High benefit

Protagen has broad expertise and a track record of success in applying its differential protein display to:

- *Optimization of production/fermentation processes,*
- *Study of nutritional effects of food additives,*
- *Analysis of effects of cosmetics on the skin,*
- *Optimization of protein containing products*
- *Protein marker discovery*
- *Mode-of-action studies of drugs,*
- *Toxicology studies*

Explaining the differences

Why should you perform a differential protein display together with Protagen

Key Features	Customer Benefits
Deep insight into your product quality	► Competitive advantage ► Opportunity for product/quality improvement ► Reliable scientific substantiation for marketing claims
High quality maintained by a Quality Management System	► Reliable and reproducible data ► Credible and valuable data for further product development and marketing
Access to high end technologies from the leading protein analysis service provider	► Cost and time savings ► Proven analytical solutions
Intellectual property rights fully owned by customer	► Also serviceable for proprietary and confidential analysis ► Free utilization and commercialization of all results
Processing in clearly defined steps	► High degree of transparency ► Cost efficient
Final customer report with all results	► Clear and concise reporting with all key findings ► Ready-to-use for publication purposes

we move ideas

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Analytics | Protein Biochips | Bio-IT

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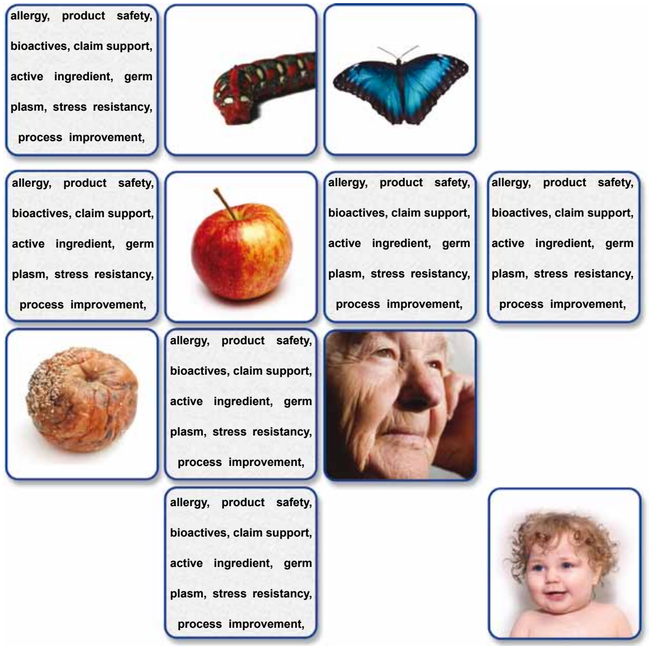
PROT@GEN®

Differential Protein Display

Getting competitive advantage for your products by modern protein analysis



Comprehensive

Proteins are important for every aspect of our life

Proteins fulfill all functions in life. Our skin and our hair are made of proteins. Our muscle proteins allow us to move and our brain proteins build the most sophisticated computer known to man. Special proteins, like enzymes are digesting our foods and receptors proteins connect us to the environment.

Proteins are important in each and every organism and they are also relevant in our daily life from another perspective. Products like food, cosmetics, adhesives and drugs contain and/or interact with proteins.

To fully understand proteins and the production of protein based as well as protein interacting products, the exploitation of protein patterns is crucial. This is especially true for the life sciences industries, e.g. agriculture, food and nutrition, cosmetics, specialty chemistry, biotechnology and pharma, to develop better and safer products and processes.

Differential Protein Display

Protagen offers its differential protein display as a powerful full-service package. This enables our customers to gain deep insight into protein patterns and to use these results to build up a competitive advantage for their products. The differential protein display can detect differences between e.g. product batch A and batch B, ingredients of supplier A and supplier B or differences between young and old or with and without your product.

In principal, differential protein display can be applied to almost any issue that involves proteins such as physiological, pathological, development, aging, toxicological processes and product characterization.

High quality

Differential Protein Display

Four steps to get results

1. Sample preparation

- *Close collaboration with customer for sample preparation*
- *Assure sample compatibility with analysis workflow*
- *Guarantee reproducibility*

The sample preparation is a critical step right at the beginning of the differential protein display, as it assures the compatibility of the samples with the subsequent analysis workflow.

Before commencing the full study, we verify the reproducibility of the entire analysis workflow using two of the samples. The full differential protein display analysis will be conducted only, if the results are of sufficient quality. We can advice our customers on the best practice due to the high expertise and long experience in differential protein display analyses at Protagen.

2. Differential display analysis

- *Separate and visualize thousands of proteins with highest resolution for each sample*
- *Ensure statistical significance and biological relevance*
- *Expert review and manual verification of all results*

Our long experience in differential protein display has led to a study design that combines statistical significance with biological relevance and cost efficiency. In order to obtain significant results, we use several biological replicates. We also perform replicate high-resolution 2-dimensional gel electrophoresis for each sample for the most accurate results.

The use of software-based image analysis together with expert-review and manual validation of all results gives reliable quantitative data for revealing differential proteins.

3. Protein identification

- *Application of advanced mass spectrometry techniques*
- *Utilization of sophisticated proprietary algorithms and databases*
- *Identification of differential proteins*

For protein identification we use optimized protocols, state-of-the-art mass spectrometry techniques, and high-end instrumentation. In combination with sophisticated proprietary algorithms for data analysis, this gives our customers access to cutting edge technology status.

4. Preparation of results & report

- *Summary of all results and conclusions*
- *Clear and understandable customer report*
- *All intellectual property rights fully owned by customer*

All results and conclusions as well as applied methods and materials will be summarized in a detailed customer report. Relevant information is compiled and illustrated in a comprehensible way and can be used for publication or other marketing purposes like e.g. claim substantiation. All intellectual property rights remain the exclusive property of our customers.

Long experience and a proven study design ensure:

- *A high degree of transparency*
- *Close communication during the whole project process*
- *High quality results and reliable data*

Full-Service

Our „Differential Protein Display“

… a proven full-service package for customers in all fields of life science

Customer provides

- 3 biological replicates (= samples) of 2 different states

  => Total: 6 samples

We perform and deliver

1.) High-resolution 2-dimensional gel electrophoresis

- Optimized preparation of samples
- 12 high-resolution 2D-gels (20x30cm)
- Quality check on all protein separations

2.) Identification of differences in differential protein displays

- Image analysis of all 12 protein displays
- Statistical analysis (66 comparisons, multi-step averaging)
- Localisation of statistically significant differences
- Expert review of the results

3.) Protein identification

- Optimized protein separation for protein identification
- Analysis of 10 differential spots included (more on request)
- High-sensitivity protein identification by mass spectrometry
- Advanced bioinformatics and expert analysis

4.) Final report

- Preparation of a detailed report with methods, results and conclusions
- Relevant information compiled and illustrated in a comprehensible way

How to order

Product/Service	Cat. No.	Description
Differential Protein Display	1103-1000	Full-service study, includes analysis of 6 customer samples, 12 high-resolutions gels and identification of 10 proteins

Please contact our sales representatives for further information or inquiries or visit our website at **www.protagen.de**