Creative Proteomics

Olink Proteomics White Paper

NEXT-GENERATION TARGETED PROTEOMICS WITH OLINK® TECHNOLOGY

From Biomarker Discovery to Translational Research

For Research Use Only

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EXECUTIVE SUMMARY

Creative Proteomics' Olink Proteomics platform, powered by Proximity Extension Assay (PEA) technology, delivers ultra-sensitive, multiplex protein profiling for life science and translational research. With just 1–6 µL of sample, you can measure over 3,000 proteins across a broad dynamic range, detecting low-abundance targets at fg/mL levels.

Integrated with genomics, transcriptomics, metabolomics, and microbiome profiling, Olink enables end-to-end insights from discovery to validation.

Key Advantages:

Ultra-sensitive
Detect rare, low-abundance proteins for early biomarker discovery.

High-throughput
Analyze 48 to 3,072 proteins per run.

Broad sample compatibility
Serum, plasma, CSF, tissue lysates, exosomes, and more.

Seamless multi-omics integration
Link proteomics with other omics layers for systems-level understanding.

INTRODUCTION:

THE EVOLVING LANDSCAPE OF PROTEOMICS

Over the past decade, proteomics has shifted from low-throughput immunoassays toward scalable, multiplexed platforms.

This transformation has been driven by:

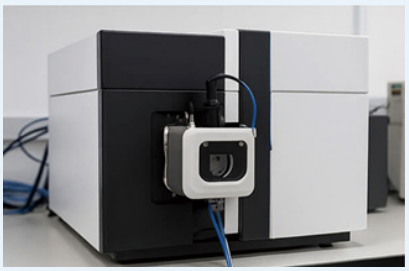
- The growing need for multi-biomarker signatures in complex diseases.
- Advances in high-specificity immunoassay chemistry coupled with powerful digital readouts.
- Increasing demand for cross-study comparability in multi-center and longitudinal research.

Traditional protein assays often require trade-offs between sensitivity, throughput, and sample volume. Olink's PEA technology removes these constraints, enabling high-multiplex, ultra-sensitive, low-volume protein profiling for research applications across immunology, oncology, cardiometabolism, neurology, and beyond.

ABOUT CREATIVE PROTEOMICS

Creative Proteomics is a global CRO delivering comprehensive omics solutions for academic, biotech, and pharmaceutical clients. Our expertise spans proteomics, genomics, transcriptomics, metabolomics , lipidomics, and microbiome analysis, supported by state-of-the-art infrastructure and a multidisciplinary scientific team. We provide end-to-end project support: study design, sample handling, high-throughput data generation, advanced bioinformatics, and integrated interpretation. Our Olink proteomics services are designed for both targeted validation and large-scale biomarker discovery, with the added power of cross-platform multi-omics integration.






OLINK® TECHNOLOGY OVERVIEW

Olink's Proximity Extension Assay (PEA) technology delivers unmatched specificity and sensitivity in protein biomarker detection.

Proximity Extension Assay (PEA) Principle

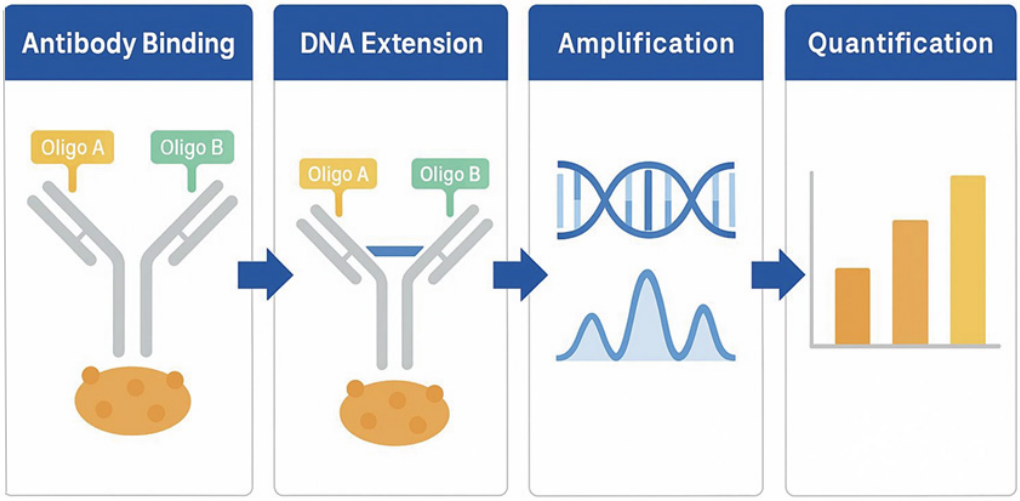
- Dual antibodies bind the same protein target.
- Each antibody is linked to a unique DNA oligonucleotide.
- When both antibodies are in proximity, the oligos hybridize and are extended by DNA polymerase.
- The resulting DNA "barcode" is amplified and quantified by qPCR or NGS. This dual-binding requirement eliminates off-target noise, ensuring high specificity.

