Eidgenössische Technische Hochschule Zürich
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Product Development Group Zurich
Produktentwicklungsgruppe Zürich

Masterthesis

LabDisk - Businessplan

Development of a Business Strategy for a Life-Science Start-up

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Independence Declaration

I hereby declare that I have written the present thesis independently and have not used other sources and aids than those stated in the bibliography.

Arnau Armengol Casali

Confirmation

This thesis was written at and accepted by pd | z Product Development Group Zurich of ETH Zurich.

Supervisors

Professor

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Acknowledgement

My thanks go to Prof. Dr. Meboldt who enabled this work. Further I want to say thank you to my supervisors Oliver Schlatter, Stephan Fox and Diane de Zelicourt for their motivation and great support.

Abriss

Die Allgegenwärtigkeit von Bakterien ist eine ständige Bedrohung der menschlichen Gesundheit. Sie ist die häufigste Ursache von Lebensmittelvergiftungen, welche einen ernsthaften Krankheitsverlauf nach sich ziehen können. Die wirtschaftlichen Auswirkungen für die Lebensmittelindustrie und die entstehenden Kosten für das Gesundheitswesen sind enorm hoch, in der Grössenordnung von mehreren Milliarden US-Dollar pro Jahr.
Diese Arbeit ist ein Businessplan für ein Startup-Unternehmen mit dem Namen Vestigo. Dieses Unternehmen entwickelt ein innovatives Gerät für die Detektion von Bakterienkontamination in Anlagen für die Lebensmittelproduktion. Dieser Businessplan soll dazu dienen, Meilensteine zu definieren und eine Strategie zu erarbeiten, um diese zu erreichen. Zudem sind weitere Informationen, wie beispielsweise eine Markt- und Konkurrenzanalysen, enthalten.

Abstract

Bacterial presence in the environment is a constant health hazard for human beings. It is the most common cause associated with food poisoning, which could lead to a severe disease. The economical impact on the food industry and health organizations is very high, in the order of several billion US-Dollars per year.
The following report is a business plan for a Start-up company, named Vestigo. This company is developing a new device to offer an innovative solution to detect pathogen contamination in food production environments. This business plan has been helpful to set clear goals and describe business strategies to achieve them. Additionally, it contains further information such as a market and competition analysis.

Contents

Executive Summary

The executive summary is a stand-alone part of this business plan and is presented as an inserted document on the next page.

EXECUTIVE SUMMARY

Food-producing companies have to test their products to avoid bacterial contamination. The main problem is the time required to run a pathogen test and obtain the results. Vestigo is a Swiss start-up, which focuses on delivering new revolutionary solutions for pathogen detection.

Currently, the methods that are used by the food industry to perform tests need on the order of 24 hours, to obtain the results. During this time, the company must keep the product in quarantine. Vestigo will provide a solution, which will allow our costumers to obtain the results within one hour. Also, unskilled personnel could operate Vestigo's device because it is not going to require technical knowledge to be used. Moreover, our device does not require a clean environment unlike other tests relying on laboratory equipment. Vestigo's system will consist of two blocks: an analysis device and a disposable cartridge. The cost saving for production line is approximately CHF 100,000 because of reduced warehouse space and less qualified personnel needed.

The initial market Vestigo is going to focus on is the food industry. A market analysis indicates that the food testing market is strong; generating annual revenues over $9[1] billion. It is projected to reach a value of $17.16[2] billion of by 2021, at a CAGR of 7.4%[2] (2016). The Swiss market is about $141,9 millions of dollars and more than five million tests are performed annually.

Vestigo's costumers are the Swiss food companies. In total, there more than 200[3] companies. Our target segments are meat, fruit and beverage companies because they have many issues with contaminated products.

The key element in Vestigo's strategy is not to market directly. We are going to work with several companies to develop a customized product in order to enrich our expertise and to understand the market needs. This will benefit both parties. Later on, Vestigo will use the knowledge gained to develop a generic device.

A review of our competitors shows that Vestigo will be competing against three multinational companies: 3M, DuPont and BioMérieux. Vestigo's competitive advantages are fastness and easiness. In contrast to our competitors, we found a new way to circumvent cell culture, which allows us to obtain the results in less than one hour.

A financial plan based on a forecast for next five years was done. Vestigo's start-up funds required are approximately CHF 270,000 for assets and operating capital. Two financing rounds are going to be raised in order to keep the activity along the first five years.

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	CHF 400'000	CHF 995'000	CHF 1'255'000	CHF 1'860'000	CHF 4'845'000
Expenditures	CHF 435'266	CHF 1'09'046	CHF 1'259'795	CHF 1'866'523	CHF 3'199'798
Net profit	CHF -35'266	CHF -154'046	CHF -4'795	CHF -6'523	CHF 1'645'202
FTE	4,5	8,5	10,75	14	16

Vestigo's business model is based on developing customized products for individual companies during the first stage. The major part of the revenue will come from selling cartridges, which is a disposable product for only one use. The more devices are sold, the more cartridges are used.

Mission: Vestigo's mission is to develop and provide a unique solution for the detection of pathogens.

[1] www.rapidbiosystems.com/problem/market-overview/
[2] www.marketsandmarkets.com/PressReleases/food-safety-testing-market.asp
[3] www.swissfoodnet.ch/food-research-switzerland/swiss-european-food-industry.htm

1 Company Summary

Vestigo will research and develop personalized and specific testing device, to aid in the detection of pathogenic organism.

1.1 Target Market

Vestigo's priority is to focus on the food sector due to its advantages over other markets. This sector allows Vestigo to find out its potential costumers without needing distribution partners. In the beginning, the company came up with the idea to focus on the medical sector. The main reason was the proximity between pathogen detection and medical field.

The main barriers of entry are:

- Economic requirements: Investment and regulatory approvals
- Distribution partners
- Competition

The food sector is the perfect place to start as a new company. There are fewer costumers than in the medical sector, hence, it is not as attractive for big companies. The following chapters will discuss this more thoroughly.

1.2 Mission

Vestigo's mission is to develop and provide a unique solution for the detection of pathogens.

1.3 Start-up Expenses

The estimated initial costs to launch the start-up company are approximately CHF 270,000, which are mostly for building up the new office, insurances, legal and accounting fees.

The highest percentage goes to building the wet laboratory (CHF 50.000) and the workshop (CHF 100.000).

The assumptions are shown in the following chart:

Table 1.1: Start-up expenses

Startup Expenses	Cost (CHF)
Building and Real State	
Remodelling	20'000
Rent deposit	10'500
Capital equipment list	
Furniture	2'000
Laboratory	50'000
Workshop	100'000
Office	10'000
Location and Admin Expenses	
Utility deposits	75
Telecommunications	200
Legal and accounting fees	6'000
Prepaid insurance	10'000
Marketing website	8'000
Other Expenses	
Software	20'000
Other expense	-
Reserve for Contingencies(15%)	36'536
Total Start-up Expenses (CHF)	273'111

The fixed assets are the facilities and equipment that the company will need to launch its activities. The total amount is CHF 162'000. Furthermore, the operating capital (CHF 111'111) is the cost to make sure Vestigo is ready to start business, such as bureaucratic papers. The total investment are the sum of the previous values plus CFH 100'000 of cash, provided by the founders.

The Start-up expenses are explained in detail in Appendix A.1.

2 Product

2.1 Problem

The main problem is the time required to perform a pathogen test. Current devices do not provide results in a short time. Additionally, laboratory facilities and a lab technician are needed to run those tests.

2.2 Product

Vestigo's team can differentiate two products for the first five years of activity. The first one is to offer food companies a customized solution to detect pathogen contamination. This solution will be a service, which will last approximately 21 months. The main objective is to develop a unique and specific device for the costumer to detect pathogen contamination in existing production lines. Vestigo claims (proven by the prototype) that it is possible to get the results from a sample within one hour. This service will focus on detecting pathogen's presence at a low concentration in watery samples. The targets are the facilities where food is manufactured.

The second product is Vestigo's generic device. After providing the service, the company will focus on developing this device by using all the knowledge gained.

2.3 Prototype

Vestigo's technology can be divided into the following areas:

- Re-concentration: Starting with a large sample (250 ml) with a low bacteria density, a high percentage (>90%) of the present pathogens

have to be collected into a small chamber. This is achieved through a filter-cascade.

- DNA-extraction and amplification: If a given pathogen is present in the initial sample, a sequence of its DNA can be defined which is unique to this organism. If this DNA sequence can be detected in a sample, it follows that the corresponding bacteria must have been present as well. To detect such a DNA sequence, the entire genome has to be extracted from the original organism. This can be done through a chemical reaction which dissolves the bacteria cell wall. Afterwards, this unique sequence needs to be amplified, such that it can be detected by a macroscopic system. For this step, several well investigated standard techniques are at our disposal (PCR, RPA or LAMP, Just to name a few).
- DNA-detection: If a positive sample was inserted, the unique DNA-sequence will have been extracted and amplified until several million copies are present in the sample. An optical system can detect an increase in fluorescence that is emitted by the copied DNA-strands.

2.4 Unique Value Proposition

The benefits for Vestigo's costumers apart from safety, speed and easiness, will be cost savings.

Vestigo is going to improve the pathogen detection through a new sample-capture technology. This technology together with Vestigo's process method will provide a fast method to obtain the results. Fast is not always synonym of safety and accuracy, but Vestigo's team managed to obtain highly significant levels of specificity and sensitivity.

The demand for a simple and easy-to-use product will be served through a design that requires short hands-on time. Thus, this product does not require laboratory knowledge. The ease-of-use leads to cost saving, using unskilled personnel such as the cleaning crew to run the test instead of professional technicians.

The average annual salary of a laboratory technician in Switzerland is about CHF 85'000 (CHF 45/hour), meanwhile, a cleaner salary is CHF 45'000(CHF 24/hour). Furthermore, the amount of hours required to run test will decrease using Vestigo's device. Assuming that a lab technician is working eight hours six days of the week running test. Vestigo assume that a cleaner could now do it in half time because it is possible to circumvent the bacteria culture. Vestigo's assumption says that our costumers will perform 1'500 tests per

month. Then, it is possible to obtain the cost to run a test. Every test run by a laboratory technician cost CHF 5,6 , while the test run by a cleaner cost CHF 1,5. The total cost of having the cleaner running the tests is CFH 27'000/year. The difference will be of CHF 74'000 per year.

Another cost benefit will be provided in the value chain and supply chain, because there is no need to store the product for more than 24 hours, any more. With Vestigo's technology, it is not required to transport the original sample to an external facility or to do a culture to obtain enough bacteria to detect their bacterial DNA. Therefore, it means less stock and no need for a warehouse to store the product. Also, there are less chances for a possible contamination in the storage site. Finally, the product such as fruits, vegetables and meats not being retained have a longer life cycle.

For example, assuming that a company has two production lines and each line produces per shift 300 pallets. Every day, each lines produces two batches. The total amount of pallets is 1200 pallets per day. The dimensions of a pallet are 1,2x 0'8 (0,96 mm^2). The room required to keep all those products in quarantine is 1'152m^2. The cost in Switzerland (Zurich canton) is approximately CHF 183/year [1]per square meter. Setting values, it is worth as CHF 210'000 each year.

Hence, the total cost saving that Vestigo could provide to its costumers will be about CHF 284'000 per year and company.

This value is indicative for medium size companies with two productions lines. There are companies that would need more or less space for its products.

2.5 Unique Selling Proposition

A unique and personal device that is adapted to costumers needs and specifications. Vestigo is going to protect its research and development by registering its intellectual property.

2.6 Future Product

Plans for future development by Vestigo include new concepts and technologies to be created by the company. For example, Vestigo will develop a generic device for food industry, as was said.

[1] *BWorld Robot Control Software* (2015)

Once an industry reputation has been achieved, the company intends to expand its products by developing new systems tailored to specific consumer segments such as medical and military. For example, in the medical sector, by introducing a new device specialized in detection of human pathogens.

Finally, Vestigo may seek to register its intellectual property, as a result of its investigation, to make profits by licensing.

3 Marketing Plan

3.1 Market Analysis

Vestigo has identified two key market sectors. The first segment is the food industry, focusing on food quality and safety. The second segment is the health care industry, aiming to provide goods and services to prevent and treat diseases.

- Food sector

  The global food testing industry generates revenues over $9 billion[1] every year. The market is projected to reach a value of $16.1 billion [2] with an annual increase of 7.4% from 2016, reaching a value of $17.16 billion by 2021. Basically, this increase of revenues will come from the areas, where food testing is still unrepresented.

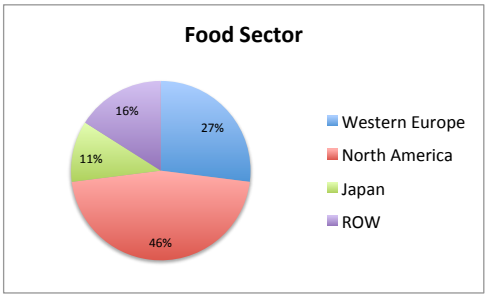

Figure 3.1: Food market[3]

The major part of revenues comes from North America (46%) and Western Europe (27%)(Figure: 3.1). Vestigo's priority is to get into these regions as soon as possible. Nevertheless, the company will focus

[1] Rapidbiosystems (2016)
[2] Rohan (2016*a*)
[3] http://rapidbiosystems.com/problem/market-overview/

on the Swiss market to develop and release its services. The Swiss food testing market is about $140 million (Appendix: C.1), scaling the market size by the ratio of Swiss gross domestic product to Western Europe GDP. Hence, the share is 4,3% GDP of Western Europe.

