

R&D systems™
by biotechne

Meet Jess

The Simple Way to
Experience Fast, Powerful
Multiplex Western Results





Transform Protein Analysis for the 21st Century

Protein analysis comes with no shortage of challenges: labor-intensive protocols, long time to results, and multiple hands-on steps that can introduce user error and data variability. To detect specific proteins in a sample, researchers have long relied on traditional western blotting. Yet for decades, western blotting has remained a laborious, multi-step process with numerous opportunities for inconsistency and error.

It's time to move beyond the blot with Simple Western™ technology, an automated capillary electrophoresis immunoassay platform that transforms the traditional workflow through automation. By reducing manual intervention and standardizing every step, Simple Western delivers reproducible, quantitative protein data in as little as 3 hours with minimal hands-on time.

And that's just the beginning of what Simple Western can do for your lab.

Meet Jess

The Jess™ system, powered by Simple Western™ technology is a quantitative capillary electrophoresis-based immunoassay platform with an automated hands-off workflow. Targets can be detected using chemiluminescence and fluorescence (NIR and IR) channels as well as multiplexing between chemiluminescence or chemiluminescence and fluorescence channels. The Jess system also enables in-capillary protein normalization and allows you to strip and reprobe using the RePlex assay in the same capillary without signal loss, harsh chemicals, or manual labor.

Jess modernizes protein analysis by combining automation, sensitivity, and robust multiplexing. By fully automating protein size separation and immunodetection for up to 25 capillaries per run, Jess provides fully analyzed and quantitated results in as little as three hours—eliminating the variability and labor-intensive steps of traditional western blots.

The Jess Advantage

Accelerate Results
Up to 25 capillaries in as little as 3 hours

Save Your Previous Samples
Only 3 µL sample/well

Confidence in Data
With high precision, accuracy and reproducibility offering <15% intra-assay CVs

Detect Low Abundance Targets
Low picogram sensitivity in chemiluminescence

Antibody Pairs Not Required
Save time and effort needed to find compatible antibody pairs, derisk downstream development

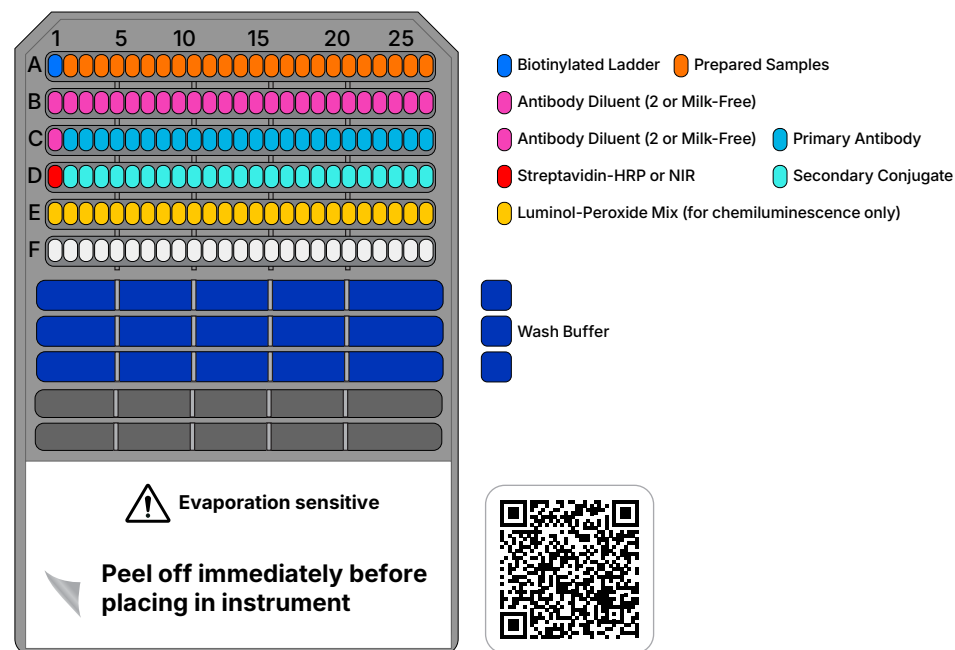
Gain More Data from Samples
With chemiluminescence and fluorescence detection channels, and RePlex

