

Case Study

MASCOT Integra

University of Reading BioCentre installs Mascot Integra to manage high-throughput proteomics research data

The **BioCentre** at the **University of Reading** is a newly established scientific hub, comprising facilities and expertise in genomics, post-genomics, structural and computational biology. It opened in 2005 under the direction of Professor **Rainer Cramer**



The BioCentre is housed in state-of-the-art research laboratories. An investment of £8M, with more than £2.5M spent on new equipment, makes The BioCentre one of the best

equipped research laboratories of its type in Europe.

There are three core units operating within the Biocentre, each addressing a different aspect of biotechnology: DNA Analysis and Transcriptomics, Structural Biology, and Mass Spectrometry and Proteomics.

The research interests of the Mass Spectrometry and Proteomics Division include

- Investigation of novel MS technologies for enhanced proteome coverage and analytical sensitivity (e.g. liquid UV-MALDI, IR-MALDI, peptide derivatisation, MALDI post-ionisation)
- Improvements in peptide and protein separation methodologies for down-

stream peptide characterisation and identification (e.g. ultrahigh pressure LC, molecular imprinting for affinity chromatography, one-dimensional LC-MALDI)

- Clinical Proteomics including research in drug discovery (analysis of target compounds/biomolecules) and diagnostics (proteomic pattern diagnostics using body fluids and biosensor development)
- Nanobiotechnology in sample preparation and analysis to achieve higher levels in sensitivity for rapid large-scale proteomics (nano/micro-vials and capsules, nanoliter sample volumes, microfluidics, nanodot labelling)

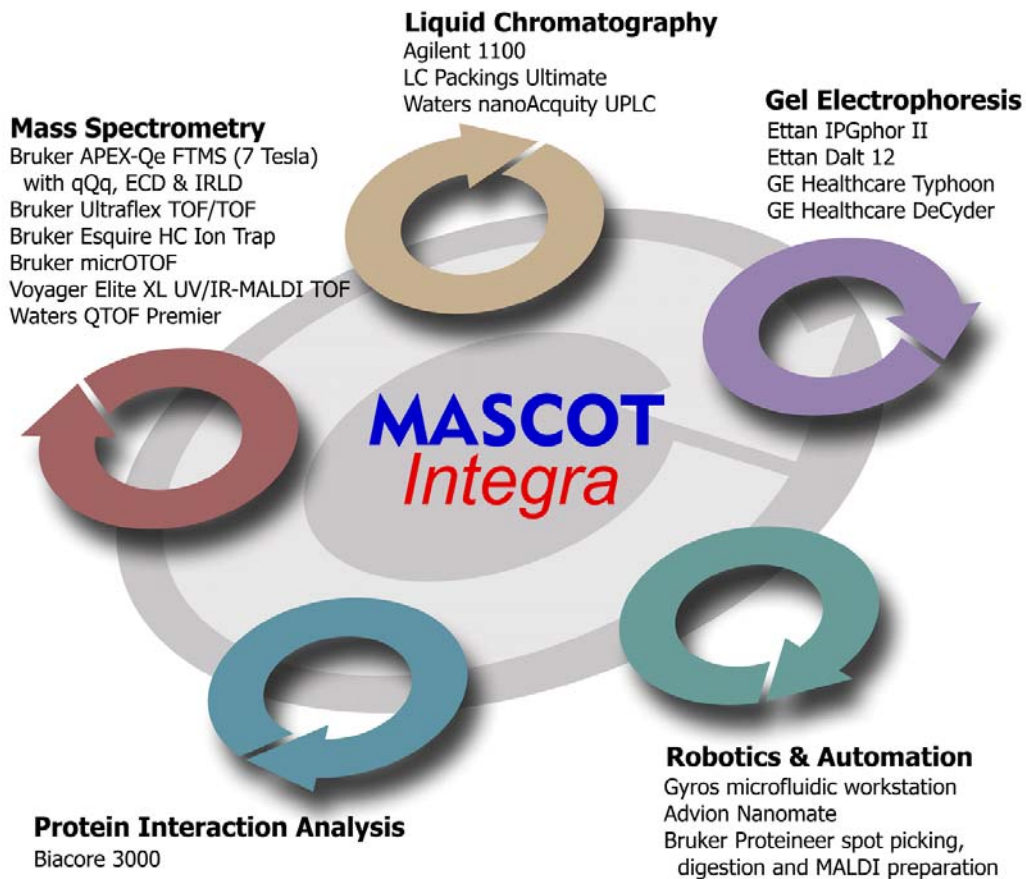
Instrumentation includes MALDI and electrospray mass spectrometers from Bruker, Waters, and Applied Biosystems. Pride of place goes to a 7 Tesla Apex Qe FTMS instrument from Bruker,

which has a qQq front end, ECD for “top-down” proteomics, and an infra-red laser.

