Association INSTITUTS CARNOT

Carnot institutes network

Research and innovation for industry

Partnership with ICÉEL Carnot Institute and Crossject

Carnot ICÉEL contributes to Crossject successful completion of a specific needle-less syringe

Crossject has reached its intended goal of providing safe medical injection without the use of a needle in a format adapted to the needs of both the professionals and the patients.

Supporting Innovation

Crossject aspires to make the injection of medical products at a more reliable pace with a single button press using NFIT (Needle-free injection technology). Indeed, the needle-free procedure minimises the stress induced by the patient as well as the unpredictable effects upon the medical injection considerably. ZENEO®'s commercialisation move comes after several years of research in co-operation with doctors and patients. The simple 'single-use' device guarantees the correct quantity of products in an ideal environment. The unique highly specialised expertise acquired has made it possible for Crossject to become a key player in his field. The SME undeniably provides enhancements that can help improve the self-injection process when caring for chronically ill persons and/or in an emergency setting.

The client needs

Crossject has been demonstrating the validity of its concept in 2005 since day one, when conducting the first controlled clinical evaluation of a specific influenza vaccine. Initially, concrete steps had to be taken in terms of ergonomics and regulation of injection quantity. The device was designed to allow adaptation to different fluid injection viscosity volumes according to the depth desired, whether intradermal, subcutaneous or intramuscular.
However, the conventional methods used to validate the device effectiveness fell short of expectations. According to statements by Patrick Alexandre, the Crossject's CEO, the partnership with a team of the ICÉEL Carnot Institute*, a Fluid Dynamics specialist, enabled to explore solutions very far apart from the traditional reasoning.
For Crossject, the TJFU** Laboratory, a unit of Carnot ICÉEL, has drawn on its experience in modelling and implementation of pulsed microjet nozzles to conceive an innovative injection duct A key component of the delivery device, it is the subject of numerous patents placing Crossject in a situation of authority over the competition.

* ICÉEL : Institut Carnot Énergie et Environnement en Lorraine

** Technical centre specialising in abrasive water jet destined to the cutting of metal parts

*** Technological Resource Centre

Partnership

The ICÉEL Carnot Institute brings together 22 laboratories. Its R&D spectrum allows the backing of projects with a significant social impact in areas relating to energy and environmental sustainability.
The Institute acting as the R&D partner of a majority of the largest manufacturers, as well as SME's matching Crossject's profile, has helped the latter to innovate by breaking with normal practice. As a pulsed microjet specialist, TJFU's CRT***, has been a 10-20% hydrodynamic efficiency saver for the injector duct using an innovative geometry optimisation. Abdel Tazibt, a TJFU CRT researcher, underscores the importance of such contributions for the successful improvement of ZENEO® in terms of effectiveness.
To further enhance the ZENEO®-designed syringe's flexibility and robustness and reduce costs, co-operation is being continued and extended beyond the common patent application.
5 out of 7 products to be used during emergency and disaster situations are currently awaiting regulatory approval.
In 2017, ZENEO® has scooped the Janus Award, in the Prospective category, acknowledging the impact of user behaviour, the introduction of newer applications and the emergence of a new economy.

CROSSJECT

INSTITUT CARNOT ICÉEL