOVATIVE CULTIVATION SOLUTIONS

Turnkey Plant Project









Winpact

major science

Thanks for Your Attention

https://www.majorsci.com/

滅菌釜在微生物培養應用與滅菌確效驗證

ONETEC 巨興化學儀器股份有限公司

微生物培養

1. 器材滅菌
2. 培養基配置
3. 無菌操作
4. 樣品接種
5. 培養與觀察

滅菌方式

滅菌方法	核心原理	常見條件	優點
濕熱滅菌	蛋白質凝固	121°C ，約 15-30 分鐘	物品會弄濕、不耐高溫高壓的會壞
乾熱滅菌	蛋白質氧化脫水	160°C - 180°C ，約 2 小時	溫度非常高、耗時長，塑膠會熔化
Gamma 滅菌	破壞 DNA 結構	放射線照射	設備昂貴、有些塑膠照完會變黃變脆
EO 滅菌	化學殺菌	需數小時與通氣排毒	氣體通常有毒或易燃、需要時間排氣

為什麼需要 Autoclave?



* 升溫數率 - 加熱功率

* 數據顯示 - 壓力與溫度

* 精準控制 - 精準控溫與達溫計時

* 安全 - 超壓洩壓、超溫停機與防乾燒等



* 升溫數率 - 加熱功率





* 數據顯示 - 壓力與溫度







* 精準控制 - 精準控溫與達溫計時





* 安全 - 超壓洩壓、超溫停機與防乾燒等



滅菌釜滅菌確效

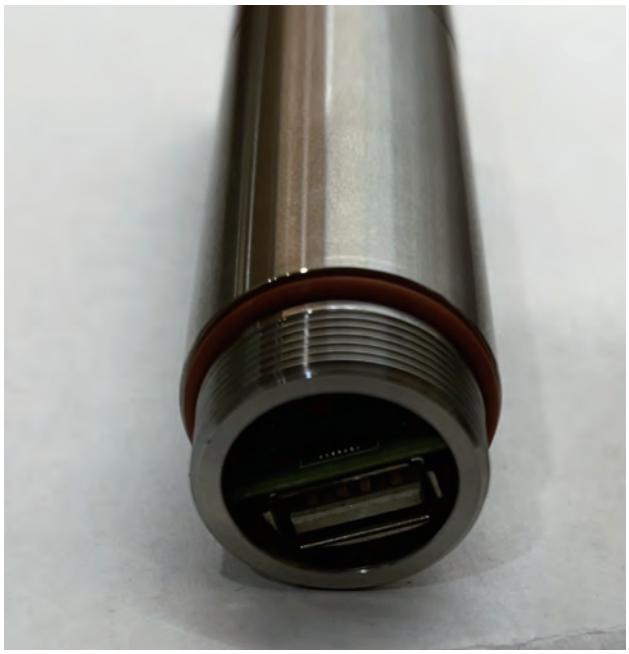
常見方式

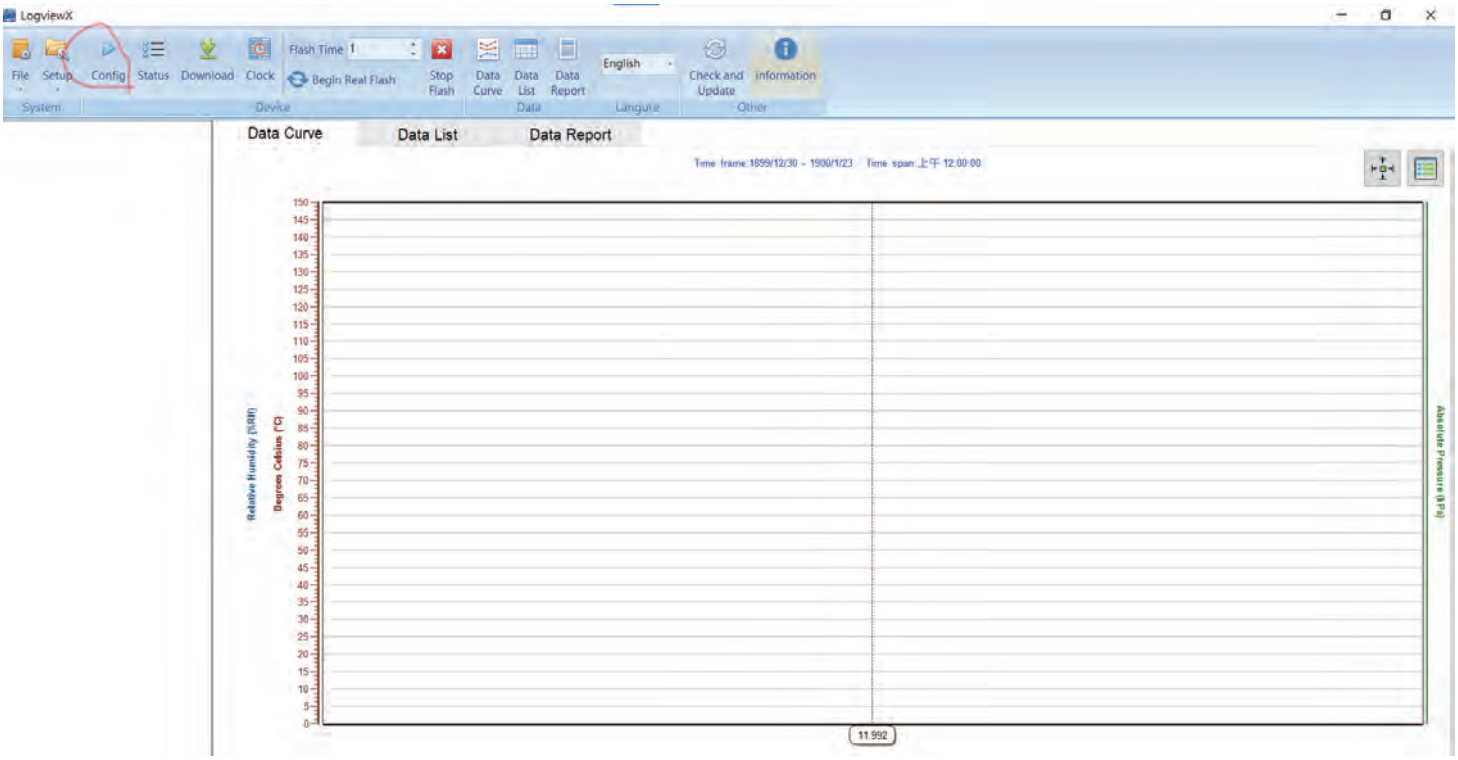


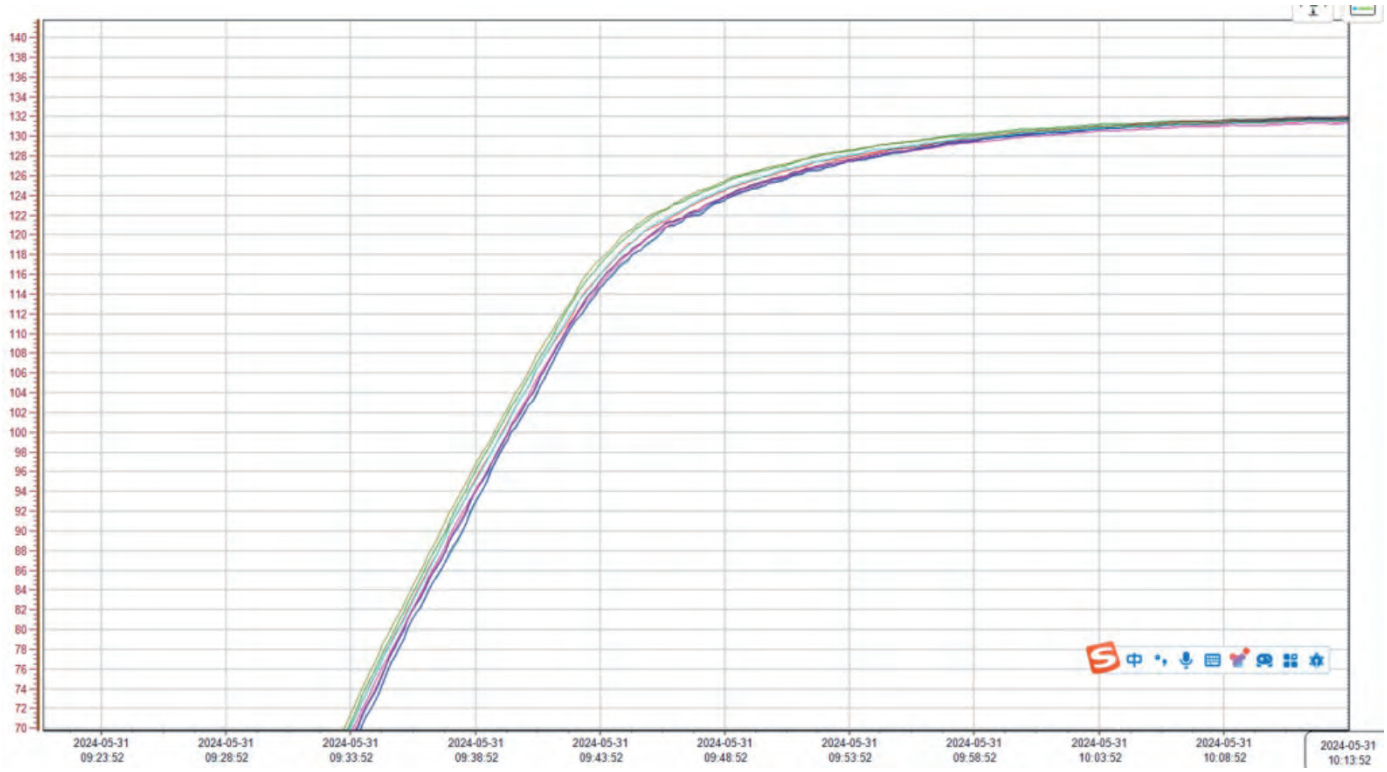


耐高壓式無線溫度紀錄器






LogviewX
File
Setup
Config
Status
Download
Clock
Flash Time 1
Begin Real Flash
Stop Flash
Data Curve
Data List
Data Report
English
Check and Update
information
System
Device
Data
Language
Other
Data Curve
Data List
Data Report
Time frame:1899/12/30 ~ 1900/1/23 Time span:上午 12:00:00
Relative Humidity (%RH)
Degrees Celsius (°C)
Absolute Pressure (kPa)
11.992


2024-05-31 09:23:52
2024-05-31 09:28:52
2024-05-31 09:33:52
2024-05-31 09:38:52
2024-05-31 09:43:52
2024-05-31 09:48:52
2024-05-31 09:53:52
2024-05-31 09:58:52
2024-05-31 10:03:52
2024-05-31 10:08:52
2024-05-31 10:13:52

學歷 / 證照

- 人類學系
- 英國釀造專門學校Brewlab文憑
  - Diploma in British Brewing Technology
- 國際釀造與蒸餾學院啤酒基礎釀造證照
  - IBD General Certificate in Brewing
- 國際釀造與蒸餾學院蘋果酒基礎釀造證照
  - IBD General Certificate in Cider
- 啤酒比賽認證評審
  - BJCP Certified Judge
- 啤酒侍酒師初級認證
  - Cicerone Certified Beer Server
- 國際釀造與蒸餾學院釀酒文憑 (Module 1 & 2)
  - IBD Diploma of Brewing (Module 1&2)
- 堆高機操作技術員
- 小型鍋爐操作人員
- HACCP 進階訓練
- 缺氧作業主管

經歷

- Heineken Master Brewer
- 海尼根台灣 釀造課課長
- 酉鬼啤酒資深釀酒師
- 臺虎精釀釀酒員

Now

HEINEKEN

酉鬼啤酒 UGLY HALF

REDISCOVER MICROORGANISMS.



質譜分析助攻發酵量產：代謝體學在製程開發、放大與監控的應用

Mass Spectrometry Supporting Fermentation Scale-Up: Applications of Metabolomics in Process Development, Scale-Up, and Monitoring

鄭凱文博士 | Kevin Cheng Ph.D.
雷文虎克 學研技術部門-業務副理
2026/09/18 11:45-12:20 農業部農業科技園區管理中心3樓大型會議室

關於我-鄭凱文 (Kevin)



學歷與專業歷程

- 2016 - 2018 國立台灣大學醫學院法醫學研究所 研究助理
- 2018 - 2019 台北醫學大學藥學系 研究助理
- 2019 - 2024 國立台灣大學化學系 博士
- 2024 - 2025 國立台灣大學化學系 博士後研究員
- 2025 - 至今 雷文虎克生物科技 業務副理

Publications

11 SCI papers; 3 (co-) first author papers

- Rapid Screening of Drug– *J. Am. Soc. Mass Spectrom. ,2024*
- Single-cell analysis platform– *Anal. Chem. 2024 (Front cover)*
- Auto-SPE-GC/MS method– *Rapid Commun. Mass Spectrom.,2020*

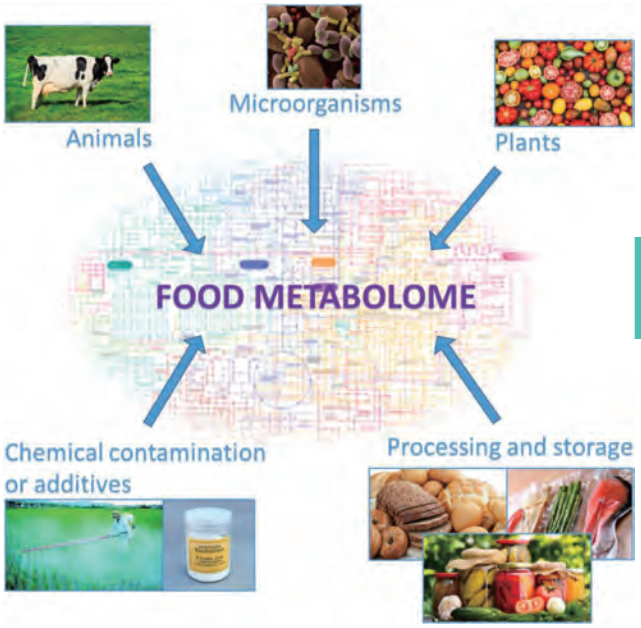
2

Outline｜今日內容重點

- 質譜代謝體學基礎與應用範疇-發酵量產為什麼需要質譜代謝體
- 代謝物到化合物預測: From Known to Unknown
- 如何提供高品質非標靶數據結果

3

發酵透過微生物代謝，重新塑造食品中的代謝物組成
Fermentation reshapes the food metabolome through microbial metabolism.



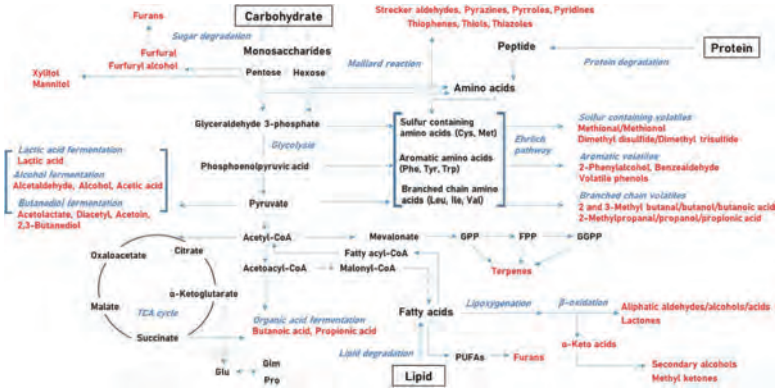
Microbial biotransformation of metabolites



What actually changes during fermentation?

Diez-Simon, C., Mumm, R. & Hall, R.D. Mass spectrometry-based metabolomics of volatiles as a new tool for understanding aroma and flavour chemistry in processed food products. *Metabolomics* **15**, 41 (2019). https://doi.org/10.1007/s11306-019-1493-6

How do microorganisms generate key metabolites during fermentation?



Carbohydrates

Pyruvate → Organic acids & alcohols

Proteins

Amino acids → Sulfur & aromatic compounds

Lipids

Fatty acids → Aldehydes, ketones & lactones

Park, M.K., Kim, YS. Mass spectrometry based metabolomics approach on the elucidation of volatile metabolites formation in fermented foods: A mini review. *Food Sci Biotechnol* **30**, 881–890 (2021). https://doi.org/10.1007/s10068-021-00917-9

How do microorganisms generate key metabolites during fermentation?



How can we capture these dynamic metabolic changes?

Carbohydrates

Pyruvate → Organic acids & alcohols

Proteins

Amino acids → Sulfur & aromatic compounds

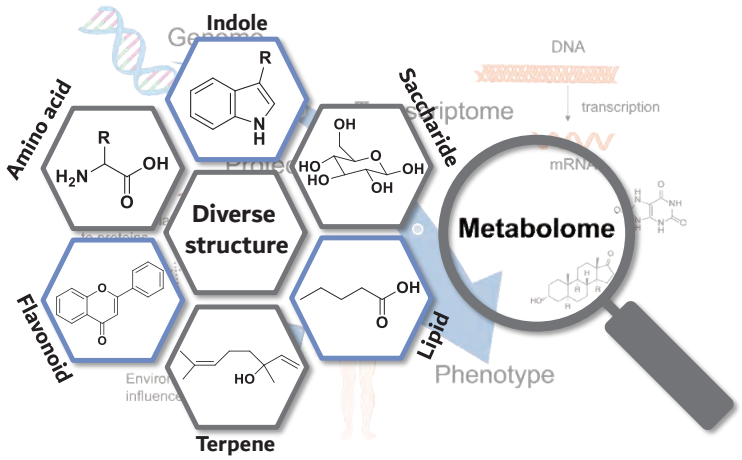
Lipids

Fatty acids → Aldehydes, ketones & lactones

Park, M.K., Kim, YS. Mass spectrometry based metabolomics approach on the elucidation of volatile metabolites formation in fermented foods: A mini review. *Food Sci Biotechnol* **30**, 881–890 (2021). https://doi.org/10.1007/s10068-021-00917-9

MS-Metabolome

- Complete set of small molecules (< 1,500 Da) within biological specimen

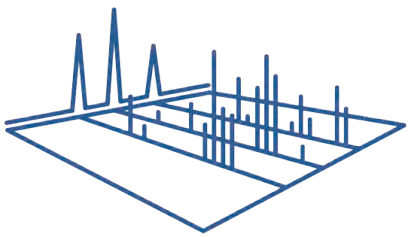




Steuer et al., *Front. Chem.*, **2019**.

7

Tandem MS-Based Metabolomics



Tandem Mass spectrometry (Tandem MS)

High sensitivity
Quantitative analysis (ppb level)

High specificity
Each chemical with distinct *m/z*

High selectivity
Acceptable to analyze with complex matrix

High throughput
~ 100 msec for each scan

Large dynamic range
Able to analyze both dominant / minor analytes

Require minimal prior knowledge
Untargeted analysis

8

Tandem MS-Based Metabolomics

High sensitivity
Quantitative analysis (ppb level)

High specificity
Each chemical with distinct *m/z*

High selectivity
Acceptable to analyze with complex matrix

High throughput
~ 100 msec for each scan

Large dynamic range
Able to analyze both dominant / minor analytes

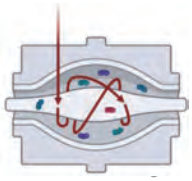
Require minimal prior knowledge
Untargeted analysis



Triple Quad
low-Resolution MS

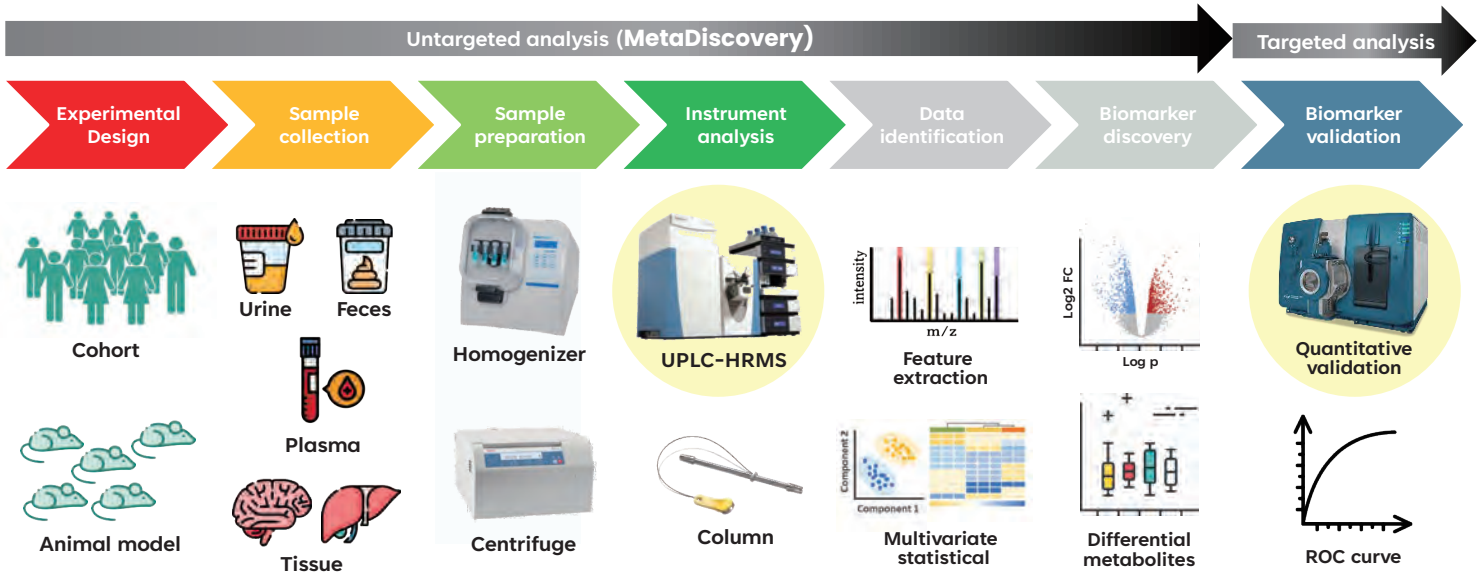
Targeted Analysis-Validation
- Well-defined groups of metabolites
- Absolute quantitation

Untargeted Analysis-Discovery
- Hypothesis generating
- Relative quantitation



High-Resolution
Mass Spectrometry (HRMS)
Orbitrap

質譜代謝體分析流程

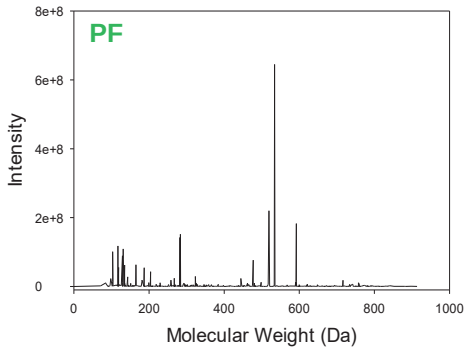


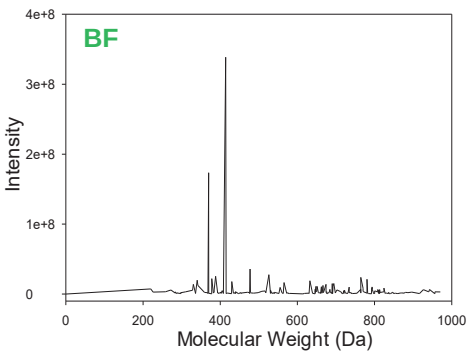
Case Study: Metabolomic Differences between Plate and Bioreactor Fermentation





Untargeted Composition Analysis





Compared with traditional plate fermentation (PF) and fermentation in a bioreactor (BF).



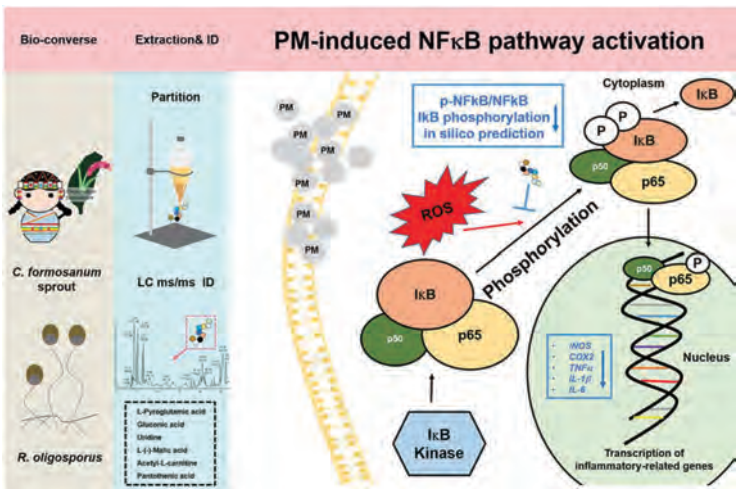
Dr. Kuan-Chen Cheng



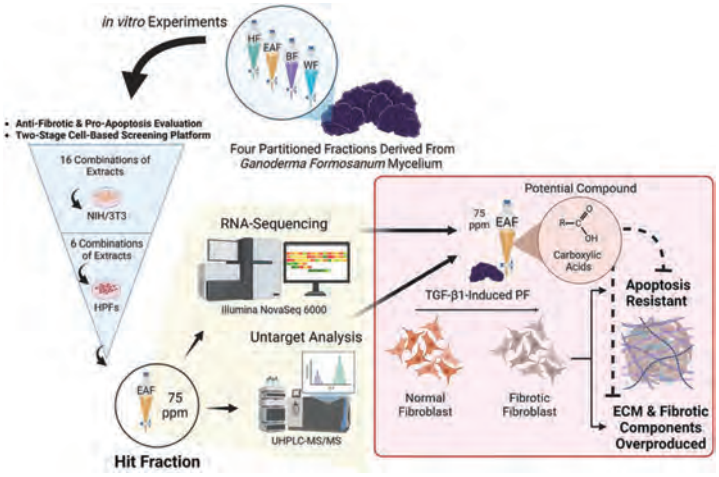
Dr. Chen-Che Hsieh

*C. C. Hsieh⁺, S. H. Yu⁺, **K. W. Cheng** et al.. Food. Res. Int. (2023).*
*C. C. Hsieh⁺, S. H. Yu⁺, H. C. Kuo, **K. W. Cheng** et al. J. Ethnopharmacol. (2024).*
*K. C. Cheng⁺, Patrick C. T. Chong, **K. W. Cheng** et al. J. Ethnopharmacol. (2024).*

Case Study: Metabolomic Differences between Plate and Bioreactor Fermentation



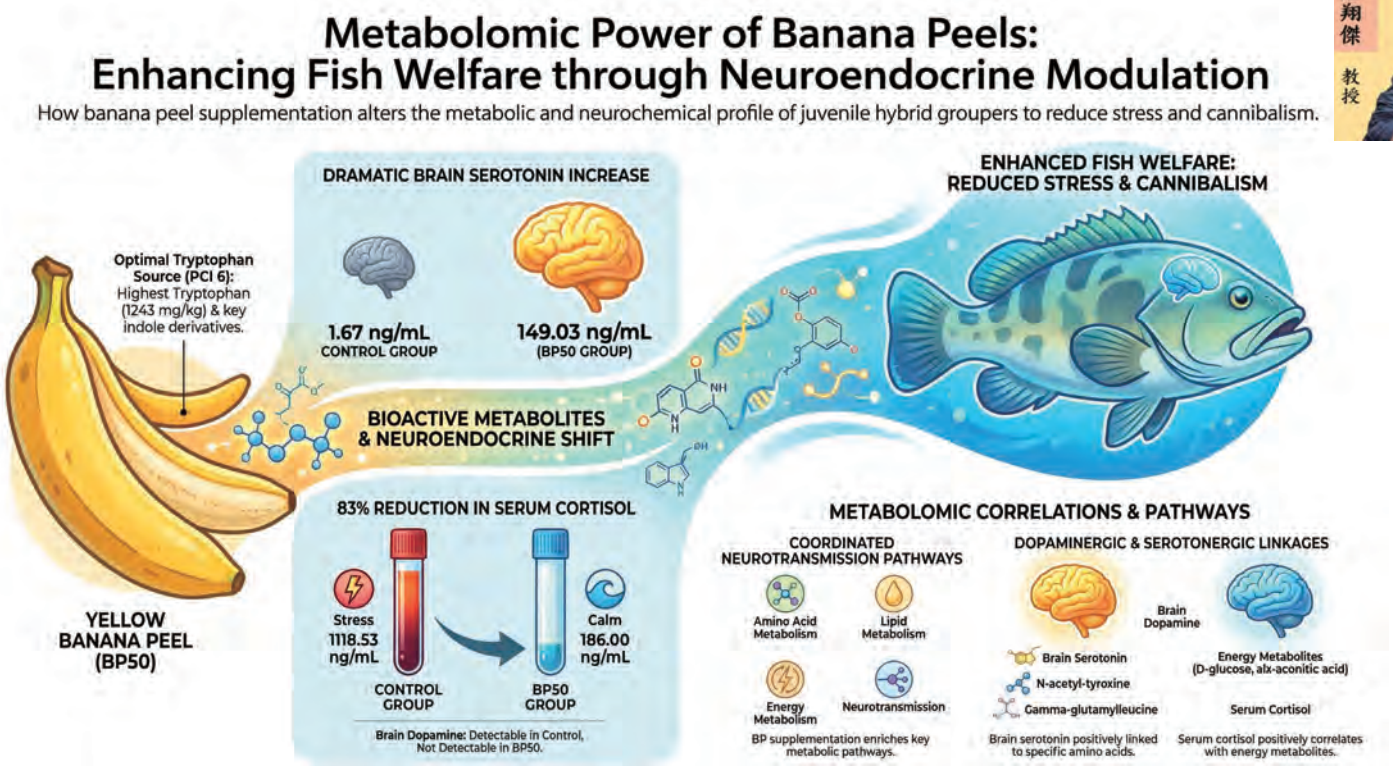
After identification, six compounds contribute the anti-inflammatory effect.



Ethyl acetate fraction analysis identified three bioactive compounds that penetrate TGF-βR1's active pockets in silico.

