

Proteomics analysis for better process and quality management



Using mass spectrometry Wageningen UR (business unit Bioscience) develops and exploits advanced protocols for both targeted and untargeted analysis of multi protein mixtures. The developed proteomics approaches support industries for better understanding and managing industrial processes like fermentation and purification. Compared to traditional antibody-based quantification methods like ELISA, the protocols we develop and use are faster, more accurate, more (isoform) specific. Our approach also gives information about more proteins: up to 100 proteins in one analysis. We develop protocols based upon known markers and based upon markers identified and tailored using protein profiling.



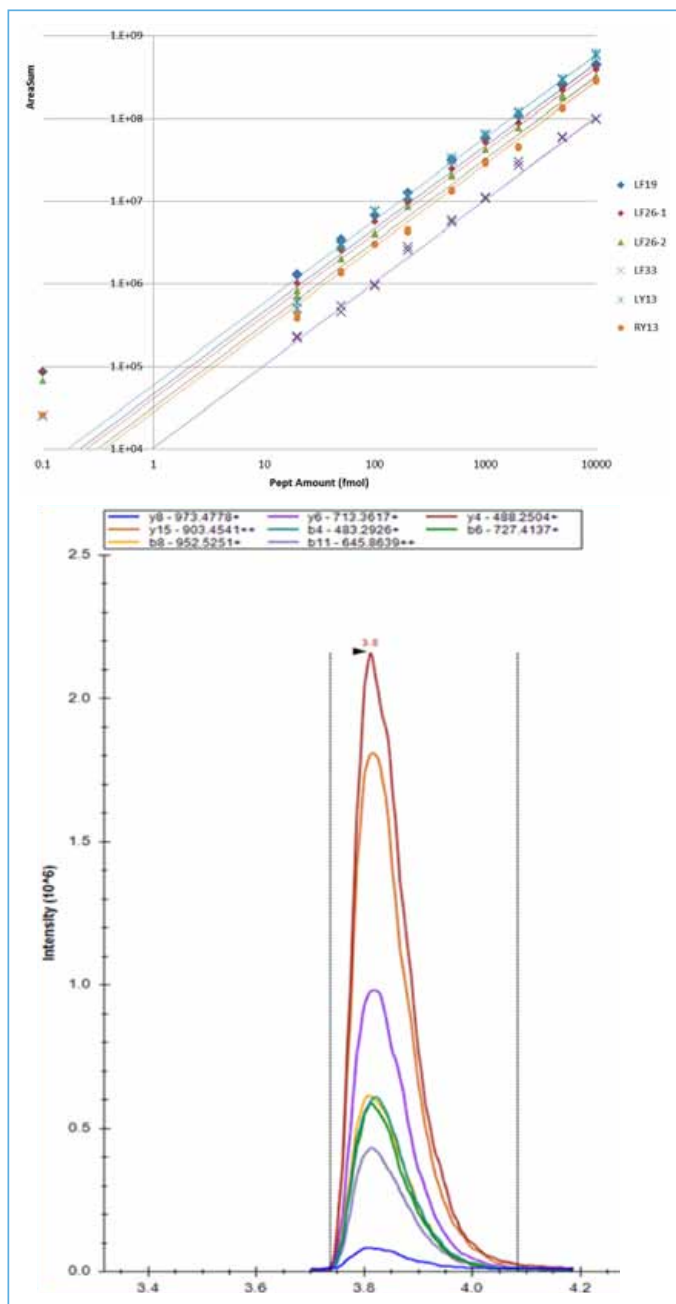
WAGENINGEN UR

For quality of life

Service for product quality

Next to protocol development, Wageningen UR also offers proteomics services. Using mass spectrometry, which allows for a fast, accurate, and (isoform) specific multi proteins analysis, we offer services like

- Peptide/protein fingerprinting of complex protein samples and identification of hundreds of proteins
- Accurate detection of modifications occurring post-translationally or during processing of protein containing products
- Based on these untargeted analyses, we can identify the crucial and most effective markers for your process of interest



MRM mass spectrometry is developed for specific detection of a selected set of ions per target molecule. This results in an accurate quantitative analysis covering a broad range of concentrations (see calibration lines). Multiple peptides can be reliably detected during a single analysis of a complex protein mixture.

Advantages of MRM compared to antibody-based quantification methods

- Selective and sensitive detection of multiple peptides/proteins (10-100 proteins) in a single MRM run
- Highly specific for peptide sequences (isoforms) and various modifications (e.g. phosphorylation, oxidation, glycosylation)
- Absolute quantitation of distinct proteins is possible within a broad concentration range (ng-ug/ml)
- Fast method development including standardization and use in quality control (QC) assessment; less expensive and time-consuming than ELISA assay development

Targeted analysis for quantitative detection of multiple proteins

Targeted proteomic approaches involving MRM (Multiple Reaction Monitoring) mass spectrometry are rapidly emerging as an alternative to antibody based quantification methods. MRM allows absolute quantitation of (multiple) proteins in a single sample using specific (stable-isotope labelled) peptides as standards. We have developed several MRM assays, e.g. for absolute quantification of toxic gluten proteins in wheat products and allergic epitopes in vaccines.

Numerous application areas

We develop and use protocols enabling sensitive detection and quantitation of a set of proteins in a complex protein mixture, for applications like

- Characterisation of protein product batches (e.g. enzymes, vaccines, antibodies)
- Quality control in fermentation or industrial processing, purification, enrichment
- Contaminant detection
- Detection and characterisation of allergens in agro and food products
- Detection and quantification of numerous biomarkers related to e.g. the physiological status and health in biological samples

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