



Successful completion of the MyTreat project conducted in collaboration with ARTORG – University of Bern

Bern, Lausanne, September 20, 2018: The ARTORG Center for Biomedical Engineering Research of the University of Bern, Debiotech SA, and the Division of Endocrinology, Diabetes and Clinical Nutrition of Bern University Hospital “Inselspital” are proud to announce the successful completion of the R&D project “**MyTreat – A mobile platform for personalisation of insulin delivery based on a patch pump and reinforcement learning**”. The MyTreat consortium has developed a mobile platform able to personalise the care of people under insulin treatment, independently of the glucose monitoring device (self-monitoring of blood glucose, SMBG or continuous glucose monitors, CGM). The two-year project was funded by the Commission of Technology and Innovation (CTI, the Predecessor of Swiss Innovation Agency, Innosuisse) and coordinated by the ARTORG.

An innovative algorithm, developed by the engineers of the ARTORG center, allows daily adjustment of the insulin infusion profile (basal and bolus dose), on the basis of the fluctuations in the patient’s glucose. Information from SMBG or CGM provides input to the algorithm, which outputs basal daily insulin and boluses – one value for each of the three main meals. The algorithm is based on reinforcement learning, a type of artificial intelligence which teaches systems to learn. Our self-learning approach is adaptable and personalises daily insulin values in order to ensure glucose control, despite the inter- and intra-patient variabilities. The approach is data-driven, real-time and of low computational cost. The FDA-approved diabetes simulator was used to validate the newly introduced algorithm. The algorithm was able to achieve glucose control over the course of four virtual trials that lasted three months under extreme scenarios for disturbances, uncertainties and variabilities. After the *in silico* clinical trials, the algorithm was implemented on JewelCOM™, which integrates an SMBG, can wirelessly control the JewelPUMP™ and which delivers accurate amounts of insulin. Both JewelCOM™ and JewelPUMP™ were provided by DEBIOTECH SA.

Several clinical studies are in the pipeline to validate the developed algorithmic approach. The current version of the algorithm is designed for insulin pump users and can potentially be extended to insulin pen users. The newly introduced technology may provide a holistic solution to personalised treatment of the insulin treated diabetic population. The project results have been presented (or are under review) in a number of scientific journals and conferences, while a patent portfolio has been created around the technology.