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Invitation to a Lecture on

EU Horizon Project – SimInSitu

In-silico Development- and Clinical-Trial-Platform for Testing in-situ Tissue Engineered Heart Valves

Dr.-Ing Nils Götzen
Senior FEA Consultant & Life-Science Expert
4RealSim, Netherlands

SimInSitu is aiming to develop a sophisticated in-silico method to predict the short- and long-term behavior of in-situ tissue engineered heart valves by combining advanced tissue remodeling algorithms with a personalized virtual heart modelling approach. The method will be specifically developed to predict the complex transformation process of biodegradable heart valves from the initially synthetic scaffold into a fully remodeled & functional valve. This transformation process, named ETR for Endogenous Tissue Restoration, is the core technology for a new generation of very promising biodegradable vascular device currently developed by Xeltis. ETR makes the use of animal derived tissue, which is used in the majority of commercially available bioprosthetic heart valves, obsolete and avoids thereby durability related issues and potentially minimized the need for reoperations. Though, significant progress was made during the past years in developing ETR based devices, it remains very challenging, costly, time-consuming, and rich with obstacles. New knowledge can only be generated through a tedious trial & error process (requiring preclinical and clinical studies), since the restorative process cannot be replicated in an in-vitro environment. Advanced Computer Modelling & Simulation technologies have the potential to overcome this limitation by allowing to test new designs, modified scaffold compositions, or other applications in a virtual patient-specific environment – in-silico. SimInSitu will not only develop such a computer model, but will also verify and validate it thoroughly by making use of the extensive in-vitro and in-vivo data available and where necessary will generate new data to support the credibility of this in-silico method. The availability of this computer model could contribute significantly to an acceleration of especially the ETR-device development and accelerate their translation into the clinic and market.

Date: Monday, May 16, 2022, 4:30 pm

Place: Stremayrgasse 16/I, seminar room BMT01046