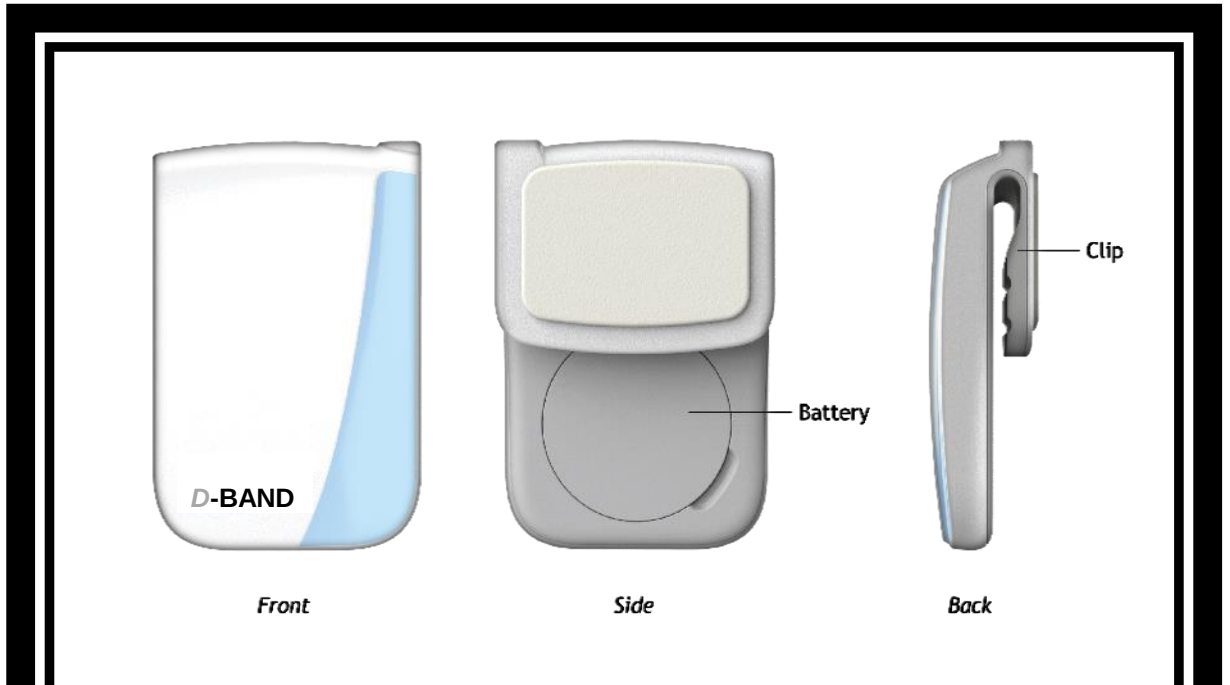
OM Sciences Company Limited

Ductless - Breath ANalysis Device

(*D*-BAND)

A Novel Obstructive sleep Apnea Monitoring Device

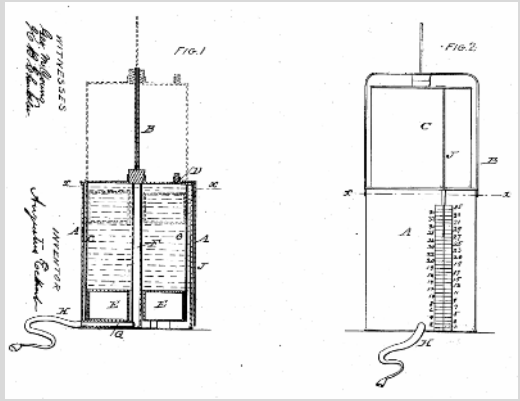


Background

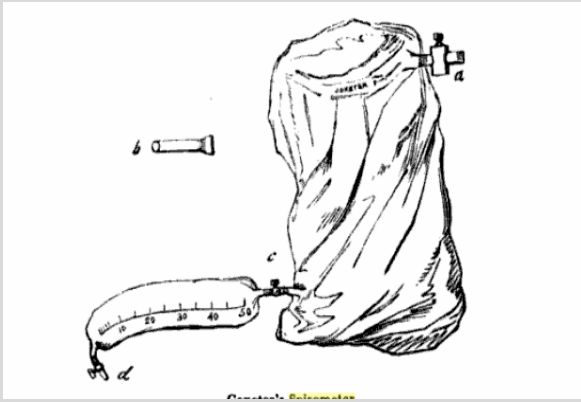
Pulmonary function test / monitoring instruments are mainly composed of **spirometers** and gas analyzers. Combining two, most indicators of lung function can be measured, such as lung capacity, ventilation, diffusion, respiratory muscle strength, oxygen consumption, The amount of carbon dioxide produced, **spirometers** are the most commonly used in lung function testing.

