

CATCHERs

Early Detection, Your Best Protection

BUSINESS PLAN

Health & Nutrition (China)

Team Name: The Early Catchers

Company Name: CATCHERs Inc.

Matthew Yibo Cheng Chief of Executive & Operations officer

Xiulian Grace Cui Chief of Financial & Market Officer

Website:

<http://123.56.127.137:3838/>

Note: Our full website design is best viewed with the reader function disabled.

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Company Introduction

Officers



Matthew Yibo Cheng is the Chief Executive & Operations Officer. He oversees all activities, especially managing communication, overseeing prototype development, managing the patent filing process, and conducting market research. He also makes major decisions of the company. Matthew is an outgoing and positive fitness lover. He is passionate about using sustainable technology to solve pressing healthy challenges.

"The power of science lies in transforming complex discoveries into simple and practical tools. What we are doing is to make early cancer detection as convenient and quick as measuring just a saliva sample."



Xiulian Grace Cui is the Chief of Financial & Market Officer. Her responsibilities include maintaining funds for the team, developing plans for company, ensuring investments being properly allocated for the project.

"Early Detection, Your Best Protection! "

"Protection Over Treatment! "

"Your health is not just in your genes; it is on your tongues!"

Our Journey



As Geckos from Shekou International School, we not only accept who we are but also constantly strive to become someone who make the world better. The passion for sustainable technology to solve pressing healthy challenges united us as “The Early Catchers”.

We are motivated by witness the pain and agony endured of a loved one’s struggle with cancer, and the desperation caused by the lack of cost-effective approaches for early detection and timely treatment of cancer. Spurred by the link we drew between oral hygiene and esophageal cancer during our previous research, we pioneered the “EarlyDetect for Esophageal Cancer” prototype/Kit—a novel, non-invasive technology for early detection of esophageal cancer via a unique "oral bacterial fingerprint".

Captain Matthew brings years of experience from his collaboration with a research institution in cancer prevention. He brainstormed with Grace and implemented the innovative idea, including overseeing prototype development, managing the patent filing process, and conducting market research. Grace and Matthew crafted the business plan. We are excited to launch a polit program.

Based on our IB education and previous research experience, we have built a strong interdisciplinary foundation in biomedical science and public health. We

have mastered many cutting-edge experimental techniques and skills, which include but not limited to, marketing research, data science, microbiology. Our core strength lies on integrating scientific insight with market-awareness strategic thinking to develop novel techniques for real-world challenges. Our experience has uniquely positioned us to tackle the challenging, interdisciplinary research of the Conrad Challenge China.

Business Prospectus

Business Description

[Company Basics] CATCHERs Inc. is a pioneering biotechnology company dedicated to the early detection and auxiliary diagnosis of cancer. Our mission is to discover cancer (e.g. esophageal cancer, EC) at pre-symptomatic stages, enabling more successfully cancer treatment through timely intervention. We leverage cutting-edge (e.g. microbiome sequencing, machine learning model) to identify predicted biomarkers and construct specific detection algorithm/model at earlier and treatable stages.

[Business Model & Core Activities] CATCHERs Inc. has pioneered “EarlyDetect for Esophageal Cancer”, an efficient, cost-effective, and easy-to-use screening prototype/kit that enables early detection of esophageal cancer. By analyzing just a saliva sample, it targets 15 microbial genera that constitutes the unique "oral bacterial fingerprint" for EC patients, delivering higher sensitivity and specificity for individuals aged 40 years and over.

[The Problem & Your Solution] Currently, upper gastrointestinal endoscopy is the main approach to diagnose esophageal cancer; however, it is a type of invasive examination method and is inconvenient to be done to discover

esophageal cancer in time. The lack of cost-effective approaches for early detection of esophageal cancer caused poor five-year survival rate (less than 20%) and huge economic burden. Our innovated early detection prototype/kit, constructed by 15 specific microbial genera, can detect esophageal cancer with higher sensitivity and specificity at its earlier, most treatable stages.

[Unique Value Proposition (UVP)/Competitive Advantage] Unlike gastrointestinal endoscopy, our product is a non-invasive, user-friendly, and cost-effective tool for esophageal cancer screening. **[Sustainable Advantage]** Our proprietary dataset enabled identification of specific esophageal cancer biomarkers. The constructed detection algorithm is adaptive, ensuring continuous optimization.

[Successful Factors] We ensure the high quality/performance, the acceptable price, and the convenience of our product to attract the market. Moreover, we plan multiple channels to sell our product to customers, including engagement with government-led health screening programs, bulk sales to enterprise clients, etc. CATCHERs Inc. has partnered with multiple Local Health Commissions and hospitals to enhance our patented adaptive algorithm/model. Additionally, CATCHERs Inc. has received a \$200,000 government funding from “The 100-Billion-Yuan Investment Project in Shanxi Province” to cover the R&D and launch our first product via public health initiatives.

[Goals & Vision] Our vision is to create a better world where cancer is no longer a “Crab Monster” but a first manageable step towards a successful cure. Long-term, we strive to become the pioneer in early cancer detection. Let us help you find it before it hits you! Early detection, the best protection! Your health is on your tongue!

Market Analysis

Target Market

Epidemiological statistics indicate that the global burden of esophageal cancer is expected to escalate significantly from 511,000 new cases globally in 2022 to 874,000 new cases in 2045, representing an increase of over 70% in new cases (Figure 1). Moreover, age is one of the high-risk factors for esophageal cancer, with an increase incidence from the age of 40 years and peaking in 70 or more years (Figure 2). According to UN Population Division Data Portal, there is approximately 3 million users globally who are over 40 years old in 2024 and will dramatically increase (Figure 3). With an aging population and the increased public health awareness, the market is poised for sustained growth.

Our customer not only includes the individuals/buyers directly using the product, but also the entities purchasing the product (payers, e.g. private hospitals or commercial health examination centers), and those who can shape purchasing decisions (e.g. the National or Local Health Commission). Our target segments include demographic (e.g. age, income, location), psychographic (e.g. lifestyle, health mindset), behavioral (e.g. usage pattern), etc.