*C. C. Hsieh⁺, S. H. Yu⁺, **K. W. Cheng** et al.. Food. Res. Int. (2023).*
*C. C. Hsieh⁺, S. H. Yu⁺, H. C. Kuo, **K. W. Cheng** et al. J. Ethnopharmacol. (2024).*
*K. C. Cheng⁺, Patrick C. T. Chong, **K. W. Cheng** et al. J. Ethnopharmacol. (2024).*

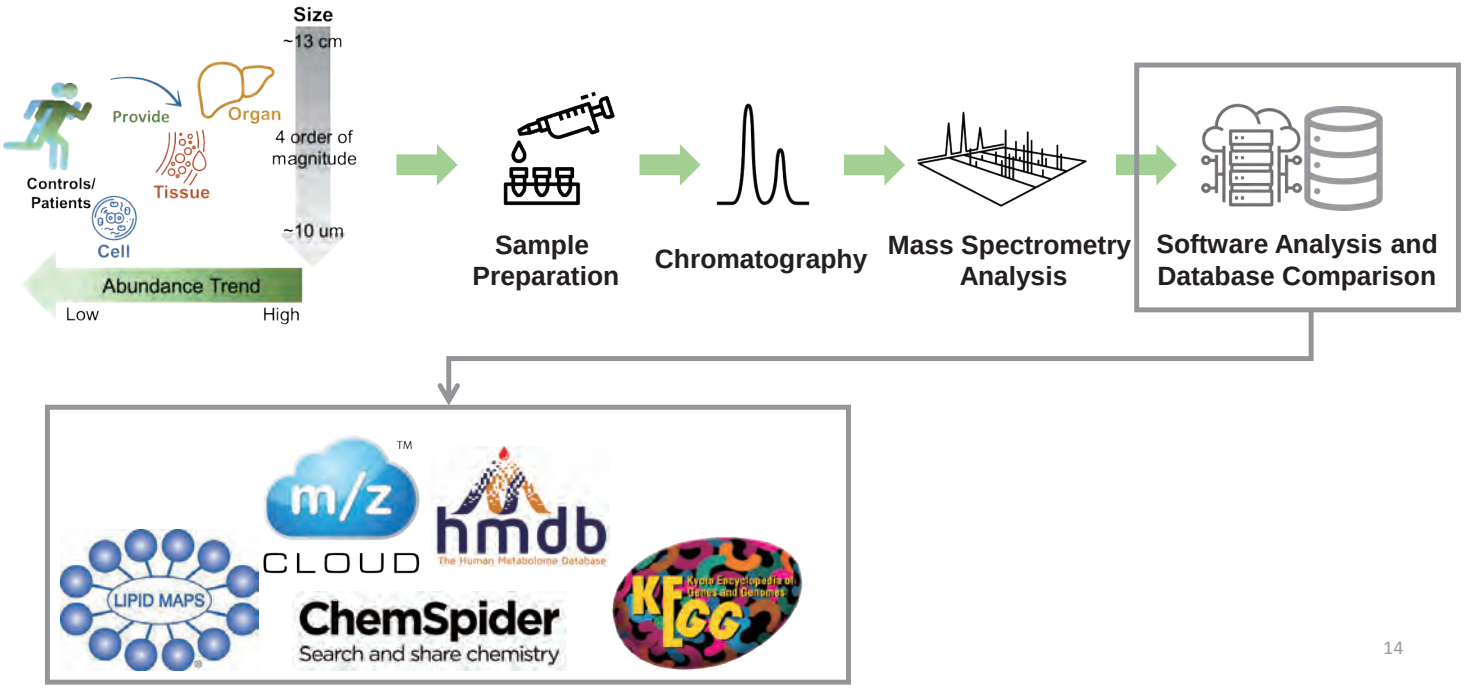




Cheng SY, Chuang HC. Banana peel valorization for sustainable aquaculture: Improving fish welfare and water quality. J Environ Manage. 2026 Jun 15;410:130110. doi: 10.1016/j.jenvman.2026.130110. Epub 2026 Jun 4. PMID: 42241853.

13

MS-based Metabolomics Workflow-Limitation



14



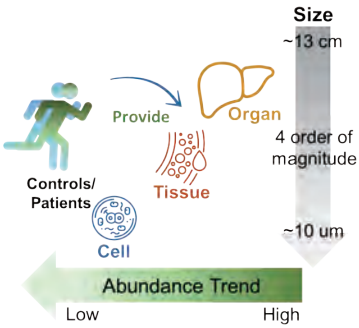






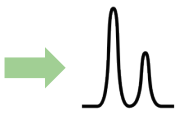


MS-based Metabolomics Workflow-Limitation

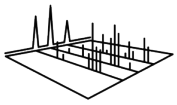




Sample Preparation



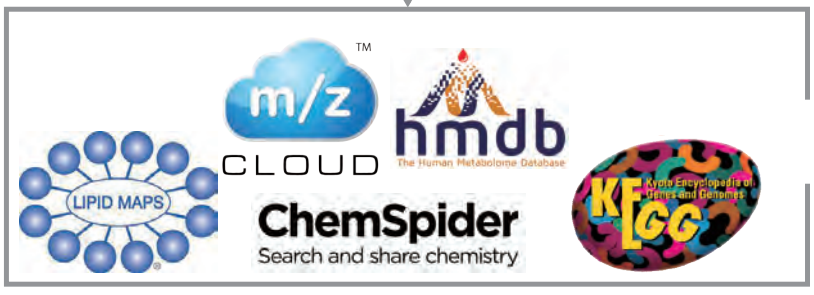
Chromatography



Mass Spectrometry Analysis



Software Analysis and Database Comparison





Global Natural Product Social Molecular Networking (GNPS)

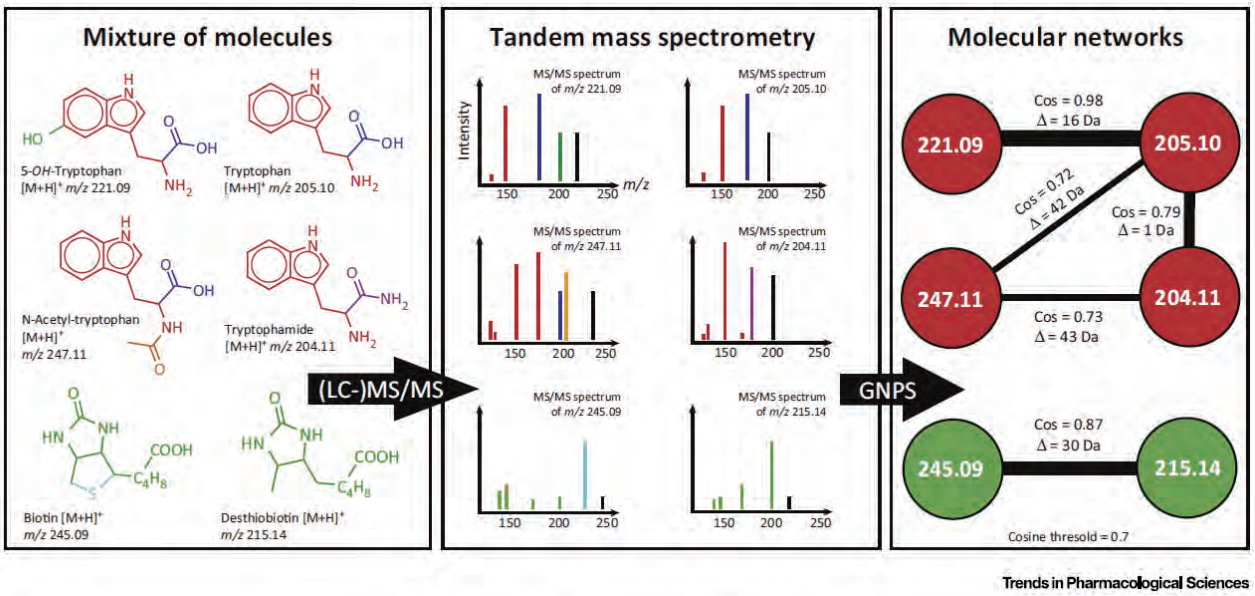
16

Global Natural Product Social Molecular Networking

A Graph-Based Tool to Explore Spectral Similarity in LC-MSMS Data from Molecular Mixtures



Prof. Pieter C. Dorrestein



17

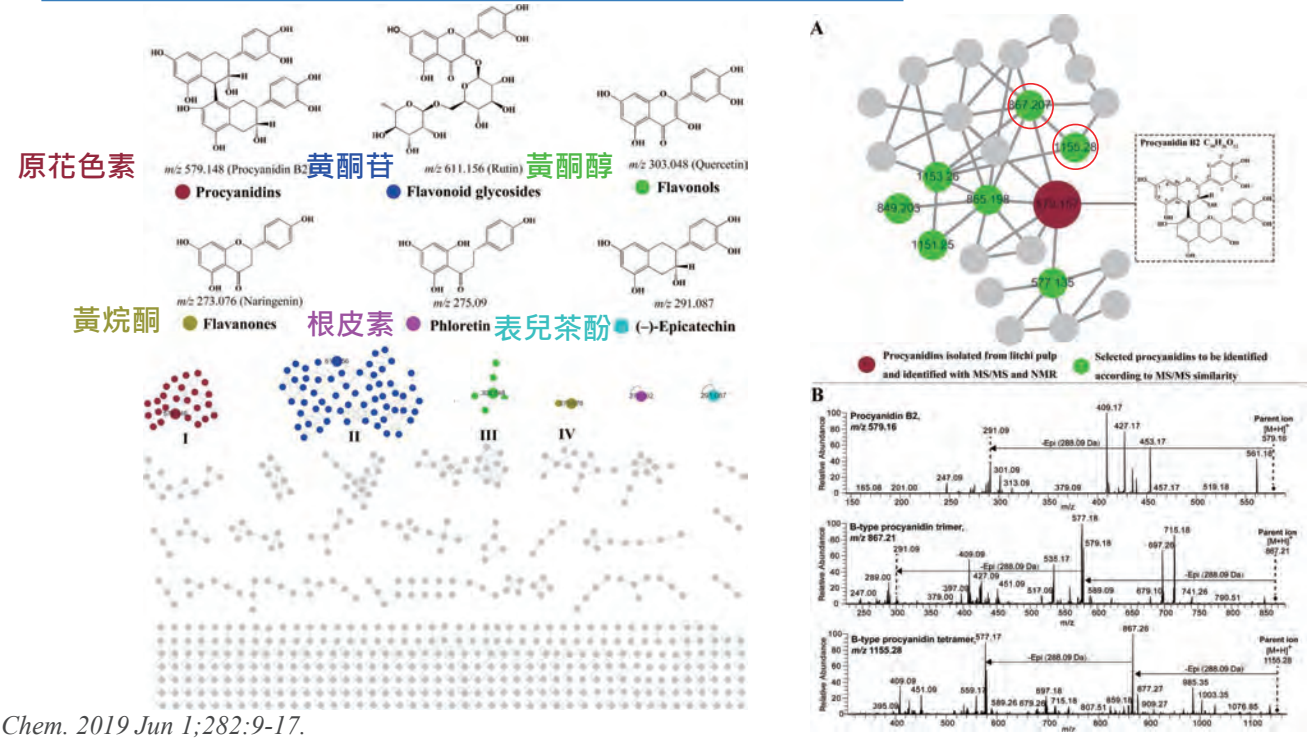
Trends in Pharmacological Sciences, February 2017, Vol. 38, No. 2

GNPS Application:

Molecular networking of phenolic compounds



呂強博士



18

Food. Chem. 2019 Jun 1;282:9-17.

GNPS Application:

Comparative metabolite profiles and molecular networking of two G. lucidum strains.



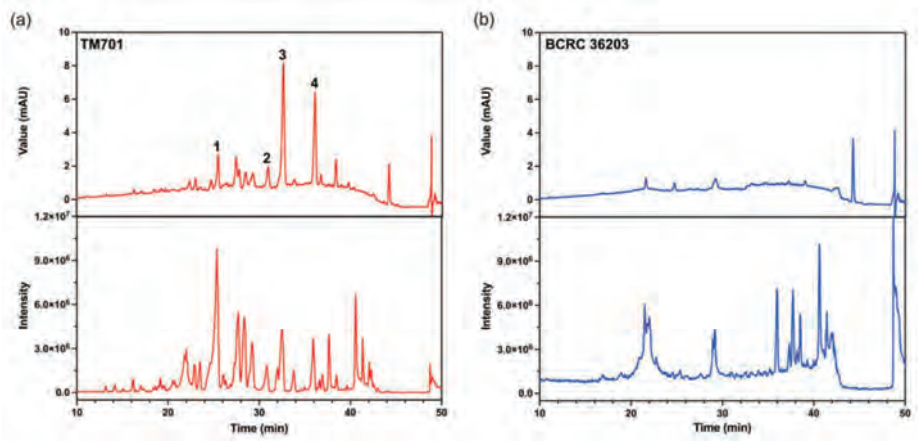
Dr. Nan-Wei Su



Dr. Hsin-Ya Tsai

LC-UV

LC-MSMS



19

J. Fungi 2026, 12(7), 500; https://doi.org/10.3390/jof12070500

GNPS Application:

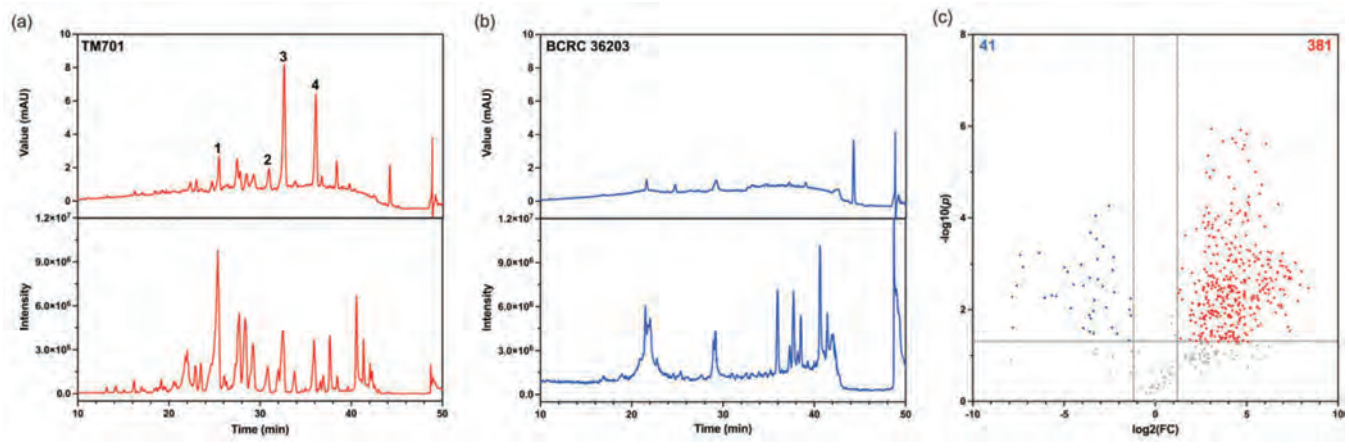
Comparative metabolite profiles and molecular networking of two G. lucidum strains.



Dr. Nan-Wei Su



Dr. Hsin-Ya Tsai



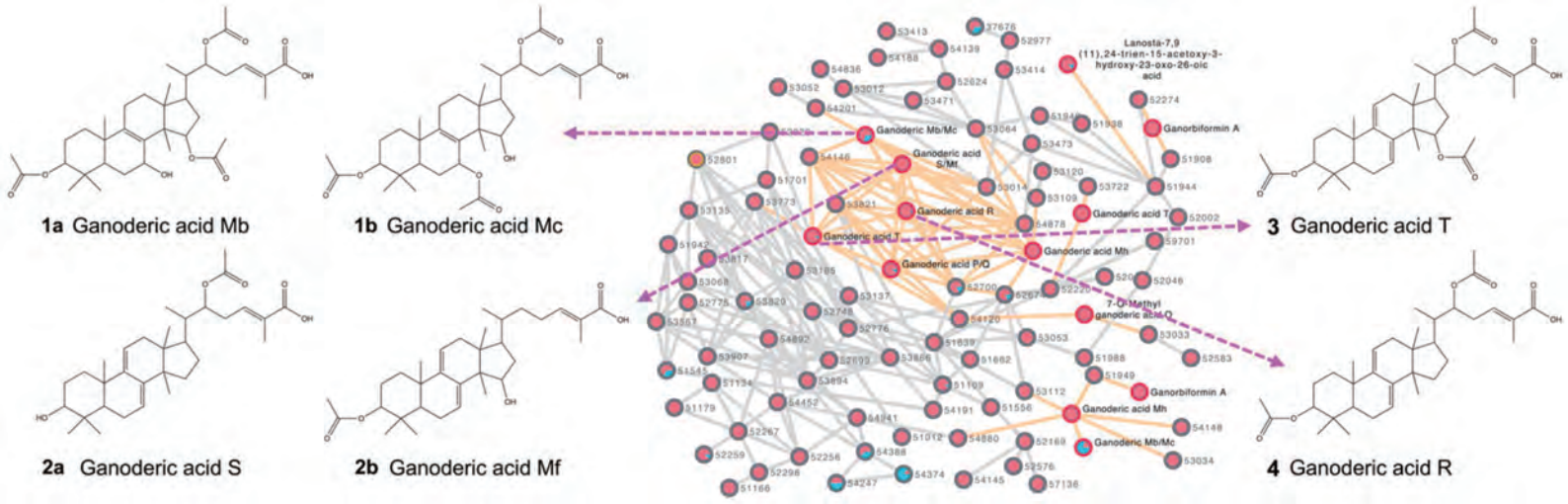
(TM701/BCRC 36203)

20

J. Fungi 2026, 12(7), 500; https://doi.org/10.3390/jof12070500

GNPS Application:

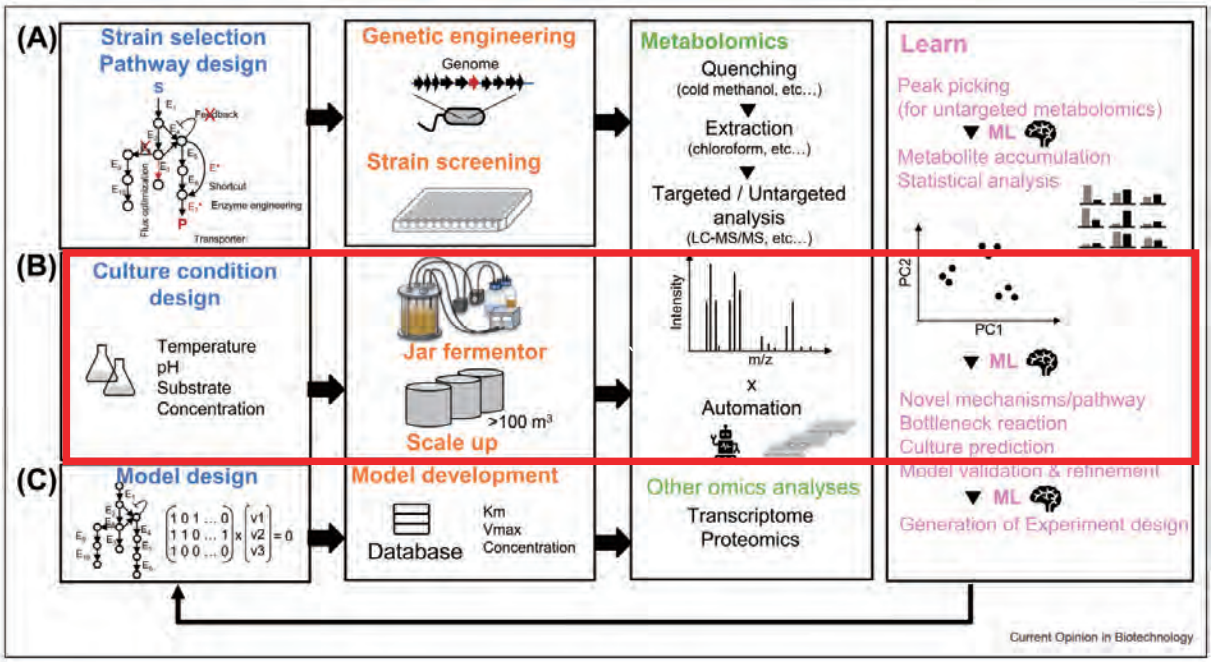
The major triterpenoid cluster from the MS/MS molecular network of G. lucidum strains TM701 and BCRC 36203 generated via GNPS. metabolite profiles and molecular networking of two G. lucidum strains.



21

J. Fungi 2026, 12(7), 500; https://doi.org/10.3390/jof12070500

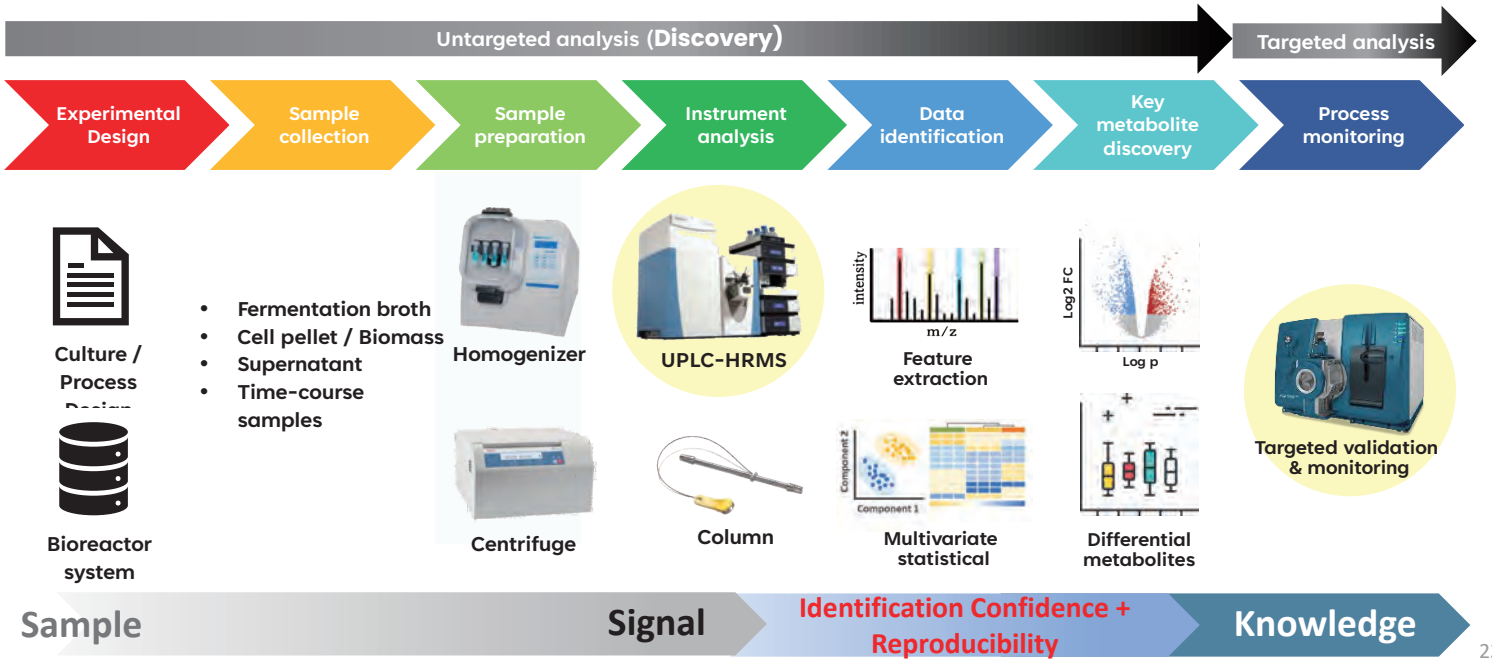
Metabolomics for Fermentation Scale-Up and Process Optimization



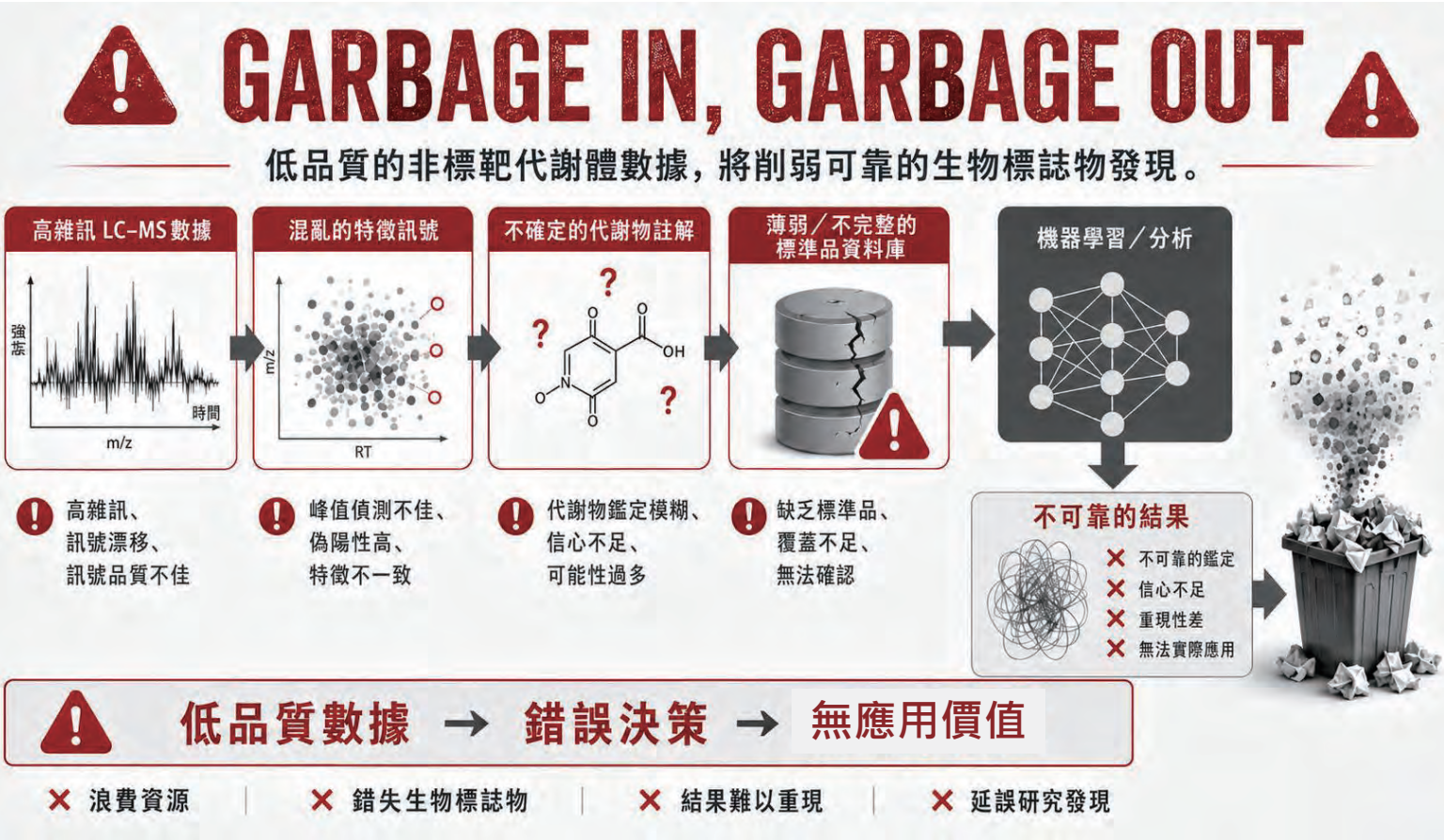
22

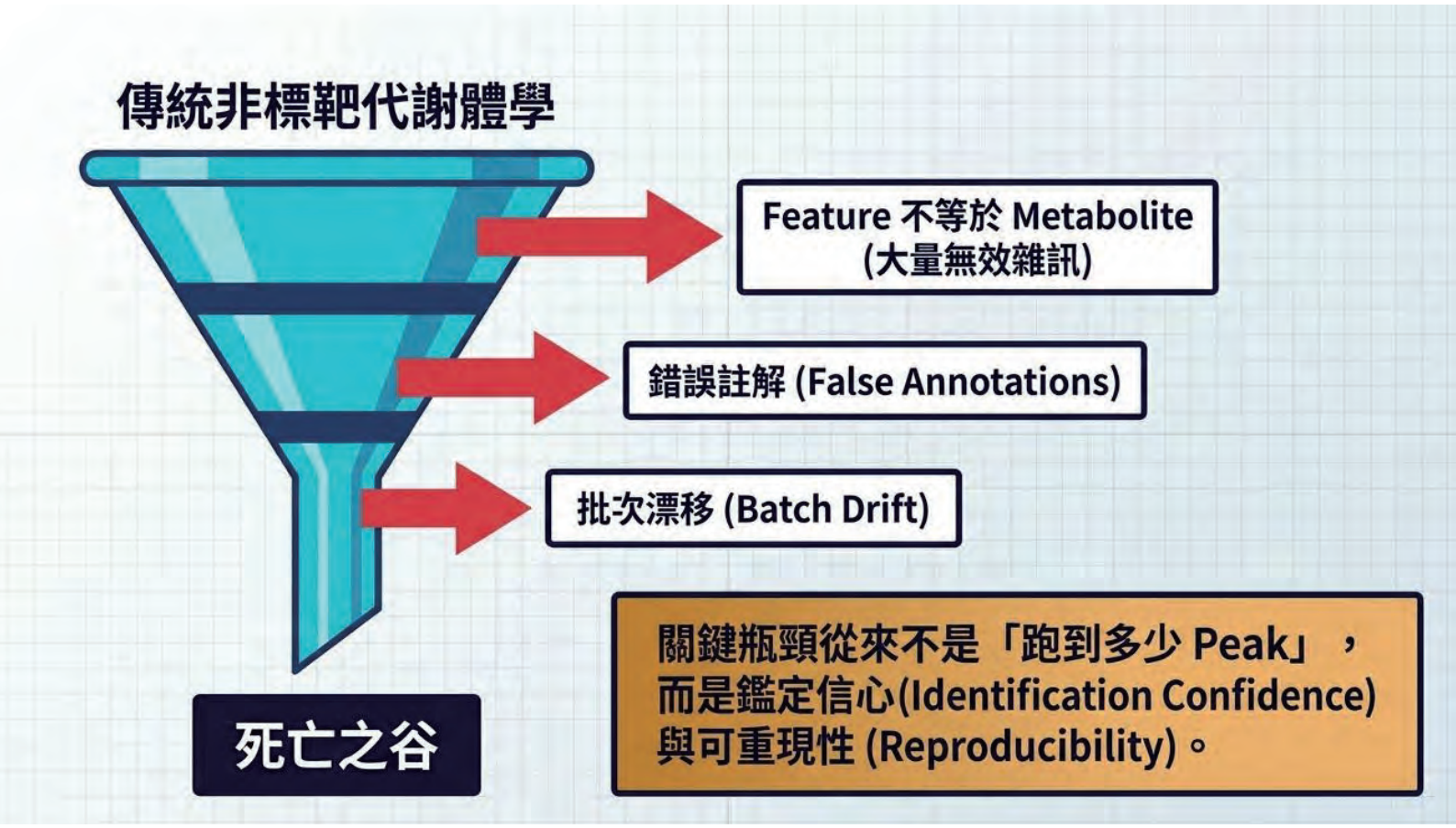
Tanaka K, Bamba T, Kondo A, Hasunuma T. Metabolomics-based development of bioproduction processes toward industrial-scale production. Curr Opin Biotechnol. 2024 Feb;85:103057. doi: 10.1016/j.copbio.2023.103057. Epub 2023 Dec 28. PMID: 38154323.

