SMRT SEQUENCING — HOW IT WORKS

PacBio® systems are powered by Single Molecule, Real-Time (SMRT®) sequencing, a technology proven to produce exceptionally long reads with high accuracy.

SMRT sequencing allows you to accelerate your science with the complete range of PacBio applications to produce data you can trust.

---

**SMRT SEQUENCING ADVANTAGES**

- Long reads
- Uniform coverage
- Epigenetics
- High accuracy
- Single-molecule resolution

---

**Accelerate your science**

- Improve human health
- Propel agricultural advancements
- Generate new biological insights

---

**SMRT sequencing enables the full spectrum of PacBio applications**

- Whole genome sequencing
- Variant detection
- Targeted sequencing
- RNA sequencing
- Complex populations
- Epigenetics

---

**Polymerase read**

- Long reads span large regions for improved assembly, variant detection, and haplotype phasing
- Nucleotide incorporation kinetics are measured in real time
- Uniform sequencing coverage through low-complexity regions with no amplification bias
- Calling consensus from subreads increases accuracy
- Highly accurate long read

---

**From viruses to vertebrates**

Isolate DNA or RNA

Ligate adapters

Generate SMRTbell® libraries

Primer + polymerase

Prepare sequencing reaction

Use PacBio Sequel® systems to sequence genomes, transcriptomes, and epigenomes

SMRT® Cells contain millions of zero-mode waveguides (ZMWs)

A single molecule of DNA is immobilized in each ZMW

Directly detect DNA modifications during sequencing

As anchored polymerases incorporate labeled bases, light is emitted

SMRTbell templates enable repeated sequencing of circular template with real-time detection of base incorporation

Subreads

Polymerase read

Highly accurate long read