

Real-time Sample Recognition with LiveID Software

No up-front sample preparation, easy to use, and no waiting for results

LiveID™ Software enables the real-time classification of samples using direct-analysis mass spectrometry (MS). Information is provided to the user **immediately at the time of analysis** enabling informed, real-time, decision making and removing doubt from sample identity.

The process is fast, simple and robust with **no requirements for up-front sample preparation**. Direct analysis MS measures a range of compounds in an unbiased fashion providing a holistic molecular profile of the chemical components within a sample. LiveID has a visually modern, attractive, web-based interface that offers a workflow-driven process which is easy to learn and use. Initially, authentic verified samples are used to create and validate a statistical model. Validated models can then be used with test samples to generate live classifications. The output is a simple to interpret yes/no answer.

LiveID can be used with nominal mass data generated from a Waters™ ACQUITY™ QDa™ Mass Detector fitted with DART® technology, or high resolution time-of-flight data generated from Waters Xevo™ G2-XS/SYNAPT™ G2-Si MS instruments fitted with a REIMS™ source.

Application areas are extensive and include:

- Confirmation of sample authenticity for foods and bulk chemicals
- Food fraud
- Plant phenotyping in herbicide research
- Microbe classification
- Bioengineering research

LiveID is intended for research and commercial use only and not for diagnostic use.



" I have had discussions with various sectors of the food industry and what is emerging is a very strong interest in determining if REIMS could be a possible innovation in determination of product quality. I am currently in discussions with the UK pork industry and Australian beef and lamb industry about the potential of the technology to be used to improve product quality and also as a potential at-line tool to monitor quality. I think to get a pilot study undertaken with one of these industry sectors could be very important to the future of the REIMS program at Waters."

PROFESSOR CHRIS ELLIOTT

Institute for Global Food Security, Queens University Belfast

HIGH PERFORMANCE MASS SPECTROMETRY WITH MINIMAL SAMPLE PREPARATION

- Access the power of MS technology without laborious sample preparation
- Suitable for high throughput applications
- Accurate molecular profiling in seconds
- Added confidence in sample identity
- Easy to interpret results
- Quick decision making



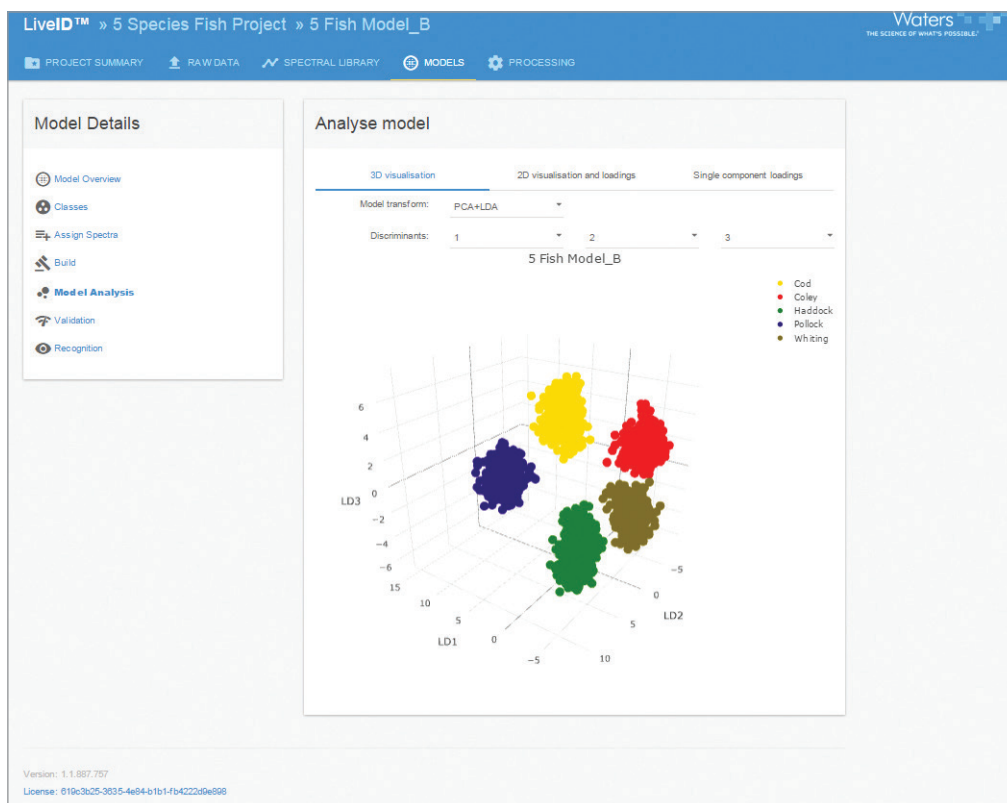
Direct analysis MS data are imported into LiveID. Shown is a total ion chromatogram from three collections from a single fillet of cod fish (upper), and an example MS spectrum (lower). MS spectrum is a combined spectrum from the second burn or region of interest (ROI area highlighted in orange).