Spirometer

The design of spirometers appeared as early as the late 1800s, there were different instruments for measuring air flow and volume. **After two centuries of evolution, certain techniques and principles still remain. Possible cross contamination.**



Eckert's Spirometer, 1860



Coxeter's spirometer from 1861

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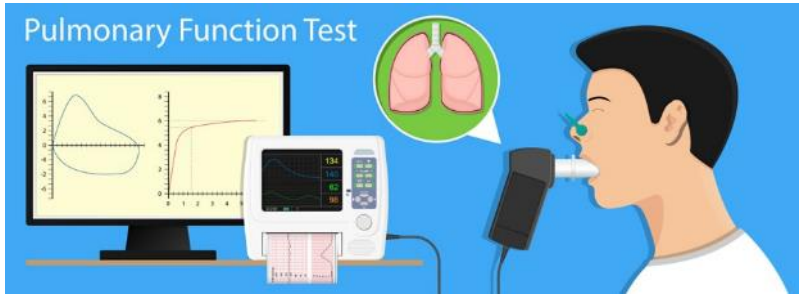

The spirometer can be used as a time spirometry chart, a flow volume curve, and a resting ventilation function test

Patient with sleep apnea and wear CPAP

Table-top spirometer
Autospiro AS-307/407/507, 2010's

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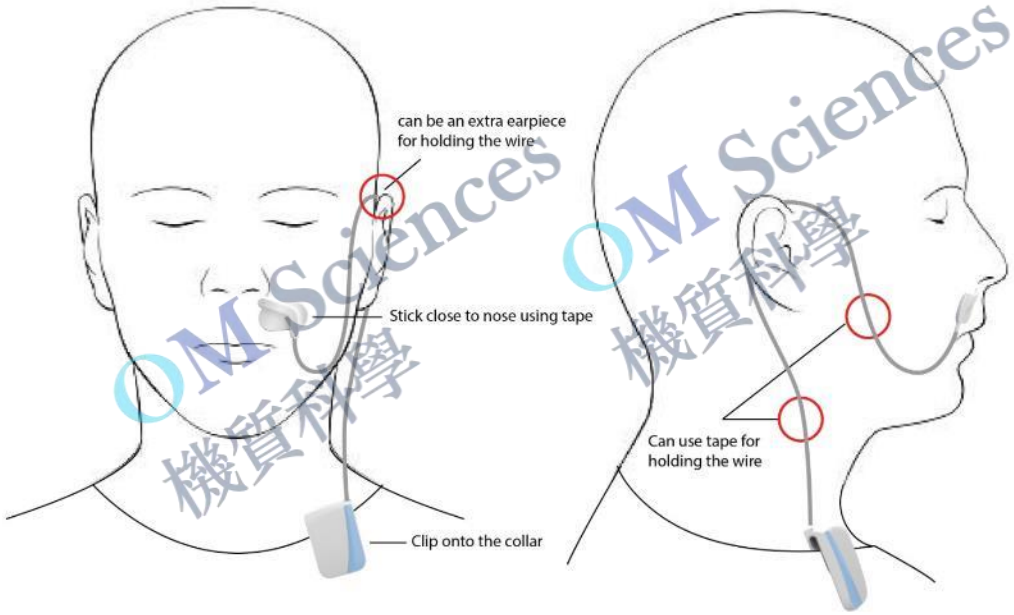
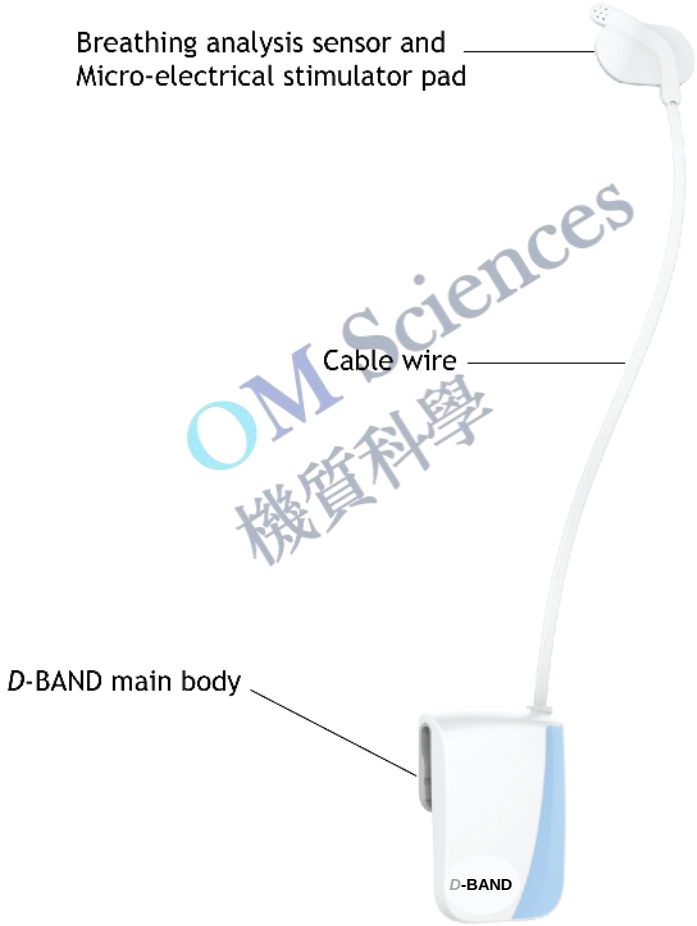
Introduction of the *Ductless* - Breath ANalysis Device (*D*-BAND)

