



Digitalizing biochemical-signal for
health management and long term care

tst biomedical electronics Co., Ltd.

嘉碩生醫電子股份有限公司

Dr. Justin Liu

E-mail: justinliu@tst.bio

電子 ➡ 生醫電子



TST
TAI-SAW TECHNOLOGY CO., LTD.

Products Lineup
SAW filter / DR filter / Crystal / TCXO / RF module
Your Best Partner for Frequency Devices

tstbio



tst biomedical electronics co., Ltd.

台嘉碩 **TST** (3221 Taipei Exchange) span-off

Location	- Ping-Chen Industrial Park, Tao-Yuan, Taiwan
Capital	- \$115 M NT (\$140 M NT Paid In) ; additional \$30 M NT Call Options
Founded	- 2018 (Span off from TST (Taipei Exchange: 3221)
Facility	- 4359 M2 (Taiwan)
Employee	- 17+3 in Total (TWN 17, JPN 3); additional part support 20 of TST
Capacity	- 1 ~1.2 M pc SAW Sensor cassettes/ yr
Products	- SAW Immunoassay biosensors (Reader + assay kits) Pet Veterinary blood Tests, Long-term care product ...etc.

ISO13485, QMS certified;

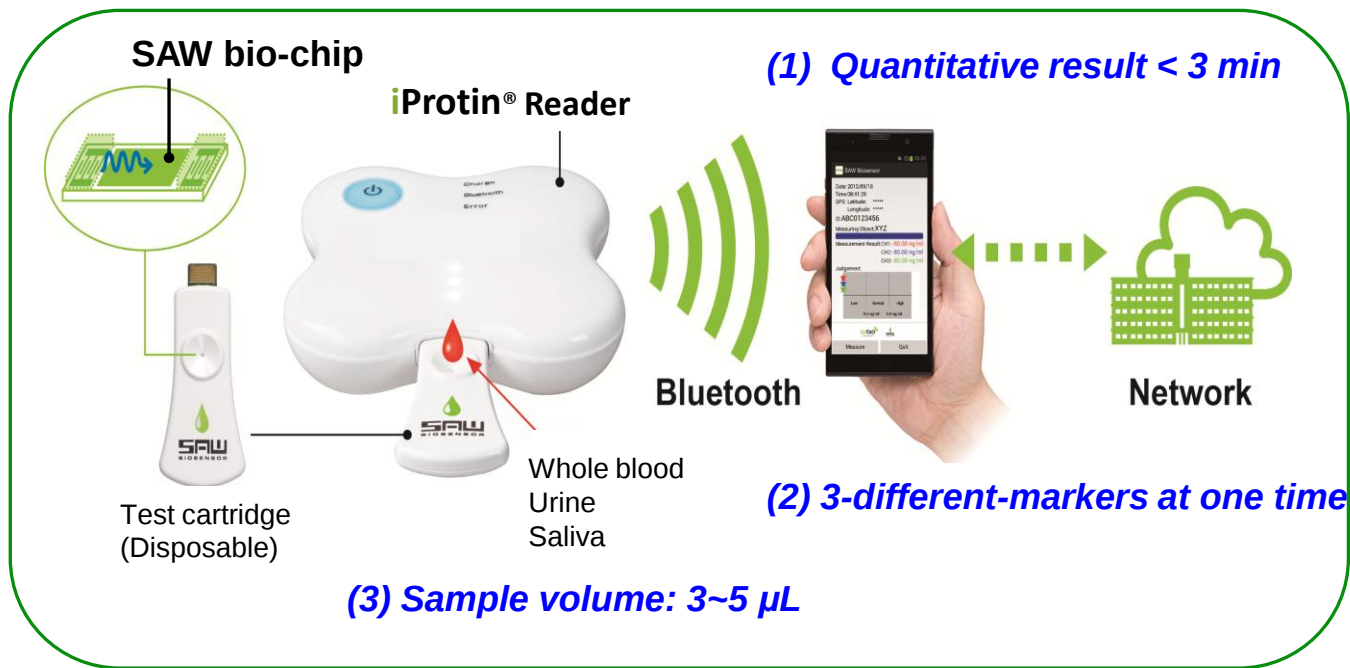
POCT products **PMDA, TFDA and CE** approved;

Transferring our electronics CORE technology for biomedical applications!

