



The Outlook of DR. Chip

DR. Chip Biotechnology Incorporation



Market of Food safety testing

Year	Country	Total value	
2004	American	277 million dollars	
2009	American	416 million dollars	1.5 times
2012	American	3.35 billion dollars	8.1 times
2017	American	4.4 billion dollars	+1.05 billion dollars
2004	Taiwan	117 million NTD	
2009	Taiwan	175 million NTD	
2012	Taiwan	<700 million NTD	
2020	Taiwan	3 billion NTD	
2020	China	792 million dollars	
2018	Global	19.7 billion dollars	

Resource : Taiwan Institute of Economic Research



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Product Advantage of DR. Chip

The technology of DR. Chip will lead the food testing toward miniaturization



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The Difference of DR. Chip



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Customers need to prepare



All you need is 30 m² space and 1 operator

Services of DR. Chip

- Lab planning and design
- Operate equipment
- Procedure teaching
- After-sales service
- Professional advice



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Food safety detection system

DR. ELISA

Extract



Centrifuge



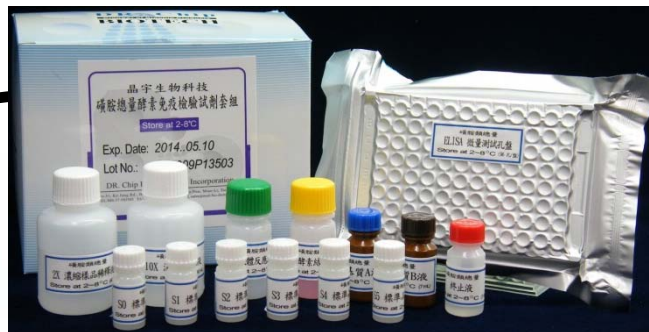
Concentrate



Screen & Result



Operating



Only in 2 hours



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The Advantage of DR. Chip's ELISA Kit



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「食品安全鐵三角」

食安黑心無良廠商在台灣無法立足





They all choose DR. Chip



Industrial development of DR.CHIP

✓ **Human Diagnostics**

- 1) DR. HPV Genotyping IVD Kit
- 2) DR. MTBC Screen IVD Kit
- 3) DR. Microorganism IVD Kit
- 4) Contact lens(Subsidiary Operating)

✓ **Pathogen Screening Reserch**

- 1) DR. HBV IVD Kit
- 2) DR. RV (Respiratory Virus) IVD Kit
- 3) DR. EV (Enterovirus) IVD Kit

✓ **Food & Plant Science**

- 1) DR. Food-10 Kit
- 2) Betagro DR. Salmonella Kit
- 3) DR. Milk Kit
- 4) DR. Brewery Kit
- 5) DR. Orchid Kit

✓ **Apparatus**

- 1) DR. Mini Oven
- 2) DR. Fluidic Station
- 3) DR. AiM Reader





DR. Food-10

solve all problems of microorganism assay

DR. Chip

Ensure Food Safety

DR. Food-10™ Kit



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TROUBLES

when you use traditional microorganism assay method



Lots of people/materials



Mass experiment space



Pollutions of microorganism



Plenty of time



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DR. Food-10

solve all problems of microorganism assay



Immediately

Production line never stop



Cost Down !

(People/Time/Supplies)



Simple & Fast

Result comply with CNS



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Certification of DR. Food-10 Chip



b) 検出キット類 **食品衛生検査指針(2004)**

製品名	用途	製造または販売元
PYR キット	鑑別用	アスカ純薬, 三菱ヤトロン, Oxoid
サルモネラチェック	イムノアッセイ	三菱ヤトロン
F-サルモネラ「生研」	イムノアッセイ	デンカ生研
サルモネラアッセイ	イムノアッセイ	Gene Trak
Dynabeads anti Salmonella	イムノアッセイ	Dynal
Salmonella-Tek ELISA	イムノアッセイ	オルガノ
Reveal	イムノアッセイ	Neogen
Assurance Salmonella EIA	イムノアッセイ	BioControl
Path-Stik Salmonella IC, Dip stick	イムノアッセイ	Lumac
TECRA Salmonella VIP	イムノアッセイ	セティ
Salmonella immunoassay	イムノアッセイ	Transia
Taq Man Salmonella PCR Amplification / Detection Kit	DNA アッセイ	PE ビオシステムズ
核さんテストサルモネラ Amplification / Detection Kit	DNA アッセイ	日本製粉
サルモネラ菌 (invA) 遺伝子, One Step PCR Screening Kit	DNA アッセイ	PE ビオシステムズ タカラバイオ
DR. Food™ chip	DNA アッセイ	関東化学



ISO 13485(2003)



SN/T 1543(2005)

SN

中华人民共和国出入境检验检疫行业标准

SN/T 1543—2005

食源性致病菌基因芯片鉴定方法

GeneChip methods for identification of foodborne pathogens

2005-02-17 发布

2005-07-01 实施

中华人民共和国
国家质量监督检验检疫总局 发布



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Worried about fake meat?