NPX Data Format

- NPX (Normalized Protein eXpression)provides relative quantification on a log2 scale.
- Enables direct comparison between studies, panels,and batches.
- Supports bridging strategies for longitudinal and multi-site studie

SampleRequirements & Compatibility

- As little as 1–3 µL per assay.
- Compatible with plasma, serum, CSF, urine, cell culture supernatants, and more. - Minimal freeze–thaw tolerance for maximum protein stability.



OLINK® PLATFORM PORTFOLIO – MATCHING EVERY RESEARCH SCALE

1

Olink Target 48 – Focused Hypothesis Testing

- 45–48 proteins per panel.
- Ideal for pilot studies, targeted hypothesis validation, and candidate biomarker confirmation.
- Cost- effective, low-sample requirement, quick turnaround.

2

5.2 Olink Target 96 – Mid-Throughput Discovery

- 92 proteins per panel,15 themed panels covering immune response, oncology, cardiometabolism, neurology, and organ injury.
- Validated for human and mouse samples. - High sensitivity with robust intra/inter-plate reproducibility (<10% CV).

3

Olink Flex – Fully Customizable Panels

- Select 15–30 proteins from a library of 200+ validated biomarkers.
- Supports human, mouse, and rat studies.
- Perfect for focused translational research requiring tailored biomarker panels.

4

Olink Explore 384 – High-Multiplex Profiling

- 384 proteins per panel, organized by disease/pathway theme.
- Suitable for systems biology and pathway-focused discovery.
- Can be combined for expanded coverage (Explore 1536).

5

Olink Explore 3072 – Ultra-High Multiplex Discovery

- Combines eight Explore 384 panels for >3,000 proteinsin a single workflow.
- Ideal for large cohort studies, cross-pathway analyses, and multi-omic integration.

6

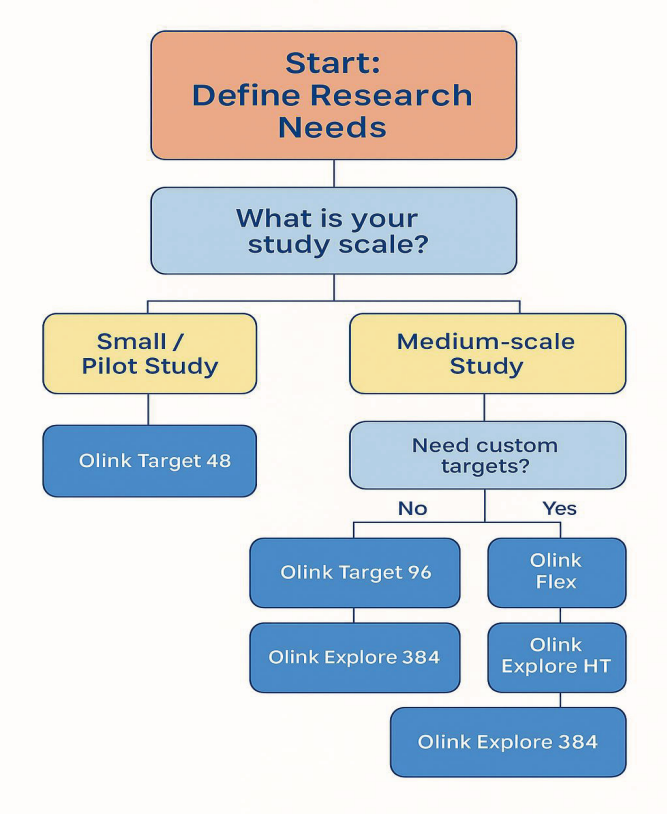
Olink Explore HT – Next-Generation High-Throughput

