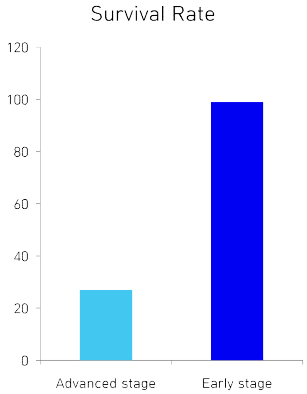
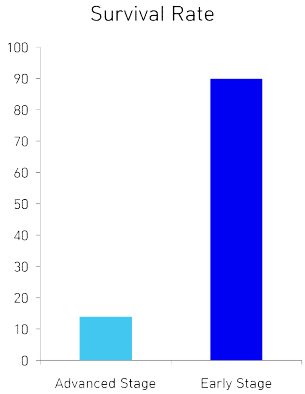
Cancer Survival Rate

Breast



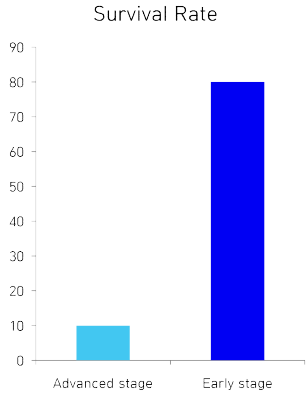
27% → **99%**

Colorectal



14% → **90%**

Lung



10% → **80%**

Source : National Cancer Institute

How?

Through Smell

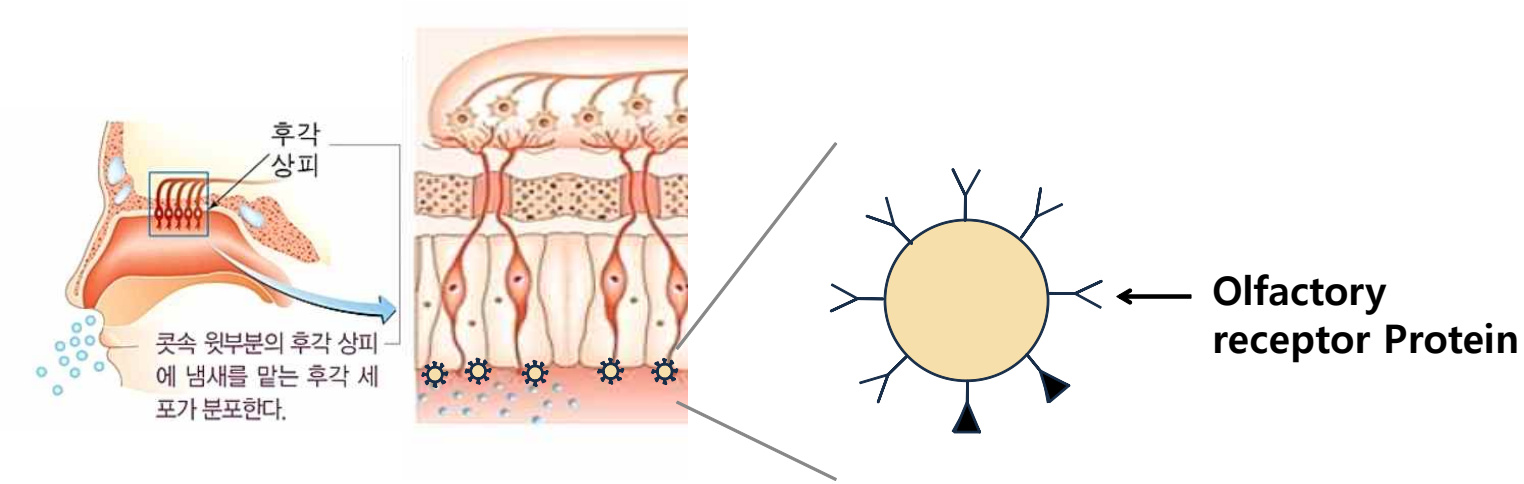
Do you know?

