# A holistic view of biology, with multiomics

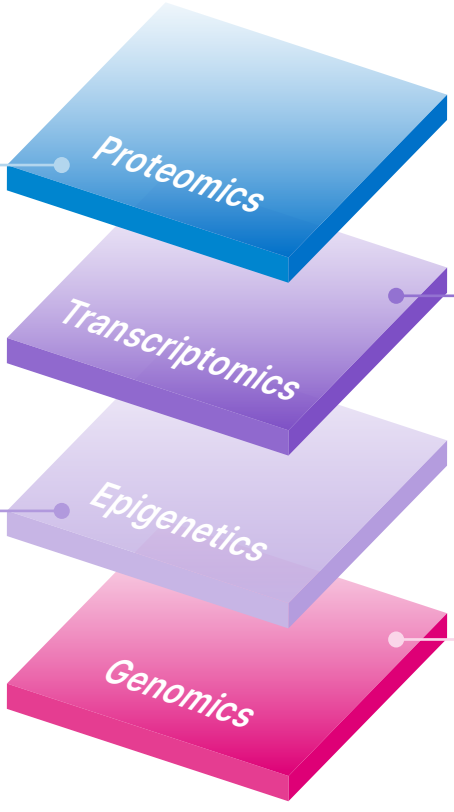
Multiomics is a rapidly emerging approach that incorporates multiple methods and data sets for an integrated understanding of your samples. Enabled by cutting-edge sequencing and array technology, multiomic methods revolutionize research and push the limits of novel scientific insights to make new discoveries possible.

**66%**

**of life science research incorporates multiomics[1]**

## What is multiomics?

A multidisciplinary approach that combines two or more "-omics" for a multidimensional view of human biology with limitless applications.




Quantifies protein expression to understand cellular phonotype and function. **Mass spectrometry, mass cytometry, NGS-based protein detection (CITE-Seq, PEA, Ab-Seq)**

The study of the transcriptome, the complete set of RNA transcripts that are produced by the genome, and how they are altered during the process of transcription and splicing. **mRNA-Seq, Total RNA-Seq (including non-coding RNAs), cfRNA**

The study of how cells control gene activity through processes like DNA methylation and histone modification. **Methylation arrays, WGBS, ATAC-Seq, CUT&Tag, ChIP-Seq, Hi-C**

Focuses on the structure, function, evolution, mapping, and editing of information coded within an organism's DNA (the genome). **WGS, WES, targeted, genotyping arrays**

# What are the benefits of multiomics?

Enhanced discovery power: Next-generation sequencing revolutionizes the types of discoveries possible.

**Multiomics publications have increased an average of**

**63%**

**each year since 2012[2]**

**Grants for multiomics research have increased by nearly**

**50%**

**on average each year[2]**

### A More Holistic View

Gain a comprehensive picture of biological systems with an integrated approach to research.

### Deeper Understanding

Single-cell multiomic sequencing offers a powerful way to investigate individual cells for discovery at high resolution.

### Maximizing Data

Make the most of precious research samples by extracting the maximum amount of data possible.

### Novel Drug Discovery

Discover new therapeutic targets that enable the development of precision medicine.

### A Customizable Approach

With expert advisors and a range of technologies, our multiomics offerings provide the versatility to pursue whichever "-omics" fit your needs.

"My advice is to dive right in. Multiomic workflows have become quite standard and just about anybody can do this type of work. The field is moving so quickly, if you wait for a time when it seems like it's mature, it will already have moved on to the next great thing."

**– Ben Humphreys, MD, PhD**

Chief of the Division of Nephrology, Washington University in St. Louis

# How can multiomics be applied?

By providing insights into how the genome functions under different conditions, multiomics unlocks important discoveries that can help scientists optimize time and research in multiple fields:

## Cellular Molecular Biology

Deeper analysis at the single-cell level through multiomics gives a more holistic picture of biology that can help reveal profound insights that inform more robust research.

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## Cancer Research

Multiomics is adding to our ability to identify novel drug targets, improve current therapies, and discover novel biomarkers.

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## Genetic Diseases Research

Multiomics provides biological context to disease-causing genetic variants, allowing for the discovery of novel pathways, biomarkers, and drug targets.[3]

**LEARN MORE**

# More to see. More to understand. More with multiomics.

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Illumina is here to help you learn more about multiomics and decide which approach best fits your research needs. Learn more at www.illumina.com/more-with-multiomics1.


1. Cell Biologist Market Research. Percepta Associates, Inc. Accessed 2021, www.perceptaassociates.com.
2. Digital Science. Dimensions [Software] available from app.dimensions.ai. Accessed May 21, 2021, under license agreement.
3. Crowther, LM, Poms, M, Plecko, B. Multiomics tools for the diagnosis and treatment of rare neurological disease. *Journal of Inherited Metabolic Disease*, 2018;4(3):425–434.