CROSSJECT

Crossject: the expert in needle-free injection

Press kit 2018

Crossject
is revolutionizing needle-free injection

ZENEO® is the manifestation of Crossject's expertise in the needle-free injection of drugs, an expertise unmatched elsewhere in the world. The device is the result of nearly 20 years of R&D and it has earned close to 400 patents worldwide. **For patients, ZENEO® enables the simple, rapid, needle-free, intramuscular or subcutaneous self-administration of treatments in a ready-to-use package.**

The company's portfolio currently contains eight products in advanced stages of development, seven of which are for urgent or life-threatening situations. Crossject aims to become the world leader in self-administered emergency treatments.

Crossject has been listed on the Euronext Growth market since February 2014. The company has completed three fund raising campaigns and furthermore received financing from the French Ministry of Defense and grants from Bpifrance as part of the Investissements d'Avenir program.

KEY FIGURES

- 400 patents delivered worldwide
- €80 million in cumulative investments
- 8 ZENEO® products
- 10 clinical studies
- 20 years of research and development
- Workforce: 60 employees

ZENEO®, a major breakthrough

ZENEO®, an unprecedented device

Crossject is revolutionizing the use of clinically-proven treatments by making them self-administrable with its needle-free injector, ZENEO®, **a prefilled, single-use device that propels a medical formulation through the skin in less than a tenth of a second.**

The injection parameters for ZENEO® are entirely factory-set according to the viscosity, dosage and injection route of the drug formulation. ZENEO® is **the only needle-free auto-injector capable of subcutaneous or intramuscular injection.**

With its unprecedented performance, ZENEO® is protected by **400 patents** worldwide until 2036.

Our driving force for more than 20 years: saving lives in emergency situations

Patrick Alexandre began exploring the possibilities of needleless injection in 1997, when he was working at Laboratoires Fournier. Building upon his initial results, he created Crossject in 2001. There, he pursued ceaselessly his research to improve the concept and find the solution he hoped to bring to patients.

R&D is Crossject's spearhead in a nonetheless challenging setting: how does a startup consolidate its flexibility and reactivity with pharmaceutical imperatives necessitating long and costly research? In other words, how to conjugate innovation and perseverance?

To always move forward, Crossject has progressively gathered **a vanguard of specialists from a range of industries** and their expertise to empower each step of its evolution. Therefore, over the years, the company has formed a tightly woven community of about 60 people, originating from such fields as medicine, pharmacy, automobiles, pyrotechnics, plastics, marketing, sales, and more.

THE HISTORY OF CROSSJECT

1997
Emergence of the concept of **needlefree injection** + **first preclinical results** and prototypes

Creation of **Crossject**
2001

2005
First successful clinical trial with an influenza vaccine

Creation of **ZENEO®** with its current ergonomics
2010

2014
Initial public offering + integration of **seven medications**, six of witch are for emergency situations

Inauguration of a manufacturing unit in Gray (Haute-Saône, France)
2016

2017
Inauguration of the new headquarter and **launch of a production facility "PARC" in Dijon** (Côte d'Or, France)

A business model to accelerate market access

Crossject's strategic approach is to conceive new, proprietary, non-interchangeable treatments by associating well-established, off-patent molecules with its ZENEO® injector.

Crossject tested approximately 100 well-known, off-patent, proven molecules and decided to **focus on treatments in emergency situations**. Today, the company's portfolio comprises **eight solutions in advanced development stages, including five for life threatening situations and two for highly-urgent situations.**

The distribution of Crossject's solutions is entrusted to pharmaceutical laboratories as part of regional partnership agreements.

THE CROSSJECT PORTFOLIO

- **ZENEO® Sumatriptan**
  for severe migraine attacks
- **ZENEO® Naloxone**
  for opioid overdose
- **ZENEO® Midazolam**
  for epileptic seizure
- **ZENEO® Hydrocortisone**
  for acute adrenal crisis
- **ZENEO® Apomorphine**
  for off episodes in Parkinson's disease
- **ZENEO® Adrenaline**
  for anaphylactic shock
- **ZENEO® Methotrexate**
  for rheumatoid arthritis
- **ZENEO® Terbutaline**
  for severe asthma crisis

Global ambition

Crossject focuses on emergency situations, a fast-growing market estimated at $10 billion[1], half of which is in the United States. With its unmatched expertise in needle-free treatment administration, Crossject aims **to become the world leader in emergency auto-injectables.**

MARKET AUTHORIZATION PROCEDURE ACCESSIBLE IN 4 STEPS

Since the concerned molecules are already approved, Crossject market approval requires only four steps:

1. Combining a pharmaceutical formulation with ZENEO®.
2. Performing a comparative bioavailability study on healthy volunteers to demonstrate effective delivery.
3. Verifying drug stability over time.
4. Producing and analyzing commercial-size batches.