Core technologies:

Palm-sized Digital Diagnostics

for point of care testing (POCT) applications



SAW : Surface Acoustic Wave

SAW bio-sensor 的優點

SAW

iProtein CRP assay cartridge kit
艾普定 C-反應蛋白分析卡匣組



<5 min

- 最輕便之手持式偵測生物標的儀器
- 免疫反應為主的測試及分析
- 易攜式、快速量測兼具便利性
- 與落地型大型機台具高度相關性

Electrochemical



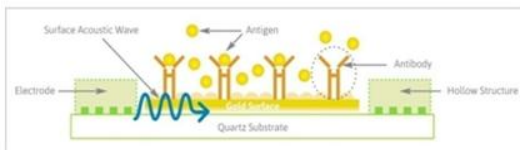
血糖 Blood Glucose	酮體 β-Ketone	尿酸 Uric Acid	總膽固醇 Total Cholesterol
採血量 0.5 μL (0.050cc)	採血量 0.8 μL (0.080cc)	採血量 1.0 μL (0.100cc)	採血量 3.0 μL (0.300cc)
反應秒數 5秒	反應秒數 10秒	反應秒數 15秒	反應秒數 60秒

Optical



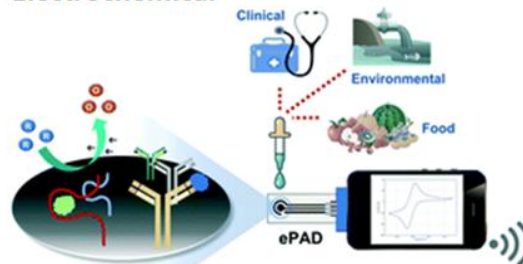
SAW bio-sensor 的優點

SAW



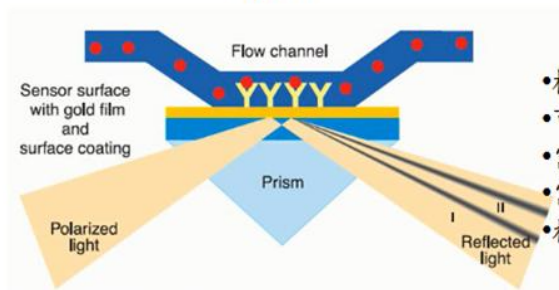
- 檢驗項目多
- 可靠度高
- 可居家操作

Electrochemical



- 檢驗項目少
- 容易居家操作

Optical



- 檢驗項目多
- 可靠度高
- 需實驗室
- 需專家
- 機台體積大

Products: iProtein® assay cartridge kits



(ASCVD Marker)

**CRP
assay cartridge kit**

Cat No. TU0001A  

**iProtein Lp(a)
assay cartridge kit**

Cat No. BMLPAP0110  

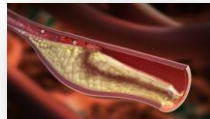
**iProtein ApoB
assay cartridge kit**

CE is processing

**iProtein ApoA1
assay cartridge kit**

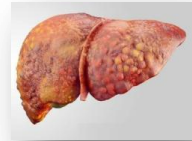


**Infection/
Inflammation**



CVD biomarkers

Cancer



**iProtein AFP
assay cartridge kit**

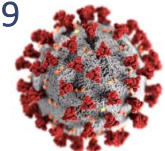


**COVID-19 S Protein Ab
assay cartridge kit**

TAIWAN FDA EUA is processing
Cat No. BMCOVP0110



Covid-19



Products: iProtein® reader

iProtein Reader (Portable)

Cat No. TO0001AA1010



Protein Biomarkers & advance CVD biomarkers

Home visiting doctor,
Online Doctor/Telemedicine



iProtein Reader (Desktop type)