You may trust DR. Meat

DR. Chip

DR. Meat™ Kit

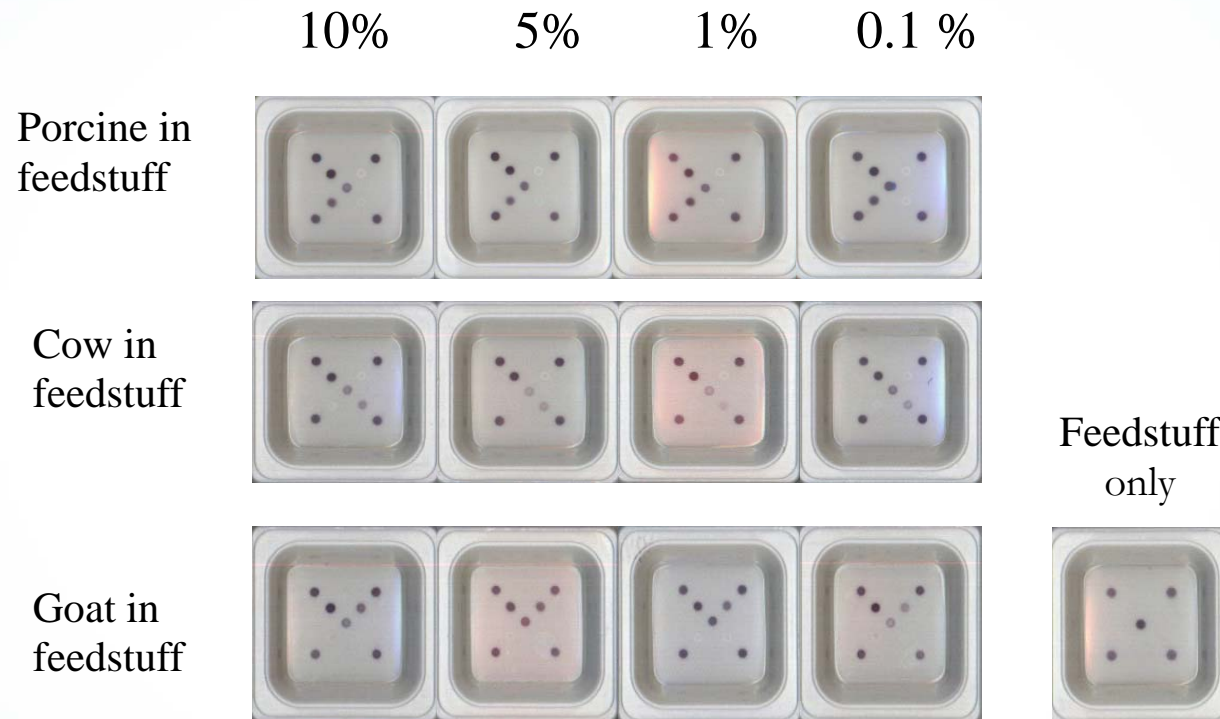


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DR. Meat

Extremely few meat also can be tested



⇒ Even though only 0.1% meat in feedstuff, it also can be tested.

