





This document was created at the request of French Healthcare Association, an organization which is supported by the French Ministry for Europe and Foreign Affairs, in the context of studies by the Strategic Committee of the Healthcare Industry.

Diabetes healthcare professionals and researchers were consulted during qualitative interviews in order to specify the global challenges regarding diabetes and the status of French companies in the care pathways of diabetics.

Health companies, health institutions and research groups were also solicited to present, in this document, their contribution in the care pathway and care of diabetic patients. The information provided in this document has been shared with the cited stakeholders (they have completed their profile themselves, giving information about their initiatives against diabetes). Only the companies, health facilities and the research group which have favourably answered to our solicitations have been integrated in this document and are hereby presented.



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A foreword by Special advisor to the ministry of Europe and foreign affairs

Jean-Patrick LAJONCHÈRE



Thanks to an internationally recognized healthcare system, pioneering research, and quality infrastructure, France is a leader in medicine (see « Health made in France » brochure*).

With medical teams featuring in the top 10 on a global scale, French excellence is prevalent in several surgical and medical specialties, especially for the treatment of cancers, cardiac pathologies, orthopedic surgery, corrective surgery, diabetes, geriatrics, and antibiotic resistance.

France has achieved scientific excellence, and public research is promoted: the works of French medical research teams were rewarded by 13 Nobel Prizes, the most recent of which in 2008 (*Prof. François Barré – Sinoussi and Luc Montagnier: discovery of retrovirus causing AIDS*) and 2011 (*Prof. Jules Hoffmann: works on the innate immune system*).

French research is very active and mostly structured around world-class research institutes, recognized University Hospital Institutes (*UHI*) and competitive clusters (*life sciences*). France makes every effort to efficiently transfer technological and scientific innovation to the therapeutic domain;

training centres dedicated to new technologies were created: the IRCAD, the European School of Surgery, Cancer Campus...

Such structuring of research facilitates the transfer and deployment of therapeutic innovation and anticipate the medicine of tomorrow.

France's quality control system features amongst the best in the world, overseen by the High Authority of Health. A mandatory certification of French institutes every four years guarantees the quality level based on fundamental criteria. These certification standards figure amongst the most demanding ones in the world.

France's healthcare system relies on its territorial network and adapted health levels which ensure access to all sorts of care (32 University Hospital Centers called CHU, over 3 000 public or private health institutes, city doctors – over 115 000 liberal doctors including around 61 000 general practitioners). A very large social security system safeguards this access whatever the financial situation of the insured party.

Lastly, France benefits from a dense network of healthcare industries that are well-performing and innovative.



The Ministry of Europe and Foreign Affairs (*MEAE*) naturally supports the influence of this ecosystem. While endeavoring to respond to the great development and cooperation challenges in terms of global health, the MEAE's action aims at spreading French technology and know-how in terms of health abroad, especially through the promotion of its brand French Healthcare.

Through its diplomatic network and with the support of its Health institute, the MEAE supports partnerships and cooperation between stakeholders in the domain of health, medical research, and health institutes. Besides, it backs up and helps the diffusion of French industrial expertise in healthcare. In this context, census work and promotion of French offers relating to chronic diseases management like diabetes are conducted.

Jean-Patrick LAJONCHÈRE, Special advisor to the ministry of Europe and foreign affairs

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A foreword by the President of the French Healthcare Association

Jean-François GENDRON



Officially born in January 2018, French Healthcare (https://frenchhealthcare.fr) brings together French companies and hospitals that want to promote their international activities in a collective way. Reflecting the diversity of the French health ecosystem, one of its objectives is to promote the excellence of French healthcare offerings internationally, in conjunction with other actors in the healthcare sector, and in line with the international aspect of Strategic Committee of Industry and Health Technologies (CSF-ITS).

The association has implemented a first project around a major public health issue, diabetes, with the mapping of French actors and companies involved in the management of this pathology. The support of the firm Junior ESSEC Conseil was asked to carry out this process.

The result of this work highlights the excellence of the health actors and the French companies in the service of the path of health of diabetic patients. They develop products and services to help patients and healthcare professionals throughout the entire health care journey (from prevention to treatment of the patient to management of diabetes-related complications). These actors are involved and present for all types of diabetics and at each stage of the disease's progress.

Such a document is intended to be distributed internationally (at conferences, at embassies, health clubs, chambers of commerce abroad, etc.) to promote this French diabetes sector and to know and connect French actors and their international partners.

We hope that it will lead to constructive and fruitful dialogues for the benefit of all.

Jean-François GENDRON
President of the French Healthcare
Association





Diabetes worldwideIntroduction

Diabetes leads to an excess of blood sugar levels, called hyperglycaemia. It can be provoked by a disorder in the production, assimilation, utilization or the storage of sugars contained in patients' diet. There are two types of diabetes. Type 1 diabetes, which over 40 million people worldwide suffer from, is mostly developing amongst children or teenagers and is characterized by a very low or inexistent production of insulin within the body, thereby obliging the diabetic patient to inject himself daily doses of insulin. Type 2 diabetes is the kind of diabetes which 90% of diabetic patients suffer from (*over 380 million people worldwide*)¹. It is defined by a chronic increase of the blood glucose concentration due to a lack of insulin production or a bad use of the insulin by the organism's cells.

Contrary to type 1 diabetes, type 2 diabetes is correlated to factors like the lifestyle. Those factors are the consequences of people's behaviour. It is therefore necessary to ensure an upstream prevention of the disease in order to avert its apparition. Indeed, the increase in the number of type 2 diabetes is related to cultural and social evolutions (*modification of food habits, low physical activity, population ageing*). It particularly affects countries with lower and middle incomes (80% of diabetic people in the world) and if this trend carries on, the number of diabetics should increase by over 10 million people per year worldwide¹.

Over 212 million people worldwide don't know they are suffering from diabetes¹. Africa is the region with the highest percentage of non-diagnosed diabetes in the world: over two thirds (69.2%) of people affected by diabetes do not know their condition¹. Likewise, in China we estimate that 6.1 million people suffer from a non-diagnosed diabetes ¹.

The detection of type 2 diabetes is therefore key, and it can be achieved through screening tests of the patient's level of glycemia. For type 1 diabetes, this diagnosis can be performed at an early age and mostly after the apparition of symptoms like fatigue, losing weight, abdominal pain and infections.

Taking care of diabetics is a top priority issue: in 2045, it is projected that 629 million people will suffer from type 1 or type 2 diabetes ¹.

The treatment of the disease differs according to the type of diabetes. For type 1 diabetics – also referred to as insulin dependency – patients need daily injections of insulin in order to survive. They can be performed through various means (*pens, syringes, pumps*). For type 2 diabetics, the treatment relies on a healthy diet, losing weight, physical activity and anti-diabetic medicine (*oral anti-diabetic medicine that is completed if appropriate by injectable antidiabetics including insulin*) in order to reach an optimal level of glycaemia.

¹International Federation of Diabetes – Diabetes Atlas – Eighth edition 2017 – p.9, p.47, p.49



Throughout the life of a diabetic person, some complications can appear related to failing body functions, the most critical of which are diabetic feet, cardiovascular diseases, eye diseases and renal conditions.

Finally, the care pathway of diabetic patients includes a daily management of the condition, concerning the diet, the administration and the follow-up of the treatment, and the care received from healthcare professionals.

French companies develop products and services to intervene on diabetes and help patients throughout their care pathways (from prevention, to treatment and the management of complications related to diabetes). Those companies are involved and present across all types of diabetics and at each stage of the disease.

The longstanding ties between the French offer in the domain of diabetes and research are strong. They are particularly organised around:

- The Francophone Foundation for Diabetes Research (FFDR) which includes the leading protagonists of the knowledge society. This expertise applies to both fundamental research and clinical research.
- Public organisations like the Inserm, the CNRS or University Hospital Centres also regularly work with French companies in order to develop health products associated with innovation stemming from research.
- Health products companies, through their fundamental research and their clinical research, participate to the discovery and the development of new health products.

The profiles of the players are therefore introduced according to the care pathways of the diabetic patients across 5 stages:

- Prevention,
- Screening and diagnosis,
- Disease treatment.
- Prevention and healing of complications,
- Daily management of diabetes.



Diabetes worldwide

Figures



1 St

Non-contagious disease pandemia worldwide



Adults suffer from diabetes worldwide

Type 1 diabetes

The body doesn't produce enough insulin

Type 2 diabetes

The body doesn't exploit insulin well enough



Euros of spending worldwide to fight diabetes

Gestational diabetes

Excess of blood glucose during pregnancy

Multiple complications



Dialysis



Blindness



Wounds and infections



Cardiovascular diseases



Amputations

Source: World Health Organisation



Diabetes worldwide A 5-step healthcare pathway



Prevention



Treatment



Diagnosis



Complications



Disease management



The care pathway of the diabetic patient Prevention and diagnosis



Prevention

Type 2 diabetes is strongly correlated to the patient's lifestyle and this is why education is critical in order to prevent bad habits.

The association <u>Santé en Entreprise</u> put in place prevention and screening campaigns for company employees. It operates in France and Africa across several diseases including diabetes. They produce information material, educative and communication tools, and they also regularly organize workshops for companies.

The company <u>Valbiotis</u> is currently developing a medical supplement aiming at the prevention of type 2 diabetes. Its main active ingredient is composed of a specific and patented association of 5 plant extracts that are selected for their effects on the metabolism. It operates on several targets of the pathophysiology of type 2 diabetes in order to reduce the risk factors of the disease.

Screening and diagnosis

The main challenge is uncovering the signs of diabetes as soon as possible and in the least constraining way for the patient in order to diagnose a large proportion of the population.

The company <u>Impeto Medical</u> develops a patented medical device which does diagnostic tests on the risks of diabetes. This technology uses an electrical tension which stimulates the sweat glands to assess autonomous peripheral neuropathies, indicative of diabetes and pre-diabetes.

The company <u>Toutenkamion</u> conceives, manufactures and commercializes mobile medical units. They are generally produced on trucks, trailers or containers, which facilitates the access to secluded rural populations lacking health infrastructures of all types. In this context, the company has delivered two diabetes and arterial hypertension screening units to Algeria in 2015 and 2018.

The <u>Cerba HealthCare</u> Group provides medical biology and clinical trial services for over 450 laboratories. Those laboratories can perform blood glucose tests that are necessary to diagnose diabetes.



The care pathway of the diabetic patient Treatment



France's territorial grid in terms of health stakeholders is strong, allowing an efficient care and treatment of diabetes. All diabetic patients have access several treatments as well as instruments in order to measure the glucose levels in their blood. However, on a global scale, access to these vital treatments is unequal. Favouring the distribution of medicine even in those secluded areas through innovative solutions by facilitating their delivery could help actively participate in the fight against this chronic disease.

Medication: insulin, oral and injectable diabetes treatment

Insulin is essential to the survival of type 1 diabetic patients. It is also vital for type 2 diabetic patients when the patient's diet, weight loss, physical activity and diabetic treatment (*oral or injectable*) does not help him or her reach the targeted blood glucose level.

Several companies like <u>Sanofi</u> or <u>Servier</u> are commercializing or developing oral or injectable diabetic treatments for patients suffering from type 2 diabetes.

<u>Sanofi</u> commercializes several forms of insulin (*rapid or prolonged action*) delivered through disposable insulin pens (*device allowing to select the dose and trigger the injection*).

<u>Servier</u> is a historical protagonist in the prevention and treatment of type 2 diabetes. It produces a drug to control the patient's glycaemia, the first priority of type 2 diabetes treatment, which is available in over 120 countries. The formulation of the medicinal product has been continuously improved since its commercialization in order to better respond to the patients' needs.

In order to automate the treatment of diabetic patients as much as possible, the <u>Diabeloop</u> company has developed a system that allows continuous measurement of the patient's blood sugar level. With these measurements, a self-learning algorithm, connected to an insulin pump, continuously adjusts the injected dose.





Insulin pumps and injection pens

Insulin can be injected under the skin by three different means:

- With syringes,
- With an insulin pen,
- With an insulin pump.

Some French companies are developing solutions for these devices that are essential to the daily life of diabetics. Indeed, having a continuous follow-up of the disease is constraining for the diabetic patient which must take into account several criteria before injecting the insulin.

The company <u>Biocorp</u> offers an injection pen which allows type 1 or type 2 diabetics to follow their treatment on the long run. Composed of a case with an intelligent sensor on the insulin pen, which is also connected to the mobile application, this system is conceived to help patients improve their adherence to treatment and share the information with healthcare professionals. It allows them to record the selected dose, as well as the date and the time of each injection; the patient can find this data on the mobile application on his smartphone.

A connected object has also been developed by <u>DiabNext</u>. It connects to an insulin pen in order to retrieve the information related to injections and transfer them afterwards to a *smartphone* application. This application acts as an automatic auto-surveillance notebook for diabetic patients. This notebook is filled in automatically with essential data for the follow-up of the disease thanks to data on insulin injections, but also thanks to data on the patient's glycemia transferred by *Bluetooth*.

Other French companies are developing by-products for administration and care. <u>Lifeina</u> produces transporting solutions for fragile medicine like insulin. LifeinaBox, its first product, is the smallest fridge in the world. It allows to safely transport 8 insulin pens and is connected to a mobile application which assists the user during the insulin injections (*conservation temperature*, *period since the last injection*, *etc.*).

The blood glucose meter

In order to adapt their treatment, diabetic patients must regularly (several times a day for type 1 diabetic patients) control their blood glucose levels thanks to a glucometer (blood glucose meter with a drop of blood). Several companies including Sanofi and Dinno Santé, subsidiary of Air Liquide Healthcare, produce blood glucose meters.

In a more innovative way, **PKVitality** has developed a smartwatch that is able to measure the blood sugar level of the wearer and warns the diabetic patient whenever the level deviates.





Research and perspectives

The hospital-university Endocrinology-Diabetes team of the <u>CHU</u> and the <u>University of Montpellier</u> develops and evaluates innovative therapeutics for type 1 diabetes: automated insulin delivery systems ("artificial pancreas") and pancreas and pancreatic islet transplants.

Within the <u>Assistance publique - Hôpitaux de Paris</u> (*AP-HP*), the Cochin hospital and the HEGP in particular, are also developing innovative treatments.

Specialised hospital services

Hospitals and groups such as <u>AP-HP</u>, <u>Groupe Hospitalier Paris Saint-Joseph</u> and the <u>Adolphe de Rothschild Foundation</u> offer a structured, multidisciplinary range of care at the cutting edge of medical progress. They are committed to developing the care of foreign diabetic patients.



The care pathway of the diabetic patient Prevention and addressing complications



Diabetes is a chronic disease which exposes patients to complications. To counteract these complications, French healthcare protagonists develop solutions which can prevent some difficulties facing diabetic patients throughout his or her lifetime, the aim being to anticipate these complications and if they do occur, heal them as quickly as possible to avoid critical alterations to the patient's life (*like amputation*).

The diabetic foot

Feet amputations are 10 to 20 times more frequent amongst diabetic patients compared with other patients². When the glycemia is badly controlled, the nerves which are responsible for sensitivity in the lower limbs are at risk of deterioration, a condition named peripheral diabetic neuropathy. In parallel, a badly balanced diabetes also has a negative impact on blood vessels which circulation can be affected. Small wounds heal badly and are easily infected. Associated with a lack of sensitivity in the feet, the risk of infection becomes very important.

The company <u>FeetMe</u> has developed a connected shoe sole with pressure sensors in order to monitor hyperpressures in diabetic patients. It is a connected solution for the prevention of feet ulcers.

<u>Genbiotech</u> is a biopharmaceutical company created in 2012. It offers a dermic substitute for the treatment of diabetic foot ulcers.

<u>Urgo</u> offers a bandage for the treatment of non-infected wounds caused by diabetic feet. It is a patented innovation by Urgo Laboratories which aims at reducing healing time. Besides, the company currently develops a connected wound healing solution. It is a medical device for wound assessment, wound healing follow-up, as well as the coordination of the care provided by heal professionals.

<u>WoundEL Health Care</u> has developed a system reproducing the endogenous electric current so as to stimulate all the factors contributing to healing.

The <u>Paris Saint-Joseph Hospital Group</u> has created a specialized Center for the care of diabetic feet. The establishment offers a diabetology service which is integrated to the cardio-neurovascular and metabolic cluster.

²Moxey PW, Gogalniceanu P, Hinchliffe RJ, and al. "Lower Extremity amputations – a review of global variability inincidence". Diabetic Medicine. 2011; 28:(10)1144–53





Eye diseases

Diabetic retinopathy is a serious complication from diabetes which affects 35% of type 2 diabetes. Proliferative retinopathy (*which threatens eyesight*) concerns 7% of diabetics³. The excess of blood glucose weakens the capillary walls, which are the vessels that compose the retina, causing a loss of sealing. Subsequently, those vessels can rupture, then burst (*micro-aneurisms*) which then leads to blindness.

In the case of diabetic retinopathy, the French company **Evolucare** has developed an artificial intelligence device for the diagnosis of this complication and the follow-up of the patient in time. Thanks to the image of the retina, artificial intelligence determines whether the patient suffers from retinopathy and if he does, in which part of the eye.

<u>Tilak Healthcare</u> has produced a medical game in the form of a mobile application that targets the detection of slow visual acuity drops. During the game, the patient is required to perform monocular tests to assess near vision, contrast sensitivity and the presence and evolution of scotomes or metamorphopsia.

In partnership with the Institute of Tropical Ophthalmology of Africa (*ITOA*) in Mali, the A. de Rothschild Foundation seeks to deploy screening operations for diabetic retinopathy through telemedical platforms, portable retinography and smartphones between 2019 and 2022. It envisages the implementation of a complete and specific check-up for diabetes.

Cardiovascular diseases

Due to chronic hyperglycaemia, diabetes favours the development of fatty layers (atherosclerosis) at the level of large arteries. The accelerated ageing or coronary arteries produces premature mortality amongst diabetics, and particularly women patients. The probability to develop a myocardial infarction is multiplied by two to four for a diabetic and those seizures are twice as much mortal⁴.