1

2

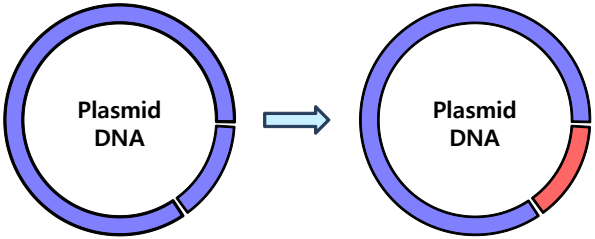
Source : Paula Jendrny, Scent dog identification of samples from COVID-19 patients-a pilot study

How humans perceive Smell

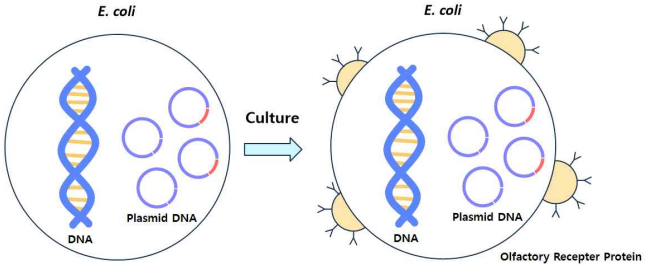


Bio-Enose based on FET

1 DNA Recombination

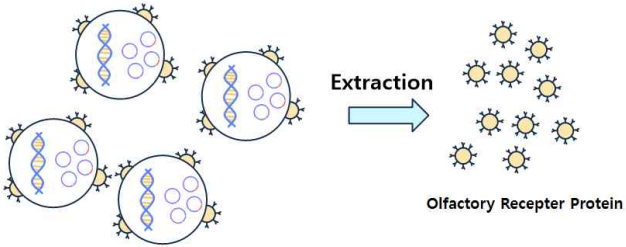


2 Cell culture

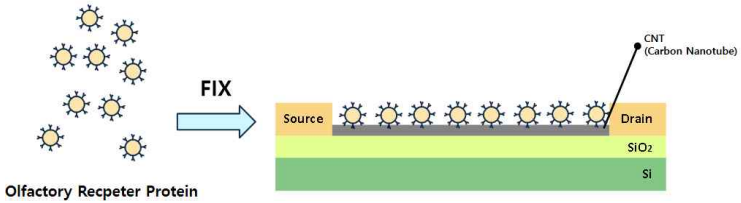


3 Olfactory Recepter Protein Extraction

Mass Production



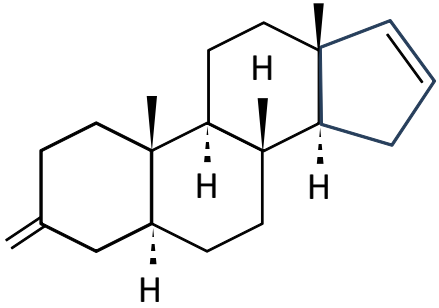
4 Recepter FIX on FET



The Smell of Sweat

3

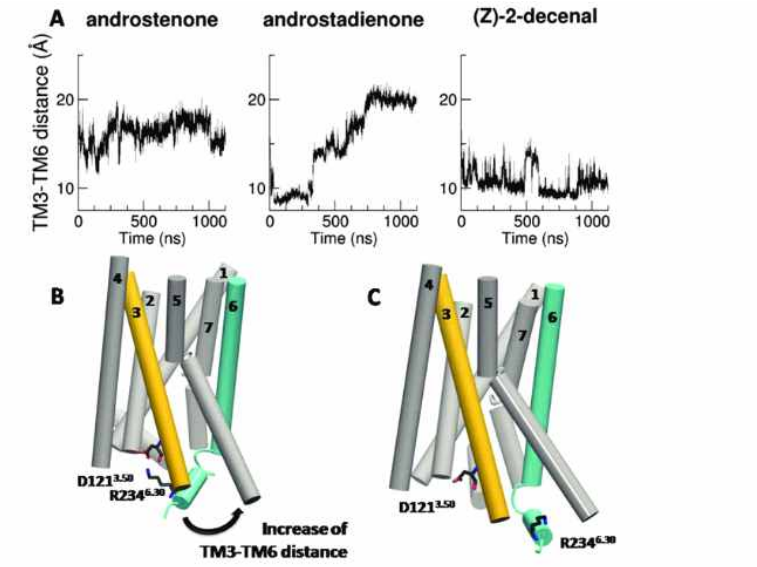
Androstenone



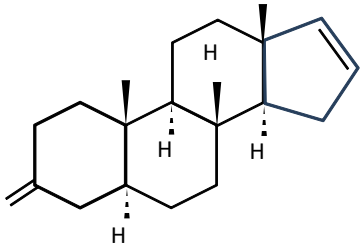
- Male Human Hormone Odor
- Male Pig Pheromone
- Truffle Odor

