



The Value of Certified Refurbished Analytical Instruments

Bridging the Gap Between Performance and Cost for Drug Discovery, Antibody Development, and Demanding Analytical Applications

During drug and biotherapeutic development, the ability to measure binding activities between biomolecules is often critical. Such interaction assays serve an important role in screening, antibody structure analysis, drug and antibody binding assays, and other target-based investigations.

State-of-the-art instruments for molecular interaction studies, such as Surface Plasmon Resonance (SPR) and Bio-Layer Interferometry (BLI), can come with premium price tags when buying new. As an alternative, certified refurbished instruments can help equip your lab with the tools needed for these challenging applications. Securing these instruments at the right price with the proper support can help set your lab up for success—allowing you to focus on the science and not only on your budget.

Complex instrumentation for molecular interaction studies

SPR and BLI instruments provide exquisite insight into binding specificity and the kinetics of biomolecular interactions.

What is surface plasmon resonance?

SPR is an optical technique allowing the real-time measurement of molecular interactions. SPR occurs when plane-polarized light is directed to a thin metal film (typically gold) under total internal reflection conditions. The excitation resulting from reflection or surface plasmon resonance signal is directly dependent on the refractive index of the medium near the metal surface. Binding of biomolecules can result in a change in the refractive index, thus indicated by a measurable change in the SPR signal.

In a typical experiment, a ligand is immobilized on the surface of a SPR binding chip. Analytes in sample flow are passed over the chip where they interact in real-time in a concentration dependent manner with the immobilized ligand. The resultant binding enables detailed measurements of kinetic binding constants and equilibrium binding constants between two interacting molecules.

Instrument Solutions for Drug Discovery, Antibody Development, and Other Demanding Applications



In principle, SPR can be used to measure interactions between any kind of molecule, from organic compounds to proteins, nucleic acids, glycoproteins, and even whole protein complexes and cells. Importantly, SPR does not require labeling of the interactants. Measurements can be performed in complex mixtures, including cell cultures and extracts and analysis can be performed regardless of the spectral qualities of the analyte sample.

Common applications of SPR include antibody-antigen interaction analyses, conformational change studies, mutation detection, high-throughput screening (HTS), and many other uses.

SPR instruments

SPR platforms include the Biacore 8K, which is a high-throughput SPR system that can perform high-sensitivity interaction analysis enabling screening, characterization, process optimization, and quality control applications. The instrument can perform 64 interaction runs in four hours and can screen up to 2,300 molecules per day. The high sample capacity can handle up to four 384-well microplates in a single run.

The high-sensitivity of the instrument enables analysis of low-abundance molecules or complex targets that have

suboptimal activity and stability. The high-throughput capabilities allow applications such as rapid epitope mapping and mutation profiling. Add on software features provide dedicated tools for concentration and potency analysis, as well as predefined methods for fast assay development. Regulatory compliance software solutions are also available.

What is bio-layer interferometry?

BLI is also an optical technique for measuring molecular interactions in real-time. The technique is based on a correlation of two wavelength interference patterns obtained from the tip of a biosensor. A ligand is first immobilized on the biosensor in solution. The tip is then dipped in the sample solution where the target molecule can associate with the immobilized ligand. This interacting complex forms a layer on the tip. When compared with the ligand alone, a thin-film interference is evident when white light is reflected on the biosensor tip. The difference in interference forms the basis of binding measurements. BLI can measure real-time interactions and can be used to calculate kinetic and equilibrium binding constants like SPR.

Beyond protein interactions related to drug discovery and antibody engineering, BLI can be used in quality control workflows during bioprocessing among many other applications.

BLI instruments

The Sartorius Octet is a fluidics-free BLI platform offering rapid protein-protein or protein-small molecule analysis. The system allows direct detection of interactions in complex mixtures and unpurified samples, including cell culture supernatants and lysates.

The Octet RH96 RTX can analyze up to 96 samples in a single run, allowing quantitation of a 96-well plate in two minutes. The platform is capable of workflow automation with robot compatibility. Automated microplate and biosensor tray loading allows for extended walkway times and reduced operator interaction. Common applications include high-throughput immunoassays, antibody epitope mapping, protein contamination testing, and many more.

Instrument Solutions for Drug Discovery, Antibody Development, and Other Demanding Applications



Certified refurbished as an attractive alternative to buying new

SPR and BLI instruments like the Biacore 8K and the Octet RH96 incorporate complex componentry to function with the highest level of performance. As opposed to buying new, there are viable options available that can provide high-performance refurbished instruments at a fraction of the price. Such refurbished instruments can provide significant value over used instruments, with knowledge they have been evaluated, updated, and tested for performance.

Considering the complexity of these instruments, the refurbishment process must be thorough and expertly guided to ensure all components function with top performance. For instance, SPR instruments require periodic maintenance to ensure pumps, valves, and flow cells operate free of buildup or contamination. Inspecting and replacing troublesome components during refurbishment can be vital to instrument performance. Furthermore, preventative maintenance measures can be important in helping you to avoid unplanned downtime in the future.

A qualified refurbished vendor should offer certification and warranty of the work. Once wear and tear or faulty components are replaced, instruments should be tested to ensure they meet original equipment manufacturer (OEM) specifications and comply with relevant standards. An internal certification of this testing can

provide assurance that the vendor has performed due diligence and stands firmly behind the work. The offer of a warranty for up to one year can add extra security to this workmanship.

Service contracts that cover maintenance, repairs, and support for the instruments can provide a safety net in case unforeseen issues arise. A qualified refurbished vendor may offer a range of options and be ready to jump in for support before the instruments suffer significant downtime.

A qualified refurbished instrument vendor may also offer installation services which may include full installation of complex equipment such as SPR or BLI instruments. The service may involve a comprehensive setup process including calibration, software configuration, and testing to ensure the equipment meets all performance specifications.

Summary

To obtain state-of-the-art analytical instruments such as SPR and BLI for your research, you shouldn't have to compromise price for performance and reliability. Certified refurbished instrument vendors can span the middle ground, offering high-quality instruments and service at a reasonable price. In the end, this frees up funds that might otherwise be used for new instrument purchases, allowing you to allocate this money to important pursuits such as advancing your research.

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