The company <u>Stendo</u> has developed a massage suit which operates in synchronization with the cardiac frequency of the patient and which allows to stimulate blood circulation. The aim of the solution is to accompany cardiac pulses in order to fight against the endothelial dysfunction caused by diabetes.

International Federation of Diabetes – Eigth edition 2017 – p.88

⁴Kannel WB, McGee DL – Diabetes and cardiovascular disease: the Framingham study



The care pathway of the diabetic patient The management of diabetes



Diabetes needs a strong implication of the patient in the management of his condition in order to prevent any form of complication and ensure an efficient treatment. It also requires the involvement of many experts (*diabetologists*, *ophthalmologists*, *cardiologists*, *nephrologists*, *dentists*, *chiropodists*, *etc.*). This complementarity is necessary to detect or diagnose, and take care of the condition adequately. It is therefore essential to ensure a regular follow-up of the diabetic patient. He can therefore ask for several types of support:

- Being taken care of by health professionals at home,
- Telemedicine.
- Education of the diabetic patient.

Healthcare of diabetic patients at their home

On top of being taken care of by specialists of healthcare establishments, the care can also occur at the diabetic patient's house.

This care can be performed via insulin injections, control of the glycemia, as well as bandages in case diabetes has caused wounds. Besides, weekly check-ups are feasible, particularly amongst elderly people for whom the prevalence of diabetes is less important than in the rest of the population.

Nurses and dieticians from Air Liquide Healthcare take care of diabetic patients treated by insulin under prescriptions from their hospital doctor or from a city doctor. In 2010, the company has invested in DinnoSanté, a French company specialized in the home care of diabetic patients, more particularly for type 1 diabetic cases in order to train them to the use of insulin pump thanks to an adapted pedagogical support and medical devices

Telemedicine

The daily use of technological tools like glucometers, insulin pumps or injectable pens by diabetics allows them to directly share their information with healthcare professionals via digital or numeric solutions. Besides, the medical care of the patients can also be performed through remote medical advice or acts.

These solutions as a whole are often grouped together under the term « telemedicine », which entails medical acts or a specific, remote accompaniment. Some French companies have been developing e-health or telemedicine solutions for over 10 years in order to favour homecare for diabetes.





<u>MirambeauAppCare</u>, created in 2017, develops medical platforms which aim at accompanying patients in the respect of their prescriptions. The application is dedicated to diabetics and allows patients to calculate the dose of insulin according to their medical prescription, their diet and physical activity.

<u>Hillo</u>, a *start-up* that was created in 2016 and which is based in Paris, develops a decision support platform for diabetic patients which relies on a predictive technology for glycemia and adapts itself to the physiology and habits of each person. This technology is based on artificial intelligence. It should be granted rights for commercialization in France and in the United States by 2020.

Integrated health solutions (connected devices, telemedicine and e-health) are developed by Sanofi with partners.

Education of the diabetic patient

Diabetes is a complex disease and implies a precise knowledge of treatments, adapted lifestyle, as well as potential complications. It is therefore necessary to educate type 1 and type 2 diabetic patients to raise their awareness of the disease and help them adopt the most virtuous behaviour in terms of treatment follow-up but also about the best diet for them.

The <u>DietSensor</u> solution accompanies patients from the supermarket to the dinner table, by advising them on their dietary choices in order to count carbohydrates. The applications aims at learning about the dietary balance in order to impact the HbA1c (*long-term glycaemic balance*) of the diabetic patient.

The company Observia uses behavioural theories to bring knowledge to healthcare professionals and chronic patients in order to better understand their attitude towards diabetes. It assesses the risk of non-adherence of the patient as well as its need for being accompanied. Thanks to this profile, the company provides recommendations to the patients on the adapted pedagogical support in order to help them better understand their disease and better adhere to their treatment.



Presentation of players

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* Members of French Healthcare Association







1/ History and structure of the company

Air Liquide Healthcare is committed to working alongside patients, healthcare professionals and hospitals to help patients live better with illness, and to make the care pathway and treatment follow-up more efficient and less costly. As a major player in homecare worldwide, an expert in the homecare of chronic diseases and a supplier of medical gases and hygiene products for hospitals, we work to make the healthcare system effective and virtuous for all. Air Liquide Healthcare takes care of people suffering from chronic illnesses such as respiratory diseases, diabetes or Parkinson's disease at home, on medical prescription, with the aim of increasing patients' autonomy and quality of life, improving their adherence to treatment and preventing their risk of relapse or re-hospitalization.

Air Liquide Healthcare is headquartered in France and is present, through its subsidiaries, in 35 countries around the world. Very active in research and innovation, the Air Liquide Group has created a worldwide network of Innovation Campuses in the United States (*Delaware*), Asia (*Shanghai, Tokyo*) and Europe (*Paris, Frankfurt*). Each of these campuses includes an R&D Centre, in close contact with Operations, and relies on numerous partnerships with universities and technology institutes, industrialists and start-ups.

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2/ Expertise in diabetes

2019: Air liquide Healthcare acquires DiaLibre, a Spanish start-up specialising in diabetes care, which offers patients therapeutic support and personalised medical monitoring using digital technologies.

2019: Air Liquide Healthcare strengthens its homecare offer with support for diabetic patients in Germany and Benelux.

2017: Air Liquide Healthcare launches its first e-health solution "Chronic Care Connect".

2017: Air Liquide Healthcare participates in the French project on artificial pancreas in partnership with the French Center for Studies and Research on Treatment for Diabetes (CERITD) and through the acquisition of shares of the French start-up, Diabeloop.

2016: Air Liquide Healthcare acquires Novalab Iberica, a Spanish company specialised in providing products and services to diabetic patients.

2015: Dinno Santé, subsidiary of Air Liquide Healthcare, and the French association Help for young diabetics (AJD) create Glucozor®, the first educative mobile application for diabetic children.

2010: Air Liquide Healthcare acquires Dinno Santé, a French company specialized in home healthcare treatment of diabetic patients.





Segments concerned by your expertise:

- Research.
- Remote Patient Monitoring,
- Patient education and training,
- Distribution of devices.
- Home Healthcare services.

Products and offers in the field of Diabetes:

The nurses and dietitians of Air Liquide Healthcare take care of insulin-treated diabetic patients based on hospital or ambulatory doctor prescription. This home-based long-term care is in most countries financed by public authorities or health insurance organizations.

Clients:

We are connected with the various players: patients, prescribers, funding bodies. Air Liquide Healthcare's expert nurses provide patients, both adults and children, with information on their pathology, personalized advice and assistance in the use of medical devices. We have in-depth knowledge of medical devices and are in direct contact with patients, either at home or in specialized centers. We are therefore an interface between patients and prescribers.

3/ Products and level of development

Services around innovative technologies like the Artificial Pancreas

Level of development: 8 / 10

Development stage: Pilot ongoing

Segment of the diabetes disease which is concerned: Medical device allowing an automatic administration of

insulin and follow-up services

Target population: Insulin-dependant diabetic patients

Distribution channel (patients, pharmacies, hospitals...): Hospitals

Remote patient monitoring of diabetic patients

Level of development: 7 / 10

Development stage: Pilots

Segment of the diabetes disease which is concerned: Remote patient monitoring

Target population: Type 1 or 2 diabetic patients

Distribution channel (patients, pharmacies, hospitals...): Doctors







4/ Financial model

3,7 billion €

Turnover (worldwide)

16,500

Employees (worldwide)

> 5,000

Employes (France)

1 600 000

Home healthcare patients (worldwide)

35

Countries (worldwide)



5/International ambitions

Air Liquide wishes to develop its Diabetes business unit abroad by adapting to the needs and structures of local markets.

Pilot projects are ongoing in several countries to test innovative offers; an example of this is associating innovative medical devices with patient follow-up services.

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6/Business clients and foreign partners

CLOSE Project: Air Liquide Healthcare is part of a European consortium aiming to develop an artificial pancreas and other services for patients affected by type 2 diabetes. This project is part of the European Institute for Innovation and Technology in Healthcare (*EIT Health*) and benefits from European Union funds.

2018: Air Liquide Healthcare signs a 3-year research partnership with the Fédération Francophone pour la Recherche sur le Diabète (*FFRD*) for the 1st phase of the "*SFDT1 cohort study*" which aims to explore the specific factors increasing the risk of cardiovascular complications in patients with type 1 diabetes.

2020: From the start of the Covid-19 pandemic, together with the scientific societies (*SFD*, *SFE*, *FFRD*) and the patient association (*FFD*), Air Liquide Healthcare has been committed to supporting the CORONADO study to better understand the relationship between Diabetes and Covid-19.

Membership in Medical Societies: Yes

French Healthcare membership: Yes







7/ Major publications

Schliess F, et al. Artificial Pancreas Systems for People With Type 2 Diabetes: Conception and Design of the European CLOSE Project. J Diabetes Sci Technol, 2019

Girardot S, et al. New method to assess the precision of insulin pumps in the context of an artificial pancreas. Presented at Societe Francophone du diabete annual congress; 26-29 March 2019; Marseille, France; Abstract CO-037



8/Contact

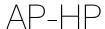
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1/ History and structure of the company

Created in 1848 to bring together all Parisian hospitals under a single administration, the Assistance publique - Hôpitaux de Paris (*AP-HP*) was developed to meet the needs of the population of the French capital, which grew rapidly throughout the 20th century.

AP-HP currently manages 38 hospitals covering all medical fields including rehabilitation and care for the elderly. It is legally a single public health establishment. It has university agreements with 6 faculties of medicine and represents the university hospital centre of the Île-de-France region, i.e. all its services have a triple mission of care, teaching and research.

Its size, with 20,000 beds and 100,000 staff, including 12,000 doctors, makes it the largest university centre in Europe. Every year it receives 1.4 million stays in medicine, surgery and obstetrics, 17,000 hospital stays at home and 5 million outpatient consultations. It has 389 centres of reference for rare diseases. Its technical platform is highly efficient, with 12 surgical robots in particular.

Closely linked to the major research organisations, AP-HP is among the top 50 in terms of the number of publications worldwide in many disciplines and carries out 40% of clinical research in France.

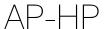
AP-HP has 3 University Hospital Institutes that bring medical research to an international level and the largest health data warehouse in the world. Being a major player in applied research and innovation in health, AP-HP holds a portfolio of 650 active patents, its clinician-researchers sign nearly 9,000 scientific publications each year and more than 4,000 research projects are currently under development, all promoters combined.

International presence:

AP-HP has 60 framework cooperation agreements with universities or reference hospitals throughout the world in Asia, the Middle East, Africa and America. Every year, it welcomes nearly 450 foreign doctors who come to train in its services and carries out more than 80 hospital partnership projects. In addition, in the field of diabetes, AP-HP has been particularly involved in Mali, where for four years it has been supporting the training of a DES in endocrinology in partnership with the diabetes health NGO.

AP-HP has been welcoming international patients for a very long time, with around 4,000 stays per year. A certain amount of information is available on the institution's website and each hospital has a medical-administrative unit to guide patients and answer their questions. Patients are always accommodated in single rooms with the possibility of a companion.







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2/ Expertise in diabetes

The AP-HP offers a structured, multidisciplinary, cutting-edge medical care offer, integrated into university hospital departments, which guarantees patients the best care with a global and multidisciplinary approach. The care offer consists of outpatient consultations and day hospitals as well as full hospitalisation if necessary. Some hospital services are committed to developing the care of foreign diabetic patients.

Diabetes highlights: Cochin Hospital, AP-HP. University of Paris Centre:

- Service ranked by the newspaper "Le Point", depending on the year, first or second in its speciality in France, first
 in Île-de-France.
- Partner service of the Paris Diabetology Federation, bringing together the three diabetes departments of the University of Paris, with a cohort of more than 30,000 diabetic patients, all forms of diabetes combined.
- Annual hospitalisation activity (2018): Day Hospital: 1,480; Therapeutic Education Hospital: 900; Traditional Hospital (discovery of diabetes, acute complications, chronic complications): 880.
- Annual consultation activity: 10,500 consultations and 1,500 "diabetic foot" consultations.
- Cohort of 1,000 patients on pump and implanted pump.
- 5 active therapeutic education programmes recognised by the ARS.

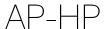
Diabetes highlights: HEGP hospital, AP-HP. University of Paris Centre:

- Annual hospitalisation activity (2018): Day hospital: 278.
- Annual consultation activity: 2,813.
- Mobile diabetes team activity: 2,788.
- Cohort of 200 type 1 diabetic patients, 50% of whom are on pump +- connected sensors.

Concerned segments of diabetes: Cochin hospital, AP-HP. University of Paris Centre:

- Management of all types of diabetes, from the diagnostic announcement to the major complications of the disease. All types of care: hospitalisation, educational stays, day hospital, consultation, telemedicine. Complete diabetes team with specialist doctors, IDE experts, advanced practice nurses in training, dieticians, chiropodists, orthoptists, clinical psychologists, social workers. Sports educator being recruited.
- Investment in the missions defined by the American Diabetes Association (ADA): prevention of type 1 diabetes, treatment of autoimmune disease leading to type 1 diabetes, improving the quality of life of all patients with diabetes, pumps, glucose measurement, closed loop. 5 therapeutic education programmes.
- International recognition, participation in international consortia on the pathophysiology of autoimmune disease leading to type 1 diabetes. Leading service in France for the INNODIA programme.
- Historic participation in the national research group on insulin pumps, implanted pumps, continuous glucose measurement.
- Investment in research on genetically determined, monogenic diabetes. Competence service of the reference centre for rare diseases of insulin secretion and action.
- Expertise in diabetes after organ transplantation.







Concerned segments of diabetes: HEGP hospital, AP-HP. University of Paris Centre:

- Complete management of secondary, iatrogenic diabetes, with poly-vascular and multi-complicated attacks.
- Telemedicine and connected health development.
- Management of type 1 and type 2 diabetic patients in sport.
- Metabolic surgery of obese diabetic patients.



3/ Products and level of development

Innovative treatments proposed with their level of development: Cochin Hospital, AP-HP. University of Paris Centre:

- Participation in immunotherapy projects in the early phase of type 1 diabetes under the aegis of the European consortium INNODIA: populations concerned: subjects with type 1 diabetes and non-diabetic relatives. Active programme.
- Diabetes treatment programme using implanted pumps, under the aegis of the French EVADIAC network: populations concerned: subjects with type 1 diabetes and non-diabetic relatives. Active programme.
- Development of the closed-loop diabetes treatment research programme, participation in industrial research projects, populations concerned: subjects with type 1 diabetes and non-diabetic relatives. Active programme.
- Management of diabetic foot wounds, new dressings. Active programme, populations concerned: diabetics with foot wounds.
- Study of immunity in patients with other forms of diabetes: populations concerned: type 2 diabetes, diabetes after transplantation, cystic fibrosis, chronic pancreatitis: active programme.

Innovative treatments proposed with their level of development: HEGP hospital, AP-HP. University of Paris Centre:

Development of metabolic surgery.

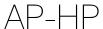


4/ International ambitions

The AP-HP's super-specialised diabetology teams are committed to putting their know-how at the service of each patient and ensuring that they receive the best possible care. They are also keen to develop the management of foreign diabetic patients.

Major global AP-HP project. University of Paris Centre: Creation of the University of Paris Diabetology Institute bringing together 3 adult and 2 paediatric diabetes departments, 6 INSERM/CNRS labelled research units.







Focus: Cochin Hospital, AP-HP. University of Paris Centre:

- Immunology of type 1 diabetes: leading service for France in the European "Innodia" project.
- Founding member of the national "EVADIAC" group, insulin pump therapy and glucose sensors.
- Active member of the national "Glucogen" programme for genome sequencing in atypical diabetes.
- Participation in the European research programme on diabetic cardiomyopathy "CARDIATEAM".
- Participation in the RHU research programmes: EVIRED (diabetic retinopathy) and QUID NASH (metabolic hepatopathy).

Focus: HEGP hospital, AP-HP. Centre University of Paris:

- Development of metabolic surgery.
- Evaluation of metformin in the prevention of diabetes recurrence after obesity surgery: randomised trial.



5/Contact

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1/ History and structure of the company

For the last 25 years, BIOCORP became a specialist in the conception and manufacture of both medical devices and innovative systems for supplying medicine. Today, BIOCORP is recognized for its expertise in meeting the constantly changing needs of its patients. Our capacity to innovate has allowed us to develop a large spectrum of connected products to accompany patients – and specifically the ones suffering from chronic diseases by helping them understand and follow their doctor's prescription.

BIOCORP's headquarters and production site are in Issoire (63500), whereas its R&D site and back office are in Cournon d'Auvergne (63800) near Clermont-Ferrand.

The team has 50 people over two sites.

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2/ Expertise in diabetes

2016: Pharmapack Award for our medical device dedicated to diabetes

2019: Medical device gets C E0459 mark, class II-b

Concerned segments of diabetes:

- Treatment,
- Teleconsultation,
- Patient education

Products and offers in diabetes treatment:

Our medical device is a connected and communicating smart cap for pen injectors.

Clients:

The final user of our medical device is the type 1 or type 2 diabetic patients. Data can be shared with doctors and healthcare professionals, in order to facilitate the follow-up of patient cohorts (*insulin injections are correlated to glycaemic measures*).

Our partners and distributors are pharmaceutical laboratories, players in glycaemic measurement, e-health platforms, healthcare centers...

Our device aims at increasing the therapeutic observation of diabetic patients, and thereby diminish the risks of complications. To this effect, it can be interesting for public institutions as well as private ones.









3/ Products and level of development

Health solution n°1: Medical device

Level of development: 9 / 10

Consisting of a cap and a knob placed on insulin pen and connected to the mobile application, the system is intended to help patients improve adherence to their treatment and share information with health professionals.

It allows the recording of the selected dose, the date and time of each injection, information that the patient then finds in the mobile app on his smartphone, with the possibility of generating a summary report of injections (dose-date-time-insulin time) over a specified period.