Furthermore, it is highly interesting to know how many tests are performed every year. According to Innoclinic Research[4], each year more than 600 million pathogen test are performed. It means that in Switzerland, approximately 6,9 million tests (Appendix: C.2) are performed and with an average cost of $15 per test.

The bottom-up approach is slightly different. Assuming that in Switzerland there are 235 food manufacturing companies with an average of two production lines, performing 750 test per line per month, it makes a total amount of 4,2 million of test performed per year (Appedinx: C.2).

- Medical sector

  The sector of the healthcare medical industry that Vestigo is interested in, are the rapid diagnostic tests named as point of care (POC). The total POC revenues is estimated to be $15.4 billion[5] ,with a at compound annual growth (CAGR) of 9.8%[6] from 2016 to 2021.

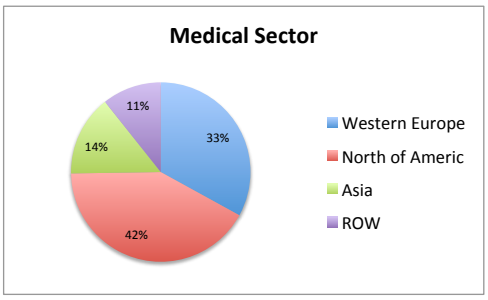

Figure 3.2: In Vitro Diagnostic total market share[7]

The medical sector looks like to be more adjusted than food. Western Europe used to have 27%, and now it has 33% (Figure: 3.2). It means that this sector is more matured and hence is not as attractive than food.

The Swiss medical testing market is about $218,5 millions (Appendix: C.3), assuming by gross domestic product(GDP), its weight is 4,3% of Western Europe.

[4]Rapidbiosystems (2016)
[5]Grandviewresearch (2016)
[6]Rohan (2016*b*)
[7]https://www.linkedin.com/pulse/birth-ivd-part-1-narayan-krishnaswami

POC diagnostics market is divided into many major segments. Vestigo would like to tailor the segment of infectious disease testing. This segment encompasses 22%[8] of POC revenues. According to DxMA Global Marketing Summit[9], infectious disease testing is expected to have a 15% grown rate. This is possible because new technologies have been developed, allowing to surpass previous limitations its limitations.

3.2 Market Segmentation

In the beginning, Vestigo will focus on food companies located in Switzerland. The food market is classified according to USDA[10], into the following sectors:

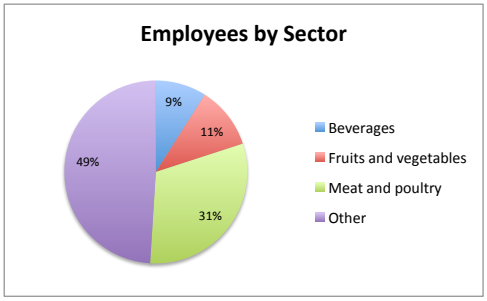

Figure 3.3: Food industry segments by employees [11]

The size of these sectors, is classified by the number of employees (Figure:3.3). Assuming similar values for Switzerland, the company will focus on these three segments: meat and poultry, fruits and vegetables, and beverage. The reason is because these segments are the biggest ones and they have contamination issues occasionally. This leads to high revenues and cost saving interest.

After identifying the top three segments, Vestigo's was interested in knowing which segments are more susceptible to suffer contamination and which pathogen causes it. In order to know the probability to suffer contamination, the proportion of outbreak-associated illnesses by each food is used, collected data from 1998-2008 (Figure: 3.4). The segments, which suffer more outbreaks are meat, poultry and fruits.

[8] *Medical market study* (2015)
[9] (2015)
[10] USDA (2013)
[11] http://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy.aspx

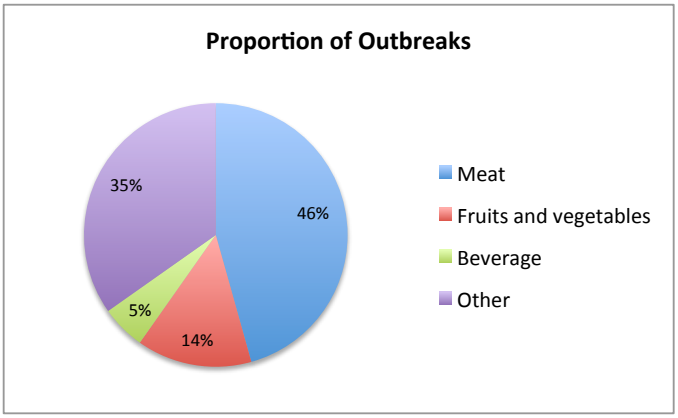

Figure 3.4: Proportion of Outbreaks [12]

The annual cost of food borne pathogens in United States (figure: 3.5), leads Vestigo's team to investigate the relationship between food segments and food-borne pathogens. It seems that the companies that have more outbreaks are specialized in the production of meat, vegetables, fruits and beverages. The outbreaks where caused by Salmonella, E.coli, Listeria and Toxoplasma Gordi.

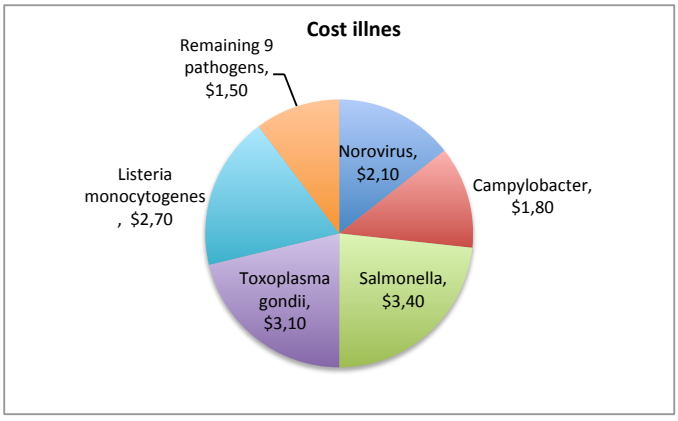

Figure 3.5: Cost illness [13]

Hence, Vestigo concludes that the type of clients that the company is looking for are those engages in the production of all kind of meats, fruit, vegetables and beverages.

[12] http://www.cdc.gov/foodsafety/fdoss/reporting/

[13] http://http://www.ers.usda.gov/amber-waves/2013-november/recent-estimates-of-the-cost-of-foodborne-illness-are-in-general-agreement.aspx

3.3 Competition

Large companies with established brand names and distribution patterns have a distinct advantage. Vestigo's success will come from competitor's weaknesses. Vestigo's competitors are mainly laboratory facilities with devices like 3M®, Du Pont® and BioMerieux®. These devices need a clean and sterile area, such as a laboratory, and need to be performed by a laboratory technician. Vestigo will offer to its costumer a device that could be performed by the unskilled personnel and without the need to be performed in a laboratory. There is no device that currently could provide these features.

The main characteristics of the competitors' devices are high specificity and sensitivity, wide range of applications (different targets). But their price device tends to be quite expensive.

Although the competitors can obtain a rapid result when the culture is done, all of them need a pre-enrichment step (overnight culture). This step lowers the limit of detection but also significantly increases test time. Finally, although, the competitors have many pathogen applications, these are still not enough to meet all food testing market.

3.4 Strategy Implementation

Table 3.1: SWOT

Strengths	**Weaknesses**
• Using new method (differentiation) • Expertise • Developing flexibility • Networking (Universities) • Swiss brand • Cost advantages from proprietary know-hows	• Lack of investment • A weak brand name • No reputation among customers • Lack of access to raw materials or natural resources • Lack of access to key distribution channels
Opportunities	**Threats**
• Partner-up with established companies • High growth-rate market • Technological change • Swiss importation barriers	• Competition (big companies) • Get the regulatory approval • Patents • Substitute products • Supply and costumers power

It is important to know what are the strengths and weaknesses of Vestigo's company in order to describe the best strategy implementation.

Vestigo's is going to use its strengths to accomplish the main objective, partner-up. Being a Swiss Start-up is synonym of quality for the costumers. The universities that are involved in Vestigo provide networking that will help contact established companies. The experience and knowledge capabilities of all Vestigo's staff, are very high and specific according to the required task.

The external environment suggests that there are good opportunities and a huge market out there. The market is growing steadily, which means it is not yet matured and saturated. There are many large companies, which are still using traditional laboratories. That means there is a great possibility to create alliances with food companies to work and innovate in the field of pathogen detection. On the other hand, Vestigo will offer a new technology that improves existing methods. Furthermore, Switzerland has a few policies

that avoid the importation of certain food in order to maintain the survival of the Swiss food industry. Hence, it means that the food must be manufactured in Switzerland and this leads to a higher presence of food industry than other countries.

Vestigo's short term strategy will be to partner-up with several established Swiss food companies. Those companies have to share a common objective: contamination detection. Strategic alliances are made for a win-win scenario. Vestigo is going to set clear goals and time frames (average 21 months). The partnership is so important for industry influencers because it could lead to gain more costumers and reputation. Vestigo's team came up with the idea to partner-up with at least three food companies before developing its own device. The main reason is the company wants to acquire knowledge and expertise in the real field and at the same time register its intellectual properties. Vestigo's partner benefits will be cost saving, customized device, shared intellectual properties and best prices for cartridges. At the same time, this strategy will allow to obtain an early cash flow that it will help to balance the expenses.

Marketing Strategy

Vestigo will employ strategy based on:

- Exhibition of Vestigo's technology in major congresses
- Write academic papers
- Win Start-up competitions and ventures
- Partner-up with food companies
- Advertising Vestigo's first product
- Deal with a large multi-national distributor

Vestigo's main objective it is a partner-up. The above listed marketing strategies only apply until such partnerships are established. Afterwards, other strategies will be defined down due to sell the future products (such as the device and cartridges) internationally.

Promotion Strategy

Vestigo's team has many connections through ETH and UZH universities. First, awareness of our product among Swiss companies has to be established.

This will be achieved through personal visits and interviews.

Pricing Strategy

Vestigo's pricing strategy for costumer projects is not set because the product would be unique and specific for each company. Depending on the needs of costumers the price would be different. Vestigo's financial department assumes that approximately CHF 25'000 monthly will be the average cost for costumers. Taking in to account that the cost savings for a company while they are using Vestigo's device are going to be about CHF 130'000 per year for a medium size company, this price is fair enough. For Vestigo's future products, it is currently difficult to establish and assume the prices.

The price of the main device is set in CHF 10'000, is cheaper than competitors. Although the margin is up to 95% because the cost of goods are low, Vestigo needs to get regulatory approval which is expensive.

Sales Forecast

Vestigo's sales have been assumed by the number of projects and costumer. Sales forecast assumes no change in cost or prices for the entire five year period.

The company has assumed that every new costumer will purchase three devices per factory, performing 1500 test per month.

The first four years, Vestigo will focus on developing costumers projects and its own generic device, hence, sales will be low, just generated by the income from project developments. Once, costumers products have been developed, Vestigo will start having income from these companies by selling them cartridges.

At the end of year four, Vestigo's device is going to be released. The more devices are in the market, the more cartridges will be sold, as is shown in Figure 3.6. The main part of Vestigo's profits will be the devices at the beginning, until the number of costumer acquisitions stabilizes. Then, the major part of the incomes will be selling cartridges because they are disposable.

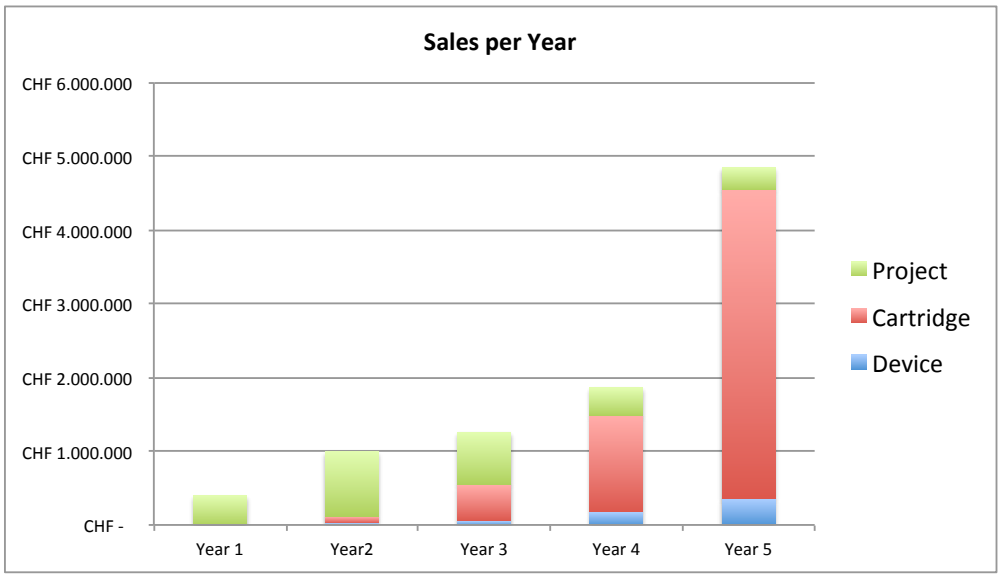

Figure 3.6: Sales per year

4 Management Summary

The founders of Vestigo are Oliver Schlatter and Diane de Zelicourt. Also they are going to be the principals of the management team.