Source : NIH - National Library of Medicine

The Smell of Sweat



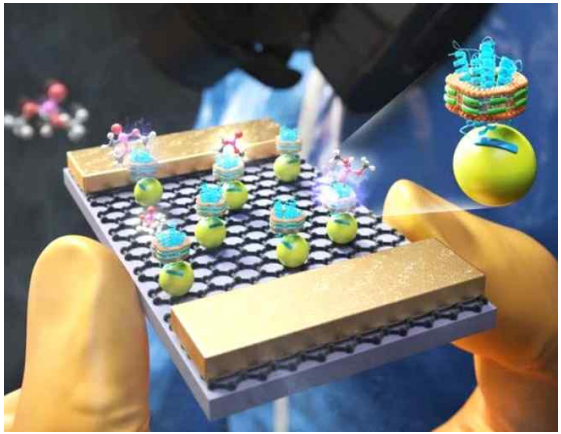
Androstenone



OR7D4

Source : NIH - National Library of Medicine

WHALE - BACO



01 **Detecting**

Identify **Complex Odors**

02 **Very Small - Portable**

Biosensor Size(2cm x 1cm x 2mm) - Nail Size
2~300 times smaller than other company

03 **Low Price**

Biochip 10$(US) (Mass Production), **Very Cheap**

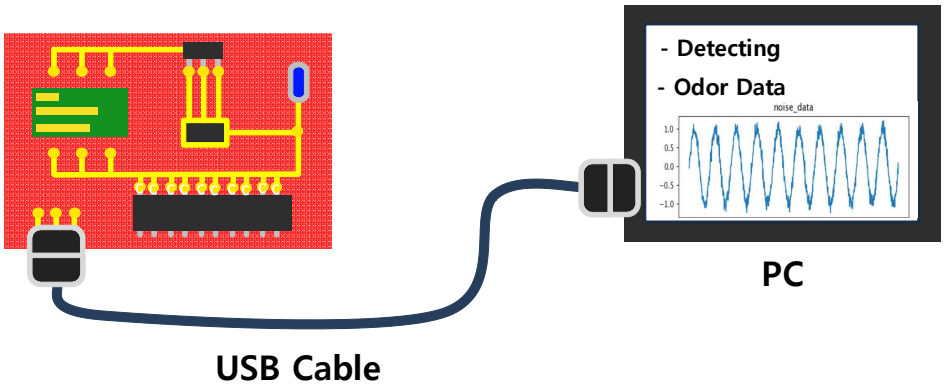
04 **Contactless**

Just Breathe

05 **Powerful Software**

Analysis and visualization of Odor Waveform Bigdata

WHALE - BACO



You can identify disease quickly in your house.