A Novel Obstructive Sleep Apnea Monitoring Device

OM *Ductless* - Breath ANalysis Device (*D*-BAND)

***D*-BAND -** *"Lightweight, comfortable, low power consumption and quiet"*



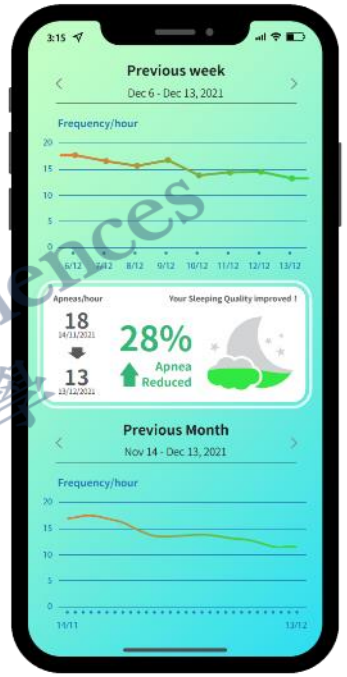


1. Ductless - Breath ANalysis Device (*D*-BAND)

Applications:

1. Athletic trainings
2. Sleep quality monitoring
3. Individual respiratory-related health information
4. Meditation
5. Filter lifespan indicator for facemasks

Prototype of *D*-BAND



1. Ductless - Breath ANalysis Device (*D*-BAND)

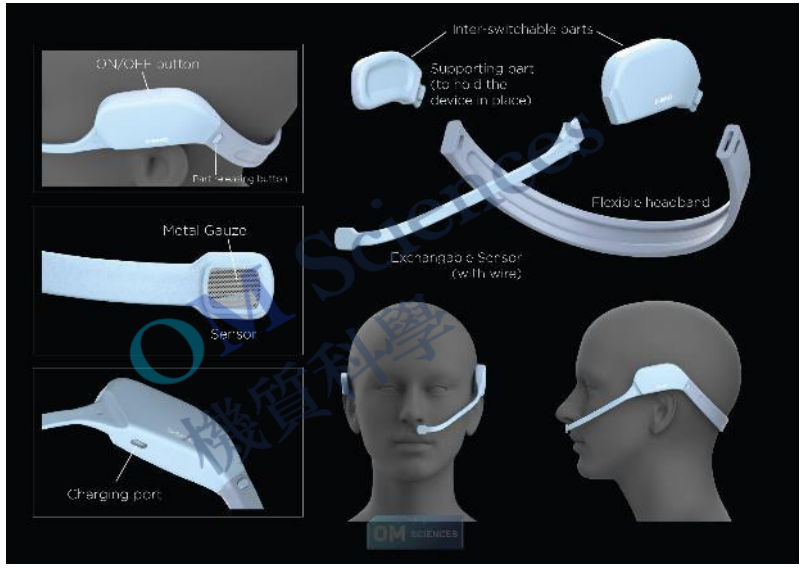
- A Novel Obstructive Sleep Apnea Monitoring Device
- Correlations to different age groups to give suggested health advice
- **Lightweight, comfortable, low power consumption and quiet**

Preliminary data collected:

1. Full breath rate
2. Inhale rate
3. Exhale rate

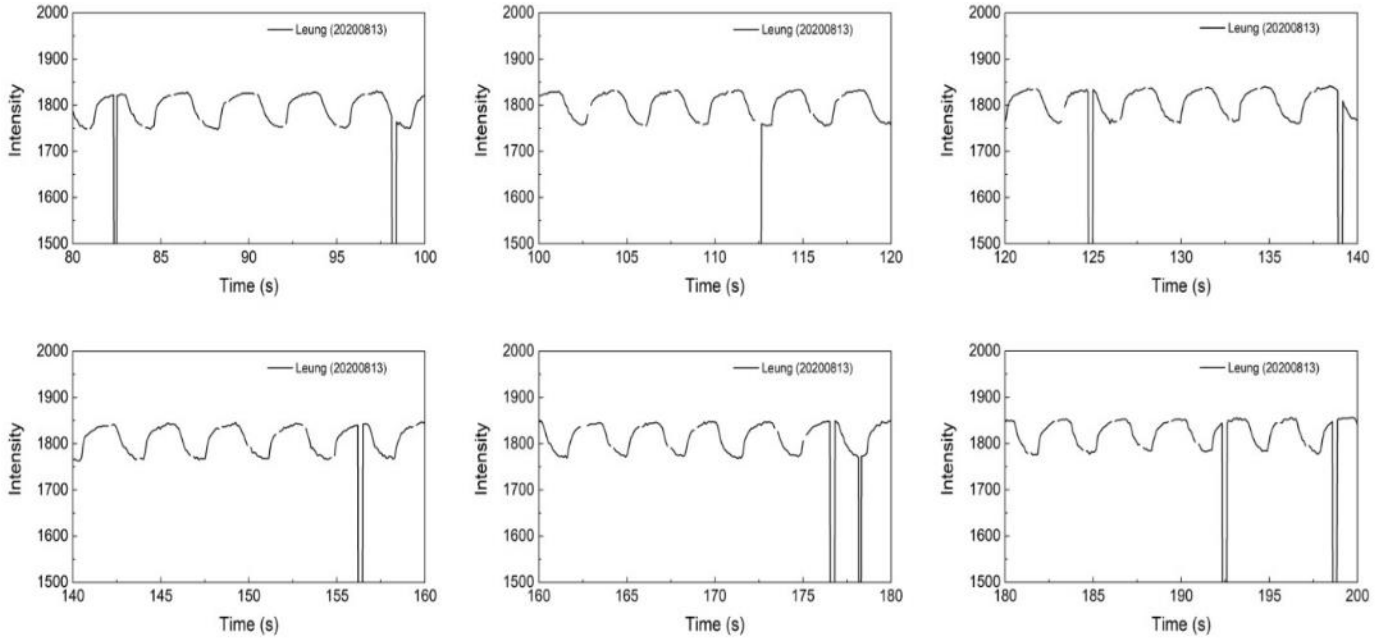
In development data:

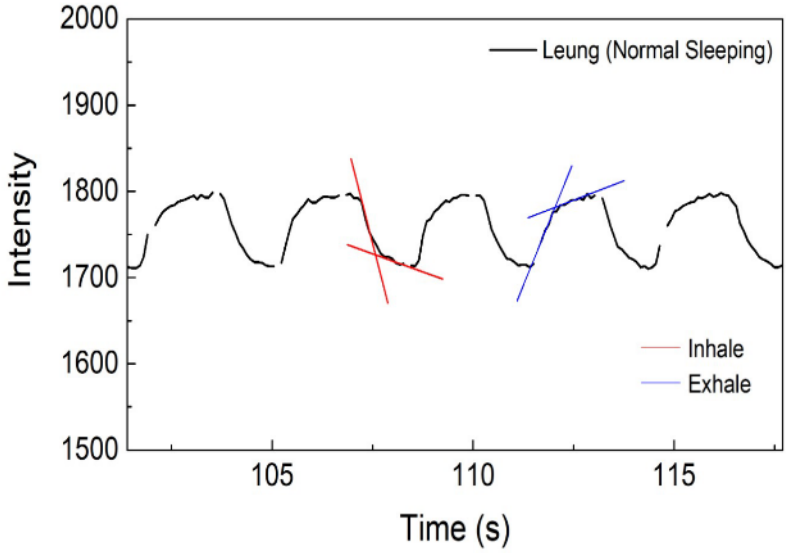
1. The pulmonary volumes
2. Vital capacity
3. Tidal volume measurements