- Oliver has finished his Master in Mechanical Engineering at ETH (2015) with a thesis on lab-on-a-chip systems and their usage in point-of-care DNA-detection devices.
- Diane is a post-doctoral fellow at the University of Zurich. Her main research drive is to address clinical needs through the convergence of engineering, cell biology and medical research. She has co-implemented a surgical planning tool that is currently used in the clinic in the USA. Over the past 4 years, she has applied micro-biology to the development of point-of-care devices for bacterial infections.

4.1 Organizational Structure

The organization chart consists of a hierarchical structure, efficient for a small number of workers.

4.2 Personnel Plan

Actually, Vestigo is working with students, who are doing their master or bachelor thesis.

Vestigo is going to hire new personnel to replace ETH and UZH students. Vestigo will hire one micro-fluid/manufacturer specialist and molecular biologist to develop each costumer's product. These people will work together with an administrative assistant to manage and distribute information among the costumers and Vestigo.

Once the project is finished, the personnel working in costumer's product will join the main Vestigo's project in order to transfer all the knowledge and expertise gained. Also, sales manager are going to be hired, who will focus on sales planning and look for new costumers. Finally, Vestigo will hire several assembly workers to produce the device and its cartridges in mass manufacturing.

The personnel plan for the next five years is related to the sales forecast. The personnel plan (table:4.1) shows the growth of the organization to approximately 12 employees in the first five years. Each year may require a few additional people besides those indicated.

Table 4.1: Personnel Plan

	Year 1	Year 2	Year 3	Year 4	Year 5
Production					
Assembly workers	-	-	50'400	134'400	134'400
Administrative					
Admin	28'000	28'000	57'600	115'200	115'200
Sales and marketing					
Sales manager	-	-	76'800	153'600	153'600
R&D					
Micro-fluids	89'600	212'800	268'600	319'200	336'000
Molecular biologist	89'600	212'800	268'600	319'200	336'000
FTE	4,5	8,5	10,75	14	16
Total Payroll (CHF)	255'112	557'322	886'023	1'277'522	1'318'733

Vestigo is going to hire the assembly workers and sales manager in year three. There is no production until the latest month of year two, which will be handled by the current personnel. Furthermore, Vestigo's costumers will be found by university networking, so the real necessity to find more customers, will only appear, when Vestigo generic project will be developed at the beginning of year three.

5 Financial Summary

The financial scenario is quite encouraging. Sales are projected to start slowly, but this is due to the necessity of developing costumers' and Vestigo's project. Vestigo's team predicts one round of financing is going to be raised:

- Seed investment of CHF 500'000, for Start-up investment and the expenses of the first year of activity.

As an exchange for the financing support, the investing party will receive preferred shares or a percentage of the company.

The proceeds from the capital will be used to build the new office (including all the equipment) and to maintain the cash-flow in positive values, after running the business operations of the company.

5.1 Profit and Loss

Vestigo does not expect high sales until the fourth year. The first three years the company is going to focus on developing the costumers' product.

Table 5.1: Profit and Loss statement

	Year 1	Year 2	Year 3	Year 4	Year 5
Total Income	400'000	995'000	1'255'000	1'860.000	4'845'.000
Total cost of sales	-	27'479	150'508	396'925	1'271'601
Gross margin	400'000	967'520	1'104'491	1'463'074	3'573'399
Total salary and wages	255'112	557'322	886'023	1'277'522	1'318'733
Total fixed expenses	106.800,00	148.204	153.826	159.675	165.762
Income from operations	38'859	261'995	64'641	25'876	2'088'903
Other expenses	69.437	69.437	69.437,00	32.400	32.400
Net income (CHF)	-31'349	192'588	-4'795	-6'523	2'056'503

The major part of the expenses comes from the cost of salary and wages. This industrial sector, where Vestigo belongs, tends to have the highest salary payroll (average 50%) due to research and development personnel. During the fifth year, the percentage of salary payroll of gross income is 55%. Probably, within the next years this percentage will decrease because the revenues will increase.

The net income from year one to year four are negative. This is the main reason why Vestigo needs additional funds.

5.2 Cash Flow

Vestigo will start the company with CHF 100'000 cash, contributed by the founders. As it is said, Vestigo will need one financing round in order to survive the firsts years. Nevertheless, after the fifth year, the cash flow will be positive.

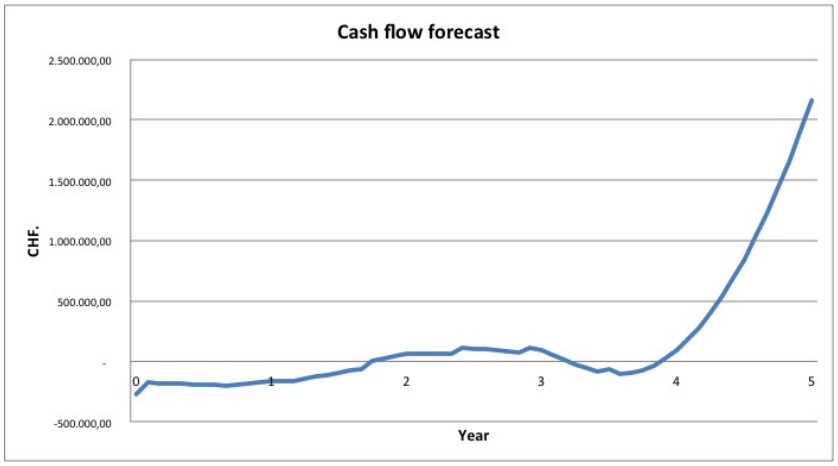

Figure 5.1: Cash flow forecast

5.3 Projected Balance Sheet

It is presented a balance sheet summary for the five years of activity. The balance sheet is not balanced in order to know the money required for the financing rounds.

Table 5.2: Balance Sheet

	Year 1	Year 2	Year 3	Year 4	Year 5
Current assets	142'725	266'632	69'278	0	2'068'440
Fixed assets	162.000	162.000	162.000	162.000	162.000
Total assets (CHF)	272'325	363'832	134'078	32'400	2'068'440
Liabilities	-	-	-	-	-
Equity	273'111	273'111	273'111	273'785	273'785
Total Liabilities and equity (CHF)	273'111	273'111	273'111	273'785	273'785

6 Conclusion

The main objective of this master thesis has been to write a business plan, which is a description for a business opportunity. It analyses the overall pathogen detection sector to provide a suitable solution in order to develop a product from its root to the constitution, taking into account all the steps required to fulfill them.

The idea came up when the founders of Vestigo realized that there was a market opportunity for an immature and growing sector. The possibility to offer a new technology, which would meet the needs of this market, suited the team.

Although, Vestigo is currently at an early stage, there is a lot of potential to achieve its objectives. Vestigo is still developing its prototype. There are many paths that Vestigo is considering to take in order to fulfill its objectives such as researching several more years. Hence, it is a scenario in constant motion.

Writing this business plan has been difficult because there was a lack of information that it was impossible to know. Many assumptions have been made in order to be as realistic as possible. The team had to assume many values to calculate the financial statement.

In addition, the business plan has been complemented with a patent research. It is important to know what technologies and method are patented to avoid infringing patents. Also, Vestigo is going to patent its own technology.

My personal reflection is that this master thesis has helped me gain knowledge in two fields I always liked: management and biomedical engineering. Furthermore, it helped me with my communication and writing skills.

A Stat-up Expenses

In this section we detail the projected costs to the business plan activity.

As for the initial costs will have a total of Fr.273.111, that costs corresponds to the expected start-up expenditure needed to start the business activity .

The highest percentage corresponds to build up the laboratory and workshop, included all the equipment required.

Table A.1: Start-up expenses

Startup Expenses	Cost (Fr.)
Building and Real State	
Remodelling	20'000
Rent deposit	10'500
Capital equipment list	
Furniture	2'000
Laboratory	50'000
Workshop	100'000
Office	10'000
Location and Admin Expenses	
Utility deposits	75
Telecommunications	200
Legal and accounting fees	6'000
Prepaid insurance	10'000
Marketing website	8'000
Other Expenses	
Software	20'000
Other expense 2	-
Reserve for Contingencies(15%)	36'536
Total Start-up Expenses (CHF)	273'111

It is going to be explained in more detail all the expenses:

A.1 Building and Real State

- Remodelling(CHF 20'000): paint the walls, reorganize rooms and windows with Vestigo's logo.
- Rent deposit (CHF 10'500): 3 months in advance for renting Vestigo's office.

A.2 Capital equipment list

- Furniture(CHF 2'000): closets, shelves, coaches, paintings.
- Laboratory(CHF 50'000): Set up standard wet laboratory (BSL-3) with all its equipment. Equipment: Centrifuge; hot plates and stirrers; refrigerated and heating baths; basic laboratory fume hoods; micro and semi-Micro balances; analogue vortex mixer; PCR machine...
- workshop(CHF 100'000): installation of all the equipment and set up of the room. Some of the equipment is going to need are: laser cutters and press, injection moulding, work bench and tools, electronics and soldering.
- Office(CHF 10'500): Computers; tables; chairs; phones; office material (paper, pens...);printer.

A.3 Location and Administrative Expenses

- Rent(CHF 3'500): Office with 120 square meters divided in 4 room.
- Utility cost (CHF 500): Electricity; heat expenses.
- Telecommunications (CHF 200): internet; calls; fax.
- Utility deposits (CHF 75): deposit of the utility cost.
- Legal and accounting fees (Fr. 6.000)[1]: Seek for legal representation and advices for run the company.
- Prepaid insurance (CHF 10'000): Insurance for the next year period. Including general liability insurance, business insurance, property insurance, commercial auto insurance.

[1]https://www.lexisnexis.com/legalnewsroom/banking/b/venture-capital/archive/2014/01/24/how-much-should-a-startup-pay-in-legal-fees.aspx

- Marketing website (CHF 8'000): Creating e-commerce website including 5 years maintenance.

Other Expenses

- Software licenses (CHF 20'000): Microsoft office®; Autocad®; Siemens NX®.
- Vehicle (CHF 2'000): Renting for van including all the vehicle expenses.
- Contingencies (CHF 36'536): 15% of Start-up expenses.

Annual Fix Cost

Table A.2: Start-up fixed expenses first year

Concept	Monthly Cost (CHF)	Annual Cost (CHF)
Salaries	21'260	255'112
Advertising	500	6'000
Renting car	2'000	24'000
Insurance premium	833	10'000
Legal and Professional Services	500	6'000
Licenses	1'000	12'000
Office expenses	200	2'400
Rent property	3'500	42'000
Cleaning service	1'000	12'000
Software License	1'666	20'000
Utility cost	500	6'000
Telecommunication	200	2'400
Depreciation	2'700	32'400
Total Start-up Expenses (CHF)	35'859	430'312

Referring to fixed costs, we have an annual expenditure of Fr. 430'312. The highest percentage corresponds to wages (69% of total costs) followed by expenses related to the local renting (9% of total costs).

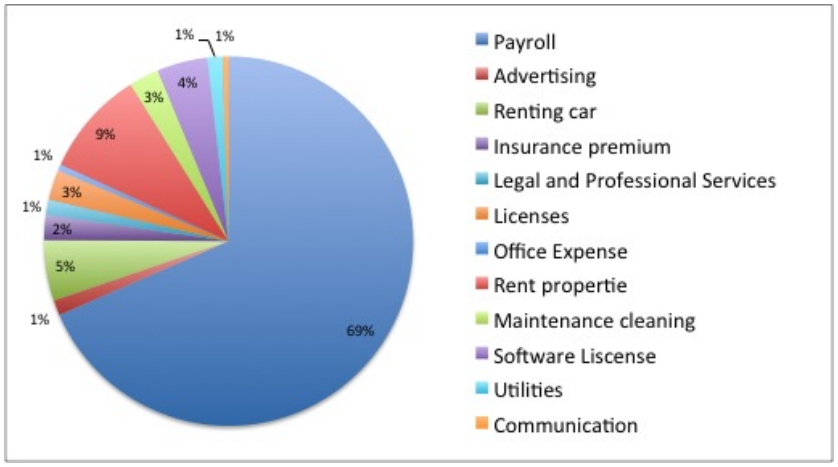

Figure A.1: Start-up fixed expenses first year

It is been assumed that the expenses has the following growth rate:

Table A.3: Annual growth rate

Concept	Annual growth rate
Salaries	3%
Advertising	5%
Renting car	3%
Insurance premium	3%
Legal and Professional Services	3%
Licenses	5%
Office expenses	3%
Rent property	3%
Cleaning service	3%
Software License	5%
Utility cost	3%
Telecommunication	3%
Depreciation	3%

Variable Cost

The variable costs associated can be seen in the next table where the initial variable costs are the expenditure related due to the device components cost (cost/device).