01 **Disease**

Cancer, Fat, etc

02 **Hormone**

Secondary Sexual Characterisrics, Climacteric

03 **Body Condition**

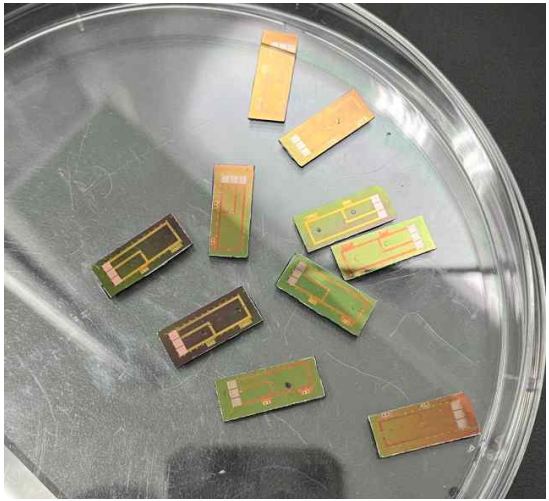
Exercising Recording

04 **Hospital Booking**

Hospital Booking, Matching Doctor

Product Development Phase

01 Biochip - G-FET



02 Biochip - Nanocellulose

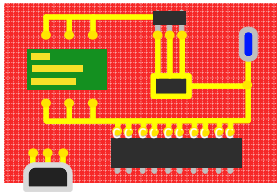
Product Development Phase

01 Biochip

4

Graphene FET : Using ZimmerPeacock

02 Analyzer



- **MCU**(Micro Control Unit)
ATmega328 Arduino Uno, Nano, Raspberry Pi 3

- **ADC**(Analog to Digital Converter)
Analog to Digital converting
32bit(LTC2508-32)

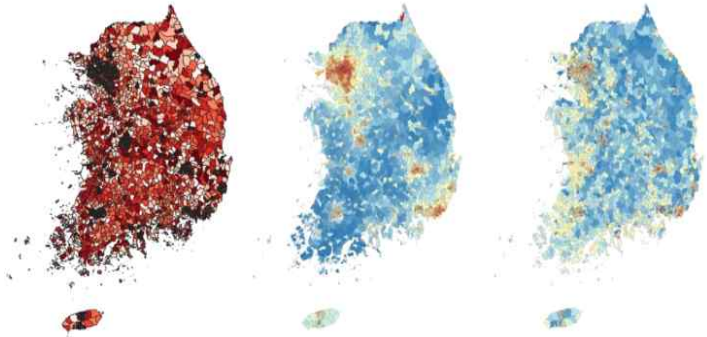
- **Op-Amp**
(ADA4522-1)

Product Development Phase

03 BigData Analysis

Search Desired Data for area-specific Odor bigdata
(Tool : Pandas Library)

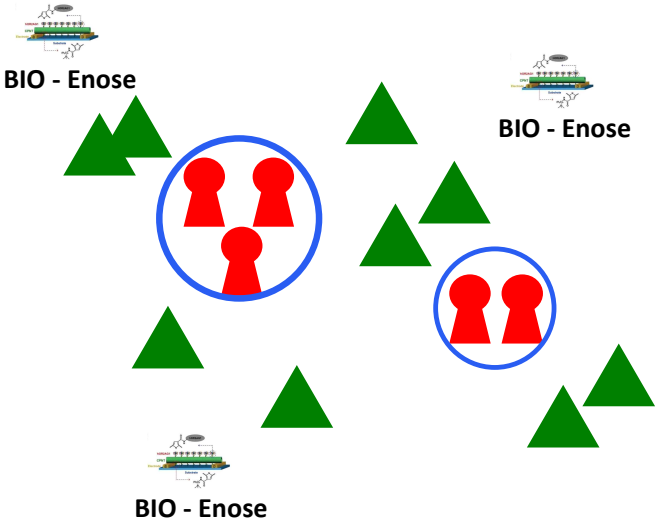
04 BigData Visualization



Displaying a real-time map based on location
(Visualizing the current location and direction of propagation of odor)
(Tool : QGIS)

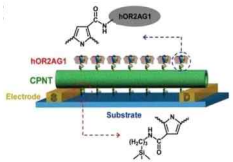
Our Project with AIS

05 Technical Research Service Business

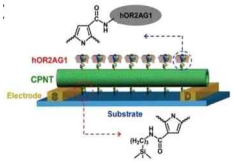


A Hidden enemy Detecting Using the Smell of Sweat

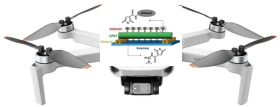
Detecting enemy forces in areas where visual identification is difficult by tracking the sweat smell of enemy forces hiding in oprational areas.