- Optimized for mega-cohort andepidemiology studies.
- Increased throughput with cost efficiency and scalability for population-scale research.

OLINK PLATFORM COMPARISON

Platform	Proteins per Panel	Sample Volume	Throughput	Technology	Typical Applications
Olink Target 48	48	1 - 3 μL / protein	Low - Medium	PEA + qPCR	Hypothesis - driven studies, pilot validation
Olink Target 96	92	1 - 3 μL / protein	Medium	PEA + qPCR	Disease mechanism, biomarker discovery
Olink Flex	15-30(Custom)	1 - 3 μL / protein	Custom	PEA + qPCR	Custom panels, cross - species research
Olink Explore 384	384	1 - 3 μL / protein	High	PEA + NGS	Large - scale protein profiling, systems biology
Olink Explore 3072	3072	1 - 3 μL / protein	Ultra-High	PEA + NGS	Cohort studies, cross - pathway integration
Olink Explore HT	Thousand+	1 - 3 μL / protein	Ultra-High (Optimized)	PEA + NGS	Mega - cohorts, epidemiology, precision medicine

DECISION FLOW FOR SELECTING THE RIGHT OLINK PROTEOMICS PANEL



MULTI-OMICS INTEGRATION WITH OLINK PROTEOMICS

At Creative Proteomics, we go beyond standalone proteomics. We integrate Olink® proteomics data with other omics layers to deliver deeper biological insights:

Olink + Metabolomics

Map metabolite–protein pathways.

Olink + Microbiome

Study host–microbe interactions in disease and health.

Olink + Single-cell Transcriptomics

Co-profile intracellular proteins and RNA in single cells.

Olink + Mass Spectrometry Proteomics

Cross-validate and expand proteome coverage.

APPLICATIONS

Therapeutic Development
Target identification, drug response prediction, safety profiling.

Disease Research
Cardiovascular, metabolic, oncology, neurology, immune, inflammatory studies.

Population & Cohort Studies
High-throughput profiling for epidemiology and clinical translation.

Emerging Areas
Aging biomarkers, liquid biopsy, immune monitoring.

INSTRUMENTATION & INFRASTRUCTURE

Creative Proteomics operates a full suite of advanced platforms to deliver high- quality Olink Proteomics and integrated multi-omics data. Our facilities support qPCR- and NGS-based protein detection, large-scale sequencing, targeted/ untargeted metabolomics, and advanced bioinformatics.

Olink Signature Q100

Fluidigm BioMark HD

Illumina NovaSeq 6000

Illumina NextSeq 2000

WORKFLOW

Our Olink proteomics workflow is optimized to ensure high-quality, reproducible results for every study.

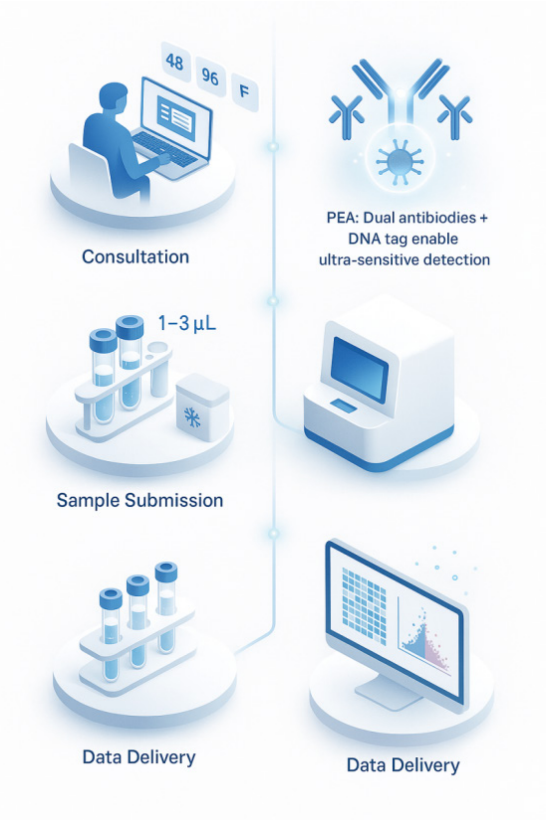
Sample Receipt & Verification
Volume, matrix, and labeling checks.