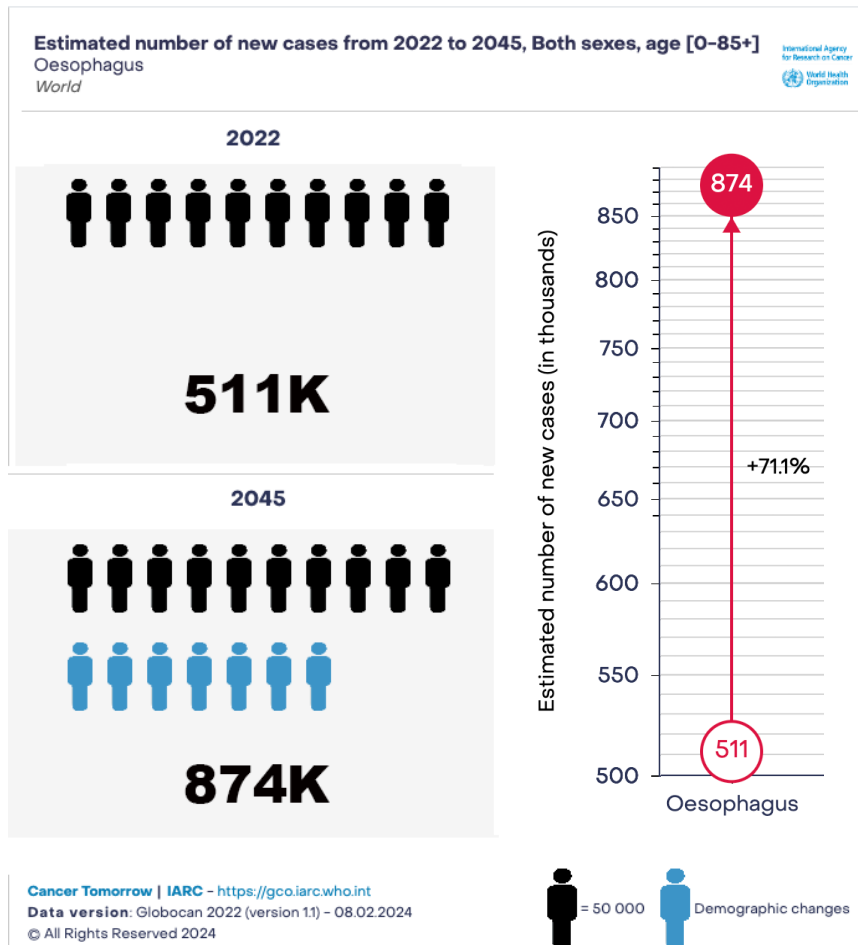


Figure 1. Global cancer incidence, death of esophageal cancer in 2022 and the number forecasts to 2045 from World Health Organization.

The population of older persons is increasing both in numbers and as a share of the total

Population pyramids: estimates, 2021, and medium projections, 2050

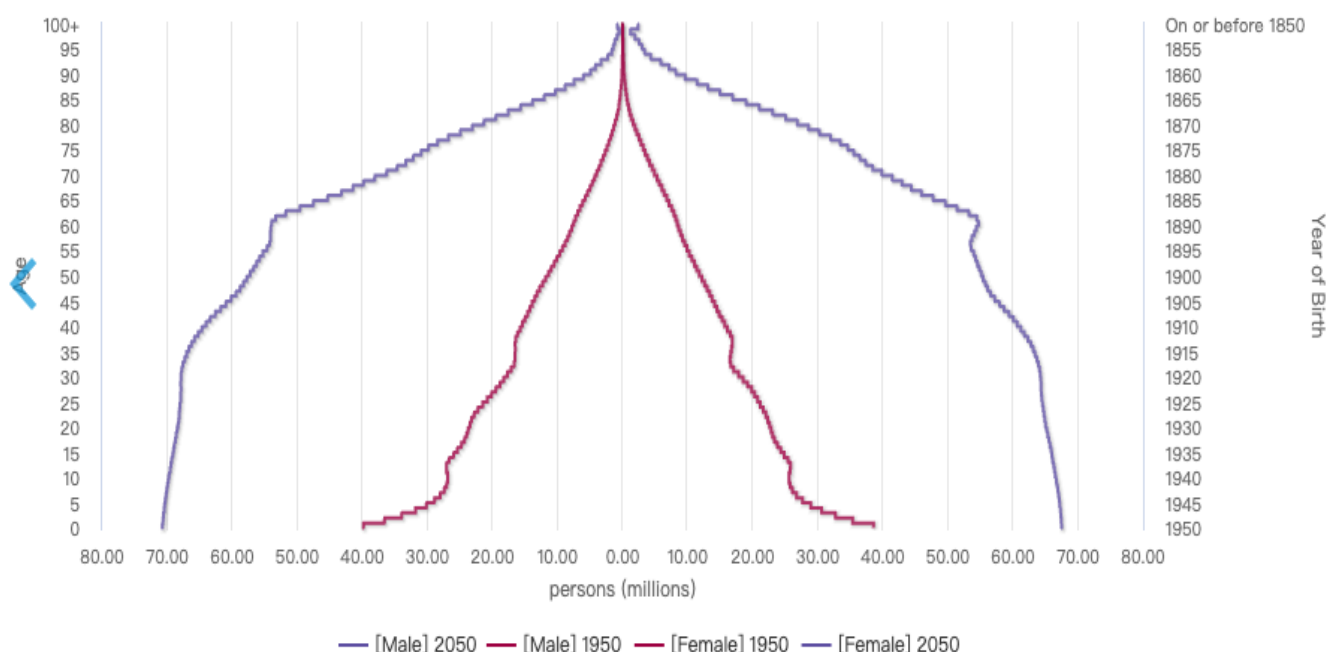


Figure 2. Changing levels of fertility, mortality and migration influence the age composition of populations. Globally and for individual countries or areas, the share of population above the age of 65 years is projected to increase, while the share below age 25 is projected to decrease between 2021 and the end of the century. Already, most populations face decreasing numbers of working-age persons (from 25 to 64 years) relative to the number of older persons (65 years and over), and within a few decades this trend is expected for all countries and areas of the world. Globally, the potential support ratio, which equals the number of persons aged 25 to 64 years divided by the number aged 65 or over, is projected to decline from 5.1 in 2021 to 3.0 in 2050 and to reach 2.0 at the end of the century. Cited from UN Population Division Data Portal (<https://population.un.org/dataportal/home?df=144e05e2-970e-485b-85b1-e0889eac381d>)