BIO - Enose (Fix)



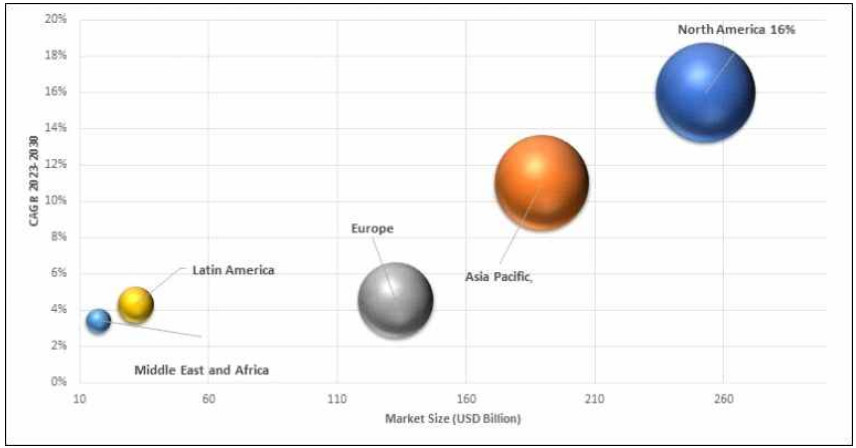
BIO - Enose (Portable)



BIO - Enose (Drone)

14

Target Country



*** Country Trends and market entry Strategies**

Middle East
(Saudi, UAE)

Space) Recently, Middle East invest huge amount of money in Space
(1st Target Market : Space Industry)

- Satrec eye sell Satellite Technology to UAE
- Korean Space Society(UAE Program)

Asia Pacific
(Republic of Korea, China, Taiwan, Vietnam)

Environment) Expected to be used in semiconductor processing and environment industries
(1st Target Market : Air Environment)

- Korea, China, Taiwan semiconductor company
- Vietnam Air Environment Industry Growth

North America
(USA)

Everything) usa invest in various areas
(1st Target Market : Space Industry)

- Artemis Project(NASA)
- CIS Challenge

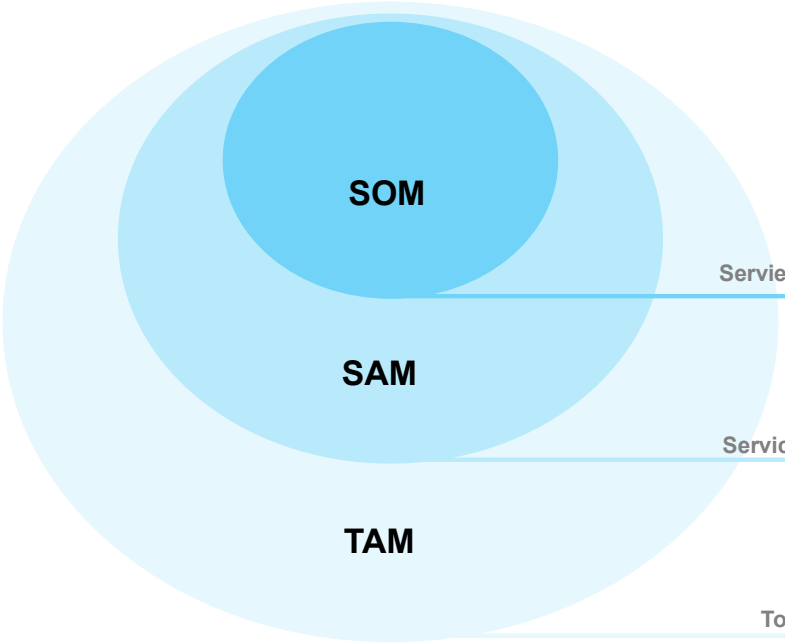
Market Size

North America 251.7(USD Billion)
Asia Pacific 190
Europe 132
Latin America 33
Middle East and Africa 17.8

CAGR(Compound Annual Growth Rate)

North America 16%
Asia Pacific 11%
Europe 4.5%
Latin America 4.2%
Middle East and Africa 3.5%

Market Size Analysis



Servieable obtainable market

SOM($0.85 Billion(USD)
* (Market Size x Expected Market Share, 2022)
- ECO, 0.35Billion(USD)(SAM x 15%, 2022)
- Food & Beverages, 0.09Billion(USD)(SAM x 5%, 2022)
- Healthcare, 0.15Billion(USD)(SAM x 2%, 2022)
- Others, 0.19Billion(USD)(SAM x 15%, 2022)