⇒ DR. Meat can be used on “Vegetarian identification” and

“HALAL certification”



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DR. HPV Genotyping IVD Kit

(晶宇人類乳突病毒基因分型檢測套組)

第三類查登許可證 - 第004934號



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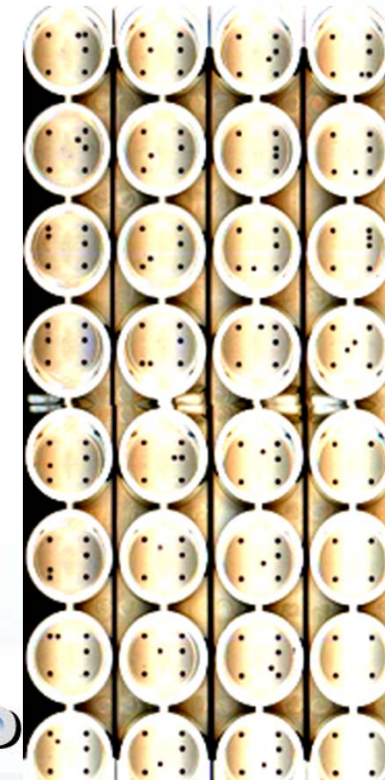
DR. HPV Genotyping IVD KIT

(晶宇人類乳突病毒基因分型檢測套組)

- 可同時偵測27種HPV型別，並具有一HPV共通性探針
- 階段式品管：PCR control (β -globin)，Hybridization control
- 高風險型別：HPV16/18/31/33/35/39/45/51/52/56/58/59/68/73/82
- 中低風險型別：HPV6/11/53/54/61/62/66/69/70/72/81/84

晶片判讀方向

B1	●	HPV16	A4	●	HPV68
C1	●	HPV18	B4	●	HPV69
D1	●	HPV31	D4	●	HPV70
E1	●	HPV33	E4	●	HPV73
A2	●	HPV35	F4	●	HPV82
B2	●	HPV39	A5	●	HPV6
C2	●	HPV45	B5	●	HPV11
D2	●	HPV51	C5	●	HPV54
E2	●	HPV52	D5	●	HPV61
F2	●	HPV53	E5	●	HPV72
A1, A6, F1, F6	●	Hybridization Positive Control	B3	●	HPV56
C4, D3	●	β -globin	C3	●	HPV58
A3	○	Negative control	E3	●	HPV59
C6	●	HPV consensus	F3	●	HPV66





DR. MTBC Screen IVD Kit

(晶宇結核分枝桿菌群檢驗試劑套組)
第三類查登許可證 - 第003020號

DR. Chip Microorganism IVD Kit

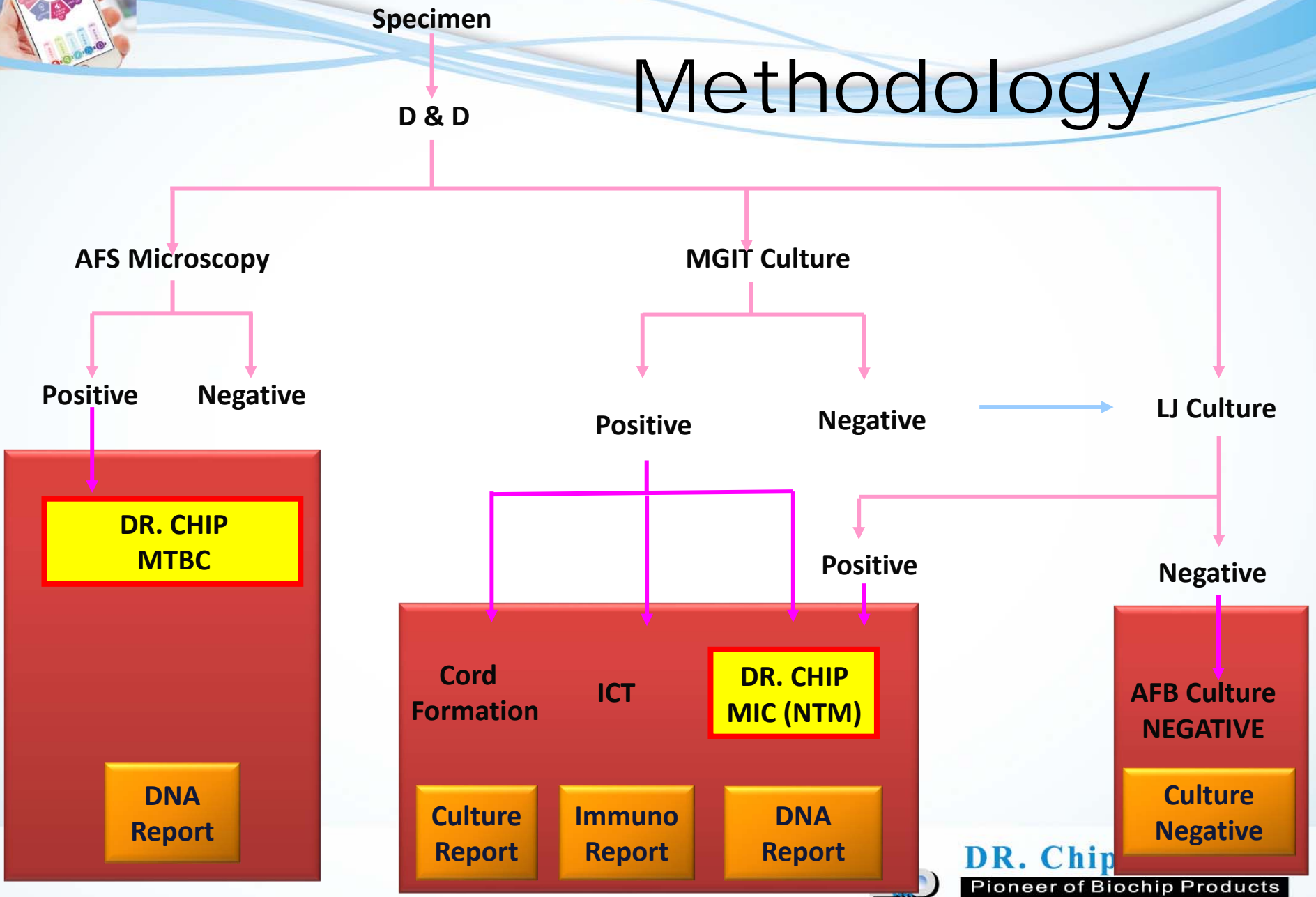
(晶宇微生物檢驗試劑套組)
RIF抗藥檢驗及17種非結核分枝桿菌分型
第一類查登許可證 - 第004446號



