find out how TTP Ventus is helping to save 100,000 lives by 2020
TTP Ventus works with entrepreneurial companies, both large and small, to bring disruptive new products to market. Our award-winning micropump platform and excellent development support enables our partners to deliver their ambitious visions.

Our platform

Our micropump platform, Disc Pump, was created by The Technology Partnership (TTP) in 2005 to address a need in the micro fuel cell market. The pump's unique features derive from its operating principle. Rather than changing the volume of a chamber, Disc Pump excites a high-frequency acoustic standing wave in a fixed-volume cavity. Our patented ultra-fast valve technology rectifies this standing wave to deliver pumped flow. The technology platform was recognised by the Institute of Physics, winning its inaugural Business Innovation Award in 2012.

Our culture

As a sister company, we share TTP’s culture of technical excellence, innovation, and customer focus. We draw upon TTP’s exceptional strength and depth – including its 250 world-class scientists and engineers – to accelerate the integration and development of our partners’ products.

To exploit the potential of the Disc Pump platform TTP invested in developing a second-generation design and in establishing its own manufacturing facility. In 2017 TTP Ventus was launched, establishing a new business focused on the development, licensing, and manufacture of the Disc Pump platform.

Owlstone Medical

Owlstone Medical has developed a breathalyser for disease. With a focus on non-invasive diagnostics for cancer, inflammatory disease and infectious disease, the company aims to save 100,000 lives and $1.5B in healthcare costs by 2020.

Founded in 2004 as a spin-out from the Engineering Department at the University of Cambridge, Owlstone Inc is a profitable business selling its proven FAIMS technology to military and industrial customers globally. Owlstone Medical was spun out from Owlstone Inc in 2016 to develop and commercialise FAIMS in diagnostic applications. Owlstone Medical is headquartered in Cambridge, UK, with offices in London, UK.
Biomarkers in breath present. The Lonestar VOC Analyzer is a Breath Sampler device. The Vitro Analysis (ReCIVA™) Respiration Collector for In-via the Owlstone Medical Breath samples are collected (VOCs) in breath. as volatile organic compounds of chemical signatures known cancers through the analysis detection of lung and bowel is designed to enable early...the Breath Biopsy...disc pump enhances the quality of new diagnostic platforms

**TTP Ventus’ disc pump enhances the quality of new diagnostic platforms**

**TTP Ventus and Owlstone Medical have collaborated to create the next generation of leading edge diagnostic platforms; delivering systems with the potential to transform approaches to non-invasive point of care diagnostics. Integration of the TTP Ventus Disc Pump device within Owlstone Medical’s Breath Biopsy™ diagnostic system has broadened the possibilities for these clinical tools and may lead to improved outcomes for thousands of patients through early detection of cancer, infectious disease and inflammatory disease.**

**Breath Biopsy® technology**

Owlstone Medical has developed a breathalyser for disease, which has been refined and enhanced through the integration of Disc Pump. The Breath Biopsy® technology is designed to enable early detection of lung and bowel cancers through the analysis of chemical signatures known as volatile organic compounds (VOCs) in breath. Breath samples are collected via the Owlstone Medical Respiration Collector for In-via Analysis (ReCIVA™) Breath Sampler device. The Lonestar VOC Analyzer is then used to identify chemical biomarkers in breath present even at very low concentrations, using the highly sensitive and selective Field Asymmetric Ion Mobility Spectrometry (FAIMS) technology. Changes in the concentrations of VOCs occur at the very earliest stages of disease, detecting these chemical biomarkers can therefore allow for early disease diagnosis, before other physical symptoms are apparent. Early diagnosis is critical for successful treatment of cancer. Around 90% of bowel cancer patients will survive the disease for more than 5 years if diagnosed at the early stage and around 70% of lung cancer patients will survive for at least a year following diagnosis compared with a survival rate of just 14% for people diagnosed with the most advanced stage of disease.  

Owlstone Medical and TTP Ventus hope that early detection of cancer through breath-based systems will lead to many thousands of lives being saved.