Serviceable available market

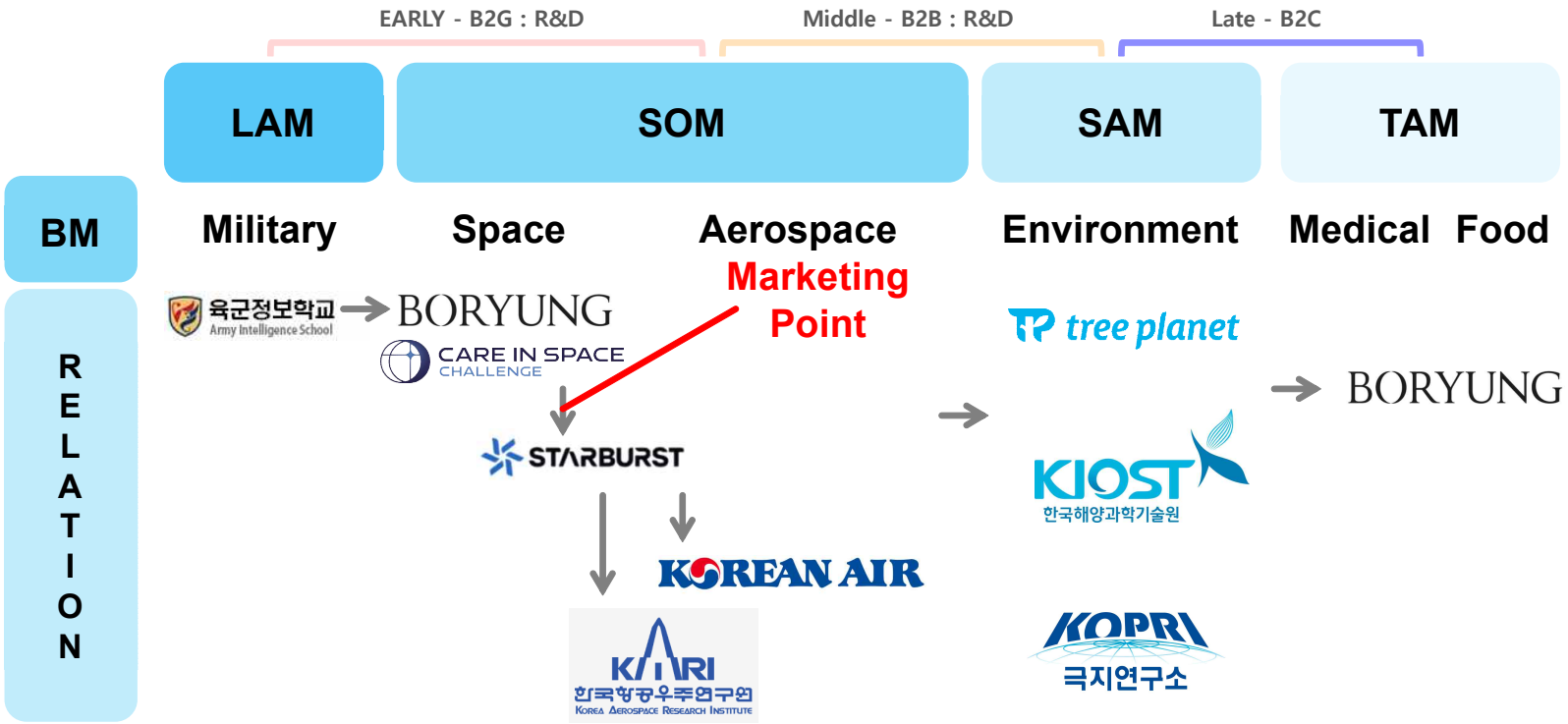
SAM($7.09 Billion(USD)
*Market(Consumer/Total x Target Country X Target Technology)
- ECO, 2.37Billion(USD) (32.38% x 65% x 22.5%, 2022)
- Food & Beverages 2.51 Billion(USD)(25.09% x 65% x 22.5%)
- Healthcare, 1.45 Billion(USD) (18.82% x 65% x 22.5%, 2022)
- Others, 2 Billion(USD) (24.29%x 65% x 22.5%, 2022)

Total addressable market

TAM($42.39 Billion(USD)
- $42.39 Billion(USD)
- CAGR of 6.49% from 2023 to 2030
- Research : Verified Market Research
- Survey : 2022, Published : July 2023

Research
- Users : Environmental Monitoring, Food & Beverages Industry, Healthcare, Others