Assay Execution
qPCR or NGS readout depending on platform.

Quality Controls
Incubation, extension, and detection controlsplus external references.

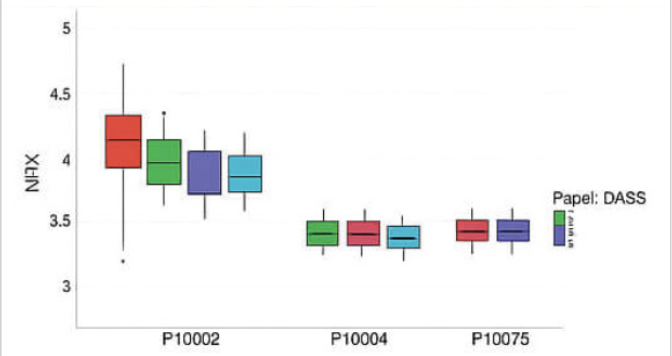
Data Processing
NPX Manager normalization, QC flagging, and statisticalsummaries.

Reporting
Volcano plots, heatmaps, scatter plots for quick biological interpretation.

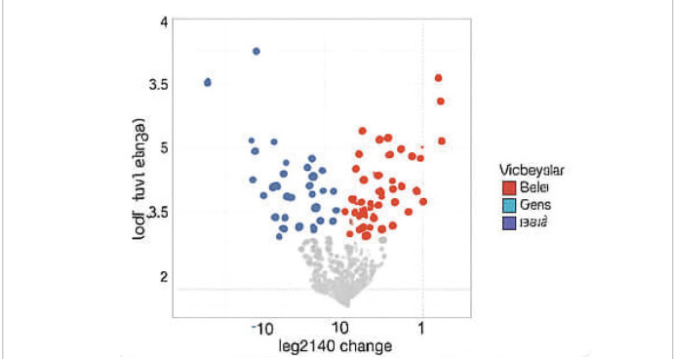


EXAMPLE DATA VISUALIZATIONS

Expression Boxplot



Volcono Plot



Core Deliverables:
NPX value tables QC reports
Heatmaps, volcano plots, PCA scatter plots

Extended Bioinformatics:
Differential protein functional enrichment
Pathway mapping and network analysis
Machine learning–based predictive modeling

