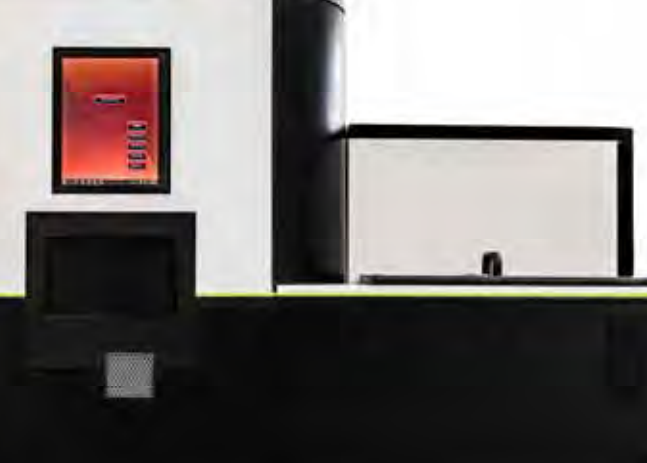
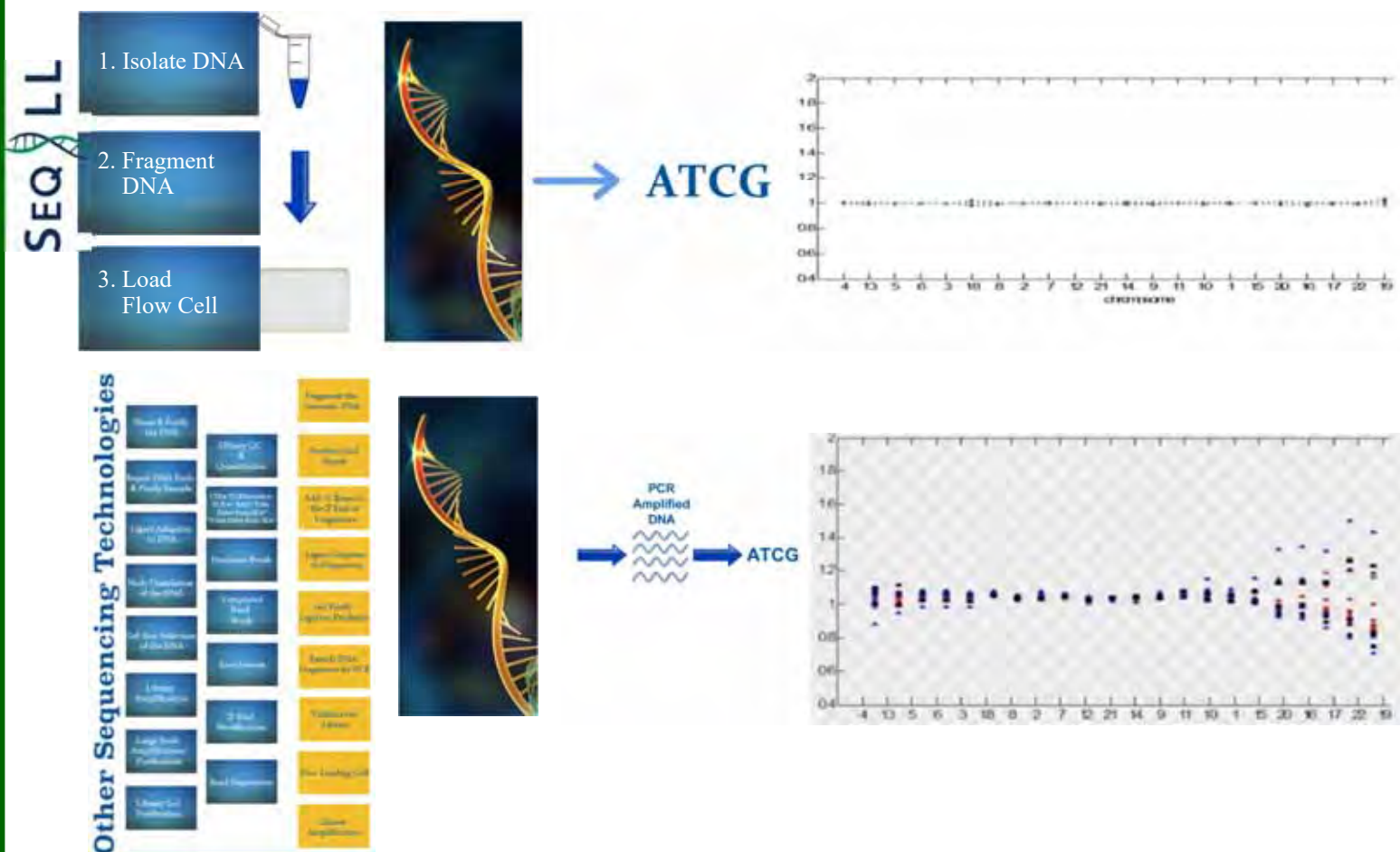




Unbiased Quantitative RNA & DNA Specialty Sequencing Solutions



Sample Preparation is minimal thus avoiding the bias and errors introduced by the complex multi step procedures typically required.