Table A.4: Start-up expenses

Concept	Device	Cartridge
Raw material	36	3,6
Shipment	19	0,5
Package	4,75	0,5
Direct labour	-	0
Total Variable cost per unit	59,75	4,6

B Financial Statement

Fixed Assets	Amount	Depreciation (years)
Real Estate-Land		Not Depreciated
Lab	50.000	5
workshop	100.000	5
Furniture and Fixtures	2.000	5
Office	10.000	5
Other		5
Total Fixed Assets	CHF 162.000,00	

Operating Capital	Amount
Remodeling	20.000
Prepaid Insurance Premiums	10.000
Legal and Accounting Fees	6.000
Rent Deposits	10.500
Utility Deposits	75
Advertising and Promotions	8.000
Licenses	20.000
Other Initial Start-Up Costs	36.536
Working Capital (Cash On H	-
Total Operating Capital	CHF 111.111,00
Total Required Funds	**CHF 273.111,00**

Sources of Funding	Percentage	Totals
Owner's Equity	100,00%	273.111

Complete This Chart First:				
Product Lines	**Units**	**Sales Price Per Unit**	COGS Per Unit	**Margin Per Unit**
Device		CHF 10.000,00	CHF 59,75	**CHF 9.940,25**
Reagent Kits		CHF 15,00	CHF 4,55	**CHF 10,45**
Project		CHF 25.000,00		**CHF 25.000,00**

Product Lines	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Annual Totals
Device	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Sales	-	-	-	-	-	-	-	-	-	-	-	-	-
Total COGS	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Margin	-	-	-	-	-	-	-	-	-	-	-	-	-
													-
Cartridge	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Sales	-	-	-	-	-	-	-	-	-	-	-	-	-
Total COGS	-	-	-	-	-	-	-	-	-	-	-	-	-
Margin	-	-	-	-	-	-	-	-	-	-	-	-	-
													-
project	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	2,00	2,00	2,00	2,00	**16,00**
Total Sales	25000	25000	25000	25000	25000	25000	25000	25000	50000	50000	50000	50000	**400.000,00**
Total COGS	-	-	-	-	-	-	-	-	-	-	-	-	-
Margin	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	50.000	50.000	50.000	50.000	**400.000,00**
													-
Total Units Sold	1	1	1	1	1	1	1	1	2	2	2	2	**16,00**
Total Sales	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 50.000,00**	**CHF 50.000,00**	**CHF 50.000,00**	**CHF 50.000,00**	**CHF 400.000,00**
Total Cost of Goods Sold	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**
Total Margin	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 25.000,00**	**CHF 50.000,00**	**CHF 50.000,00**	**CHF 50.000,00**	**CHF 50.000,00**	**CHF 400.000,00**

Product Lines	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Annual Totals
Device	-	-	-	-	-	-	-	-	3,00	-	-	-	**3,00**
Total Sales	-	-	-	-	-	-	-	-	30.000,00	-	-	-	**30.000,00**
Total COGS	-	-	-	-	-	-	-	-	179	-	-	-	**179,25**
Total Margin	-	-	-	-	-	-	-	-	29.821	-	-	-	**29.820,75**
													-
Cartridge	-	-	-	-	-	-	-	-	1.500,00	1.500,00	1.500,00	1.500,00	**6.000,00**
Total Sales	-	-	-	-	-	-	-	-	22.500,00	22.500,00	22.500,00	22.500,00	**90.000,00**
Total COGS	-	-	-	-	-	-	-	-	6.825	6.825	6.825	6.825	**27.300,00**
Margin	-	-	-	-	-	-	-	-	15.675	15.675	15.675	15.675	**62.700,00**
													-
project	2,00	2,00	3,00	3,00	3,00	3,00	3,00	3,00	4,00	3,00	3,00	3,00	**35,00**
Total Sales	50000	50000	75000	75000	75000	75000	75000	75000	100000	75000	75000	75000	**875.000,00**
Total COGS	-	-	-	-	-	-	-	-	-	-	-	-	-
Margin	50.000	50.000	75.000	75.000	75.000	75.000	75.000	75.000	100.000	75.000	75.000	75.000	**875.000,00**
													-
Total Units Sold	2	2	3	3	3	3	3	3	1.504	1.503	1.503	1.503	**6.035,00**
Total Sales	**CHF 50.000,00**	**CHF 50.000,00**	**CHF 75.000,00**	**CHF 75.000,00**	**CHF 75.000,00**	**CHF 75.000,00**	**CHF 75.000,00**	**CHF 75.000,00**	**CHF 152.500,00**	**CHF 97.500,00**	**CHF 97.500,00**	**CHF 97.500,00**	**CHF 995.000,00**
Total Cost of Goods Sold	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF 7.004,25**	**CHF 6.825,00**	**CHF 6.825,00**	**CHF 6.825,00**	**CHF 27.479,25**
Total Margin	**CHF 50.000,00**	**CHF 50.000,00**	**CHF 75.000,00**	**CHF 75.000,00**	**CHF 75.000,00**	**CHF 75.000,00**	**CHF 75.000,00**	**CHF 75.000,00**	**CHF 145.495,75**	**CHF 90.675,00**	**CHF 90.675,00**	**CHF 90.675,00**	**CHF 967.520,75**

Product Lines	Month 25	Month 26	Month 27	Month 28	Month 29	Month 30	Month 31	Month 32	Month 33	Month 34	Month 35	Month 36	Annual Totals
Device	-	-	-	-	3,00	-	-	-	-	-	3,00	-	**6,00**
Total Sales	-	-	-	-	30.000,00	-	-	-	-	-	30.000,00	-	**60.000,00**
Total COGS	-	-	-	-	179	-	-	-	-	-	179	-	**358,50**
Total Margin	-	-	-	-	29.821	-	-	-	-	-	29.821	-	**59.641,50**
													-
Cartridge	1.500,00	1.500,00	1.500,00	1.500,00	3.000,00	3.000,00	3.000,00	3.000,00	3.000,00	3.000,00	4.500,00	4.500,00	**33.000,00**
Total Sales	22.500,00	22.500,00	22.500,00	22.500,00	45.000,00	45.000,00	45.000,00	45.000,00	45.000,00	45.000,00	67.500,00	67.500,00	**495.000,00**
Total COGS	6.825	6.825	6.825	6.825	13.650	13.650	13.650	13.650	13.650	13.650	20.475	20.475	**150.150,00**
Margin	15.675	15.675	15.675	15.675	31.350	31.350	31.350	31.350	31.350	31.350	47.025	47.025	**344.850,00**
													-
project	3,00	3,00	3,00	3,00	3,00	2,00	2,00	2,00	2,00	2,00	2,00	1,00	**28,00**
Total Sales	75000	75000	75000	75000	75000	50000	50000	50000	50000	50000	50000	25000	**700.000,00**
Total COGS	-	-	-	-	-	-	-	-	-	-	-	-	-
Margin	75.000	75.000	75.000	75.000	75.000	50.000	50.000	50.000	50.000	50.000	50.000	25.000	**700.000,00**
													-
Total Units Sold	**1.503**	**1.503**	**1.503**	**1.503**	**3.003**	**3.002**	**3.002**	**3.002**	**3.002**	**3.002**	**4.502**	**4.501**	**33.028,00**
Total Sales	**CHF 97.500,00**	**CHF 97.500,00**	**CHF 97.500,00**	**CHF 97.500,00**	**CHF 150.000,00**	**CHF 95.000,00**	**CHF 95.000,00**	**CHF 95.000,00**	**CHF 95.000,00**	**CHF 95.000,00**	**CHF 147.500,00**	**CHF 92.500,00**	**CHF 1.255.000,00**
Total Cost of Goods Sold	**CHF 6.825,00**	**CHF 6.825,00**	**CHF 6.825,00**	**CHF 6.825,00**	**CHF 13.829,25**	**CHF 13.650,00**	**CHF 13.650,00**	**CHF 13.650,00**	**CHF 13.650,00**	**CHF 13.650,00**	**CHF 20.654,25**	**CHF 20.475,00**	**CHF 150.508,50**
Total Margin	**CHF 90.675,00**	**CHF 90.675,00**	**CHF 90.675,00**	**CHF 90.675,00**	**CHF 136.170,75**	**CHF 81.350,00**	**CHF 81.350,00**	**CHF 81.350,00**	**CHF 81.350,00**	**CHF 81.350,00**	**CHF 126.845,75**	**CHF 72.025,00**	**CHF 1.104.491,50**

Product Lines	Month 37	Month 38	Month 39	Month 40	Month 41	Month 42	Month 43	Month 44	Month 45	Month 46	Month 47	Month 48	Annual Totals
Device	-	-	-	-	-	3,00	-	3,00	3,00	3,00	3,00	3,00	**18,00**
Total Sales	-	-	-	-	-	30.000,00	-	30.000,00	30.000,00	30.000,00	30.000,00	30.000,00	**180.000,00**
Total COGS	-	-	-	-	-	179	-	179	179	179	179	179	**1.075,50**
Total Margin	-	-	-	-	-	29.821	-	29.821	29.821	29.821	29.821	29.821	**178.924,50**
													-
Cartridge	4.500,00	4.500,00	4.500,00	4.500,00	4.500,00	6.000,00	6.000,00	7.500,00	9.000,00	10.500,00	12.000,00	13.500,00	**87.000,00**
Total Sales	67.500,00	67.500,00	67.500,00	67.500,00	67.500,00	90.000,00	90.000,00	112.500,00	135.000,00	157.500,00	180.000,00	202.500,00	**1.305.000,00**
Total COGS	20.475	20.475	20.475	20.475	20.475	27.300	27.300	34.125	40.950	47.775	54.600	61.425	**395.850,00**
Margin	47.025	47.025	47.025	47.025	47.025	62.700	62.700	78.375	94.050	109.725	125.400	141.075	**909.150,00**
													-
project	1,00	1,00	1,00	2,00	2,00	2,00	1,00	1,00	1,00	1,00	1,00	1,00	**15,00**
Total Sales	25000	25000	25000	50000	50000	50000	25000	25000	25000	25000	25000	25000	**375.000,00**
Total COGS	-	-	-	-	-	-	-	-	-	-	-	-	-
Margin	25.000	25.000	25.000	50.000	50.000	50.000	25.000	25.000	25.000	25.000	25.000	25.000	**375.000,00**
													-
Total Units Sold	**4.501**	**4.501**	**4.501**	**4.502**	**4.502**	**6.002**	**6.001**	**7.501**	**9.001**	**10.501**	**12.001**	**13.501**	**87.015,00**
Total Sales	**CHF 92.500,00**	**CHF 92.500,00**	**CHF 92.500,00**	**CHF 117.500,00**	**CHF 117.500,00**	**CHF 170.000,00**	**CHF 115.000,00**	**CHF 167.500,00**	**CHF 190.000,00**	**CHF 212.500,00**	**CHF 235.000,00**	**CHF 257.500,00**	**CHF 1.860.000,00**
Total Cost of Goods Sold	**CHF 20.475,00**	**CHF 20.475,00**	**CHF 20.475,00**	**CHF 20.475,00**	**CHF 20.475,00**	**CHF 27.479,25**	**CHF 27.300,00**	**CHF 34.304,25**	**CHF 41.129,25**	**CHF 47.954,25**	**CHF 54.779,25**	**CHF 61.604,25**	**CHF 396.925,50**
Total Margin	**CHF 72.025,00**	**CHF 72.025,00**	**CHF 72.025,00**	**CHF 97.025,00**	**CHF 97.025,00**	**CHF 142.520,75**	**CHF 87.700,00**	**CHF 133.195,75**	**CHF 148.870,75**	**CHF 164.545,75**	**CHF 180.220,75**	**CHF 195.895,75**	**CHF 1.463.074,50**

Product Lines	Month 49	Month 50	Month 51	Month 52	Month 53	Month 54	Month 55	Month 56	Month 57	Month 58	Month 59	Month 60	Annual Totals
Device	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	**36,00**
Total Sales	30.000,00	30.000,00	30.000,00	30.000,00	30.000,00	30.000,00	30.000,00	30.000,00	30.000,00	30.000,00	30.000,00	30.000,00	**360.000,00**
Total COGS	179	179	179	179	179	179	179	179	179	179	179	179	**2.151,00**
Total Margin	29.821	29.821	29.821	29.821	29.821	29.821	29.821	29.821	29.821	29.821	29.821	29.821	**357.849,00**
													-
Cartridge	15.000,00	16.500,00	18.000,00	19.500,00	21.000,00	22.500,00	24.000,00	25.500,00	27.000,00	28.500,00	30.000,00	31.500,00	**279.000,00**
Total Sales	225.000,00	247.500,00	270.000,00	292.500,00	315.000,00	337.500,00	360.000,00	382.500,00	405.000,00	427.500,00	450.000,00	472.500,00	**4.185.000,00**
Total COGS	68.250	75.075	81.900	88.725	95.550	102.375	109.200	116.025	122.850	129.675	136.500	143.325	**1.269.450,00**
Margin	156.750	172.425	188.100	203.775	219.450	235.125	250.800	266.475	282.150	297.825	313.500	329.175	**2.915.550,00**
													-
project	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	**12,00**
Total Sales	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	**300.000,00**
Total COGS	-	-	-	-	-	-	-	-	-	-	-	-	-
Margin	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	**300.000,00**
													-
Total Units Sold	**15.001**	**16.501**	**18.001**	**19.501**	**21.001**	**22.501**	**24.001**	**25.501**	**27.001**	**28.501**	**30.001**	**31.501**	**279.012,00**
Total Sales	**CHF 280.000,00**	**CHF 302.500,00**	**CHF 325.000,00**	**CHF 347.500,00**	**CHF 370.000,00**	**CHF 392.500,00**	**CHF 415.000,00**	**CHF 437.500,00**	**CHF 460.000,00**	**CHF 482.500,00**	**CHF 505.000,00**	**CHF 527.500,00**	**CHF 4.845.000,00**
Total Cost of Goods Sold	**CHF 68.429,25**	**CHF 75.254,25**	**CHF 82.079,25**	**CHF 88.904,25**	**CHF 95.729,25**	**CHF 102.554,25**	**CHF 109.379,25**	**CHF 116.204,25**	**CHF 123.029,25**	**CHF 129.854,25**	**CHF 136.679,25**	**CHF 143.504,25**	**CHF 1.271.601,00**
Total Margin	**CHF 211.570,75**	**CHF 227.245,75**	**CHF 242.920,75**	**CHF 258.595,75**	**CHF 274.270,75**	**CHF 289.945,75**	**CHF 305.620,75**	**CHF 321.295,75**	**CHF 336.970,75**	**CHF 352.645,75**	**CHF 368.320,75**	**CHF 383.995,75**	**CHF 3.573.399,00**