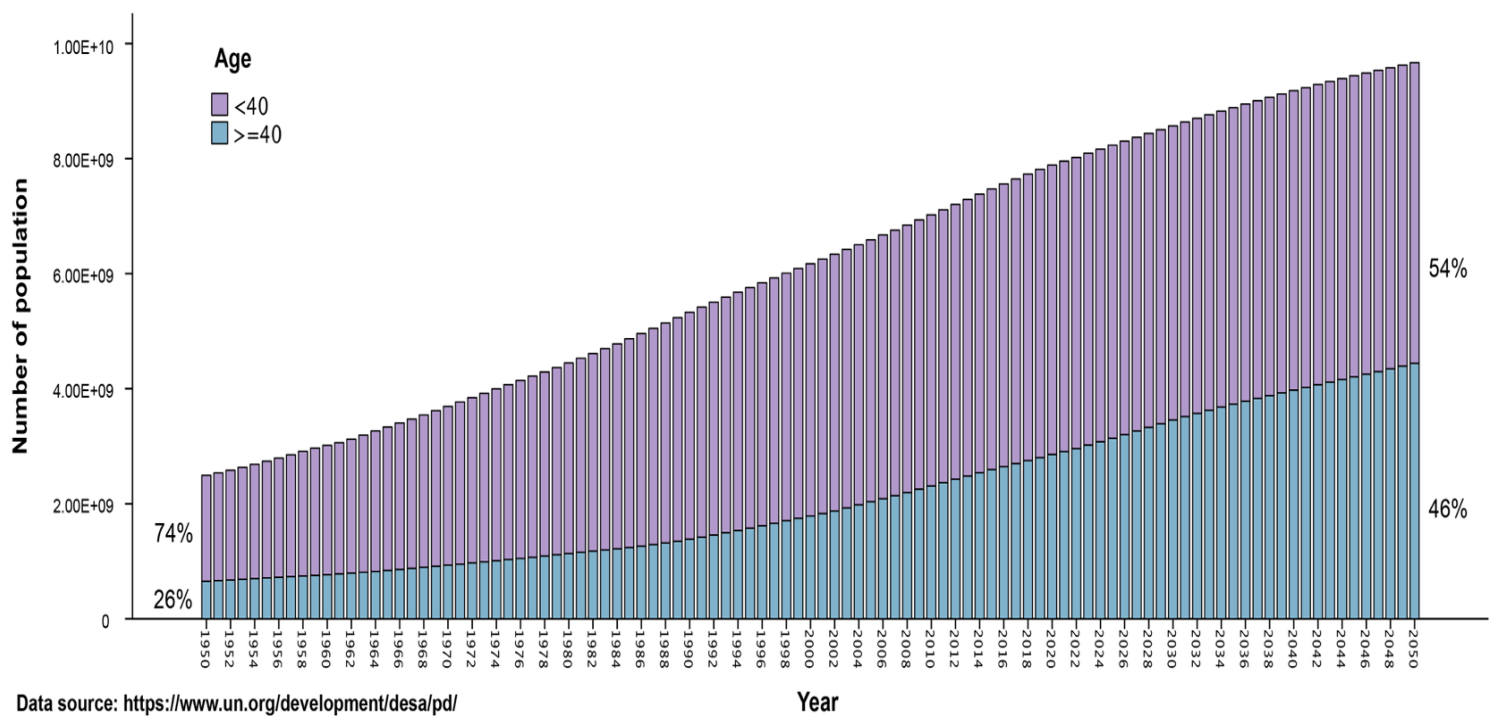


Figure 3. Total population (both sexes combined) by age less than 40 years old (purple) and more than 40 years old (blue), annually for 1950-2050. Cited from UN Population Division Data Portal (<https://population.un.org/dataportal/home?df=144e05e2-970e-485b-85b1-e0889eac381d>).

Market Penetration Strategy

CATCHERS Inc. will attract customers through multiple-channel strategy that integrates targeted digital marketing, participation in government and industry events, and engagement in healthcare conferences. The first one is professional channels. We will establish a medical advisor team to provide support for clinicians and participate in hospital tender processes, providing comparative data on kit performance and cost-effectiveness (e.g. per-test cost, detection sensitivity/specificity). The second one is government and corporate partnerships. We will collaborate with health commissions (e.g., National/Provincial/Municipal Health Commission) to launch regional screening programs with bulk procurement. We will offer group purchase plans for commercial medical examination centers or corporate employee wellness

programs. A key element of our approach is a pilot-based marketing: we will offer services at discounted rates in selected regions for brand promotion, followed by regular pricing/rates in broader regions. The last one is consumer-direct channels. We will distribute popular science knowledge about cancer testing on online platforms to drive purchases via e-commerce channels.

Competitive Analysis

CATCHERs Inc. has two primary competitors: gastrointestinal endoscopy and liquid biopsy (e.g. blood-based cancer screening). Upper gastrointestinal endoscopy is the main approach for diagnose of esophageal cancer, however, which is a type of invasive examination method and is inconvenient to be done to discover esophageal cancer in time and may cause some complications. Even so, there is insufficient endoscopy resource (e.g., equipment, the accessibility of endoscopists) given China's population base. Blood-based screening for esophageal cancer is currently in a transitional phase, moving from research to clinical application. Our innovation and blood-based screening method exhibit potential to transform the current invasive, endoscopy-dependent screening paradigm.

Our innovation shows unique value proposition. It is the first oral-microbiota-based screening prototype/kit for esophageal cancer and is scalability due to the lower cost and convenience for users. Most importantly, our data is protected by patents and proprietary, creating a significant barrier to entry. The constructed detection algorithm is adaptive, ensuring continuous optimization. This discovery is protected by patents filed both in China and internationally.

Comparison Chart

As shown in the table, compared to the main competitors, our innovation features good performance (faster, higher efficiency), more accessible (easy-to-use at home). It is more affordable because its cost is much lower than competitors. Most importantly, our innovation shows no environmental impact and is sustainability.