Flexible Normalization Options
With housekeeping proteins or built-in total protein normalization

Support Regulatory Compliance
Compass for Simple Western with 21 CFR Part 11 Compliance

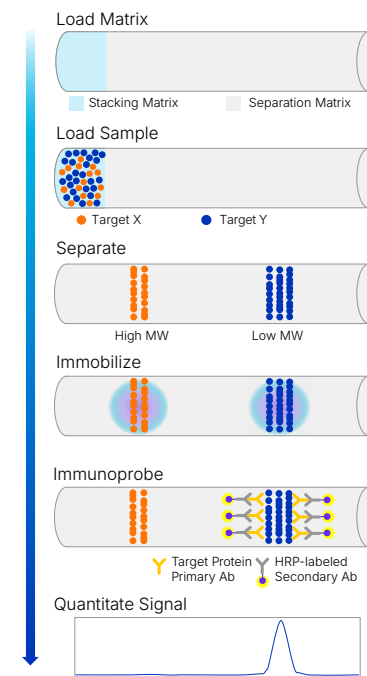
How Does Jess Work?

Jess is built on proven and trusted Simple Western technology. It separates proteins by size using capillary electrophoresis. Separated proteins are immobilized on the capillary surface and can be identified using an immunoassay. Simply load your samples and reagents in to the microplate, and Jess takes care of the rest. It precisely manages every step: protein separation by size, antibody additions, incubations, washes, and even detection. Return to analyzed quantified results in as little as 3 hours.

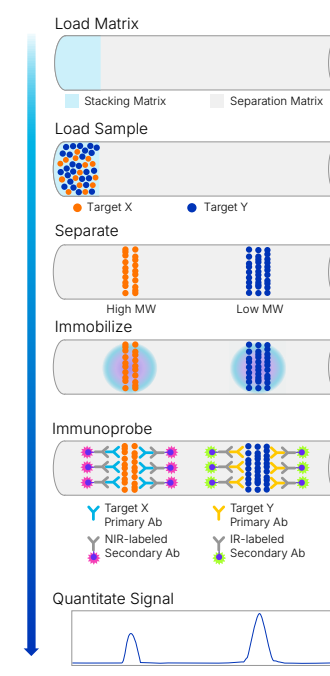


Request a Quote or Talk to a Specialist Today
Scan the QR code or visit www.rndsystems.com/jess-contact

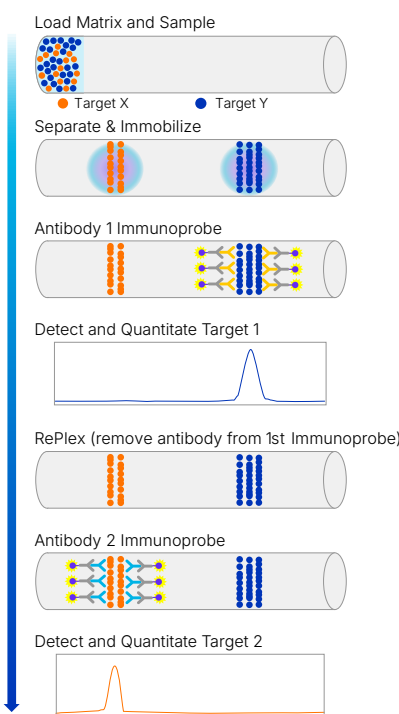
Sized-Based Assay: Chemiluminescent Detection



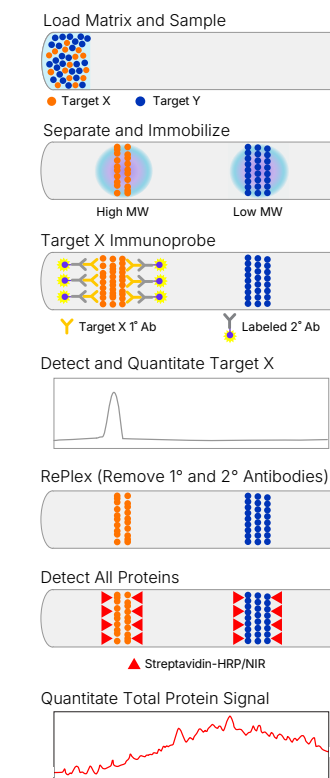
Sized-Based Assay: Fluorescent Detection



RePlex Assay Run Two Sequential Immunoassays



Total Protein Normalization using RePlex with Chemiluminescent or NIR Detection



CE-ing is Believing
Watch the Video to See How Jess Works
Scan the QR code or visit rndsystems.com/jess

Discover the Power of Jess

Excellent Reproducibility Across Multiple Users and Days

The Jess system provides excellent reproducibility, not just within a run, but also across multiple users and days.