Operating Expenses Year 1

Line Item	First Year	Growth Rate 1 to 2	Second Year	Growth Rate 2 to 3	Third Year	Growth Rate 13 to 4	Four Year	Growth Rate 4 to 5	Fifth Year
Expenses									
Advertising	6.000	3,0%	6.180	3,0%	6.365	3,0%	6.556	3,0%	6.753
Renting car	24.000	5,0%	25.200	5,0%	26.460	5,0%	27.783	5,0%	29.172
Insurance premium	10.000	3,0%	10.300	3,0%	10.609	3,0%	10.927	3,0%	11.255
Legal and Professional Services	6.000	3,0%	6.180	3,0%	6.365	3,0%	6.556	3,0%	6.753
Licenses	12.000	5,0%	12.600	5,0%	13.230	5,0%	13.892	5,0%	14.586
Office Expense	2.400	3,0%	2.472	3,0%	2.546	3,0%	2.623	3,0%	2.701
Rent propertie	42.000	3,0%	43.260	3,0%	44.558	3,0%	45.895	3,0%	47.271
Maintenance cleaning	12.000	3,0%	12.360	3,0%	12.731	3,0%	13.113	3,0%	13.506
Software Liscense	20.000	5,0%	21.000	5,0%	22.050	5,0%	23.153	5,0%	24.310
Utilities	6.000	3,0%	6.180	3,0%	6.365	3,0%	6.556	3,0%	6.753
Communication	2.400	3,0%	2.472	3,0%	2.546	3,0%	2.623	3,0%	2.701
Total Expenses	CHF 142.800,00		CHF 148.204,00		CHF 153.826,12		CHF 159.675,70		CHF 165.762,51
Other Expenses									
Depreciation	32.400,00 €		32.400,00 €		32.400,00 €		32.400,00 €		32.400,00 €
Total Other Expenses									
Total Fixed Operating Expenses	CHF 175.200,00		CHF 180.604,00		CHF 186.226,12		CHF 192.075,70		CHF 198.162,51

Cash Flow Forecast Years 1-3

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Year 1 Totals
Beginning Balance	CHF 100.000,00	CHF 96.719,60	CHF 93.439,20	CHF 90.158,80	CHF 86.878,40	CHF 83.598,00	CHF 80.317,60	CHF 77.037,20	CHF 73.756,80	CHF 81.739,60	CHF 89.722,40	CHF 97.705,20	
Cash Inflows													
Cash Sales	25.000	25.000	25.000	25.000	25.000	25.000	25.000	25.000	50.000	50.000	50.000	50.000	**CHF 400.000,00**
Total Cash Inflows	CHF 25.000,00	CHF 25.000,00	CHF 25.000,00	CHF 25.000,00	CHF 25.000,00	CHF 25.000,00	CHF 25.000,00	CHF 25.000,00	CHF 50.000,00	CHF 50.000,00	CHF 50.000,00	CHF 50.000,00	**CHF 400.000,00**
Cash Outflows													
Cost of Goods Sold	-	-	-	-	-	-	-	-	-	-	-	-	**CHF -**
Operating Activities													
Operating Expenses	11.600	11.600	11.600	11.600	11.600	11.600	11.600	11.600	11.600	11.600	11.600	11.600	**CHF 139.200,00**
Payroll	13.600	13.600	13.600	13.600	13.600	13.600	13.600	13.600	24.800	24.800	24.800	24.800	**CHF 208.000,00**
Taxes	3.080	3.080	3.080	3.080	3.080	3.080	3.080	3.080	5.617	5.617	5.617	5.617	CHF 47.112,00
Total Cash Outflows	CHF 28.280,40	CHF 28.280,40	CHF 28.280,40	CHF 28.280,40	CHF 28.280,40	CHF 28.280,40	CHF 28.280,40	CHF 28.280,40	CHF 42.017,20	CHF 42.017,20	CHF 42.017,20	CHF 42.017,20	**CHF 394.312,00**
Net Cash Flows	CHF -3.280,40	CHF -3.280,40	CHF -3.280,40	CHF -3.280,40	CHF -3.280,40	CHF -3.280,40	CHF -3.280,40	CHF -3.280,40	CHF 7.982,80	CHF 7.982,80	CHF 7.982,80	CHF 7.982,80	**CHF 105.688,00**
Operating Cash Balance	CHF 96.719,60	CHF 93.439,20	CHF 90.158,80	CHF 86.878,40	CHF 83.598,00	CHF 80.317,60	CHF 77.037,20	CHF 73.756,80	CHF 81.739,60	CHF 89.722,40	CHF 97.705,20	CHF 105.688,00	
Ending Cash Balance	CHF 96.719,60	CHF 93.439,20	CHF 90.158,80	CHF 86.878,40	CHF 83.598,00	CHF 80.317,60	CHF 77.037,20	CHF 73.756,80	CHF 81.739,60	CHF 89.722,40	CHF 97.705,20	CHF 105.688,00	

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Year 2 Totals
Beginning Balance	CHF 105.688,00	CHF 110.220,47	CHF 114.752,93	CHF 130.548,60	CHF 146.344,27	CHF 162.139,93	CHF 177.935,60	CHF 193.731,27	CHF 209.526,93	CHF 282.081,55	CHF 299.815,42	CHF 317.549,28	
Cash Inflows													
Cash Sales	50.000	50.000	75.000	75.000	75.000	75.000	75.000	75.000	152.500	97.500	97.500	97.500	**CHF 995.000,00**
Total Cash Inflows	CHF 50.000,00	CHF 50.000,00	CHF 75.000,00	CHF 75.000,00	CHF 75.000,00	CHF 75.000,00	CHF 75.000,00	CHF 75.000,00	CHF 152.500,00	CHF 97.500,00	CHF 97.500,00	CHF 97.500,00	**CHF 995.000,00**
Cash Outflows													
Cost of Goods Sold	-	-	-	-	-	-	-	-	7.004	6.825	6.825	6.825	**CHF 27.479,25**
Operating Activities													
Operating Expenses	15.050	15.050	15.050	15.050	15.050	15.050	15.050	15.050	15.050	15.050	15.050	15.050	**CHF 180.604,00**
Payroll	24.800	24.800	36.000	36.000	36.000	36.000	36.000	36.000	47.200	47.200	47.200	47.200	**CHF 454.400,00**
Taxes	5.617	5.617	8.154	8.154	8.154	8.154	8.154	8.154	10.691	10.691	10.691	10.691	CHF 102.921,60
Total Cash Outflows	CHF 45.467,53	CHF 45.467,53	CHF 59.204,33	CHF 59.204,33	CHF 59.204,33	CHF 59.204,33	CHF 59.204,33	CHF 59.204,33	CHF 79.945,38	CHF 79.766,13	CHF 79.766,13	CHF 79.766,13	**CHF 765.404,85**
Net Cash Flows	CHF 4.532,47	CHF 4.532,47	CHF 15.795,67	CHF 15.795,67	CHF 15.795,67	CHF 15.795,67	CHF 15.795,67	CHF 15.795,67	CHF 72.554,62	CHF 17.733,87	CHF 17.733,87	CHF 17.733,87	**CHF 229.595,15**
Operating Cash Balance	CHF 110.220,47	CHF 114.752,93	CHF 130.548,60	CHF 146.344,27	CHF 162.139,93	CHF 177.935,60	CHF 193.731,27	CHF 209.526,93	CHF 282.081,55	CHF 299.815,42	CHF 317.549,28	CHF 335.283,15	
Ending Cash Balance	CHF 110.220,47	CHF 114.752,93	CHF 130.548,60	CHF 146.344,27	CHF 162.139,93	CHF 177.935,60	CHF 193.731,27	CHF 209.526,93	CHF 282.081,55	CHF 299.815,42	CHF 317.549,28	CHF 335.283,15	

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Year 3 Totals
Beginning Balance	CHF 335.283,15	CHF 336.604,01	CHF 337.924,86	CHF 339.245,72	CHF 340.566,58	CHF 387.383,18	CHF 379.379,04	CHF 371.374,90	CHF 363.370,75	CHF 355.366,61	CHF 347.362,47	CHF 384.854,07	
Cash Inflows													
Cash Sales	97.500	97.500	97.500	97.500	150.000	95.000	95.000	95.000	95.000	95.000	147.500	92.500	**CHF 1.255.000,00**
Total Cash Inflows	CHF 97.500,00	CHF 97.500,00	CHF 97.500,00	CHF 97.500,00	CHF 150.000,00	CHF 95.000,00	CHF 95.000,00	CHF 95.000,00	CHF 95.000,00	CHF 95.000,00	CHF 147.500,00	CHF 92.500,00	**CHF 1.255.000,00**
Cash Outflows													
Cost of Goods Sold	6.825	6.825	6.825	6.825	13.829	13.650	13.650	13.650	13.650	13.650	20.654	20.475	**CHF 150.508,50**
Operating Activities													
Operating Expenses	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	**CHF 186.226,12**
Payroll	60.200	60.200	60.200	60.200	60.200	60.200	60.200	60.200	60.200	60.200	60.200	60.200	**CHF 722.400,00**
Taxes	13.635	13.635	13.635	13.635	13.635	13.635	13.635	13.635	13.635	13.635	13.635	13.635	CHF 163.623,60
Total Cash Outflows	CHF 96.179,14	CHF 96.179,14	CHF 96.179,14	CHF 96.179,14	CHF 103.183,39	CHF 103.004,14	CHF 103.004,14	CHF 103.004,14	CHF 103.004,14	CHF 103.004,14	CHF 110.008,39	CHF 109.829,14	**CHF 1.222.758,22**
Net Cash Flows	CHF 1.320,86	CHF 1.320,86	CHF 1.320,86	CHF 1.320,86	CHF 46.816,61	CHF -8.004,14	CHF -8.004,14	CHF -8.004,14	CHF -8.004,14	CHF -8.004,14	CHF 37.491,61	CHF -17.329,14	**CHF 32.241,78**
Operating Cash Balance	CHF 336.604,01	CHF 337.924,86	CHF 339.245,72	CHF 340.566,58	CHF 387.383,18	CHF 379.379,04	CHF 371.374,90	CHF 363.370,75	CHF 355.366,61	CHF 347.362,47	CHF 384.854,07	CHF 367.524,93	
Ending Cash Balance	CHF 336.604,01	CHF 337.924,86	CHF 339.245,72	CHF 340.566,58	CHF 387.383,18	CHF 379.379,04	CHF 371.374,90	CHF 363.370,75	CHF 355.366,61	CHF 347.362,47	CHF 384.854,07	CHF 367.524,93	

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Year 4 Totals
Beginning Balance	CHF 367.524,93	CHF 327.873,49	CHF 288.222,04	CHF 248.570,60	CHF 220.182,36	CHF 191.794,11	CHF 208.901,62	CHF 171.188,38	CHF 178.970,88	CHF 202.428,39	CHF 241.560,90	CHF 296.368,40	
Cash Inflows													
Cash Sales	92.500	92.500	92.500	117.500	117.500	170.000	115.000	167.500	190.000	212.500	235.000	257.500	**CHF 1.860.000,00**
Total Cash Inflows	CHF 92.500,00	CHF 92.500,00	CHF 92.500,00	CHF 117.500,00	CHF 117.500,00	CHF 170.000,00	CHF 115.000,00	CHF 167.500,00	CHF 190.000,00	CHF 212.500,00	CHF 235.000,00	CHF 257.500,00	**CHF 1.860.000,00**
Cash Outflows													
Cost of Goods Sold	20.475	20.475	20.475	20.475	20.475	27.479	27.300	34.304	41.129	47.954	54.779	61.604	**CHF 396.925,50**
Operating Activities													
Operating Expenses	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	**CHF 186.226,12**
Payroll	78.400	78.400	78.400	89.600	89.600	89.600	89.600	89.600	89.600	89.600	89.600	89.600	**CHF 1.041.600,00**
Taxes	17.758	17.758	17.758	20.294	20.294	20.294	20.294	20.294	20.294	20.294	20.294	20.294	CHF 235.922,40
Total Cash Outflows	CHF 132.151,44	CHF 132.151,44	CHF 132.151,44	CHF 145.888,24	CHF 145.888,24	CHF 152.892,49	CHF 152.713,24	CHF 159.717,49	CHF 166.542,49	CHF 173.367,49	CHF 180.192,49	CHF 187.017,49	**CHF 1.860.674,02**
Net Cash Flows	CHF -39.651,44	CHF -39.651,44	CHF -39.651,44	CHF -28.388,24	CHF -28.388,24	CHF 17.107,51	CHF -37.713,24	CHF 7.782,51	CHF 23.457,51	CHF 39.132,51	CHF 54.807,51	CHF 70.482,51	**CHF -674,02**
Operating Cash Balance	CHF 327.873,49	CHF 288.222,04	CHF 248.570,60	CHF 220.182,36	CHF 191.794,11	CHF 208.901,62	CHF 171.188,38	CHF 178.970,88	CHF 202.428,39	CHF 241.560,90	CHF 296.368,40	CHF 366.850,91	
Ending Cash Balance	CHF 327.873,49	CHF 288.222,04	CHF 248.570,60	CHF 220.182,36	CHF 191.794,11	CHF 208.901,62	CHF 171.188,38	CHF 178.970,88	CHF 202.428,39	CHF 241.560,90	CHF 296.368,40	CHF 366.850,91	

