



The research commercialisation office of the University of Oxford, previously called **Isis Innovation**, has been renamed **Oxford University Innovation**

All documents and other materials will be updated accordingly.  
In the meantime the remaining content of this Isis Innovation document is still valid.

URLs beginning [www.isis-innovation.com/](http://www.isis-innovation.com/)... are automatically redirected to our new domain, [www.innovation.ox.ac.uk/](http://www.innovation.ox.ac.uk/)...

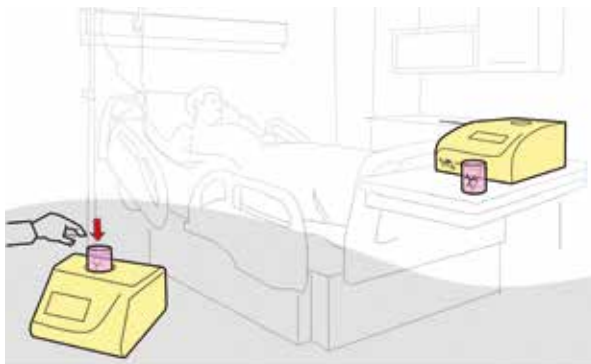
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# DIABLO – Detection of Infectious Agents By Laser Optics

Our aim is to develop an instrument capable of diagnosing *Clostridium difficile* – associated disease (CDAD) on the hospital ward within a few minutes. Existing tests and methods based on traditional analytical instruments cannot meet this challenge: a novel approach is needed.

DIABLO comprises Bedford Hospital NHS Trust, Cranfield University and Cascade Technologies Ltd, an SME, co-funded by the Technology Strategy Board and EPSRC.



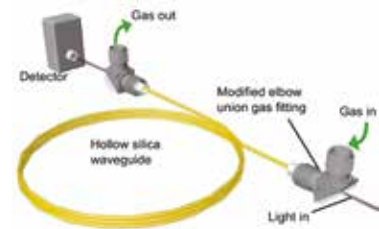
It has been established since the 1980s that bacteria grown in culture can be identified on the basis of the different mixtures of volatile organic compounds (VOCs) which they emit into the surrounding air. Moreover, substantial anecdotal evidence points to a distinctive odour associated with the faeces of patients suffering from *Clostridium*-associated disease. We hypothesised that this odour was associated with the presence of the active bacterium and that the volatile organic compounds giving rise to it would be detectable using laser spectroscopy.

Our aim, rapid diagnosis of *Clostridium difficile* infection at point-of-care, is a challenging problem requiring a multidisciplinary approach which involves:

- Biomarker discovery and faecal headspace sampling
- A novel optical cell for rapid biomarker determination using hollow core optical waveguides
- High-resolution laser spectroscopy for point-of-care diagnosis
- Clinical expertise in infection biology and knowledge of clinical practice and approvals

Six novel biomarkers were identified – volatile compounds found in faeces - which discriminated between infected and non-infected patients and led to a patent application. The DIABLO approach uniquely measures activity rather than presence of infectious organisms – important when organisms can be carried asymptomatically.

This success allowed us to extend the project scope to alternative biomarkers in breath. A prototype instrument using Cascade's proprietary laser detection technology was developed for early diagnosis of infection in critical care. Clinical trials are awaiting final MHRA approval. Cascade will manufacture and exploit the instrument.



Future research will focus on other conditions which are known to be associated with variation in the gut microbiome such as colorectal cancer, inflammatory bowel disease and arthritis. We are also exploring other applications including methane emission from agricultural sources (such as ruminants, valuable in climate research), and detection of food putrefaction for the Agrifood industry.



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