FIGURE 1

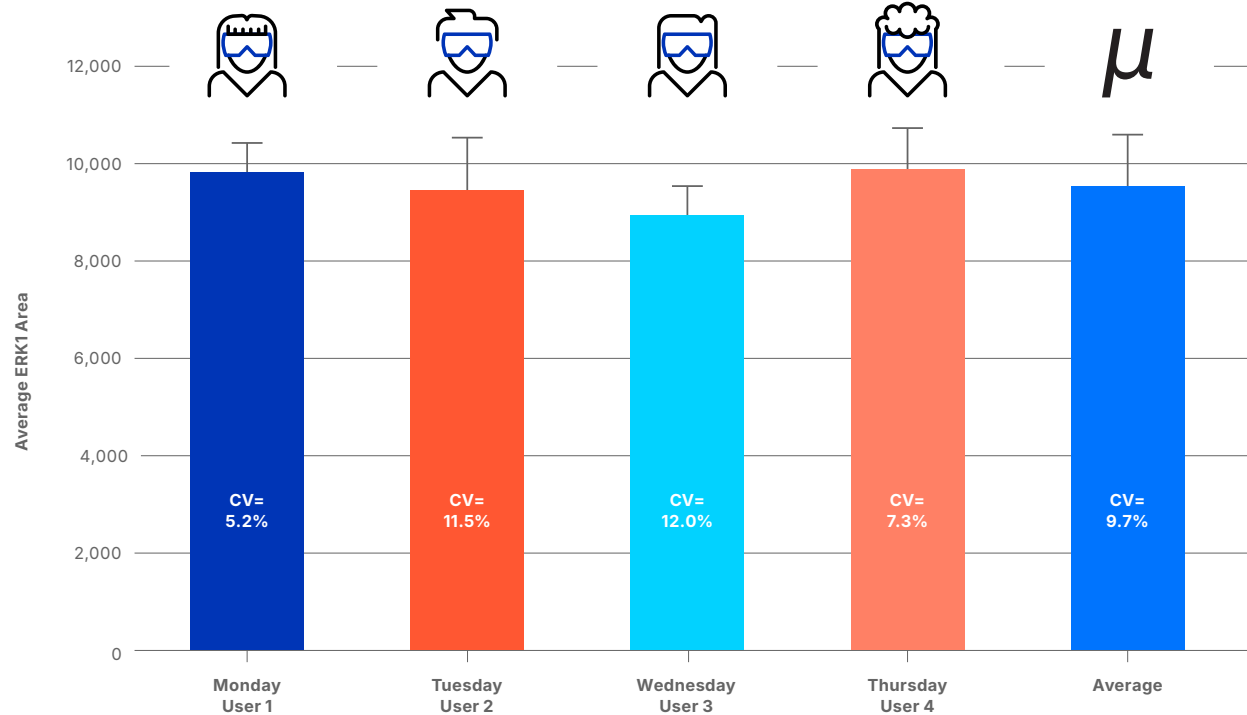


Figure 1. The figure shows the same Simple Western assay run on Monday, Tuesday, Wednesday and Thursday, each with a different user. The average ERK1 area per day was measured. The inset on each bar graph is the percent CV of the ERK1 average area. The day-to-day average ERK1 area does not change significantly. Overall, this group generated a CV for all ERK1 data points across four days under 10%. Having this sort of user-to-user and day-to-day consistency means that Simple Western can confidentially be adopted where traditional western falls short, like in analytical development groups.

Superior Sensitivity for Low-Abundance Targets in Precious Samples

The Jess Simple Western system provides over 4 logs of dynamic range, while traditional western has only 2.5 logs using Chemiluminescence detection. High sensitivity allows use of just 3 μ L of sample per capillary saving precious, limited samples.