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Year 5 Totals
Beginning Balance	CHF 366.850,91	CHF 453.008,42	CHF 554.840,92	CHF 672.348,43	CHF 805.530,94	CHF 954.388,44	CHF 1.118.920,95	CHF 1.299.128,46	CHF 1.495.010,96	CHF 1.706.568,47	CHF 1.933.800,98	CHF 2.176.708,48	
Cash Inflows													
Cash Sales	280.000	302.500	325.000	347.500	370.000	392.500	415.000	437.500	460.000	482.500	505.000	527.500	**CHF 4.845.000,00**
Total Cash Inflows	CHF 280.000,00	CHF 302.500,00	CHF 325.000,00	CHF 347.500,00	CHF 370.000,00	CHF 392.500,00	CHF 415.000,00	CHF 437.500,00	CHF 460.000,00	CHF 482.500,00	CHF 505.000,00	CHF 527.500,00	**CHF 4.845.000,00**
Cash Outflows													
Cost of Goods Sold	68.429	75.254	82.079	88.904	95.729	102.554	109.379	116.204	123.029	129.854	136.679	143.504	**CHF 1.271.601,00**
Operating Activities													
Operating Expenses	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	15.519	**CHF 186.226,12**
Payroll	89.600	89.600	89.600	89.600	89.600	89.600	89.600	89.600	89.600	89.600	89.600	89.600	**CHF 1.075.200,00**
Taxes	20.294	20.294	20.294	20.294	20.294	20.294	20.294	20.294	20.294	20.294	20.294	20.294	CHF 243.532,80
Total Cash Outflows	CHF 193.842,49	CHF 200.667,49	CHF 207.492,49	CHF 214.317,49	CHF 221.142,49	CHF 227.967,49	CHF 234.792,49	CHF 241.617,49	CHF 248.442,49	CHF 255.267,49	CHF 262.092,49	CHF 268.917,49	**CHF 2.776.559,92**
Net Cash Flows	CHF 86.157,51	CHF 101.832,51	CHF 117.507,51	CHF 133.182,51	CHF 148.857,51	CHF 164.532,51	CHF 180.207,51	CHF 195.882,51	CHF 211.557,51	CHF 227.232,51	CHF 242.907,51	CHF 258.582,51	**CHF 2.068.440,08**
Operating Cash Balance	CHF 453.008,42	CHF 554.840,92	CHF 672.348,43	CHF 805.530,94	CHF 954.388,44	CHF 1.118.920,95	CHF 1.299.128,46	CHF 1.495.010,96	CHF 1.706.568,47	CHF 1.933.800,98	CHF 2.176.708,48	CHF 2.435.290,99	
Ending Cash Balance	CHF 453.008,42	CHF 554.840,92	CHF 672.348,43	CHF 805.530,94	CHF 954.388,44	CHF 1.118.920,95	CHF 1.299.128,46	CHF 1.495.010,96	CHF 1.706.568,47	CHF 1.933.800,98	CHF 2.176.708,48	CHF 2.435.290,99	

	Year 1		Year 2		Year 3		Year 4		Year 5	
Revenue										
Device	**CHF**	**-**	**CHF**	**30.000,00**	**CHF**	**60.000,00**	**CHF**	**180.000,00**	**CHF**	**360.000,00**
Cartridge	**CHF**	**-**	**CHF**	**90.000,00**	**CHF**	**495.000,00**	**CHF**	**1.305.000,00**	**CHF**	**4.185.000,00**
Project	**CHF**	**400.000,00**	**CHF**	**875.000,00**	**CHF**	**700.000,00**	**CHF**	**375.000,00**	**CHF**	**300.000,00**
Total Revenue	**CHF**	**400.000,00**	**CHF**	**995.000,00**	**CHF**	**1.255.000,00**	**CHF**	**1.860.000,00**	**CHF**	**4.845.000,00**
Cost of Goods Sold										
Device	**CHF**	**-**	**CHF**	**179,25**	**CHF**	**358,50**	**CHF**	**1.075,50**	**CHF**	**2.151,00**
Cartrdige	**CHF**	**-**	**CHF**	**27.300,00**	**CHF**	**150.150,00**	**CHF**	**395.850,00**	**CHF**	**1.269.450,00**
Project	**CHF**	**-**	**CHF**	**-**	**CHF**	**-**	**CHF**	**-**	**CHF**	**-**
Total Cost of Goods Sold	**CHF**	**-**	**CHF**	**27.479,25**	**CHF**	**150.508,50**	**CHF**	**396.925,50**	**CHF**	**1.271.601,00**
Gross Margin	**CHF**	**400.000,00**	**CHF**	**967.520,75**	**CHF**	**1.104.491,50**	**CHF**	**1.463.074,50**	**CHF**	**3.573.399,00**
Payroll	**CHF**	**255.112,00**	**CHF**	**557.321,60**	**CHF**	**886.023,60**	**CHF**	**1.277.522,40**	**CHF**	**1.318.732,80**
Operating Expenses										
Advertising	**CHF**	**6.000,00**	**CHF**	**6.180,00**	**CHF**	**6.365,40**	**CHF**	**6.556,36**	**CHF**	**6.753,05**
Renting car	**CHF**	**24.000,00**	**CHF**	**25.200,00**	**CHF**	**26.460,00**	**CHF**	**27.783,00**	**CHF**	**29.172,15**
Insurance premium	**CHF**	**-**	**CHF**	**10.300,00**	**CHF**	**10.609,00**	**CHF**	**10.927,27**	**CHF**	**11.255,09**
Legal and Professional Services	**CHF**	**-**	**CHF**	**6.180,00**	**CHF**	**6.365,40**	**CHF**	**6.556,36**	**CHF**	**6.753,05**
Licenses	**CHF**	**12.000,00**	**CHF**	**12.600,00**	**CHF**	**13.230,00**	**CHF**	**13.891,50**	**CHF**	**14.586,08**
Office Expense	**CHF**	**2.400,00**	**CHF**	**2.472,00**	**CHF**	**2.546,16**	**CHF**	**2.622,54**	**CHF**	**2.701,22**
Rent propertie	**CHF**	**42.000,00**	**CHF**	**43.260,00**	**CHF**	**44.557,80**	**CHF**	**45.894,53**	**CHF**	**47.271,37**
Maintenance cleaning	**CHF**	**12.000,00**	**CHF**	**12.360,00**	**CHF**	**12.730,80**	**CHF**	**13.112,72**	**CHF**	**13.506,11**
Software Liscense	**CHF**	**-**	**CHF**	**21.000,00**	**CHF**	**22.050,00**	**CHF**	**23.152,50**	**CHF**	**24.310,13**
Utilities	**CHF**	**6.000,00**	**CHF**	**6.180,00**	**CHF**	**6.365,40**	**CHF**	**6.556,36**	**CHF**	**6.753,05**
Communication	**CHF**	**2.400,00**	**CHF**	**2.472,00**	**CHF**	**2.546,16**	**CHF**	**2.622,54**	**CHF**	**2.701,22**
Total Operating Expenses	**CHF**	**106.800,00**	**CHF**	**148.204,00**	**CHF**	**153.826,12**	**CHF**	**159.675,70**	**CHF**	**165.762,51**
Income (Before Other Exp	**CHF**	**38.088,00**	**CHF**	**261.995,15**	**CHF**	**64.641,78**	**CHF**	**25.876,40**	**CHF**	**2.088.903,69**
Other Expenses	**CHF**	**361.912,00**								
Amortized Start-up Expe	**CHF**	**37.037,00**	**CHF**	**37.037,00**	**CHF**	**37.037,00**				
Depreciation	**CHF**	**32.400,00**	**CHF**	**32.400,00**	**CHF**	**32.400,00**	**CHF**	**32.400,00**	**CHF**	**32.400,00**
Total Other Expenses	**CHF**	**69.437,00**	**CHF**	**69.437,00**	**CHF**	**69.437,00**	**CHF**	**32.400,00**	**CHF**	**32.400,00**
Net Income Before Income	**CHF**	**-31.349,00**	**CHF**	**192.558,15**	**CHF**	**-4.795,22**	**CHF**	**-6.523,60**	**CHF**	**2.056.503,69**
Income Tax	CHF	3.917,11	CHF	38.511,63	CHF	-	CHF	-	CHF	411.300,74
Net Profit/Loss	**CHF**	**-35.266,11**	**CHF**	**154.046,52**	**CHF**	**-4.795,22**	**CHF**	**-6.523,60**	**CHF**	**1.645.202,95**

ASSETS	Opening Statement	First Year	Second Year	Third Year	Forth Year	Fifth Year
Current Assets						
Cash	-	105.688	229.595	32.242	-	2.068.440
Prepaid Expenses	74.575	24.858	24.858	24.858		-
Other Initial Costs	36.536	12.179	12.179	12.179		-
Total Current Assets	**CHF 111.111,00**	**CHF 142.725,00**	**CHF 266.632,15**	**CHF 69.278,78**	**CHF -**	**CHF 2.068.440,08**
Fixed Assets						
Lab	50.000	50.000	50.000	50.000	50.000	50.000
workshop	100.000	100.000	100.000	100.000	100.000	100.000
Furniture and Fixtures	2.000	2.000	2.000	2.000	2.000	2.000
Office	10.000	10.000	10.000	10.000	10.000	10.000
Total Fixed Assets	**CHF 162.000,00**	**CHF 162.000,00**	**CHF 162.000,00**	**CHF 162.000,00**	**CHF 162.000,00**	**CHF 162.000,00**
(Less Accumulated Depreciation)		CHF 32.400,00	CHF 64.800,00	CHF 97.200,00	CHF 129.600,00	CHF 162.000,00
Total Assets	CHF 273.111,00	CHF 272.325,00	CHF 363.832,00	CHF 134.078,00	CHF 32.400,00	CHF 2.068.440,00
LIABILITIES & EQUITY						
Liabilities						
Accounts Payable	-	-	-	-	-	-
Line of Credit Balance	-	-	-	-	-	-
Total Liabilities	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**	**CHF -**
Equity						
Common Stock	273.111	273.111	273.111	273.111	273.111	273.111
Retained Earnings		-	-	-	674	674
Dividends Dispersed/Owners Draw	-	-	-	-	-	-
Total Equity	**CHF 273.111,00**	**CHF 273.111,00**	**CHF 273.111,00**	**CHF 273.111,00**	**CHF 273.785,02**	**CHF 273.785,02**
Total Liabilities and Equity	CHF 273.111,00	CHF 273.111,00	CHF 273.111,00	CHF 273.111,00	CHF 273.785,00	CHF 273.785,00
Balance sheet in or out of balance?	CHF -	CHF -786,00	CHF 90.721,00	CHF -139.033,00	CHF -241.385,00	CHF 1.794.655,00
	Balanced!	Warning: Not Balance	Warning: Not Balanced	Warning: Not Balanced	Warning: Not Balanced	Warning: Not Balanced

PROFIT AND LOSS STATEMENT

	Year One	Year Two	Year Three	Year four	Year five
Total Income	CHF 400.000,00	CHF 995.000,00	CHF 1.255.000,00	CHF 1.860.000,00	CHF 4.845.000,00
Total Cost of Sales	CHF -	CHF 27.479,25	CHF 150.508,50	CHF 396.925,50	CHF 1.271.601,00
Gross Margin	CHF 400.000,00	CHF 967.520,75	CHF 1.104.491,50	CHF 1.463.074,50	CHF 3.573.399,00
Total Salary and Wages	CHF 255.112,00	CHF 557.321,60	CHF 886.023,60	CHF 1.277.522,40	CHF 1.318.732,80
Total Fixed Business Expens	CHF 106.800,00	CHF 148.204,00	CHF 153.826,12	CHF 159.675,70	CHF 165.762,51
Income From Operations	CHF 38.088,00	CHF 261.995,15	CHF 64.641,78	CHF 25.876,40	CHF 2.088.903,69
Other Expenses					
Depreciation	CHF 32.400,00	CHF 32.400,00	CHF 32.400,00	CHF 32.400,00	CHF 32.400,00
Amortization Start/up	CHF 37.037,00	CHF 37.037,00	CHF 37.037,00		
Line of Credit	-	-	-	-	-
Taxes	-	-	-	-	-
Total Other Expenses	CHF 69.437,00	CHF 69.437,00	CHF 69.437,00	CHF 32.400,00	CHF 32.400,00
Net Income	CHF -31.349,00	CHF 192.558,15	CHF -4.795,22	CHF -6.523,60	CHF 2.056.503,69

C Assumptions

C.1 Food Industry Sector

Europe GDP: $16.477.211 billion[1].

