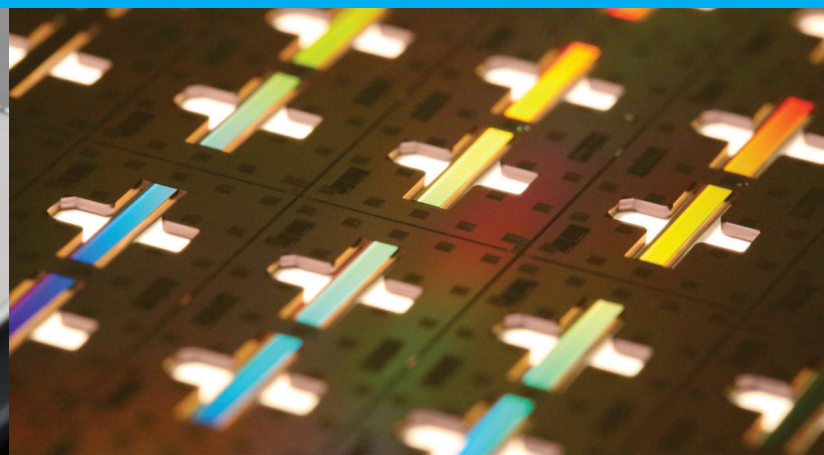


# The Irys® System



Next-Generation Mapping (NGM) using the Irys® System  
Add the Power of Physical Genome Maps Back to Your Research

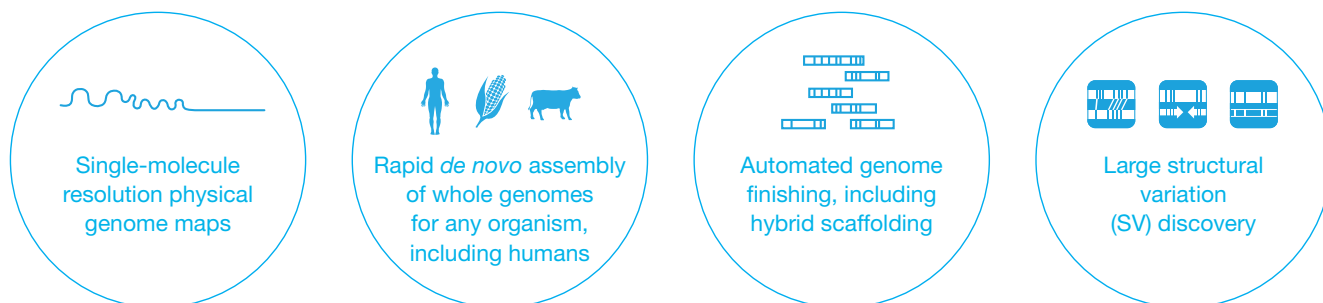


# Move Forward by Looking Back

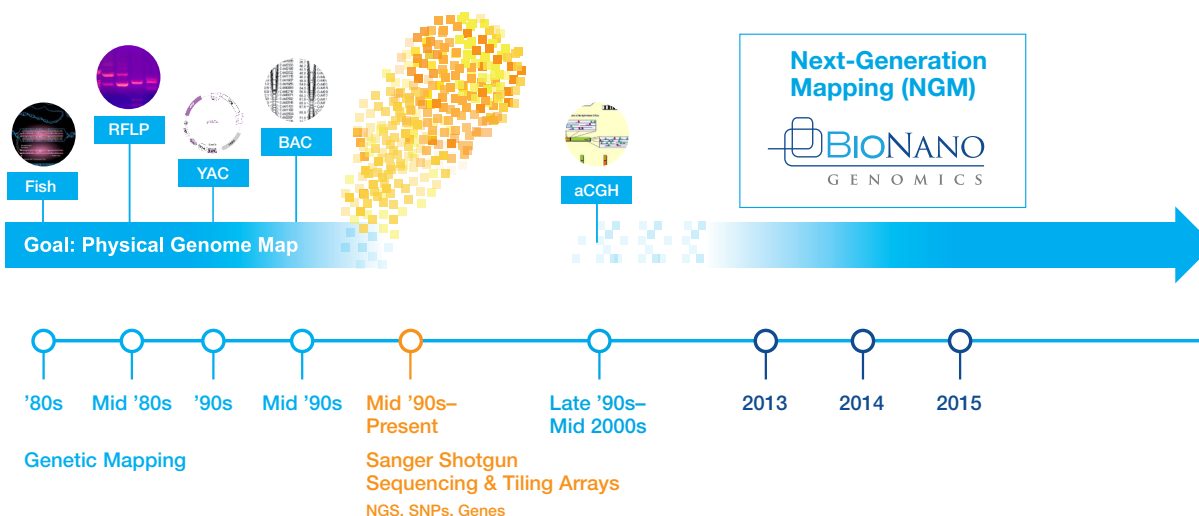
Early genomic research began with the pursuit of a physical genome map—a tool that allowed researchers to directly view the positions and associations of genomic events across large segments of a genome. The cost and time required to generate physical maps were prohibitive, and the industry evolved.

