

Integrated Proteomic and Phosphoproteomic Systems Analysis

Functional Molecular State. Measured Directly.

Proteas Health delivers development-grade, unbiased proteomic and phosphoproteomic analysis in primary human cells and tissues to define systems-level functional molecular state. Using quantitative multiplexed high-resolution mass spectrometry and advanced computational modeling, the platform directly quantifies global protein abundance and phosphorylation-driven signaling within a unified workflow.

Unconstrained by predefined affinity panels or transcript-level inference, this infrastructure enables mechanistic resolution of pathway activation and coordinated signaling architecture in physiologically relevant human systems.

Analytical Capabilities

- Discovery-scale proteome coverage without predefined analyte constraints
- Parallel quantification of protein abundance and phosphorylation state
- Multiplex isobaric labeling enables simultaneous analysis of up to 32 samples per run, minimizing inter-run variability and increasing statistical confidence
- Enhanced quantitative sensitivity supports detection of subtle protein and phosphoprotein abundance shifts (~20%) across biological conditions

Key Performance Metrics

Quantitative Depth

- 9,000 proteins
- 15,000 phosphopeptides

Integrated Systems Analytics & Drug Discovery Modeling

Proteomic and phosphoproteomic outputs are integrated with advanced network-level computational analysis to enable mechanistic interpretation and therapeutic hypothesis generation.

- KEGG pathway and gene ontology enrichment analysis
- Transcription factor enrichment analysis (TFEA)
- Kinase enrichment analysis (KEA) and integrated TFEA-KEA modeling
- Direct protein-protein interaction (PPI) network mapping
- Integration with >16,000 small-molecule-induced gene expression signatures (L1000FWD)

Differential protein signatures are computationally mapped against large-scale drug-response libraries to identify pathway-modulating therapeutic candidates and mechanistically informed intervention strategies.

Translational Applications

- Mechanistic target discovery beyond transcript-level screening
- Drug mechanism-of-action characterization
- Target engagement assessment in physiologically relevant systems
- Structured progression toward assay development or therapeutic prioritization