List of Western Europe countries [2]:

- Andorra: 3'249
- Austria: 384'799
- Belgium: 465'248
- Denmark: 301'784
- Finland : 234'578
- France: 2'464'790
- Germany: 3'467'780
- Greece: 194'594
- Iceland: 18'633
- Ireland: 254'596
- Italy: 1'848'690
- Liechtenstein: 5'488
- Luxembourg: 60'176
- Malta:10'355
- Monaco: 7'060
- Netherlands: 762'521
- Norway: 366'873
- Portugal: 205'085
- San Marino: 1'569
- Spain: 1'242'360
- Sweden: 512'748
- Switzerland: 651'770
- Turkey: 751'186
- United Kingdom: 2'760'960

Total GDP of Western Europe is $15'265.'821 billion.

Food industry total revenue market: $9 billion

Western Europe is 27% = $3.3 billion

[1] https://en.wikipedia.org/wiki/List$_of_countries_by_GDP(nominal)cite_note-IMF_Groups-8$

[2] https://en.wikipedia.org/wiki/Western$_Europe$

Western Europe GDP: $15'265'821 billion.
Swiss GDP: $651,770 billion.

Swiss foot industry is 4.3% of the 27% = $141.9 millions

C.2 Test Performed per Year

- Top-down approach

  Test performed over the world: 600 million[3]

  Test performed in Western Europe is 27% = 162 million

  Western Europe GDP: $15'265'821 billion.
  Swiss GDP: $651'770 billion.

  Swiss foot industry is 4.3% of the 27% = 6.9 millions test performed.

- Bottom-up

  In Switzerland there were 207[4] food manufacturing companies in 2011, increasing 2,5% respect 2010 (202). It is assumed a similar growth rate, obtaining 235 companies for 2016,

  Average medium size company has two production lines. Every they day, there is one change per line. Assuming that this companies take three samples per batch produced, at the end the total amount is approximately 15 tests are performed. Also, they have to take up samples from all over the plant, around 150 per week per production line (Source: Coca Cola quality manager).

  Setting number, keeping the activity of the production line six of seven days per week, 750 tests are performed per month per production line.

  Total test performed per year in Switzerland according the previous assumptions: 4'230'000

C.3 Medical Industry Sector

Total revenue market: $15.4 billion[5]

[3] http://rapidbiosystems.com/problem/market-overview/

[4] http://www.swissfoodnet.ch/food-research-switzerland/swiss-european-food-industry.html

[5] http://www.grandviewresearch.com/industry-analysis/point-of-care-poc-diagnostics-industry

Western Europe is 33% = $5.1 billion

Western Europe GDP: $15'265'821 billion.
Swiss GDP: $651,770 billion.

Swiss foot industry is 4.3% of the 33% = $218.5 millions

D Porter's Five Forces

The next figure show up the Porter's five forces:

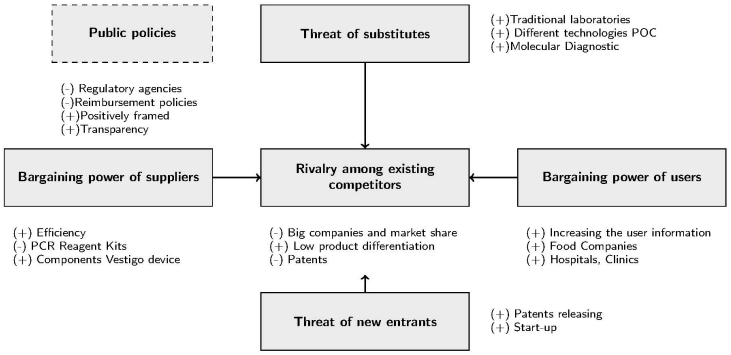

Figure D.1: Porter's Five Forces

- Rivalry among existing competitors: There are many companies competing with each other for the same market. The medical scenario, is less optimistic than food market basically because there more big players and the improvement that Vestigo could bring is less important and innovate than food market, where most of the companies still using traditional laboratories.

- Threat of new entrants: Being a market with great competence and the need for large amounts of money makes it an unattractive market if you do not have the backing of a large company or university to make effectively the entry into the market.

- Bargaining power of users: Being a Start-up company means that our potential costumers have more power to negotiate because they are dealing with a new company. Once it has gotten few clients, bargaining power of users will definitely decrease to being moderate.

- Threats of substitutes: The barriers for entry in this market are so high. Therefore, the effect of substitute products on the market of test devices

could be described as relatively weak. Our close substitute product or service would the traditional laboratories and actually they are losing share against rapid test devices.

- Bargaining power of suppliers: The suppliers of the components to build up our chip are few, basically because it's a difficult market to get into and there are less manufacturers. Some reagents components are still patented. So Vestigo's power here is weak.

  At the contrary, the raw materials needed to build up our device are common materials such as plastic. This means it is feasible to find more manufacturers.

- Public policies: Here we have to take in account the rules and laws of every country and its corresponding regulatory policies.

E Patent research

Vestigo is going to develop a prototype to detect contamination. This device will consist in two parts: the mechanical part and chemical. Vestigo's priority is to know what kinds of method are used out there by the competitors and check whether those methods are still patented or available.

- Mechanical part: How is the sample taken from the environment? What methods are used to take the sample and are not patented? How does the sample is introduced into the device or cartridge without any possible contamination?
- Chemical part: What DNA amplification methods do exist?

All the patents are classified by cooperative patents classification system (CPC):

(**A**) HUMAN NECESSITIES

(**B**) PERFORMING OPERATIONS; TRANSPORTING

(**C**) CHEMISTRY; METALLURGY

(**D**) TEXTILES; PAPER

(**E**) FIXED CONSTRUCTIONS

(**F**) MECHANICAL ENGINEERING; LIGHTING; HEATING WEAPONS; BLASTING ENGINES OR PUMPS

(**G**) PHYSICS

(**H**) ELECTRICITY

(**I**) GENERAL TAGGING OF NEW TECHNOLOGICAL DEVELOPMENTS

It is proceed to classify each interested part by CPC:

E.1 Extraction Part

Classification

- B01L9/00 : Chemical or physical laboratory apparatus for general use. Supporting devices and holding devices.
- G01N : Investigating or analysing materials by determining their chemical or physical properties
- A61B10 : Other methods or instruments for diagnosis, e.g. instruments for taking a cell sample, for biopsy, for vaccination diagnosis (vaccination prophylaxis, vaccination therapy

Results

1. US 20150241401 [1] Methods, systems and devices for batch.

   Priority date: 18-FEB-2014

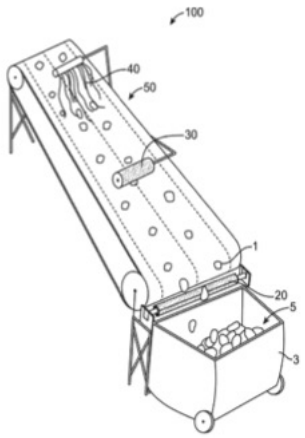

Figure E.1: Batch system

Abstract: A sampling swab useful in trace analyte detection is provided. The sampling swab possesses absorption/adsorption and desorption properties suitable for use trace analyte sample collection. The sampling swab is also capable of withstanding repeated high heat treatment and

[1] WU et al. (2015)

mechanical stress. A method for producing a sampling swab that is substantially free of impurities and detection interferants is also provided

2. US 20130118275 [2] : Device for holding a sampling sponge.

   Priority date: 10-NOV-2011

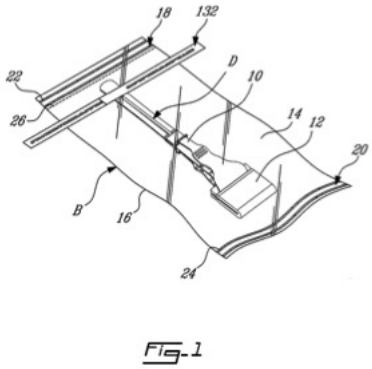

Figure E.2: Holding sponge

Abstract: A device for swabbing a surface and collecting a substance therefrom comprises a handle and a sponge realisably mounted to the handle. The handle includes at least one gripping member adapted to engage the sponge and retain the sponge mounted to the handle in a first position of the gripping member, the gripping member being adapted upon pressure exerted on an actuator to move the gripping member to a sponge-release position thereof for releasing the sponge from the handle. Typically, there are provided two opposed gripping members, wherein the pressure is exerted by a user's fingers on each gripping member and towards one another. The gripping members are actuated to the sponge-release position without requiring that the user substantially moves his/her hand and fingers longitudinally along the handle.

3. US 9103749 [3] Biological sample collection apparatus

   Priority date: 12-AUG-2013

[2]Lafond et al. (2013)
[3]Nagy (2015)

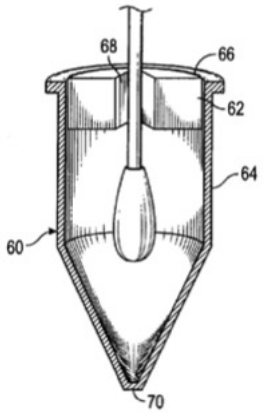

Figure E.3: Collection apparatus

Abstract: A testing container is described having a vessel with a first end, a second end, and a sidewall extending between the first end and the second end. The first end forms an opening into the vessel. The sidewall has one or more protrusions extending inwardly therefrom. The one or more protrusions form a gap having a width in a range between 2 - 4 mm, and the one or more protrusions have sufficient strength to withstand lateral pressure of a swab positioned in the gap relative to the one or more protrusions and to remove a head of the swab.

4. US 20110146419 [4] Sample acquisition device

Priority date: 15-FEB-2008

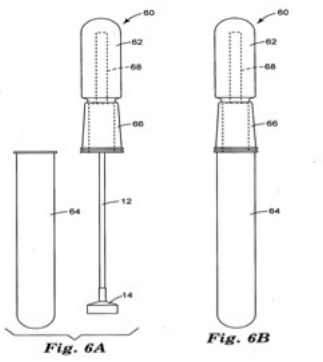

Figure E.4: Sample acquisition device

[4]Gonzalez et al. (2014)

Abstract: A sample acquisition device includes a capillary array configured to draw in a sample and retain the sample by capillary action. The capillary array may be coupled to an elongated member, such as a stem or a hollow tube, which defines a longitudinal axis extending in a first direction. In some embodiments, the capillary array defines a major sample acquisition surface that extends in a second direction different than the first direction. A ratio of the major sample acquisition surface area to maximum volume retained by the capillary array may be selected to minimize physical binding between the capillary array and sample. In some embodiments, the device may include a feedback mechanism to indicate the relative pressure applied to a sample source with the sample acquisition device. In addition, in some embodiments, the sample acquisition device may include a suction source to help draw the sample into the capillary array.

5. US 6129894 [5] for taking swab samples and sample dilution

   Priority date: 10-DEC-1998

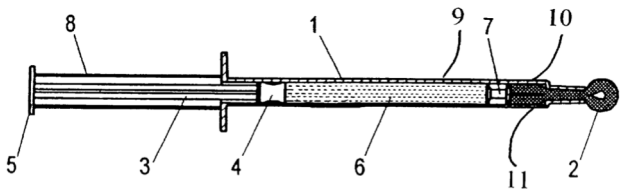

Figure E.5: Device for taking swab sample and sample dilution

Abstract: A device is provided for taking swab samples and sample dilution. The device has a plug made of a porous, absorbent material, which projects from a sleeve and is used to take a swab sample. The plug is located in one end of the sleeve. A piston, which can be moved in the sleeve by means of a piston rod, is located in the other end of the sleeve. A closure, which can be opened by means of pressure, is located between the piston and the plug, so that a liquid arranged between the piston and the plug moves through the closure to the plug and wets same on actuation of the piston rod.

6. US 20050008536 [6] :Method and apparatus for surface sampling

   Priority date: 08-NOV-2002

[5] Rabenecker et al. (2000)
[6] Wilson & Estrada (2003)

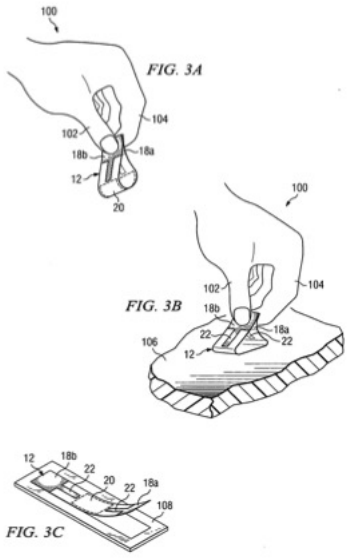

Figure E.6: Surface Sampling

Abstract: According to one embodiment of the invention, a test strip for obtaining a test sample includes an adhesive substrate that includes a first surface and a second surface. The second surface includes a first adhesive layer adhering at least a portion of the adhesive substrate to a backing. A first handling surface is positioned proximate to a first end of the substrate. A second handling surface is positioned proximate to a second end of the substrate. The first and second handling surfaces define a contact area for collecting a test sample.