Sensitivity - tSMS offers an unparalleled level of sensitivity as single molecules are identified and synthesized without having to resort to bias based amplification. This translates in many applications to being able to obtain accurate information earlier and allow treatments or decisions to be made sooner.



Accuracy - True single molecule sequencing provides an accurate set of data and results as well as a broader range of molecules to be evaluated. Low expressing transcripts and certain constructs are typically masked due to preferences in any amplification process and may be missed or have their numbers minimized in the final data analysis.



Simplified Sample Prep - reduces the hands on and linear time required to carry out a dozen of steps utilizing multiple technologies. A truer picture is also obtain of the molecules being studied as each prep step has inherent losses and biases. Direct RNA synthesis DRS, Direct capture and RNA Seq protocols reduce sample prep to 1-3 steps.



Sample Accessibility - increases as tSMS technology can address a wider range of degraded and damaged molecules.



Rapid Protocol Development - extensive library preparation is not required using tSMS for short read evaluation. This reduces the time required and adds to accuracy by eliminating library bias.



Quantitative Capabilities - are increased as single molecules can be evaluated and counted accurately.



Simple and Powerful

The single molecule sequencing system combines simplified operation with powerful capabilities to directly sequence your original short read samples of RNA / DNA. tSMS chemistry is performed and images captured to track the reactions for billions of individual molecules per run.



The analysis engine - simultaneously processes the images to produce accurate sequence data for the molecules in real time.



The sample loader - speeds and simplifies upfront sample preparation, providing flexibility for managing experiments with multiple samples.



Convenient reagent packaging - joins with intuitive software to provide easy operation, automated tracking of consumables and effective overall cost and productivity management of the system.



Custom Flow Cells can be created for specific applications and approaches. Use of custom flow cells can dramatically reduce sample preparation time and steps as well as increasing the throughput and accuracy. Typical applications can include use of not so random primers and DRS.