FIGURE 2

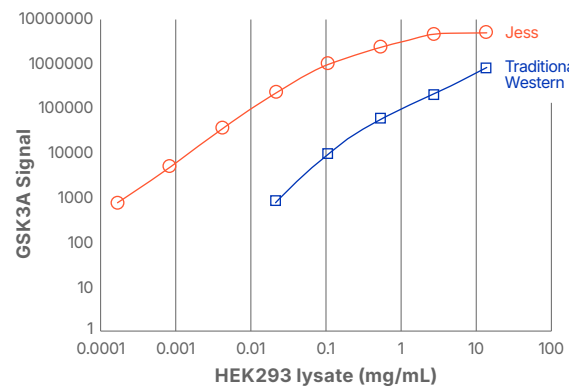


Figure 2. Comparison of traditional western and Simple Western for GSK3A signal detected in HEK2993 lysate. Traditional western, shown in blue squares, can only detect GSK3A in as little as 10 μ g/mL HEK2993 lysate. In contrast, Simple Western – shown in orange circles, using the same lysate, can detect GSK3A down to 100 pg/mL of HEK2993 lysate.

Protein Quantitation You Can See and Trust

Depending on your needs, perform relative or absolute quantitation with the Jess system.

FIGURE 3

Relative Quantitation: Fold Change Between Samples and Treatments

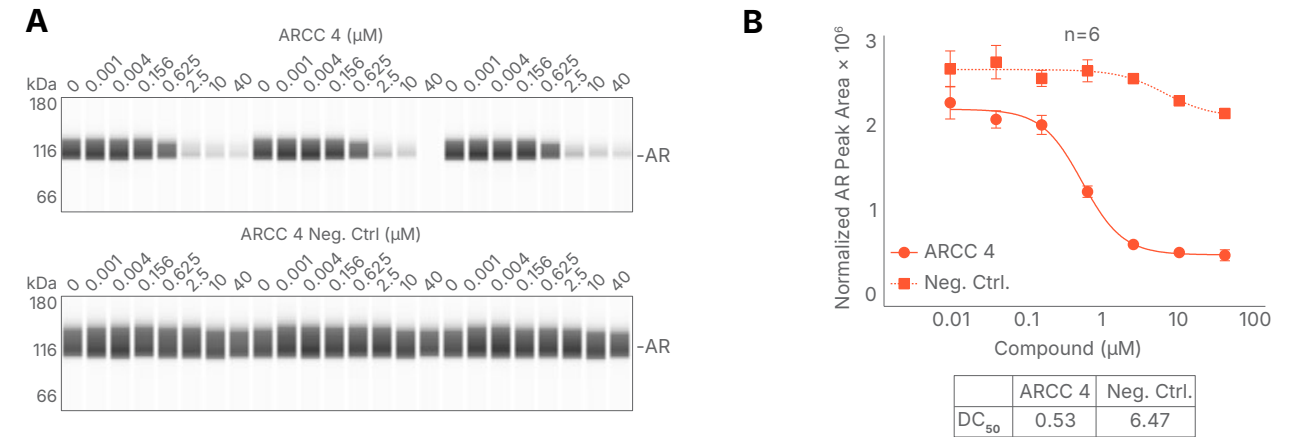


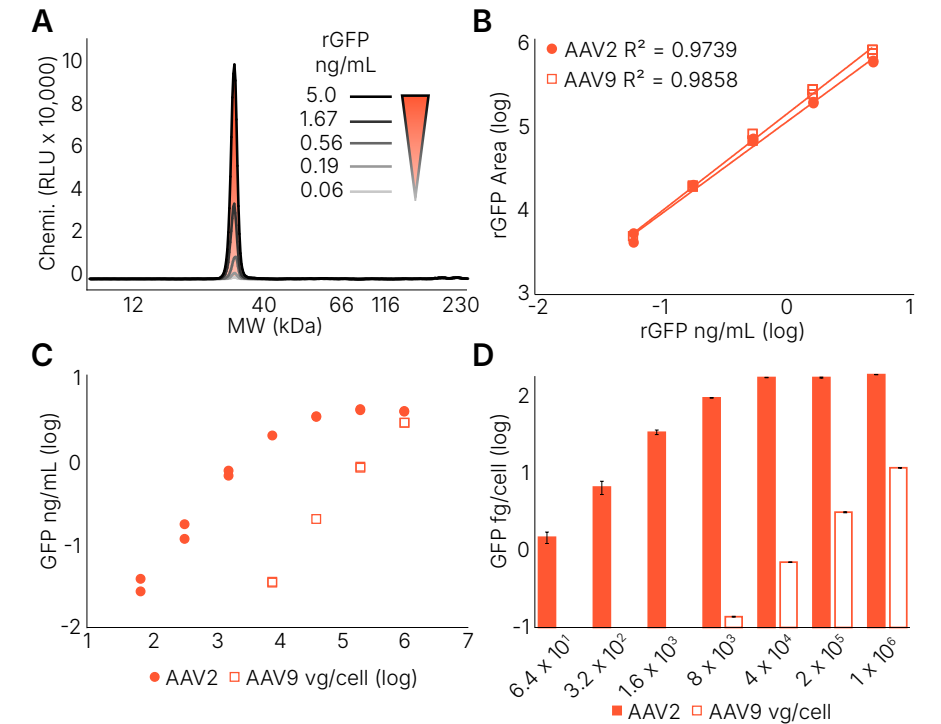
Figure 3. Dose response by treatment with ARCC 4 and Negative Control in MDA-MB-453 cells. (A) Lane view showing AR degradation by ARCC 4 and ARCC 4 negative control measured on Jess. (B) Quantitation of AR peak area and DC₅₀ values. All values are normalized to total protein measured in the same sample capillaries using RePlex. Values represent averages of all biological and technical replicates (n = 6). Error bars represent standard deviations from the means.

FIGURE 4

Absolute Quantitation: Target Concentration in Sample

Simple Western can provide absolute target concentration in a sample.

Figure 4. Absolute quantification of GFP expression levels in AAV-transduced liver cells. (A) Electropherogram view of recombinant GFP (rGFP) titration to generate a standard curve on Jess. (B) Standard curve of rGFP. (C-D) Absolute quantification of GFP in AAV-transduced liver cells with (C) ng/mL and (D) fg/cell concentrations.



Taking Your Assay Further