7. US 20030157728 [7] Swab extraction system

Priority date: 20-FEB-2002

[7] Uhl & Cockerill (2002)

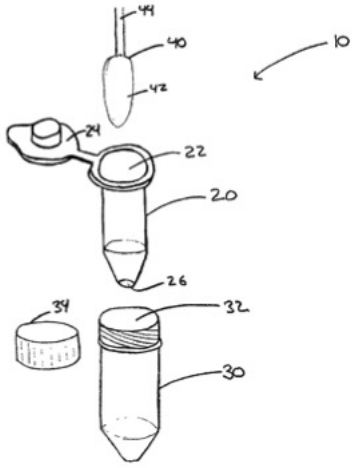

Figure E.7: Swab extraction system

Abstract: Disclosed are tools and techniques that can be used to rapidly and inexpensively obtain micro-organisms from biological samples collected on swabs. The disclosed swab extraction systems and methods can speed diagnostic procedures and expedite therapeutic intervention, thereby improving patient outcomes

8. WO 1998027196 [8] Sample collection and assay device
Owner: :Anthony Cooke; Ramin Pirzad.
Priority date: 16 DEC 1996

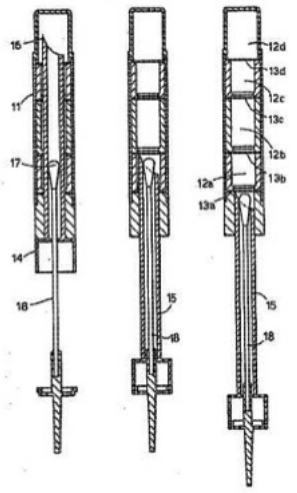

Figure E.8: Sample collection and assay device

[8]Cooke & Pirzad (1998)

Abstract: An assay device comprising: a tube having a removable top closure on which is mounted an elongate member associated with swab means adapted to take up material to be assayed at the distal end of the elongate member; wherein the tube includes one or more frangible membranes defining one or more compartments each containing a compartmentalised agent, and the elongate member is movable, within the tube, to break the one or more membranes and bring said distal end into contact with the or each agent. Such a device can be used to assay micro-organisms, by taking the micro-organisms up in liquid on the swab, introducing the elongate member into the tube, and moving the elongate member with respect to the tube, to break the one or more membranes and bring taken-up liquid and its contents into contact with the or each agent. A conventional bioluminescence assay can then be used.

9. US 9027420 [9] Specimen collection

Priority date: 30-NOV-2011

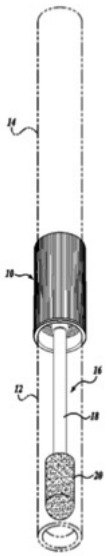

Figure E.9: Specimen collection

Abstract: A swab for obtaining a biological surface sample has a shaft extending from a first side of a cap. A first test tube can be coupled to the first side of the cap in a detachable watertight fit, to enclose the swab. A second tube can be coupled to a second side of the cap in

[9] Ward (2015)

a manually detachable watertight fit. The first tube or the swab can include a collection solution; the second tube can be used as a handle to extend the reach of the swab when the first tube is detached; and the second tube can contain an enrichment broth and/or developer solution for the collected sample.

E.2 Insertion Part

Classification

- A61B10/0096: Casings for storing test samples and take precedence; preservation of living parts of the human or animal body
- A61B10/0045: Devices for taking samples of body liquids (devices for taking blood samples
- B01L3/502715: Containers or dishes for laboratory use, e.g. laboratory glassware, characterised by interfacing components, e.g. fluidic, electrical, optical or mechanical interfaces
- B01L2200/10: Integrating sample preparation and analysis in single entity, e.g. lab-on-a-chip concept

Results

1. US 20120271127 [10] Sanitary swab collection system

   Priority date: 31-JUL-2007

[10]Battrell et al. (2012)

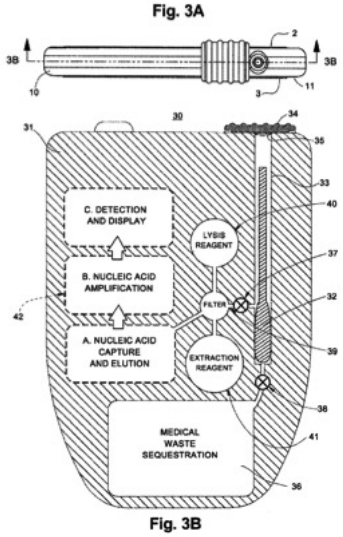

Figure E.10: Sanitary swab collection system

Abstract: Biohazard specimen collection containers are provided with an external disposable skin, that is stripped away and discarded after the biohazardous specimen is collected, thus reducing or eliminating objectionable or dangerous residues on the outside surfaces of the container. Further, we teach that the sample collection container with external disposable skin may also serve as an integrated microfluidic biosample processing and analytical device, thereby providing a single entry, disposable assay unit, kit and system for "world-to-result" clinical diagnostic testing. These integrated assay devices are provided with synergic, multiple safe-handling features for protecting healthcare workers who handle them. The modified collection containers and analytical devices find application, for example, in PCR detection of infectious organisms or pathogenic markers collected on a swab.

2. US 20150285715 [11] Swab Elution Chamber in a Test Cartridge

   Priority date: 02-MAY-2012

[11] Fabra et al. (2015)

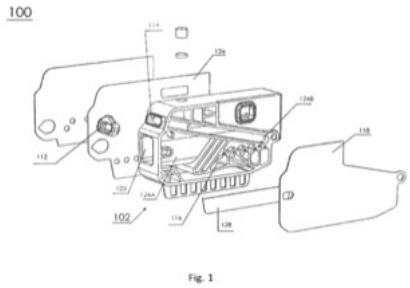

Figure E.11: Swab Elution Chamber in a Test Cartridge

Abstract: A system and method for eluting a sample from a swab are presented. The system includes a chamber dimensioned to receive at least a portion of the length of at least one swab, a fluidic channel connected to the chamber, and an actuator. The chamber has at least one wall being a flexible film. The fluidic channel is configured to at least one of introduce and expel liquids from the chamber. The actuator is configured to contact an outer surface of the flexible film such that movement of the actuator against the outer surface of the flexible film causes a respective movement of the at least one swab when the at least one swab is disposed next to an inner surface of the flexible film. The respective movement of the at least one swab elutes the sample from the at least one swab into the chamber.

E.3 DNA Amplification

Classification

- C12Q1/68: Measuring or testing processes involving enzymes, nucleic acids or micro-organisms ; Compositions therefor; Processes of preparing such compositions

Results

1. US 8901287B2 [12] Detection of nucleic acid by target-specific hybrid capture method

[12]Nazarenko et al. (2014)

Priority date: 20-OCT-2010

Abstract: Target-specific hybrid capture (TSHC) provides a nucleic acid detection method that is not only rapid and sensitive, but is also highly specific and capable of discriminating highly homologous nucleic acid target sequences. The method produces DNA: RNA hybrids which can be detected by a variety of methods.

2. US 2010075384 [13] Helicase-dependent amplification of circular nucleic acid

   Priority date: 25-MAR-2004

   Abstract: A helicase-mediated amplification method for circular DNA templates and target DNA sequences within the templates is provided. The method combines a DNA polymerase and a helicase preparation to amplify a target sequence as well as the entire circular DNA template.

3. US 2008268498 [14] Thermostable viral polymerases and method of use

   Priority date: 06-OCT-2005

   Abstract: Thermostable viral polymerases exhibiting a combination of activities selected from, proofreading exonuclease activity, nick translating nuclease activity, synthetic primer-initiated polymerase activity, nick-initiated polymerase activity, reverse transcriptase activity, strand displacement activity, and/or decreased discrimination against incorporation of nucleotide analogs. Also provided are compositions including the polymerases, polynucleotides encoding the polymerases and methods of using the polymerases.

4. US 2005869252 [15] Method of multiplex ligase chain reaction

   Priority date: 31-03-1992

   Abstract: The invention relates to multiplex ligase chain reaction (LCR). Two or more purative target sequences are selected. For each one, a set of four probes is used simultaneously to amplify the putative sequence if it is present in the sample. Preferably, all the amplicons are labeled with a common label/hapten and, for each different target, with a unique label/hapten. The invention also relates to an immunochromatographic strip device and method employing a diagonal array of capture spots.

[13] Kong & Xu (2005)
[14] Schoenfeld et al. (2008)
[15] Bouma et al. (1999)

5. US 6124120 [16] Multiple displacement amplification

   Priority date: 8-OCT-1997

   Abstract: Disclosed are compositions and a method for amplification of nucleic acid sequences of interest. The method is based on stand displacement replication of the nucleic acid sequences of interest by multiple primers. In one preferred form of the method, referred to as multiple strand displacement amplification, two sets of primers are used, a right set and a left set. The primers in the right set are complementary to one strand of the nucleic acid molecule to be amplified and the primers in the left set are complementary to the opposite strand. The 5' end of primers in both sets are distal to the nucleic acid sequence of interest when the primers have hybridized to the nucleic acid sequence molecule to be amplified. Amplification proceeds by replication initiated at each primer and continuing through the nucleic acid sequence of interest. A key feature of this method is the displacement of intervening primers during replication by the polymerase. In another preferred form of the method, referred to as whole genome strand displacement amplification, a random set of primers is used to randomly prime a sample of genomic nucleic acid (or another sample of nucleic acid of high complexity). By choosing a set of primers, which are sufficiently random, the primers in the set will be collectively, and randomly, complementary to nucleic acid sequences distributed throughout nucleic acid in the sample. Amplification proceeds by replication with a highly processive polymerase initiated at each primer and continuing until spontaneous termination. A key feature of this method is the displacement of intervening primers during replication by the polymerase. In this way, multiple overlapping copies of the entire genome to be synthesized in a short time.

6. EP 0629706 [17] Improved method for nucleic acid amplification

   Priority date: 24-Aug-1993

   Abstract: The present invention relates to an improved method for the amplification of nucleic acid. The invention is characterized in that ribonucleotides are introduced during amplification that weaken normal basepairing. Preferably the ribonucleotides are inosine-triphosphate nucleotides which partly substitute guanine-triphosphate nucleotides normally present in the amplification reaction mixture. The incorporation of nucleotides, during amplification, that weaken normal base

[16] Lizardi (2000)
[17] Adriaanse et al. (2004)

pairing prevents the formation of secondary structures in the amplification. The efficiency of the amplification is thereby increased. The introduction, during amplification, of nucleotides that weaken normal base pairing also results in an improved sensitivity during detection of the amplified nucleic acid, when the detection method comprises the hybridization of the amplified nucleic acid to a complementary sequence.

7. US 2009017453 [18] Nicking and extension amplification Reaction for exponential amplification of nucleic acids

   Priority date: 14-Jul-2007

   Abstract: The invention is in general directed to the rapid exponential amplification of short DNA or RNA sequences at a constant temperature.

8. WO 2015079042 [19] Rolling circle amplification method

   Priority date: 29-Nov-2013

   Abstract: The present invention is directed to a method for performing a rolling circle amplification (RCA) reaction comprising at least two rounds of RCA, said method comprising: a) providing a concatemeric first RCA product comprising a multiplicity of monomer repeats, each repeat representing a complementary copy of a first RCA template; b) cleaving the first RCA product into monomer units, wherein the monomer unit is reduced in size as compared to the monomer repeat of the first RCA product; c) circularising monomer units resulting from said cleavage to form second RCA templates wherein the second RCA template is smaller than the first RCA template; d) performing a second RCA reaction using said second RCA template of (c) and a primer for said second RCA, to form a second RCA product; wherein any one or more of steps (a) to (d) may be performed sequentially or in combination. The method may be used in the detection and/or analysis of a nucleic acid molecule, including in particular in the detection of an analyte.

9. US 7270981 [20] Recombinase polymerase amplification

   Priority date: 21 Feb 2002

[18] Maples et al. (2007)
[19] JARVIUS (2015)
[20] Armes & Stemple (2007)

Abstract: This disclosure describes kits, reagents and methods for Recombinase Polymerase Amplification (RPA) of a target DNA that exploit the properties of recombinase and related proteins, to invade double-stranded DNA with single stranded homologous DNA permitting sequence specific priming of DNA polymerase reactions. The disclosed kits, reagents and methods have the advantage of not requiring thermocycling or thermophilic enzymes, thus offering easy and affordable implementation and portability relative to other amplification methods.

E.4 Conclusion

It has been selected the most important patents, or at least the most interesting, from a list of thousands. It is been productive because now Vestigo's team knows what methods are used, which are still patented.

In terms of DNA extraction from a sample, it is seen that there is not any technology similar to Vestigo's re-concentration patented. The next step will be to protect Vestigo's intellectual properties.

For DNA amplification, the team though to use the method recombinase polymerase amplification . This method is still patented until 21st of February,2022. TwistDx's proprietary technology, claims[21]: RPA represents a complete revolution in DNA diagnostics, combining superiority in speed, portability and accessibility with exquisite sensitivity and specificity compared to other diagnostic testing systems now on the market. It is usable in nearly any setting, eliminating the need for a trained technician or laboratory environment.

[21] TwistDx (2016)

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