"We have been really impressed with the new LiveID Software. It's quick to learn, easy to use, and combined with the REIMS Technology has enabled us to generate model for rapidly classifying hard to analyze samples."

DR. JOSCELYN HARRIS

Institute of Integrative Biology, University of Liverpool



After MS data is imported, Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA) are used to build a statistical model of the samples under examination.

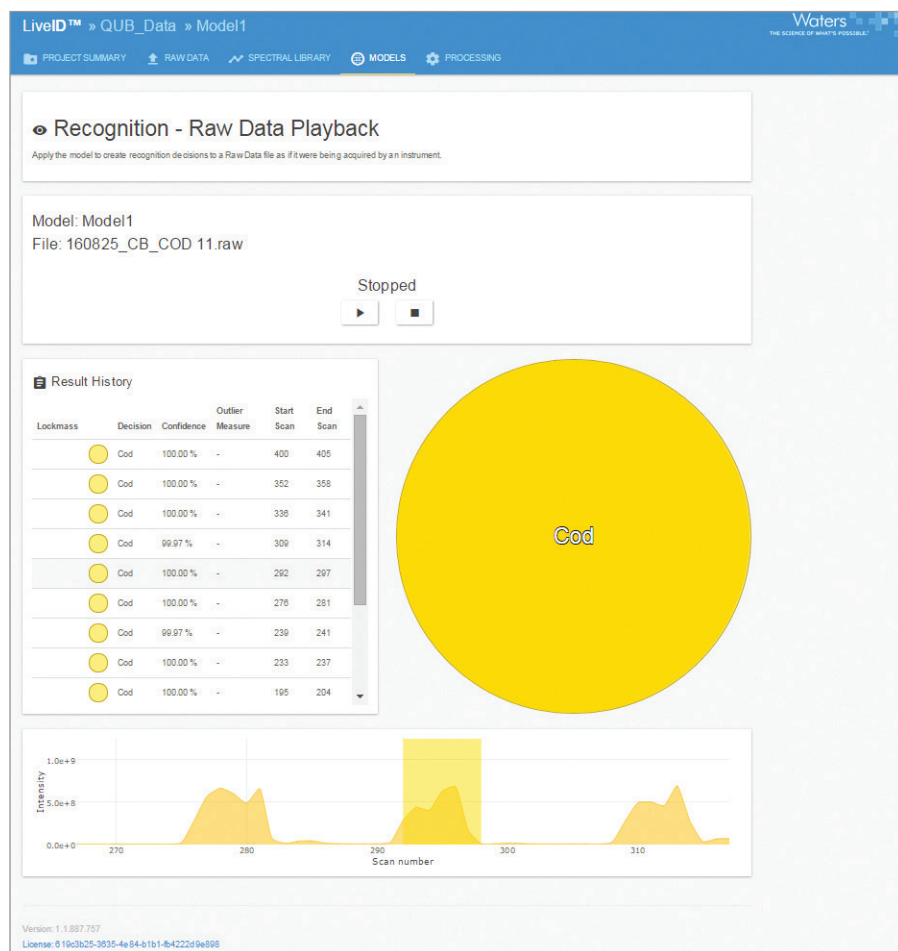
Shown is a PCA-LDA plot of data from five classes of white fish (cod in yellow, coley in red, haddock in green, pollock in purple, whiting in brown; n= 50–194 different samples of fish per class, with 8–12 ROIs collected per sample).



“ LiveID is a big step forward from the first version in terms of usability and the addition of new methods for model validation is a practical solution allowing quick checks in the early stages of sample analyses, but then being more thorough for model refinement. We are pleased with the outcome, it is user friendly, and we will use it on many of our food authentication projects.”

DR. OLIVIER CHEVALLIER

*Mass Spectrometry Core Technology Unit Manager,
Institute for Global Food Security, Queens University Belfast*



" I really like the new version of LiveID; it is quick and easy to use, it helps me to build useful models more efficiently. The new leave one group out cross validation feature has proved really valuable in analyzing fish samples acquired in different locations."

DR. FRANCESCA RIGANO
*Chromaleont Srl,
Dipartimento di Scienze
Chimiche, Biologiche,
Farmaceutiche ed
Ambientali, University
of Messina*

Once a statistical model is built with authentic samples and validated, it can be used for live recognition. Shown above is data from nine measurements that have been classified as cod fish.

For more information about the identity of chemical components observed from samples, MS data can be further analysed off-line in Progenesis™ QI. Please refer to waters.com/progenesisQI for more information.

Waters

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