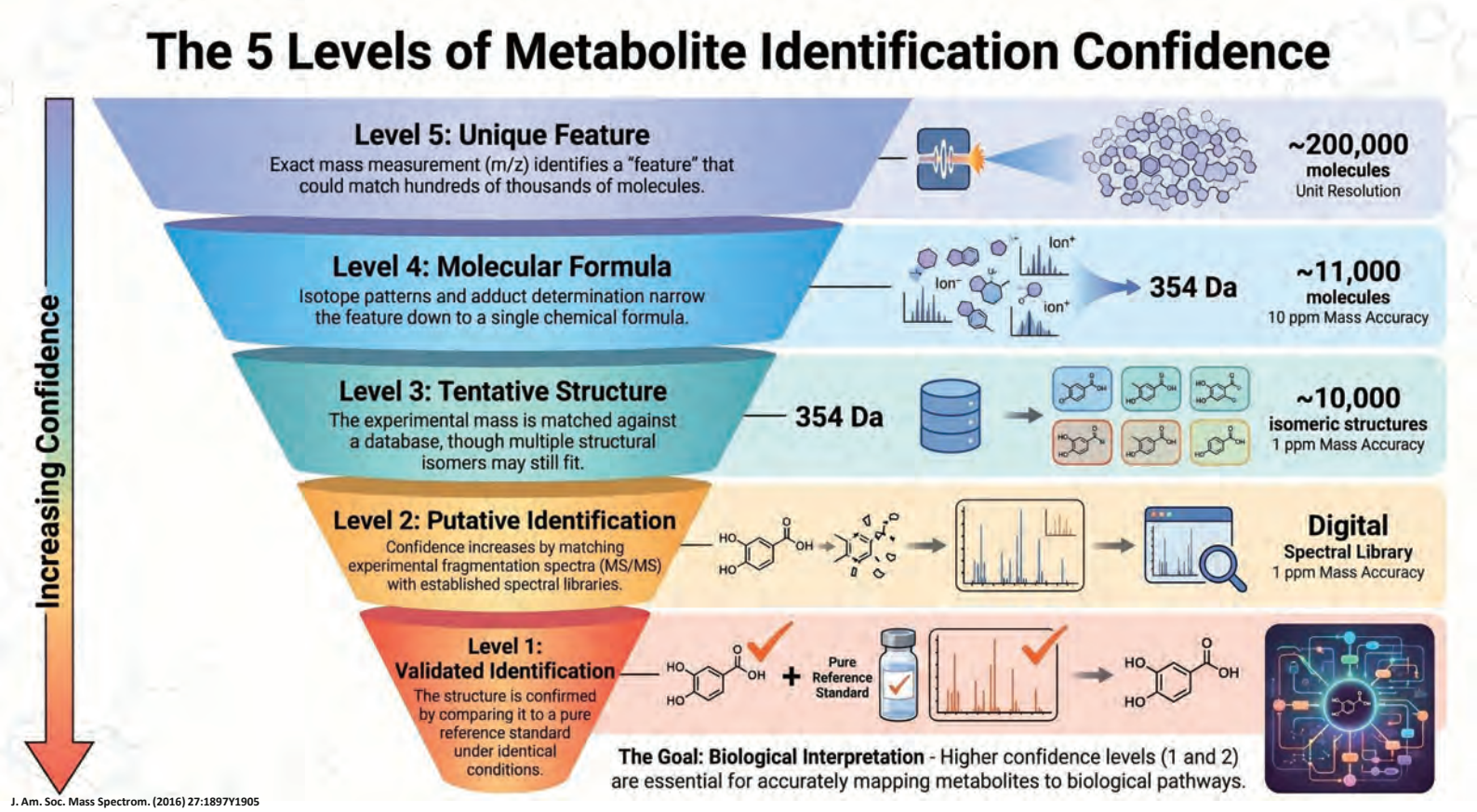
質譜代謝體分析流程



23







J. Am. Soc. Mass Spectrom. (2016) 27:1897Y1905

最具公信力的代謝體研究基礎_LWHK 資料庫

1,000+

Reference Standards

高品質非標靶代謝體學

結合千種標準品庫，確保數據鑑定的最高精確度與可重現性。

為發酵製程優化與關鍵代謝物驗證提供高可信度的分析基礎

1,000+ 標準品庫的核心價值

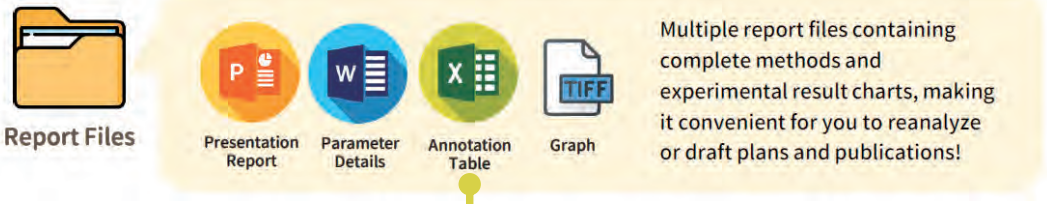
- 高可信鑑定：同時比對 MS/MS、RT 與標準品，遠超一般資料庫。
- 加速應用：候選物可直接開發為 MRM Targeted Panel
- 跨中心可比：一致的基準讓不同研究具備數據互通性。

非標靶代謝體學-MetaDiscovery 品質架構

01. Sample	02. LC-MS	03. QC Control	04. Feature
樣品 前處理與萃取	高解析度質譜儀 採集數據	Pooled QC 穩定性監控	產出高品質 質譜數據

標準化前處理 + pooled QC + 批次監控

非標靶代謝體學-結果呈現



Metabolites information

Compound NO.	Compound NO ion mode	Name	Formula	PubChem NO.	CAS NO.	HMDB	KEGG NO.	Calc. MW	m/z	RT [min]
1	P001	Decanoyl-L-carnitine	C17 H33 N O4	11953821	1492-27-9	HMDB0000651	C03299	315.2403	316.2475	12.163
2	P002	Methionine sulfoxide	C5 H11 N O3 S	847	62697-73-8	HMDB0002005	C02989	165.0459	166.0532	1.161
3	P003	Valeryl-L-carnitine	C12 H23 N O4						246.1697	7.256
4	P004	N-acetylserine	C5 H9 N O4						148.0603	1.437
5	P005	Guanosine	C10 H13 N5 O5	135398635	118-00-3	HMDB00133	C00387	283.0913	284.0986	4.69
6	P006	5-Hydroxyindole	C8 H7 N O	16054	1953-54-4	HMDB0059805		133.0527	134.06	7.201
7	P007	L-Pyroglutamic acid	C5 H7 N O3	7405	98-79-3	HMDB0000805	C01879	129.0426	130.0499	1.096
8	P008	Hypoxanthine	C5 H4 N4 O	135398638	68-94-0	HMDB00157	C00262	136.0383	137.0456	2.043
9	P009	Glycodeoxycholic acid	C26 H43 N O5	3035026	360-65-6	HMDB0004012	C05464	449.3126	450.3199	12.792
10	P010	N6-Acetyl-L-lysine	C8 H16 N2 O3	92832	692-04-6	HMDB00206	C02727	188.1159	189.1232	1.511

Confidence level	Annot. Source: LWHK Search	Annot. Source: mzCloud Search	Annot. Source: Metabolika Search	Annot. Source: ChemSpider Search	Annot. Source: Predicted Compositions	Annot. DeltaMass [ppm]
1	●	●	●	●	●	-2.2
1	●	●	●	●	●	-0.52
1	●	●	●	●	●	-1.27
1	●	●	●	●	●	-1.16
1	●	●	●	●	●	-1.34
1	●	●	●	●	●	-0.66
1	●	●	●	●	●	0.1
1	●	●	●	●	●	-1.39
1	●	●	●	●	●	-3.3
1	●	●	●	●	●	-1.14
1	●	●	●	●	●	-1.41
1	●	●	●	●	●	-3.03
1	●	●	●	●	●	-1.06
1	●	●	●	●	●	-1.66
1	●	●	●	●	●	-1.29

© 2025.03

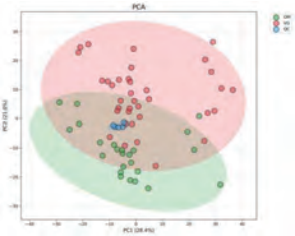
非標靶代謝體學-結果呈現



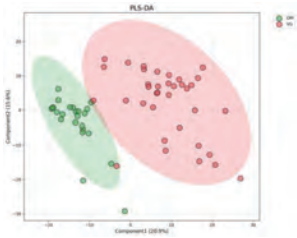


Multiple report files containing complete methods and experimental result charts, making it convenient for you to reanalyze or draft plans and publications!

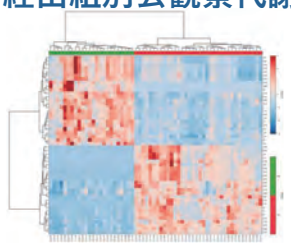
經由組別去觀察代謝體內小分子的變化



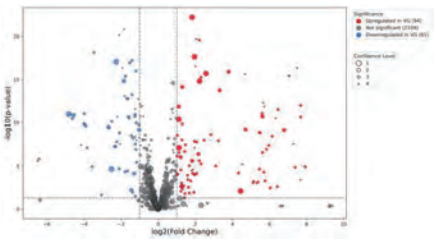
PCA



PLS-DA



Heatmap



Volcano plot

© 2025.03

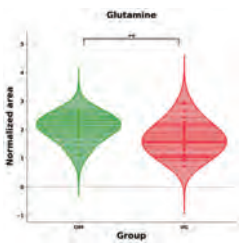
非標靶代謝體學-結果呈現





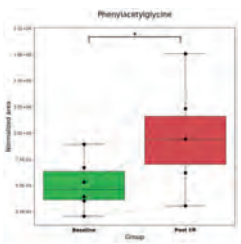
Multiple report files containing complete methods and experimental result charts, making it convenient for you to reanalyze or draft plans and publications!

經由組別去觀察代謝體內小分子的變化



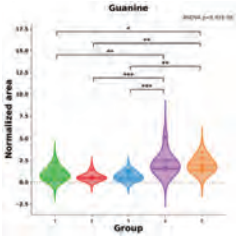
Violin plot

Unpaired Sample



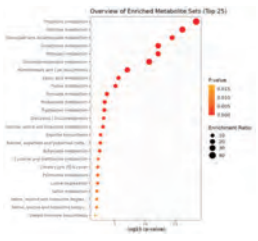
Box plot

Paired Sample



Violin plot

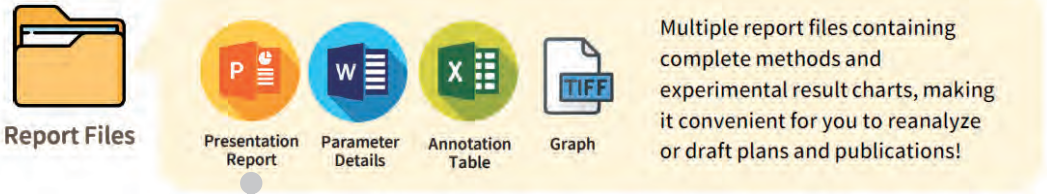
One-Way ANOVA



Enrichment Analysis

© 2025.03

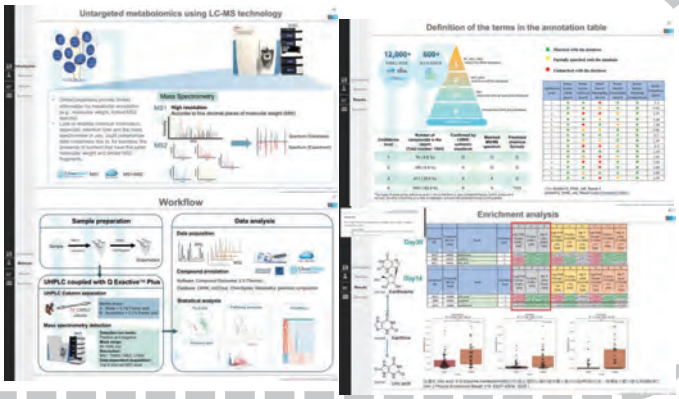
非標靶代謝體學-MetaDiscovery 結果呈現





專人報告解說

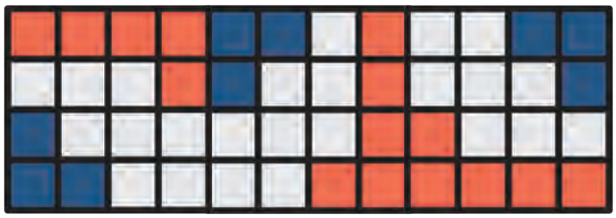
- Introduction
- Untargeted metabolomics
- Study information
- Materials and methods
- Results
  - Compound identification
  - Statistical analysis
  - Pathway analysis
- Summary



© 2025.03

代謝體 × 製程參數：相關性分析與功能性整合

Correlation Analysis 範例



*支援Pearson or Spearman分析
*同時提供p value and q value結果

- Organic acids × pH / fermentation time評估酸化進程與代謝活性變化
- Amino acids / sugars / secondary metabolites × DO / biomass / product yield找出與製程表現相關的關鍵代謝物

※數據要求：須為相同批次或相同時間點可對應的 paired data，例如同一發酵批次之 metabolomics 與 pH、DO、biomass、product yield。。

適合與代謝體做關聯性分析的數據		
多體學整合分析	範例	常見應用
轉錄體 (Transcriptomics)	基因表現量	代謝物 × 微生物豐度 (找出菌-代謝物共表現) 代謝物 × 基因表現 (找出代謝-基因調控關係)
蛋白體 (Proteomics)	蛋白質表現量、酵素活性	
微生物體 (Microbiome)	16S rRNA abundance	
其他指標	範例	說明
Process Parameters	pH / DO / Temperature / Biomass Substrate concentration / Product yield / Fermentation time	評估發酵過程與化學組成的變化

© 2023

REDISCOVER MICROORGANISMS.

Take-home message

Untargeted discovery + confident identification + targeted monitoring

將發酵製程從「看到差異」推進到「理解差異、監控差異、預測差異」。

鄭凱文博士 | Kevin Cheng Ph.D.
雷文虎克 業務副理
Email: kevin@lwhklab.com.tw

王芝穎 | Miffy Wang
雷文虎克 南區業務
Email: miffy.wang@lwhklab.com.tw



從醱酵到機能
發泡性細菌纖維素複合材料於功能性包材與生醫敷材之跨域應用

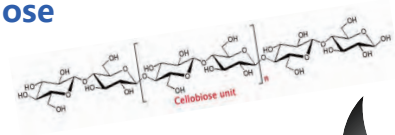
林欣平 副教授
食品安全學系 臺北醫學大學

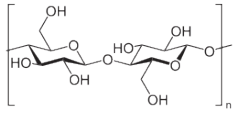
Winpact

2026年第一屆南區醱酵技術研討會

Cellulose

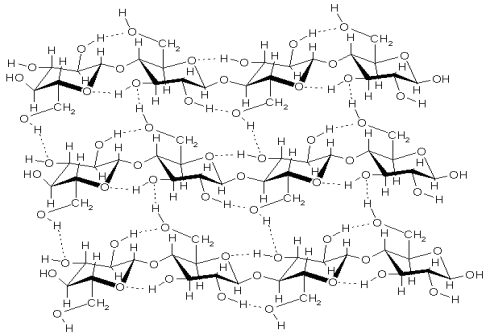
Structure of cellulose





Single chain (1~9 mm in length)

Hydrogen-bind



Multi-layer

β-(1,4)-linkage

Formula: $(C_6H_{10}O_5)_n$

Origin of cellulose



Animal



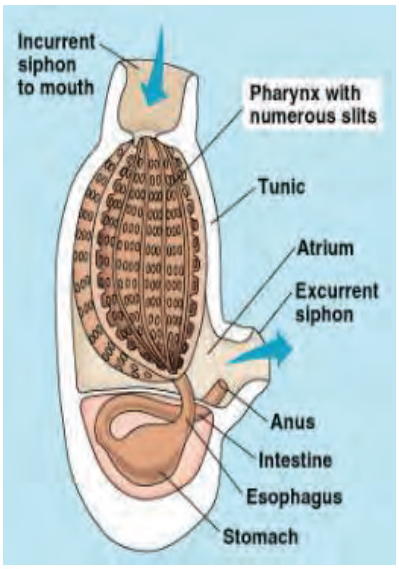
Plant



Microorganism

Animal cellulose

Tunic, a kind of animal cellulose











Ascidiacea

(Matthysse et al., 2004)

Plant cellulose

Applications



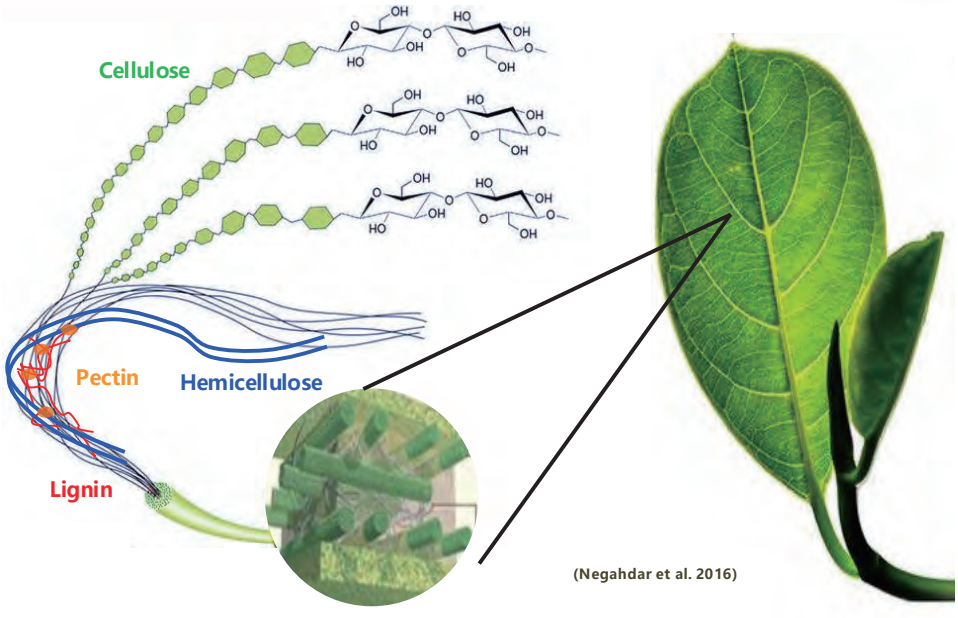
Furniture



Clothes



Paper



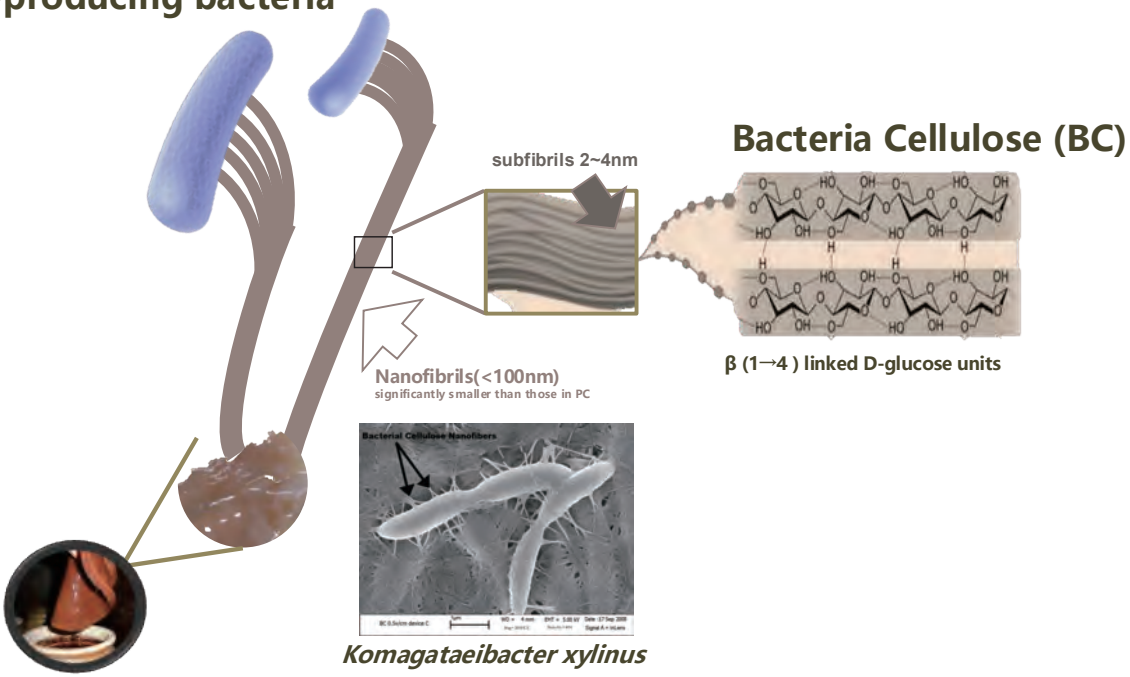
(Negahdar et al. 2016)

Plant cellulose (PC)

(Sannigrahi et al,. 2010)

Bacterial cellulose (BC)

BC-producing bacteria



(Castro et al. 2011; Lin et al. 2016)

(Klemm et al., 2001; Kunahoko et al., 1998)

The unique properties of BC

BC possesses unique properties

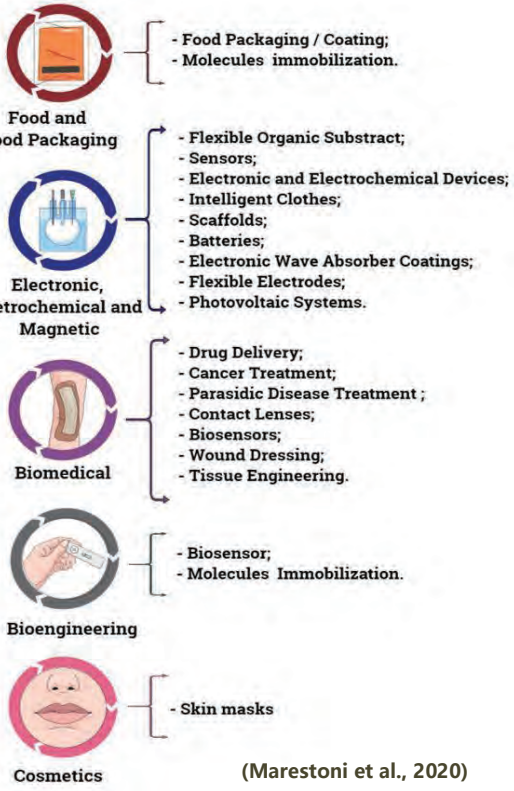
1) High purity
2) Excellent mechanical strength
3) High water uptake capacity
4) Good permeability for gas and fluid exchange
5) Biocompatible
6) Non-toxic



Applications of Bacterial Cellulose in Brazil

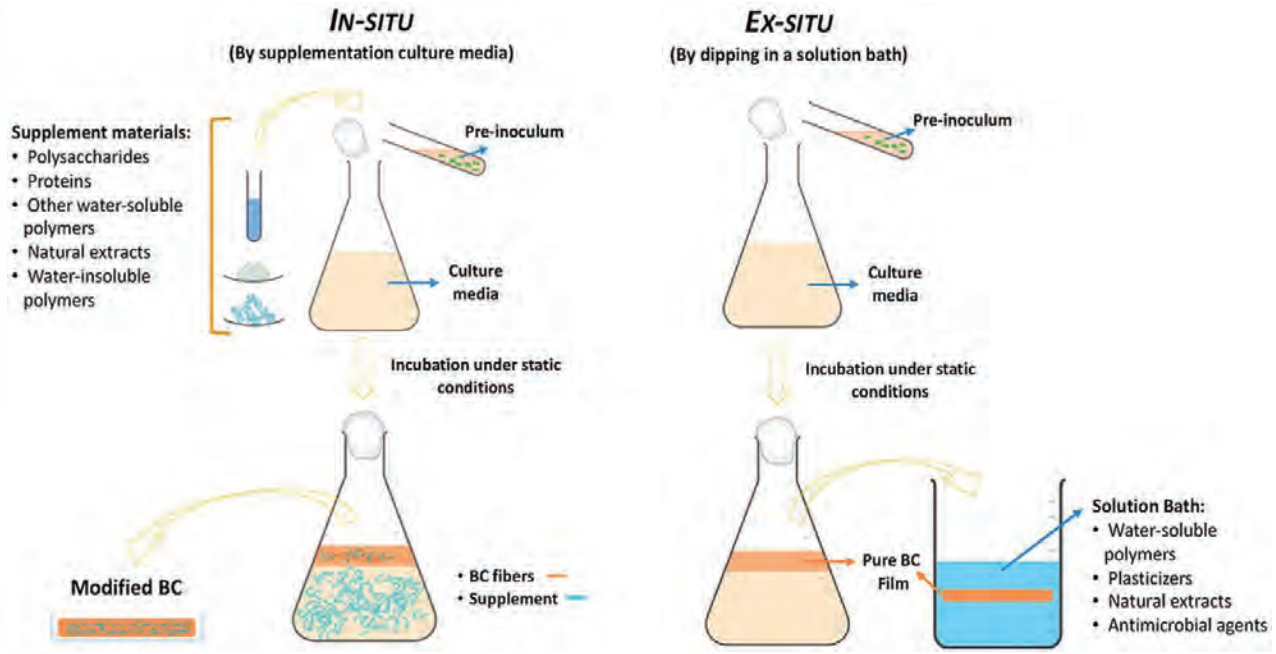
Limitation of BC

1) Additives incorporation is difficult.
2) Lack of biological functions.