Table 1. Comparison chart

Metric	Our Innovation (EarlyDetect for Esophageal Cancer)	Competitor A (Gastrointestinal Endoscopy)	Competitor B (Blood-based cancer screening)
Performance	Faster (2-3 days)	At least 1 week	1-2 weeks
	Relatively accurate	Diagnosis according to microscopic morphology	Relatively accurate
User experience	More accessible, saliva self- collection	Require endoscopy resource (e.g., equipment, the accessibility of endoscopists)	Require nurses, involve blood draw
	No risk of complications	Carry risk of complications such as bleeding, adverse reactions to sedation or anesthesia	Carry risk of infection
Cost Efficiency	\$100 per unit/test	Ranges \$180~\$300 depends on painless examination or not	Ranges \$120~\$420 based on the selected blood screening panel
Resource	Ample supply	Shortage of endoscopy resources, especially in rural regions	Relatively sufficient source
Sustainability	Sustainable, No environmental impact	Lack of medical resources	Sustainable, No environmental impact
Regulatory Approval	In trials	Gold standard for clinical diagnosis	In trials

Cost

Product Expenses

Major costs of our product comprise R&D (product development, testing, and updates), marketing (event participation, sales team expenses), operational expenses (customer support, technical testing personnel), regulatory compliance (quality control, data security). Our pricing strategy includes a low-cost pilot package for early adopters and premium enterprise/government

package that aligns with customer benefits (e.g. efficiency gains).

Given that the estimated manufacturing cost per product is \$50 (Table 2), we plan to set the detection fee at \$100 per person, achieving a 50% gross margin. With a global target market of approximately 3 million users aged 40 and above, the \$100 price is expected to generate substantial profits for CATCHERS Inc. Moreover, supported by an aging population and growing public health awareness, the market is well-positioned for sustained growth.

Table 2. Product Expenses

Subsection		Estimated Cost Per Test
Material Cost		
	Consumables cost	\$15
	EP tubes	
	DNA extraction kit	
	PCR kit	
	Equipment cost	\$10
	Real-time PCR equipment	
	Centrifuge	
Manufacturing Cost		
Data analysis		\$5
Labor cost		\$10
Delivery cost		\$10
Total		\$50

Company Financials

Financial Overview Summary

CATCHERS Inc. is a pre-revenue, R&D-stage biotechnology company seeking \$200,000 of non-repayable government funding in the first two years to construct the adaptable detection algorithm for esophageal cancer, complete clinical validation, secure regulatory approval, and prepare for commercial launch. The below financial model exhibits a transition to profitability over 5 years.

Financial Chats

- **Pre-Revenue Burn (Year 1-2):** CATCHERS Inc. received \$200,000 nonrepayable funding from government, which is designed to cover expensive phase of R&D, Sales & Marketing, and General & Admin. We expect the occurrence of money loss and cash burn in the first year.
- **The Commercial Launch (Year 3):** Revenue begins, but the company is still loss-making due to Sales & Marketing investment and campaign & partnerships. Luckily, the money loss shows a decrease trend over years.
- **Path to Profitability (Year 4-5):** The company turns profitable on an operating basis as revenue scales faster than expenses. The brand gains market recognition, leading to massive cash generation.

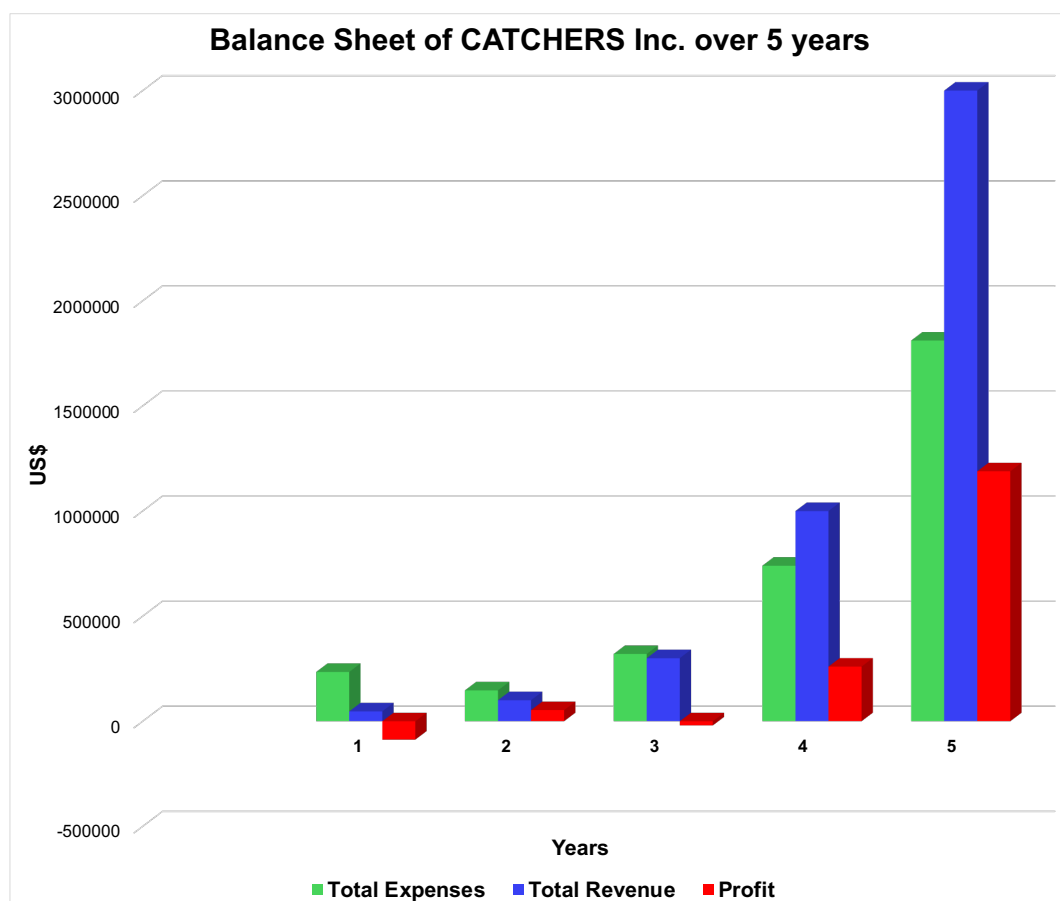


Figure 3. Graph of Expenses, Revenue, and Profit over 5 years

The financial picture reflects a high-potential and a high-risk biotech startup. The initial money losses are a strategic investment to expand the company brand, launch pilot, and capture market. Over 5 years, CATCHERS Inc. can exhibit an increasing profit (Figure 4), achieving nearly US\$ 4,647,100 of total revenue and US\$ 1,394,550 of profit, with US\$ 3,252,550 of total expenses (Table 3). Supported by an aging population and growing public health awareness, the market is well-positioned for sustained growth, and the profits of CATCHERS Inc. will continue grow.

