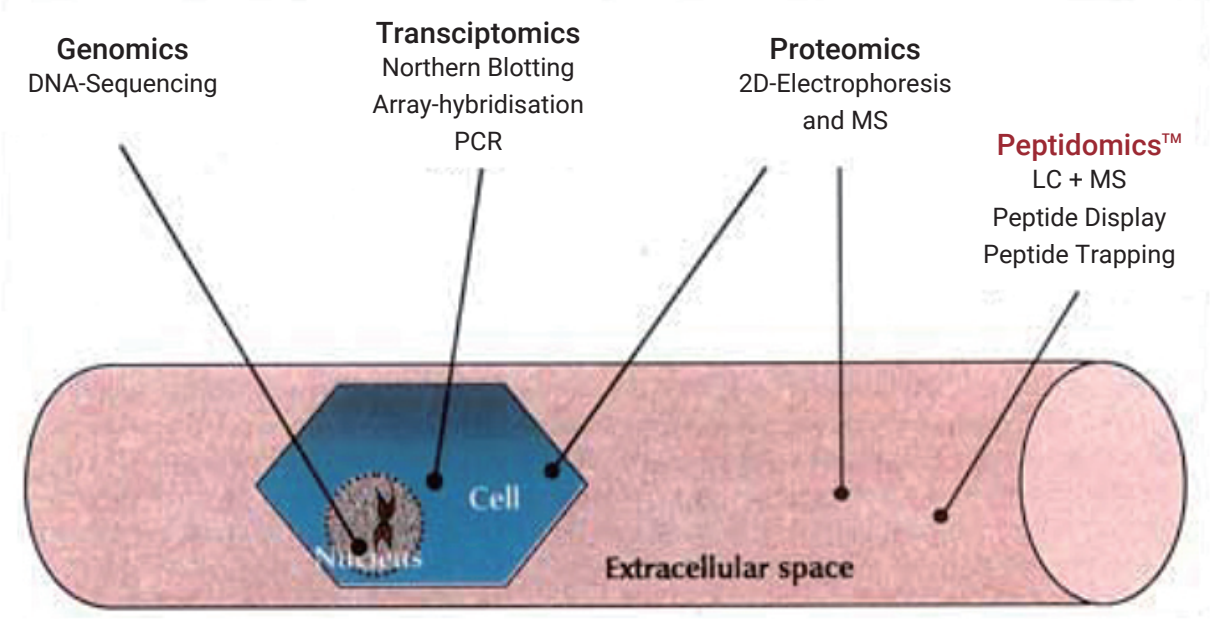
Peptidomics Service Overview

Service Description

Bioactive polypeptides are polypeptides with multiple biological functions, including signal molecules (such as cytokines), antimicrobial peptides and other small protein fragments, as well as peptides with undetermined functions or from disease-specific enzyme digestion.

Peptidomics is an emerging field filling the research gap between proteomics and metabolomics and can be defined as the comprehensive qualitative and quantitative analysis of all endogenous peptides from biological samples at a specific time and location.

Peptidomics analysis employs many proteomics techniques but with a different target. Rather than examining intact proteins in a sample, peptidomics detects endogenous protein fragments. The research object of peptidomics are the short peptides (with molecular weight less than 10 kDa) secreted extracellularly after processing of a precursor protein inside the cell, or the wide range of polypeptides produced by the further hydrolysis of extracellular macromolecular proteins.



Different strategies are currently used to gain insight into the complex biology of organisms
Schulz-Knappe P, et al., Peptidomics: The Comprehensive Analysis of Peptides in Complex Biological Mixtures, (2001)

Endogenous peptides in vivo exist in various body fluids. These low molecular weight peptides record a series of enzyme-catalyzed reactions in and out of the cell in the microenvironment of tumor tissue and reflect the related molecular mechanisms, which can be used as a rich resource for tumor specific diagnosis.

BGI has extensive experience in the field of peptidomics spanning disease biomarker study, off target effects of drugs, food processing and fermentation research, the molecular mechanisms of animals and plants, and cell antigen epitopes prediction.

Research Applications

- Disease biomarkers research
- Study of off target effects of peptide drugs
- Study of the molecular mechanisms of animals and plants
- Food processing and fermentation research
- Cell antigen epitopes prediction

Peptidomics Analysis Workflow

Biological samples → Enrichment of endogenous polypeptides → LC-MS/MS analysis → Data analysis

Peptidomics Service Advantages

Non-Destructive Sample Preparation	Highly Efficient Enrichment	High Throughput Analysis
This approach avoids enzyme denaturation and preserves the original integrity of endogenous peptides.	More than 99% of the proteins are removed in the sample treatment.	Based on high precision mass spectrometer, high throughput global analysis of polypeptides is realized.