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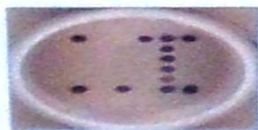


Methodology

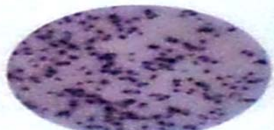




USE STATUS



Chip assay



Interferon- γ release assay

Investigation of the Distribution in *Mycobacteria* spp. with ITS Probe

利用ITS雜交探針探討分枝桿菌屬分布情形

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陳盟勳 黃紹宗 蔣佳蓉 張素英 曾美亨

研究背景
分枝桿菌 (*Mycobacterium*)，該屬細菌包括許多已和疾病相關動物中造成嚴重疾病的病原菌，尤其為結核分枝桿菌 (MTBC, *Mycobacterium tuberculosis* complex) 最為重要。過去台灣結核盛行率甚高，但隨著抗結核治療進步，結核菌的比率逐漸下降，但結核分枝桿菌 (NTM, *Non-tuberculous mycobacterium*) 的比率也逐漸上升。臨床上也發現NTM感染人的案例也增加趨勢。因此，建立分枝桿菌混合MTBC及NTM不能充分鑑定醫藥的意義，故發展其他分枝桿菌分型的快速工具，亦即探討交與聯合鑑定意義。

實驗目的
依結核分枝桿菌及臨床常見之非結核分枝桿菌屬共計12型設計DNA探針，分析各屬種的結核或感染病人之情形。

實驗設計
實驗流程
本研究利用分枝桿菌屬 16S-23S rDNA 內之轉錄間隔 (ITS, internal transcribed spacer) 之具備高度變異性，被利用其鑑定分枝桿菌的型別。以 ITS 設計為引子進行聚合鏈鎖反應擴增核酸，並依結核分枝桿菌及臨床常見之非結核分枝桿菌屬設計 DNA 探針，PCR 產物與探針進行雜交反應，利用 Biotin-streptavidin 方式呈色的雜交顯，最後依呈色之雜交顯即可判讀分枝桿菌屬之屬種，統計各屬種之數量，探討各屬種感染病人之比率。

數據討論
依照圖二探討分型的結果，觀察其探針呈色顯示，即為該屬種之屬名。

實驗結果

Species	Strain	No.	Percentage
M. tuberculosis complex	M. tuberculosis	58	31.17%
	M. bovis	1	0.53%
	M. africanum	1	0.53%
Non-tuberculous mycobacteria	M. abscessus	1	0.53%
	M. fortuitum	7	3.87%
	M. goodii	1	0.53%
	M. neoaurum	1	0.53%
	M. indicus pranii	1	0.53%
	M. thermophilus	1	0.53%
	M. neoaurum	1	0.53%
	M. neoaurum	1	0.53%
	M. neoaurum	1	0.53%