Targeted segments of diabetes: insulin delivery and treatment follow-up

Targeted population: type 1 or type 2 diabetic patients using pen injectors

Distribution channel (patients, pharmacy, care institutions): directly to patients, pharmacies, healthcare centres, e-

health platforms, glycaemic measurement players

Acknowledgement (distinctions etc.): Phamapack Award 2016, CPhl Award 2017



4/ Financial model

3,89 M€ Turnover (worldwide)

Employment (worldwide)

50

2,39 M€ Turnover (*France*)

rance) Emi

50 Employees (*France*)

28



BIOCORP





5/International ambitions

BIOCORP aims at distributing this device worldwide. A first agreement was sealed with a major player in glycaemic measurement (*AgaMatrix*) to distribute the device in the United States, Europe and in the United Kingdom. BIOCORP also partnered with Israli company DreaMed to put in place a combined offer worldwide. Numerous discussions are ongoing and should lead to distribution partnerships in the United States, Europe, Middle East and in Asia.



6/Business clients and foreign partners

Distribution agreement with AgaMatrix – USA, UK, EU

Strategic partnership with DreaMed to put in place a combined solution to manage diabetes – Markets to be defined

Health Club membership: SNITEM, SIMV, GIMRA – France – Adherent and members of e-health groups

French Healthcare membership: No



7/ Major publications

On Drug Delivery - December 2018: "Successful connected device development requires a robust value proposition"



8/Contact

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L'EXCELLENCE FRANÇAISE EN SANTÉ

Cerba Healthcare





1/ History and structure of the company

Created in 1967, Cerba Healthcare became a european leader in Medical biology, human, and most recently veterinary

Present in 3 synergetic segments which are:

Routine testing: Cerballiance (Fr), CMP(Belg.), Khetterthill (Lux.), CH Italia

Specialty / esotheric testing: Cerba

Clinical trials: BARC Lab

Recently added: Cerba Vet

650 sites worldwide

c. 8000 staff

1 reference lab. in France for specialty testing, collecting c. 40 000 cases a day from France and 40 other countries

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2/ Expertise in diabetes

Concerned segments:

- Prevention.
- Diagnostic

Products and offers in diabetes, main tests utilized for diabetes

- Biochemical assay,
- Haematology,
- The haemostatic balance,
- Immunology,
- Bacteriology,
- Medicine dosage,
- Virology analysis,
- Groups for the screening of unexpected antibodies,
- Hepatitis B, C and HIV viral load,
- Lymphocytic count: CD4+ and CD8+,
- Hormonal dosages



Cerba Healthcare





3/ Products and level of development

Health solution

Level of development: Mark 10 out of 10

Tailored solution to propose a 'longitudinal' approach to patient:

- Adapt logistic to the activity of clients: Collect frequency and reactivity
- Training of personnel for pre-analytical phase
- · Physicians interface: Direct on-call services
- · Development of new panels of test: BNP and new tech for albumin
- IT connection "Hemadialyse"



4/ Financial model

c. 1 000 m€

Turnover (worldwide) Forecasted 2019 7 700

Employment (worldwide)

500 m€

Turnover (France)

4 000

Employees (France)



Cerba Healthcare





5/ International ambitions

Capitalise on European clients and develop the accounts overseas. Focus development in Africa and Middle East



6/ Business clients and foreign partners

- Diaverum France (ongoing)
- Diaverum international (project)
- Medical facilities in France, Europe and Africa



7/ Major publications

Focus on specialty testing: Cerba Lab

1 500 publications



8/Contact

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CHU Montpellier





1/ History and structure of the research group

The Endocrinology-Diabetes University Hospital Team of the CHU and the University of Montpellier, created in 2010, develops and evaluates innovative therapeutics for type 1 diabetes: automated insulin delivery systems ("artificial pancreas") and pancreas and islet cell transplantation. Its research activity is based on the collaborative meeting of three structures coordinated by its director, Professor Éric Renard, including the INSERM 1411 Clinical Investigation Centre for early clinical trials of medical devices; the Biotherapy Research Institute of Montpellier University Hospital for the isolation of pancreatic islets and cell therapy trials; and the "Innovative therapeutics for diabetes: Understanding and correction of insulin secretion dysfunction and loss" team from the Institute of Functional Genomics (UMR CNRS/INSERM/University of Montpellier) for translational research.

These 3 entities constitute an applied research site for the treatment of type 1 diabetes, resulting in a broad and original range of cutting-edge treatments combining technology, artificial intelligence and transplantation.

The research group was created on the basis of the work carried out by the team of Professors Jacques MIROUZE and Jacques BRINGER from 1980 to 2010 on insulin pumps, continuous glucose measurement and experimental models of artificial pancreas. In addition to deepening this field of research in collaboration with the University of Virginia (*Charlottesville, VA, USA*) and the University of Padua (*Italy*) to develop an artificial pancreas for use in everyday care, which is now commercially available, the research team has developed a Diabetes Cell Therapy laboratory with the ability to isolate insulin-secreting pancreatic islets for clinical transplantation. It has also created a translational research team aimed at applying fundamental knowledge on the regulation of insulin secretion by pancreatic islet beta cells to therapy. Clinical experimentation is carried out at the INSERM 1411 Clinical Investigation Centre for early trials and at the Montpellier University Hospital for larger scale, real-life studies.

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2/ Expertise in diabetes

2011: World's first real-life use of an ambulatory artificial pancreas for the treatment of type 1 diabetes.

2017: First clinical trial of a fully automated artificial pancreas using intraperitoneal insulin infusion.

2018: First application of synthetic biology for the diagnosis of diabetes.

2018-2020: Longer experience with the use of an ambulatory artificial pancreas for the treatment of type 1 diabetes in children in real life.

Concerned segments of diabetes:

- Reasearch,
- Treatment.
- Patient education.



Diabeloop





1/ History and structure of the company

Diabeloop is an independent company that develops automated solutions to manage type 1 diabetes. Its mission: make technological innovation accessible to every person living with type 1 diabetes.

Guillaume Charpentier, diabetologist, and Erik Huneker co-founded Diabeloop in 2015. Marc Julien joined the company in 2016 as co-CEO. Today, Diabeloop brings together the passion, skills and experience of more than 70 employees.

The medical device almost completely automates the treatment of type 1 diabetes by replicating the functions of the pancreas, which has been destroyed by the disease.

It combines a continuous glucose monitoring system (CGM), an insulin pump and a dedicated handset hosting the proprietary self-learning algorithm that instructs the delivery of insulin for optimized blood glucose management.

As a result of input from patients, doctors and engineers, this innovation, which has unprecedented personalization capabilities, will transform the lives of patients by relieving them of some of the thirty or so therapeutic decisions that they have to make every day and night.

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2/ Expertise in diabetes

Initiated by Dr Guillaume Charpentier, Diabetologist & president of CERITD (center of studies and research for enhancement of Diabetes Treatment) together with diabetologists from 12 university hospitals, a medical research project was the founding basis for the creation of Diabeloop.



3/ Products and level of development

DBLG1 System:

- Development stage: Limited release phase,
- CE mark in November 2018,
- Target population: Adults aged of at least 22 years old.

DBL4K:

- Development stage: Achieved clinical phase,
- Target population: Device dedicated to 6-13 years old children.

DBLHU:

- Development stage: Clinical phase,
- Target population: Device for highly unstable diabetes.

DBL4Teens:

- Development stage: Pre-clinical phase,
- Target population: Device for teenagers.



Diabeloop





4/ Financial model

13,5 millions € 1st funding round in 2017

2020

Positive appraisal by French reimbursement authorities (CNEDIMTS) with ASA III

2018

CE Marking of DBLG1 (November)

31 millions €

2nd funding round in 2019 - largest funding round in Europe for therapeutic artificial intelligence



5/International ambitions

Diabeloop is preparing for a launch across Europe by the end of 2020. Additionally, Diabeloop is planning for the FDA clearance process by conducting a dedicated clinical study (*SP8- DBLUS*) with the aim to launch in the USA. Diabeloop has already established a GMBH structure in Germany and is involved in several european countries including Belgium and Sweden.



6/ Business clients and foreign partners

Several International partnerships are already in place with Insulin pumps manufacturers such as Vicentra (*Netherlands*) and SOOIL (*Korea*) as well as a Continuous Glucose Monitoring provider, DEXCOM (*USA*).



7/ Major publications

Closed-loop insulin delivery in adults with type 1 diabetes in real-life conditions: a 12-week multicentre, open-label randomised controlled crossover trial

Pierre-Yves Benhamou, Sylvia Franc, Yves Reznik, Charles Thivolet, Pauline Schaepelynck, Eric Renard, Bruno Guerci, Lucy Chaillous, Celine Lukas-Croisier, Nathalie Jeandidier, Hélène Hanaire, Sophie Borot, Maeva Doron, Pierre Jallon, Ilham Xhaard, Vincent Melki, Laurent Meyer, Brigitte Delemer, Marie Guillouche, Laurène Schoumacker-Ley, Anne Farret, Denis Raccah, Sandrine Lablanche, Michael Joubert, Alfred Penfornis, Guillaume Charpentier, on behalf of the DIABELOOP WP7 Trial Investigators

Lancet Digital Health 2019; 1: 17-25

Efficacy of the Diabeloop closed-loop system to improve glycaemic control in patients with type 1 diabetes exposed to gastronomic dinners or to sustained physical exercise.

Hanaire H, Franc S, Borot S, Penfornis A, Benhamou PY, Schaepelynck P, Renard E, Guerci B, Jeandidier N, Simon C, Hannaert P, Xhaard I,Doron M, Huneker E, Charpentier G, Reznik Y.

Diabetes Obes Metab. 2020 Mar;22(3):324-334. doi: 10.1111/dom.13898. Epub 2019 Oct 16.

<u>Customization of home closed-loop insulin delivery in adult patients with type 1 diabetes, assisted with structured remote monitoring: the pilot WP7 Diabeloop study.</u>

Benhamou PY, Huneker E, Franc S, Doron M, Charpentier G; Diabeloop Consortium.

Acta Diabetol. 2018 Jun;55(6):549-556. doi: 10.1007/s00592-018-1123-1. Epub 2018 Mar 9.



Diabeloop



<u>Preliminary evaluation of a new semi-closed-loop insulin therapy system over the prandial period in adult patients with type 1 diabetes: the WP6.0 Diabeloop study.</u>

Quemerais MA, Doron M, Dutrech F, Melki V, Franc S, Antonakios M, Charpentier G, Hanaire H, Benhamou PY; Diabeloop Consortium; Diabeloop Consortium.

J Diabetes Sci Technol. 2014 Nov;8(6):1177-84. doi: 10.1177/1932296814545668. Epub 2014 Aug 4.

Accuracy of a new patch pump based on a microelectromechanical system (MEMS) compared to other commercially available insulin pumps: results of the first in vitro and in vivo studies.

Borot S, Franc S, Cristante J, Penfornis A, Benhamou PY, Guerci B, Hanaire H, Renard E, Reznik Y, Simon C, Charpentier G; Diabeloop Study Group.

J Diabetes Sci Technol. 2014 Nov;8(6):1133-41. doi: 10.1177/1932296814543946. Epub 2014 Jul 30.

Modeling the variability of insulin sensitivity for people with Type 1 Diabetes based on clinical data from an artificial pancreas study Blanc R, Ugalde HMR, Benhamou PY, Charpentier G, Franc S, Huneker E, Villeneuve E, Doron M.

Conf Proc IEEE Eng Med Biol Soc. 2019 Jul;2019:5465-5468. doi: 10.1109/EMBC.2019.8857170.

PMID: 31947092



8/Contact

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Diabnext

DIABNEXT[™]



1/ History and structure of the company

DIABNEXT is the first solution for diabetes monitoring platform which combines patented connected objects and a mobile application for patients, as well as a monitoring platform for professionals. The solution automatically gathers, records and analyses data which is essential to patients, without any additional effort. It also prevents the medical complications associated with the pathology.

The solution targets type 1 and type 2 diabetic patients (3.3M in France). On the healthcare professionals' side, remote monitoring and therapeutic care are optimized through DIABNEXT through analysis and managing patient cohorts. DIABNEXT is declared compliant by public authorities (DGOS) to the remote monitoring program ETAPES and is now fully reimbursed.

Co-founded by Laurent NICOLAS (*type 1 diabetic*) and Richard BINIER, the company's headquarters are in France (*product manufacturing, R&D, marketing and commercialization*). It has an office in Taiwan (*R&D, manufacturing, quality*) and a commercial office in the United States. Professor Roussel, department head at the hospital Bichat (*Paris*) manages the Strategic and Medical council of the company, which is composed of prestigious healthcare professionals.

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2/ Expertise in diabetes

2017: Prototypes

2018: CE marking and market deployment

2018: DIABNEXT deemed compliant to ETAPES program by public authorities

Concerned segments of diabetes:

- Teleconsultation.
- Patient education.

Products and offers related to diabetes:

1 - B to C

Self-monitoring logbook for diabetic patients: automatic recordings of essential data.

- Insulin injection data: recorded and transferred via Bluetooth with a connected device, towards the self-monitoring logbook of the Patient's mobile application
- Blood glucose levels data: transferred by Bluetooth via a connected device, towards the self-monitoring logbook of the patient

Glucose level assessment of dishes is an additional function of the application (Freemium model).

Access to social networks where diabetic patients can share their experience via the application.

2 - B to B

The remote monitoring platform and the therapeutic care platform, developed in partnership with French hospitals. Following official accreditations, DIABNEXT is now reimbursed for diabetic patients who follow the ETAPES program.



Diabnext

DIABNEXT



3/ Products and level of development

Health solution n°1 – Digital self-monitoring logbook

Level of development: 10 / 10

Targeted segments of diabetes: disease follow-up

Targeted population: type 1 and type 2 diabetic patients, women with gestational diabetes

Distribution channel (patients, pharmacy, care institutions): online

Acknowledgement (distinctions etc.): patented solution

Health solution n°2 - Remote surveillance solution

Level of development: 8 / 10

Targeted segments of diabetes: remote surveillance of diabetic patients in the ETAPES program

Targeted population: diabetes services in hospitals

Distribution channel (patients, pharmacy, care institutions): health facilities

Acknowledgement (distinctions etc.): recognition from public authorities (DGOS)

Health solution n°3 - Glucose level assessment

Level of development: 7 / 10

Targeted segments of diabetes: diabetes management, pre-diabetes

Targeted population: patients and health professionals

Distribution channel (patients, pharmacy, care institutions): our mobile application Freemium



4/ Financial model

1.3 M€

Turnover (worldwide)

25

Employment (worldwide)

6

Employees (France)

800 €

Turnover (France)

2 M€

Fundraising for the production and development of CLIPSULIN & GLUCONEXT



Diabnext

DIABNEXT



5/International ambitions

Except for its headquarters in Paris, DIABNEXT is present in Asia (*Taiwan*) and the United States. Its application is already available in 4 languages (*French*, *English*, *Spanish*, *Mandarin*). We have distribution agreements with different laboratories: Medtronic, Dexcom, Novo Nordisk, Sanofi, AG2R, AXA. We are present on Amazon worldwide and will soon be available on e-commerce platforms like WALMART.

Other international companies are also interested in distributing DIABNEXT:

CVS Health – US; Miteck Trading – US; Kraft Medical – Romania; Genexo – Poland; Connected Health – Ireland; Huge Medical – Panama; Diabeticosas – Chile; OMNI Health Group – Taiwan.



6/Business clients and foreign partners

- Medtronic US: study amongst 200 patients equipped with DIABNEXT starting in April 2019
- Dexcom US: pilot amongst 100 patients equipped with DIABNEXT January 2019
- Sanofi China: pilot amongst 100 patients equipped with DIABNEXT February 2019

Health Club membership: French Tech Taiwan - Richard Binier, DIABNEXT founder and shareholder, is president of French Tech Taiwan



7/ Major publications

- Finalist of the 2019 Start-up competition hosted by SNITEM
- Winner of the 2017 Diabetes innovation challenge organized by the French national insurance and the Association of Diabetics in France
- Company of the year in the PM360 Trailblazer, Medical device category (USA)
- CES Innovation award 2017 (USA)
- Connected devices: DIABNEXT prepares the launch of its solution in December Mindhealth Nov 2018
- Start-up & Co: DIABNEXT, artificial intelligence used for diabetes BFM Business Oct 2017



8/Contact

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DietSensor





1/ History and structure of the company

DietSensor was created in 2015 by a couple, after finding out that one of their children was affected by type 1 diabetes. The primary goal of DietSensor is helping people with type 1 or type 2 diabetes with their nutrition, faced with the realization that nutritional advice was very insufficient compared with what exists in insulinotherapy and blood sugar level education. Furthermore, patients spend 600 hours per year managing diabetes on their own, against 6 hours only with a healthcare professional. The DietSensor solution creates a link between healthcare professionals and patients by accompanying them from the supermarket to the kitchen, by giving them scientific advice on their food choices, in order to count carbohydrate intakes as well as learning about a balanced diet.

The French company which started DietSensor has incorporated a structure in the United States in Cambridge, MA, in order to develop their offer. Most of the R&D is made in France and some of it is done off-shore.

Partnership with Air Liquide Healthcare in France (2017)

Partnership with Air Liquide Healthcare in Italy (2018)

Partnership with Air Liquide Healthcare in Australia (2019)

Partnership with Helloconsult.com (teleconsultation) (2019)

Concerned segments of diabetes:

- Prevention.
- Treatment,
- Teleconsultation.
- Patient education.