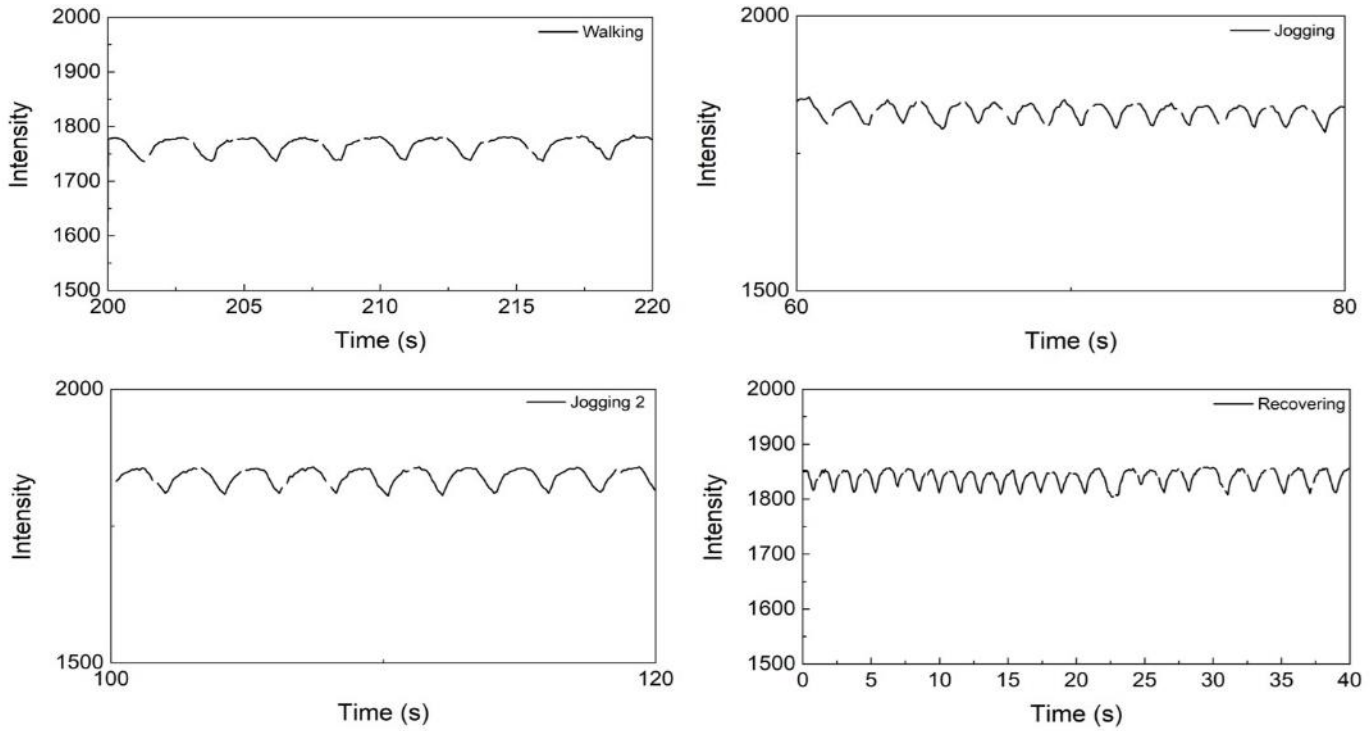
Pulmonary function data analysis

- Big data platform construction
- Artificial intelligence and image analysis of breath data
- In-house apps compilation