(Marestoni et al., 2020)

Modification of BC

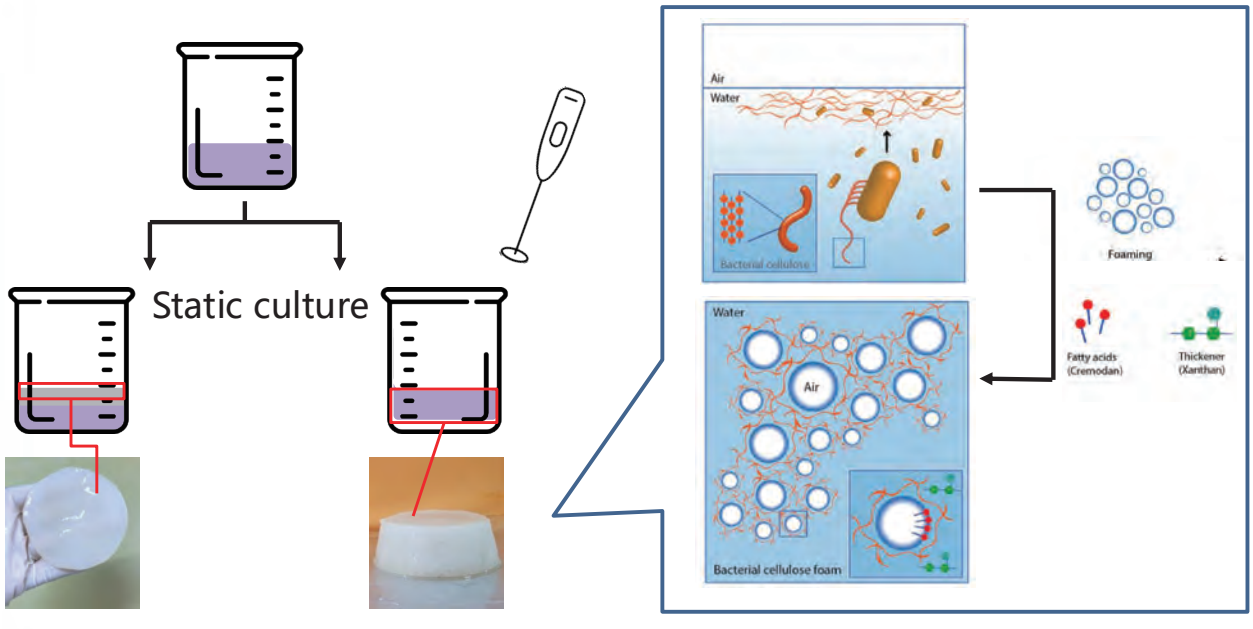


(Cazón and Vázquez, 2021)

7

Foaming BC (FBC) system

8



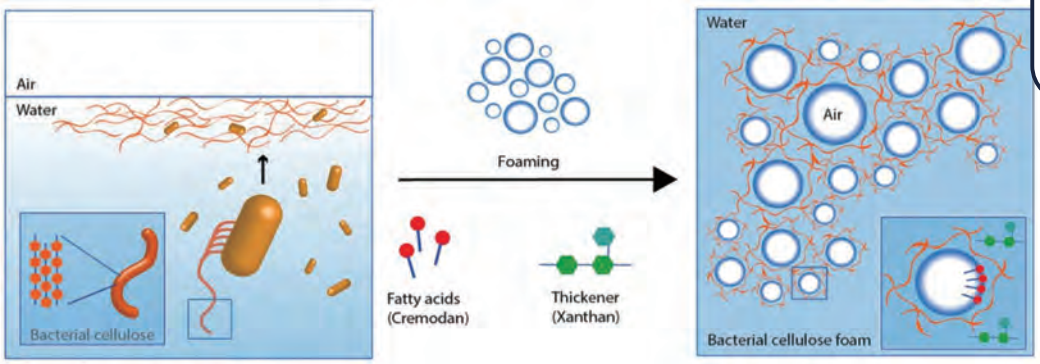
(Rühs *et al.*, 2018)

Foaming bacterial cellulose

ARTICLE OPEN

3D bacterial cellulose biofilms formed by foam templating

Patrick A. Rühs[1,2], Flavian Storz[3], Yuly A. López Gómez[3], Matthias Haug[1] and Peter Fischer[3]



Porous foaming BC (FBC)

Surface area ↑
Absorption ↑

(Rühs et al., 2018)

Foaming bacterial cellulose



(Lin et al., 2023)

- **FBC**

Porosity ↑ **Thickness** ↑

Water content ↑ **Swelling ability** ↑

More absorbent

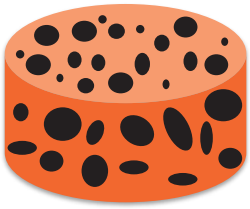


(Kusuma et al., 2023)

- **FBC demonstrated an instant release of carvacrol in 12 hr**

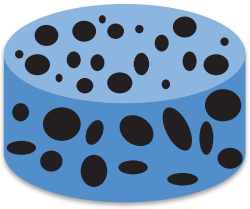
Limitation in sustained release

pH-sensitive active packaging



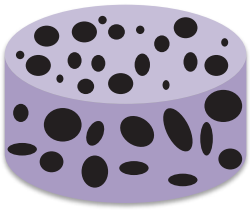
Eudragit/FBC

Antimicrobial packaging



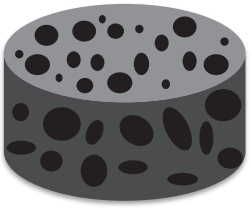
TiO_2/FBC

Metal ion absorption



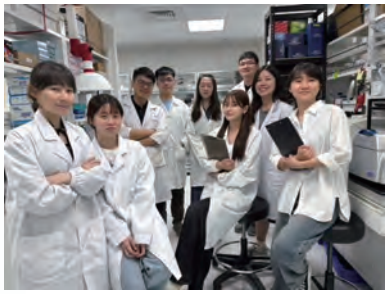
Violacein/FBC

Photothermal materials



MoS_2/FBC

Acknowledgment









The 1st Southern Region Fermentation Technology Seminar

Scaling Up Microbial Fermentation for Phosphorylated Functional Polyphenols：Real-World Challenges and Solutions

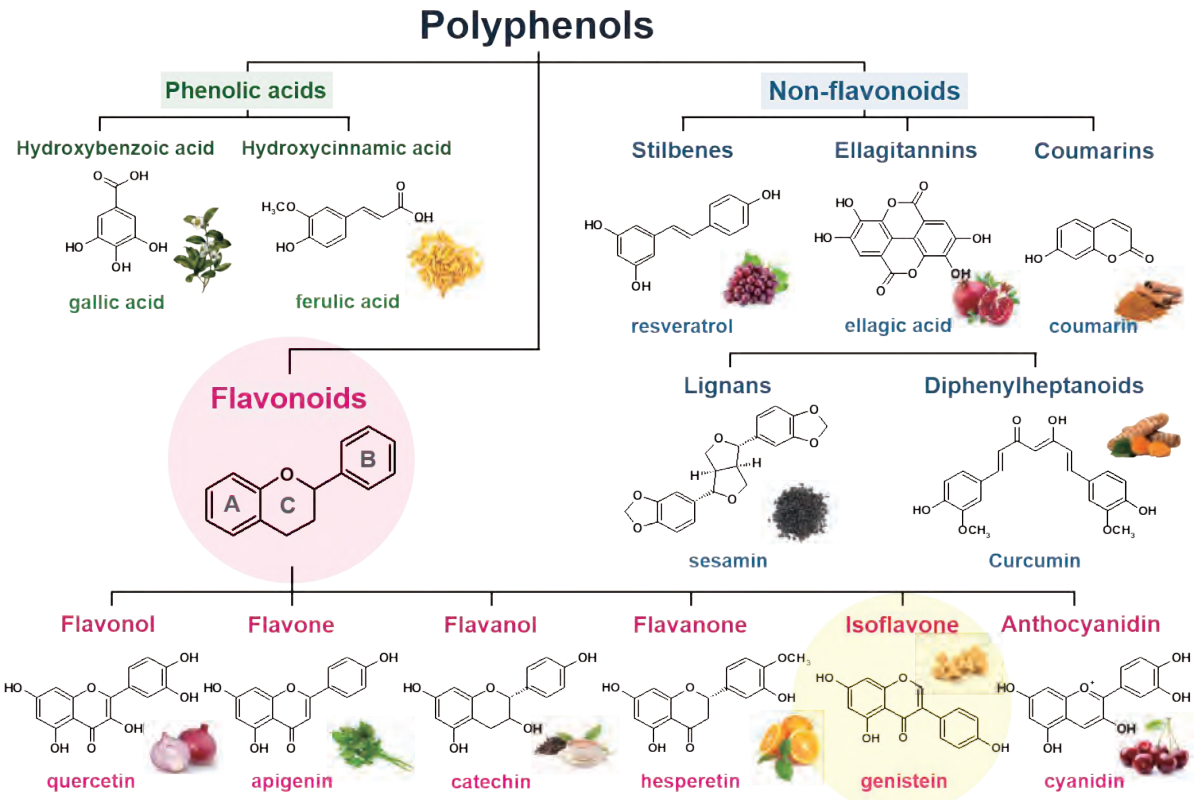
Chen (James) Hsu, Ph. D.

Sep. 18, 2026

Laboratory of Food Chemistry
Department of Agricultural Chemistry, National Taiwan University

5

Structural diversity of polyphenols and distribution in foods



6

Most of polyphenol belongs to BCS class IV

Biopharmaceutics Classification System

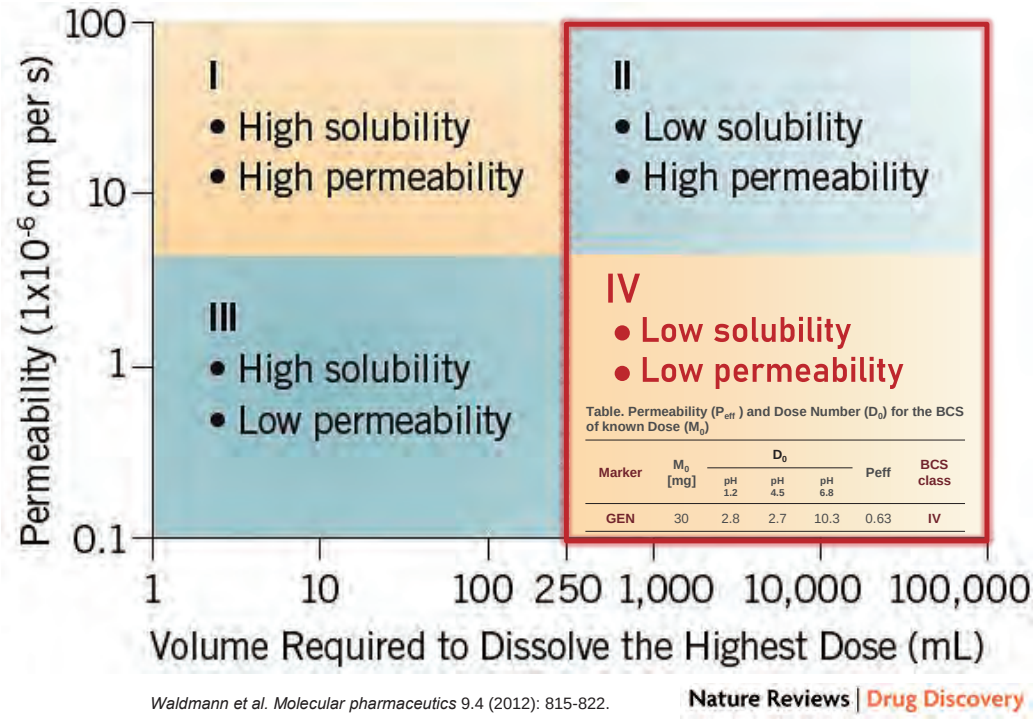


Table. Permeability (P_{eff}) and Dose Number (D_0) for the BCS of known Dose (M_0)

Marker	M_0 [mg]	D_0 pH 1.2	D_0 pH 4.5	D_0 pH 6.8	Peff	BCS class
GEN	30	2.8	2.7	10.3	0.63	IV

Waldmann et al. Molecular pharmaceutics 9.4 (2012): 815-822.

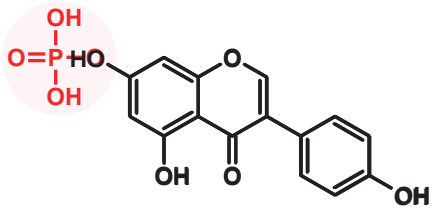
Nature Reviews | Drug Discovery

8

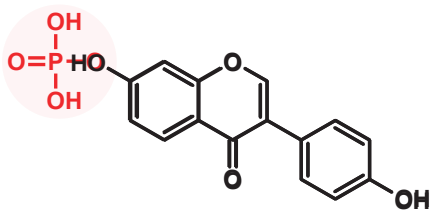
Soy isoflavone-phosphate conjugates



Traditional fermented soybean products - Natto



Genistein 7-O-phosphate, GEN-7P



Daidzein 7-O-phosphate, DIA-7P

9

The aqueous solubility of GEN-7P compare with GEN

Water solubility
1.03 × 10^5 mg/L

Water solubility
0.82 mg/L

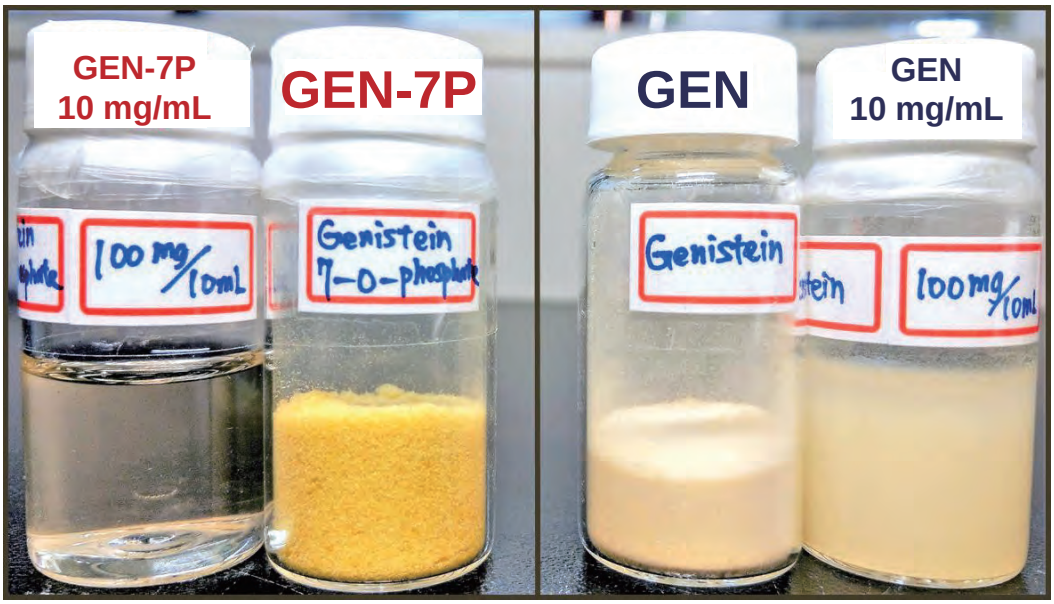
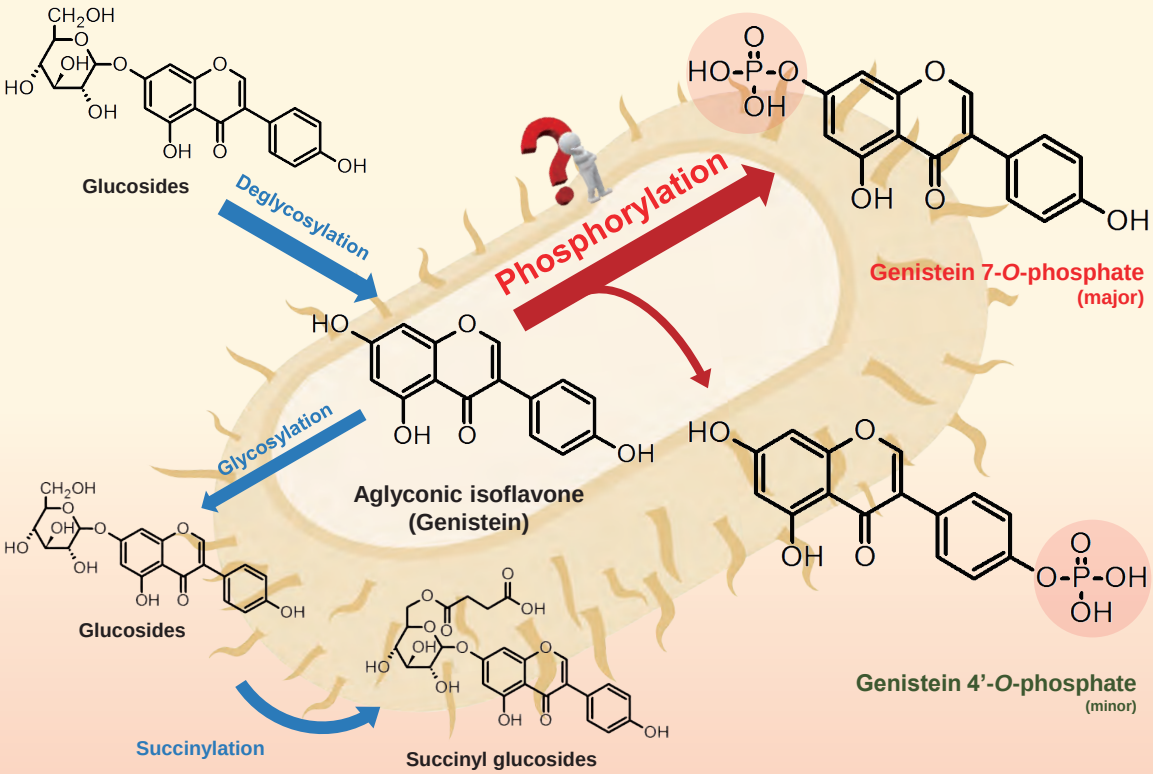


Fig. The sample of GEN-7P dissolved in ddH_2O (10 mg/mL) at ambient temperature compare with GEN. According to the *Merck Index*, GEN is practically water-insoluble. GEN-7P showed an aqueous solubility >100 mg/mL, so it was highly soluble in water.

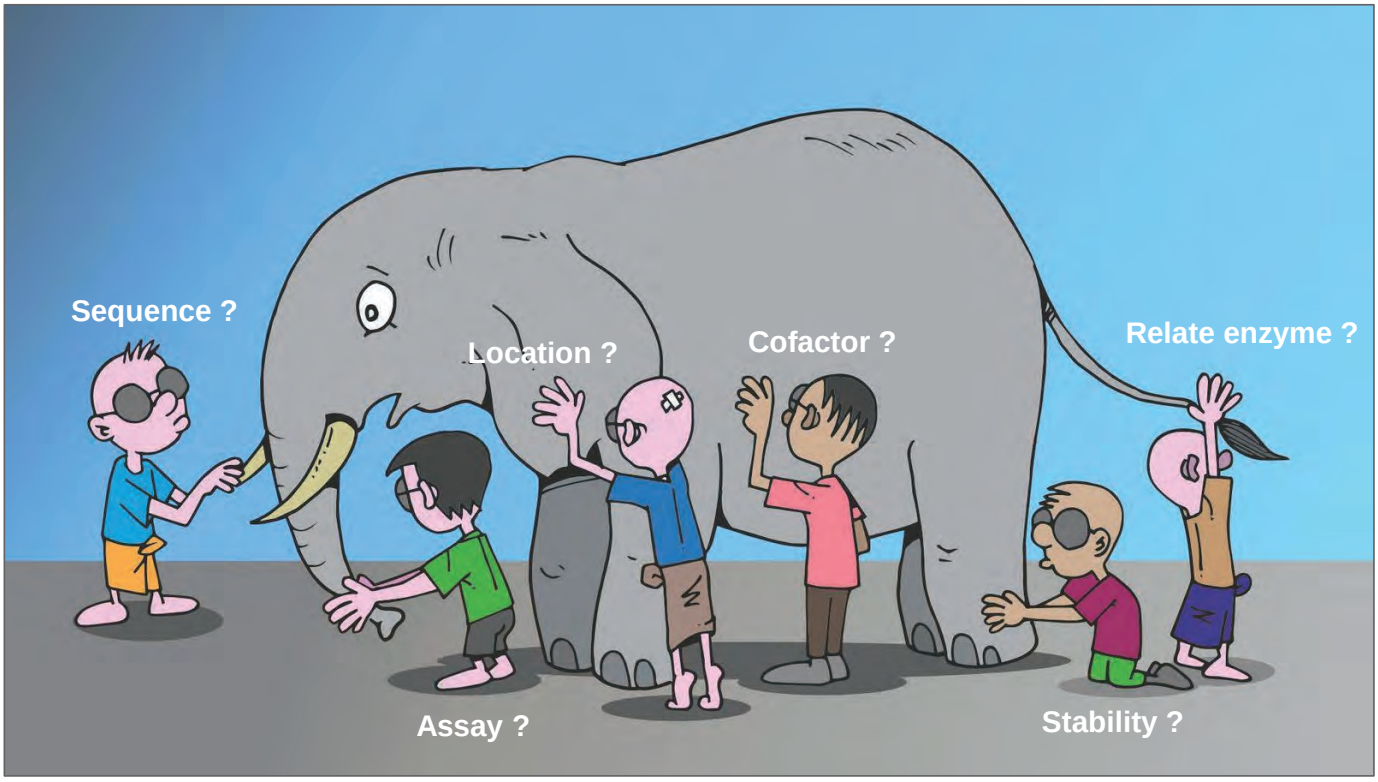
10

Metabolic route of isoflavones in *B. subtilis*



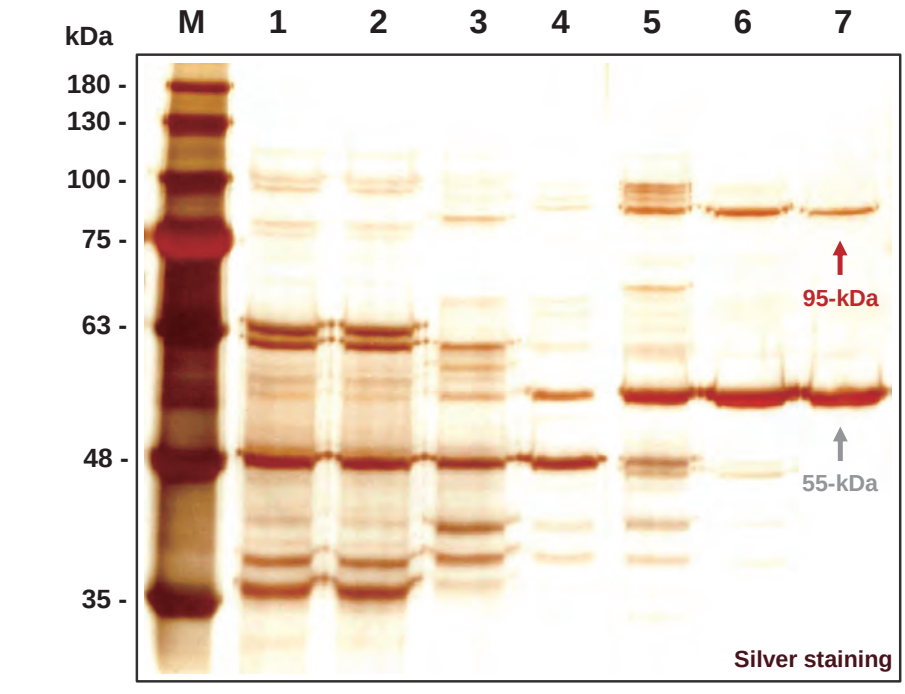
11

GEN-phosphorylating enzyme: Describing an elephant



17

SDS-PAGE analysis of purified *Bs*PPS from native *B. subtilis*

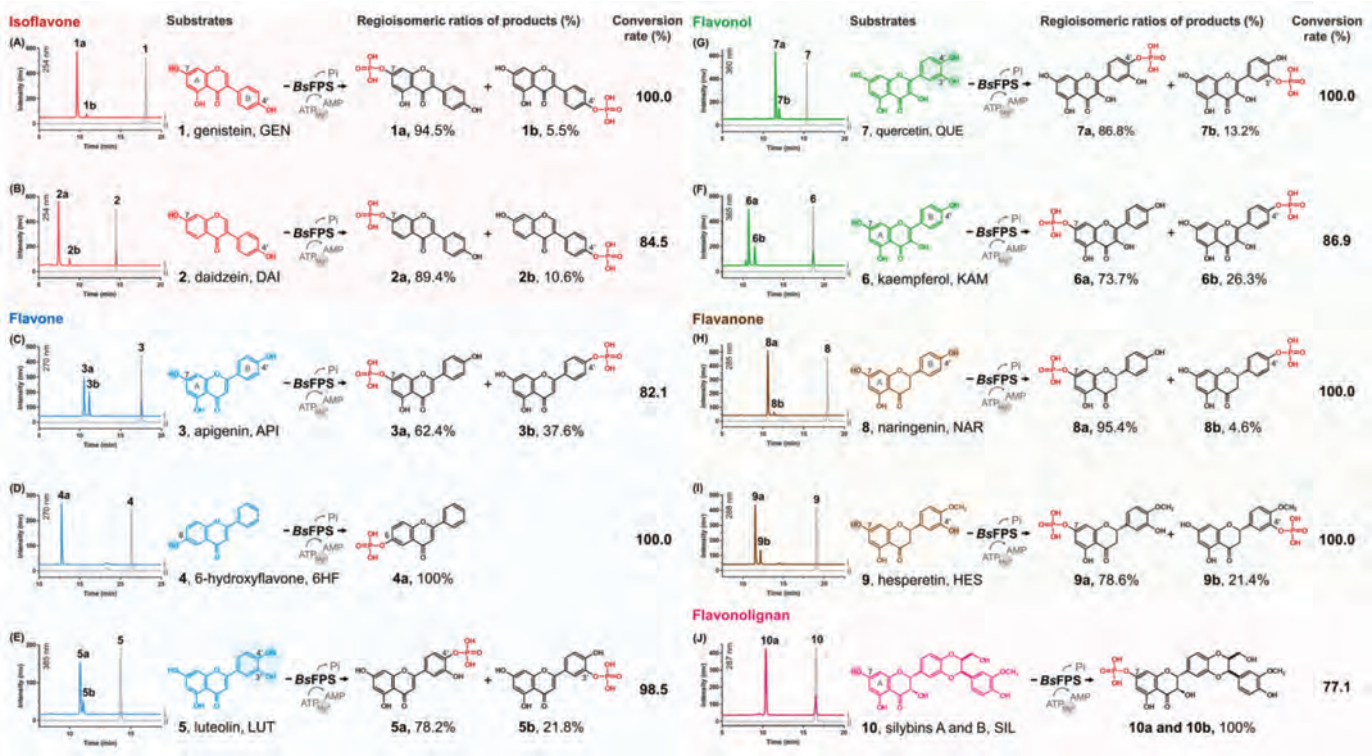


Specific activity (nmoles/min/mg)	0.7	1.7	3.1	88.6	103.9	120.9	127.8

Lane M: protein marker
Lane 1: Cell-free extracts
Lane 2: Ammonium sulfate frac.
Lane 3: DEAE FF frac.
Lane 4: Q^1 HP frac.
Lane 5: Q^2 HP frac.
Lane 6: Phenyl HP frac.
Lane 7: Superdex 75 frac.

19

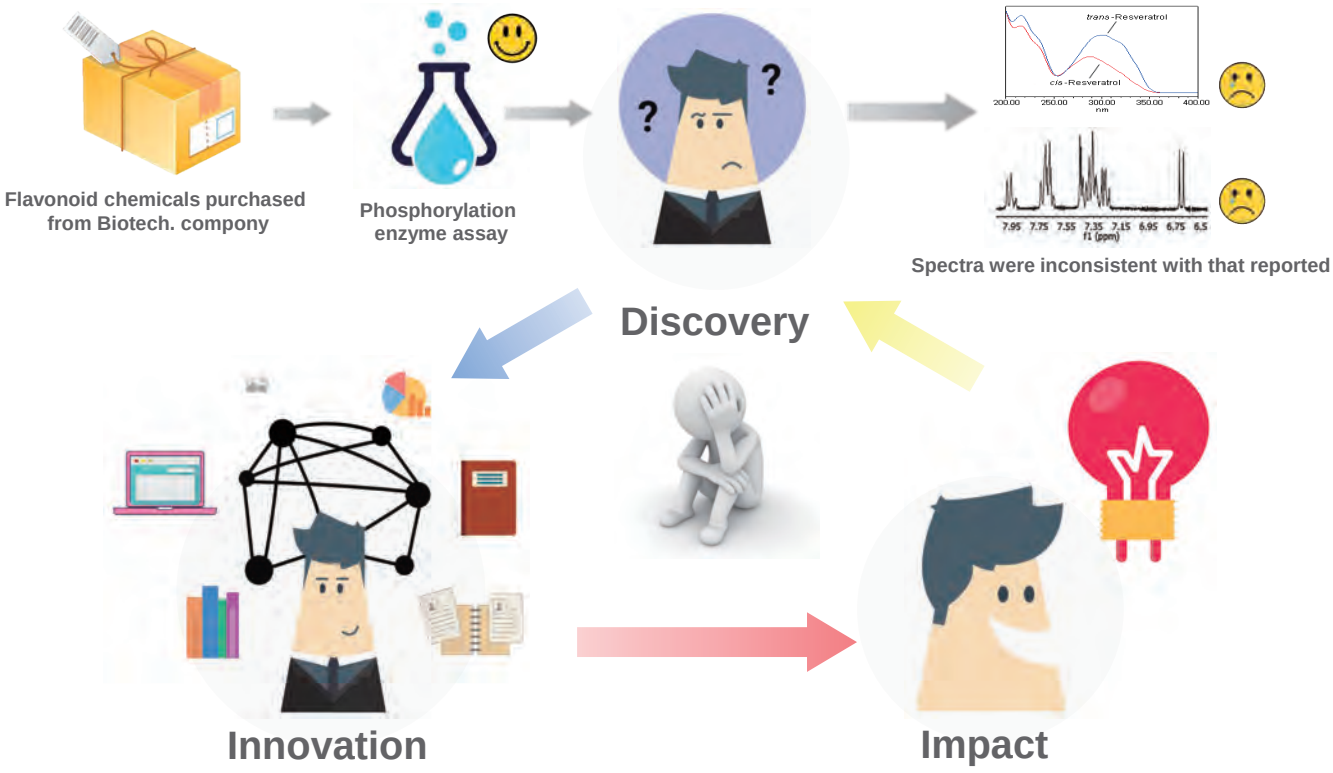
BsFPS phosphorylation of a broad range of flavonoid substrates



(Hsu et al., 2023)

20

Serendipitous discovery of resveratrol as *Bs*PPS substrate



21

*Bs*PPS exhibits unprecedented substrate scope

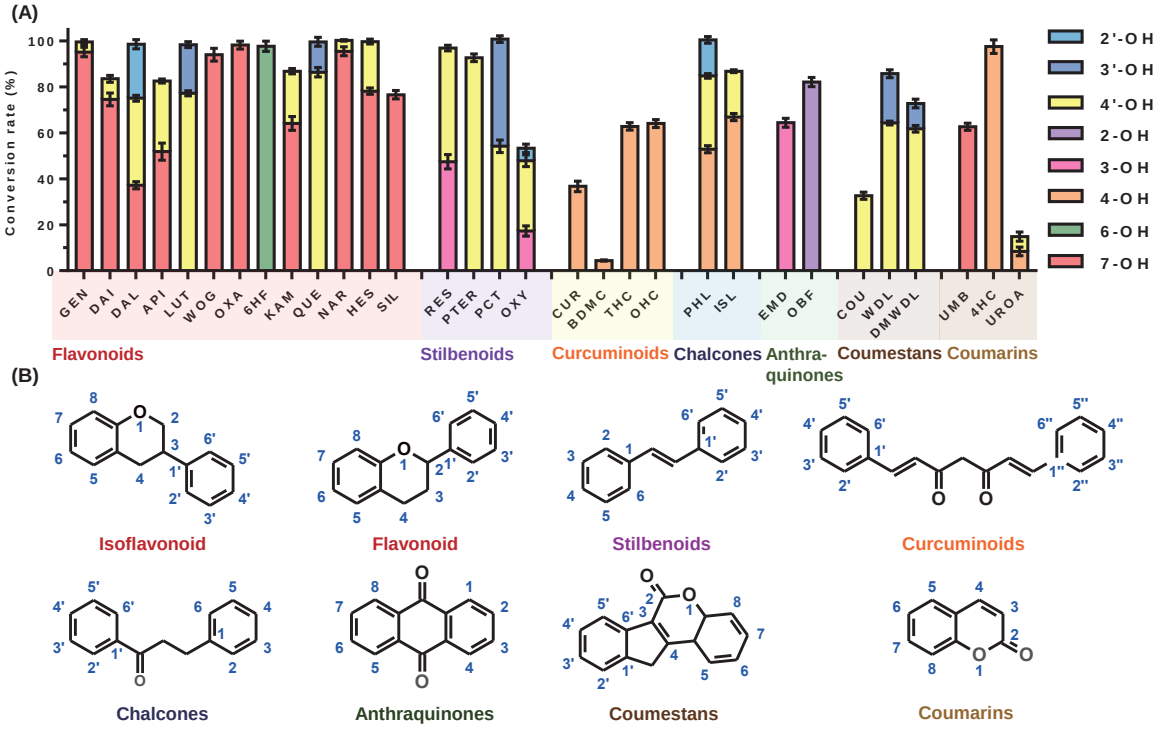


Fig. Phosphorylation of polyphenolics by *Bs*PPS with broad substrate promiscuity. (A) Percent conversion rate of each polyphenol when using ATP as phosphate donor. The colors in the bar graphs represent the ratio of phosphorylated products at different *O*-position in the total product yield of each polyphenol. Experiments were performed in triplicate, and the S.D. is shown. (B) Polyphenolics ring structure and numbering. The reactions were conducted in 200 mL reaction buffer containing 2 mM substrate, 10 mM Mg2+/ATP and 1 mg/mL (10 μM) recombinant BsPPS, then incubated at 40 ºC for 2 h.