Profit of CATCHERS Inc. over 5 Years

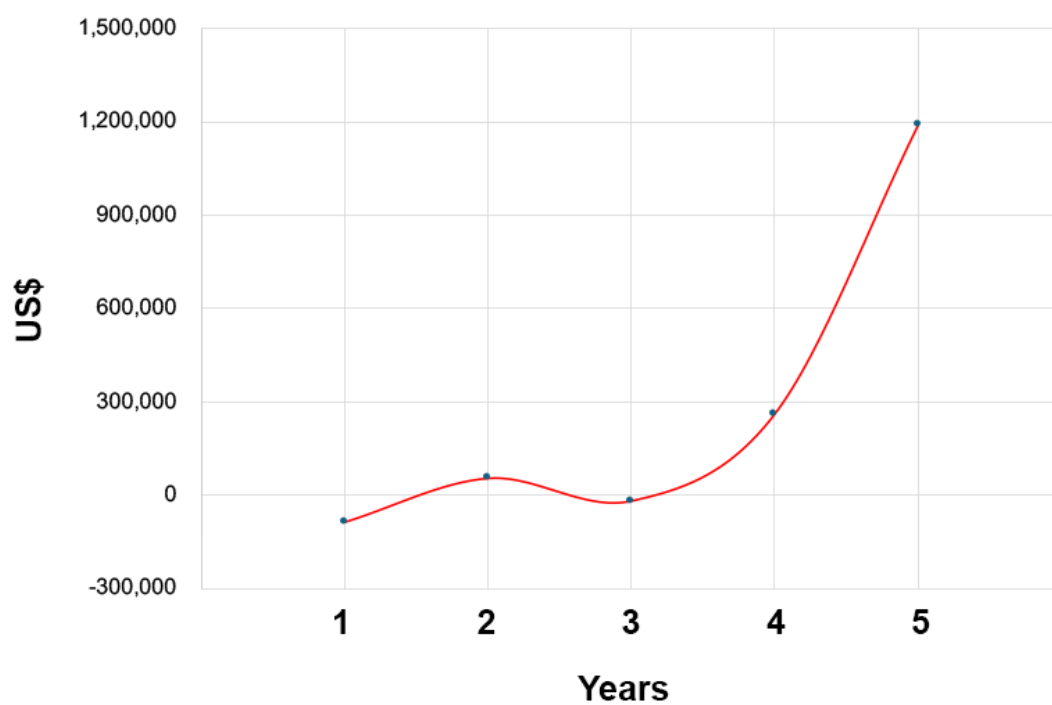


Figure 4. The trend of Profit over 5 years

Table 3. Balance Sheet & Cash Flow

Year		1	2	3	4	5	Total
		Pre-Revenue Burn	Commercial Launch	Growth	Scale	Maturity	
Estimated Operating Expenses							
Research & Development (R&D)		US\$ 60,000	US\$ 10,000	US\$ 10,000	US\$ 10,000	US\$ 10,000	US\$ 100,000
Sales & Marketing							
	Digital Media Marketing	US\$ 10,000	US\$ 10,000	US\$ 10,000	US\$ 10,000	US\$ 10,000	US\$ 50,000
	Campaign & Partnerships	US\$ 50,000	US\$ 50,000	US\$ 60,000	US\$ 70,000	US\$ 80,000	US\$ 310,000
	Officers Payroll	US\$ -	US\$ -	US\$ 50,000	US\$ 60,000	US\$ 80,000	US\$ 190,000
	Employee Wage	US\$ -	US\$ -	US\$ -	US\$ 20,000	US\$ 40,000	US\$ 60,000
	Prepaid Expenses (Equipments)	US\$ 50,000	US\$ -	US\$ -	US\$ -	US\$ -	US\$ 50,000
	Manufacturing	US\$ 10,000	US\$ 12,000	US\$ 25,000	US\$ 50,000	US\$ 50,000	US\$ 147,000
	Patents	US\$ 21,000	US\$ -	US\$ -	US\$ -	US\$ 21,000	US\$ 42,000
General & Admin (G&A)		US\$ 10,000	US\$ 15,000	US\$ 15,000	US\$ 20,000	US\$ 20,000	US\$ 80,000
Total Operating Expenses		US\$ 211,000	US\$ 97,000	US\$ 170,000	US\$ 240,000	US\$ 311,000	US\$ 1,029,000
Estimated Revenue							
Non-repayable government project revenue		US\$ 100,000	US\$ 100,000	US\$ -	US\$ -	US\$ -	US\$ -
# of Tests Sold		471	1000	3000	10,000	30,000	44471
Total Revenue of Tests Sold		US\$ 47,100	US\$ 100,000	US\$ 300,000	US\$ 1,000,000	US\$ 3,000,000	US\$ 4,447,100
Cost of Tests Sold (# of Tests Sold x Cost per Test \$50)		US\$ 23,550	US\$ 50,000	US\$ 150,000	US\$ 500,000	US\$ 1,500,000	US\$ 2,223,550
Gross Profit (Total Revenue of Tests Sold - Cost of Tests Sold)		US\$ 23,550	US\$ 50,000	US\$ 150,000	US\$ 500,000	US\$ 1,500,000	US\$ 2,223,550
Gross Margin		50%	50%	50%	50%	50%	50%
Cash Flow							
Cash Flow from Expenses		Requires Funding	Requires Funding				
	Total Operating Expenses	US\$ 211,000	US\$ 97,000	US\$ 170,000	US\$ 240,000	US\$ 311,000	US\$ 1,029,000
	Cost of Tests Sold	US\$ 23,550	US\$ 50,000	US\$ 150,000	US\$ 500,000	US\$ 1,500,000	US\$ 2,223,550
Total Cash Flow form Expenses		US\$ 234,550	US\$ 147,000	US\$ 320,000	US\$ 740,000	US\$ 1,811,000	US\$ 3,252,550
Cash Flow from Revenue							
	Non-repayable Government Project Revenue	US\$ 100,000	US\$ 100,000	US\$ -	US\$ -	US\$ -	US\$ 200,000
	Total Revenue of Tests Sold	US\$ 47,100	US\$ 100,000	US\$ 300,000	US\$ 1,000,000	US\$ 3,000,000	US\$ 4,447,100
Total Cash Flow from Revenue		US\$ 147,100	US\$ 200,000	US\$ 300,000	US\$ 1,000,000	US\$ 3,000,000	US\$ 4,647,100
Profit (Total Cash Flow from Revenue - Total Cash Flow from Expenses)		-87,450	US\$ 53,000	-20,000	US\$ 260,000	US\$ 1,189,000	US\$ 1,394,550

Funding Sources

CATCHERS Inc. features the high-impact healthcare, cutting-edge technology (like sequencing), and regulatory hurdles. So, we actively seek funding support from various channels.