Market - Relation



Technical Competitiveness

01 Detecting Complex smell

Identify **Complex Odors**(Disease, fruits odors)

02 Very Small - Portable

Biosensor Size(2cm x 1cm x 2mm) - Nail Size

03 Low Price

Biochip 10$(US) (Mass Production), **Very Cheap** under

04 Contactless

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05 Powerful Software

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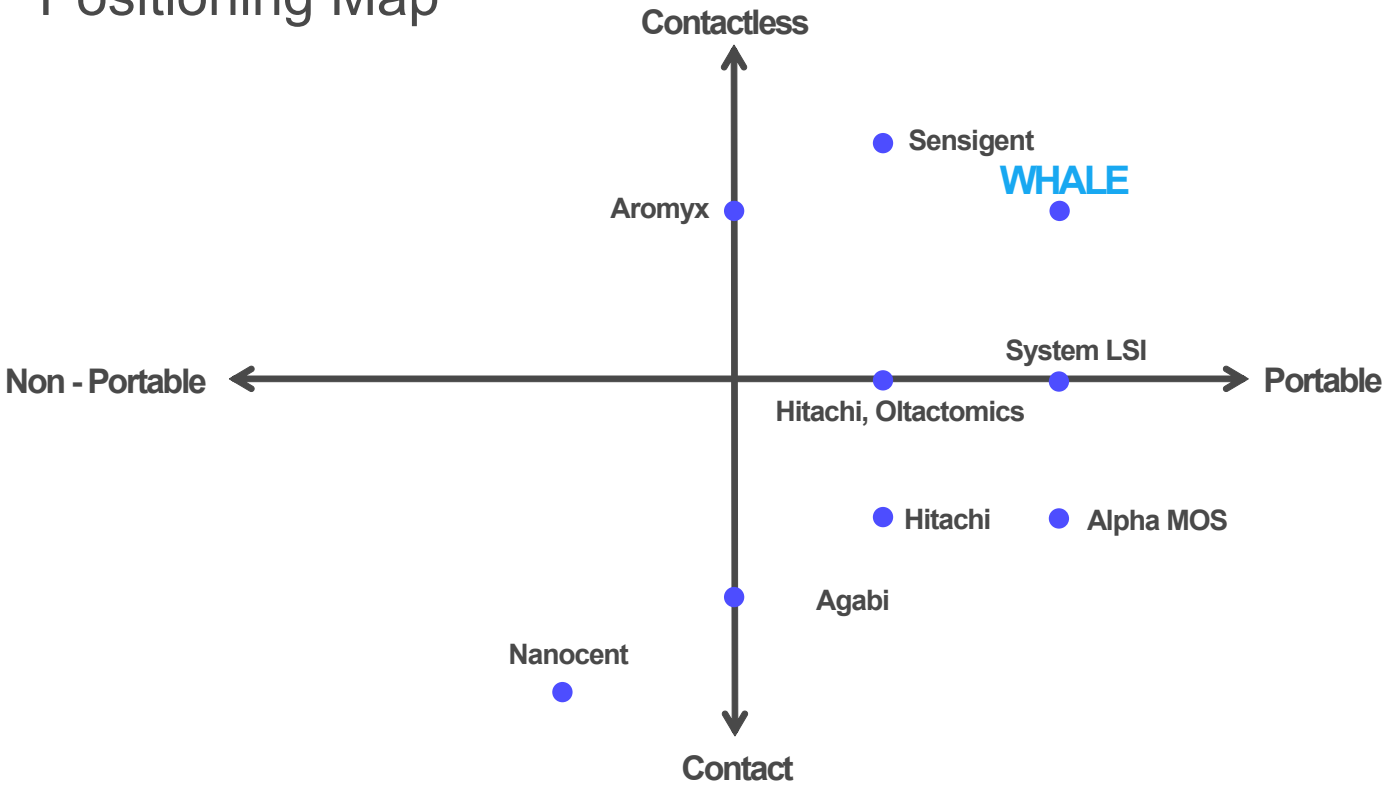
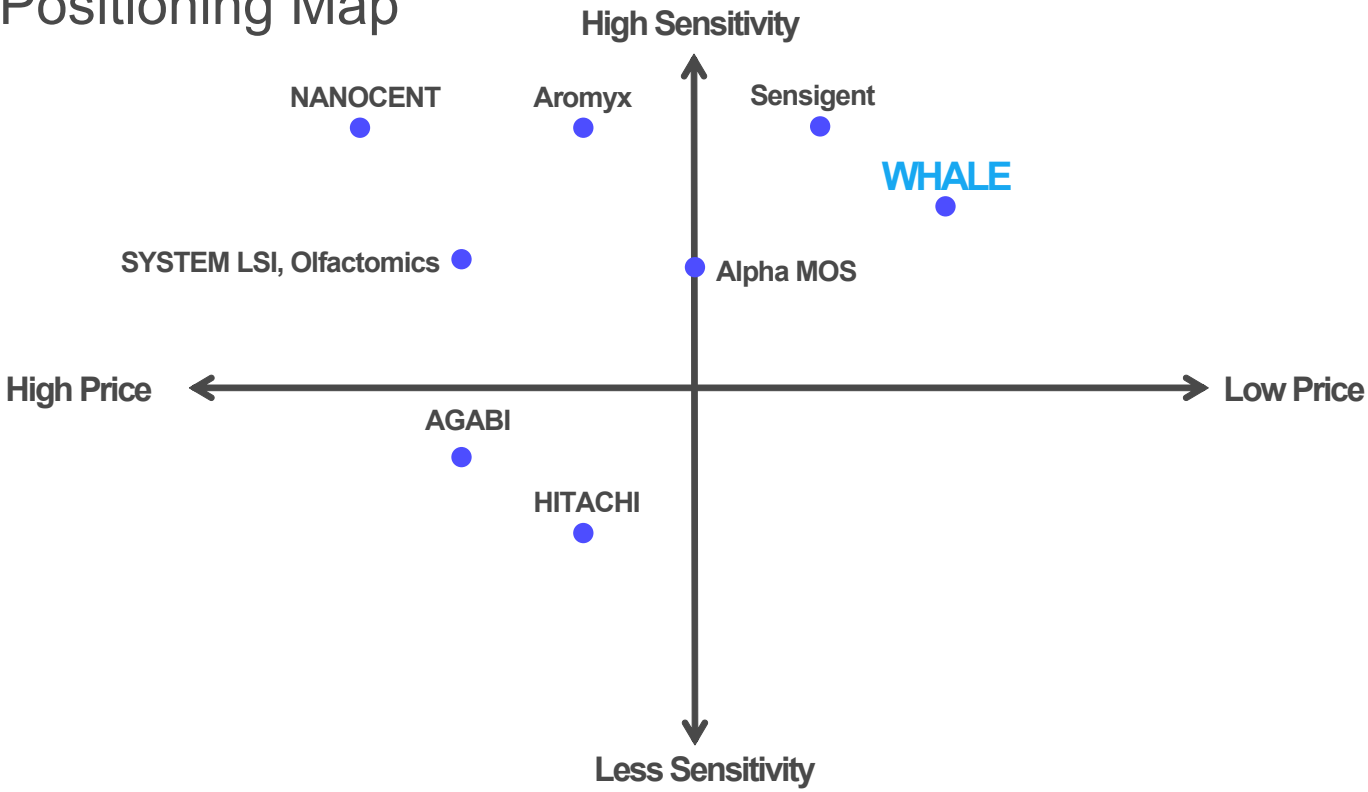
Positioning Map

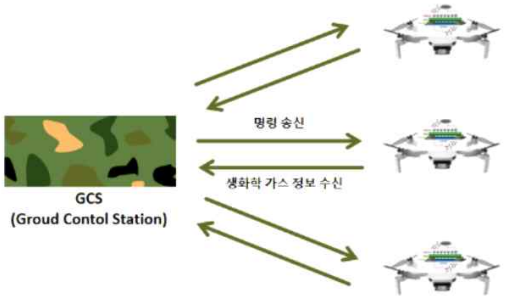


Positioning Map



Scalability

01 Biochemical weapon detection



02 Food freshness, Taste quality inspection

5

6

03 Drug detection

04 Early Diagnosis of (Seafood, Livestock Diseases)

WHALE - BACO

Until Smelling everything in the world