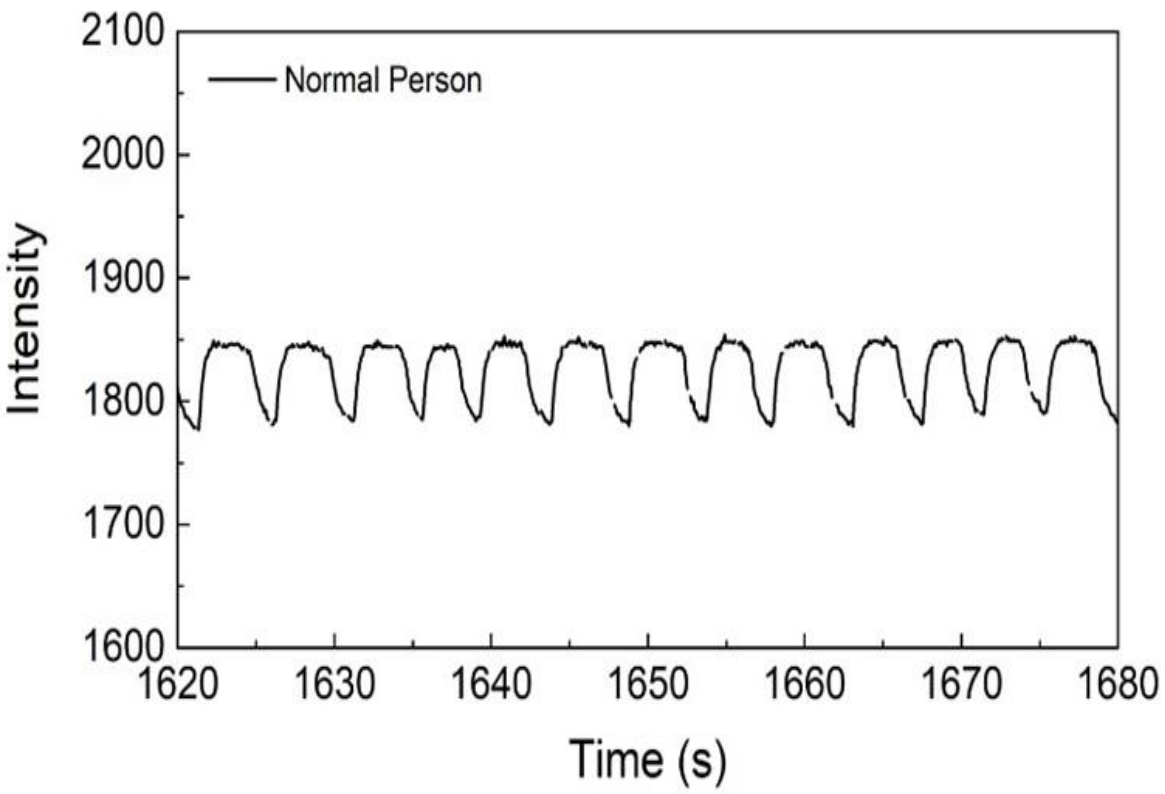


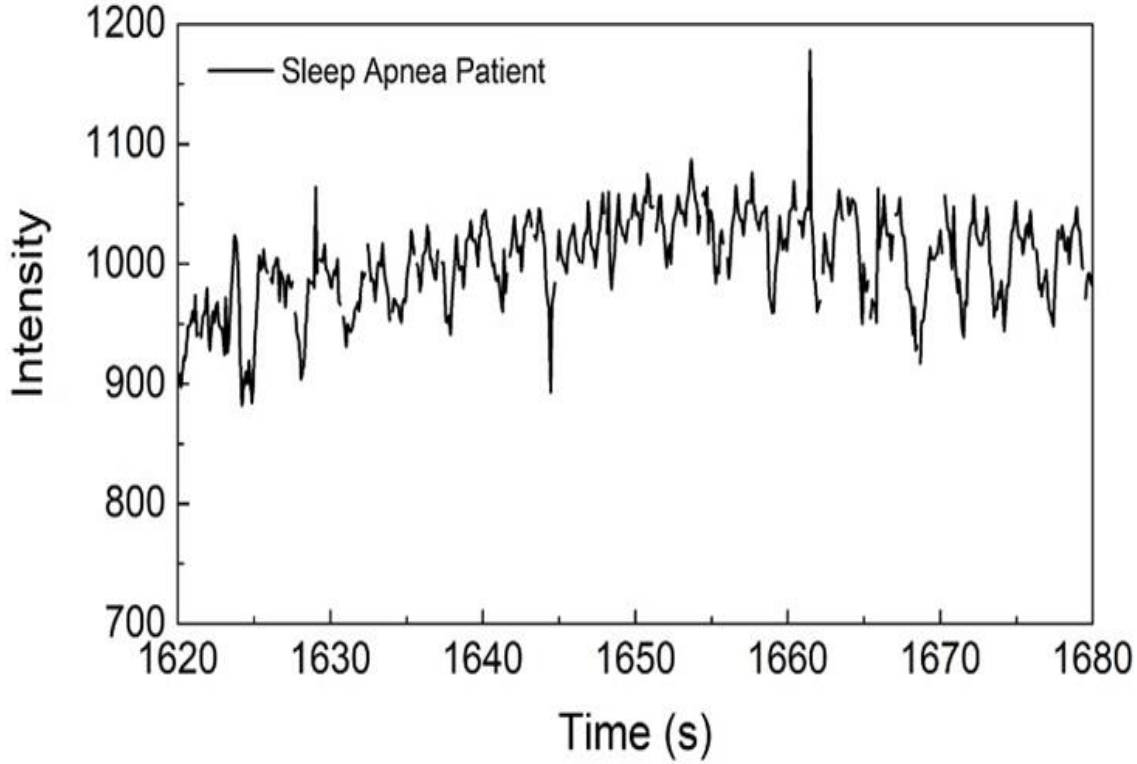
Exercising / Running



EXP	Breathing Rate ± std (breaths/min)
Walking	24
Jogging	45
Jogging 2	30
Recovery after jogging	---