Bioinformatics Analysis Standard Workflow

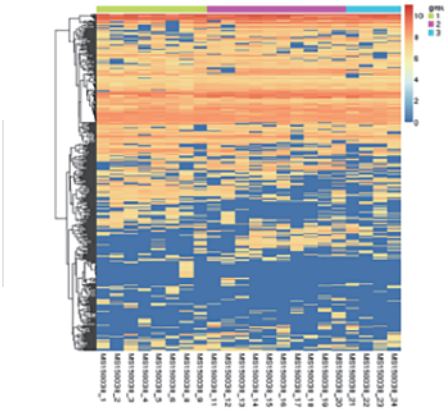
Standard:

01	Identification of peptides and proteins	02	Peptide quantification	03	Protein GO annotation
04	Protein COG annotation	05	Protein pathway annotation		

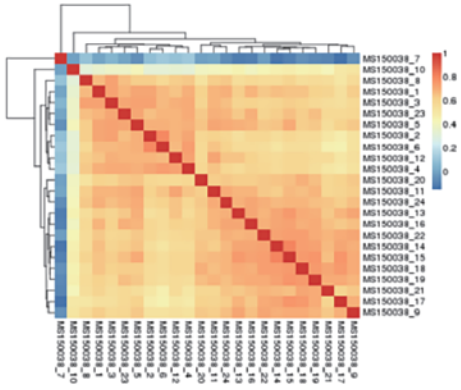
Customized:

Identified peptide matching analysis of specific protein

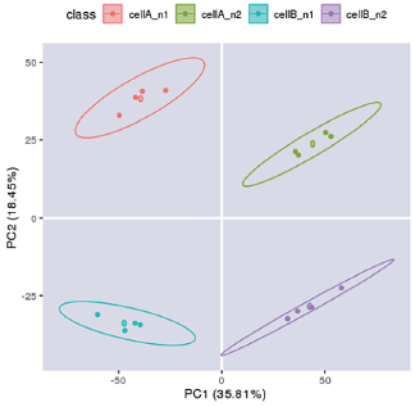
Examples of Peptide Quantification Analysis



Clustering Distribution

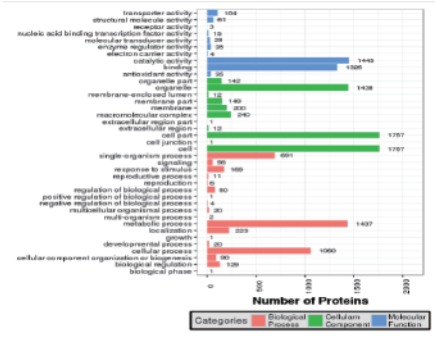


Quantitative Correlation

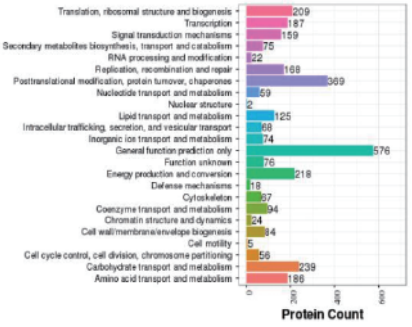


PCA Analysis

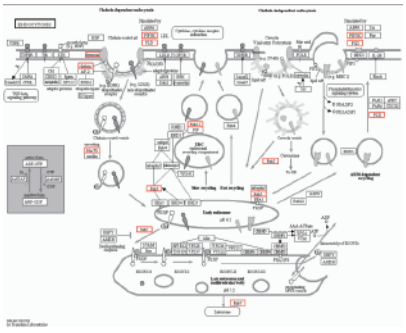
Examples of Protein Function Annotation



Protein GO Annotation



Protein COG Annotation



Protein Pathway Annotation

General Sample Requirements

SAMPLE TYPE		AMOUNT	COMMENT
Body fluids	Serum/Plasma	200 μL	100 μL/one experiment
	Saliva	5 mL	2 mL/one experiment
	Urine	50 mL	20 mL/one experiment
Enriched polypeptides		2 μg	For complex polypeptide samples, the sample amount of molecular weight less than 10kDa is > 2 μg (refer to A280 detection value), and the purity is > 90%. And it does not contain special and hard-to-remove substances, such as SDS, Triton x, chaps, etc

Turn Around Time

4-5 weeks for identification project and 5-6 weeks for quantification project.

To Learn More

To learn how your research can benefit from BGI's extensive experience in Peptidomics, visit www.bgi.com, write to us via info@bgi.com or contact your local BGI office.

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We Sequence, You Discover