Early-Stage (Seed & Series A)

This is for generating proprietary sequencing data, constructing the detection algorithm, developing the prototype, and building initial proof-of-concept data.

- **Government Funding (Non-profit)**

There are several types of government grants CATCHERS Inc. can apply, such as grants from National/Provincial/Municipal Health Commission, National/Provincial Ministry of Science and Technology, National/Provincial Development and Reform Commission, etc. CATCHERS Inc. has been awarded an amount of US\$ 200,000 of non-repayable governmental funding for Series A to initiate corporate activities, including expensive phase of R&D, Sales & Marketing, General & Admin, manufacturing, etc.

Growth-Stage (Series B)

This is for launching a pilot in a high-incidence region to validate the efficiency of our product in larger clinical cohorts, scaling the initial commercial efforts.

- **Venture Capital or Corporate Venture Capital**

After building a complete functional prototype, we plan to seek investment from Venture Capital (VC, like Danen Investment Management Co., Ltd.) or Corporate Venture Capital (CVC, like Fosun Diagnostics), which seek prototypes aligning with their existing products (e.g. diagnostics, microbiome sequencing) and can fund clinical trials.

- **Strategic Partnerships**

CATCHERS Inc. seeks cooperation with large diagnostics company who can provide milestone payments to co-develop or license our innovation technology.

Technical Concept Report

Technical Summary

CATCHERS Inc. is a pioneering biotechnology company dedicated to the early detection and auxiliary diagnosis of cancer. Our core technology platform utilizes validated salivary biomarkers for esophageal cancer and powerful bioinformatics to bridge the gap between genomic sequencing and accessible real-world clinical solutions.

We processed the raw saliva microbiome sequencing data from 844 individuals using a bioinformatics pipeline to identify specific microbial features that differentiate esophageal cancer patients from healthy controls and periodontitis patients. By analyzing these extracted features with a machine learning model—such as a random forest classifier, we developed a proprietary algorithm. The algorithm was trained on extensive, curated datasets from esophageal cancer patients, healthy individuals, and periodontitis patients. The resulting adaptive model generates the core of the “EarlyDetect for Esophageal Cancer” Kit/prototype.

In the discovery cohort (N=235), the prototype demonstrated strong key performance metrics (KPMs), with a sensitivity of 0.839—reflecting its ability to correctly identify those with esophageal cancer (true positive rate), and a specificity of 0.911—indicating its ability to correctly identify non-cancer individuals (true negative rate). These results yield an area under the curve (AUC) of 0.932 (95%CI: 0.900-0.965), reflecting high discriminative power between esophageal cancer and non- cancer cases, where a value of 1.0 represents perfect discrimination. In two independent validation cohorts, the model also exhibited robust performance, achieving an AUC of 0.856 (95% CI: 0.806-0.906) with a sensitivity of 0.768 and a specificity of 0.820 (N=236), and an AUC of 0.800 (95% CI: 0.749-0.851) with a sensitivity of 0.726 and a specificity of 0.832 (N=373).

Need Statement

Our mission is to discover cancer (e.g. esophageal cancer) at its earliest, most treatable stages using non-invasive technologies, thereby reducing cancer mortality and economic burden.

We prospect a world where cancer is no longer terrible Crab Monster, where simple accessible tests can detect cancer at earliest, most curable stages. By integrating the most advanced technologies in liquid biopsy, microbiome, and artificial intelligence, we develop highly sensitive and specific tool that serve as a vital auxiliary to clinical diagnosis.

Due to no specific symptoms in early-stage, most patients are diagnosed at advanced-stages with limited and less effective treatment options, and consequently, high mortality. Existing screening techniques are often restricted to a few cancers, invasive, or insufficiently sensitive for early-stage detection. This diagnostic gap creates delays, places a heavy economic burden, leads to patient despair, and ultimately, preventable loss of life.

We develop a non-invasive screening tool that enables early-detect of esophageal cancer. Our pioneering platform utilizes a simple saliva sample draw to detect the specific microbiota feature of esophageal cancer. Through algorithmic analysis, we not only signal esophageal cancer patients but also discriminate those with periodontitis patients. This empowers clinicians and individuals find cancer before symptoms appear, thus direct patients toward life-saving interventions sooner.

Our guiding principles include: 1) Our tests exhibit scientific rigor, which are built on a foundation of robust clinical proprietary dataset. 2) Our technology serves as an early screening tool to identify high-risk individuals for further examination; it is not a replacement for clinical endoscopy, which remains the diagnostic gold standard.

We are committed to shifting the cancer paradigm from one of fear and late-stage intervention to one of hope and early interception.

Background Technology

The existing solution addressing the detection of esophageal cancer is gastrointestinal endoscopy, which exhibits high diagnostic accuracy and is the clinical gold standard. However, while endoscopy an indispensable and powerful tool for definitive diagnosis and treatment for cancers, it presents significant limitations as a widespread screening solution. The challenges include its invasive procedures, which can cause physically uncomfortable and psychologically distressing for patients, risks of procedural complications such as bleeding and adverse reactions to sedation or anesthesia. Moreover, it requires specialized equipment and clinicians, causing high cost (\$180~300), slow results (1+ weeks), and resource scarcity. These bottlenecks lead to constrained accessibility and long waiting lists, especially in rural areas.

Most importantly, given China's vast population, the combination of invasive procedures, high cost, and resource intensity render endoscopy as a perfect screening tool for early detection of cancer.