Products and offers in diabetes:

Application for the nutritional follow-up of patients – global coverage Teleconsultation in France in partnership with Helloconsult.com

Clients:

- Type 1 or type 2 diabetic patients
- Healthcare facilities
- Services offering homecar



DietSensor





3/ Products and level of development

Health solution n°1 – DietSensor iOS & Android application for patients

Level of development: 10/10

Targeted segments of diabetes: education, prevention, treatment

Targeted population: type 1 and type 2 diabetic patients

Distribution channel (patients, pharmacy, care institutions): AppStore, Android Store

Acknowledgement (distinctions etc.): 2016 CES Best of Innovation Award, 2016 Publicis Second prize for world innovation

Health solution n°2 - Hellodietsensor.com platform (teleconsultation for nutrition in France)

Level of development: 9/10

Targeted segments of diabetes: treatment Targeted population: type 2 diabetic patients

Distribution channel (patients, pharmacy, care institutions): Web and mobile

Acknowledgement (distinctions etc.): N/A



4/ International ambitions

We wish to develop abroad via AppStore promotions, but also by distributing licenses which would be provided or sold to patients:

- Healthcare insurance
- Hospitals
- Home diabetes services
- Medical devices sellers
- Employers (for diabetes prevention)



DietSensor





5/Business clients and foreign partners

- Australia: Air Liquide equipment of patients and nutritional advice by Air Liquide dieticians
- Italy: Air Liquide equipment of patients with insulin pumps



6/Contact

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Astrid Bonnasse

Communication officer and co-founder – +33 1 77 75 52 28 – astridbonnasse@dietsensor.com









1/ History and structure of the company

Evolucare Technologies is a 30 years old company and today a leading healthcare IT solutions provider in Europe, with over 2000 healthcare institutions using its solutions.

Evolucare has particularly strong expertise in patient workflow, medical data management and IT systems interoperability. It helps various services and health specialties such as ICU, medical imaging, chronical diseases and ophthalmology, streamline processes, save time and lower operating costs.

Evolucare serves all kinds of healthcare institutions, from large public hospitals to private clinics and small practices.

Evolucare is based in France with direct or indirect operations in China, Chile, Mexico, Canada, Europe and North Africa.

40% of the workforce is dedicated to R&D and spread across 3 offices in France.

♠★★ 2/ Expertise in diabetes

Early 2019, Evolucare has released an artificial intelligence based solution for the screening of diabetic retinopathy, as well as other eye pathologies (glaucoma and AMD), from retina color fundus images.

This solution is the result of three years of collaboration between artificial intelligence experts, eye care professionals and a company specialized in medical workflow software development. It relies on artificial intelligence algorithm which is integrated in the Evolucare Imaging workflow solution.

In March 2019, this solution received the CE certification.

Concerned segments of diabetes:

- Research.
- Prevention.
- Diagnostic,
- Teleconsultation,
- Screening.

Products and offers in diabetes:

Evolucare solution is designed to facilitate Diabetic Retinopathy screening and the follow up of patients through time and help doctor establish an accurate diagnosis.

In addition, Evolucare workflow solution allows to manage the patient through the entire examination workflow, from admission to invoicing. It allows the clinic to save time, digitize the information and improve the quality of care provided to the patient.

Any type of eye care establishment can access Evolucare solution: public hospitals, private clinics, reading centers, small practices, permanent or temporary screening organizations.









3/ Products and level of development

Evolucare solution 1: Diabetic Retinopathy and other eye pathologies screening solution

Level of development: 10 / 10

Development stage: Preventive early stages Screening

Targeted segments of diabetes: Peoples with type 2 diabetes and general population

Targeted population: Diabetic patients suffering from neuropathy

Distribution channel: All type of eye care services (*public hospitals, private clinics*), screening organizations Acknowledgement (*distinctions etc.*): Awarded Systematic Competitive Champion 2018, in October 2018

 Evolucare solution 2: Workflow solution to manage patient, from appointment to report delivery (through patient portal). Includes patient medical condition, patient exam history, image and patient file sharing and archiving, telemedicine capabilities

Level of development: 10 / 10

Targeted segments of diabetes: Preventive early stages Screening – organization of care / screening Distribution channel: Diabetic Retinopathie screening institutions, eye care services and clinics



4/ Financial model

30M€ Turnover

300

employees

40%

of worforce in R&D









5/ Major publications

- Abràmoff MD, Folk JC, Han DP, Walker JD, Williams DF, Russell SR, Massin P, Cochener B, Gain P, Tang L, Lamard M, Moga DC, Quellec G, Niemeijer M. Automated analysis of retinal images for detection of referable diabetic retinopathy. JAMA Ophthalmol. 2013 Mar;131(3):351-7.
- Quellec G, Lamard M, Abràmoff MD, Decencière E, Laÿ B, Erginay A, Cochener B, Cazuguel G. A multipleinstance learning framework for diabetic retinopathy screening. Med Image Anal. 2012 Aug;16(6):1228-40.
- Quellec G, Charrière K, Boudi Y, Cochener B, Lamard M. Deep image mining for diabetic retinopathy screening.
 Med Image Anal. 2017 Jul;39:178-93.
- Quellec G, Lamard M, Cazuguel G, Bekri L, Daccache W, Roux C, Cochener B. Automated assessment of diabetic retinopathy severity using content-based image retrieval in multimodal fundus photographs. Invest Ophthalmol Vis Sci. 2011 Oct;52(11):8342-8.Zhang X, Thibault G, Laÿ B, Danno R, Quellec G, Lamard M, Cazuguel G, Massin P, Chabouis A, Victor Z, Erginay A, Marcotegui B, Decencière E. Exudate detection in color retinal images for mass screening of diabetic retinopathy. Med Image Anal. 2014 Oct;18(7):1026-43.



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FeetMe





1/ History and structure of the company

The number of people in situation of dependence will double from 1.12 million in 2010 to 2.26 million in 2060. Medical treatment of large scale mobility issues is a major challenge in the coming years. Considered a major problem by the WHO, we need more innovative technologies to educate and take care of these populations.

FeetMe is an innovative company which was created in October 2013. It develops connected medical devices for the ambulatory care of patients who suffer from chronic mobility losses.

FeetMe's headquarters are located in the Paris area. All the conception, research and development are in Ile-de-France. The production is in China. FeetMe has international clients.

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2/ Expertise in diabetes

Concerned segments of diabetes:

- Prevention.
- Teleconsultation,
- Complications,
- Homecare.

Products and offers in diabetes:

FeetMe has developed a smart medical wearable with pressure sensors to prevent injuries in diabetic patients affected by neuropathy.

Clients:

Our clients are service companies which take care of foot problems amongst diabetic populations (vascular surgery, endocrinology, physical and re-adaptation medicine).

Our clients will eventually be the patients, who will want to equip themselves with our preventive connected solutions.

Our clients are also insurance companies.



FeetMe





3/ Products and level of development

Health solution n°1

Level of development: 10 / 10

Development stage: Medical device is fully developed and was granted a CE marking Targeted segments of diabetes: 25% of diabetic patients will have an ulcer in their lifetime

Targeted population: Diabetic patients suffering from neuropathy

Distribution channel (patients, pharmacy, care institutions): Use in centres for diagnosis / medical prescriptions for

home usage

Acknowledgement (distinctions etc.):



4/ Financial model

20

Employment (worldwide)

19

Employees (France)



FeetMe





5/ International ambitions

Development of our solution on markets where diabetes prevalence is high (United States, Central America, Middle East).

Strategic partnerships



6/ Major publications

Biofeedback and decrease of plantar pressure amongst neuropathic diabetics: advantages of the FEETME connected wearable soles, a preliminary study

Georges Ha Van, Jérôme Haddad, Yves Bensimon, Laurent Dillard, Damien Jacobs, www.http://admin.nancy.sofmer2017.com

https://business.lesechos.fr/entrepreneurs/financer-sa-creation/030654407450-feetme-leve-1-95-million-d-euros-pourses-semelles-connectees-314068.php

https://www.medgadget.com/2018/12/feetme-partners-with-novartis-to-study-gait-of-ms-patients-interview-with-ceo-alexis-mathieu.html



7/Contact

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Fondation A. de Rothschild





1/ History and structure of the company

Founded in 1905 in the heart of Paris, Rothschild Foundation Hospital treats all head and neck diseases, from screening to surgery for the most complex cases in disciplines such as ophthalmology, neurology, neurosurgery, interventional neuroradiology and ENT. Rothschild Foundation Hospital holds the most cutting-edge biomedical equipment in each disciplinary. Rothschild Foundation Hospital has woven a dense partnership network with renowned hospitals to offer continuity of care and be part of care journeys able to provide a global a secured patient management.

Rothschild Foundation Hospital has an ophthalmology department comprising 6 divisions, a neuroscience department (adult and paediatric neurosurgery, stroke neurology, interventional neuroradiology, paediatric endocrinology) and other departments, including anaesthesia – intensive care, ENT, internal medicine, imaging or pharmacy. Rothschild Foundation Hospital also has a dedicated Clinical Research Unit. The Edmond de Rothschild Center, very close to the Hospital's main building and dedicated to screening and post-operative follow-ups in ophthalmology, was created in 2015. At the international level, Rothschild Foundation Hospital participates in cooperation and exchange programs to foster cross-fertilization and transfer of expertise in all head and neck diseases, the development of international academic partnerships and hosts foreign patients as part of Paris Hospital Foundations, a platform to offer complete and structured care to patients from all countries, from diagnosis to hospitalization.

♦ 2/ Expertise in diabetes

Since 2017: organization of events dedicated to prevention (free annual screening within Rothschild Foundation
Hospital or conference with the Association française des diabétiques (French charity dedicated to diabetic
patients) led by specialists in diabetology, ENT and odontology) on the occasion of the World Diabetes Day and
Diabetes Prevention Week.

Concerned segments of diabetes:

Research

Training

Prevention

Patient education

Diagnostic

Complications

Treatment

Surgery.

Telemedicine

Products and offers in diabetes:

The Rothschild Foundation Hospital's specificity lies in providing a structured and multidisciplinary healthcare offer in coordination with the ophthalmology, cardiology, medical imaging and neurology internal departments to ensure a comprehensive care for diabetic patients. This offer is complemented by screening through telemedicine, therapeutic education and prevention.

Clients:

- Patients referred by local general practitioners and specialist physicians
- Patients referred through the Paris Hospital Foundations platform



Fondation A. de Rothschild





3/ Products and level of development

 Health solution: structured and multidisciplinary healthcare offer in coordination with ophthalmology, cardiology, medical imaging and neurology internal departments to ensure a comprehensive care for diabetic patients.

The Internal Medicine Unit provides care through medical consultations and outpatient or inpatient hospitalizations in diabetology, whether it is for balancing, therapeutic adaptation or insulin delivery. Care is provided using innovative techniques, such as injectable treatments, optimized insulin regimens, the use of new diagnostic and therapeutic devices (*insulin pumps, connected glucometers*). In addition to diabetes specialists, the Foundation brings together in a single place several medical specialties involved in the treatment of diabetes and its complications in order to provide comprehensive care for diabetic patients and coordinate a smooth patient journey in close collaboration with the following departments: ophthalmology, cardiology, medical imaging and neurology.

- Ophthalmology: screening (it can also be done through the OPHDIAT network), treatment and follow-up of diabetic retinopathies by the ophthalmology department led by Professor Sahel, specialized in retinal pathologies;
- Cardiology: screening and management of all cardiovascular complications and risk factors (such as arterial hypertension) related to diabetes, using state-of-the-art technology equipment, including an electrocardiogram, a cardiac ultrasound, cardiac stress test equipment as well as an Holter monitor (tension and ECG);
- Medical Imaging: arterial echo-dopplers, coronary CT calcium scan and other radiological examinations;
- Neurology: diagnosis and treatment of diabetic neuropathies using an electromyogram and treatment of pain (practitioners from a unit dedicated to treatment of pain within the hospital).

Level of development: 8/10

- Stage of development: medical consultations and outpatient/inpatient hospitalizations are open to patients and care journeys are implemented.
- Diabetes' segment concerned: Any type of diabetes (type 1 type 2, or secondary diabetes), whether at an early stage or multi-complicated, is cared.
- Target population: any diabetic patient
- Distribution channel (patients, pharmacy, healthcare facilities): Patients are referred by the Rothschild Foundation Hospital's internal departments or by local general practitioners or local specialist physicians.



4/ Financial model

111 094 000 €

care activities income (Estimate – excluding grants, financial products and exceptional incomes)

130 517 000 €

Rothschild Foundation Hospital's income (estimate)

231 823 €

(diabetic patients' intravitreal

injections income)

2,773

intravitreal injections carried out for diabetic patients

126

patients cared as part of hospitalizations 892

patients cared as part of consultations

Jobs in France

1142

240 687 €

(hospitalizations for diabetes income)

47 005 € (diabetes consultations income)

50



Fondation A. de Rothschild





5/ International ambitions

Rothschild Foundation Hospital provides care for international diabetic patients as part of the healthcare package offered by the *Paris Hospital Foundations* platform, created in 2017. This patients can be redirected to the Rothschild Foundation Hospital's Internal Medicine Unit or one of the departments that also include diabetes treatment as part of those of other pathologies. This will continue over the next few years.

In order to widen its healthcare offer dedicated to international diabetic patients, Rothschild Foundation Hospital plans to set up a complete checkup offer specific to diabetes, which would include the following examinations: retinal ophthalmological assessment, cardiovascular assessment, cervical and intracranial Doppler ultrasound, Doppler ultrasound for lower limbs, diabetology consultation and dietetics consultation.

As part of its international cooperation program, Rothschild Foundation Hospital supports the *Institut d'Ophtalmologie Tropical de l'Afrique* (*Institute of Tropical Ophthalmology in Africa*) in Mali on the implementation of a project dealing with the treatment of diabetic retinopathy and glaucoma, and more specifically on the following actions:

- Screening for diabetic retinopathy via telemedicine using the Al Vision platform, portable retinographs and smartphones;
- Integrated management of diabetic patients through the use of equipment and medical devices such as the Argon laser, intravitreal injections or anti-VEGF therapy.

These different actions will be deployed between 2019 and 2022.



6/Business clients and foreign partners

Institut d'Ophtalmologie tropicale de l'Afrique (IOTA) – Mali

Membership to the French Healthcare association



7/ Major publications

- Acute Increases in Serum Creatinine After Starting Angiotensin-Converting Enzyme Inhibitor-Based Therapy and Effects of its Continuation on Major Clinical Outcomes in Type 2
 Diabetes Mellitus (January 2019)
 - Ohkuma T, Jun M, Rodgers A, Cooper ME, Glasziou P, Hamet P, Harrap S, Mancia G, Marre M, Neal B, Perkovic V, Poulter N, Williams B, Zoungas S, Chalmers J, Woodward M; ADVANCE Collaborative Group.
- Variations in Risk of End-Stage Renal Disease and Risk of Mortality in an International Study of Patients With Type 1 Diabetes and Advanced Nephropathy (January 2019)
 - Skupien J, Smiles AM, Valo E, Ahluwalia TS, Gyorgy B, Sandholm N, Croall S, Lajer M, McDonnell K, Forsblom C, Harjutsalo V, Marre M, Galecki AT, Tregouet DA, Wu CY, Mychaleckyj JC, Nickerson H, Pragnell M, Rich SS, Pezzolesi MG, Hadjadj S, Rossing P, Groop PH, Krolewski AS.
- Lower extremity arterial disease in patients with diabetes: a contemporary narrative review (October 2018)
 - Nativel M, Potier L, Alexandre L, Baillet-Blanco L, Ducasse E, Velho G, Marre M, Roussel R, Rigalleau V, Mohammedi K.



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Genbiotech





1/ History and structure of the company

Genbiotech was created in 2012, as a spin-off of Genévrier Laboratories, a biopharmaceutical company which develops innovative products in three domains: dermatology, aesthetics, and musculoskeletal diseases.

The company operates within the Genévrier Laboratories on Sophia Antipolis (*France*) technology.

ል ተ 2/ Expertise in diabetes

Key event:

Development and CE marking for a dermal substitute treating foot ulcers for diabetic patients

Concerned segments of diabetes:

Complications

Products and offers in diabetes:

The medical device is composed of collagen, chondroitin sulphate and chitosan.

Clients:

Diabetic patients



Genbiotech





3/ Products and level of development

Level of development: 8
Targeted segments of diabetes: complications



4/ Major publications

- Guillemin et al, J Wound Care 2016;25(7):406-13
- Dumont et al, J Am Podiatr Med Assoc 2018, In press.
- Dumont et al, J Surg tech & Proc, 2018; 2(2): 1017.



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Groupe Hospitalier Paris Saint-Joseph Groupe hospitalier Paris Saint-Joseph





1/ History and structure of the company

The hospital group Paris Saint-Joseph (GHPSJ) is a private non-profit hospital, designated "private health institution of public interest". It is managed by the Saint-Joseph Hospital Foundation and its origins date back from the 19th century. The hospital group is profoundly attached to its core values: welcoming patients, ethics, professionalism, team spirit. These are embodied by all of its workers.

All the GHPSJ personnel are salaried employees and doctors do not perceive fees. The GHPSJ has obtained the V2014 certification by the High Authority for Healthcare with the best possible score.

2/ Expertise in diabetes

Type 1 and Type 2 diabetic patients receive custom care after a pedagogical diagnosis to offer the most adapted structure, from the medical consultation by a nurse or a dietician, until hospital care by day or throughout the week. The therapeutic education takes place within individual or group workshops with a possibility to bring along other people.

The centre is a reference for insulin pump installation and does a 24/24 follow-up. Additional services include functional insulin therapy, glycaemic holters and pregnancy diabetes (supported by the obstetrician service from the hospital group).

Thanks to its comprehensive and complementary technical offer, the hospital also developed a structure to care for diabetic patients' feet, which relies on a pluridisciplinary and specialized team with adapted premises. Since efficiency is key, the diabetes services proposes urgent medical and surgical consultations, as well as hospitalizations with specialized council on vascular medicine, vascular surgery, and infectious medicine.

- 2014: creation of a diabetic feet hospital unit,
- 2014: opening of the Center for Surgery in Obesity
- 2016: Intermediary service for geostationary diabetes
- 2016: "Weekly diabetic feet" consultation
- 2019: creation of the "Medical-Surgical diabetic feet Unit"

Research:

- Participation to phase 2,3 and 4 industrial trials (firms: Ely Lilly, Novo Nordisk; Bohringer Ingelheim, Sanofi, and others...),
- Collaborative DICAR study for cardiology on cardiac insufficiency,
- Collaborative LIRA DIAL study with the AURA on diabetic patients with dialysis,
- Participation to the deployment of teleconsultation (*ETAPES experimentation*).