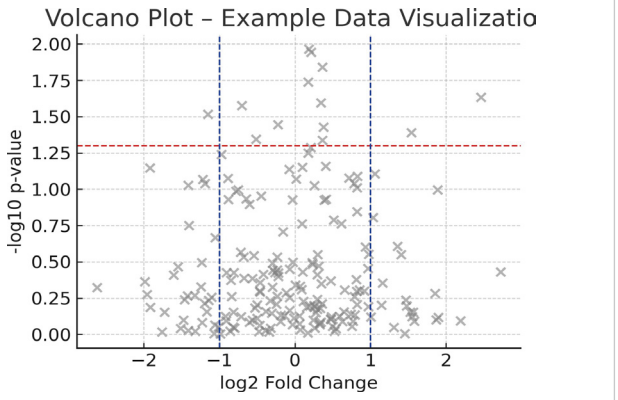


Figure 1. Volcano Plot – Example Data Visualization

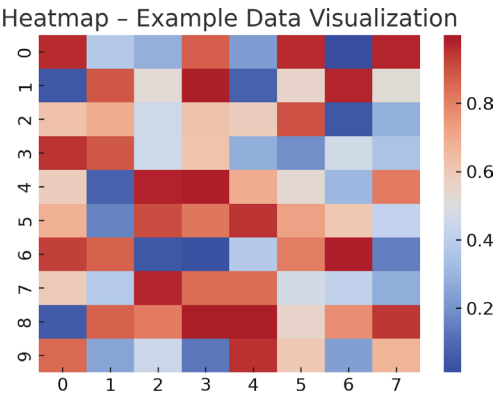


Figure 2. Heatmap – Example Data Visualization

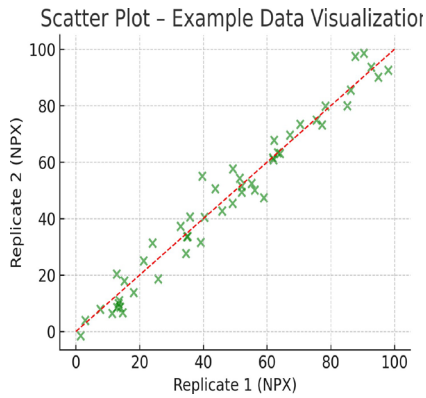


Figure 3. Scatter Plot – Example Data Visualization

SAMPLE TYPES & REQUIREMENTS

Sample Type	Volume Required	Notes	Storage
Serum	50 µL	Avoid hemolysis	-80°C
Plasma	50 µL	EDTA or heparin	-80°C
CSF	50 µL	Sterile collection	-80°C
Cell supernatant	50–100 µL	Clarify by centrifugation	-20/-80°C
Urine	100 µL	Midstream, centrifuged	-80°C

Blood-based samples

Neurological samples

Tissue-derived materials

Cell culture
media and cell lysates

Other biofluids
urine, saliva, synovial fluid, icrodialysates, and tear fluid.

Tissue-derived materials

Special formats
dried blood spots and other minimally invasive collection methods.

WHY PARTNER WITH CREATIVE PROTEOMICS

Creative Proteomics combines advanced Olink® proteomics platforms with deep scientific expertise, making us the partner of choice for translational research.

Key Advantages:

- End-to-End Service –From panel design to data interpretation.
- Scientific Expertise – Decades of combined experience in Olink technology and proteomics research.
- Custom Bioinformatics – Pathway enrichment, multi-omic integration, predictive modeling.
- Fast Turnaround – Optimized lab workflows to meet project deadlines.
- Global Support – Collaborative projects with academia, biotech, pharma, and public healthinstitutions.

By working with Creative Proteomics, researchers gain a trusted partner dedicated to delivering high-quality, actionable insights that accelerate scientific progress.

OLINK PLATFORM COMPARISON

At Creative Proteomics, we streamline every step of Olink proteomics projects for clarity, speed, and quality - from first consultation to final delivery.

Initial Consultation

Discuss research goals, sample types, panel selection, and expected deliverables.

Project Proposal & Study Design

Customized plan with Olink panel selection and integration strategy.

Sample Submission & Logistics

Coordinate sample shipping, handling, guidelines, and timeline tracking

Laboratory Workflow

- Sample QC
- Olink Panel reaction setup, read - out via QPCR
- (Targeted) via Olink Explore)

Data Processing & Bioinformatics

- NPF calculation, normalization, QC
- Statistical and pathway analysis

Reporting & Delivery

- Technical report, technical report
- Raw and processed data
- Publication - ready figures

