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Xeltis AG
Founded in 2006 as a
University of Zurich spinoff
2012 merger with the Qtis/e, NL
Headquarters in Zurich;
second seat in Eindhoven
50 employees,
150 jobs planned by 2021

A matter vital to the heart

Xeltis has developed an artificial heart valve that ulates the body to rebuild a replacement one of its own. The implant is gradually absorbed while the tissue is being restored. Millions of children worldwide can be helped with this natural approach. This innovative ethod allows for faster healing and reduces the number of further risky operations.

As the father of three sons, Laurent Grandidier cares about children. “Helping them is our biggest motivation,” says the CEO of Xeltis. The problem: many babies are born with a closed - or a missing - pulmonary heart valve. In young patients in the past it was common to replace it with a vein from the neck of a cow and then prevent any rejection of foreign tissue with medication. Biological heart valves, however, must often be renewed 5 to 15 years after the initial operation. “The symptoms and risks increase with every further open-heart surgery. This is horrifying and an enormous challenge for the children, their parents as well as every cardiac surgeon,” says Grandidier.

Organism recreates itself automatically & correctly

In order to remedy the problem, Xeltis has developed an artificial heart valve that is very porous. The ingenious aspect of this method is that the patient’s blood vessels regrow and fill in the open pores. This initiates a healing process which results in the implant being absorbed by the body - all in the absence of an immune response. This process can take months but in the end the patient has a new heart valve generated by its own resources. And that’s not all: because it is stimulated by the implant, the body replicates the missing tissue according to its original function - including the right type, size and shape.

Nobel Prize winning technology

Endogenous Tissue Restoration (ETR) was the breakthrough for Xeltis.
Behind their «RestoreX» platform are two groundbreaking innovations: Firstly, the material used consists of supramolecular polymers developed by Nobel laureate Jean-Marie Lehn, a current advisor for Xeltis. Secondly, the company uses its patented electrospinning procedure for the production of heart valve components. The prop-

Laurent Grandidier, CEO, Xeltis.

erties of the polymers are altered specifically in an electric field of tension until, for example, a micrometer thin and several kilometres long fibre is created to construct a heart valve.

Twelve successfully treated patients

Xeltis started with the first implantations in Budapest because early clinical trials were possible there, according to Grandidier. Twelve pulmonary valves have been successfully implanted in patients as part of feasibility studies in Europe and Asia. More tests / studies are currently running in the USA. Young patients aged 6 to 21 years are carefully selected by doctors according to their needs as well as a risk / benefit assessment. Grandidier recalls an eight-year-old he accompanied during the procedure: "The girl was already so weak that she could only reach the operating theatre by wheelchair. Two years after the procedure she's able lead to a nearly normal life again, "he says happily.

But the Xeltis platform is reaching further. The company is currently using the same principles to continue research into, among other things, the development of aortic valves for adults. "But one cannot conserve the animal tissue needed for a biological valve for long periods of time. In addition, there would not be enough animal material available for the demand worldwide," says Grandidier. Implanting artificial heart valves is not a good alternative as patients must take blood clotting inhibitors with strong side effects. Xeltis' new therapy approach eliminates these serious drawbacks as well. The preclinical studies also attest to the full functioning of the valves – already within 12 months after implantation.

Billion market for aortic valves

Scientists and surgeons worldwide are convinced by the results of the new therapeutic approach. Xeltis plans to introduce the pulmonary valve in the EU and Switzerland under Professor Thierry Carrell in Bern's Inselspital in 2021. There is a high demand: around 2% of the population in industrialised countries suffer from this form of cardiovascular disease. Grandidier estimates the market for pulmonary valves in Europe and the US to be $300-400 million per year. He even predicts the potential for aortic valves to be up to $5 billion worldwide - and the trend is increasing.

Saving millions in treatment costs

Using ETR can save millions in treatment costs over the lifetime of a patient. Each procedure costs close to CHF 100,000 and that's not taking into account the examinations and subsequent treatments for chronic inflammation, the medications, treatment materials, etc. The economic benefits of the new method could be enormous