An alternative innovation in the same field is liquid biopsy (e.g. blood-based cancer screening). Blood-based test provides a less invasive option with relatively accurate results but still requires professional blood draw and takes 1-2 weeks. Major technologies used in blood-based test include next-generation sequencing, methylation analysis, etc. Its cost varies widely (\$120~420) based on the selected panel. Moreover, due to the small amount of cancer markers (e.g., circulating tumor cells, tumor cell ctDNA, exosome), the sensitivity of blood test is relatively low and often generate false negatives, which may lead to the loss of chance for patients to be intervened in time.

Hence, the limitations of the existing technologies to early detect cancer driver for the development of less invasive, more accessible, highly sensitive & specific, and cost-effective screening alternatives.

Our innovation presents a unique and compelling value proposition. It is the first oral-microbiota-based screening prototype/kit for detection of esophageal cancer. Our core technology is based on a specific microbial model/algorithm derived from a large-scale salivary microbiome cohort and is scalability due to the adaptive algorithm, the lower cost and convenience for users. Users don't need to go to a hospital—just by providing a saliva sample, our innovation empowers customers to efficiently, accurately, and affordably assess their risk of esophageal cancer before symptoms appear. Most importantly, our data is protected by patents and proprietary, creating a significant barrier to entry.

However, we do need optimize our screening model. The constructed detection algorithm is adaptive, ensuring continuous optimization. As our product enters the market and generates more data, we will use this data to optimize the product model.

Concept Details

Our concept is Early Detection is your Best Protection—revolutionizing esophageal cancer detection through the oral microbiome.

The core technology & scientific foundation

Previous studies link oral microbiota dysbiosis to esophageal cancer, however, the predictive value remains unclear due to limited sample size and a critical lack of periodontitis patients as a control group. Since periodontitis is a known EC risk factor and its pathogens can promote cancer, distinguishing its microbial profile from EC is essential to avoid false positives.

Our technology platform is a specific microbial model/algorithm derived from a large-scale salivary microbiome cohort (healthy individuals, periodontitis patients, and esophageal cancer patients).

To identify the oral microbiota biomarkers that can distinguish esophageal

cancer patient from healthy individuals and periodontitis patients, we enrolled a cohort (N=471) including 109 of age-matched healthy volunteers, 138 of periodontitis patients, 224 of esophageal cancer patients from Shanxi Province, a well-known high-risk area for esophageal cancer. Their oral swap samples were collected and sequenced via full length 16S-rDNA sequencing technology. LEfSe was performed for differential bacteria; a detection model based on relative abundance of indicator microbiota was constructed by Random Forest analysis. Receiver Operating Characteristic (ROC) was carried out to evaluate the detection effect of constructed model.

Compared to healthy volunteers and periodontitis patients, esophageal cancer patients presented unevenly altered of some genera; 15 genera were identified as indicator microbiota for constructing the esophageal cancer detection model. The model demonstrated strong predictive performance on esophageal cancer patients screening, which achieved an AUC of 0.932 (Sensitivities=0.839; Specificities=0.911) in the discovery cohort (N=235) and an AUC of 0.856 (Sensitivities=0.768; Specificities=0.820) in the validation cohort (N=236). Moving forward, we validated our prototype via a 6-month hospital pilot, which was supported by a government-funded project to test approximately 300 clients from high-risk population in Shanxi. We achieved key performance indicators (KPIs) that exhibit an AUC of 0.800 (sensitivities 0.726; specificities 0.832) in an independent validation cohort of 373 participants (117 of age-matched healthy volunteers, 99 of periodontitis patients, 157 of esophageal cancer patients).

Based on these results, a non-invasive prototype targeting 15 genera was developed as an early detection kit for esophageal cancer which could be easy-to-use (only collecting saliva) for those high-risk individuals aged 40 years or older.

Product Portfolio

Our “EarlyDetect for Esophageal Cancer” prototype/kit includes an instruction booklet, a sterile collection tube, a sterile funnel, a cap with bacteria lysis buffer, a mailing bag, and a code that provides video instruction. It is specifically

designed for people who are over 40 years old, especially those high-risk individuals, to screen for esophageal cancer.

It functions as a highly sensitive, non-invasive, personalized test for regular monitoring. People who are positive for this test will be suggested to see doctor for next step. As expected, this kit only needs at-home saliva collection, and the saliva sample will be stored in a pre-prepared buffer included in the kit. Then, the sample can be mailed to the provided address for the following procedure, including the DNA extraction, PCR, library construction, sequencing and analyzing.

Target Market & Commercial Strategy

Our customer not only includes the individuals/buyers directly using the product, but also the entities purchasing the product (payers, e.g. private hospitals or commercial health examination centers), and those who can shape purchasing decisions (e.g. the National or Local Health Commission). Our target segments include demographic (e.g. age, income, location), psychographic (e.g. lifestyle, health mindset), behavioral (e.g. usage pattern), etc.

Our commercial strategy employs a multiple-channel approach to market penetration. We will establish a medical advisor team to provide support for clinicians and participate in hospital tender processes, providing comparative data on kit performance and cost-effectiveness (e.g. per-test cost, detection sensitivity/specificity). Simultaneously, we will form partnership with health commissions (e.g., National/Provincial/Municipal Health Commission) to launch regional screening programs with bulk procurement or commercial medical examination centers to corporate employee wellness programs. Importantly, a targeted pilot program with lower pricing will build brand presence in high-risk regions. Finally, consumer-direct channels via distribute popular science knowledge about cancer testing on online platforms will drive purchases via e-commerce channels.

Competitive Advantage

Our innovation shows unique value proposition. It is the first oral-microbiota-based screening prototype/kit for esophageal cancer and is scalability due to

the lower cost and convenience for users. Most importantly, our data is protected by patents and proprietary, creating a significant barrier to entry. The constructed detection algorithm is adaptive, ensuring continuous optimization. This discovery is protected by patents filed both in China and internationally.

Business Model

The key revenues include direct product sales to B2B clients such as government agencies, corporate customers, commercial medical examination centers. We will adopt a recurring revenue model (e.g. annual procurement contracts) to ensure sustainable cash flow. Additionally, sales of testing kit to C2C consumers via online retail channels create complementary revenue streams.