CE is processing

Protein Biomarkers & advance CVD biomarkers

Clinic, Care Center, Animal Clinic,
EM in Hospital

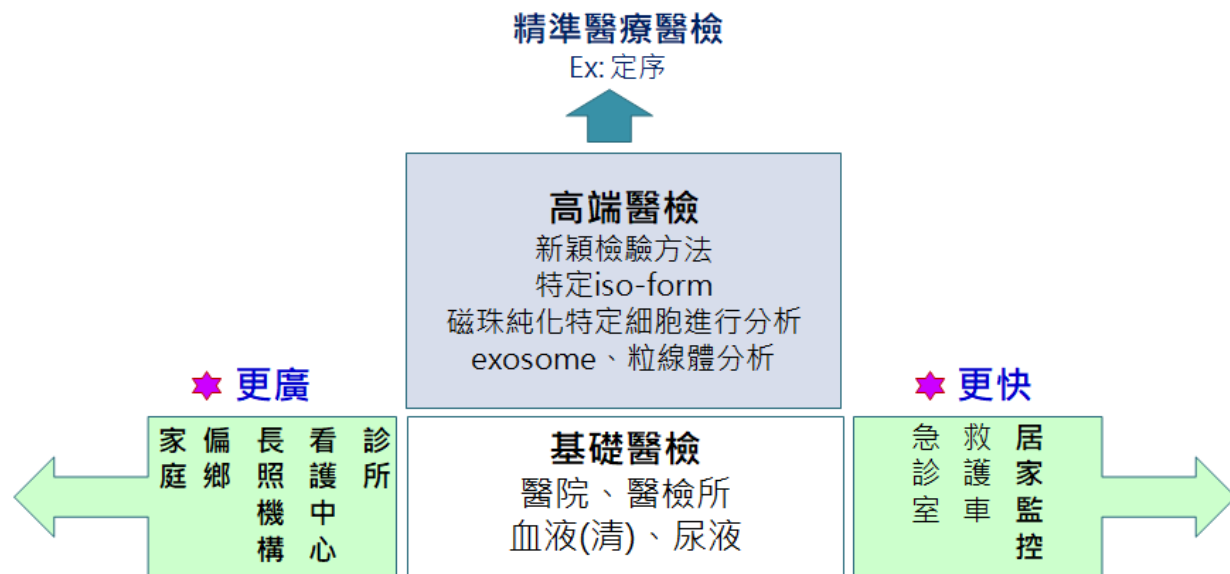
Clinical chemistry Analyzer



Classical Lipid Panel

TC, TG
LDL-C, HDL-C
Non-HDL-C

創新理念:推動醫檢學進步



艾普定C反應蛋白分析卡匣組

iProtein® CRP assay cartridge kit

艾普定免疫定量分析儀

iProtein® reader



Smallest, quickest
inflammation and cancer marker detection

“One drop”
of blood

tstbio



- ❑ 製造工廠已經取得ISO13485, QMS(GMP) 醫療器材品質系統認證。
- ❑ 產品已經取得台灣上市許可、歐洲CE上市許可。
- ❑ 產品可於室溫下存放一年，適合POCT/遠距醫療推行。

iProtein[®] CRP assay cartridge kits

Confidential Proprietary



Only take a drop
(5 micro liters) of
blood
From finger prick

We can help



To reduce the pain of
blood sampling for
the elderly

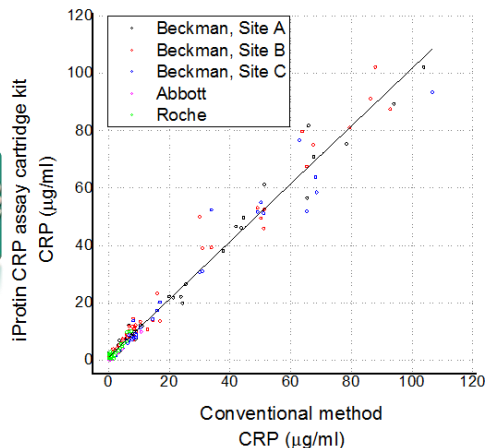


To reduce the amount of
blood taken by
newborns/children



Reduce the risk of medical staff being
exposed to infection

Smallest and quickest in the world, as high performance as conventional (hospital) method