Expertise:

Therapeutic Education: Training to the therapeutic education degree

Participation to the peri-operation degree as a trainer, nutrition & sport, nutrition & ageing

Participation to the wound healing institute Jean Paul Belmondo Member of the Diabetes Francophone Society and elected to the **Administration Committee**

Concerned segments of diabetes:

- Research.
- Patient education
- Prevention,
- Complications,
- Diagnostic,
- Surgery.
- Treatment,
- Teleconsultation.
- Training



Groupe Hospitalier Paris Saint-Joseph Groupe hospitalier Paris Saint-Joseph





3/ Products and level of development

Healthcare solution 1

The diabetes service is integrated in the Cardio-neurovascular and metabolic unit; it uses the most modern techniques of expertise and treatment in the vascular field and pain treatment. It coordinates the Center for the surgical treatment of obesity.

Access to the functional cardiac exploration plateau (electrocardiogram, arterial echo-dopplers, cardiac echography, echography for cardiac effort equipment, holter monitoring).

Medical imaging: traditional, scanner with calcium score if needed, MRI, intervention and radiological exams.

Healthcare solution 2

Development stage: creation of a Diabetic feet Center

Segment of diabetes: when it is not well balanced for several years, chronic hyperglycaemia can cause serious complications for the feet. Arteries of the lower limbs, nerves (diabetic neuropathy) that are related or not to an infection can imply serious troubles in feet, from chronic wounds to amputation. Patient care relies on a pluridisciplinary specialized team that associates specialized council from vascular medicine, vascular surgery and infectious medicine.



4/ Financial model

Sno	cial	izad	stays
Obc	CIUI		Siugs

125 diabetic feet stays

183 183 gestational diabetes stays

125 retinpathy stats

26 beds for diabetes

6 places in the day hospital

6,5 ETP senior doctors

5,5 ETP interns

5 FTP externs

238.4 M€

Turnover France

677 Beds and seats

2213 ETP* employees

5,5 M€

Turnover of the diabetes service

73 319 staus Conventional hospitalization

28 452 stays Day hospital

> 217,567 consultations



Groupe Hospitalier Paris Saint-Joseph 💘





5/ International ambitions

Since 2012, the Paris Saint-Joseph hospital group cares for a growing number of international clients. It has a dedicated international unit which offers patients a therapeutic care offer with a detailed associated quote within 48 hours.

The quality of its hotel installations allow it to respond to the needs of a demanding clientele.

Its diabetes services features amongst the largest ones in Paris and is specialized in diabetic feet, allowing it to cater for foreign patients in the context of comprehensive check-ups with retina ophthalmologic care, cardiovascular check-ups, echo-dopplers for lower limbs, diabetes consultation, nutritional consultations and day or conventional hospitalization.

It particularly seeks to provide its expertise in diabetic feet for patients who have suffered from imbalanced diabetes for years.

Its development also comprises caring for obese patients, with higher diabetes frequencies.



6/Business clients and foreign partners

Cooperation agreements for intern trainings with Romania, Maghreb countries Externs from Maghreb or Erasmus students Senior doctors upon demand



7/ Major publications

O. DUPUY, L. BORDIER, C. GARCIA, A BRINKANE, B. LORMEAU, M POPELIER, M LEVY, JP BERESSI, H. MAYAUDON. B BAUDUCEAU. Paramètres prédictifs de la réponse au liraglutide: résultats d'une étude dans la vraie vie. Médecine des maladies Métaboliques 2014; 8:56-60

R. SAKR, O. DUPUY, A. VOICAN, L. PIETRI, D. HUET

Difficultés de prise en charge de jeunes diabétiques en transition

Médecine des maladies Métaboliques 2016 ;10:763-770

A KALLERGI, <u>O DUPUY</u>, A VOICAN, A VIAL DUPUY, M SANCHEZ, L. PIETRI, D HUET

Une « allergie » déclenchée lors du port d'un appareillage de SAS chez un diabétique de type 2.

Revue de pneumologie 2016 ;72: 380.

MOUCHEL V, ANTAKLY Y, GRELICHE N, BEZIE Y, HUET D, CADOR R, DUPUY O, CORNY J

Impact de l'implant patient d'un pharmacien clinique sur la prise en charge des patients diabétiques de type II hospitalisés en service de cardiologie (étude pilote) Diab metab CA 050 Congrès annuel SFD Marseille, 26-29 mars 2019

DUPUY O. CHAMPAULT A, VOICAN A, ANGLIVIEL B. PIETRI L, AMATO R, TAMAZASHVILI N, J LORIAU J.

Difficulté de la prise en charge chirurgicale de l'obésité en lien avec les recommandations HAS

CA 136 Congrès annuel SFD Marseille, 26-29 mars 2019

NOILHAN C, CAZALS L, BORDIER L, CEPHISE-VELAYOUDOM FL, CHEVALIER N, DISSE E, <u>DUPUY O</u>, GAUTIER JF, MARRE M, MATAR O, MEYER L, SANZ C, VALENSI P, GOURDY P

Association fixe Degludec-Liraglutide en situation de vie réelle: Étude multicentrique française sur les modalités d'initiation et l'efficacité à six mois. Diab metab CA 189 Congrès annuel SFD Marseille. 26-29 mars 2019

M. Fumery*, Y. Antakly, P. Garcon, P. Abassade, V. Boileve, M. Rovani, MJ. Aroulanda, A. Voican, I. Banu, A. Ben Hamou, O. Dupuy, M. Komajda, R. Cador Systematic echo-doppler screening identifies subtle structural and functional cardiac abnormalities in type 2 diabetes mellitus without documented cardio vascular disease: DIACAR a prospective study. JEFSC 2019



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1/ History and structure of the company

Hillo is a Paris-based startup founded in 2016. Hillo develops a decision support platform for diabetic patients, based on a blood glucose levels predictive system that adapts to every patient's physiology and habits. Our technology combines pharmacokinetics modelling and artificial intelligence, we develop tools for patients to help them anticipate and avoid hypo- or hyperglycemia, and for care teams to help them understand each patient's specific glycemic response.

Hillo develops its artificial intelligence and applications in-house, and has dedicated teams of developers and data scientists. We are developing multiple international collaborations, especially with hospitals, world-class universities' researchers and endocrinologists across Europe and the USA.

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2/ Expertise in diabetes

2019: Results of the first observational study conducted at the Montpellier University Hospital with Prof. Eric Renard, which demonstrated unprecedented accuracy and robustness of our predictive technology.

Concerned segments of diabetes:

- Prevention,
- Patient education

Products and offers in diabetes:

Based on our Artificial Intelligence, which is able to understand and reproduce the each patient's specific glycemic response, we develop a platform comprising two products:

- A mobile application for patients, which uses our AI to predict blood glucose levels and provide personalized therapeutic advice. This product is a medical and requires adequate CE mark (pending).
- A dashboard for health care professionals, which uses our AI to provide personalized therapeutic education services.

Clients:

Our system will be distributed as a BtoB service to pharma corps and medtech companies.









3/ Products and level of development

Smartphone application

Level of development: 8 / 10

Targeted segments of diabetes: Decision support, Patient education, Prevention
Targeted population: Type 1 and Type 2 diabetic patients under insulin-therapy
Distribution channel (*patients, pharmacy, care institutions*): B2B pharma / medtech
Acknowledgement (*distinctions etc.*): CES 2019 Innovation award, Innovation & Galien Prize, Innov'Up Leader PIA, 1st
Prize France is AI contest

Dashboard

Level of development: 8 / 10

Targeted segments of diabetes: Patient education, Prevention

Targeted population: Endocrinologists, Nurses

Distribution channel (*patients, pharmacy, care institutions*): B2B with pharma / medtech / Medical device providers Acknowledgement (*distinctions etc.*): CES 2019 Innovation award, Innovation & Galien Prize, Innov'Up Leader PIA, 1st Prize France is Al



4/ Financial model

23

Employment (worldwide)

23

employees France

800 000€

seed round in 2018









5/International ambitions

We ambition to deploy our solution in Europe first and then in the US soon after. CE mark as a medical device for the patient application is underway (2019), FDA clearance should follow soon after (2020).



6/ Business clients and foreign partners

Partnership under discussion in the US



7/ Major publications

CHALLENGES: « 2019 top 100 start-ups in which to invest » https://www.challenges.fr/start-up/healsy-l-appli-qui-change-la-vie-des-diabetiques 648609

Scientific publications at ATTD: FIRST ASSESSMENT OF THE PERFORMANCE OF A PERSONALIZED MACHINE LEARNING APPROACH TO PREDICTING BLOOD GLUCOSE LEVELS IN PATIENTS WITH TYPE 1 DIABETES: THE CDDIAB STUDY

LE MONDE: https://www.lemonde.fr/economie/article/2019/01/11/l-e-sante-francaise-s-expose-au-ces-de-las-vegas 5407742 3234.html



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Impeto Medical *impetomedical



1/ History and structure of the company

Impeto Medical is an innovative French company created in 2005, which develops and markets a medical device for the detection and monitoring of small fiber neuropathy.

Small fiber neuropathy is one of the first complications observed within diabetic patients, it can lead to diabetic foot.

The medical device is a patented diagnosis test.

It is a digital chrono-amperometric analyzer used for early identification and follow-up of peripheral autonomic neuropathies.

The device measures the capacity of the sweat glands to release chloride ions in response to an electric stimulus. It is a dynamic test for the sweat glands equivalent to a stress test.

Impeto Medical headquarter is based in Paris, France. The medical device is marketed in more than 35 countries worldwide. The company has a subsidiary in China and the USA. The production is carried out in France.

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2/ Expertise in diabetes

2005: Impeto Medical creation

2007: CE certification, 2008: CFDA-China certification, 2010: FDA-USA approval.

2017: new medical device generation launch

Concerned segments of diabetes:

- Prevention,
- Diagnostic,
- Complications.

Products and offers in diabetes:

- Medical device 1: Class IIa medical device for early identification and follow-up of peripheral autonomic neuropathies.
- Medical device 2: Class IIa medical device to identify people at increased risk of diabetes (pre-diabetes included).

Clients:

Practitioners and diabetes screening operators.



Impeto Medical *impetomedical



3/ Products and level of development

Medical device 1

Level of development: 10

Targeted segments of diabetes: Prevention and detection of diabetes complications (neuropathy and diabetic foot)

Targeted population: Diabetic patients

Distribution channel (patients, pharmacy, care institutions): Practitoners and hospitals Acknowledgement (distinctions etc.): Included in diabetes management guidelines

EZSCAN

Level of development: 10

Targeted segments of diabetes: Diabetes screening. Targeted population: Patient at risk for diabetes

Distribution channel (patients, pharmacy, care institutions): Practitioners and diabetes screening centers

Acknowledgement (distinctions etc.): Several scientific publications



4/ Financial model

5,3 Millions €

31

20

Turnover worldwide

employees worldwide

employees France

3,7 Millions €

60%

Turnover France

Share of worldwide turnover in diabete



Impeto Medical *impetomedical



5/International ambitions

Impeto Medical aims to find local partners to develop internationally. The company is already marketing in several countries but also needs to develop its distribution network. For affiliate companies, Impeto Medical manages business projects by itself.

BBS

6/Business clients and foreign partners

- Diabetes screening campaign in China
- Partnership in "Prevention of microvascular complications in pre-diabetes" involving 15 European countries and funded by UE
- Chinese health club
- Membership to the French Healthcare association: Yes



7/ Major publications

IMPETO MEDICAL technology has been reviewed in more than 100 scientific publications, here after 5 main publications in diabetology:

- C. M. Casellini et al, "Sudoscan, a noninvasive tool for detecting diabetic small fiber neuropathy and autonomic dysfunction". Diabetes Technology & Therapeutics. volume 15, number 11, 2013.
- L. Bordier et al, "Accuracy of a Rapid and Non-Invasive Method for the Assessment of Small Fiber Neuropathy Based on Measurement of Electrochemical Skin Conductances. Front. Endocrinol. 7:18, February 2016.
- D. Selvarajah, "SUDOSCAN: A Simple, Rapid, and Objective Method with Potential for Screening for Diabetic Peripheral Neuropathy". PLoS One. Oct 12;10(10):e0138224, 2015.
- G.A. Smith and al, "The diagnostic utility of Sudoscan for distal symmetric peripheral neuropathy". J Diabetes Complications. Jul-Aug;28(4):511-6, 2014.
- A. Goel, "Comparison of electrochemical skin conductance and vibration perception threshold measurement in the detection of early diabetic neuropathy", PLoS ONE 12(9): e0183973, 2017.



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Lifeina





1/ History and structure of the company

Lifeina manufactures transportation solutions for fragile medicine like insulin. LifeinaBox, its first product, is the smallest fridge in the world. It allows to safely transport 8 insulin pen and is connected to a mobile app which allows patients to better manager its insulin injections.

Lifeina is located in Paris, with factories in China and distribution subsidiaries in the United States, Australia, Chile and Canada.

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2/ Expertise in diabetes

Concerned segments of diabetes:

- Research,
- Prevention,
- Patient education.

Products and offers in diabetes:

A mini fridge which keeps insulin at the right temperature (2°C to 8°C) An application to alert the user (temperature, time of the injection...)



Lifeina





3/ Products and level of development

Health solution n°1 – LifeinaBox

Level of development: 10 / 10

Targeted segments of diabetes: Type 1 diabetes Targeted population: 5% of the global population

Distribution channel (patients, pharmacy, care institutions): B2C, B2B2C, B2B

Acknowledgement (distinctions etc.): Galien Prize, Best Startup in the World at the 2017 Lisbon WebSummit, 2019

CES Innovation Award

Health solution n°2

Level of development: 5 / 10

Targeted segments of diabetes: type 2 diabetes Targeted population: 5% of the global population

Distribution channel (patients, pharmacy, care institutions): B2C, B2B2C, B2B

Acknowledgement (distinctions etc.): Galien Prize, Best Startup in the World at the 2017 Lisbon WebSummit, 2019

CES Innovation Award



4/ Financial model

1,8 M €

Turnover (worldwide)

10 to 30

Employees (worldwide)

50 000 €

Turnover (France)

2 to 5

employees (France)

950 000 €

Turnover (worldwide) in diabetes









5/ International ambitions

We wish to grow internationally in order to meet the needs of a more specific type of patient and to offer to these people a better everyday life.

Our perspective is helping people worldwide and therefore our projects are not restricted to Europe and/or the United States. We are hoping to become major players in Asia, Africa or the Middle East.



6/ Business clients and foreign partners

Sweden – Lund University



7/ Major publications

- Lifeina, for the safe transport of medicine (Startup.Infos)
- Lifeina, the French winner of the pitch competition at the 2017 Web Summit (www.maddyness.com)



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MirambeauAppCare





1/ History and structure of the company

Created in 2017, MirambeauAppCare is a European company which develops medical platforms to accompany patients in following up with their prescription in a collaborative way. The applications facilitate this by automating complex medical prescriptions and establishing a permanent therapeutic education. These predictive medical devices allow patients to anticipate their needs, and allow researchers to analyse data and improve protocols.

MirambeauAppCare was the only French start-up to be selected amongst thousands of companies to attend the Arab Health 2019 in Dubaï in the Innov 8 talks.

MirambeauAppCare's headquarters are located in Bordeaux, France. It aims at a rapid development abroad, relying on:

- A scientific council in France.
- A scientific council in the United Arab Emirates,
- An office at the Montreal University Hospital with a scientific council under construction,
- A strategic comittee in Canada including former Energy minister M. Gordon KAISER.

May 2016: DiabiLive wins the Prize of the President of the Republic, the highest award,

September 2016: DiabiLive wins the Medal of Social and Health Affairs and the Gold Medals of the French Medical and Physical Sport Society.

January 2018: DiabiLive wins the Innovation Award Honoree at the Las Vegas CES

January 2019: Selected to attend the Arab Health 2019 in Dubaï and participate in the Innov 8 talks

Concerned segments of diabetes:

- Research.
- Treatment,
- Teleconsultance,
- Patient education.
- Homecare.

Clients:

- diabetic patients,
- healthcare professionals,
- health facilities.
- health insurance companies

Products and offers in diabetes:

The Diabilive application received the first prize of the 2016 Innovation Lépine Competition, as well as the 2018 Innovation Award Honoree at the Las Vegas CES.

Diabilive considers all facets of a patient by calculating its insulin dose according to his medical prescription, its diet and physical activity, in basal / bolus scheme, single-injection or multi-injection.

Diabilive facilitates prescription observation and the anticipation of forthcoming needs through better knowledge of the patient. By connecting all the people, the patient is never alone again.



MirambeauAppCare





3/ Products and level of development

Health solution n°1 - DiabiLive

Level of development: 10

Targeted segments of diabetes: e-health / m-health / medical device

Targeted population: Type 1 and Type 2 diabetic patients

Distribution channel (patients, pharmacy, care institutions): B2C (patients), B2B (health establishments), B2B2C

(pharmacies, insurance companies)

Acknowledgment:

May 2016: DiabiLive wins the Prize of the President of the Republic, the highest award,

September 2016: DiabiLive wins the Medal of Social and Health Affairs and the Gold Medals of the French Medical and Physical Sport Society.

January 2018: DiabiLive wins the Innovation Award Honoree at the Las Vegas CES

January 2019: Selected to attend the Arab Health 2019 in Dubaï and participate in the Innov 8 talks



4/ Financial model

13

Employment (worldwide)

12

employees (France)

800k€

Invested in innovation with DiabiLive



MirambeauAppCare





5/ International ambitions

MirambeauAppCare aims at developing abroad:

Presence on 4 continents from 2019 onwards: Europe (France), Africa (Morocco, Lebanon), Asia (UAE), America (Canada),

Subsidiaries on those 4 continents in 2020.