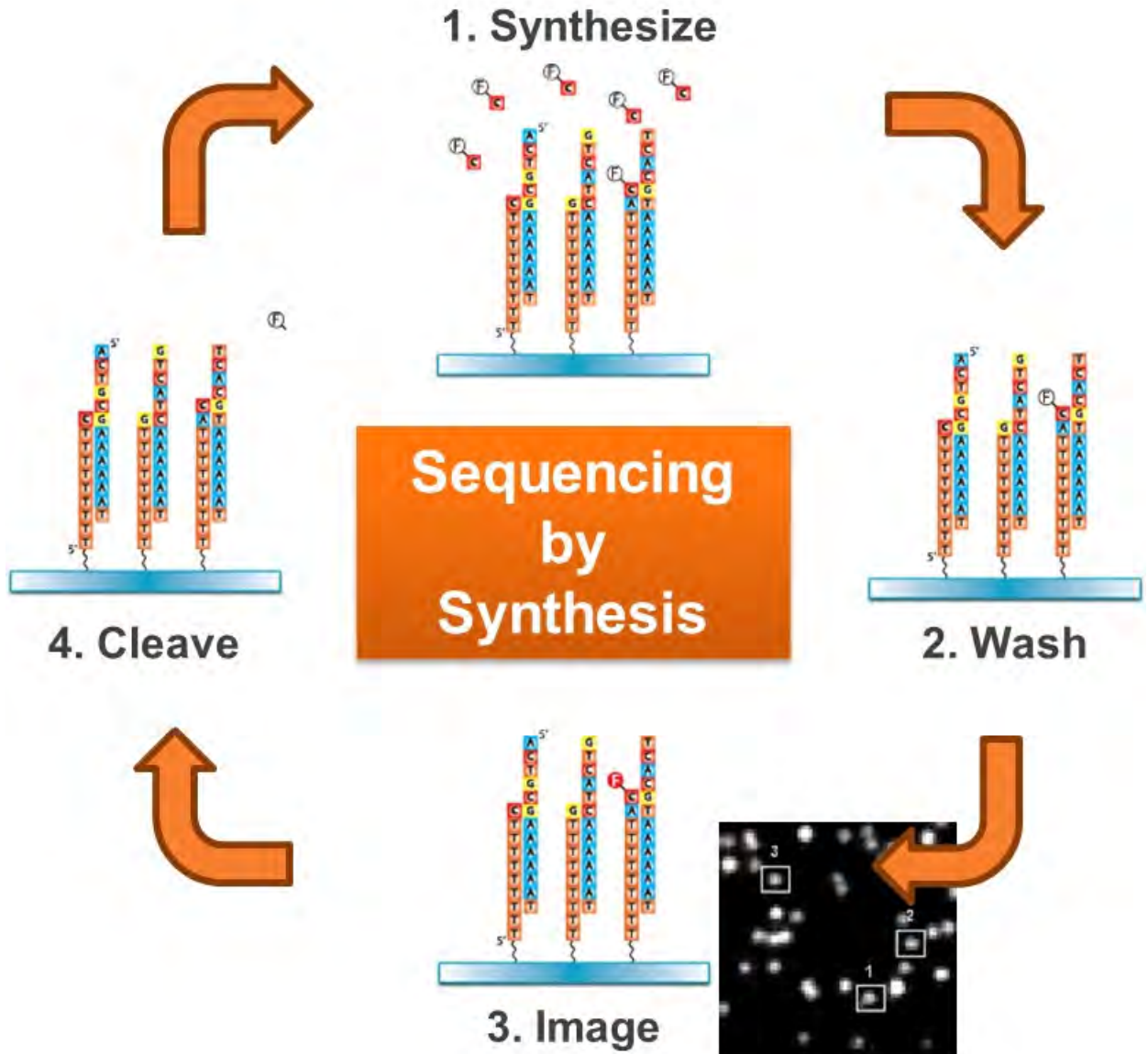
What is tSMS Technology

The tSMS technology accurately interrogates billions of single strands of RNA or DNA in parallel by directly detecting single nucleotide incorporations on each of the single strands

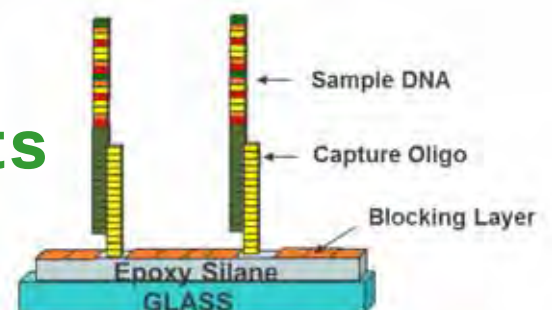
PolyA tails are appended to sample DNA and used to capture samples onto a surface within the flow cell.

Fluorescently labeled nucleotides (C, G, A, T) are added one at a time via our sequencing-by-synthesis process.

Thousands of images are taken across the flow cell surface after each base incorporation. The images track the nucleotide on each strand and are used to determine the exact sequence of each individual DNA molecule.



Active Surface Components



System Components

To achieve its breakthrough performance and simple operation, the Sequencer integrates a number of advanced technologies and innovative solutions:

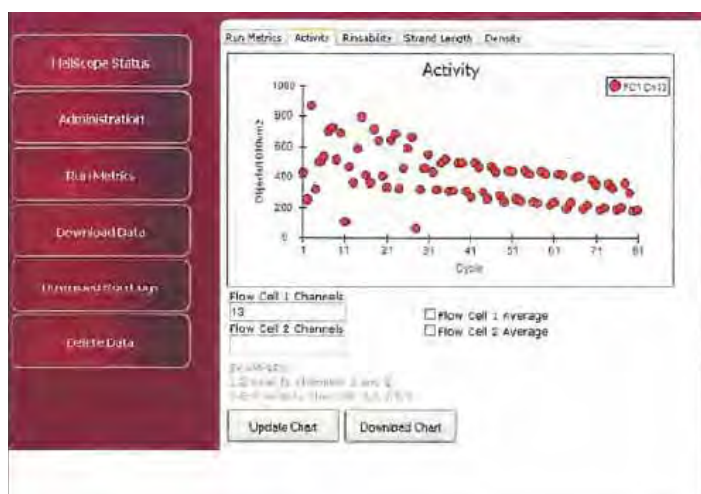
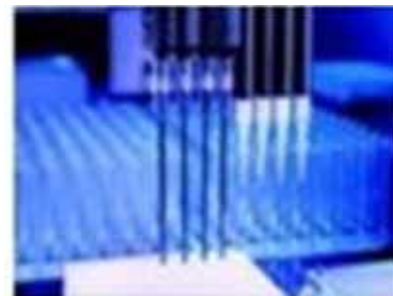
Touch Screen Monitor and Graphical User interface provides an intuitive work flow drive operation allowing the user to easily define, launch and monitor a run.