Next-generation sequencing (NGS) emerged as the *de facto* genetic research tool. While NGS has enabled significant discoveries, its short reads cannot effectively resolve the massive repetitive segments and structural variations in genomes, leaving large holes in the genetic puzzle.

**Next-generation mapping (NGM) using the Irys® System is the next great evolution in genomics, revealing the long-range information you need to accelerate your research.**



## The History of Physical Mapping



## Physical Mapping Then and Now

Gone are the days of waiting months and investing as much as it would cost to obtain a Ph.D. to generate a physical genome map. Irys® NGM provides whole-genome maps in just days and at the cost of a few textbooks.

|                | 🔍 Resolution | 📅 Time to Produce | 💰 Approx. Cost |
|----------------|--------------|-------------------|----------------|
| 2009           | 1 Mbp        | 6 Months          | \$100,000*     |
| 2015 Irys® NGM | 1 kb         | ~1 Week           | \$1,000        |

\*Lewin, H; et al. Every Genome Sequenced Needs a Good Map. *Genome Res.*, 19 (2009), 1925–1928. <http://www.genome.org/cgi/doi/10.1101/gr.094557.109>.

# Your Complete Next-Generation Mapping Solution

The Irys® System uses the patented NanoChannel Array located on the IrysChip® to linearize intact DNA for direct imaging and *de novo* assembly, providing the long-range genomic information required for high-resolution discovery of structural variations. Irys® NGM enables researchers to generate the highest-quality genome assemblies available on the market today.

## The Irys® System



### Irys® System Components



Irys® Instrument

- Fully automated cycling of DNA into chip and imaging
- Intuitive touchscreen interface
- Three laser lines for simultaneous labeling of multiple events



IrysPrep®

- Optimized labeling reagents for accurate genome maps
- Support for DNA extraction from a variety of sample sources
- Multiple label site options to support any organism



IrysChip®

- 50–100 GB/chip throughput
- ~26,000 parallel Nanochannels per chip
- Multi-sample option: two flowcells per chip



IrysView® Software

- Automatic *de novo* assembly and structural variation detection
- Easy exportation of data at any step
- Open and industry-standard file formats



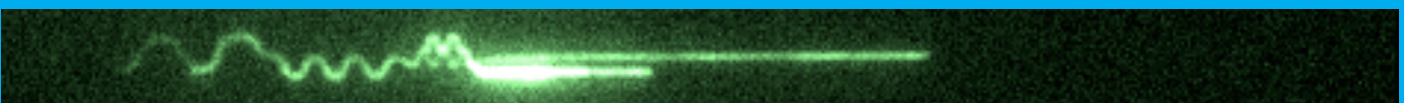
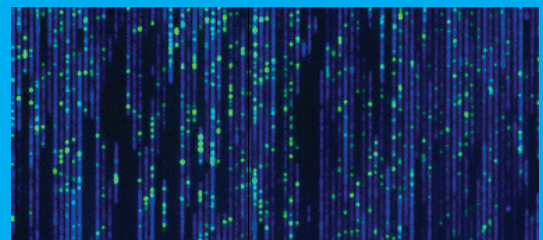
IrysSolve®  
Computational Solutions

- Integrated Irys® data analysis
- Graphical and command line interfaces
- Minimal prerequisites
- Multiple platform options

### Single-Molecule Resolution

The process of shotgun sequencing breaks up the DNA molecule, introducing bias and resulting in assemblies with errors and gaps.

Irys® NGM keeps the DNA intact. It is linearized and imaged in its native state, maintaining its structure for the most complete genome assemblies.

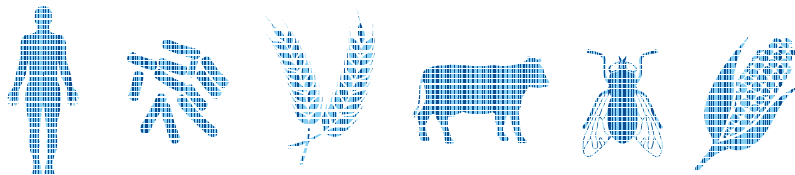


# Irys® Next-Generation Mapping (NGM) Applications

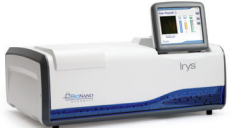
Irys® NGM offers researchers in all fields the most complete and comprehensive view of genomes. The utility of Irys® NGM is virtually unlimited, providing researchers with a new set of tools for discovery, including:



- Whole-genome *de novo* assembly
- Large structural variation discovery
- Hybrid scaffolding
- Gap sizing
- Haplotype phasing
- Assembly validation
- Quantification of repeats



## Ordering Information

| Product Description                                                                                                           | Catalog No. |
|-------------------------------------------------------------------------------------------------------------------------------|-------------|
|  <p>Irys® Instrument</p>                    | IN-011-01   |
|  <p>IrysPrep® Kit (10 reactions)</p>       | RE-011-10   |
|  <p>IrysPrep® DNA Stain (10 reactions)</p> | RE-111-10   |
|  <p>IrysChip®</p>                          | FC-020-01   |
|  <p>IrysSolve® with Xeon Phi Server</p>    | CR-001-01   |

For more information about the Irys® System and to get a quote, please visit [www.bionanogenomics.com](http://www.bionanogenomics.com).

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