6/Business clients and foreign partners

Examples of foreign partnerships in diabetes:

Montreal University Hospital, Canada Mediclinic, United Arab Emirates

Health Club membership:

- Cluster TIC Santé Nouvelle-Aquitaine, France
- Quartier Innovation Santé, Montreal, Canada



7/ Major publications

Lépine Competition: Benoît Mirambeau wins Prize of the President of the Republic (2016)

Mirambeau AppCare supported by the Region and Bpifrance (2017)

DiabiLive, diabetes management app receives awards at CES 2018 (2018)

Diabetes: Diabilive, the application from Bordeaux secudes the United States after award at the Lépine Competition

(2018)

E-health: Mirambeau AppCare from Bordeaux will raise 1.5 million to deploy abroad (2018) E-health: MirambeauAppCare will make Bordeaux shine at the Arab Health in Dubaï (2019)



8/Contact

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Observia





1/ History and structure of the company

Observia is an innovative European company which aims at creating and developing multichannel and personalised solutions to improve the life of patients with chronic illnesses and facilitate the daily life of healthcare professionals. Present in France and China, with over 50 solutions implemented throughout the world since 2011, Observia is a key e-health player. Its solutions were first developed at a national scale (France), then internationally.

Observia is present in Europe. Its historical headquarters are in Paris, in the BiotechSanté Center of the Cochin Hospital. Then, the company opened offices and representative offices in England, Germany, Switzerland and lastly China. The solutions developed by Observia are exported in South America, Asia and Maghreb since 2017.

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2/ Expertise in diabetes

2012: first e-health project to coach diabetic patients in France

2013 – 2016: 2 real life impact studies about diabetes

2017: first digital platform for therapeutic education of patients about diabetes

2017: first multichannel program for accompanying patients established abroad (Europe, Latin America, Asia)

2018: first mobile application for accompanying patients in the Maghreb

Concerned segments of diabetes:

- Prevention,
- Patient education,
- Homecare

Products and offers in diabetes:

SPURTM: digital tool assessing the risk of non adherence of diabetic patients, their need for support and attitudes towards their disease.

- D.TellsTM: personalisation tool for e-health solutions to offer patients the best accompaniment, based on their SPUR profile.
- Digital Therapeutic Education Platform diabetes: educational diagnosis elements, pedagogical content, monitoring the progress of the patient.

Pharmacists, industrial companies, homecare companies, specialist doctors, private/regional/national call centers, insurance companies and patient associations.



Observia





3/ Products and level of development

■ Health solution n°1 - SPURTM

Level of development: 10 / 10

Targeted segments of diabetes: patient comprehension
Targeted population: type 1 and type 2 diabetic patients
Distribution channel (patients, pharmacy, care institutions): e-health solutions & ethnographic studies
Acknowledgement (distinctions etc.): studies on-going

■ Health solution n°2 - D-tellsTM

Level of development: 10 / 10

Targeted segments of diabetes: personalization of e-health solutions for diabetic patients

Targeted population: type 1 & type 2 diabetic patients

Distribution channel (patients, pharmacy, care institutions): e-health solutions



4/ Financial model

1,5 Million € Turnover (*France*)

4 Millions € Turnover (worldwide)

40 employees (worldwide)

4
Studies on-going about diabetes

36 employees France









5/ International ambitions

Broadening our projects with diabetes internationally

After two years of strong internationalisation and the conception and deployment of two international programs for accompanying diabetic patients, we expect to continue enlarging our geographic coverage through our clients.

Continuation of our real life studies

We are currently doing 4 studies around our diagnosis tool *SPUR™* (in the United States, England, France and China). The first results will be known in 2019!



6/Business clients and foreign partners

Examples of foreign partnerships in diabetes:

- USA: Michigan University, Health Behaviour University
- UK: University of Kingston
- France: University of Paris Saclay
- Chine: CDC



7/ Major publications

https://www.sciencedirect.com/science/article/pii/S1262363616302890

https://observia-group.com/fr/etudes-impact/success-stories/135-l-impact-positif-des-entretiens-pharmaceutiques-sur-le-comportement-des-patients-diabetiques

https://observia-group.com/en/impact-studies/success-stories/138-outcomes-of-a-pharmacist-intervention-on-diabetic-patients

https://observia-group.com/fr/solutions-e-sante/success-stories/165-coordonner-l-acces-aux-soins-grace-a-la-digitalisation-des-pratiques-en-sante



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PKvitality





1/ History and structure of the company

PKvitality is a bio-wearable company created in 2013 specialized in analysing key physiological markers by simply "tasting" the skin rather than blood samples. It's star product is K'Watch Glucose, a painless and discreet Continuous Glucose Monitoring device. It is composed of a medical smartwatch that comes with traditional functionalities of smartwatches and a patch with microneedles which is placed at the back of it. The system measures the glucose level from the interstitial fluid painlessly. Completely invisible to others, the diabetic patient can check its level discreetly and be alerted by an on-body vibration of hypo and hyperglycemia episodes to come. It uses microneedles and soft adhesive (painless and non-irritant) and enables a precise and continuous monitoring of systemic glucose levels anytime and anywhere. K'Watch Glucose mainly target the diabetic patients taking insulin. The unique user experience and price structure should enable PK to target both diabetics Type 1 and Type 2. Using the same technology, PKvitality is also working on K'Watch Athlete, a smartwatch which will provide real-time monitoring of their lactic acid "an indicator of muscle fatigue" to significantly improve an athlete's training and performance.

Our company is based in Paris. We have offices in Taiwan and Boston.

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2/ Expertise in diabetes

Concerned segments of diabetes:

- Prevention,
- Diagnostic,
- Homecare.

Products and offers:

We are developing K'Watch Glucose, the first smartwatch Continuous Glucose Monitoring device.

Clients:

Our clients will be diabetic patients (type 1 and type 2) taking insulin.



PKvitality





3/ Products and level of development

K'Watch Glucose: TRL6: entering clinical trials

Development: pre industrialization.

Targeted segment: CGM for T1 and T2.

Distribution channel: direct and pharmacy chains.

Acknowledgement: AWARDS CES 2017 BEST OF INNOVATION in the category "*Tech for a Better World* »; 2 CES innovation awards; A Frost & Sullivan's award; Stuff award; Uberguizmo award; 01.Net award; Winner of EIT European Health Catapult in Medtech Category in 2019.

Public funding recognition: 2017: Concours innovation Numérique (*Bpifrance*); 2020: Innov'up leader PIA (*Île-de-France region, Bpifrance*); 2020: Eurostars (*EU program*); 2020: EIC accelerator (*H2020 EU program*).

Patient traction: 44K subscibers to our newsletter with 0 communication since CES 2017, mainly diabetes patients willing to know when the product will be out.

Compared to the existing Blood Glucose Meters and Continuous Glucose Monitoring devices, K'Watch has the following advantages:

- Convenient: it doesn't need an applicator.
- Painless: it only applies a slight pressure on the user's skin. There is no pain as the micro points never reach mechanical nerves or blood vessels in hypodermal layer below 1mm.
- Discreet and safe: K'Watch Glucose is discreet, measurements are easily accessible via the screen. The user can
 also be alerted of any deviation either via a buzzer or a discreet vibration. This can help prevent hypo and
 hyperglycemia episodes, at day and at night.
- Affordable: the consumable has been design with cost in mind. It has 3 times less components than competitive solutions enabling to tackle new markets.
- Data and architecture: K'Watch is the only solution providing a large set of sensors enabling the links between activity, sleep, stress, etc. and diabetes evolution.
- On body solution: It is the only on body integrated solution with strong CPU/memory/battery. It enables real time
 decision thanks to fog computing without a need to have a smartphone in range.



4/ Financial model

25

Number of employees (worldwide)

8 millions €

Spent as of today on the project

23

Number of employees (France)









5/International ambitions

Developp enhanced products in the diabetes field:

- Multi analyte products targeting diabetics,
- Advanced AI to combine activity data and glucose data to provide insights to the diabetics,
- Integration of closed loop services in our K'Watch Go beyond Europe: North America, Middle East and Asia.



6/ Business clients and foreign partners

Health Club membership: Yes

French Healthcare Association membership: Yes



7/Contact

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Predimed technology





1/ History and structure of the company

Predimed Technology is a Start-up from Strasburg (*France*) which was created in January 2018 and which is specialized in software development for e-health, as well as structuring and coordinating care pathways, and implementing teleconsultation projects. Software like My Predi were conceived by a first-class medical team and AI experts. They are also original and customizable for healthcare professionals or health facilities. Software like My Predi were tested in numerous clinical experiments for institutional projects and allow the anticipation of risky situations. My Predi mainly targets chronic diseases, cancers, postoperative follow-up, and pregnancy follow-up. It can be used in city office practices, or health facilities like hospitals. Predimed also offers services like structuring care pathways and process implementation. The company is currently has the ISO 13485, ISO 27001 certifications and its data is stored on certified hosts (*HDS*), and Saas.

Predimed's headquarters are in Strasburg. So as to offer patients the best medical pathway, R&D and innovation are at the heart of Predimed. Our teams work in collaboration with experts from the University Hospital of Strasburg, with students from the UTBM and specialists from CENTICH.

☆☆☆ 2/ Expertise in diabetes

May 2018: Modelling knowledge and development of My Predi for diabetes September 2019: Validation of the project and financial support by the FEDER February 2019: Launch of the experiment at GHT10

Concerned segments of diabetes:

- Research,
- Prevention,
- Diagnostic,
- Treatment,
- Teleconsultation.

Products and offers in diabetes:

- Smart medical remove surveillance service
- Medical teleconsultation service
- Personalized medical pathway
- Deployment of telemedical projects

Clients:

The main clients are health professionals who prescribe our remote treatment, but also health facilities wishing to implement telemedical solutions to follow up with their patients.

More generally, nursing homes or health homes who wish to telemonitor their residents.



Predimed technology





3/ Products and level of development

Health solution n°1 - My Predi Diabète

Level of development: 8 / 10, Industrialization

Targeted segments of diabetes: type 1 & type 2 diabetic patients
Distribution channel (patients, pharmacy, care institutions): health facilities, city doctors, Hospital,
Acknowledgement (distinctions etc.): the project is supported by the FEDER; labelled by the Alsace BioValley competitive cluster; collaboration with IBM, SCALE ZONE



4/ Financial model

400 000 €

Turnover (France)

7

employees (France)



Predimed technology





5/International ambitions

- Thanks to our collaboration with IBM we are projecting to develop abroad in 2019. Our commercial team are also prospecting companies in Germany and North Africa.
- In France, numerous health facilities like nursing homes and hospitals, as well as city doctors, are interested by My Predi and want to work with us.



6/ Business clients and foreign partners

Health Club Membership:

- Les Pépites Tech, France, member
- Alsace BioValley, France, member

French Healthcare membership: Yes



7/ Major publications

"E-health: a futuristic idea for an optimal care of patient with chronic diseases" E. Andrès, S. Talha, A.A. Benyahia, O. Keller, M. Hajjam, J. Hajjam, S. Ervé, and A. Hajjam

"Telemedicine and Geriatrics in France: Inventory of Experiments"

A. Zulfigar, A. Hajjam, S. Talha, M. Hajjam, J. Hajjam, S. Ervé, and E.Andrès

"Results of the Experimentation of a Platform for Automated Detection of Situations at Risk of Cardiac Decompensation (E-Care Platform) in Elderly Patients with Multiple Comorbidities"

E. Andres, S. Talha, M. Hajjam, O. Keller, J. Hajjam, S. Erve, A. Hajjam

Video: https://www.youtube.com/watch?v=Cw4isMJrgao



8/Contact

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Sanofi





1/ History and structure of the company

- Sanofi is a global biopharmaceutical company focused on human health with over a century of experience in health, operating worldwide and transforming scientific innovation into healthcare solutions. Sanofi prevents illness with vaccines, provides innovative treatments to fight pain and ease suffering, stands by the few who suffer from rare diseases and the millions with long-term chronic conditions.
- Sanofi is a leader in the development of insulin and insulin pens, which has been at the forefront of diabetes innovation and integrated care, combining medicines, services, devices and data management with the aim of enabling people to live the life they want.
- Sanofi is structured in three core global business units: Specialty Care (immunology, rare diseases, rare blood disorders, neurology and oncology), Vaccines, and General Medicines (diabetes, cardiovascular, and established products). Consumer Healthcare will be a standalone business unit with integrated R&D and manufacturing functions.
- Over 100,000 employees in 100 countries with healthcare solutions available in 170 countries.
- 15,000 people involved in R&D, which represents an investment close to €6 billion a year (close to 17% of total revenues).
- 73 industrial sites and 33,000 employees in industrial affairs. €1bn yearly investment in industrial facilities.

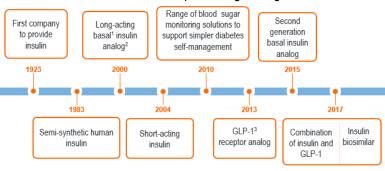
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2/ Expertise in diabetes

Over the last century, Sanofi has been at the forefront of treatment innovation, with a pioneering heritage in insulin:

Concerned segments of diabetes:

- Prevention
- Diagnosis
- Treatment
- Telemedicine
- Information of healthcare practicioners and patients
- Complications,
- Other: glucose monitoring devices



- (1) Basal insulin regulates glucose levels in between meals. It needs to act over a relatively long period of time and therefore basal insulin will
- either be long acting insulin or intermediate insulin.

 (2) Analog insulin is a sub-group of human insulin. It is laboratory grown but genetically altered to create either a more rapid acting or more uniformly acting form of the insulin.
- unionity stang norm or are insum.

 3. Glucagon-fike peptids 1 (BLP-1) are a relatively new group of injectable drugs for treatment of type 2 diabetes, normally prescribed for patients who have not been able to control their condition with tablet medication.

Products and offers in diabetes: Sanofi has a broad range of medicines in its portfolio, which includes several forms of insulin and oral therapies; as well as biosimilar insulins, medical devices, including pens and blood glucose meters and digital solutions for overall diabetes management and titration support. We also deliver innovative therapeutic solutions for cardiovascular conditions, which are frequently associated with diabetes.

Customers: Healthcare professionals (doctors, pharmacists, nurses), health care institutions, health insurance organizations,...



Sanofi





3/ Products and level of development

Health solution 1: Insulin analog solutions delivered through disposable insulin pens Stage of development: 10

Segment of the diabetes field concerned: Insulin delivery (treatment) through medical device

Target population: Insulin treated type 1 or type 2 diabetic patients

Distribution channel (patients, pharmacies, healthcare facilities): Pharmacies, hospitals

Recognition (awards, distinctions, etc.): First launched in 2007, Sanofi's disposable insulin pen was recognized in 2007 and again in 2016 by a GOOD DESIGN Award from the Chicago Athenaeum Museum of Architecture and Design.

Health solution 2: Connected delivery devices - Sanofi and Biocorp will introduce a new connected device, enabling automatic recording and transmission of dosage information via a dedicated mobile application. Stage of development: 8 (pre-launch phase)

Segment of the diabetes field concerned: Insulin treatment and connected devices (integrated solutions)

Target population: Type 1 and 2 diabetic patients

Distribution channel (patients, pharmacies, healthcare facilities): Healthcare providers, pharmacies Recognition (awards, distinctions, etc.): Pharmapack Award 2016; Frost & Sullivan 2016; CPhI Award 2017.

- Health solution 3: Digital solution for adult patients with type 2 diabetes treated with basal insulin alone. It provides patients with insulin dose recommendations and educational coaching messages based on blood glucose values.
- Stage of development: 10

Segment of the diabetes field concerned: Telemedicine / e-health

Target population: Type 2 diabetic patients

Distribution channel (patients, pharmacies, healthcare facilities): Healthcare providers. It is a medical device delivered only on medical prescription.

Recognition (awards, distinctions, etc.): This solution is currently available in France as part of the Telemedicine Experiments for the Improvement of Health Care Pathways (ETAPES) conducted by the Ministry of Health from 2018 to the end of 2021.



4/ Financial model

Company overall

€36,1 billion €

100 000 +

25 000

Worldwide sales (2019) employees (worldwide)

employees France

2,2 billion €

France sales



Sanofi





5/International ambitions

Sanofi's ultimate goal is to find a cure by working on disease modifying therapies. In the meantime, Sanofi is working to help people living with diabetes to manage their diabetes and prevent complications and associated comorbidities which represent significant unmet needs.



6/Business clients and foreign partners

With **Biocorp**, Sanofi will introduce a new connected device, enabling automatic recording and transmission of dosage information via a dedicated mobile application

Club Santé membership:

- Member of the following Clubs Santé: Algeria (Club Santé Algérie), Brazil (Club Santé Brésil), China (French Healthcare Alliance), South Korea (French Healthcare Korea), Italia (Club Santé Italie), Morocco (Club Santé Maroc), Mexico (Club Santé Mexique), Tunisia (Club Santé Tunisie), Turkey (Club Santé Turquie), Vietnam (French HealthCare Vietnam)
- French Healthcare association member: Yes



7/ Major publications



- EDITION program:
 - EDITION 1 (Riddle MC et al. Diabetes Care 2014;37:2755–2762)
 - EDITION 2 (Yki-Järvinen H et al. Diabetes Care 2014;37:3235–3243)
 - EDITION 3 (Bolli GB et al. Diabetes Obes Metab 2015;17:386–394)
 - EDITION 4 (Home PD et al. Diabetes Care 2015;38:2217-25)
 - EDITION JP1 (Matsuhisa M et al. Diabetes Res Clin Pract 2016;122:133-140)
 - EDITION JP2 (Terauchi Y et al. Diabetes Metab 2017;43(5):446-452
- BRIGHT Trial: Rosenstock J et al. Diabetes Care 2018;41:2147-2154
- Rosenstock J et al. Diabetes Care 2016;39:2026-2035
- Aroda VR et al. Diabetes Care 2016;39:1972-1980
- Press release: <u>Sanofi CEO unveils new strategy to drive innovation and growth (2019)</u>

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Santé en entreprise





1/ History and structure of the company

Created in January 2011, SANTE EN ENTREPRISE (SEE) is an association based in Paris which mission is to promote global health through companies.