圖二、探針分型圖

1800 株結核菌分型，MTBC、NTM 混合感染 (mix infection) 所佔之比率分別為 40.78% (734/1800)、56.67% (1020/1800) 與 2.56% (46/1800)。其中非結核分枝桿菌中以 MAC (M. avium complex) 為 21.17% (381/1800)、M. abscessus 17.28% (311/1800)、M. fortuitum 7% (126/1800) 所佔之比率最高。其他如 M. chelonae 或 M. malmoense 及 M. szulgai 佔比率則較少 (0.33%、0.22% 與 0.39%) 佔是仍會造成臨床病人的疾病或傳染。

由以上可知，臨床非結核分枝桿菌 (56.67%) 造成感染的比率大於結核菌 (40.78%)。其中 MAC (21.17%) 為非結核分枝桿菌之多數，表示非結核分枝桿菌在臨床及感染病人的情形已趨於普遍。過去，由於結核菌是社會相當關心重視的疾病，如非結核菌盛行率下降，而 NTM 感染逐漸顯著，因此，未來非結核分枝桿菌的分型探針應於重要。

圖二、分枝桿菌屬 16S-23S ITS 引子

Application of Genetic Diversity at 16S-23S rDNA Internal Transcribed Spacer for Identifying *Mycobacterium* by Probe Hybridization

利用探針雜交之方式鑑定分枝桿菌：16S-23S rDNA 內轉錄間隔變異性的應用

Laboratory Department, Chest Hospital, Department of Health, Executive Yuan, Taiwan
行政院衛生署胸腔病院檢驗科
Meng-Hsun Chen, Shao-Tsung Huang, Chia-Jung Chiang, Tung-Huan Wu
陳盟勳 黃紹宗 蔣佳蓉 吳東桓

目的
臨床上都將結核分枝桿菌 (Non-tuberculous mycobacterium, NTM) 與結核菌混淆，因此分枝桿菌之屬種鑑定於重要。現今研究發現許多非結核分枝桿菌屬之基因片段，可針對這些基因片段於不同種類的生物晶片上，以分子雜交方式進行分枝桿菌之屬種鑑定。

實驗設計
實驗流程
收集非結核分枝桿菌，進行消化去污物後置換於 L-J 培養基，將培養物直接利用現成之鑑定及 Asp-PCR 探針，以生化鑑定為標準，以評估 ITS 雜交之效果，如圖一所示。

生化鑑定
利用 NaOH 試驗以及鐵離子反應試驗，兩種試驗呈陽性反應，就可將結核菌屬鑑定報告。

Asp-PCR 鑑定
針對結核分枝桿菌屬 (*M. tuberculosis* complex) Asp 引子，進行擴增反應，條件如下表一，利用完成染色分析後 PCR 產物呈色。

16S-23S ITS 探針雜交
設計內轉錄間隔 ITS 設計引子，如圖二，進行聚合鏈鎖反應擴增核酸，將 15 型設計 DNA 探針，其片長度為 12.820bp 交叉雜合 (Cross-link) 方式固定於聚乙二胺生物材料上。圖二，PCR 產物與探針雜交反應後再利用 Biotin-streptavidin 方式呈色，即可分型。

圖二、分枝桿菌屬 16S-23S ITS 引子

由實驗數據顯示，利用分枝桿菌 ITS region 之雜交顯可判讀結核菌的鑑定，其結果與 Asp 相同，同時也可進行非結核分枝桿菌屬的分型。而此分子雜交技術從生化鑑定快速，可以大幅減少人力與時間，提高檢驗報告的準確性。除此之外，探針可以應用於分枝桿菌屬不同屬種，未來可以解決更多屬種的問題。