CRP system in Taiwan

0.2kg



tstbio[®] iProtein

Smallest & Quickest in the world

1 Hand-held

5kg

2 Desk top small

- Alere, Afinion
- Skyla, Skyla HI

1.7kg

5 Desk top

- AFUJI DRI-CHEM Slide
- B.R.A.H.M.S CRPus KRYPTOR
- Radiometer CRP
- Horiba, Microsemi CRP
- Roche, cobas c 111 CRPHS

24 Floor-standing





在宅醫療，是「第三種醫療」！
有別於住院、門診醫療。
在科技進步、高齡化照護需求
日增的今天，在宅醫療是未來
醫學的一環。

改善插管病人長照品質

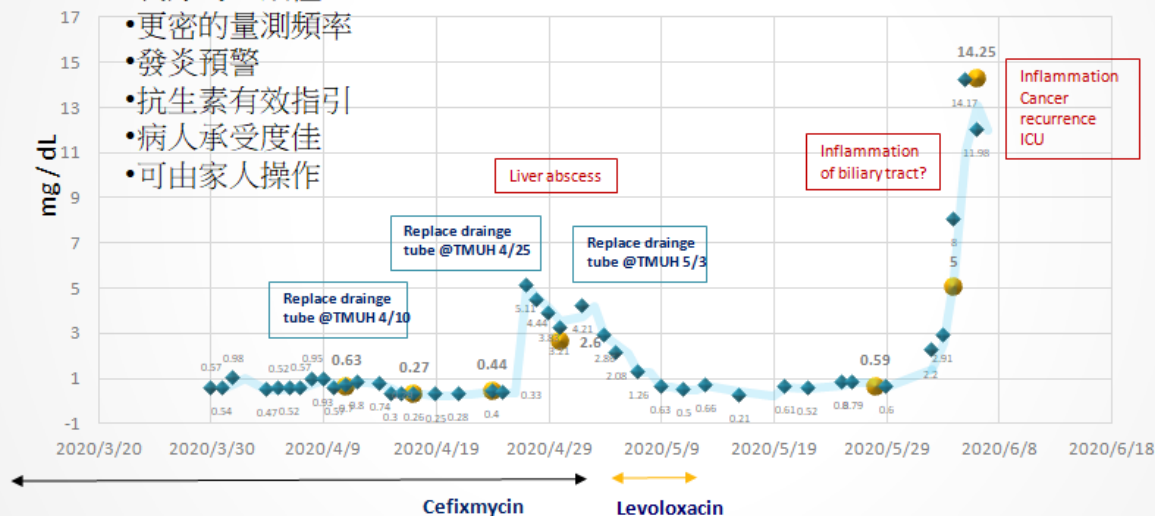
Assessing antibiotic treatment response

長期照護案例1_CRP管理

◆ CRP

● CRP@TMUH

- 良好的一致性
- 更密的量測頻率
- 發炎預警
- 抗生素有效指引
- 病人承受度佳
- 可由家人操作



專題生1號

2021年
彭郁淇同學



1. 碩士畢業後，職場無縫
接軌

※現職嘉碩生醫研發部高
級工程師

2. 出版兩篇國際論文
(第一作者、第二作者)



Article

A Novel Rapid Test to Detect Anti-SARS-CoV-2 N Protein IgG Based on Shear Horizontal Surface Acoustic Wave (SH-SAW)

Yu-Chi Peng ¹, Chia-Hsuan Cheng ², Hiromi Yatsuda ², Szu-Heng Liu ², Shih-Jen Liu ³, Takashi Kogai ^{2,4}, Chen-Yen Kuo ⁵ and Robert Y. L. Wang ^{1,5,6,*}

¹ Biotechnology Industry Master and PhD Program, Chang Gung University, Taoyuan 33302, Taiwan; jasmine170819@gmail.com

² Tst Biomedical Electronics Co., Ltd., Taoyuan 324, Taiwan; joshcheng@tst.bio (C.-H.C.); yatsuda.hiromi@tst.bio (H.Y.); justinliu@tst.bio (S.-H.L.); kogai.takashi@tst.bio (T.K.)