SEE organizes mass prevention campaigns, awareness and screening campaigns with prevention advice targeting both workers and their families, as well as the general public. These take place both in buildings and in "health caravans". SEE operates in France (mainland and oversea territories like Guadeloupe, Martinique, Guyane, the Reunion) and Africa with expertise in contagious diseases (HIV/aids, viral hepatitis), vectoral diseases (malaria, dengue, Chikungunya, Zika), non-contagious diseases (diabetes, cholesterol, hypertension).

With our permanent team of professionals and a network of 200 experts and healthcare professionals, SEE conceives educational content, advises and accompanies international organizations, companies and financers (*public and private insurance companies*) in the development of their programs.

SEE also tied a strategic partnership with the French council of Investors in Africa (*CIAN*), and the French-speaking Global Numeric University (*UNFM*) to deploy screening programs for several diseases and training programs for healthcare professionals in Africa.

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2/ Expertise in diabetes

2011: Diabetes Bus « All concerned » (France)

2014: Diabetes Caravan in the Reunion

2017: « Chronic patients in Companies » program

Concerned segments of diabetes:

- Prevention,
- Diagnostic,
- Preventive advice.

Products and offers:

- Information tools, Education, Communication,
- Awareness workshops
- Rapid screening
- Prevention advice (physical activity and nutrition)

Clients:

- Companies
- Territorial administrations
- Private insurance companies
- Prevention institutions





Santé en entreprise



3/ Products and level of development

Application which calculates risk of diabetes and collects screening data

Level of development: 1 / 10

E-Learning platform (Healthcare professional training in emerging countries on the best practices for screening and curing diabetes)

Level of development: 1 / 10



4/ Financial model

200 K€

Turnover (worldwide)

1

Employment (worldwide)

300 K€

Turnover (France)

- 7

Employment (France)

150

Pool of nurses, dieteticians, coaches

100 K€

Turnover (worldwide) in diabetes



Santé en entreprise





5/ International ambitions

- Deployment of a rapid, integrated screening solution for diabetes, hypercholesterol, hypertension,
- Dematerialized screening data collection platform



6/ Business clients and foreign partners

Ivory Coast (SEE/CIAN)

Cameroon (SEE/CIAN)



7/ Major publications

- « Promoting healthcare in companies » Guide
- https://www.latribune.fr/entreprises-finance/industrie/chimie-pharmacie/le-poids-ecrasant-du-diabete-pour-les-salaries-et-les-entreprises-en-chiffres-740166.html
- https://news.abidjan.net/h/639489.html
- https://www.lemonde.fr/sciences/article/2019/03/04/le-diabete-bombe-a-retardement-pour-lafrique_5431307_1650684.html



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Servier





1/ History and structure of the company

Servier is an international pharmaceutical company governed by a non-profit foundation, with its headquarters in France (*Suresnes*). With a strong international presence and a turnover of 4.2 billion euros in 2018, Servier employs 22 000 people worldwide. Entirely independent, the Group reinvests 25% of its turnover (*excluding generics*) in research and development and uses all its profits for development. Corporate growth is driven by Servier's constant search for innovation in five areas of excellence: cardiovascular, immune-inflammatory and neuropsychiatric diseases, cancer and diabetes, as well as by its activities in high-quality generic drugs. Servier also offers eHealth solutions beyond drug development.

While firmly anchored in France for R&D and production, the Group is present in 149 countries and has a truly international focus. It continues to invest globally, as demonstrated by the recent opening of subsidiaries in the United States, Peru and Nigeria. This strategy of local representation, as close as possible to patients, allows it to respond to the special characteristics of each country. The Group has 66 Subsidiaries, 16 Production sites in 11 countries, 3 Research Institutes (2 in France and 1 in Hungary) and 15 International Centers for Therapeutic Research undertaking clinical trials around the world.

In addition, Servier is developing an international research network in the main global innovation centers. To accelerate research and develop future treatments, the Servier Group has instituted a policy of open innovation through dynamic partnerships. So far it has established about fifty alliances, with partners including not only laboratories, but also innovative biotech firms, academia and business incubators.

☆☆☆ 2/ Expertise in diabetes

Servier has been committed to prevention and treatment of type 2 diabetes for several decades. Commercially, Servier manufactures and distributes a drug to improve glycemic control in more than 120 countries. Currently this product is considered by healthcare professionals and international guidelines to be part of standard care for patients with Type 2 Diabetes. The formulation of this medicine has been constantly improved to best meet patients' needs.

Today, more than 10 million patients with Type 2 Diabetes are treated each year with Servier's drugs. Thanks to the wide usage of Servier medicines, the company is able to gain unique insights into the needs of patients and the expectations of healthcare professionals, allowing the Group to constantly develop new solutions and services to improve Diabetes care.

For instance, Servier is committed to the fight against NASH (*Nonalcoholic Steatohepatitis*), a complication affecting more than half of Type 2 Diabetes patients. NASH is a chronic liver disease (*commonly referred to as "fatty liver disease" or "soda disease"*) which may evolve into cirrhosis or even liver cancer. Servier R&D teams along with colleagues from academic and hospital centers are involved in a consortium named "*QUID-NASH*" which is coordinated by Prof. Dominique Valla, hepatologist at the Beaujon hospital in Clichy (*France*). This collaboration aims to facilitate the diagnosis by developing novel, new, non-invasive tests and to improve the long-term care of patients with type 2 diabetes suffering from NASH.

Other collaborations with clinical and scientific experts are planned. The aim will be to improve the effectiveness of clinical trials, identify innovative non-invasive biomarkers and develop new therapeutic targets.



Servier



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2/ Expertise in diabetes

Servier also implements activities to raise healthcare professionals' awareness of their patients' daily life. For instance, during the last EASD (*European Association for the Study of Diabetes*) International congress in 2018 (16,500+ delegates), the Group provided a virtual experience demonstrating the impact of Type 2 Diabetes complications on the patient's ability to conduct normal daily activities. This allowed healthcare professionals to experiment with vision deterioration such as retinopathy or movement constraint caused by obesity.

During this congress, Servier also presented a workshop on nutrition developed with Nutrikeo through its transversal expertise in nutrition. The purpose of the activity was to give some simple advice to doctors so that they can better advise their patients on nutrition-related issues.

In China, Servier has launched a innovative new project in partnership with the Bethune Charitable foundation. Currently this project involves over 1,100 Physicians and more than 14,000 patients. Using the most common social networking application in China, WeChat, the project enables patients to monitor their condition and directly interact with their healthcare professional in order to improve blood glucose and blood pressure control. Physicians can also assess the kidney disease and cardiovascular risk of their patients. In addition patients themselves can access much needed information on their condition and how to lead a healthy and active life.



3/ Financial model

Worldwide:

10M

Patients treated each year worldwide

4,2 Mds €

22 000

Turnover (worldwide) Employment

France:

23,6% du CA monde

Turnover (france)

4 900 Employees

China:

3 million

Patients treated each day in China

Diabetes:

8th worldwide

In oral treatment for type 2 Diabetes*

40 years of history Commitment to patients

1st subsidiary

Of the Servier Group

477M€

Turnover (worldwide) in diabetes

10M

Patients treated each year worldwide



Servier





4/ Business clients and foreign partners

• Partnership with the International Diabetes Federation (IDF), Brussels

Servier supports IDF and specific projects coordinated by IDF: 1) Network of expert patients (*Blue circle voices*), 2) Booklet of dietary and hygienic recommendations for diabetic patients and adapted to different regions of the world,

3) Training module for health care professionals on kidney disease associated with Diabetes. Servier also takes part in the bi-annual congress, with a booth and a symposium

Partnership with the European Association for the Study of Diabetes (EASD), Dusseldorf

Servier is a member of the EASD and is represented at the annual congress with a booth and a symposium. The Group also supports EFSD (*European foundation for the Study of Diabetes*) research activities (*treatment adherence for instance*).

Partnership with the China Diabetes Association.

Servier is a major supporter of the China Diabetes association (*CDA*). Servier provides support for numerous CDA endorsed congresses and symposium each year and sponsors awards for young investigators to encourage clinical research projects in type 2 diabetes.

Partnership with the Tseu Medical Institute, Harris Manchester College Oxford.

The Tseu Medical Institute aims to support a group of young medical researchers from developing countries by facilitating their interactions with Oxford teams.

Partnership with the Coalition for access to NCD (Non Communicable Diseases) medicines and products (NGO based in the US).

The objective of this Coalition is to support and strengthen government approaches to treatment access for NCD pathologies at a global and national level. The Coalition is currently mobilizing its efforts on East Africa.

Health Club membership:

Servier is a member of all "Clubs Santé" worldwide and co-manages the Russian, Mexican and Gulf Countries' clubs.

• French Healthcare membership: yes (Member of the board)



5/ Major publications

- Jia Y, et al. Is metformin still the most efficacious first-line oral hypoglycaemic drug in treating type 2 diabetes? A network meta-analysis of randomized controlled trials. Obes Rev. 2019. Jan;20:1-12.
- Qian D, et al. Comparison of antidiabetic drugs added to sulfonylurea monotherapy in patients with type 2 diabetes mellitus: A network meta-analysis. PLoS One. 2018. Aug 27:13:1-17.
- Perkovic V et al (ADVANCE Collaborative Group). Intensive glucose control improves kidney outcomes in patients with type 2 diabetes. Kidney Int. 2013. Mar;83:517-23.



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Stendo Laboratoire





1/ History and structure of the company

The endothelium influences and is permanently influenced by the flow of blood (flow-dependence). Under the effect of the motor pressure, the blood flow is arranged in concentric blades (laminar flow), developing a friction between them, or "shear stress", accentuated with the wall strongly "sheared". Today more than 10,000 genes are known to be influenced by this process and allow "shear stress" to play a determining role in:

- Vasomotor tone and cell alignment favorable to hemodynamics.
- Inflammatory, antithrombotic and coagulation processes,
- Control of the inter and transcellular passage of circulating nutrients and hormones,
- The diapedesis,
- The production of vasoactive substances such as nitric oxide. (1)

In 2010, a group of French cardiologists formulated the hypothesis according to which mechanical external stimulation of the lower limbs, applied in the diastolic phase, would make it possible to reproduce a similar "shear stress" effect and stimulate all of these processes. natural. Patent owner, the textile engineers of Stendo Laboratoire have developed a combination of cardiosynchronized massage, marketable in the medical sectors treating pathologies where endothelial dysfunction is one of the main elements. Several clinical studies have confirmed the validity of this hypothesis.

Stendo Laboratoires' headquarters are in Normandy, Louviers and hosts all back office services. R&D engineers develop, in collaboration with French scientists, textile innovations which aim to naturally accompany patients' heart rate and its impact on the vascular system. They are in charge of validating the effects with clinical experiments and trials in health facilities. The production service assembles all the devices on site and dispatches them.

Thanks to over 5 dedicated workers, the commercial service France / Export develops collaborations since 2016 in over 15 countries, throughout the world.

2/ Expertise in diabetes ተ ተ

The endothelial dysfunction found in diabetes corresponds to a decrease in the bioavailability of nitric oxide specifically related to insulin resistance. The effectiveness of the application of external mechanical stimulation, in rhythm with the heartbeat, allowing the reproduction of the "shear stress" effect, has been demonstrated in several clinical studies conducted in France between 2016 and 2018, respectively promoted by Professor Amah, Professor Valensi or Professor Duclos. The first study confirmed the "shear stress" effect on healthy subjects (2), the second on type II diabetic subjects (3). Recently, it has been shown to have a positive impact on lipid balance in patients with type II diabetes (4), (5)

(2) Evaluation of the action of the Stendo®3 pulsatile suit on the modifications of microcirculation compared to the acethylcholine test_Published Study: G. Amah, S. Voicu, P. Bonnin, N. Kubis • Low-pressure sequential compression of lower limbs enhances forearm skin blood flow; Clin Invest Med • Vol 39, no 6, December 2016 E204

(3) Sequential compression/decompression by a pulsating suit increases cutaneous microcirculatory blood flow in patients with type 2 diabetes

Amel Rezki, Badreddine Merioud1, Dominique Delmas, Chantal Cyril, Raphaël Scheiwiller3, Renan Leblé3, Paul Valensi

(4) Chronic and acute effects of a new vascular rehabilitation device on the endothelial function of diabetic patients. A randomised controlled trial. Barber-Chamoux N., Verny M-A., Pereira B., Lebreton A., Lambert C., Penando S., Soule-Sonneville S., Leray V., Delmas D., Descoux J, Duale C., Cardot J-M., Dubray C., Duclos M. - In print

(5) Improvement of the lipid profile in type 2 diabetic patients after 3 months of a new vascular rehabilitation device stimulating shear stress. A randomized controlled trial. Barber-Chamoux N., Verny M-A., Pereira B., Lebreton A., Penando S., Soule-Sonneville S., Leray V., Lambert C., Delmas D., Descoux J., Cardot J-M., Dubray C., Duclos M. - In print

Concerned segments of diabetes:

- Research,
- Prevention.

- Complications,
- Homecare.

Products and offers in diabetes:

Stendo Medical V3 Massage device

Clients: Physiotherapists, hospitals, re-education centers

Patient education,



Stendo Laboratoire





3/ Products and level of development

Health solution n°1 – Massage device Stendo Medical V3

Level of development: 10 / 10

Targeted segments of diabetes: Prevention and complication

Targeted population: type II diabetic patients, chronic pathologies, patients with cardio-vascular risks

Distribution channel (patients, pharmacy, care institutions): direct distribution in France and use of proxies elsewhere.

A partner oversees Asia.

Acknowledgement (distinctions etc.): 2016 Price of Innovation – Convergence for the Industry of the Future

Health solution n°2 – Massage device Stendo Medical – Home Device

Level of development: 7 / 10

Targeted segments of diabetes: Home care

Targeted population: type II diabetic patients, chronic pathologies, elderly people, patients with cardio-vascular risks

Distribution channel (patients, pharmacy, care institutions): home care service companies

4/ Financial model

1.35 M€

Turnover (worldwide)

9

Employment (worldwide)

9

Employees (France)

400,000€

Turnover (France)

1.350 €

Turnover (worldwide) in diabetes



Stendo Laboratoire





5/ International ambitions

Stendo Laboratoire's project is to expand in countries where a distributor is identified and where it is authorized:

- **Europe:** Germany, Spain, Italy, Poland,
- Outside EU: Middle East, Mexico, Australia, Russia,
- Stendo Asia: PRC, Hong Kong, South Korea.



6/ Business clients and foreign partners

- Australie
- Koweit (Italia Nuova)



7/ Major publications

Clinical study: Study of the action of Stendo®3 on the microcirculation in comparison with the test with acetylcholine Study published: G. Amah, S. Voicu, P. Bonnin, N. Kubis • Low-pressure sequential compression of lower limbs enhances forearm skin blood flow; Clin Invest Med • Vol 39, no 6, December 2016 E204

Clinical study: Pilot study of efficacy of the Stendo®3 pulsatile combination in patients with lymphoedema of the lower limbs. Published study: P. Jonas, S. Charlois, M. Chevalerias, D. Delmas, J-C. Kerihuel, P. Blanchemaison • Efficacy of the Stendo Pulsating in Patients with Leg Lymphedema: a pilot randomized • Study Eur J Dermatol 2016; 26 (1): 82-9

Evaluation of the effect of Stendo®3 pulsatile compressions on peripheral cutaneous microcirculation and endothelial function in uncomplicated diabetic patients

In the course of publication - Prof. Paul Valensi - AP-HP Jean Verdier - Bondy - 16 patients

Evaluation of the effect of Stendo®3 pulsatile compressions on vascular function in patients with type 2 diabetes

Outstanding printing - Prof. Martine Duclos - Clermont-Ferrand Hospital - 44 patients

Study of the effects of using Stendo® pulsatile pants: cognitive and emotional analyzes

Pr Arnaud Aubert - Spincontrol private laboratory, 238 rue Giraudeau, 37000 Tours - 33 persons

Study on tolerance and well-being (self-assessment and results)

Spincontrol private laboratory, 238 rue Giraudeau, 37000 Tours - 33 persons

Heart Failure - Improving the Rehabilitation Process with Stendo®

In the course of publication - Dr. Véronique Eder EA6314 MOVE University of Poitiers Multi-centric - 50 patients



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Tilak Healthcare





1/ History and structure of the company

Tilak Healthcare is a videogame studio which was created in 2016. It is specialized in fun and playful follow-up of patients affected by chronic diseases.

Its first game, put on the market in June 2018, is a medical game which was clinically validated and allows to follow the visual acuity of patients affected by chronic diseases of the retina (AMD, diabetic retinopathy).

The company is based in Paris and has 25 workers.

Total amount raised (2016-2018): 6,5M€ (iBionext Fund)

Estimated amount of the next fundraise: 15-20M€ (iBionext and international funds)

Operations: France, Western Europe strating from Q3 2019, United States in Q2 2019.

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2/ Expertise in diabetes

June 2018: application launched

November 2018: clinical validation

Products and offers in diabetes:

Medical game for patients with diabetic retinopathy: detection of slow decrease in visual acuity.

Clients:

Final user: patients

Prescriber: ophthalmologists



Tilak Healthcare





3/ Products and level of development

■ Health solution n°1 - Odysight

Level of development: 10 / 10

Targeted segments of diabetes: Telemonitoring

Targeted population: 300,000 patients

Distribution channel (patients, pharmacy, care institutions): ophthalmologists



4/ Financial model

25

Employment (worldwide)

25

Employees (France)

3.4 M€

Invested in our solution against diabetes



Tilak Healthcare





5/ International ambitions

Q2 2019: Launch of the pilot solution in the United States

Q3 2019: Launch in other European countries



6/ Business clients and foreign partners

Examples of foreign partnerships in diabetes:

■ University of Pittsburgh (UPMC), United States



7/Contact

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Toutenkamion





1/ History and structure of the company

Toutenkamion exists since 1936 and takes its current name in 1969. It conceives, manufactures and commercializes mobile medical units. In the 1970s, it wins its first supply bid on mobile units for work medicine in France; in the 1980s, it wins a bid in Algeria for the supply of mobile clinics, signifying the start of exportations for the company without any dedicated structure. Only from the 2010s onwards does Toutenkamion really opens to exportation with the creation of a dedicated commercial service. Today, it accounts for over 50% of its annual turnover. The 2017 acquisition of Brevet Carrosserie and the 2019 acquisition of Euro-Shelter allow the Group to propose offers deriving from complementary competences. For instance, it is now possible to transport the whole medical team by modifying the cabin. These mobile medical units were conceived on straight trucks, trailers or containers/shelters, and allow medical teams to reach rural population which are far away from big urban centers and lack health infrastructures. They can then benefit from early screenings to dramatically reduce complications linked with diabetes.