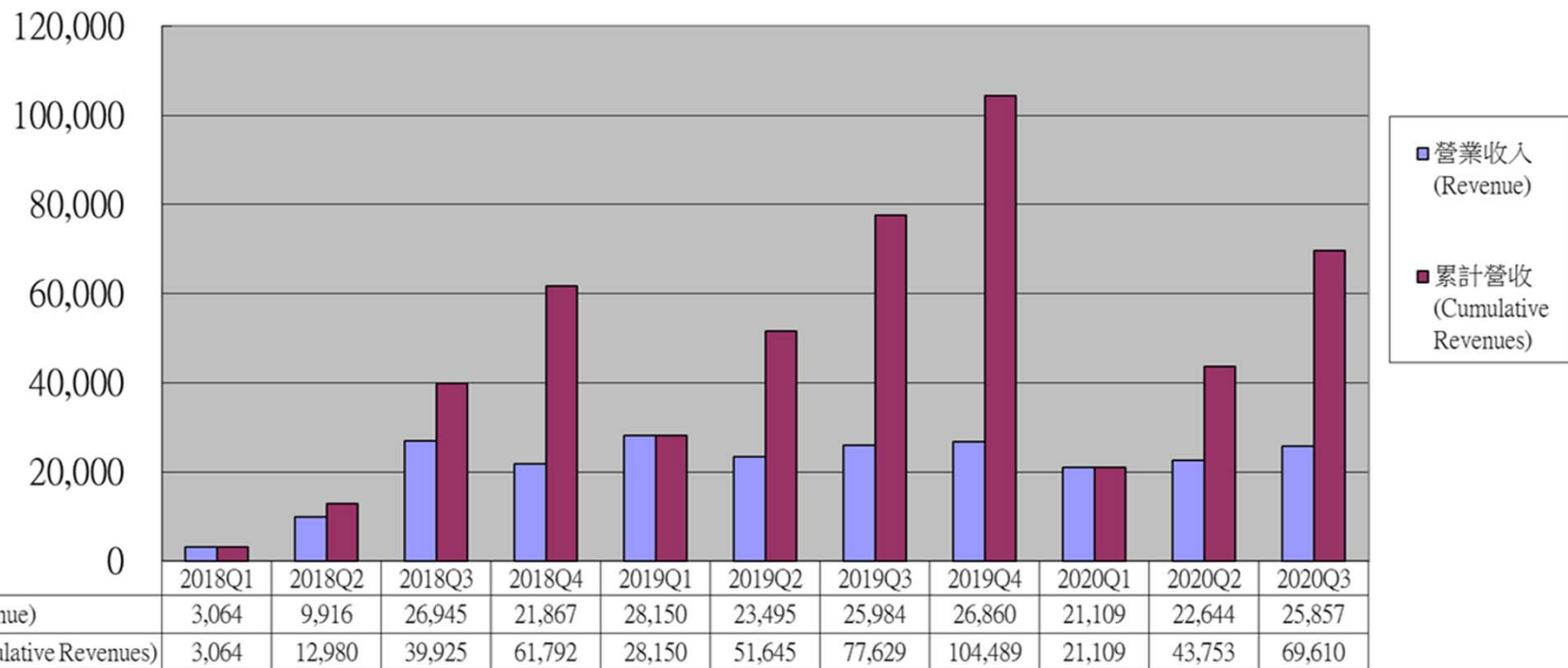
圖二、探針分型圖



Financial status and risk of DR.CHIP

DR.CHIP is still at a loss state in recent years , so please investors should be prudent investment.

單位:仟元,每季(UNIT:THOUASND,QUARTER)