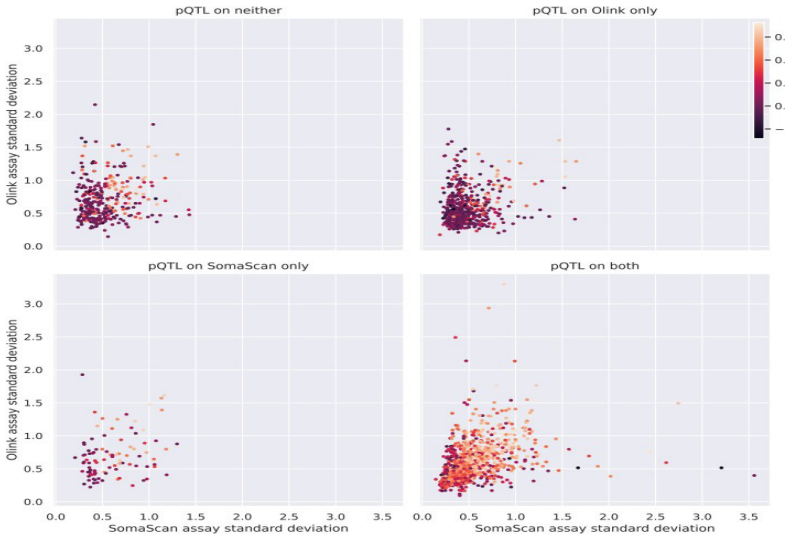
Post - Project Support

Follow - up consultation for interpretation, publication - ready figures

CASE STUDIES

Case Study 1
– Cardiovascular Disease Biomarker Discovery

Reference: Eldjarn GH, et al. *Large-scale plasma proteomics comparisons through genetics and disease associations. Nature.* 2023.



Overview:

A multi-center cohort study analyzed 13,900 heart- failure-free individuals using **Olink Explore 3072**, covering 2,926 proteins.
Integrating **genomic data (GWAS)** identified protein quantitative trait loci (pQTLs) and revealed 37 proteins significantly associated with future heart failure risk.

Key Findings:

Identified causal links between certain proteins (e.g., SPON1, MFAP4) and heart failure. pQTL integration provided mechanistic insight and validated protein–gene relationships.
Data supports development of novel therapeutic targets for cardiovascular disease.

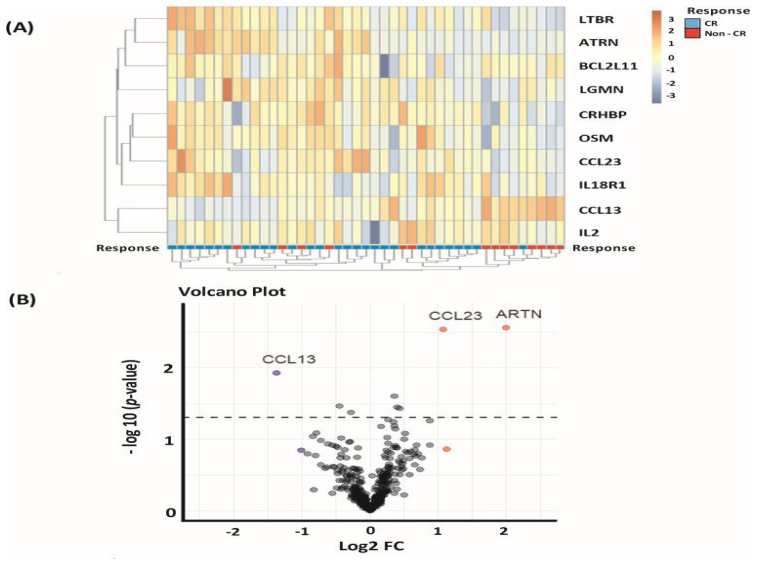
Multi-Omics Impact:

Combining Olink proteomics with genomics allowed causal inference and cross-validation, improving biomarker reliability and translational potential.

CASE STUDIES

Case Study 2
– Immuno-Oncology Drug Response Prediction

Reference: Wu TS, et al. *ARTN and CCL23 predicted chemosensitivity in acute myeloid leukemia: an Olink® proteomics approach. Clin Proteom.* 2025.



Overview:

Using the **Olink Target 96 Immune Response Panel**, researchers profiled immune-related proteins in leukemia patient plasma, combining the data with **RNA-seq transcriptomics** to predict chemotherapy response.

Key Findings:

- ARTN and CCL23 proteins were predictive of chemosensitivity.
- Transcriptomics supported protein-level findings and revealed upstream gene regulation.
- Potential to stratify patients for personalized treatment strategies.