Innovative Fluid Delivery System has precision controlled reagent mixing optimizing the tSMS chemistry, enabling efficient strand synthesis and detection of base incorporation throughout the run.

Advanced Optics Design combines solid state lasers and cameras with a high speed thermally controlled stage and optics for accurate, repeatable positioning, producing the highest images for your single molecule sequencing experiment.

Real Time system monitoring and Alerts track key run metrics, including reagent levels, temperature, pressure and other critical operating parameters. All metrics are recorded to a run log file for quality control and auditing.

Remote Monitoring is supported via a web application that allows monitoring and administrative capabilities to manage security, define and change run parameters, download data and obtain run status from experiment in progress in real time.

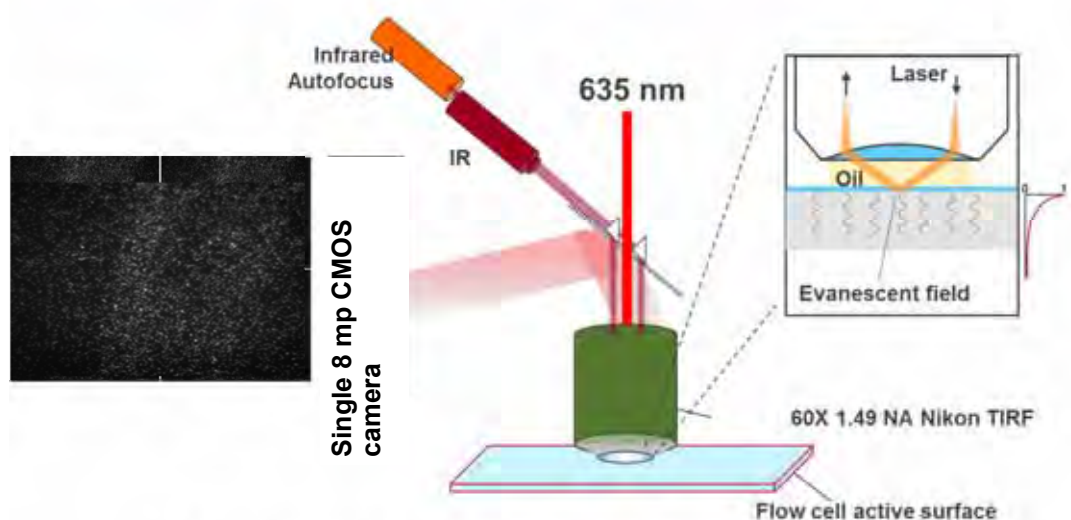


Heliscopes Sample Loader - performs the operations required to prepare precision flow cells for sequencing, including re-hydration, sample loading, hybridization and washing steps. The benchtop system has individually addressable channels that enable loading and hybridization of up to 25 discrete samples per flow cell.

As the system can run two flow cells, both can be prepared in parallel to ensure uniform process conditions and consistency.



Signal Detection & Image Formation



A detection event is about 1500 – 3000 photons

Routine Usage Specifications

Strand Output	600M to 1 B strands per run 4 - 50 million reads passing filter per channel
Total Output	21 to 35 gigabases per run 420 to 700 megabases per channel
Read Length	20 to 55 bases in length 35 base average
Accuracy	>99,995% consensus average at 20X Coverage
Raw Error Rate	Substitution: 0.2% Insertion: 1.5% Deletion 3.0%
Template Size	20 to 8,000 bases
% GC coverage	<20% coverage variation for 20 - 80% GC (<i>E. coli</i>)

System Specifications

Catalog #	30000
Dimensions	39" (99cm) H x 56" (142cm) W x 31" (79cm) D
Weight	800 lbs (365 kg)
Power	220 VAC, single phase, 20 AMP, 50/60 Hz, NEMA L6-20R receptacle.
Environmental Operating Temp:	18° C to 25° C; up to 90% RH; non-condensing; Temperature +/- 2.5° C

Instrument Configuration

Flow Cells	1 or 2 flow cells processed simultaneously 12 or 25 independent flow channels / flow cell
Sequencer Throughput	>1 gigabase per hour



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