RenoSorb®
專利後生元發酵技術
Boosting Bioavailability Naturally

- 世界首例生物製程技術
- 100%發酵食品
- 0%賦形劑，純淨原料趨勢
- 同時提升水溶性和吸收率
- 降低廢棄物、追求永續發展
- 高純度成品也可行
- 拓展商品應用性

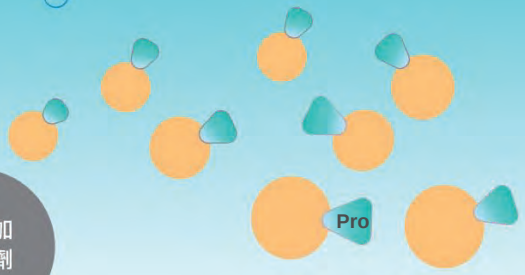


Hughes Biotechnology



原態多酚





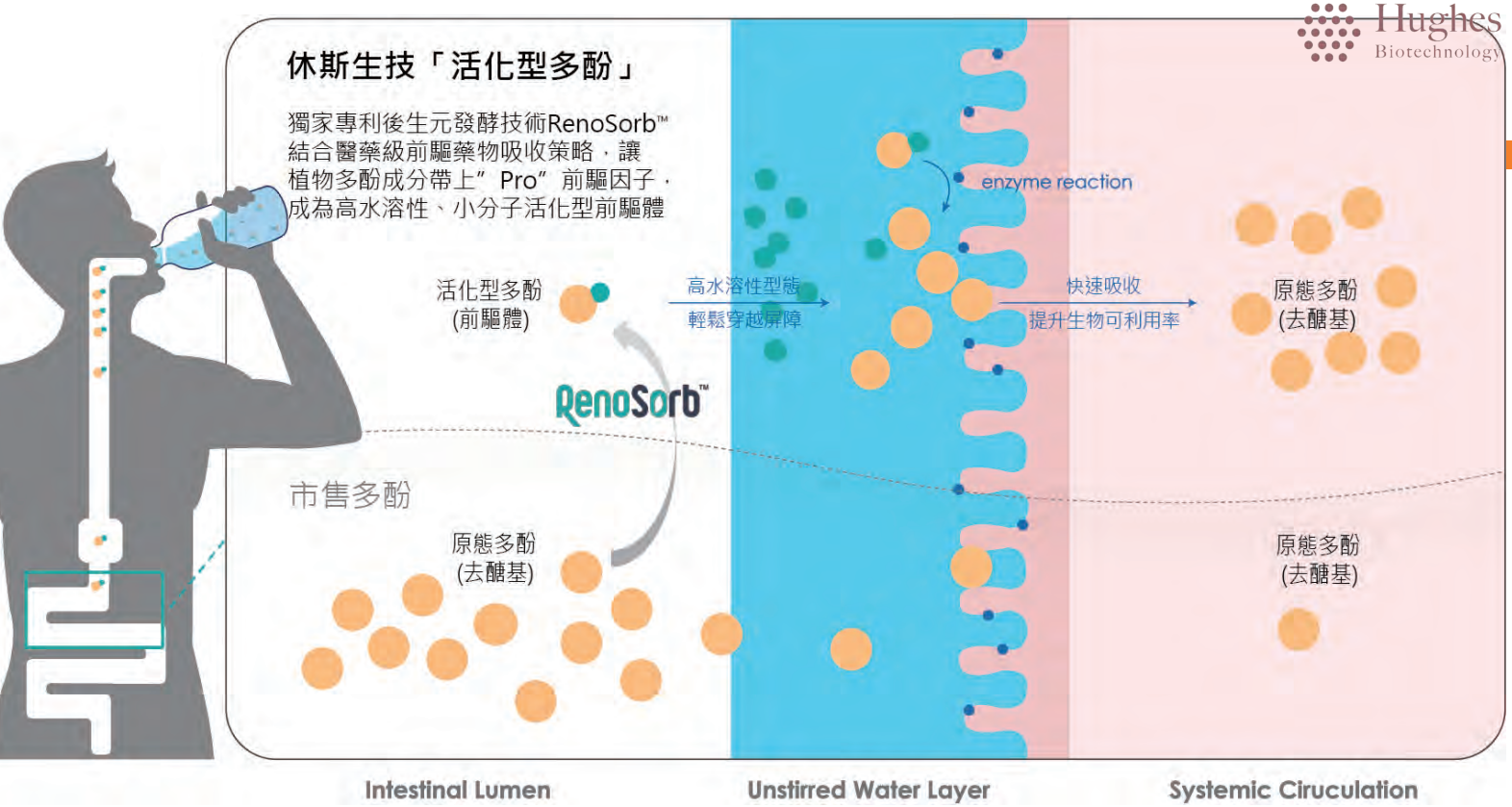
活化型多酚
(前驅體)

真正水溶、有效吸收

Hughes Biotechnology

休斯生技「活化型多酚」

獨家專利後生元發酵技術RenoSorb™
結合醫藥級前驅藥物吸收策略，讓
植物多酚成分帶上”Pro” 前驅因子，
成為高水溶性、小分子活化型前驅體





醫藥級高效吸收策略的市場知名案例

在日本市場中，最知名應用醫藥級前驅藥物(prodrug)以增加生物可利用率的策略之產品是Alinamin，將維生素B1誘導為「活化型」來提升吸收率，不僅更容易被腸道吸收、也更有效作用於體內組織、快速到達全身。

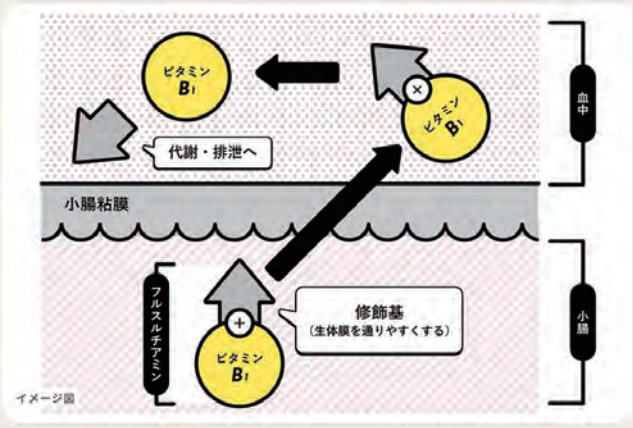
休斯生技，則是全世界首例利用食品級微生物發酵外泌技術，來實現「誘導型多酚」的高效傳遞與市場應用。

Hughes Biotechnology

ビタミンB1より多く体内に吸収され、組織へよく移行する理由

水溶性であるビタミンB1は脂質でできている小腸の細胞膜をトランスポーター（輸送担体）がなければ直接通過できないのに対し、脂溶性であるフルスルチアミンはトランスポーターが無くても細胞膜を通過して血中又は体内などに入ることが可能です。

そのため、ビタミンB1に比べて、より多く吸収され、組織内に多く届けることができます。



為什麼經 RenoSorb™ 技術應用產生之「誘導型」多酚相比一般多酚更容易被人體吸收，並能更有效地運送至組織？

Hughes Biotechnology
RenoSorb®

全球唯一利用微生物外泌策略達到醫藥級吸收傳遞的創新技術



RenoSorb™ transforms plant polyphenols into high bioavailable forms via biotransformation integrated with a prodrug delivery strategy. Clinically and real-world validated, Hughes delivers innovative ingredients for precision nutrition—bringing science closer to everyday wellness.

讓吸收更快、更強、更全面

Clinically proven | Precision health | US FDA New Dietary Ingredient

1 **在胃腸消化液具有高安定性**

經RenoSorb™技術開發之活化型多酚具備高安定性，科學實證在安全抵達腸道之前不會被胃腸道消化液分解。

2 **15 MIN 小分子「誘導型」15分鐘快速吸收**

憑藉獨特的醫藥級吸收機制，小分子誘導型多酚能輕鬆穿越人體腸道屏障，並在酵素水解後快速吸收至體內。

3 **高水溶性 高生物利用率**

活化型多酚具備高水溶性，比起一般帶醣基或去醣基形式的多酚吸收都更快速、更多且更有效率傳遞到組織。

4 **高效傳送 功效全面展現**

因此，相較傳統型態多酚，誘導型多酚能夠讓更多的去醣基型態多酚被吸收、發揮生理活性，甚至達到直接的體感支持。

全球技術優勢性比較

Hughes Biotechnology

項目	傳統乳化/包覆技術	RenoSorb® 後生元發酵技術平台
原理	外加賦形劑乳化或奈米包覆，形成水中分散體	天然微生物發酵生物轉化與醫藥級吸收策略
賦形劑比例	常達70–90%	0%，原料純度可達80%
水溶性提升	約數百～數千倍	可達10萬倍以上
吸收效率	效果有限，個別差異大	臨床實證人體藥物動力學與大鼠藥物動力學實驗表現一致
劑型限制	多為膠囊/錠劑	可拓展應用至液劑、發泡錠、果凍飲、軟糖；由於使用量不高，膠囊或者錠劑的體積也可以縮小
永續性	生產過程有廢棄物、產品對人體健康效益並非有幫助之物質	製程潔淨、落實ESG
技術含量	配方配比、製程差異	真正創新、專利保護
安全性	未能實證	產品通過美國FDA新膳食成分認證
獎項認證	無特別	Vitafoods Europe「最具創新技術獎」



台北生技獎 創新技術獎 金獎

Hughes Biotechnology

休斯生技致力高吸收植化素的開發與應用。將台大農化系研究落實於產業發展，以全球獨創 RenoSorb® 後生元外泌技術結合醫藥級「誘導型」吸收策略，突破多種植化素吸收率、實證功效最大化，樹立精準營養新標竿。2025台灣生技界奧斯卡—台北生技獎，創新技術獎之應用生技組，一舉拿下金獎殊榮。

高效植物多酚原料｜精準吸收臨床驗證
Innovation technology｜Precision Nutrition



2025 金獎 美國AII達文西國際發明展
2025 金獎、大會特獎 韓國WiC國際發明展
2025 金獎、大會特獎 俄羅斯阿基米德國際發明展
2025 金獎 馬來西亞MTE國際發明展
2025 產品RenoSage™榮獲精神研究營養學會「大腦保健產品創新獎」
2023 歐洲Vitafoods Europe「最具創新技術獎」全球五強
2023 榮獲國家品牌玉山獎
2023 產品RenoFlavone™取得美國FDA新膳食成分認證
2022 產品RenoCidin™取得美國FDA新膳食成分認證
2022 榮獲SNQ國家品質標章
2021 科技部產學小聯盟績優廠商代表
2021 取得台灣、美國、歐盟、日本、韓國五國專利
2020 入選台北市政府研發補助獎勵
2020 入選財團法人生物技術開發中心加速器

美國FDA新膳食成分 無異議許可認證

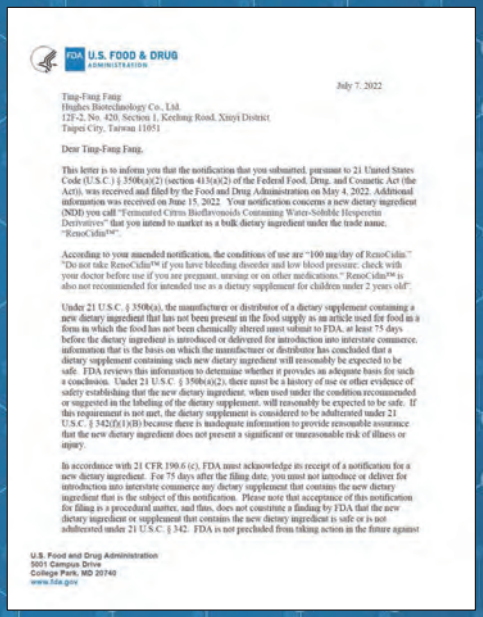
Hughes Biotechnology

US FDA New Dietary Ingredients (NDI) Notification



突破2000頁的申請文件、百萬級投資於GLP認證規格實驗室執行之安全性試驗、同時經過美國食品藥物管理局多位專家學者嚴格審查、把關與評估產品之安全性，休斯產品取得**最高等級無異議上市通知許可**

RenoFlavone™ Notification 1283


U.S. FOOD & DRUG ADMINISTRATION

July 7, 2022

Ting-Fang Fang
Hughes Biotechnology Co., Ltd.
12F-2, No. 420, Section 1, Keelung Road, Xinyi District
Taipei City, Taiwan 11051

Dear Ting-Fang Fang,

This letter is to inform you that the notification that you submitted, pursuant to 21 United States Code (U.S.C.) § 350b(a)(2) (section 413(a)(2) of the Federal Food, Drug, and Cosmetic Act (the Act)), was received and filed by the Food and Drug Administration on May 4, 2022. Additional information was received on June 15, 2022. Your notification concerns a new dietary ingredient (NDI) you call "Fermented Citrus Bioflavonoids Containing Water-Soluble Hesperetin Derivatives" that you intend to market as a bulk dietary ingredient under the trade name, "RenoCidin™".

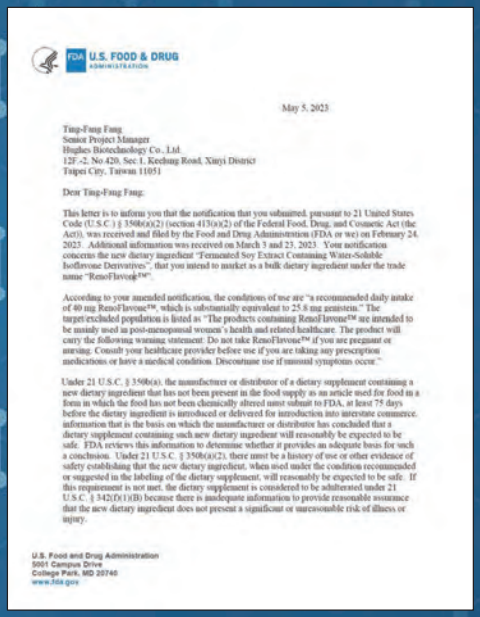
According to your amended notification, the conditions of use are "100 mg/day of RenoCidin." "Do not take RenoCidin™ if you have bleeding disorder and low blood pressure; check with your doctor before use if you are pregnant, nursing or on other medications." RenoCidin™ is also not recommended for intended use as a dietary supplement for children under 2 years old".

Under 21 U.S.C. § 350b(a), the manufacturer or distributor of a dietary supplement containing a new dietary ingredient that has not been present in the food supply as an article used for food in a form in which the food has not been chemically altered must submit to FDA, at least 75 days before the dietary ingredient is introduced or delivered for introduction into interstate commerce, information that is the basis on which the manufacturer or distributor has concluded that a dietary supplement containing such new dietary ingredient will reasonably be expected to be safe. FDA reviews this information to determine whether it provides an adequate basis for such a conclusion. Under 21 U.S.C. § 350b(a)(2), there must be a history of use or other evidence of safety establishing that the new dietary ingredient, when used under the condition recommended or suggested in the labeling of the dietary supplement, will reasonably be expected to be safe. If this requirement is not met, the dietary supplement is considered to be adulterated under 21 U.S.C. § 342(f)(1)(B) because there is inadequate information to provide reasonable assurance that the new dietary ingredient does not present a significant or unreasonable risk of illness or injury.

In accordance with 21 CFR 190.6 (c), FDA must acknowledge its receipt of a notification for a new dietary ingredient. For 75 days after the filing date, you must not introduce or deliver for introduction into interstate commerce any dietary supplement that contains the new dietary ingredient that is the subject of this notification. Please note that acceptance of this notification for filing is a procedural matter, and thus, does not constitute a finding by FDA that the new dietary ingredient or supplement that contains the new dietary ingredient is safe or is not adulterated under 21 U.S.C. § 342. FDA is not precluded from taking action in the future against

U.S. Food and Drug Administration
5001 Campus Drive
College Park, MD 20740
www.fda.gov

RenoCidin™ Notification 1253


U.S. FOOD & DRUG ADMINISTRATION

May 5, 2023

Ting-Fang Fang
Senior Project Manager
Hughes Biotechnology Co., Ltd.
12F.-2, No.420, Sec.1, Keelung Road, Xinyi District
Taipei City, Taiwan 11051

Dear Ting-Fang Fang:

This letter is to inform you that the notification that you submitted, pursuant to 21 United States Code (U.S.C.) § 350b(a)(2) (section 413(a)(2) of the Federal Food, Drug, and Cosmetic Act (the Act)), was received and filed by the Food and Drug Administration (FDA or we) on February 24, 2023. Additional information was received on March 3 and 23, 2023. Your notification concerns the new dietary ingredient "Fermented Soy Extract Containing Water-Soluble Isoflavone Derivatives", that you intend to market as a bulk dietary ingredient under the trade name "RenoFlavone™".

According to your amended notification, the conditions of use are "a recommended daily intake of 40 mg RenoFlavone™, which is substantially equivalent to 25.8 mg genistein." The target/excluded population is listed as "The products containing RenoFlavone™ are intended to be mainly used in post-menopausal women's health and related healthcare. The product will carry the following warning statement: Do not take RenoFlavone™ if you are pregnant or nursing. Consult your healthcare provider before use if you are taking any prescription medications or have a medical condition. Discontinue use if unusual symptoms occur."

Under 21 U.S.C. § 350b(a), the manufacturer or distributor of a dietary supplement containing a new dietary ingredient that has not been present in the food supply as an article used for food in a form in which the food has not been chemically altered must submit to FDA, at least 75 days before the dietary ingredient is introduced or delivered for introduction into interstate commerce, information that is the basis on which the manufacturer or distributor has concluded that a dietary supplement containing such new dietary ingredient will reasonably be expected to be safe. FDA reviews this information to determine whether it provides an adequate basis for such a conclusion. Under 21 U.S.C. § 350b(a)(2), there must be a history of use or other evidence of safety establishing that the new dietary ingredient, when used under the condition recommended or suggested in the labeling of the dietary supplement, will reasonably be expected to be safe. If this requirement is not met, the dietary supplement is considered to be adulterated under 21 U.S.C. § 342(f)(1)(B) because there is inadequate information to provide reasonable assurance that the new dietary ingredient does not present a significant or unreasonable risk of illness or injury.

U.S. Food and Drug Administration
5001 Campus Drive
College Park, MD 20740
www.fda.gov

頂尖期刊發表 國際專利認證

Hughes Biotechnology

15篇國際頂尖 SCI 期刊發表

2025 *ACS Catalysis* (IF:13.6)



8項發明專利認證

台灣、美國、日本、韓國、歐洲





RenoFlavone™
Fermented soy extract
發酵大豆多酚
(金雀異黃酮)

女性健康　心血管健康

RenoCidin™
Fermented citrus bioflavonoids
發酵柑橘多酚
(柑橘類黃酮)

運動爆發　血循代謝

RenoSage™
Fermented chrysanthemum extract
發酵菊花多酚
(木犀草素)

腦部神經健康　尿酸控制

RenoVital™
Fermented chamomile extract
發酵洋甘菊多酚
(芹菜素)

NAD+ 能量促進　紓壓舒眠





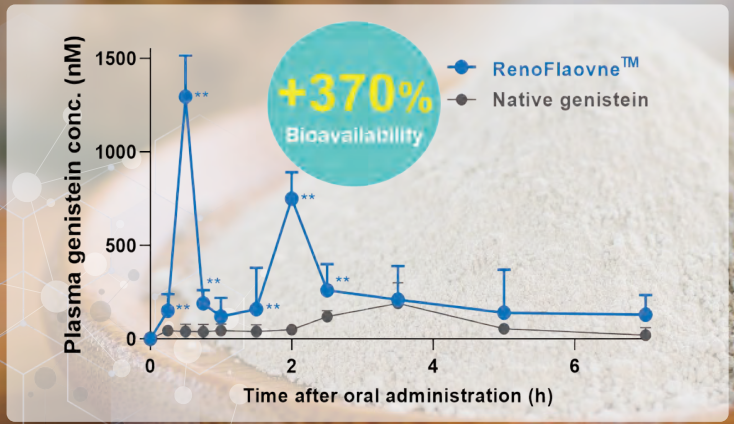

Next Generation Polyphenols
- Water Soluble • Readily Absorbed -

Hughes Biotechnology

RenoFlavone®

A Natural Approach to Supporting Women's Balance for Health and Vitality





- ✓ Women health & heart health
- ✓ 100,000X Aqueous solubility
- ✓ 3.7X Superior bioavailability
- ✓ Global patents
- ✓ Clinical proven efficacy
- ✓ US New Dietary Ingredient
- ✓ International innovation award

- ☑ Acute Toxicity: LD50 > 5000 mg/kg
- ☑ Genotoxicity: Negative
- ☑ 28-Day oral toxicity study: NOAEL 640 mg/kg bw/day



科學實證 RenoFlavone® 對於OVX大鼠具骨保護作用

Hughes Biotechnology



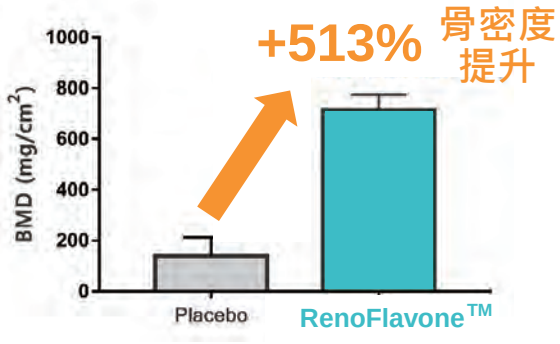
五國專利認證

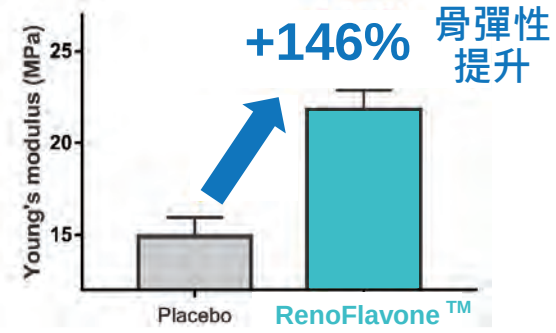
發明名稱：用以治療或預防與骨量減少相關疾病、改善骨骼結構及提高骨骼生物力學強度之方法

台灣專利	No. 7029172
日本專利	No. I756495
韓國專利	No. 10-2376603
歐盟專利	No. US 10881634 B2
美國專利	No. EP3494973A2



Wang et al., 2019





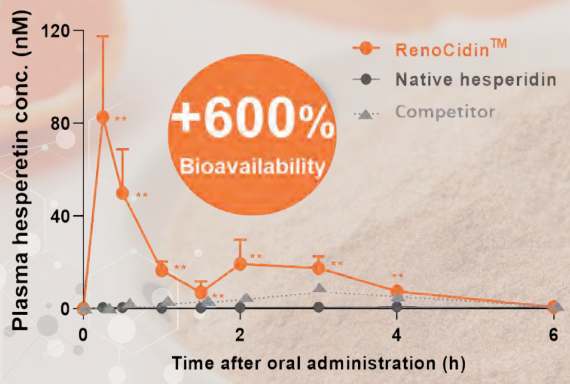
Next Generation Polyphenols
- Water Soluble • Readily Absorbed -

Hughes Biotechnology

RenoCidin®

A natural approach to precisely manage complete healthy-ageing





- ✓ Circulation & metabolic health
- ✓ 10,000X Aqueous solubility
- ✓ 6X Superior bioavailability
- ✓ Clinical proven efficacy
- ✓ US New Dietary Ingredient
- ✓ International innovation award

- ☑ Acute Toxicity: LD50 > 5000 mg/kg
- ☑ Genotoxicity: Negative
- ☑ 28-Day oral toxicity study: NOAEL 1600 mg/kg bw/day

科學實證

RenoCidin® 有助體重減輕降低發炎反應與心血管疾病風險；同時有助改善血管功能並促進血液循環

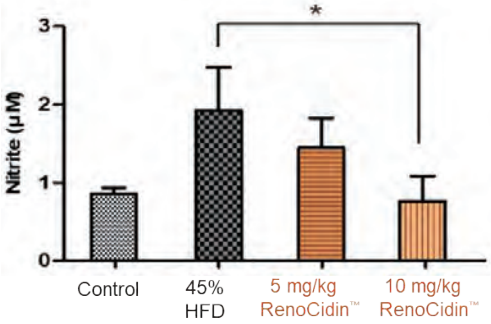
Hughes Biotechnology

體重



Control | 45% HFD | 5 mg/kg RenoCidin™ | 10 mg/kg RenoCidin™

發炎因子



food & nutrition research

ORIGINAL ARTICLE

Blood circulation effect of fermented citrus bioconversion product (FCBP) in EA.hy926 endothelial cells and high-fat diet-fed mouse model

Eun-Chae Cho[1], Hyuck Se Kwon[2], Na Young Lee[2], Hyun Jeong Oh[2] and Yean-Jung Choi[3]*

[1]Department of Convergence Science, Sahmyook University, Seoul, Republic of Korea; [2]R&D Team, Food & Supplement Health Claims, Vitech Co., Ltd., Wanju, Republic of Korea; [3]Department of Food and Nutrition, Sahmyook University, Seoul, Republic of Korea

Popular scientific summary

- This study investigated the effects of fermented citrus bioconversion product (FCBP), a fermented citrus bioflavonoid, on cardiovascular health in mice fed a high-fat diet and in endothelial cells.
- FCBP reduced weight gain and inflammatory markers (ICAM-1, VCAM-1) in mice.
- It decreased procoagulant activity without affecting normal blood clotting time.
- In endothelial cells, FCBP increased nitric oxide production and eNOS expression, supporting better blood vessel function.
- These findings suggest FCBP may help manage cardiovascular health by reducing inflammation and improving blood circulation. Further research is needed to confirm these effects in humans.

[*Food & Nutrition Research 2024, 68: 10682*]

臨床實證

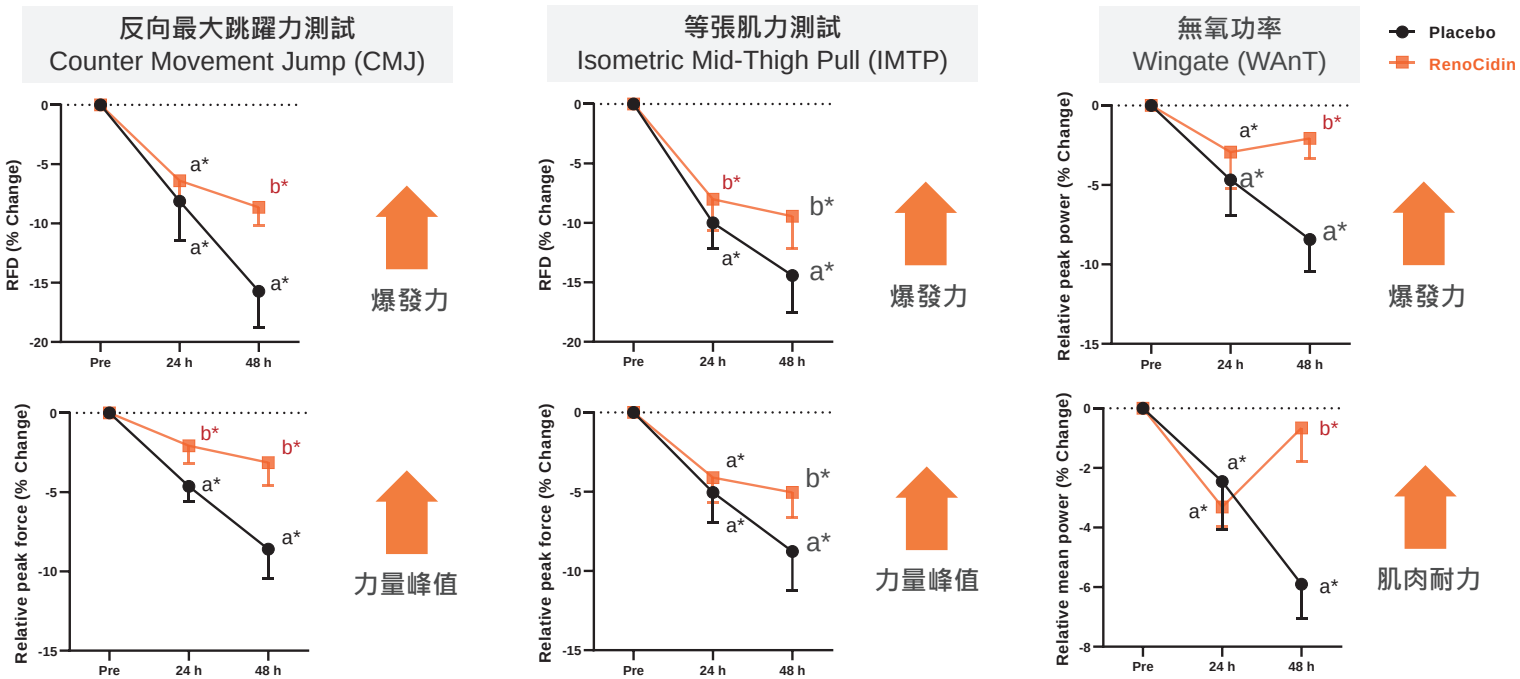
連續補充 RenoCidin®八週後對於肌肉力竭後導致力量與爆發力下降具有顯著的保護效果

Hughes Biotechnology

反向最大跳躍力測試
Counter Movement Jump (CMJ)

等張肌力測試
Isometric Mid-Thigh Pull (IMTP)

無氧功率
Wingate (WAnT)



Randomized, double-blind, placebo-control Clinical Study. 32 healthy subjects (18-40 years old) were tested for the effect of an 8-week RenoCidin™ (200 mg) trial on biomechanical changes after EIMD. Results are Mean ± SEM (n = 16). Different superscript letters and * indicate significant differences ($p < 0.05$).