The French group Toutenkamion is expanding, with an annual turnover of 23 million euros, and 230 workers. It is the leader in the conception, manufacture and transformation of heavyweight cabins and customized mobile units. Its industrial know-how (work on polyester composite, steel and aluminium – allow Toutenkamion to work on various health markets.

The integration of all competences and means which are necessary to managing complex products, allow Toutenkamion to offer its clients a perfect control over the project, a homogeneous and impeccable quality, and better costs and deadlines.

The group exports 50% of its products – above all mobile medical units – in Europe, the Middle East, Africa and Asia.

♠★★ 2/ Expertise in diabetes

2011: Delivery in Algeria of a prevention unit for diabetes screening on a trailer for Novo Nordisk. It led to the screening of over 120,000 people.

Between 2015 – 2018: Delivery in Algeria of two diabetes screening units for Sanofi, in partnership with the Ministry of Health in their program « *The path to Prevention* ». It led to 38 country-wide campaigns and 16,000 patient screenings including around 4,000 complications.

In Egypt, Toutenkamion is in contact with the Ministry of Health and Sanofi to duplicate this solution.

2019: Manufacturing for the Telemedicine Association of the Reunion (*SRT*) and the association AURAR a mobile unit on a lightweight vehicle for the implementation of itinerant screenings for diabetes complications on Réunion.

Concerned segments of diabetes:

- Prevention.
- Patient education.
- Diagnostic,
- Complications,
- Treatment,
- Surgery,
- Teleconsultation,
- Homecare.

Products and offers:

Mobile units for diabetes prevention and patient screening

Clients: Ministry of Health, Army health services, UN agencies, NGOs, private health structures, pharmaceutical companies, etc.



Toutenkamion





3/ Products and level of development

Health solution n°1 – Mobile clinic for diabetes and arterial hypertension testing

Level of development: 10 / 10

Targeted segments of diabetes: Testing (blood and urine test, medical test, ophthalmological test, cardiological test, interview with a diabetologist, patient advice)

Targeted population: Patients in secluded areas

Distribution channel (patients, pharmacy, care institutions): Pharmaceutical laboratories, Ministry of Health

Health solution n°2 – Lightweight mobile unit for diabetes testing by teleconsultation

Level of development: 10 / 10

Targeted segments of diabetes: Testing

Targeted population: Patients in precarious living conditions, elderly people in nurse homes, prison inmates.

Distribution channel (patients, pharmacy, care institutions): NGOs



4/ Financial model

23 M€

Turnover (worldwide)

230

Employment (worldwide)

50%

Part of exportation within the annual turnover

200.000

People screened with our mobile solutions



Toutenkamion





5/International ambitions

Toutenkamion produce more than 50% of our turnover in export, mainly in Africa and the Middle East. Toutenkamion wishes to work with major players in the fight against diabetes, mostly pharmaceutical laboratories that already feature in the Group's client portfolio. Our mobile solution has shown its effectiveness in Algeria, and we therefore wish to reinforce our partnership in the African countries where these laboratories are implemented.



6/Business clients and foreign partners

- Novo Nordisk: mobile unit for diabetes testing in Algeria
- Sanofi: mobile unit for diabetes and arterial hypertension testing in Algeria



7/ Major publications

http://www.toutenkamion.com/fr/actualites-article/en-couverture-ce-mois-ci-dans-usine-nouvelle.html

https://www.ladepeche.fr/article/2017/12/28/2712382-premiere-medicale.html

https://www.tdg.ch/geneve/actu-genevoise/goutte-sang-traquer-sournois-diabete/story/16579814



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1/ History and structure of the company

Urgo Medical is URGO Group's division dedicated to advanced wound care. Because serious wounds are a significant cause of suffering all over the world, Urgo Medical's mission is to relieve and to heal patients by providing healthcare professionals with the adapted healthcare protocols and therapeutic strategies. With nearly 1400 employees across 19 countries, Urgo Medical is the 2nd largest company in the advanced woundcare market.

Urgo Medical is present across 19 countries thanks to its subsidiaries.

Its 150-people R&D team is pluri-disciplinary and is based at the heart of Burgundy, France. It gathers all stages of innovation: competitive watch, research, innovation, business development, intellectual property, development, clinical studies, industrial transposition. Our innovation approach relies upon a continuous dialogue with our final users; healthcare professionals and patients.

This willingness to meet their needs enabled us to imagine high technology dressings and protocols for each type of wound. We made clinical research a fundamental point in our innovation to demonstrate the efficiency of our solutions. Since 1997, we have conducted nearly 55 clinical studies gathering 60,000 patients and produced more than 40 scientific publications in referenced magazines.

☆☆ 2/ Expertise in diabetes

- 2000: Creation of Urgo Medical. In 19 years, the former start-up has become the second largest player on the European wound healing market, 2008: Launch of SPID study, first study conducted by Urgo in diabetic foot ulcers,
- 2013: Launch of European study EXPLORER conducted in 5 countries, across 240 patients. The first clinical research study in diabetic foot ulcers. Randomised and double-blind, this study compares the efficacy and tolerance of the dressing to those of a neutral dressing on neuro-ischaemic diabetic foot ulcers.
- 2013-16: Urgo Medical takes a digital turn, with the conviction that it will play a great role in improving patient care suffering from wounds. The company creates the concept of connected wound healing and develops a first mobile application launched in 2014, then a second prototype in 2016.
- 2016: Results of the observational study REALITY across 10,200 patients, which proves that the Urgo Medical dressing reduces healing time by 100 days on average of diabetic foot ulcers, leg ulcers and pressure ulcers,
- February 2018: the EXPLORER clinical study is the first study which demonstrates the efficacy
 of a dressing in the healing in neuro-ischemic diabetic foot ulcers. It published in THE LANCET
 Diabetes & Endocrinology,
- December 2018: Urgo Medical wins the Galien Prize France 2018 for Medical devices, for its
 dressing which has proven its clinical efficiency in the treatment of diabetic foot ulcers.
- May 2019: Urgo Medical unveils its digital solution to manage wounds, including diabetic foot ulcers.

Products and offers:

Urgo Medical develops advanced wound care solutions to heal serious and disabling wounds, particularly diabetic foot ulcers.

Concerned segments of diabetes:

- Diabetic foot ulcer healing,
- Connected wound healing solution to support healthcare professionals including diabetic foot ulcers.









3/ Products and level of development

Dressing for diabetic foot ulcer healing

Level of development: 10 / 10

Development phase: Commercialized in over 10 countries

Targeted segments of diabetes: Local treatment of diabetic foot ulcers

Targeted population: Patients suffering from non infected diabetic foot ulcers

Distribution channel (patients, pharmacy, care institutions): Hospitals, Pharmacists, community (general practitioners, nurses...).

Acknowledgement (distinctions etc.): Avis HAS 2018 – ASA III, 2018 Sorbonne Prize; 2018 Galien Prize France for Medical devices; 2019 Journal of Wound Care Aware for Most Innovative Product; Official recommendation in the NICE (National Institute for Care and healthcare Excellence) guidelines in the United Kingdom; Official Recommendation from the International Working Group on Diabetic Foot (Guidelines IWGDF) about the use of this dressing in local treatment of patients suffering from non-infected neuro-ischemic diabetic foot ulcers

Connected wound healing solution for diabetic foot ulcers

Level of development: 6 / 10

Development phase: Betatest phase on a panel of healthcare professionals in France, Spain and the United Kingdom. Targeted segments of diabetes: Supporting healthcare professionals in global wound care: Medical device facilitating wound assessment, healing monitoring and follow-up and coordination of healthcare professionals across various healthcare structures.

Targeted population: Patients suffering from wounds, including diabetic foot ulcers

Distribution channel (*patients*, *pharmacy*, *care institutions*): Digital application available for healthcare professionals only Acknowledgement (*distinctions etc.*): First digital application for global wound management with a CE marking.



4/ Financial model

8-10%

Growth per year over the last 7 years

309 M €

Turnover (worldwide)

25 M€

Invested in R&D in 2018

19

Number of countries in which Urgo Medical is directly present 1400

Employees (worldwide)

7na

European rank on the advanced wound care market









5/International ambitions

Diabetic foot ulcers are one of the major complications of diabetes. Between 19% and 34% of diabetic patients will develop an ulcer in their lifetime. This very high frequency is even more alarming since in 2040, almost 640 million people will have diabetes worldwide. With one amputation every 20 seconds, diabetes is the first cause of amputation worldwide. Facing this major public health challenge, Urgo Medical's ambition is to revolutionize how diabetic feet ulcers are taken care of.

Urgo Medical has been committed for many years to improving diabetic foot ulcer treatment, and has launched an international program called « *Closing wounds, saving feet, saving lives »* for patients and healthcare professionals. Already present in 7 countries: Germany, Australia, China, Spain, France, Italy and the United Kingdom, the program is structured around 3 major pillars:

- Improve the organization of care,
- Implement the best standard of care,
- Raise awareness and train.



6/Business clients and foreign partners

Examples of foreign partnerships in diabetes:

- D-Foot international
- Fédération Française des Diabétiques (France)
- Federación Española De Diabetes (Espagne)
- Sociedad Española de Diabetes (Espagne)

Health Club membership:

French healthcare membership: Yes

- Co-President of Health Club Vietnam
- Member of Health Club China



7/ Major publications

In 2018: the EXPLORER clinical study is the first study which demonstrates the efficacy of a dressing in euro-ischaemic diabetic foot ulcers healing. The study is published in *THE LANCET Diabetes & Endocrinology*,



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Valbiotis





1/ History and structure of the company

VALBIOTIS is a French R&D company, committed to scientific innovation for preventing and combating metabolic diseases.

VALBIOTIS was founded in 2014 in La Rochelle with an innovative ambition: prevent major metabolic pathologies, including type 2 diabetes, with health products designed to reduce the risk of these diseases, based on a multitarget approach by the use of plant-based ingredients.

VALBIOTIS' staff is composed of 38 employees at 2018 December 31st, of which 75% are dedicated to R&D activities, on 3 implantations:

- Headquarters and clinical department in Périgny, near La Rochelle (France).
- A research center dedicated to plant-based chemistry, in La Rochelle (France).
- A research center dedicated to preclinical research, in Riom (*France*)

The company partners with Pierre Fabre Group to develop the industrial process for its products.

VALBIOTIS has also integrated the FrenchTech hub in Boston (Massachusetts).

2014: Foundation of VALBIOTIS

2015: Discovery of the active substance "TOTUM-63"

2017: Initial Public Offering, Euronext Growth, Paris

2017: Presentation of the first clinical results of TOTUM-63 at the American Diabetes Association congress

(San Diego, Californie, USA).

2018: TOTUM-63 patent delivered in the USA

2019: TOTUM-63 patent delivered in Europe

Concerned segments of diabetes:

Research,Prevention.

Products and services in the field of diabetes:

VALEDIA®, prevention designed for prediabetics

Its active substance, TOTUM-63, is composed of a specific and patented combination of 5 plant extracts selected for their effects on metabolism. VALEDIA® acts on several targets of the pathophysiology of type 2 diabetes to reduce the clinical risk factors of the disease.

VALEDIA® is being developed following rigorous clinical standards. It will apply for the first healthclaim related to the reduction of a risk factor in the development of type 2 diabetes, delivered by the regulatory authorities in North-America and Europe (FDA, Health Canada, EFSA).

Clients: Prediabetic subjects and healthcare professionals.



Valbiotis





3/ Products and level of development

VALEDIA® - developed to reduce type 2 diabetes risk factors

Level of development: 7 / 10

Development phase: clinical Phases II cliniques ongoing (no Phase III before regulatory submission)

Targeted segments of diabetes: prediabetes Targeted population: prediabetic population

Distribution channel (patients, pharmacy, care institutions): pharmacies, drugstores

Acknowledgement (distinctions etc.): i-Lab award from French research ministry (2015), presentations during international scientific congresses (ADA 2016, 2017and 2019, EASD 2018), member of BPI Excellence network.

VALEDIA® - developed to reduce NASH risk factors

Level of development: 5 / 10

Development phase: Clinical Phase I/II completed, Phases II being prepared Targeted segments of diabetes: Non alcoholic fatty liver disease (*NAFLD*) Targeted population: patients with NAFLD, at risk of developing NASH

Distribution channel (patients, pharmacy, care institutions): pharmacies, drugstores

Acknowledgement (distinctions etc.): presentations during international scientific congresses (AASLD 2018).



4/ Financial model

88 K€ Global revenue 38

Staff - world

Patent families



Valbiotis





5/ International ambitions

VALBIOTIS aims at marketing VALEDIA® on North-American (USA and Canada) and European markets, then worldwide, through licence agreements with players in the health sector.

BAS

6/Business clients and foreign partners

- Scientific partnership with Leiden University, Netherlands
- Scientific partnership with the Laval University, Canada

Member of a Health circles / clubs:

- LyonBiopôle, France, member
- Pôle NSL, France, member
- Synadiet, France, member of the Natural Health Products working group

Member of French Healthcare Association: No.



7/ Major publications

- VALBIOTIS veut prévenir le diabète, Pharmaceutiques, Mai 2017, www.pharmaceutiques.com/archive/une/art_1636.html
- A new botanical complex improves blood glycemic control and reduces hepatic steatosis in mice, Chavanelle V. et al. Poster, American Diabetes Association (ADA) Congress, 2016
- Phase I clinical trial to evaluate TOTUM-63, a botanical complex for managing prediabetes, Sirvent P. et al., Poster, American Diabetes Association (ADA) Congress, 2017
- TOTUM-63 displays beneficial effects on various tissues in animal models of diabetes, via pleiotropic protective actions, Chavanelle V. et al. Poster, European Association for the Study of Diabetes (EASD) Congress, 2018



8/Contact

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1/ History and structure of the company

DTF médical has been operating since 1951 in 3 universes and accompanies "patients" on a long-term basis through its brands. From the very first moments of life, with Kitett® breast pumps, throughout life, with Atomisor® nebulisation systems for bronchopulmonary, sinus ORL or otological treatments and with the WoundEL Health Care brand acquired in 2018 for wound treatment.

WoundEL Health Care's purpose is to improve the quality of life for patients and caregivers by restarting the natural healing process. The WoundEL® device has many missions:

- 1. To heal efficiently: To quickly reactivate the healing process, thanks to the stimulation and orientation of cell migration; To ensure good detersion and granulation so that the epithelialization phase is as efficient as possible,
- 2. Relieve: To relieve patients of the pain induced by their pathology thanks to the analgesic effect of WoundEL®,
- 3. Improving the quality of life: Intuitive, effective and discreet solutions to accompany the patient in his or her daily life.
- 4. Providing solutions: Accompanying the team of carers to bring a solution to the service of each patient. The values of the brand are synonymous with efficiency, proximity and innovation.

Based in Saint-Etienne (Loire-France), WoundEL Health Care specialises in the design, production and distribution of innovative, high-quality medical devices for wound treatment. The WoundEl® electrostimulation device for wound treatment is marketed in France by an integrated sales team to hospitals and in towns via HAD (home hospitalisation). The Woundel® system is also exported, mainly to European countries to date.

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2/ Expertise in diabetes

WoundEL® will provide the necessary power to reactivate the natural healing process of chronic wounds, while allowing a reduction in local pain.

- 1. How it works: Applied to a wound that is delayed in healing, WoundEL® will reproduce the endogenous electric current in order to stimulate all the factors contributing to the healing process. The current is evenly distributed to the dressing electrode, which also maintains a moist environment conducive to healing.
- 2. Benefits: Stimulation and orientation of cell migration; Increase in capillary density.
- 3. Indications: Chronic or delayed healing wounds: Ulcers (venous, arterial, mixed, necrotic angioderma) Stage 3 and 4 bedsores - Diabetic foot wounds.

Concerned segments of diabetes:

- Treatment,
- Homecare.
- Others: diabetic foot treatment.





Products and offers:

The WoundEL® device consists of the following components: - The Electrostimulation console: 2 Sessions / day of 30 minutes, spaced at least 6 hours apart - Main cable - Dressing cable - 1 to 2 Dressing electrodes (refurbished every 2 to 4 days) - 1 Dispersion electrode that can be repositioned up to 30 days of use.

Our rental consoles are always sent with a main cable and two dressing cables. Dressings can be purchased separately as required.

Additional equipment may be required for wound treatment:

- Wound preparation: Dressing set, Saline, Scissors,
- Shoreline protection: Cream, Spray, Absorbent dressing,
- Wound bed: Alginate, Hydrofibre, Hydrogel,
- Support: Bandage or support bandage.

Clients:

WoundEL's customers include both diabetic patients and healthcare professionals looking for innovative wound management solutions.



3/ Products and level of development

WoundEL® device

Level of development: 10/10

The innovation of the Woundel® device lies in the treatment of chronic wounds by electrostimulation, combining the advantages of directed healing with the benefits of daily electrostimulation sessions. In the context of diabetes: treatment of diabetic foot wounds.

Development phase: Commercialised.

Segment of the diabetes field concerned: Treatment of diabetic foot wounds.

Distribution channel envisaged: Hospital centre and HAD (Hospitalisation at Home).



4/International ambitions

Registrations in progress in different European countries.



5/Contact

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The excellence of French players supporting diabetic patients



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