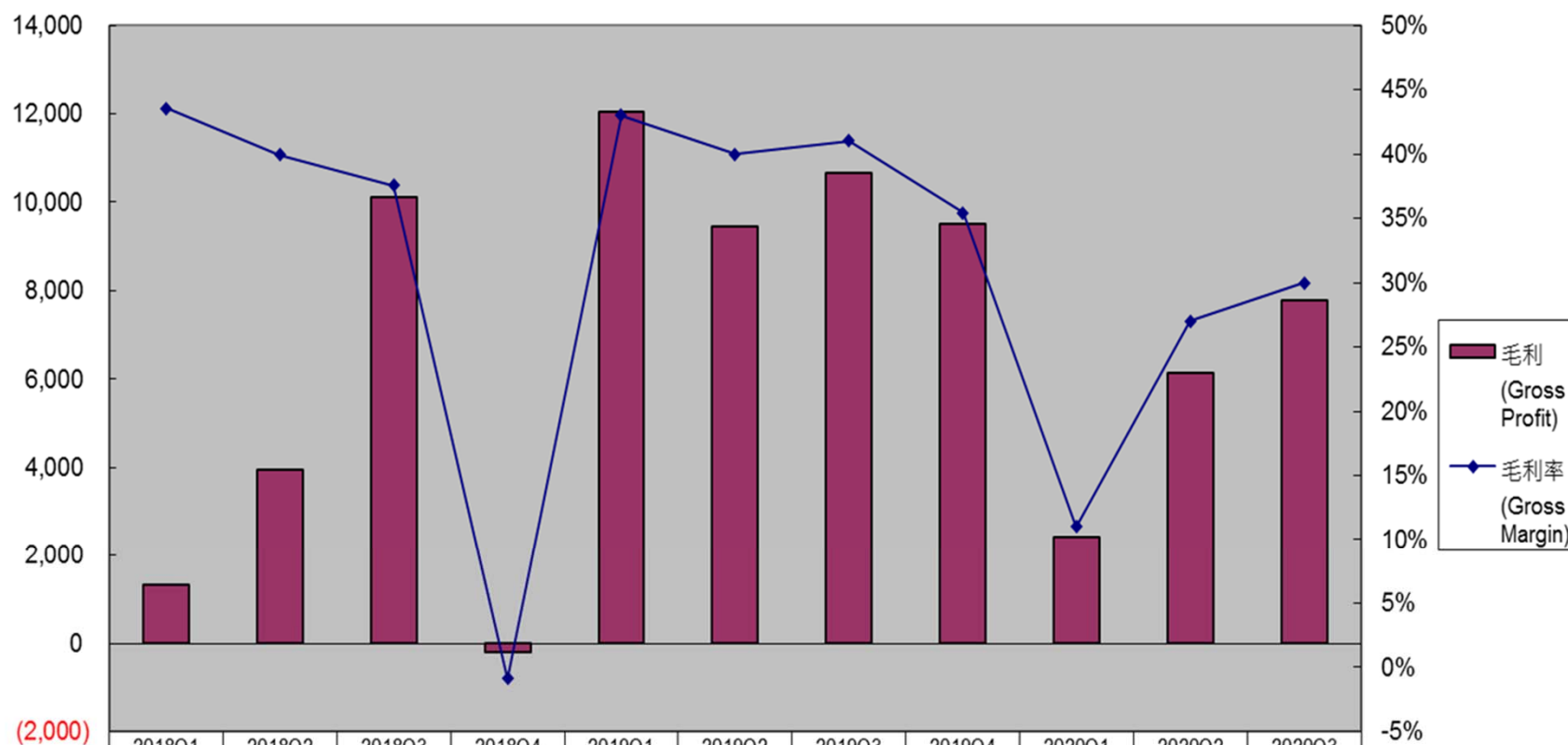


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單位:仟元,每季(UNIT:THOUSAND,QUARTER)



(2,000)

毛利(Gross Profit)	1,334	3,960	10,115	(195)	12,043	9,449	10,649	9,518	2,420	6,124	7,793
毛利率(Gross Margin)	44%	40%	38%	-1%	43%	40%	41%	35%	11%	27%	30%