³ National Institute of Infectious Diseases and Vaccinology, National Health Research Institutes, Miaoli 35053, Taiwan; levent@nhri.org.tw

⁴ Japan Radio Co., Ltd., Saitama 356-8510, Japan

⁵ Division of Pediatric Infectious Diseases, Department of Pediatrics, Chang Gung Memorial and Children's Hospital, Linkou 33305, Taiwan; jennykster@gmail.com

⁶ Department of Biomedical Sciences, College of Medicine, Chang Gung University, Taoyuan 33302, Taiwan

* Correspondence: yuwang@mail.cgu.edu.tw; Tel.: +886-3-2118800 (ext. 3691)

Peng, Y. C., Cheng, C. H., Yatsuda, H., Liu, S. H., Liu, S. J., Kogai, T., Kuo, C. Y., & Wang, R. (2021). A Novel Rapid Test to Detect Anti-SARS-CoV-2 N Protein IgG Based on Shear Horizontal Surface Acoustic Wave (SH-SAW). *Diagnostics*, 11(10), 1838.



Article

Measurements of Anti-SARS-CoV-2 Antibody Levels after Vaccination Using a SH-SAW Biosensor

Chia-Hsuan Cheng ¹ , Yu-Chi Peng ^{1,2}, Shu-Min Lin ³ , Hiromi Yatsuda ¹, Szu-Heng Liu ¹, Shih-Jen Liu ⁴ , Chen-Yen Kuo ⁵ and Robert Y. L. Wang ^{2,5,6,7,*}

¹ Tst Biomedical Electronics Co., Ltd., Taoyuan 324403, Taiwan

² Biotechnology Industry Master and Ph.D. Program, Chang Gung University, Taoyuan 33302, Taiwan

³ Department of Thoracic Medicine, Chang Gung Memorial Hospital, Linkou 33305, Taiwan

⁴ National Institute of Infectious Diseases and Vaccinology, Taoyuan 33302, Taiwan

⁵ Division of Pediatric Infectious Diseases, Department of Pediatrics, Chang Gung Memorial and Children's Hospital, Linkou 33305, Taiwan

⁶ Department of Biomedical Sciences, College of Medicine, Chang Gung University, Taoyuan 33302, Taiwan

⁷ Kidney Research Center and Department of Nephrology, Chang Gung Memorial Hospital, Linkou 33305, Taiwan

* Correspondence: yuwang@mail.cgu.edu.tw; Tel.: +886-3-211-8800 (ext. 3691)

Cheng, C.-H.; Peng, Y.-C.; Lin, S.-M.; Yatsuda, H.; Liu, S.-H.; Liu, S.-J.; Kuo, C.-Y.; Wang, R.Y.L. Measurements of Anti-SARS-CoV-2 Antibody Levels after Vaccination Using a SH-SAW Biosensor. *Biosensors* **2022**, *12*, 599.