[1] Datamonitor 2015, Anaes 2015, Int J Emerg Med (2008)

ZENEO®, a simple, intuitive and effective device

Unprecedented efficacy in emergency situations

The raison d'être of the revolutionary, needle-free auto-injection system ZENEO® is nothing less than to save lives in vital situations. A medical emergency requires quick action to ward off a risk of imminent death and/or long-term sequelae, or to manage a situation of **stress or crisis.**

Crossject is thus targeting patients who have been diagnosed with a medical disorder known to provoke crises resolvable by self-administration of pertinent treatments. When a crisis occurs, **the patient or an accompanying person triggers the device,** which is kept on or near the patient at all times.

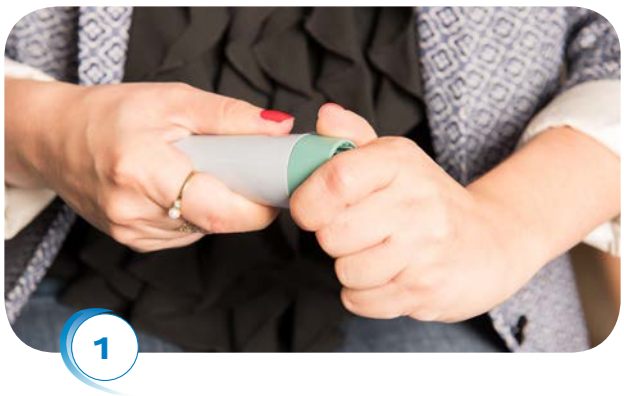
Seven of the products in Crossject's portfolio address urgent or emergency situations. For example, ZENEO® Midazolam gives adults with epilepsy a means to stop a seizure, an emergency that, until now, had no immediately-administrable treatment.

ZENEO® IN 5 KEY WORDS

- **Simplicity:** a compact, ergonomic device that can be used with one hand.
- **Rapidity:** injection in less than a tenth of a second.
- **Accuracy:** the dose is predetermined and unchangeable and its full injection is guaranteed.
- **Autonomy:** the patient self-administers the right treatment at the right dose with maximum comfort and tolerance, and has no need for a doctor's appointment or medical intervention.
- **Economy:** self-administration greatly reduces treatment costs, both for emergency situations and for chronic care.

Using ZENEO®

The administration of a drug with ZENEO® involves only two steps:



Removal of the safety cap, which automatically breaks the sterility seal.

Placement of the device on the skin surface and a push to inject the formulation in less than a tenth of a second.

The ZENEO® technology

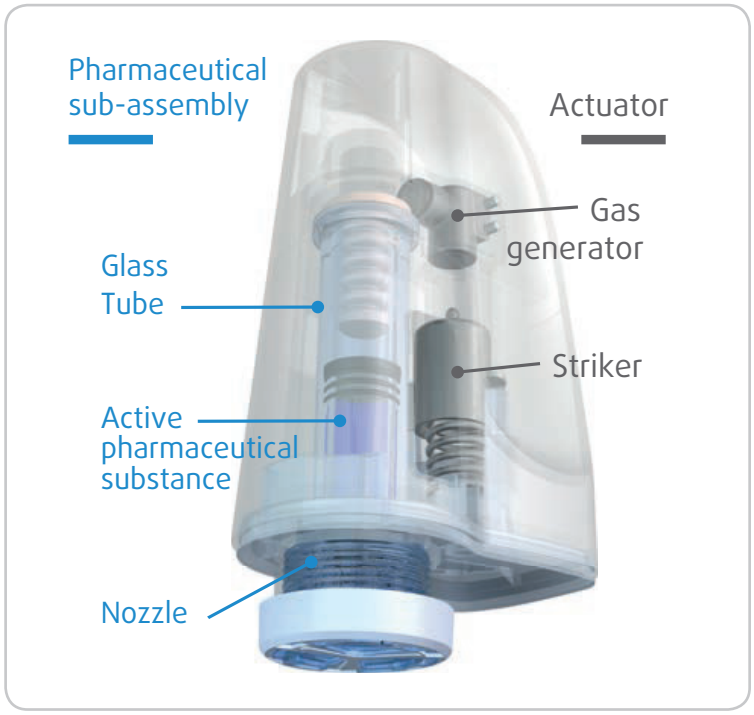
Manufacturing ZENEO® calls upon **the miniaturization and combination of cutting-edge technologies** from various sectors: **pharmaceutical manufacturing of course, but also space technologies, the automotive industry, glassworks and even defense.**

