

Pacbio Sequel

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Brand

Pacific Biosciences

Type

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Organisation

Plant Sciences Group

Department

Bioscience

Description

Nowadays the sequel is the most cost-effective and high-throughput access to Single Molecule Real Time (SMRT) sequencing. The Sequel System is ideal for projects such as rapidly and cost-effectively generating high-quality whole genome de novo assemblies. In addition the Sequel system is ideal for full length whole transcriptome analysis for alternative splice variant detection.

Technical Details

The new Sequel System is based on the Single Molecule Real-Time (SMRT) sequencing technology, successfully applied on the Pacbio RS-II system for many years. SMRT sequencing is built upon two key innovations that overcome major challenges in the field of sequencing. SMRT cells, containing 1 million ZMW wells, allow light to illuminate only at the bottom of hundreds of thousands of well, in which a single DNA polymerase/template complex is immobilized in parallel. Sequence reads are obtained by real time detection of phospho linked fluorescently labelled nucleotides as the DNA polymerase produces a completely natural DNA strand of each individual template molecule. This technique results in 300,000 to 500,000 reads per SMRT cell, with average read length > 10 Kb. SMRT sequencing is free of systematic errors, resulting in the highest consensus quality of any sequencing technology up to date.

Applications

- Construction of high-quality whole genome de novo assemblies of eukaryotic organisms
- Survey of genomic variation in complex populations on any size scale
- Full-length complete transcriptome analysis
- Detection of epigenetic modifications