Professor Cramer describes why the BioCentre selected Mascot Integra:

“Data management presents a particular challenge to a laboratory like ours, where we have a very wide range of instruments from many different vendors. High performance mass spectrometers generate huge volumes of data, so a ‘sneaker net’ approach, using spreadsheets and printouts, is just not a practical option. Mascot is our search engine of choice, so it was natural to look at what Matrix Science had to offer. One of their strengths is their independence. They are not tied to any one vendor, and aim to support all of the mainstream products and protocols used in proteomics. Another important factor was that Mascot Integra is built on top of a fully-fledged LIMS system. If we ever need to expand the system beyond proteomics, or require customisation services, we have this flexibility through the connection with LabVantage.”





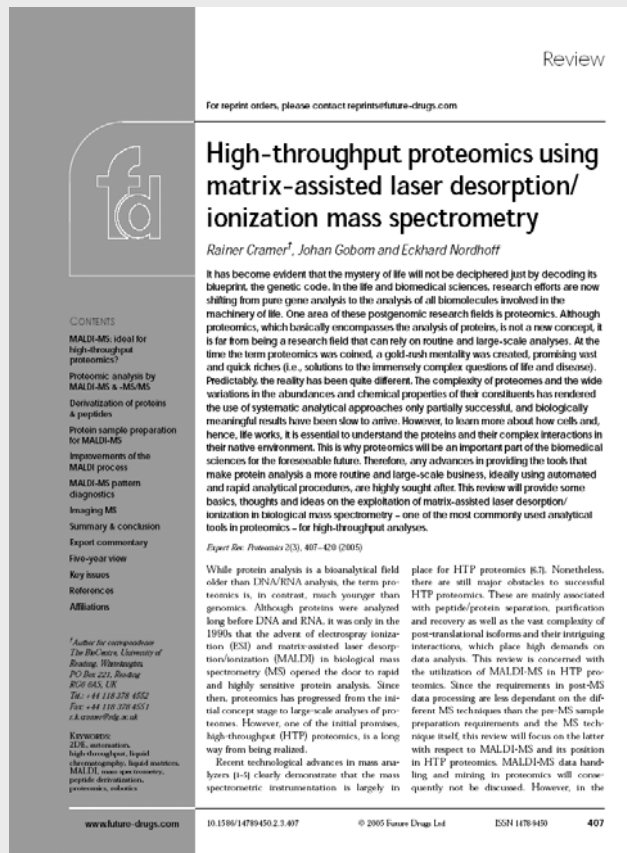
Mascot Integra has a true multi-tier architecture, allowing all of its functionality to be accessed through a standard web browser. The underlying database engine is Oracle®, ensuring that the system will scale to the largest and most demanding requirements. Role-based security allows access to certain projects, pages and functions to be restricted to project members.

Mascot Integra offers these unique capabilities:

- Supports for all of the experimental protocols used in proteomics research, including 1D gels, 2D gels, multi-dimensional chromatography, and both on-line and off-line mass spectrometry
- An intuitive drag & drop interface is used to model the experimental workflow
- Flexible and customisable integration based on file exchange for complex instruments, such as mass spectrometers, robotics, and chromatographs
- Complete automation of processing of raw mass spectrometry data into optimized peak lists and Mascot search submission
- Comprehensive reporting and data mining of Mascot search results

Professor Cramer and colleagues recently published this review of High-throughput proteomics using matrix-assisted laser desorption/ionization mass spectrometry. (Reproduced from Expert Rev. Proteomics 2 (3), 407-420 (2005) with permission of Future Drugs Ltd.)

For more information about The BioCentre, visit www.biocentre.rdg.ac.uk



For more information about Mascot Integra, including over 45 minutes of Flash movies, visit www.matrixscience.com/integra.html



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The sample tracking and workflow technology that underlies Mascot Integra has been developed by LabVantage Solutions, Inc. This ensures that Mascot Integra is compatible with and upgradeable to LabVantage's range of enterprise LIMS products. For more information visit <http://www.labvantage.com/integra>