

Transplantation Medicine

Integrating CITSens Bio, a continuous in-blood glucose monitoring system to establish artificial pancreas functions during normothermic ex-vivo liver perfusion

Zurich, Switzerland, Summer 2018

Liver4Life is a project of Wyss Zurich, a joint research and development center of the ETH Zurich and the University of Zurich in the fields of Regenerative Medicine and Robotics. The project is aiming at developing a liver perfusion device. C-CIT Sensors AG supplies single-use biosensors for applications in the field of normothermic ex-vivo organ perfusion.

The challenging aim of the Liver4Life project at Wyss Zurich is to extend the viability of liver tissue outside of the body (ex-vivo) up to five days and allow its growth. The perfusion system will provide necessary nutrients and oxygen supply and is monitoring the functional capacity of the liver. Putting one focus on the glucose metabolism is important for the overall mission's success.

As a company with its main competence in electrochemistry and in developing and manufacturing single-use sensors for the in-situ and continuous measurement of metabolically relevant parameters in aqueous solutions such as blood, cell culture media or sweat, C-CIT Sensors contributes an important feature to the Liver4Life perfusion machine.

Because the glucose metabolism is an important task of the liver, the team around Professor Philipp Rudolf von Rohr successfully evaluated C-CIT Sensors' glucose monitoring technology as part of an artificial pancreas within the Liver4Life system.

"We are happy about the latest achievements we made together with C-CIT Sensors and to continue our innovation process in this exciting field of liver regeneration", said Professor Rudolf von Rohr. "C-CIT Sensors' single-use in-situ glucose sensor technology is a valuable tool for identifying the optimal process parameters to allow extended organ perfusion under normothermic conditions. Continuous information on changing blood glucose levels help stabilize the organ on the machine.

Dr Andreas Koch, Business Development Manager with C-CIT Sensors is looking forward to continuing this experimental phase together with Liver4Life. "The results obtained so far are highly encouraging and confirm the broad applicability of our technology within different fields of Biopharmaceutical production, Cell Therapy and Regenerative Medicine."

About Wyss Zurich

The Wyss Zurich is a joint institution of the ETH Zurich and the University of Zurich, made possible by a generous donation from the Swiss entrepreneur and philanthropist Dr. h.c. mult. Hansjörg Wyss. The mission of Wyss Zurich is to drive the clinical translation and technology transfer of outstanding scientific discoveries into new therapies for patients and breakthrough innovations in the emerging fields of Regenerative Medicine and Robotics, and to promote hybrid technologies in these fields. Wyss Zurich brings together multidisciplinary teams of world-leading scientists and entrepreneurs, pooling their knowledge and expertise. By integrating projects from multiple disciplines and giving access to excellent resources, Wyss Zurich translates science into life improvements and fosters entrepreneurship.

About Liver4Life

Liver4Life is one of the projects running at the Wyss Zurich with the vision to enable ex-vivo organ regeneration in a controlled organ perfusion process.

About CITSens *Bio*

CITSens *Bio* is a metabolic monitoring systems for the in-situ, real-time, continuous and wireless measurement of critical parameters such as glucose in cell cultures and blood. The product can be used in bioreactors and perfusion vessels of different flavors. Besides standard sensor formats, customized solutions are offered.

About C-CIT Sensors

Headed by Professor Ursula Spichiger-Keller, the former ETH Zurich institute named CCS (Center for Chemical Sensors) developed the technology and expertise and built the experience in the field of bio/chemical sensors that laid the foundation for starting up C-CIT Sensors AG. C-CIT Sensors, an ISO 9001:2015 certified company with several products used as reference methods by the Swiss Federal Institute of Metrology (METAS, www.metas.ch) is backed by Abalis (<http://www.abalis.ch>) and focuses on the development, production and marketing of enzyme-based sensors and ion-selective electrodes for measuring relevant parameters in cell cultures, blood, water, sweat and other aqueous liquids.