The ReCIVA Breath Sampler reliably and reproducibly captures breath samples for analysis sampling in the ReCIVA Breath Sampler to provide precise sampling and high quality signal detection throughout the diagnostic process. Disc Pump provided a solution to the challenge of precision sampling in the ReCIVA Breath Sampler device, allowing the correct fraction of exhaled breath to be collected for analysis. Depending on the particular disease under investigation, the VOCs of interest will be present in different fractions of the exhaled breath. The high frequency of operation and low inertia of the Disc Pump operating mechanism enable ReCIVA to respond to carbon dioxide (CO$_2$) levels within the device in less than a millisecond. This speed of response offers clear benefits over conventional motor-driven pumps, which are associated with high levels of inertia. Disc Pump allows the ReCIVA device to respond in real-time to the patient’s breathing patterns so that the relevant fractions may be collected precisely.

ReCIVA was named Invention of the Year in the 2017 Top 50 Digital Health Awards in recognition of the product’s potential contribution towards improving healthcare provision. Application of ReCIVA in combination with the FAIMS technology for VOC analysis is currently being assessed at key lung cancer centres across Europe as part of the Lung Cancer Indicator Detection (LuCID) trial: the largest breath-based clinical trial ever undertaken for early detection of cancer, led by Professor Robert Rintoul at Papworth Hospital near Cambridge, UK.

Supporting delivery through close collaboration and technical expertise

The integration of Disc Pump and further development of these clinical tools was very much a collaboration between TTP Ventus and Owlstone Medical. In addition to Disc Pump, TTP Ventus provided drive printed circuit boards (PCBs), firmware, and final technical support necessary for successful integration of the pump into the ReCIVA Breath Sampler.

Each company brought complimentary skills and technical expertise to the partnership with a common understanding of the exceptional standards and quality that the final product should deliver.

Owlstone Medical’s creativity and vision led to the identification of Disc Pump as a successful technology-facing, releasing the potential of their breath capture system and elevating the precision and accuracy that they are able to deliver.

Alastair Taylor, Chief Product Manager, Owlstone Medical Limited

“TTP Ventus and Owlstone Medical have collaborated to create the next generation of leading edge diagnostic platforms; delivering systems with the potential to transform approaches to non-invasive point of care diagnostics. Integration of the TTP Ventus Disc Pump device within Owlstone Medical’s Breath Biopsy™ diagnostic system has broadened the possibilities for these clinical tools and may lead to improved outcomes for thousands of patients through early detection of cancer, infectious disease and inflammatory disease.”

“TTP Ventus新型泵技术提升新诊断平台的质量”

Billy Boyle, Founder and CEO, Owlstone Medical Limited

“I believe that the Breath Biopsy® technology offers a real opportunity to improve the lives of patients. Working alongside TTP Ventus has enabled us to elevate this diagnostic platform further, providing an extremely sensitive and accurate system that is also portable and user-friendly.”

Tom Harrison, TTP Ventus

“TTP Ventus is extremely proud and excited to have collaborated with Owlstone Medical on the development of their breath capture platform.”

Owlstone Medical’s Breath Biopsy® technology identifies chemical biomarkers in breath with a high level of sensitivity and specificity, making it an invaluable tool for early disease detection. The TTP Ventus Disc Pump is a key component of this system, providing the precision and speed necessary to collect accurate breath samples for analysis.

The Breath Biopsy® technology is designed for use in clinical trials and is already being used in several hospitals across the UK. Owlstone Medical is working closely with clinical partners to further develop and refine the technology, with the ultimate goal of bringing it to patients in the near future. By combining Breath Biopsy® and the TTP Ventus Disc Pump, Owlstone Medical is able to offer a highly sensitive and accurate solution for early disease detection, which has the potential to revolutionize the way we think about health and disease.
Disc Pump won the Institute of Physics inaugural Business Innovation Award in 2012. This unique micropump uses a piezoelectric actuator, ultrasonic resonance and a patented ultra-fast valve technology to deliver pumped flow.

Disc Pump is designed to deliver:

- silent operation
- compact - small size and light weight
- exceptional pressure and flow
- ultra-fast millisecond response to set-point changes
- ultra-low pulsatility output delivering unrivalled smoothness of flow
- full control flexibility

TTP Ventus Limited is part of TTP Group plc
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