Molecular Nutrition & Food Research

WILEY-VCH

Molecular Nutrition & Food Research

RESEARCH ARTICLE

Therapeutic Effects of Fermented Soy Extract on Osteoporotic Changes in Ovariectomized Mice as a Model of Menopause

Nisansala Chandimali[1,2] | Seon Gyeong Bak[1] | Seong-Min Hong[3] | Ji Young Hwang[4] | Hyuck Se Kwon[5] | Jaehoon Bae[6] | Sun Hee Cheong[7] | Seung-Jae Lee[1,2]

[1]Functional Biomaterial Research Center, Korea Research Institute of Bioscience and Biotechnology (KRIBB), Jeongeup, South Korea | [2]Applied Biological Engineering, KRIBB School of Biotechnology, University of Science and Technology, Daejeon, South Korea | [3]Division of Food Science and Technology, Gyeongsang National University, Jinju, South Korea | [4]Department of Food Science & Technology, College of Engineering, Dong-Eui University, Busan, South Korea | [5]R&D Team, Food & Supplement Health Claims, Vitech, Wanju, South Korea | [6]Functional Food Research Institute, Industry-university Cooperation Foundation, Daegu-hanny University, Gyeongsan, South Korea | [7]Department of Marine Bio Food Science, Chonnam National University, Yeosu, South Korea

Correspondence: Jaehoon Bae (haejaehoon@dhu.ac.kr) | Sun Hee Cheong (sunny3843@jnu.ac.kr) | Seung-Jae Lee (seung99@kribb.re.kr)

Received: 21 October 2025 | **Revised:** 1 April 2026 | **Accepted:** 8 April 2026

Keywords: bone health | estrogen receptors | fermented soy | menopause | osteoporosis

ABSTRACT

The objective of this study was to evaluate the effects of Fermented Soy Extract (FSE) on bone metabolism and selected neuroendocrine markers in an ovariectomized mouse model. An experimental study was conducted using an ovariectomized (OVX) mouse model to simulate postmenopausal conditions. FSE was administered, and its effects on bone health and neuroendocrine function were assessed. Estrogen receptor activity and the expression of genes related to bone metabolism were evaluated. Bone microarchitecture was analyzed, and serum levels of bone resorption markers, including C-terminal telopeptide of type I collagen (CTX-1), osteoprotegerin (OPG), and receptor activator of nuclear factor kappa-B ligand (RANKL), were measured. Additionally, levels of neuroendocrine factors were examined, including estradiol and norepinephrine in brain tissue and serotonin in serum. FSE treatment significantly improved bone microarchitecture in OVX mice. It reduced CTX-1 and RANKL levels while increasing OPG expression, indicating suppression of osteoclastogenesis. FSE also elevated estradiol, serotonin, and norepinephrine levels, suggesting beneficial effects on neuroendocrine regulation. Fermented Soy Extract demonstrates promise as a natural therapeutic agent for managing postmenopausal symptoms, particularly osteoporosis and mood-related disturbances. These findings support further clinical trials to confirm its efficacy and safety in human populations.

food & nutrition research

ORIGINAL ARTICLE

Blood circulation effect of fermented citrus bioconversion product (FCBP) in EA.hy926 endothelial cells and high-fat diet-fed mouse model

Eun-Chae Cho[1], Hyuck Se Kwon[2], Na Young Lee[2], Hyun Jeong Oh[2] and Yean-Jung Choi[3]*

[1]Department of Convergence Science, Sahmyook University, Seoul, Republic of Korea; [2]R&D Team, Food & Supplement Health Claims, Vitech Co., Ltd., Wanju, Republic of Korea; [3]Department of Food and Nutrition, Sahmyook University, Seoul, Republic of Korea

Popular scientific summary

- This study investigated the effects of fermented citrus bioconversion product (FCBP), a fermented citrus bioflavonoid, on cardiovascular health in mice fed a high-fat diet and in endothelial cells.
- FCBP reduced weight gain and inflammatory markers (ICAM-1, VCAM-1) in mice.
- It decreased procoagulant activity without affecting normal blood clotting time.
- In endothelial cells, FCBP increased nitric oxide production and eNOS expression, supporting better blood vessel function.
- These findings suggest FCBP may help manage cardiovascular health by reducing inflammation and improving blood circulation. Further research is needed to confirm these effects in humans.

Abstract

Background: The escalating global burden of cardiovascular diseases, largely driven by unhealthy lifestyle choices and dietary patterns, has intensified the search for effective and safe interventions. With current treatments often marred by significant side effects, the exploration of natural compounds such as flavonoids presents a compelling alternative.
Objective: This study investigated the effects of fermented citrus bioconversion product (FCBP), a fermented citrus bioflavonoid, on various markers of cardiovascular health in the context of a high-fat diet.
Design: *In vivo*, a high-fat diet-induced mouse model was used to assess the effects of FCBP on body weight, serum nitric oxide (NO) levels, activated partial thromboplastin time (aPTT), phosphatidylserine (PS) exposure on red blood cells, and the expression of inflammatory markers Intercellular Adhesion Molecule (ICAM)-1 and Vascular Cell Adhesion Molecule (VCAM)-1 in the thoracic aorta. *In vitro*, EA.hy926 endothelial cells were used to evaluate the compound's effects on cell viability, NO production, endothelial nitric oxide synthase (eNOS) expression, and cell adhesion molecule (CAM) levels to further understand the mechanisms behind the *in vivo* findings.
Results: *In vivo*, FCBP supplementation led to a dose-dependent reduction in weight gain, a significant decrease in serum NO levels at 10 mg/kg, and reduced ICAM-1 and VCAM-1 expressions in the thoracic aorta, indi-

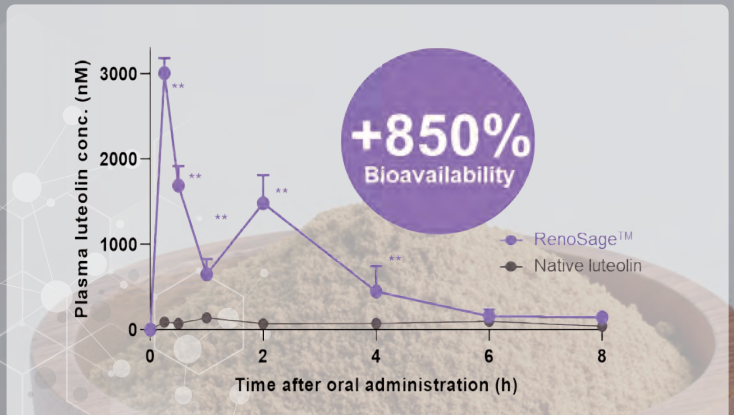
Next Generation Polyphenols
- Water Soluble • Readily Absorbed -

Hughes Biotechnology

RenoSage®

A Natural Approach to Promoting Cognitive Wellness and Stress Relief





✓ Cognitive & motional health
✓ 84,000X Aqueous solubility
✓ 8.5X Superior bioavailability
✓ Scientific-based health benefits
✓ Completed GLP safety studies
✓ International innovation award

☑ Acute Toxicity: LD50 > 5000 mg/kg
☑ Genotoxicity: Negative
☑ 28-Day oral toxicity study: NOAEL 800 mg/kg bw/day

PUBLICATION · FDA No.1253 · TECHNOLOGY PATENT · HALAL · GMP COMPLIANT · HACCP · ISO 22000


Efficacy · Efficiency
Exciting New Levels
Thanks for your attention !
RenoSorb™
From Solid to Liquid

Food Bacteria Count System

DOX

可靠 ！準確！ 省時！ 省人力！

食物中細菌數計數更快更簡單！

收錄於日本《食品安全法規標準檢驗法》中

通過 AOAC Research Institute 認證 (方法授權號 040801/120801)

收錄於《 2018 年微生物篇食品衛生檢查指引》



DOX-30F



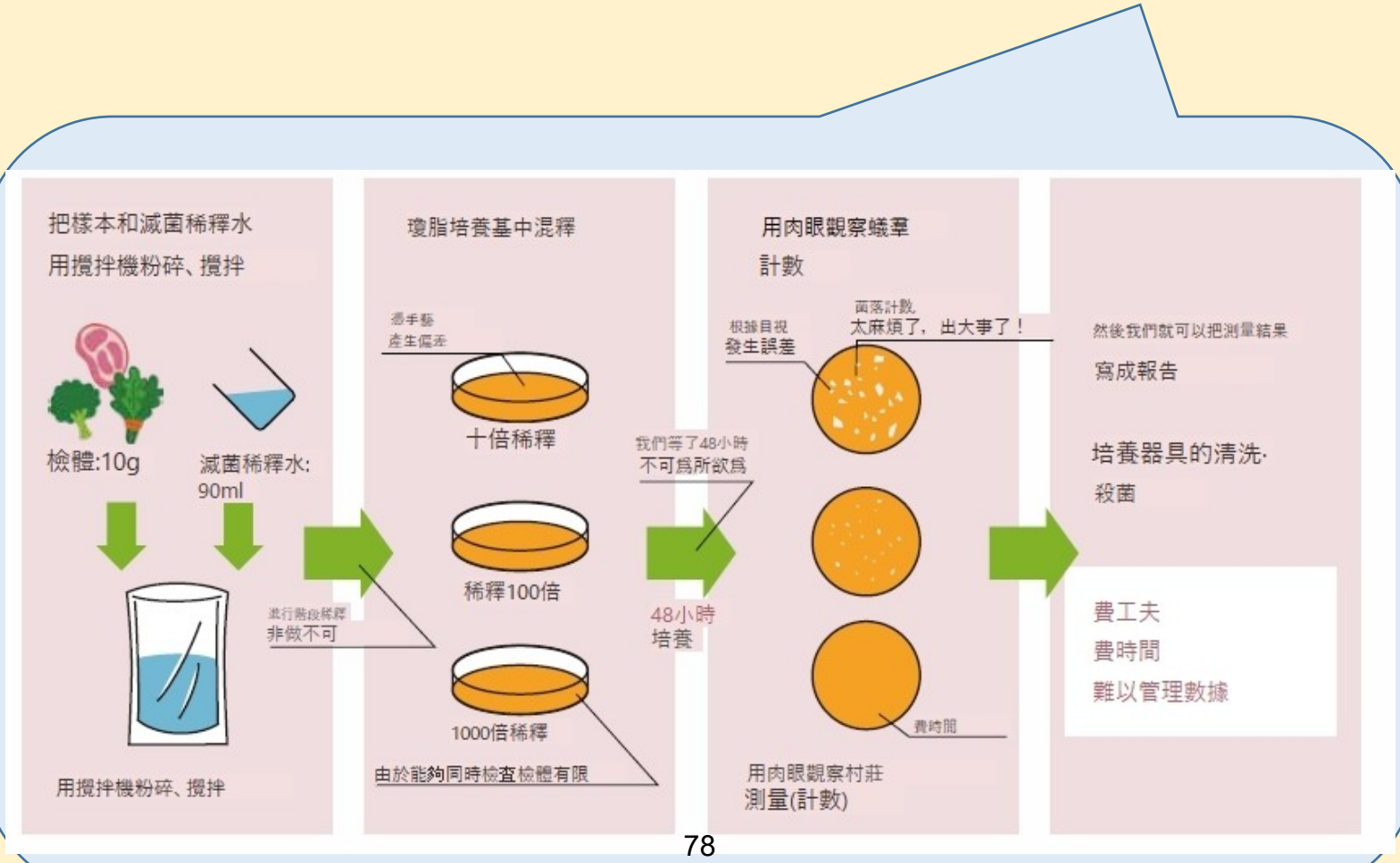
DOX-60F

檢驗菌數儀器介紹

陳立旻

常見的檢驗方法

	快速簡便的方法		傳統方法
偵測原理	**氧電極法**	細菌培養	細菌培養
	DOX	3M 測試片	標準制膠程序
初始成本	**弱**	最優	好
運行成本	**好**	弱	最優
時間與效率	**最優**	好	弱
			
	6~8 小時	1~2 天	2~4 天



Food Bacteria Count System

DOX

可靠 ！準確！ 省時！ 省人力！

食物中細菌數計數更快更簡單！

收錄於日本《食品安全法規標準檢驗法》中

通過 AOAC Research Institute 認證 （方法授權號 040801/120801）

收錄於《 2018 年微生物篇食品衛生檢查指引》



DOX-30F



DOX-60F

產品優勢

01 操作簡單，僅需三步驟即可完成檢測

- 只需三步驟：樣品稀釋 → 裝入卡匣 → 放入主機。
- 檢測流程簡化，快速上手。







02 降低人力與時間成本，有效控制檢測費用。

03 可同時處理多樣本

- 提供 30 與 60 通道機型，最多可連接三台，支援 180 樣本同時檢測。
- 無需記錄通道起始時間，放入卡匣後會自動依序啟動計數。

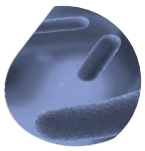
04 細菌量異常越高，偵測速度越快

- 傳統法需培養 24–72 小時， DOX 約 6 小時可偵測至 10^5 CFU/g 。
- 氧電極法原理：細菌多，反應越快，能及早反應異常。

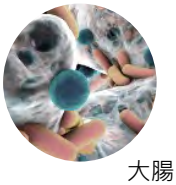
05 結果自動儲存與報告

- 免人工計算菌落，檢測時間大幅縮短。
- 自動產出報告，免人工彙整。

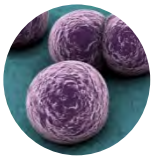
沙門氏菌（定量）



總生菌數（定量）



金黃色葡萄球菌（定量）



大腸桿菌群（定量）
大腸桿菌（定性）





DOX 操作影片

產品資訊

中文品名	品名	品號	包裝
DOX 菌種檢測機 30 卡匣	DOX-30F	XG-IDOX-30F-EA	EA
DOX 菌種檢測機 60 卡匣	DOX-60F	XG-IDOX-60F-EA	EA
DOX 卡匣 - 總生菌數用	Cell cartridge for TVC (100 pcs / box)	XG-IDOX-CELL-TVC-BOX	BOX
DOX 卡匣 - 其他	Cell cartridge for Coliforms (100 pcs / box)	XG-IDOX-CELL-ELS-BOX	BOX
DOX 卡匣 - 校正用	Dummy Cell cartridge (5 pcs / pack)	XG-IDOX-CELL-TEST-PACK	PACK
DOX 介質 - 總生菌	Medium for TVC (10 bottle / box)	XG-IDOX-MED-TVC-BOX	BOX
DOX 介質 - 大腸桿菌群	Medium for Coliform (10 bottle / box)	XG-IDOX-MED-COLI-BOX	BOX
DOX 介質 - 金黃色葡萄球菌	Medium for S.aureus (10 bottle / box)	XG-IDOX-MED-STA-BOX	BOX
DOX 介質 - 沙門氏菌	Medium for Salmonella (10 bottle / box)	XG-IDOX-MED-SALM-BOX	BOX

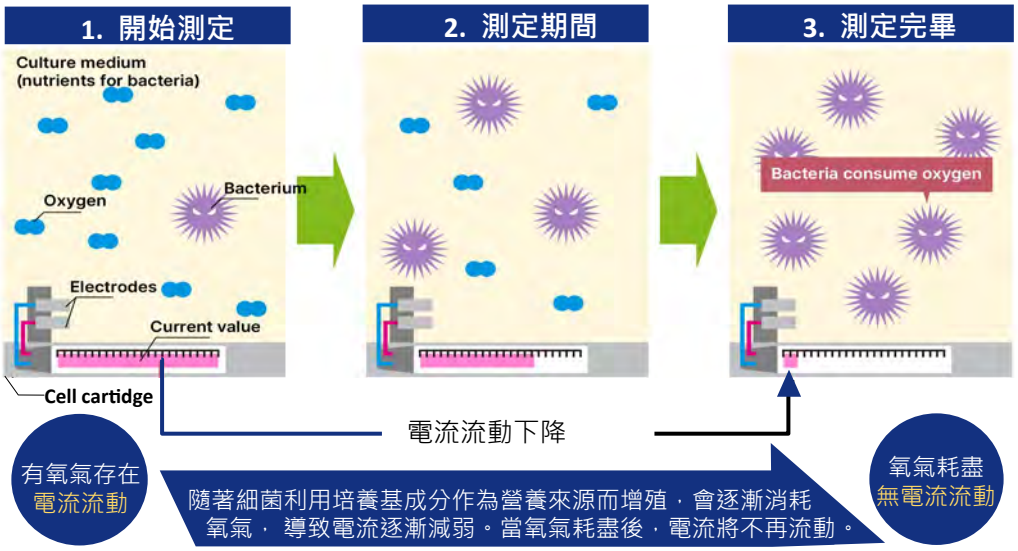
DM11407007
昱昌材料科技股份有限公司
Flamegold Material Corporation
◆台北 TEL:(02)2600-6699 ◆台南 TEL:(06)249-5488
◆新竹 TEL:(03)658-0508 ◆高雄 TEL:(07)374-8686
◆台中 TEL:(04)2355-2008 ◆花蓮 TEL:(03)836-0065
◆嘉義 TEL:(05)277-2262 www.uni-onward.com.tw

價格請洽當區業務

DOX SYSTEM



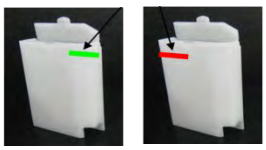
作用原理



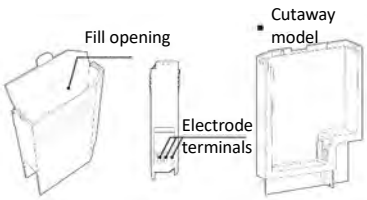
細胞準備

細胞卡匣 (Cell cartridge)

- 細胞卡匣分為兩種：
  1. 總生菌數測定用
  2. 大腸桿菌群測定用 (亦用於金黃色葡萄球菌與沙門氏菌測定)
- 兩者外觀相似，取出後請用奇異筆在頂部做記號以利區分。
- 每個卡匣中加入 1 ml 培養基
- 關閉培養瓶蓋前，請對瓶口進行火焰滅菌。



總生菌數測定 大腸桿菌群測定



培養基 (Culture medium)

共有四種類型的培養基：總生菌數用、大腸桿菌群用、金黃色葡萄球菌用以及沙門氏菌用，瓶蓋顏色不同可區分。



總生菌數 白色瓶蓋	大腸桿菌群 黃色瓶蓋	金黃色葡萄球菌 藍色瓶蓋	沙門氏菌 紅色瓶蓋

周邊耗材

電子式高溫滅菌器

利用電力加熱所產生的紅外線高溫來達到快速滅菌的效果。

XG-LRON-177300

BagRack 放置架

鐵胃袋放置架 400 ml 用

XG-Z-AI-221040

單邊濾網鐵胃袋

吸管吸取式 400 ml

使用容量 50-300 ml

XG-Z-AI-111425 680/PK

單爪可調式 3 支組

20 µl + 200 µl + 1,000 µl 各 1 支

EPP-3123000918-1SET

單爪可調式分注器

誤差 1,000 µl : 2.0 µl / 0.2 %

規格 100-1000 µl

EPP-3123001063-1EA

二位數內校天平

最大秤重 4,200g

精密度 0.01g

FS-15927510-1EA

BagMixer 袋式均質器

XG-Z-AI-024230

無菌採樣袋

Nasco Whirl-Pak

SI-WPB01065WA-500EA

11.5 X 23 (532 ml)

防潑濺實驗衣

符合美國 OSHA 29 CFR 1910 BSL-1 & BSL-2，為工作環境可能被血液或體液潑濺提供防護。

廢棄物滅菌袋

尺寸 30*61 cm

FS-01815A-1CS 100EA

無粉丁腈手套

規格 : XS, S, M, L, XL

50 雙 / 盒 XG-LGLO-1175

樣品處理



將樣品袋從底部翻起，並立在電子天平上。將樣品袋放在天平上後，將天平歸零



使用剪刀、鑷子等工具前，需用火焰消毒 2 至 3 次。



使用經火焰消毒的工具或移液管取樣 。



取樣 10 克或 10 毫升樣品



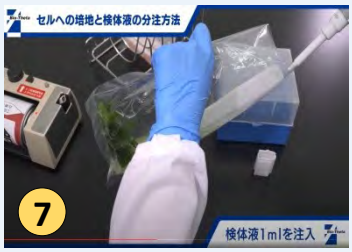
將 90 毫升稀釋水加入已秤重的樣品中。
* 依各樣品性質自行稀釋與否



將樣品袋開口摺疊三次，然後左右搖晃約 30 秒，以清洗樣品上附著的細菌 (沖洗步驟)，即完成 10 倍稀釋。

* 某些樣品建議使用均質器進行處理。

樣品溶液與培養基注入卡匣

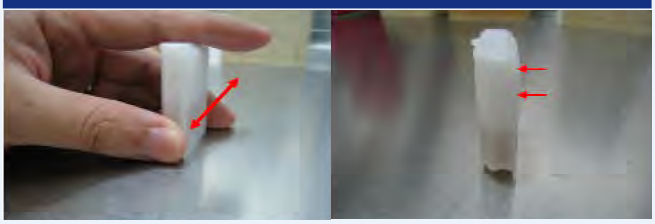


使用移液器將 1 ml 樣品溶液經過濾膜注入每個已含 1 ml 培養基的細胞卡匣中。



將 1 ml 樣品注入每個細胞卡匣後，請搖動卡匣使其混合均勻。

建議攪拌方式



先注入培養基，再注入樣品溶液，並進行搖晃。依照上圖箭頭方向前後搖動。

以每秒兩次的頻率前後搖動液體，使液面保持在圖中箭頭所示範圍內，且不溢出。

DOX 機器設定



開啟 DOX 主機。等待約 20 分鐘，直到設備溫度上升至約 35°C 。



當設備準備完成時，會發出電子提示音。啟動軟體，並確認每個通道皆處於” 待機” 狀態。



確認無誤後，將細胞卡匣插入 DOX 主機內。

樣品資訊輸入





請在軟體中將樣品資訊輸入至插入卡匣的通道。雙擊該通道並輸入詳細資訊。

① 製造日期
② 檢測項目：選擇對應的檢量線 (Test case)
③ 輸入樣品名稱及其他相關資訊 (項目 1 、 2 、 3) 。

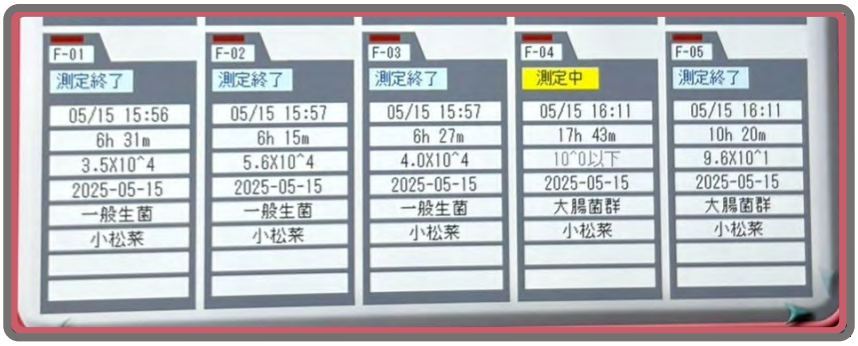
陽性檢測結果

大腸桿菌群 透明 → 黃色	大腸桿菌 大腸桿菌群測定呈陽性結果 → 紫外線 → 螢光反應	金黃色葡萄球菌 紅色 → 黃色	沙門氏菌 紅色 → 黃色
negative	E.coli (CFU／ml) 10¹ 10⁰ 10⁻¹ ﾌﾞﾗﾝｸ	negative	negative
positive	ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ E.cloacae 10⁵ CFU／ml	positive	positive

以紫外線照射，若觀察到螢光反應，表示為陽性結果。

傳輸資料

	Total viable cells		Coliforms			E. coli	Staphylococcus aureus			Salmonella		
channel	control method	DOX bacteria count	control method	DOX bacteria count	Turned yellow?	Did it fluoresce?	control method	DOX bacteria count	Turned yellow?	control method	DOX bacteria count	Turned yellow?
※Example A-1	1.E+04	2.E+04	2.E+02	5.E+02	YES・NO	YES・NO	3.E+01	8.E+01	YES・NO	0.E+00	0.E+00	YES・NO
A-1					YES・NO	YES・NO			YES・NO			YES・NO
A-2					YES・NO	YES・NO			YES・NO			YES・NO
A-3					YES・NO	YES・NO			YES・NO			YES・NO
A-4					YES・NO	YES・NO			YES・NO			YES・NO
A-5					YES・NO	YES・NO			YES・NO			YES・NO
A-6					YES・NO	YES・NO			YES・NO			YES・NO
A-7					YES・NO	YES・NO			YES・NO			YES・NO
A-8					YES・NO	YES・NO			YES・NO			YES・NO
A-9					YES・NO	YES・NO			YES・NO			YES・NO
A-10					YES・NO	YES・NO			YES・NO			YES・NO



① 點擊 Windows (C) 磁碟機
② 點擊 DOX60F 資料夾
③ 點擊 doxdata 資料夾
④ 確認檔案 2025_***-00.DAT
※ 2025 後方的數字為測定日期
⑤ 將步驟 ④ 中的檔案附加至電子郵件中

日文使用介面（有漢字）


Bio-Theta
外気温正常復帰 2023-09-01 15:44:11
設定温度:35℃ 測定時間:20時間
装置リセット
終了
状況一覧
報告書
検索
初期設定
検体情報
2023-08-31
18:04
1200 分
0.0X10^0
2023-08-09
大腸菌群
大豆

10 倍稀釋的實驗

取 10G 的 sample取 90ML 的乾淨水 (生理食鹽水搖晃約 30 秒



+





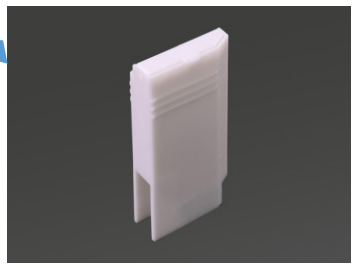
取 1ML 的 medium



1

2

取 1ML 的液體





進行搖晃。依照上圖箭頭方向前後搖動

上機 DOX

日文使用介面（有漢字）



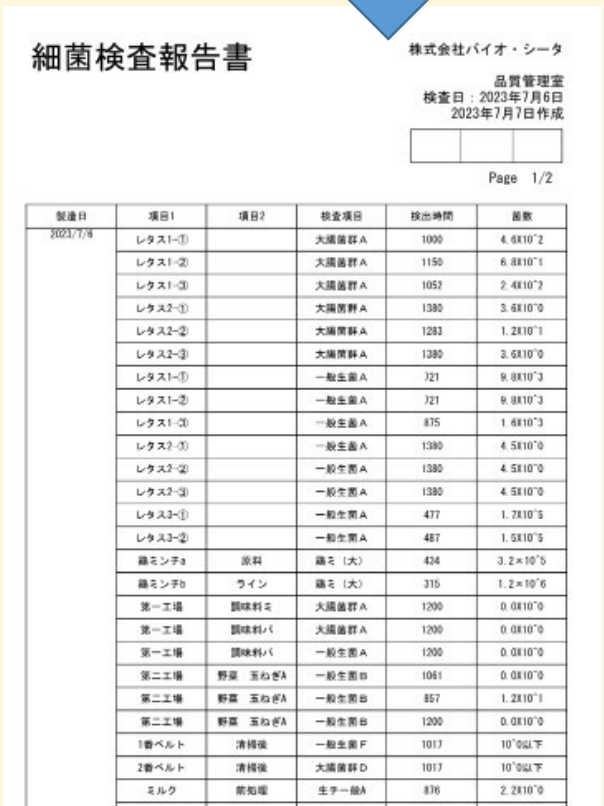
菌數測試極限

CFU: 10^2~10^7

日文使用介面（有漢字）



	製造日	項目1	項目2	項目3	検査項目	菌数	検出時間	備考欄
37	2023-08-07	チョコ			大腸菌群	0.0X10^0	1200	
38	2023-08-07	チョコ			大腸菌群	0.0X10^0	1200	
39	2023-08-07	チョコ			大腸菌群	0.0X10^0	1200	
40	2023-08-07	チョコ			大腸菌群	0.0X10^0	1200	
41	2023-08-09	大豆			一般生菌	1.6X10^6	258	
42	2023-08-09	大豆			一般生菌	10^8以上	182	
43	2023-08-09	大豆			一般生菌	6.8X10^5	291	
44	2023-08-09	大豆			一般生菌	6.4X10^5	290	
45	2023-08-09	大豆			一般生菌	10^8以上	182	
46	2023-08-18	惣菜A			一般生菌	0.0X10^0	807	
47	2023-08-18	惣菜A			一般生菌	10^8以上	182	
48	2023-08-18	惣菜A			一般生菌	1.4X10^7	184	
49	2023-08-18	惣菜A			一般生菌	1.8X10^6	255	
50	2023-08-18	惣菜A			一般生菌	1.1X10^4	432	
51	2023-08-09	大豆			大腸菌群	0.0X10^0	885	
52	2023-08-09	大豆			大腸菌群	6.3X10^2	559	
53	2023-08-09	大豆			大腸菌群	0.0X10^0	1200	
54	2023-08-09	大豆			大腸菌群	5.4X10^2	564	
55	2023-08-09	大豆			大腸菌群	2.7X10^3	512	
56	2023-08-18	惣菜B			一般生菌	10^8以上	182	
57	2023-08-18	惣菜B			一般生菌	4.1X10^6	226	
58	2023-08-18	惣菜B			一般生菌	1.4X10^5	344	
59	2023-08-18	惣菜B			一般生菌	4.1X10^6	226	



細菌検査報告書

株式会社バイオ・シータ
品質管理室
検査日：2023年7月6日
2023年7月7日作成

Page 1/2

製造日	項目1	項目2	検査項目	検出時間	菌数
2023/7/6	レタス1-①		大腸菌群A	1000	4.6X10^2
	レタス1-②		大腸菌群A	1150	6.8X10^1
	レタス1-③		大腸菌群A	1052	2.4X10^2
	レタス2-①		大腸菌群A	1380	3.6X10^0
	レタス2-②		大腸菌群A	1283	1.2X10^1
	レタス2-③		大腸菌群A	1380	3.6X10^0
	レタス1-①		一般生菌A	721	9.8X10^3
	レタス1-②		一般生菌A	721	9.8X10^3
	レタス1-③		一般生菌A	875	1.6X10^3
	レタス2-①		一般生菌A	1380	4.5X10^0
	レタス2-②		一般生菌A	1380	4.5X10^0
	レタス2-③		一般生菌A	1380	4.5X10^0
	レタス3-①		一般生菌A	477	1.7X10^5
	レタス3-②		一般生菌A	487	1.5X10^5
	鶏ミンチa	原料	鶏ミ（大）	434	3.2×10^5
	鶏ミンチb	ライン	鶏ミ（大）	315	1.2×10^6
	第一工場	調味料ミ	大腸菌群A	1200	0.0X10^0
	第一工場	調味料バ	大腸菌群A	1200	0.0X10^0
	第一工場	調味料バ	一般生菌A	1200	0.0X10^0
	第二工場	野菜　玉ねぎA	一般生菌B	1061	0.0X10^0
	第二工場	野菜　玉ねぎA	一般生菌B	857	1.2X10^1
	第二工場	野菜　玉ねぎA	一般生菌B	1200	0.0X10^0
	1番ベルト	清掃後	一般生菌F	1017	10^0以下
	2番ベルト	清掃後	大腸菌群D	1017	10^0以下
	ミルク	前加熱	生テー菌A	876	2.2X10^0

英文使用介面


Bio-Theta
Temp.:35°C Meas. Time:20h
Reset inst.
Close
Chn. Status
Report
Search
Initial Setting
Sample information

一般生菌通過 AOAC (040801)

AOAC RESEARCH INSTITUTE

CERTIFICATION

AOAC Research Institute

Performance Tested Methods^{SM}

Certificate No.