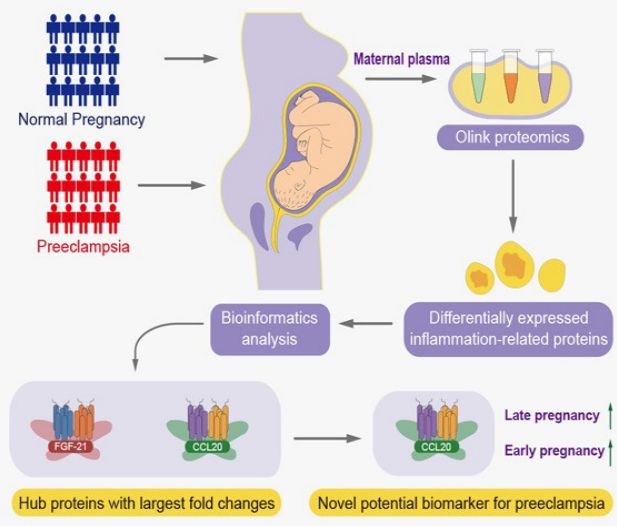
Multi-Omics Impact:

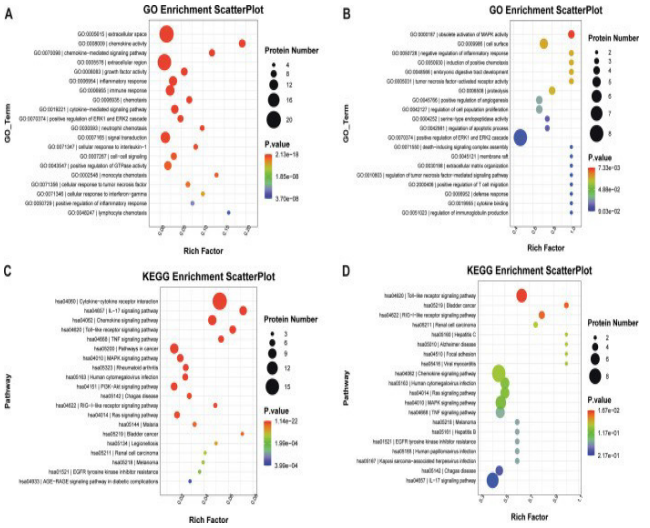
P roteomics–transcriptomics integration enabled more accurate predictive models for drug response, supporting precision oncology development.

CASE STUDIES

Case Study 3
– Inflammation Biomarkers in Pregnancy

Reference: *Plasma Olink proteomics identifies CCL20 as a novel predictive marker in preeclampsia* (Journal of Proteome Research, 2024)





Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) enrichment analysis of the differentially expressed inflammation-related proteins.

Overview:

In an assessment of maternal plasma, researchers used Olink to measure 92 inflammation-related proteins in preeclamptic and healthy pregnancies. They found **28 proteins significantly dysregulated**, highlighting **CCL20** as a novel inflammation biomarker.

Key Impact:

Olink's sensitive multiplex panels enabled early identification of predictive markers in a challenging clinical context (preeclampsia), with minimal sample volume requirements.

FUTURE DIRECTIONS IN OLINK-BASED PROTEOMICS

The future of proteomics will be shaped by the integration of cutting-edge technologies, expanded applications, and enhanced data analytics capabilities.

Key Trends

- **Multi-omic Integration:** Combiningproteomics with genomics, transcriptomics, metabolomics, and microbiomics for comprehensive biological insights.
- **AI-Driven Biomarker Discovery:** Leveraging machine learning to identify predictiveprotein signatures for disease and therapeutic response.
- **Digital Health Integration:** Connecting proteomics data to wearable sensors and patient monitoring platforms for real-time health tracking.
- **Expanded Clinical Research Applications:** Extending proteomic studies into larger, more diverse patientpopulations.

By staying at the forefront of these advancements, Creative Proteomics ensures that our Olink-based services continue to provide transformative value to the research community.