Key Team & Partners

In the early stage, we collaborated with multiple hospitals to generate proprietary saliva microbiome sequencing data, refining our detection algorithm, and establishing proof-of-concept. We have already secured US\$200,000 in non-dilutive government grants to initiate R&D and corporate operations.

In the growth stage, after building a complete functional prototype, we will seek investment from Venture Capital (like Danen Investment Management Co., Ltd.) or Corporate Venture Capital (like Fosun Diagnostics) to scale initial commercialization.

We have collaborated with Shanxi Medical University to launch a pilot-based EC screening project at Physical Examination Center of Taiyuan Steel (Group) General Hospital and The Second Hospital of Shanxi Medical University via the government's ten-billion project.

Path to Milestones

- **Pre-Revenue Burn (Year 1):** Secure initial funding, Complete phase of R&D, Sales & Marketing, and General & Admin.
- **The Commercial Launch (Year 2-3):** Launch a pilot screening project.
- **Path to Profitability (Year 4-5):** Secure key partnerships, expand into markets.

Graph Concept Representations

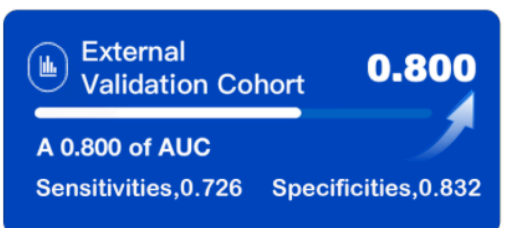
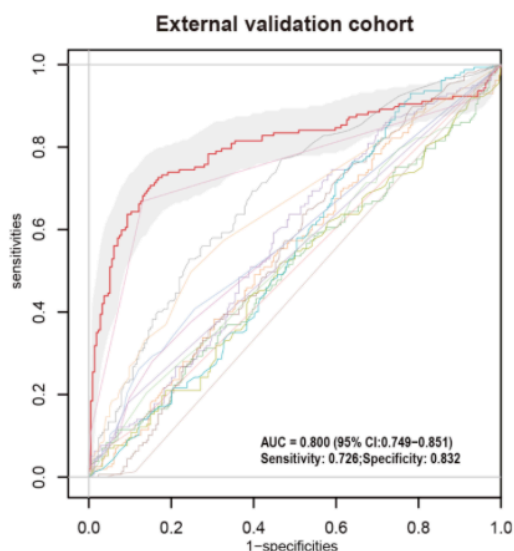
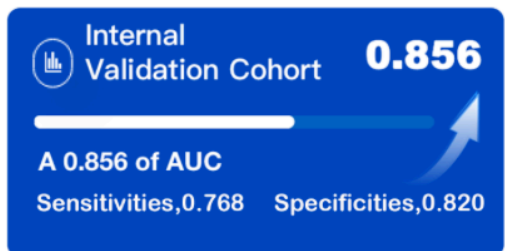
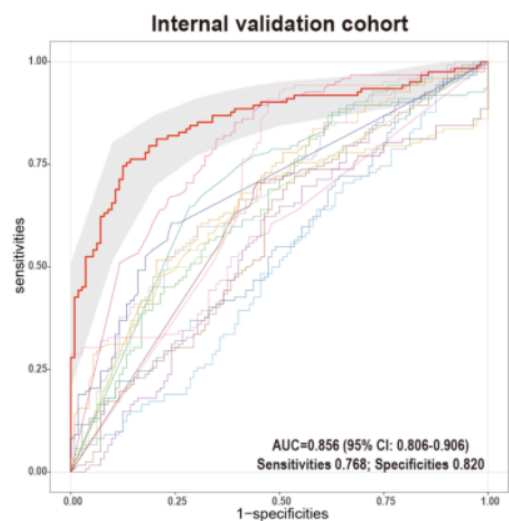
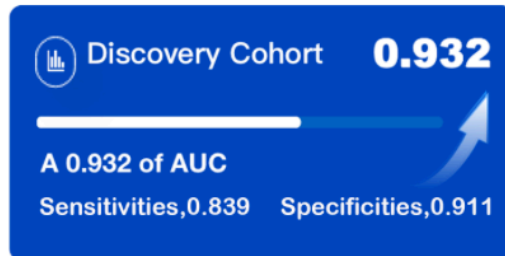
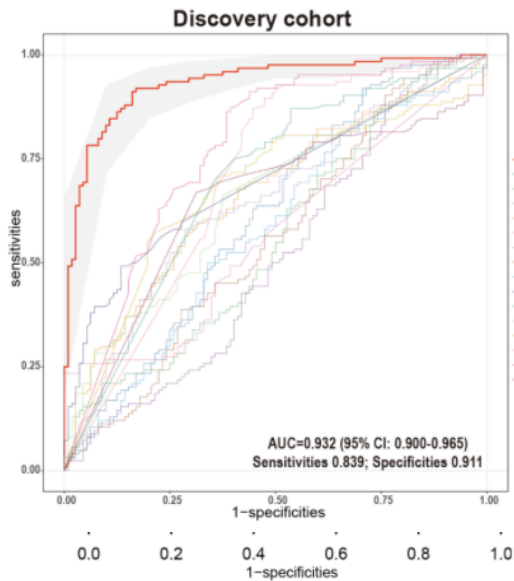


Figure 5. The diagnosis efficacy of the final EC detection model with 15 genera. A) The ROC curve for the final detection model and each bacterium in distinguishing EC patients in discovery cohort. B) The ROC curve for the final detection model and each bacterium in distinguishing EC patients in validation cohorts



Figure 6. The simple-to-use “EarlyDetect for Esophageal Cancer” kit.



Figure 7. Contents of the kit.

Conclusion

In conclusion, CATCHERS Inc. pursue a transformative approach to fight esophageal cancer by leveraging a specific oral microbial feature model in a simple oral swab to make cancer detection earlier, easier, and more effective. Our product directly solves the critical bottleneck in the late diagnosis of esophageal cancer, by shifting cancer detection to an earlier, pre-symptomatic stage.

Moving forward, we extend the conceptual stage to the utilization in the reality. Beyond a single test, we are pioneering an integrated health platform. Combined the test result with other risk factors (genetics, lifestyle, age, etc.), we can save countless lives, reduce economic burden of both countries and individuals, and redefine people's health mindsets.

Early detection, the best protection!

Your health is not just in your genes; it is on your tongues!