040801

The AOAC Research Institute hereby certifies the method known as:

DOX 60F/30F TVC

manufactured by

Bio-Theta, Ltd.
Iizuka Research Park 172-18, Koubukuro
Iizuka-shi, Fukuoka
Japan, 820-0066

This method has been evaluated and certified according to the policies and procedures of the AOAC *Performance Tested Methods*^{SM} Program. This certificate indicates an AOAC Research Institute Certification Mark License Agreement has been executed which authorizes the manufacturer to display the AOAC Research Institute *Performance Tested Methods*^{SM} certification mark on the above-mentioned method for the period below. Renewal may be granted by the Expiration Date under the rules stated in the licensing agreement.

Bradley A. Stawick, Senior Director
Signature for AOAC Research Institute

Issue Date December 05, 2024
Expiration Date December 31, 2025

2275 Research Blvd., Ste. 300, Rockville, Maryland, USA Telephone: +1-301-924-7077 www.aoac.org

大腸桿菌群通過 AOAC (120801)



AOAC RESEARCH INSTITUTE

CERTIFICATION

AOAC Research Institute

Performance Tested Methods^{SM}

Certificate No.

120801

The AOAC Research Institute hereby certifies the method known as:

DOX 60F/30F Coliforms and *E. coli*

manufactured by

Bio-Theta, Ltd.
Iizuka Research Park 172-18, Koubukuro
Iizuka-shi, Fukuoka
Japan, 820-0066

This method has been evaluated and certified according to the policies and procedures of the AOAC *Performance Tested Methods*^{SM} Program. This certificate indicates an AOAC Research Institute Certification Mark License Agreement has been executed which authorizes the manufacturer to display the AOAC Research Institute *Performance Tested Methods*^{SM} certification mark on the above-mentioned method for the period below. Renewal may be granted by the Expiration Date under the rules stated in the licensing agreement.

Bradley A. Stawick, Senior Director
Signature for AOAC Research Institute

Issue Date December 05, 2024
Expiration Date December 31, 2025

2275 Research Blvd., Ste. 300, Rockville, Maryland, USA Telephone: +1-301-924-7077 www.aoac.org

上機使用與後續校準

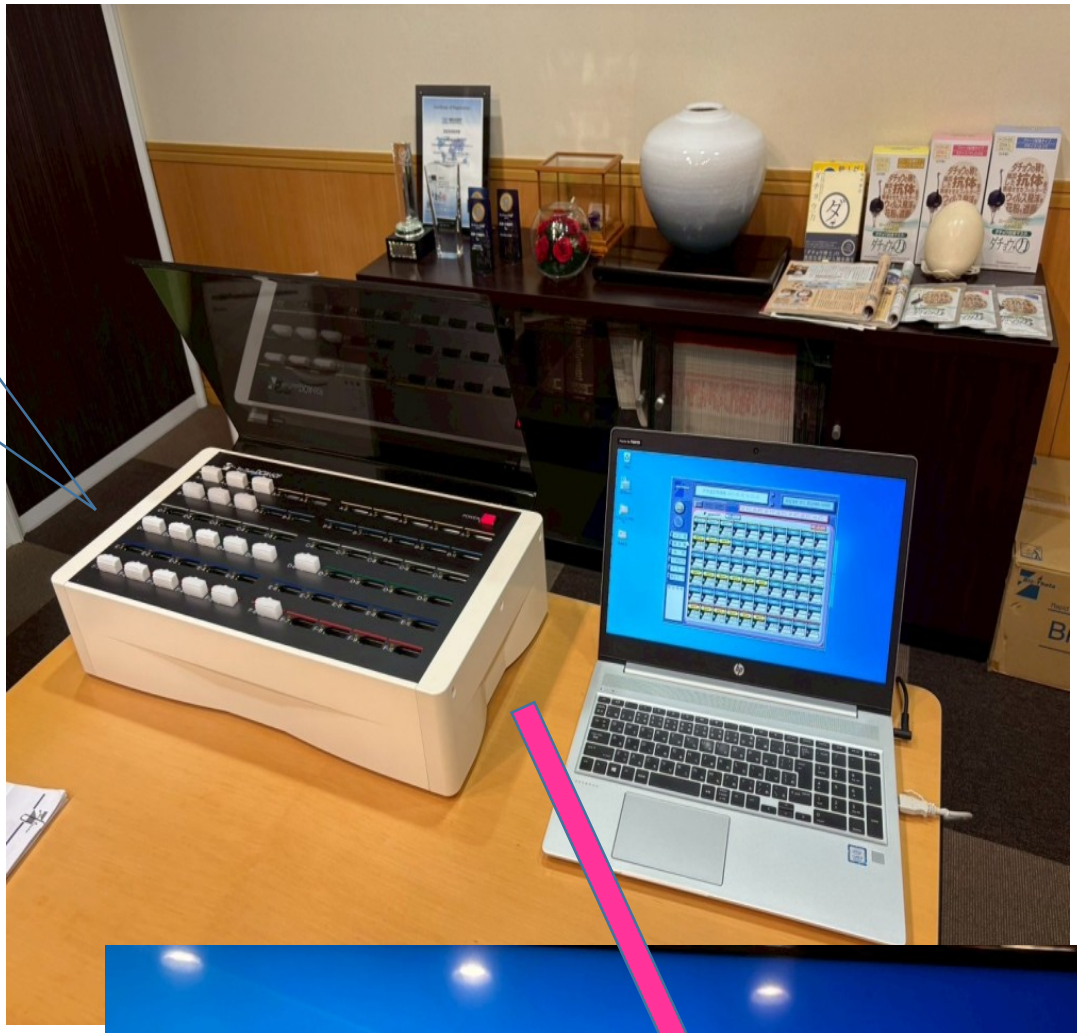
- DOX 每種菌種採 5 重複 , 各別得到其菌數數據 (超過 700~800 分鐘系統將判定為 0)
- 使用傳統皿培法測得該菌數 (1 重複), 當作驗證校準的標準
- 若測 colifrom, 另外可用 UV 光來測得 E coli. 螢光反應

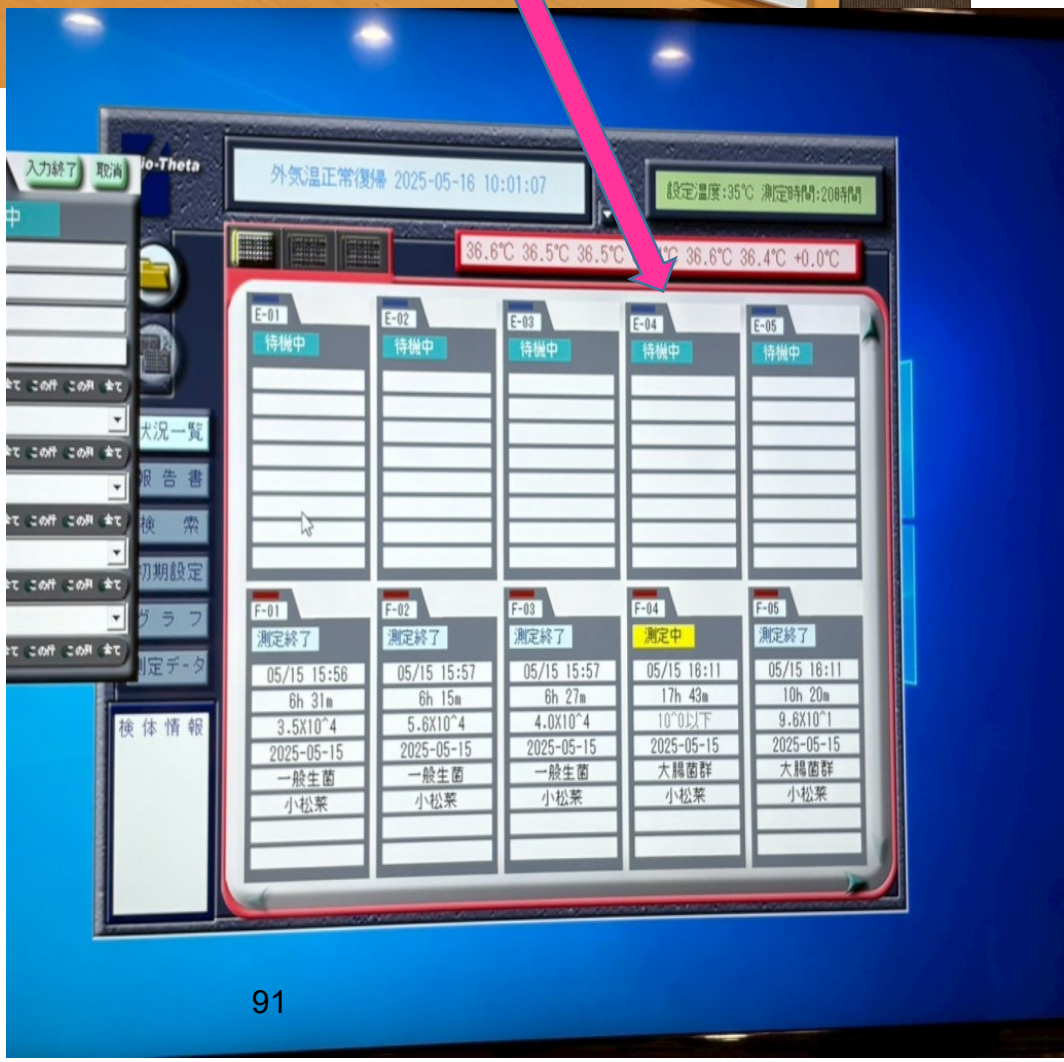
- 準備進行實驗



上機跑 6~8H

卡匣插下去即開始計算耗氧時間





① 使用 DOX 方法和標準方法進行測試。

② 將 DOX 測試結果（ DAT 檔案）和標準方法測試結果（細菌計數 Excel 表格）

③ 原廠分析測試結果。

④ 提交分析結果報告。

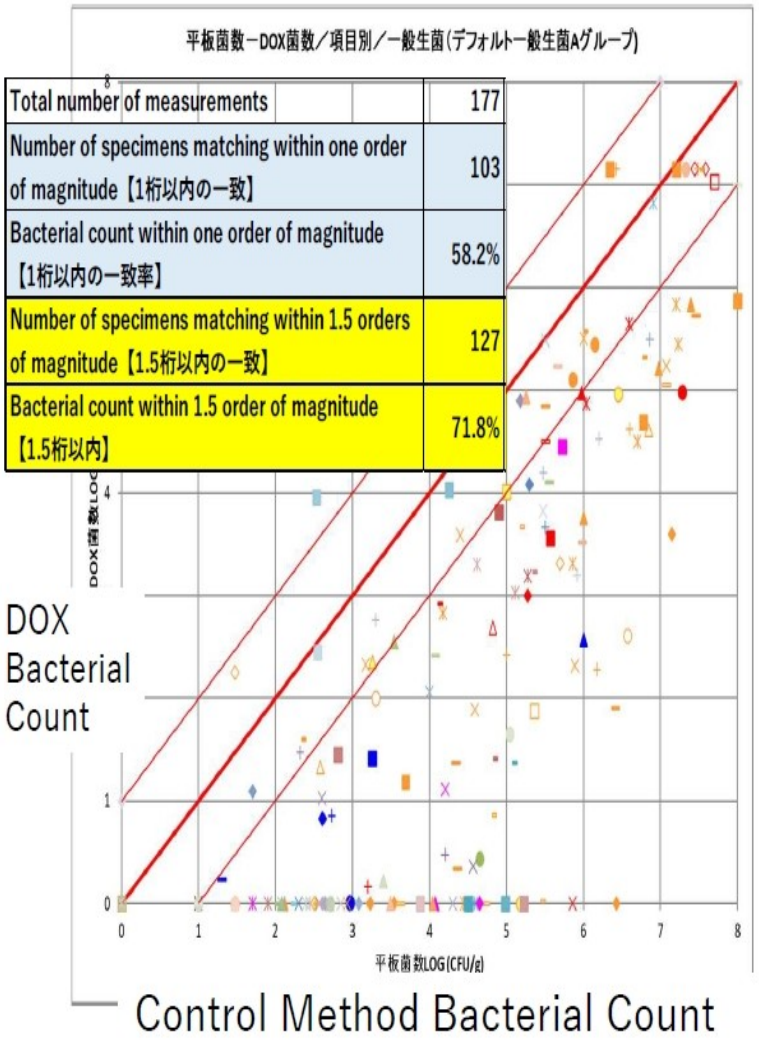
	Total viable cells		Coliforms			E. coli
channel	control methoc	DOX bacteria coun	control methoc	DOX bacteria coun	Turned yellow	Did it fluoresce
※ Example A-1	1.E+04	2.E+04	2.E+02	5.E+02	YES・NO	YES・NO
A-7	11028	2.7X10^2			YES・NO	YES・NO
A-8		0.0X10^0			YES・NO	YES・NO
A-9		5.8X10^2			YES・NO	YES・NO
A-10		0.0X10^0			YES・NO	YES・NO
B-1	680	1.2X10^3			YES・NO	YES・NO
B-2		7.5X10^2			YES・NO	YES・NO
B-3		1.7X10^3			YES・NO	YES・NO
B-4		9.4X10^2			YES・NO	YES・NO
B-5		3.9X10^2			YES・NO	YES・NO
B-6	194	0.0X10^0			YES・NO	YES・NO
B-7		1.1X10^0			YES・NO	YES・NO
B-8		0.0X10^0			YES・NO	YES・NO
B-9		0.0X10^0			YES・NO	YES・NO
B-10		0.0X10^0			YES・NO	YES・NO
C-1			13	1.6X10^5	YES	YES
C-2				3.9X10^4	YES	YES
C-3				6.1X10^5	YES	YES
C-4				2.9X10^4	YES	YES
C-5				1.7X10^4	YES	YES
C-6			0	0.0X10^0	NO	NO
C-7				0.0X10^0	NO	NO
C-8				0.0X10^0	NO	NO
C-9				0.0X10^0	NO	NO
C-10				0.0X10^0	NO	NO

每個菌種測試 5 個 sample 即可完成

日本原廠校準分析↘貼近真實數據

每個菌種測試 5 個 sample 即可完成

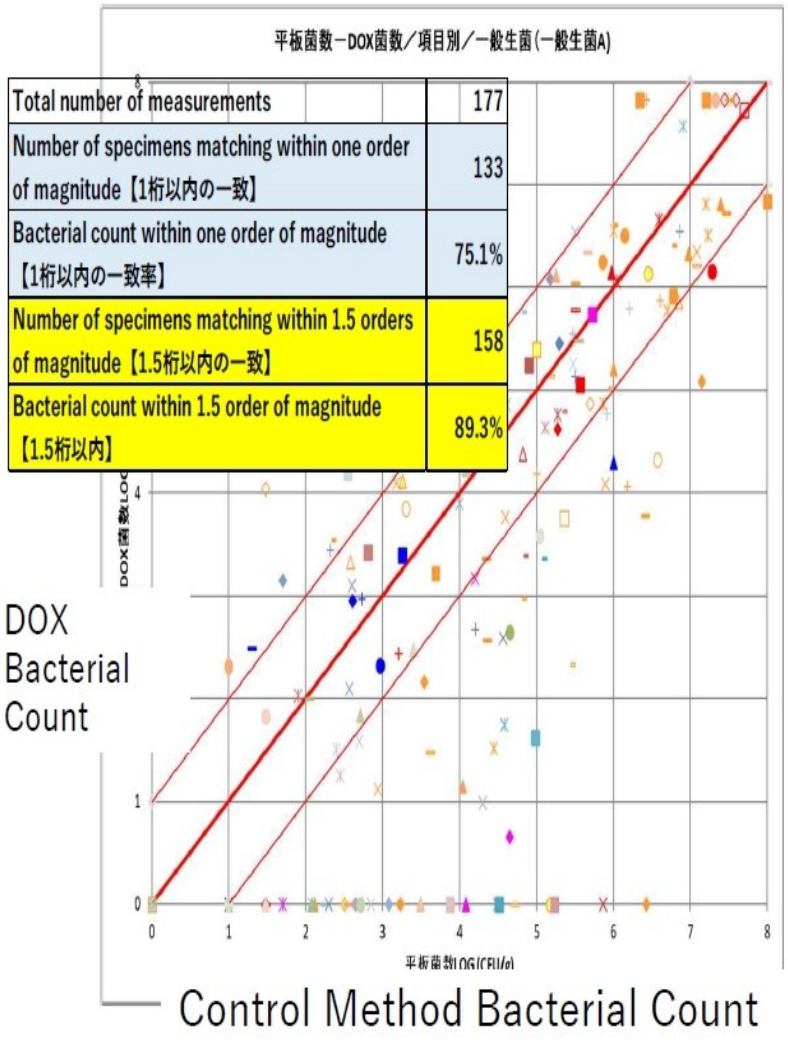
■Before creating the calibration curve ➡ ■After creating the calibration curve



Total number of measurements	177
Number of specimens matching within one order of magnitude【1桁以内の一致】	103
Bacterial count within one order of magnitude【1桁以内の一致率】	58.2%
Number of specimens matching within 1.5 orders of magnitude【1.5桁以内の一致】	127
Bacterial count within 1.5 order of magnitude【1.5桁以内】	71.8%

DOX Bacterial Count

Control Method Bacterial Count



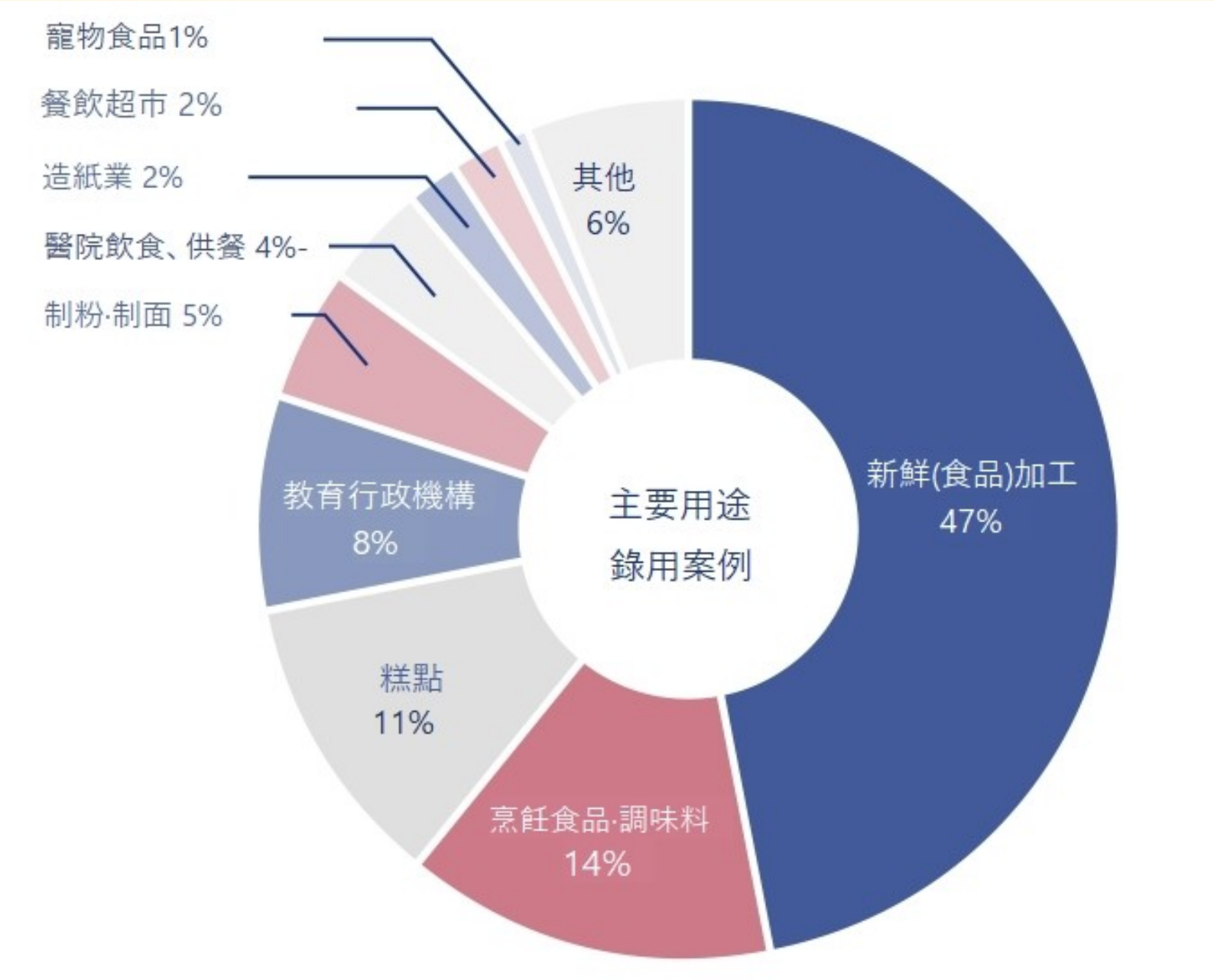
Total number of measurements	177
Number of specimens matching within one order of magnitude【1桁以内の一致】	133
Bacterial count within one order of magnitude【1桁以内の一致率】	75.1%
Number of specimens matching within 1.5 orders of magnitude【1.5桁以内の一致】	158
Bacterial count within 1.5 order of magnitude【1.5桁以内】	89.3%

DOX Bacterial Count

Control Method Bacterial Count

比較參考值以傳統皿培法來比對

我們的客層（參考日本的數據）



LGC AXIO
能力試驗（PT）方案總覽

從能力驗證、PORTAL 數據管理到各產業方案的一次掌握



資料來源：LGC AXIO Proficiency Testing Schemes 2027

什麼是能力試驗（Proficiency Testing, PT）？

用外部、獨立的實驗室間比較，客觀檢視量測／檢測結果是否可靠

核心概念

同一份測試材料

↓

多個實驗室獨立分析

↓

統計比較＋績效評估

建立可持續改善的品質證據

PT 可以回答的三個問題

- 我的結果與同業相比準確嗎？
- 方法、儀器或人員是否出現系統性偏差？
- 改善措施之後，績效有沒有真的回復？

與實驗室認可的關係

LGC PT 為 ISO/IEC 17025 與 ISO 15189 認可的重要要求之一。實務上，PT 也常被用作能力維持、品質監控與持續改善的外部證據。

資料來源：2027 Catalogue p.4–5

20

參加 PT，實驗室可以得到什麼？

把「一次成績」轉成方法、人員、儀器與品質系統的改善工具

01 找出問題

及早發現偏差、異常與潛在品質事件

02 比較方法

比較方法、程序、儀器與分析系統

03 比較人員

觀察不同分析人員的能力與一致性

04 驗證方法

確認方法在日常條件下的實際表現

05 教育訓練

用真實情境訓練與評估人員

06 建立信心

對客戶稽核與管理階層提供外部證據

07 評估不確定度

協助理解量測不確定度與結果分散

08 轉作 QC

部分剩餘 PT 樣品可作內部品質控制用途

PT 的價值在「找到差異 → 找原因 → 做改善 → 用下一次數據驗證改善」

資料來源：2027 Catalogue p.5

21

為什麼選擇 LGC AXIO PT ？

全球參與規模、真實樣品、參加彈性與快速報告

13,000+
每年參與的實驗室

165+
涵蓋國家／地區

2,700+
每年提供的 PT 測試

~5 天
平均報告週轉時間

全球比較

大量國際參與者，可把結果放到更完整的同儕背景中。

在地支援

LGC 強調在地語言與區域支援，協助方案選擇、結果與運輸問題。

真實世界基質

盡量使用接近日常檢測的樣品與濃度，讓 PT 更貼近實務。

參加彈性

多數樣品一年有多次場次，熱門測試最高可達一年 12 次。

2027：新增 50+ 項能力試驗，持續因應新法規與產業需求

資料來源：2027 Catalogue p.6–7；LGC AXIO Resource Hub

22

PORTAL：PT 不只是一份報告，而是一套數據管理平台

結果提交、報告下載、資料匯出、趨勢分析與群組管理集中在同一平台



1 提交結果 依指定期限直接輸入 PT 結果

2 下載報告 集中取得績效報告與歷史紀錄

3 匯出資料 把 PT 數據帶入內部品質系統

4 趨勢分析 跨樣品、項目、人員、方法看長期表現

群組層級管理：可建立區域／國家／自訂實驗室群組，統一查看 PT 績效。

資料來源：2027 Catalogue p.8

23

PORTAL 的規模與使用彈性

多語言、多使用者、多結果提交，讓 PT 能融入日常管理

3.8M+	5.5 天	98%	600K+
去年處理的結果數	平均報告交付時間	準時交付率	報告互動次數

12 種語言 / 中文介面

可用當地語言瀏覽，降低操作門檻。

不限使用者

可依角色設定權限，讓分析人員自行提交或集中由管理者提交。

每分析物最多 13 筆結果

可比較不同分析人員、方法或儀器；其中指定結果納入統計分析。

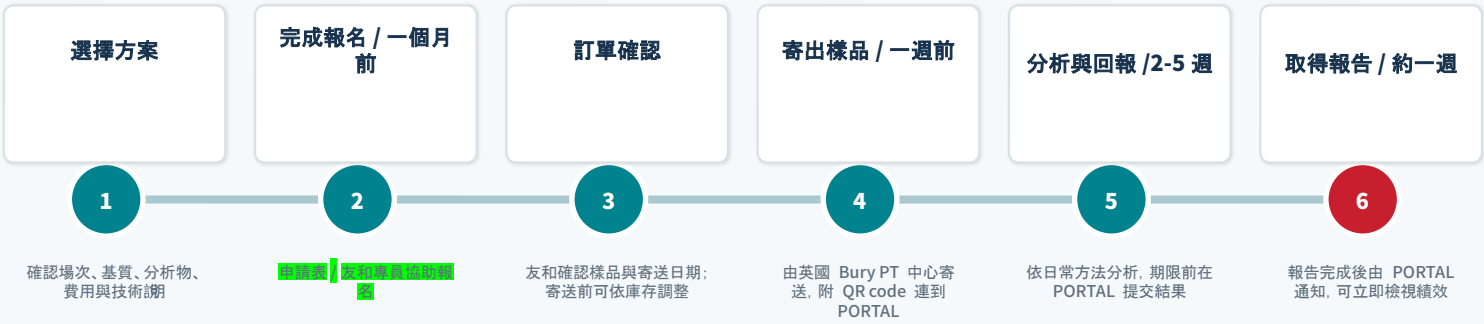
實務價值同一個 PT round 可以同時比較「人員 × 方法 × 儀器」，不必只留下單一代表值

資料來源：2027 Catalogue p.8, p.10

24

LGC AXIO PT 參加流程

從選方案到收到報告，流程可以拆成 6 個明確步驟



管理點：確認「場次／基質／分析物／截止日」；報名後把 PT round 直接納入年度品質計畫。

資料來源：2027 Catalogue p.14–15

25

2027 方案涵蓋領域

從食品、飲料、水環境，到臨床、法醫與工業檢測

食品與飼料

QMS | QFCS | QMAS | QDCS
QCS | AFPS | STEC | QGS

飲料

BAPS | DAPS | MAPS
QBS | SUPS

水與環境

AQUACHECK | QWAS | AIR
HYGIENE | CONTEST | CRYPTS

消費者安全

PHARMASSURE | CANNABIS
COSMETICS | Toys & Materials

臨床

IPT | TDM | TOX
DAU | DOF | DAH

法醫／工業／微生物 RM

FAE | QUARTZ | FIRMS
Industrial | easi-tab™

方案名稱只是第一層；真正選型仍要回到「樣品基質 × 分析物 × 場次 × 認可狀態」。

資料來源：2027 Catalogue Contents p.2–3

26

食品與飼料：LGC AXIO 的重點領域

Food Microbiology 具大規模參與者；Food Chemistry 則涵蓋非常廣的分析項目



3,000+
Food Microbiology（QMS）參與實驗室

500+
Food Chemistry（QFCS）分析物

100+
QFCS 個別樣品

8 大方案
食品與飼料主要 scheme

2027 新增樣品例子

- 飼料／穀物成分、Aflatoxins 與 Salmonella
- 鹽類重金屬、營養成分與特殊食品基質
- Cereulide 、農藥、Light filth 、MOAH 等污染／品質項目
- 過敏原、食品微生物與多種真實世界矩陣