CONCLUSION

Olink's PEA-powered proteomics platforms offer unmatched flexibility, sensitivity, and scalability for biomarker research across multiple disciplines. Creative Proteomics ensures that researchers can harness the full potential of these technologies—whether validating a single hypothesis or profiling thousands of proteins in large-scale population studies.

By integrating advanced laboratory workflows, robust quality control, and expert bioinformatics, we deliver insights that accelerate discovery and enable meaningful translational outcomes. Our commitment to innovation and collaboration ensures that we remain a trusted partner for scientists worldwide.

Together, we can drive the next generation ofproteomics-enabled research, pushing the boundaries of what is possible in biomarker discovery and precision medicine.

APPENDIX A – OLINK TARGET 48 PANELS

Panel Name	Brief Description
Target 48 Inflammation Panel	48 core inflammatory mediators for targeted studies
Target 48 Oncology Panel	Key tumor biology markers for hypothesis-driven research
Target 48 Cardiometabolic Panel	Essential cardiovascular and metabolic biomarkers
Target 48 Neurology Panel	Selected CNS and neurodegenerative disease proteins
Target 48 Custom Panel	Tailored 45–48 proteins to match specific research aims

APPENDIX B – OLINK TARGET 96 PANELS

Panel Name	Brief Description
Immune Response Panel	Profiles immune activation pathways
Inflammatory Panel	Targets cytokines and inflammation mediators
Immuno-Oncology Panel	Links immune function to tumor biology
Oncology II Panel	Core biomarkers for solid tumor studies
Oncology III Panel	Expanded oncology protein coverage
Cell Regulation Panel	Markers involved in cell cycle and apoptosis
Cardiometabolic Panel	Connects metabolic and cardiovascular health
Cardiovascular II Panel	Proteins relevant to heart disease research
Cardiovascular III Panel	Advanced cardiac biomarker insights
Metabolism Panel	Targets metabolic signaling pathways
Neurology Panel	Biomarkers for neurodegeneration and CNS studies
Neuro Exploratory Panel	Discovery panel for novel neuro proteins
Organ Damage Panel	Proteins indicating tissue and organ injury
Development Panel	Exploratory panel for emerging research needs
Mouse Exploratory Panel	Preclinical mouse-specific protein panel

APPENDIX C – OLINK FLEX TEMPLATE PANELS

Template Panel	Brief Description
UKB Type 2 Diabetes Panel	Biomarkers tied to metabolic pathways and diabetic risk
Inflammation Panel	Broad coverage of core inflammation mediators
Pro-inflammatory Response Panel	Cytokines and chemokines driving immune activation
Inflammation in Aging Panel	Markers of immunosenescence and chronic inflammation
Th1/Th2/Th17 Panel	Insights into helper T-cell differentiation and signalling
Cytokine Storm Panel	Proteins involved in severe systemic inflammation
IFN Stimulation Panel	Interferon signalling and antiviral response markers
Immuno-Oncology Panel	Immune checkpoint and tumour microenvironment profiling

APPENDIX D – OLINK EXPLORE 384 PANELS

Explore 384 Panel	Brief Description
Cardiometabolic Panel	Biomarkers for cardiovascular and metabolic health (lipids, hormon
Cardiometabolic II Panel	Expanded panel for advanced cardiometabolic pathways and novel
Inflammation Panel	Covers cytokines and chemokines for inflammatory response resea
Inflammation II Panel	Adds deeper coverage of immune mediators and inflammatory regu
Neurology Panel	Focused on CNS biomarkers and neurodegenerative disease prote
Neurology II Panel	Expands on neuroinflammation and synaptic signalling proteins
Oncology Panel	Tumor biology, cell cycle, and cancer-related protein pathways
Oncology II Panel	Broader cancer biomarker coverage and regulatory proteins

APPENDIX E – OLINK EXPLORE 3072/1536 COMBINATIONS

Panel Combination	Brief Description
Explore 3072 (8×384 panels)	Full coverage of >3,000 proteins across all major pathways
Explore 1536 (4×384 panels)	Mid-scale profiling of 1,536 proteins for targeted large studies

CONTACT US

Creative Proteomics