Powerful Multiplexing Options for Deeper Insights —
All in the Same Capillary

Multi-Channel Multiplexing
(chemiluminescence/NIR/IR)

RePlex

Total Protein Detection

Size Based Multiplexing

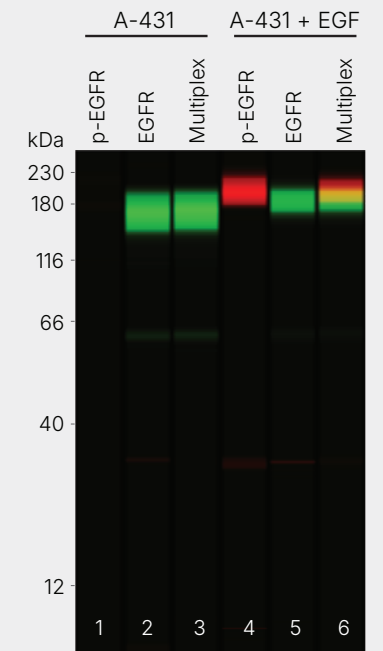
Multi-channel multiplexing on Jess lets you detect targets with overlapping molecular weights using chemiluminescence and fluorescence NIR/IR channels, and **size based multiplexing** lets you detect targets of differing molecular weight in the same capillary. Combine multiplexing with **RePlex**, which enables two sequential immunoassays or immunoassay followed by **total protein detection** to normalize your immunoassay data.

Detect Targets of Overlapping Molecular Weight

Jess supports multiplexed chemiluminescent and fluorescent assays on the same sample lets you simultaneously detect targets of varying abundance and targets of overlapping molecular weights.

Figure 5. Lane view in Compass for Simple Western software showing phosphorylated EGFR (p-EGFR) and EGFR expression levels in unstimulated versus EGF-induced A-431 cells measured by Jess. Lane 6 shows the overlapping signal achievable with multiplexing on Jess.

FIGURE 5



More Data from Every Sample with RePlex

The RePlex assay enables two sequential immunoassays (IA) or an IA and total protein assay (TPA) within the same capillary, maximizing data output from each sample load and providing deeper biological insight without additional sample consumption.

With the RePlex feature, Jess offers flexible multiplexing options that allow you to do multi-target detection and total protein normalization in the same capillary.