資料來源：2027 Catalogue p.18–19；QFCS section

27

測項	代碼	供應	類別	包裝	基質	說明
Total aerobic bacterial 生菌	PT-MC-36	Yes	食品(QMS)	2x10ml西林瓶+20g	乳制品基质	Analyte Name 場次:2/5/8/11月 Detection of coagulase-positive staphylococci Enumeration of Bacillus cereus
E.coli 大腸桿菌	PT-MC-36	Yes	食品(QMS)	2x10ml西林瓶+20g	乳制品基质	Enumeration of coagulase positive staphylococci Enumeration of coliforms
Coliform 大腸桿菌群	PT-MC-36	Yes	食品(QMS)	2x10ml西林瓶+20g	乳制品基质	Enumeration of Enterobacteriaceae Enumeration of Escherichia coli
S. aurous金黃色葡萄球菌	PT-MC-36	Yes	食品(QMS)	2x10ml西林瓶+20g	乳制品基质	Enumeration of mould Enumeration of yeast
Enterobacteriaceae 腸桿菌	PT-MC-36	Yes	食品(QMS)	2x10ml西林瓶+20g	乳制品基质	Enumeration of yeast and mould Total aerobic mesophilic count
黴菌數; 酵母計數	PT-MC-36	Yes	食品(QMS)	2x10ml西林瓶+20g	乳制品基质	
李斯特菌屬定性; 單增李斯特菌定性; 沙門氏菌定性; 李斯特菌鑒定	PT-MC-44	Yes	食品 (QMS)	10ml西林瓶+375g	食品基質	Analyte Name 場次:5月 Detection of Escherichia coli O157 Detection of Listeria monocytogenes Detection of Listeria species Detection of Salmonella species Identification of Listeria species
Vibrio parahaemolyticus (腸炎弧菌)	PT-MC-13F				食品基質	Analyte Name 場次：6月 / 9月 Detection of Vibrio parahaemolyticus /Detection of Vibrio species
Histamine; Total volatile nitrogen (TVN)	PT-MT-748			150g	魚肉基質	Analyte Name 場次：3月 / 9月 Histamine/ Total volatile nitrogen/Trimethylamine (TMA)

PT-CS-16B	化妝品 (COSMETICS)	10ml西林瓶 +10ml	液體化妝品	酵母及黴菌計數（總數）；白色念珠菌定性檢測（僅彙報是否檢出）；洋葱伯克霍爾德菌定性檢測（僅彙報是否檢出）；銅綠假單胞菌的定性檢測及/或計數	CS062
PT-CS-16B	化妝品 (COSMETICS)	10ml西林瓶 +10ml	液體化妝品	酵母及黴菌計數（總數）；白色念珠菌定性檢測（僅彙報是否檢出）；洋葱伯克霍爾德菌定性檢測（僅彙報是否檢出）；銅綠假單胞菌的定性檢測及/或計數	CS064
PT-CS-30	化妝品 (COSMETICS)	10ml西林瓶 +10ml	乳液/霜化妝品	微生物挑戰試驗（防腐效果試驗）；微生物計數；微生物減少量Log10 四月（CS062）: 巴西麵黴；十一月（CS064）: 白色念珠	CS062
PT-CS-30	化妝品 (COSMETICS)	10ml西林瓶 +10ml	乳液/霜化妝品	微生物挑戰試驗（防腐效果試驗）；微生物計數；微生物減少量Log10 四月（CS062）: 巴西麵黴；十一月（CS064）: 白色念珠	CS064
PT-CS-37	化妝品 (COSMETICS)	10mL西林瓶	-	鑒定未知微生物	CS064
PT-CS-19	化妝品 (COSMETICS)	5g	唇膏	鎘；鉻；鉛；鎳；砷；汞	CS062
PT-CS-19	化妝品 (COSMETICS)	5g	唇膏	鎘；鉻；鉛；鎳；砷；汞	CS064
PT-CS-20	化妝品 (COSMETICS)	5g	唇彩	鎘；鉻；鉛；鎳；砷；汞	CS063
PT-CS-21	化妝品 (COSMETICS)	5g	粉狀化妝品	鎘；鉻；鉛；鎳；砷；汞	CS061
PT-CS-24	化妝品 (COSMETICS)	125mL	漱口水	銻；砷；銀；銅；氟；汞；硒；鋅	CS063
PT-CS-25	化妝品 (COSMETICS)	25g	牙膏	銻；砷；銀；銅；氟；汞；硒；鋅	CS064
PT-CS-22	化妝品 (COSMETICS)	5mL	乳液/霜化妝品	對苯二酚（氫醌）	CS061
PT-CS-22	化妝品 (COSMETICS)	5mL	乳液/霜化妝品	對苯二酚（氫醌）	CS063
PT-CS-27	化妝品 (COSMETICS)	25mL	乳液/霜化妝品	尼泊金甲酯；尼泊金丙酯；尼泊金丁酯；苯甲酸；山梨酸；苯甲醇	CS061
PT-CS-31	化妝品 (COSMETICS)	5g	睫毛膏	尼泊金甲酯；尼泊金丙酯；尼泊金丁酯；苯甲酸；山梨酸	CS063
PT-CS-23	化妝品 (COSMETICS)	500mL	液體化妝品	pH；粘度；密度	CS062
PT-CS-23	化妝品 (COSMETICS)	500mL	液體化妝品	pH；粘度；密度	CS064
PT-CS-28	化妝品 (COSMETICS)	100g	液體或固體肥皂	氯化物（以氯離子計）；游離苛性鹼（以氫氧化鈉計）；游離脂肪酸（以油酸計）；乙醇不溶物；水分及揮發性物質；總脂肪含量	CS063
PT-CS-29	化妝品 (COSMETICS)	100g	粉狀洗滌劑（洗衣粉）	水不溶物；pH（25°C下1%水溶液）；水分及揮發性物質；陰離子活性物質；陽離子活性物質；氯化物（以氯離	CS061
PT-CS-32	化妝品 (COSMETICS)	100mL	洗衣液	水不溶物；pH值（25°C下1%水溶液）；水分及揮發性物質；陰離子活性物質；陽離子活性物質；氯化物（以氯離子計）；磷酸鹽（以磷酸根計）	CS063
PT-CS-33	化妝品 (COSMETICS)	50mL	洗手液	乙醇；甲醇; 正丙醇，丙胺，總酒精	CS063
PT-CS-34	化妝品 (COSMETICS)	20xFacemasks	口罩	細菌過濾效率（BFE）；差力壓（透氣性）；微生物潔淨度（微生物負載）；合成血液穿透	CS062
PT-CS-39	化妝品 (COSMETICS)	2 x 10g	唇部護理或護膚品	動物DNA定性（存在/不存在）	CS064

友和貿易股份有限公司
UNI-ONWARD Corp.
客服專線：（02）2600-0611
◆ 台北 TEL：(02) 2600-6699 FAX：(02) 2600-0799
◆ 新竹 TEL：(03) 658-0508 FAX：(03) 658-0509
◆ 台中 TEL：(04) 2355-2008 FAX：(04) 2355-2006
◆ 嘉義 TEL：(05) 277-2262 FAX：(05) 277-2263
◆ 台南 TEL：(06) 249-5488 FAX：(06) 249-5499
◆ 高雄 TEL：(07) 374-8686 FAX：(07) 374-8585
◆ 花蓮 TEL：(03) 836-0065 FAX：(03) 836-0075
www.uni-onward.com.tw

2027 新增項目：消費安全與跨領域需求更完整

型錄新增內容反映法規、補充品、微生物與新興污染物需求

藥品／膳食補充品

植物化學身分、減重品摻偽、Creatine ／ Vitamin C ／ Berberine ／ CoQ10 ／ Astaxanthin potency 、膳補充品重金屬、運動補充品胺基酸

消費品安全

粉末／乳霜／液體之厭氧菌，膠類 VOC，睡衣可燃性，紡織品 PFAS

水與微生物

超低電導度水、膳食補充品／藥草中的 Listeria 等新樣品

年度 PT 計畫建議：除了既有認可項目，也要檢查新法規／新產品是否需要新增外部能力證據。

資料來源：2027 Catalogue p.97, p.101

29

感謝聆聽

Because it matters

From Membranes to Automation Integrated TFF Solution

- Introduction of BenQ Dialysis Technology Corp.
- Qflow TFF solutions

Dr. Jessica YC Tsai
Technical Manager
BenQ Dialysis Technology Corp.
Sep 2026

About BenQ/Qisda Group

BenQ Group, wholly owned by Qisda listed in TWSE:2352

ESTABLISHED YEAR
1984

NO. OF EMPLOYEES
26,000
(2025/12)

GLOBAL LOCATIONS
Taiwan China Vietnam
Singapore Japan USA



R&D Center – Taiwan/China
Manufacturing Site – Taiwan/China/ Vietnam
Service Center – Singapore/Japan/USA

REVENUE 2025
USD
$6.7B

2018 THOMSON REUTERS
TOP100
GLOBAL TECH LEADER

ICT Products	Commercial & Industrial Products	Business Solution	Medical Business	Networking & Communication

BenQ Dialysis Technology Corp

Confidential. © BenQ Corporation, all rights reserved.

BenQ Medical Overview

Technology for better healthcare



BenQ Dialysis Technology Corporation is the only dialyzer manufacturer in Taiwan



2023 Taiwan Excellence Award

2024 Taiwan BIO Awards 傑出生技產業獎 榮獲2024潛力標竿獎 Emerging Company of the Year

2024 BIO Asia-Taiwan

國品字第P040021號

National Biotechnology and Medical Care Quality Awards

2025 / 2023 / 2022 Taiwan Sustainability Action Awards

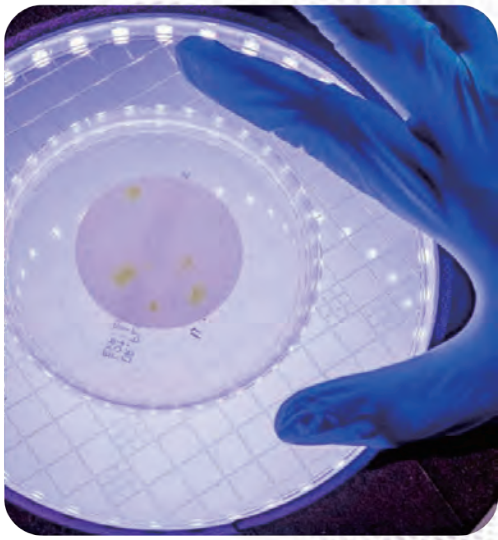


Confidential. © BenQ Corporation, all rights reserved.

Manufactured with Excellence

From Cleanroom Production to In-House Laboratory Testing





Certified Quality
QMS, ISO 13485 Class 10,000 Clean room

Reliable Testing
ISO 17025 Accredited Laboratory

Patient Safety
Ensuring Quality, Safety and Reliability

BenQ Dialysis Technology Corp

Confidential. © BenQ Corporation, all rights reserved.

Global Markets



15+
Regions

BenQ Dialysis Technology Corp

Confidential. © BenQ Corporation, all rights reserved.

Qflow



Integrated Tangential Flow Filtration (TFF) Solutions for Research and Process Development



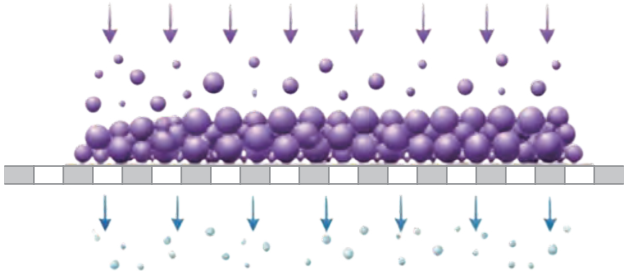
Precision Filter Assembly

TFF System

Global Supplier Network

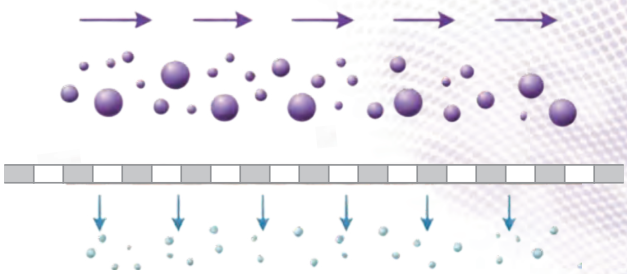
Tangential Flow Filtration (TFF)

Membrane fouling clog easily





Reduces fouling and improves filtration efficiency



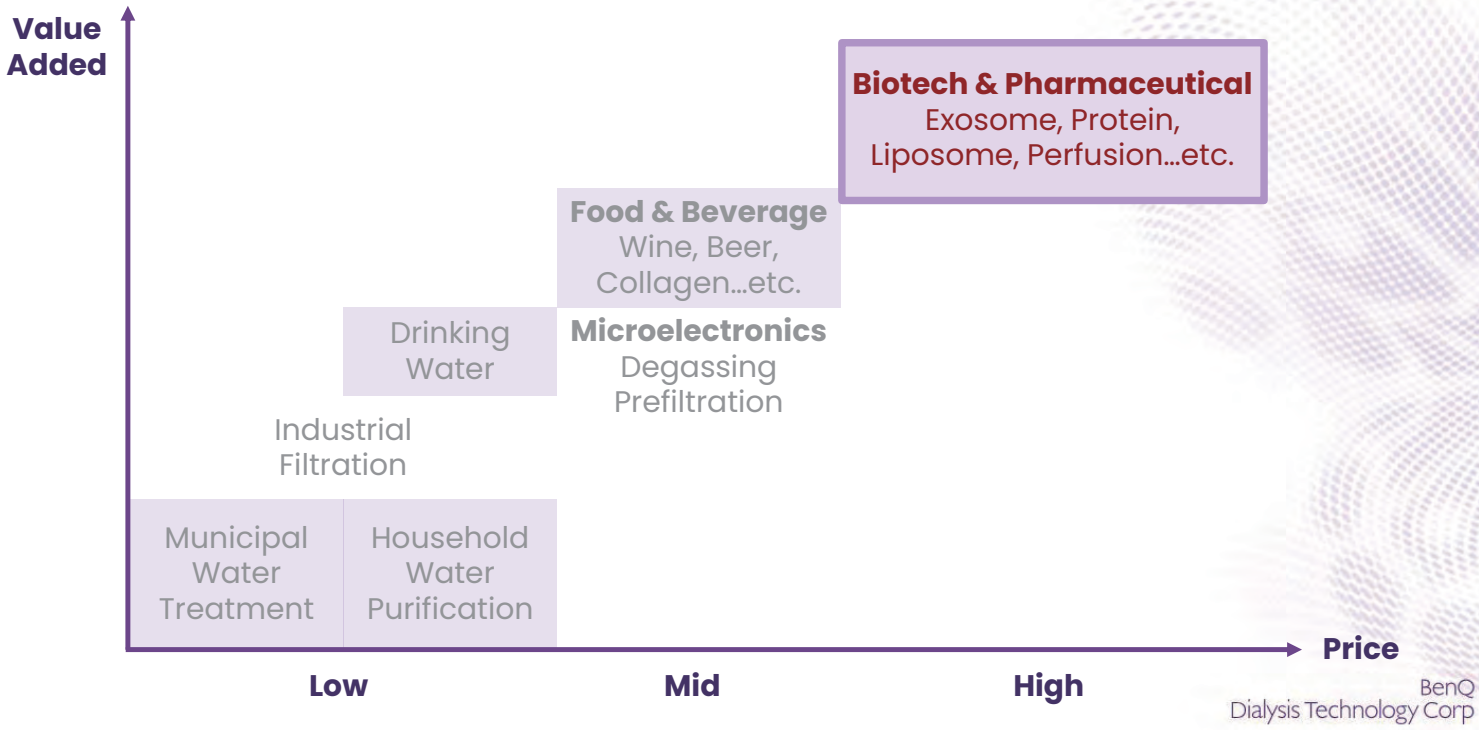


Hollow fiber was first used in dialysis

BenQ
Dialysis Technology Corp

Confidential. © BenQ Corporation, all rights reserved.

Hollow Fiber Filter for Non-medical Applications

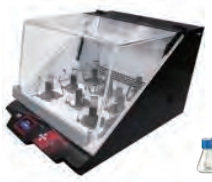


BenQ Dialysis Technology Corp

Confidential. © BenQ Corporation, all rights reserved.

Qflow for Bioprocess Applications

Upstream Processing



Shaker / Incubator



Bioreactor / Fermenter



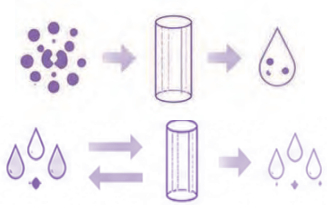
Harvest

Downstream Processing



Qflow System

- **Clarification**
- **Concentration**
- **Buffer Exchange**
- **Purification**



Purification

Chromatography (as needed)

Ultrafiltration

Qflow System

Preparing Filling

How to Choose the Hollow Fiber Filter?

1 Filtration Goal



- Clarification
- Concentration
- Buffer Exchange
- Purification

2 Target Molecule Size



- Protein
- Exosomes
- Viruses
- Liposome...etc.

3 Sample Characteristics



- Protein concentration
- Viscosity
- Fouling tendency
- Cell debris...etc.

4 Membrane Area & Scale



- Small (< 0.5 L)
- Medium (0.5–5 L)
- Large (> 5 L)

5 Operating Conditions



- Flow Rate
- TMP
- Sterility
- Single-use...etc.

BenQ Dialysis Technology Corp

Confidential. © BenQ Corporation, all rights reserved.

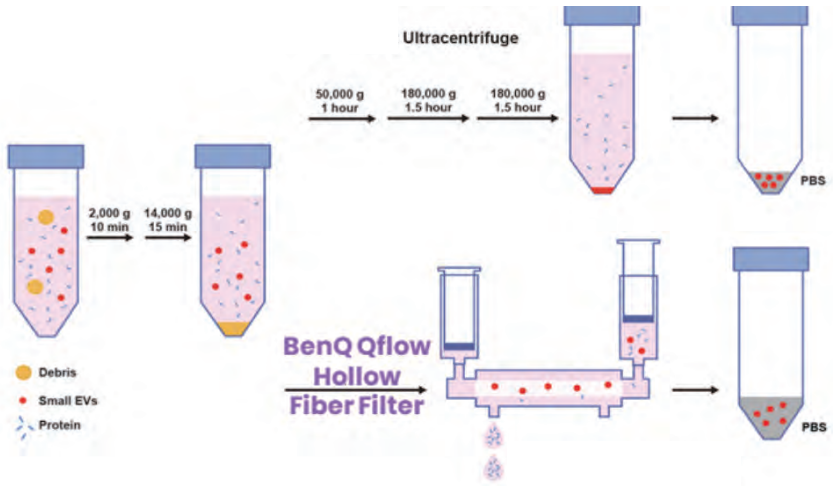
BenQ Qflow Hollow Fiber Filter

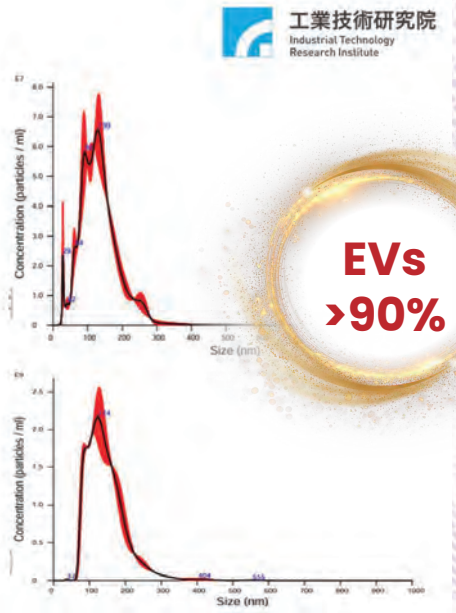
MWCO / Pore Size	Fiber ID (mm)	Size	Recommended Processing Volume (L)	Surface Area (m²) 1.0 mm	Surface Area (m²) 1.5 mm	Effective Length (mm)	Feed / Retentate Port	Permeate Port
10 kDa 30 kDa 50 kDa 100 kDa 300 kDa 500 kDa 750 kDa 1000 kDa 0.22 µm 0.45 µm 0.65 µm	1.0 1.5	Lab	0.3	0.003	0.003	320	FLL	FLL
			0.6	0.006	0.006	640		
			0.6	0.006	0.006	320		
			1	0.012	0.012	640		
			1	0.018	0.015	320	0.5" TC	3/16" HB
			2	0.036	0.03	640		
			5	0.07	0.042	320	3/4" TC	3/8" HB
			10	0.14	0.084	640		
		Pilot	15	0.16	0.1	320	1.5" TC	0.5" TC
			30	0.33	0.2	640		
			20	0.23	0.18	320		
			40	0.47	0.36	640		
		Process	120	1.7	1.05	320	1.5" TC	1.0" TC
			250	3.4	2.11	640		

BenQ Dialysis Technology Corp

Confidential. © BenQ Corporation, all rights reserved.

Fast & Convenient for Exosome Isolation (Customized)





- Ultracentrifugation: 5 hours
- Hollow Fiber Filter: <30 minutes

BenQ
Dialysis Technology Corp

Confidential. © BenQ Corporation, all rights reserved.

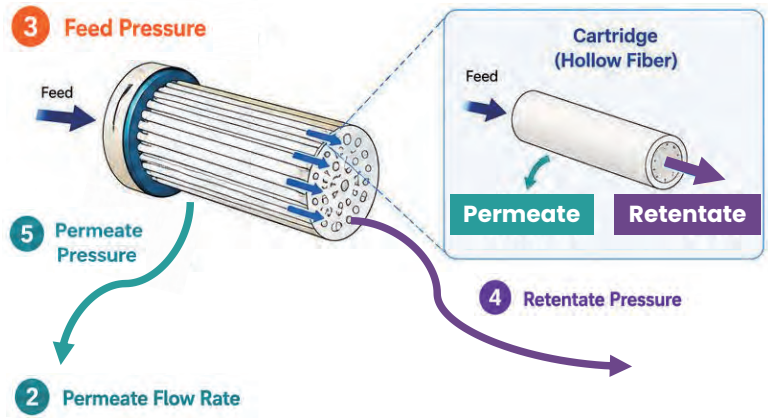
Flexible Hollow Fiber Solutions for Every Process Stage



BenQ
Dialysis Technology Corp

Confidential. © BenQ Corporation, all rights reserved.

Critical Process Parameters for TFF Operation



1 TMP

$$TMP = \frac{(P_{feed} + P_{retentate})}{2} - P_{permeate}$$

6 Flux (LMH)

$$Flux = \frac{\text{Permeate Flow (L/h)}}{\text{Membrane Area (m}^2\text{)}}$$

1 Transmembrane Pressure (TMP)	The driving force for filtration; key indicator of membrane loading and performance.
2 Permeate Flow Rate	Indicates filtration productivity and membrane performance.
3 Feed Pressure	Reflects inlet operating conditions and system hydraulic status.
4 Retentate Pressure	Indicates pressure on the retentate side; used for TMP calculation and process control.
5 Permeate Pressure	Reflects downstream pressure; affects TMP and filtration performance.
6 Flux	Measures membrane throughput efficiency (LMH) and process productivity.

BenQ
Dialysis Technology Corp

Confidential. © BenQ Corporation, all rights reserved.

Qflow Neo Automated TFF System

Smart • Flexible • Reliable

- Purification
- Desalting
- Concentration
- Clarification
- Buffer Exchange



MODULAR OPTIONS

- pH Electrode (Optional)
- Conductivity Electrode (Optional)
- Additional Pump (Optional)
- 0.1 m² Cassette Fixture (Optional)

PROCESS MONITORING

- Pressure Sensor
- Weight Module
- Real-time Monitoring
- Automated Control & Data Recording

BenQ
Dialysis Technology Corp

Confidential. © BenQ Corporation, all rights reserved.



系統操作流程圖

方法	說明
水通量測試	測量過濾器水通量與標準化水通量，評估膜性能
加樣	將待處理樣品自動輸送至系統儲液罐
TMP最佳化	透過Flux–TMP曲線找出建議操作壓力
濃縮	排出溶劑與小分子，提高目標物濃度
等體積透析	在維持體積不變的情況下，自動進行緩衝液置換
排空	排出或回收系統內的剩餘液體
清洗	執行過濾器與管路的沖洗及清潔程序
暫停	在指定階段暫停，等待人工操作或確認

BenQ
Dialysis Technology Corp

Qflow-Neo TFF

系統會根據配置進行檢查
- 綠色指示燈：所有設備連結成功
- 紅色指示燈：設備連結失敗

- 方法與多階段設定
- 即時數據與趨勢監控
- 歷史譜圖比較
- PDF及Excel輸出
- 使用者權限及電子簽名
- 審計追蹤



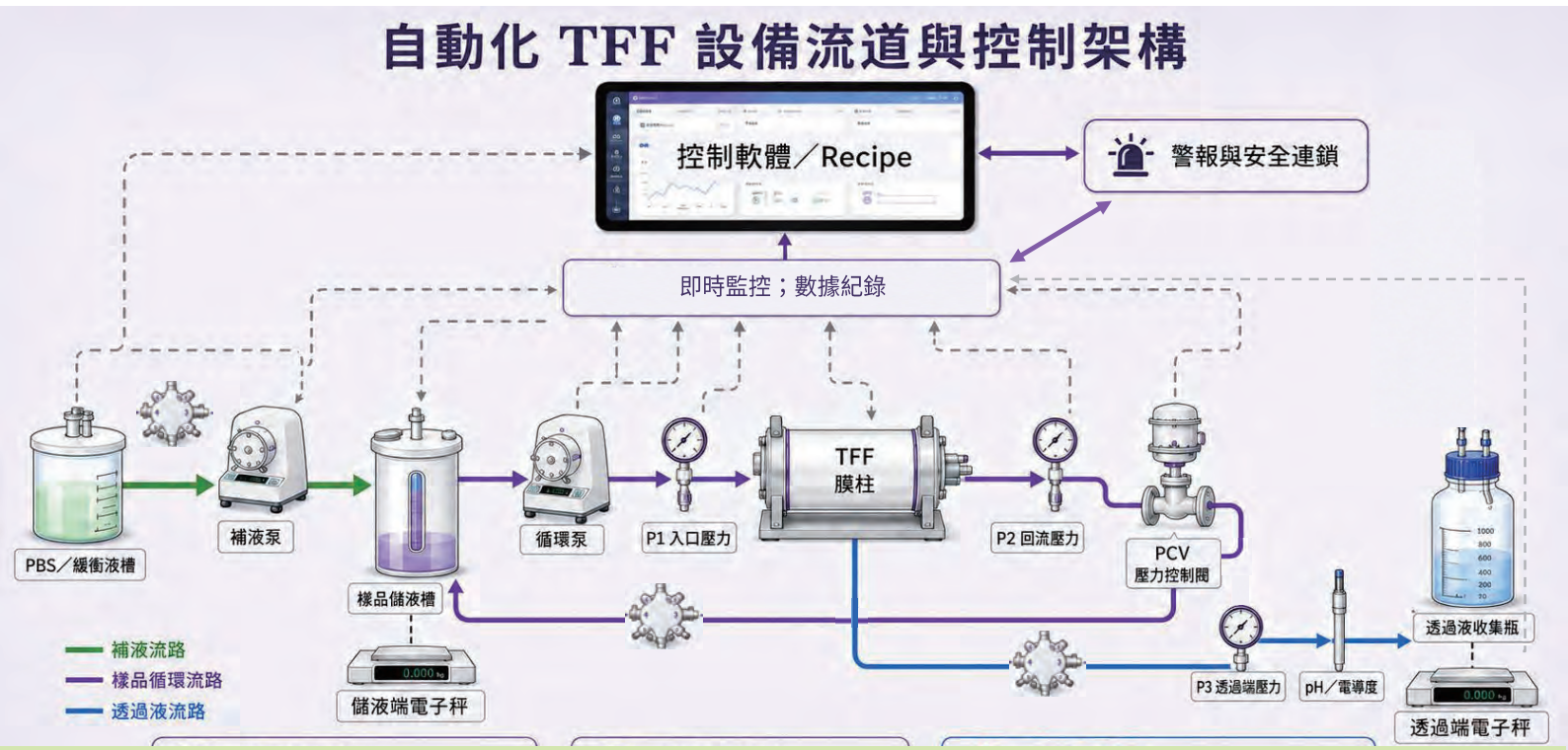
舉例:
TMP最佳化曲線
顯示Flux–TMP曲線與建議操作TMP

顯示設備連接、流路及部件運行狀態

運行日誌: 記錄時間、操作者、操作類型及備註
方法資訊: 顯示目前方法、階段、結束條件及執行狀態

BenQ
Dialysis Technology Corp

Confidential. © BenQ Corporation, all rights reserved.



客製化服務 依據客戶需求調整設備服務

Qflow Neo Automated TFF Solution

Peristaltic Pump with Automatic Pressure Control
蠕動泵與壓力自動控制

Precise pressure regulation ensures stable operation and protects your process integrity.

Automated Program Operation
自動化程式運行

Predefined methods and flexible sequencing enable reliable and consistent process execution.

Automatic Buffer Replenishment
緩衝液自動補充

Intelligent liquid level monitoring and automatic replenishment ensure uninterrupted process flow.

High Expandability
高度擴充性

- Modular design for easy scalability
- Compatible with various accessories
- Tailored to fit your evolving needs

Data Logging & Recording
數據紀錄與追溯

- Real-time data acquisition
- Secure data storage
- Easy export and traceability
- Meets compliance requirements

Customized Solutions
客製化解決方案

Flexible configuration of flow range, vessel capacity, sensors, valves, flow paths, and software recipes to meet specific process needs.



BenQ Qflow

Your Partner in Bioprocessing

BenQ

Because it matters

明基透析
BenQ Dialysis

BenQ Qflow

Integrated Tangential Flow Filtration (TFF) Solutions for Bioprocessing

- Linear scale-up from laboratory to production with reliable and predictable performance.
- Modified polyethersulfone (mPES) membrane with low protein binding and reduced fouling for higher flux and throughput.





- Clarification
- Concentration
- Desalting
- Buffer Exchange
- Purification



www.majorsci.com
info@majorsci.com

主辦單位：

Innovative Life Sciences Tools

協辦單位：

主辦單位: major science
協辦單位: 國立高雄科技大學水產食品科學系、教育部教學實踐計劃
贊助單位: 台灣寶帝股份有限公司、暢鴻生物科技股份有限公司、
桂鼎科技股份有限公司、台灣歐姆龍股份有限公司、整合股份有限公司