專題生2號

2021年
黃健庭同學

升學: 現為台大微生物所
研究生
※預計2024年畢業

專題生3號

2022年

朱家儀 同學

1. 參與研發:一滴血檢測狗
狗發炎

※預計2023年7月上市

2. 行銷:
行銷影片產品女主角



專題生4號

2022年

阮家恩 同學



1. 參與研發:執行一個處長
指派的秘密實驗最終失敗

※但至少證明不可行

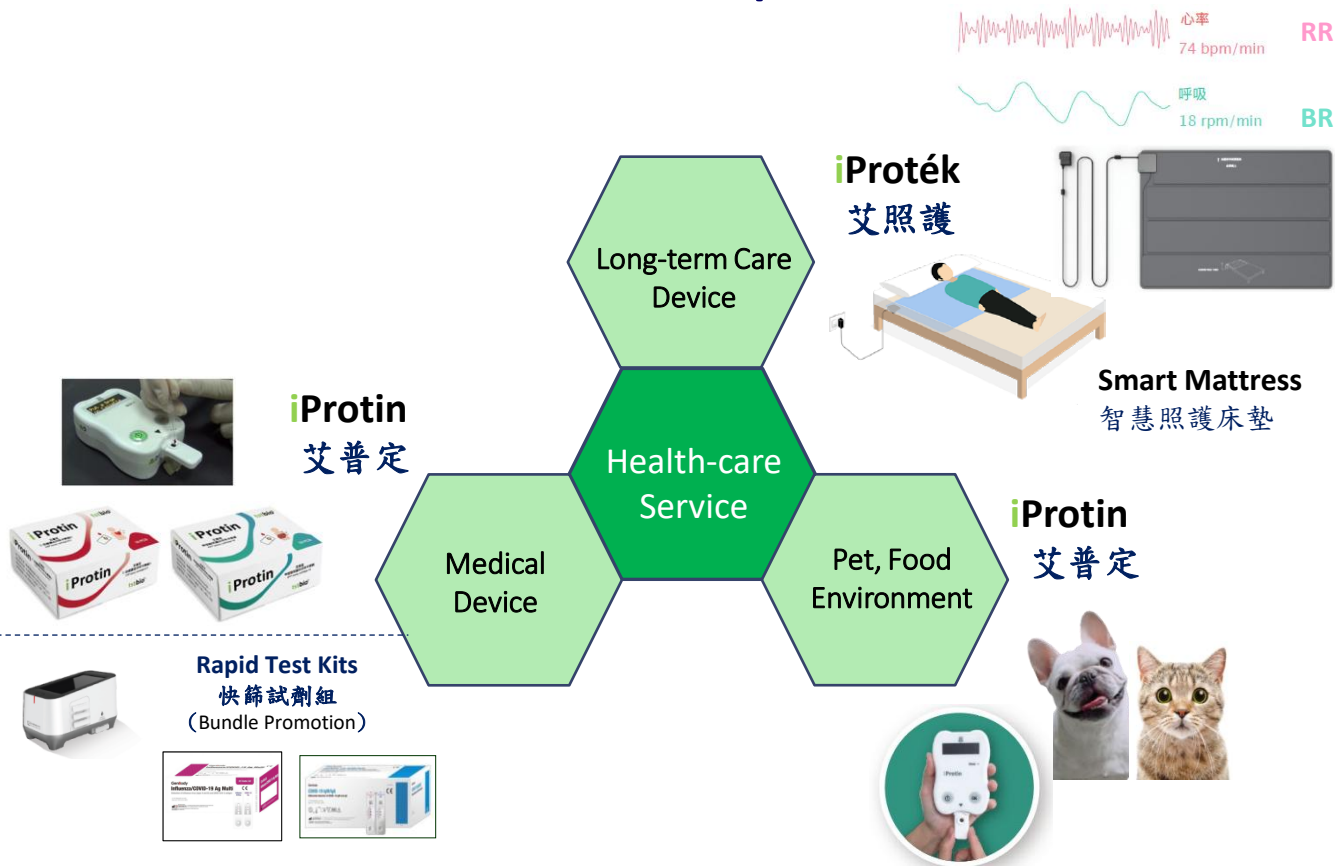
2. 行銷:

行銷影片產品演員



- 徵求5號、6號
- 大學部及碩士班皆可 (有熱情優先錄取)
- 需完整工作7月與8月 (與上班族一樣的日程)

tstbio[®] Main Business Scope



tstbio[®] Milestones

2015 2016 2017 2018 2019 2020 2021 2022



Taiwan IDB project award
(37.5 Million NTD)

JRC 日本無線



Clinical Trials at
Mackay Memorial Hospital
NTU Hospital

Taiwan IDB project award
(40.0 Million NTD)
tstbio (spin-off)
Clinical Trials at TVGH



TST got ISO13485:2016 certificate

TST, tstbio both got Medical Device Sale License

TST got Medical Device Manufacturing License

tstbio iProtein[®] CRP and iProtein[®] Reader got Japan Pmda

TST got GMP certificate (TFDA)



SBIR, RD Projects
Clinical Trials at
TMUH, CGMH

CE
TFDA
Approved



Help Taiwan
government
fight the
COVID-19
epidemic





Thank You

Dr. Justin Liu

E-mail: justinliu@tst.bio

<https://www.tst.bio/>