FIGURE 6

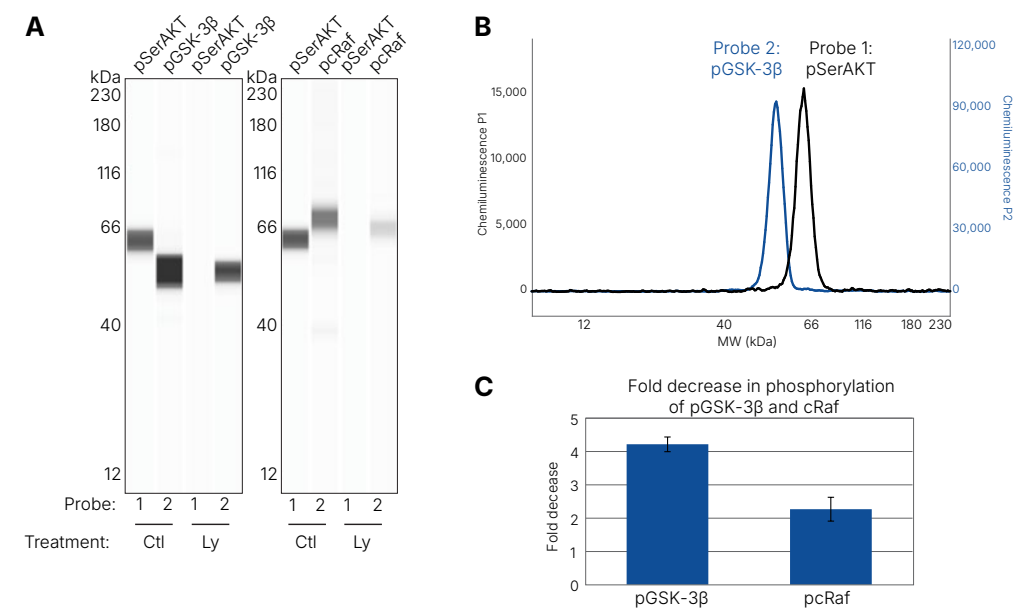


Figure 6. RePlex detection of concomitant phosphorylation for AKT and downstream targets in the same capillary. (A) Lane view of AKT, GSK-3β and cRaf phosphorylation in control (Ctl) and LY294002-treated (Ly) Jurkat lysates. (B) RePlex enables use of the same secondary antibody in Probe 1 and Probe 2, with no carryover signal, as demonstrated by detection of phosphorylated AKT and GSK-3β and using rabbit-derived primary antibodies in sequential probes of the same sample. (C) Quantitation shows a decrease in GSK-3β and cRaf phosphorylation in LY294002-treated Jurkat lysates. Error bars represent standard deviations of the means.

Normalization with Total Protein Using RePlex

Total protein normalization (TPN) provides a more accurate and reliable way to quantify protein expression by correcting differences in total protein load and avoiding the variability seen with housekeeping proteins. With RePlex, Jess offers total protein normalization using either chemiluminescent or NIR detection, enabling flexible and consistent analysis across a wide range of targets. Simultaneous runtime detection within the capillary delivers highly consistent, dependable results without any blot staining or wash steps—modernizing normalization and strengthening confidence in every data set.