People with sleep apnea





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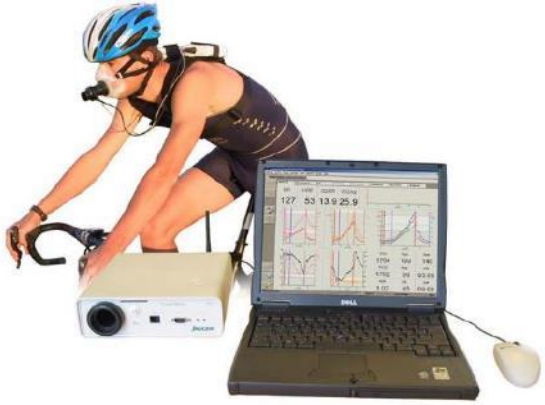
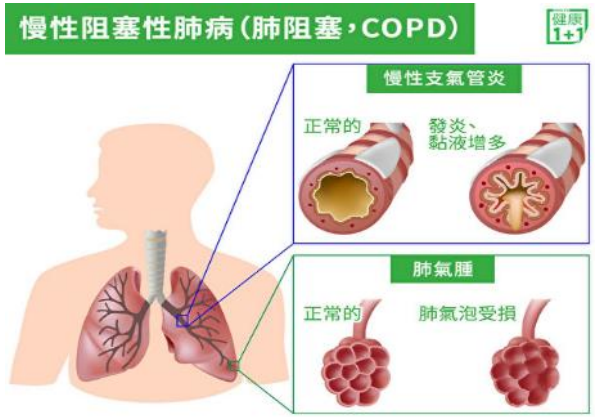
Targeted Clients

COVID-19 patients/recovered



Pulmonary exercisers (athletes)



Chronic lung disease (chronic obstructive pulmonary disease,

People with sleep apnea

Long-term smokers

Elderly Pulmonary Function Test (Elderly Technology)

Targete Clients

Obstructive Sleep Apnea (90% of Total Apnea cases)

- When patient asleep, the throat soft tissue relaxes and blocks / narrows the upper airway and causing suffocation
- As a result, the blood oxygen content decreases and causes suffocation. Suffocation wakes up the patient to regain breath then go back to sleep; But once asleep, suffocation comes back. Lack of oxygen gives patient health heavy pressure to all aspect.
- Each temporary suffocation can last for several seconds to even more than a minute. It could happen ten times or even hundreds of times a night

Targeted Clients (Dilemma)

People who are not satisfied with the current spirometer monitoring approaches

(**Continuous Positive Airway Pressure,** CPAP):

- **Not used to sleeping with a CPAP mask**
- **Not able to tolerate continuous pressure from the respirator**
- **Dry nose/mouth or stuffy nose**
- **Cause headache/ear pressure**
- **Cause hiccups**
- **Claustrophobia**
- **Machine is too noisy**
- **Hard to fall asleep**

- **Overnight analysis cost per visit: USD400-800**

Patient with sleep apnea and wear CPAP

Average suggested retail price for a apnea machine CPAP ~USD1,200

Product Comparison

- https://www.airofit.com/products/breathing-trainer
  airofit
- And other related turbine-based spirometer

Premium Alice 6 LDxS PSG Sleep System

https://www.usa.philips.com/healthcare/solutions/sleep/sleep-diagnostics

Singapore Nanyang University

Under developing

https://neuro.natus.com/products-services/embletta-mpr-sleep-system

Product Name	Ductless	Portable	Battery operated	Require mouth piece	Price (USD)
Airofit	No	Yes	Yes	Yes	400
Nanyang Mask	No	No	??	??	??
Average spirometer	No	No	No	Yes	1,000
OM *D*-BAND	Yes	Yes	Yes	No	388