On one end of the device, there is a **siliconized, depyrogenated, pharmaceutical-quality glass tube** (technique unique worldwide) that can support up to 1,200 bars of pressure, in contact with a polycarbonate nozzle with submillimeter conduits. On the other end is a **reaction-based gas generator with an actuator** that includes an innovative unlocking and opening system.

The actuator activates the generator and the resulting gas propels the liquid formulation at a very high speed. The first phase propels the product through the skin and the second diffuses the treatment at the desired depth, **all in less than a tenth of a second.**

According to the European Medicines Agency, a classic auto-injector must have a needle at least 25 mm long to correctly administer ~epinephrine in anaphylactic shock. ZENEO® set for intramuscular injection reaches an average depth of 30.1 mm.

Thus, **ZENEO® is the only system to offer full performance regardless of patient morphology.** This characteristic is crucial for all injections using the intramuscular route.



Strategic partnership with the world specialist in injectables

Specialist in injectables, Cenexi produces 15 million syringes per year for annual sales of €160 million. Its 8,000 sq.m. facility at Braine l'Alleud (Belgium) is largely dedicated to injectables.

Cenexi has invested several million euros and mobilized a 25-member team in a truly custom- tailored partnership with Crossject. The fabrication of tubes and diverse components, aseptic filling, final assembly and secondary packaging are subcontracted to this partner.

This partnership makes it possible to respect the highest international standards (particularly those of the American Food and Drug Administration and European Medicines Agency). **The Scale-Up line is dimensioned for 10 million units per year**. Furthermore, a manual assisted line, with one filling position, designated Fast Track line is in qualification phase. This pilot line will support stability and registration batches. An automatized line on the same site, with same technology filling but with six simultaneous filling positions, designated Scale-up line/ will begin producing commercial batches mid-2018.

Ergonomics for patients under stress

People facing an emergency, especially if they themselves are the victim, need an immediate therapeutic solution, but will be hampered by clumsy movements and an incapacity to act with serenity and reflection. The physical and/or psychological state of a person having an epileptic seizure, experiencing anaphylactic shock or suffering an overdose does not permit a sure medical gesture, all the more so if it involves syringes and needles.

Over years of development, ZENEO® has been **precisely tailored to the needs of patients living with invalidating or life-threatening disorders. Beyond making sure that the device meets all European and American regulatory requirements, Crossject worked with specialists and patients to make sure that its ergonomics provide true patient autonomy.**

Its compactness, weight, shape, prehension and ease-of-use were all subjected to in-depth studies. For example, the quick opening mechanism of ZENEO® can be easily actioned by patients with hand mobility issues. ZENEO® also provides visual cues for simple and intuitive use.

Thus, for the patient, ZENEO®: alleviates any fear of needles; eliminates all risks of injury; ensures complete and correct injection; enables quick, one-handed use; and excludes any risk of contamination with its single-use nature.

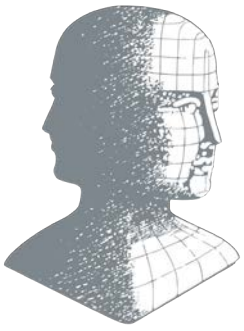
ZENEO® has won **several international prizes** for its overall ergonomics (Product design award, Medical design excellence awards, Observeur du design, Hospitevent), and, more recently, received **the 2017 JANUS Prospective award from the French Institute of Design.**

ABOUT THE FRENCH INSTITUTE OF DESIGN'S JANUS AWARDS

Since 1953, the JANUS jury has been convening in 10 yearly sessions to reward excellence in and the collaborative dimension of design.

The jury unites about 60 members representing such fields as architecture, design, industry, commerce and academia. This diversity enables a meeting of minds and a multiplication of perspectives for the range of considered projects.

Products honored with the JANUS label share not only originality and creativity but also pertinence for the «5 E's»: **Economy, Ergonomics, Esthetics, Ethics, Emotion**; the cornerstone values of the French Institute of Design.



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DE LA PROSPECTIVE

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