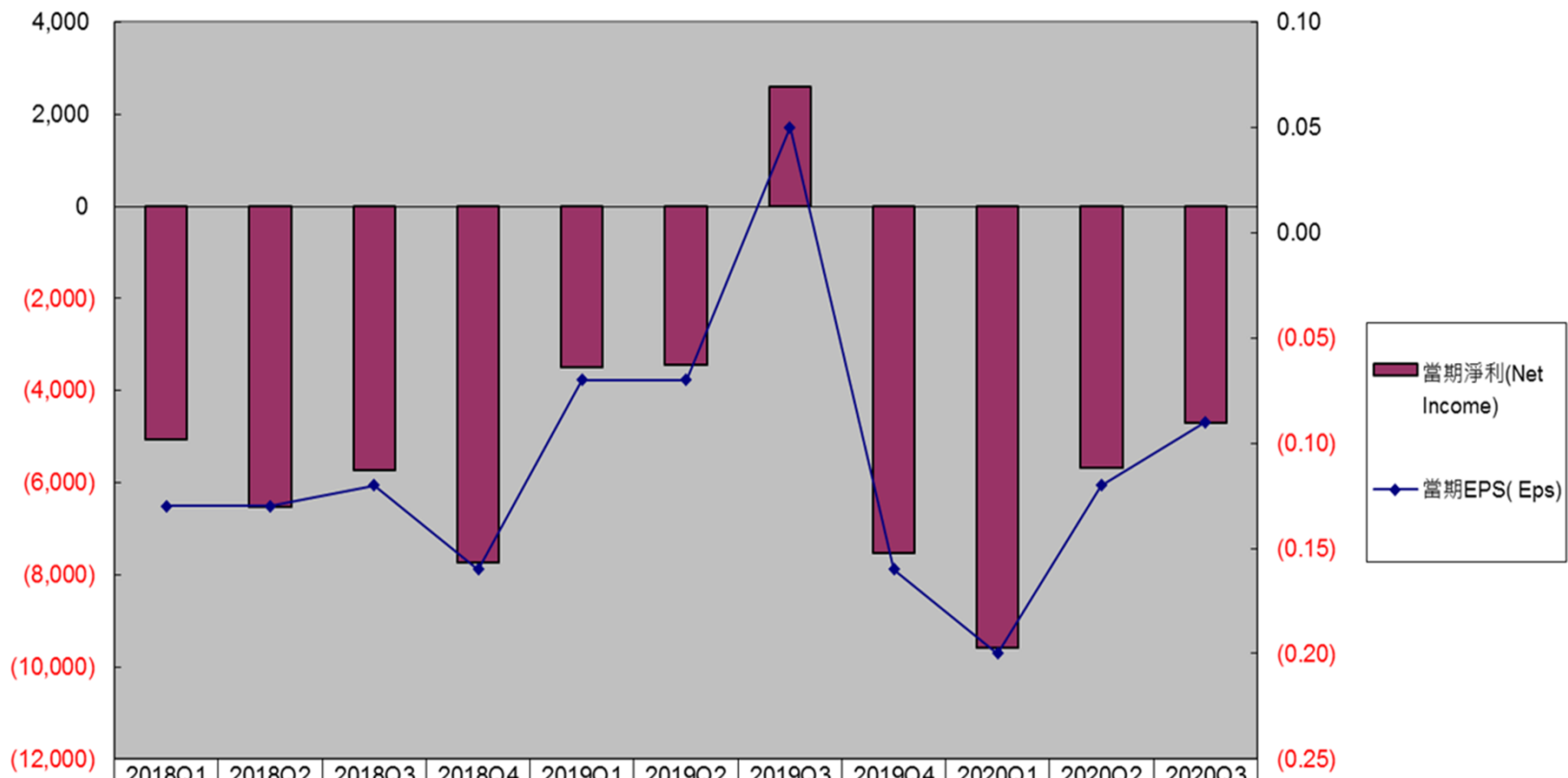


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單位:仟元,每季(UNIT:THOUSAND,QUARTER)



當期淨利(Net Income)	(5,058)	(6,537)	(5,730)	(7,745)	(3,493)	(3,443)	2,608	(7,537)	(9,587)	(5,682)	(4,701)
當期EPS(Eps)	(0.13)	(0.13)	(0.12)	(0.16)	(0.07)	(0.07)	0.05	(0.16)	(0.20)	(0.12)	(0.09)

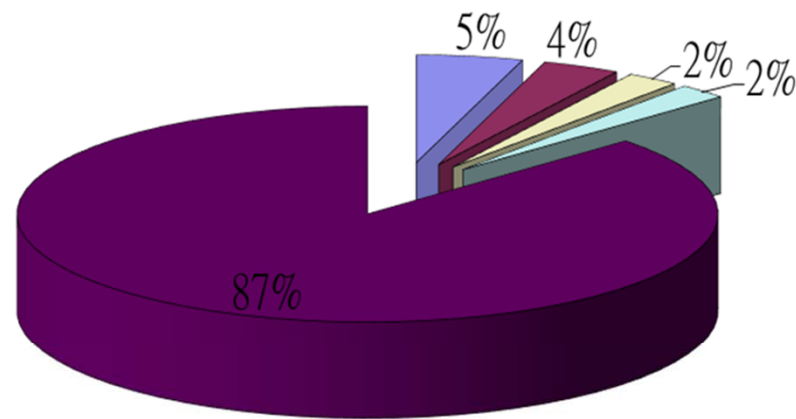


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2020 YEAR PRODUCT CATEGORY (UNIT:THOUASND)



- 子宮頸乳突病毒檢測套組(HPV KIT)
- 肺結核暨其抗藥性產品檢測套組銷售(TB KIT)
- 食安類檢測產品(FOOD KIT)
- 其他類(OTHER)
- 子公司隱型眼鏡營收(Subsidiary Operating revenue)





THE END



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