Our Advantages and Uniqueness

- Personalized *Ductless* - Breath ANalysis Device (*D*-BAND)
- **A Patented Technology**
- Lightweight, comfortable and quiet
- Avoid delay in diagnosis and get appropriate treatment as soon as possible
- Reduce unnecessary medical expenses
- CONTINOUS uninterrupted real-time monitoring
- Early diagnosis / monitoring of lung-related diseases (asthma, apnea, fibrosis...)
- Device for treating **obstructive sleep apnea**
- Cooperate with treatment and exercise to improve lung function

- Competitive price (Recommended retail price for ***D*-BAND** : USD169.50)

Prospect :
Our Ongoing Research and Development

Collaboration with local institutes

- Pilot clinical research on subjects with multiple lung dysfunction (Collaboration with PWH, CUHK)
- Big data platform construction and analysis with local Institutes (PolyU: Artificial Intelligence Analysis of Clinical Research Data)

Prospect :
Our Business Strategies

Marketing Plan

- Product design & optimization (comfortable, durable, pleasant, easy to carry)
- Pricing (B2B, B2C and Differential Pricing Strategies)
- Branding Strategy (Publicity, Product Placement and Promotion Logistics)

Revenue Streams

- Sales of Goods
- Licensing Income

Implementation:
Regulatory application before entering the market

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CN Phase (3rd Year)

NMPA Regulation

EU (1st Year)

CE Approval

U.S. (1st Year)

FCC Approval

U.S. (3rd Year)

USPTO

FDA Class I Medical Device

Awards

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附件 2: 最近的奖项 - IPIC 香港科技創新大賽-2024 -最佳研發獎

Awards

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Awards

第二屆"京津冀-粵港澳"青年創新創業大賽 銀獎
香港分區優勝隊伍

Sustainability Impact Corporate Award

Press Inteviews

Media: Singtao

Format: print and online article

Target publish date: Week of Jan 8

Interviewing company: OM Sciences

大題：科學園港企研有機微電子晶片 電子產品可100%回收

香港科學園有不少具前瞻性的初創，微電子港企機質科學（OM Sciences）就是開發和產業化新一代聚合物。OM Sciences 開發的有機電子材料，已被科學界公認為綠色材料；OM Sciences 有機半導體產品金屬量比現有半導體少八成，最終將研發出產品100%可回收，亦可生物降解的電子材料。

小題：聚合物前途無限

人類利用愈來愈多電子產品，電子產品也最終會被棄置，有毒重金屬回收困難，造成污染環境。

傳統上，導電材料都是無機材料，或是金屬氧化物。近年科學家研究聚合物（Polymers）和有機小份子獲得突破，衍生不同電子性質，具備金屬或半導體的特性。以有機聚合物製作的半導體材料，減少污染和能耗，性能和靈敏度卻毫不遜色、加上嶄新製造流程，為應用和行業帶來新機遇。

OM Sciences 共同創辦人兼行政總裁及首席顧問倪世明教授說，過去五六十年電子產品急速發展，一般電子產品含多種重金屬，多年日積月累破壞環境，有機材料興起是遲早問題。

Media: on.cc
Format: online article
Target publish date: Week of Jan 8

本地首初創研綠色物料 「打印」環保微電子產品

* 倪世明教授（左）稱，科技發展及科研應為長遠發展項目，需改變現時短視的風氣。右為蘇承樂。

不含金屬的機質科學專利的有機電子材料。

有機電子材料可將電路打印在不同物料表面，有較大的可塑性。

有機電子材料用於傳感器上的穩定性亦較有保證。

Media: BastillePost

Format: Online article

Target publish date: Week of Jan 8

OM Sciences 研發有機微電子材料 半導體產品少八成重金屬

香港科學園微電子企業機質科學有限公司(OM Sciences)研究有機電子材料開發，其有機半導體電子產品可應用於智慧城市、家用氣體監測及電子消費產品等方面，公司表示，其產品較傳統同類產品金屬少 80%，最終目標是製造可100%回收的電子產品。

機質科學共同創辦人兼行政總裁及首席顧問倪世明教授表示，公司研究有機電子材料開發，屬於有機電子學產業鏈上游，現時公司主要透過有機化學合成方式，製作有機半導體聚合物原材料，並已能完全合成多種能應用於不同場景的小分子和聚合物材料。近年來一直在做傳感器樣板和參加不同展覽，向大眾及其他企業介紹可打印的微電子產品的概念和前景。

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In 2020, OM Sciences has become the Hong Kong Science Park InCuTech startups

OM laboratory in Hong Kong Science Park

R/D of equipment system for OM materials

R/D of OM sensor equipment