FIGURE 7

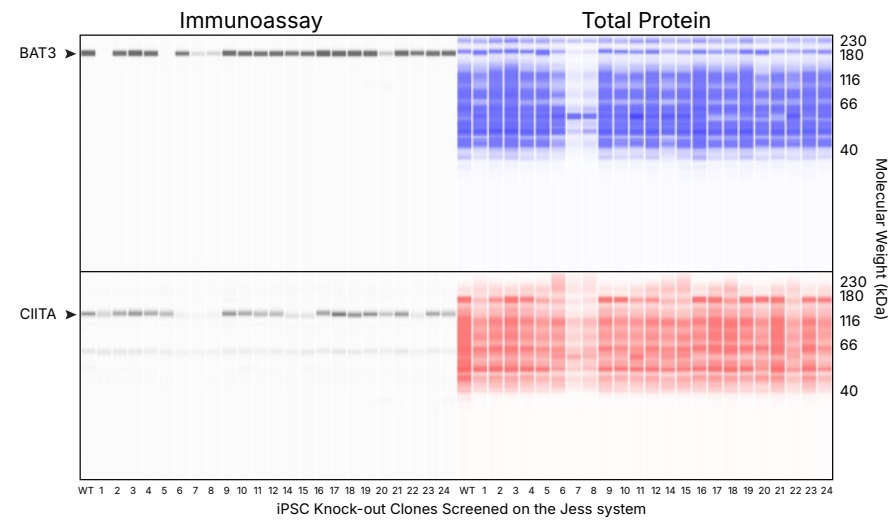
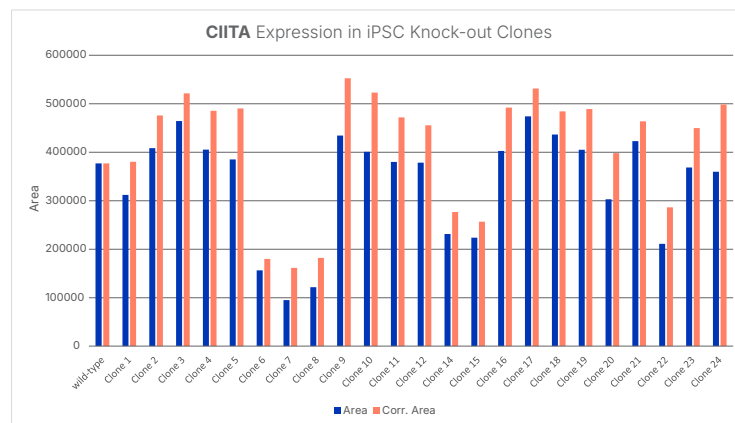
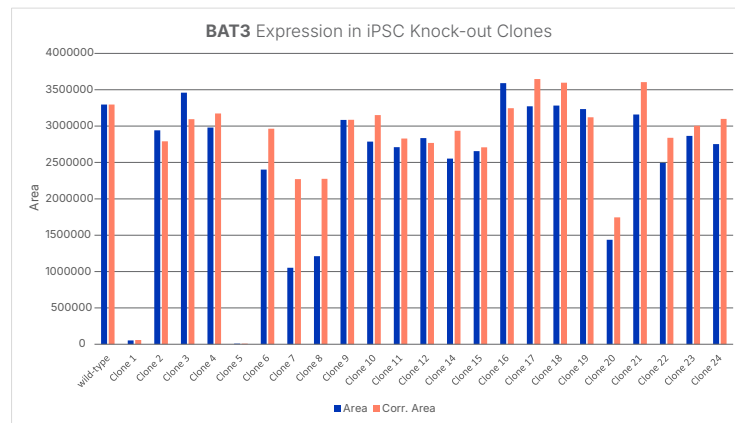


Figure 7. Flexibility to choose between two TPN methods on Jess: TPN using RePlex with chemiluminescence detection (BAT3) and TPN using RePlex with NIR detection (CIITA). TPN with NIR detection is ideal when using high concentration lysates (0.2-2 mg/mL) to detect low abundance targets, while TPN with chemiluminescence detection offers increased sensitivity when using low concentration lysates (0.05-0.4 mg/mL) for detecting high abundance targets.



Flexible Imaging for Traditional Western Blot Membranes

Jess includes an integrated imaging system that supports imaging of traditional western blotting membranes, offering added flexibility for labs that need both fully automated capillary-based Simple Western analysis and conventional blot imaging in a single instrument.

FIGURE 8

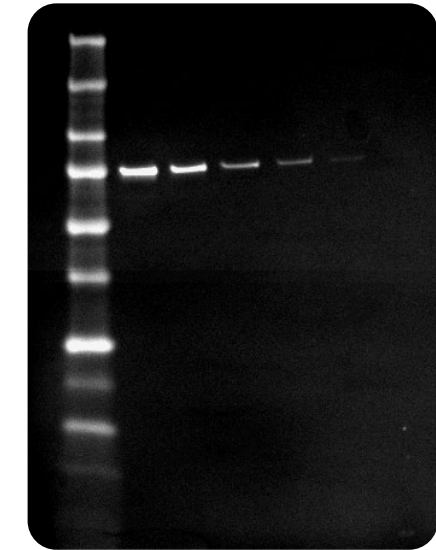
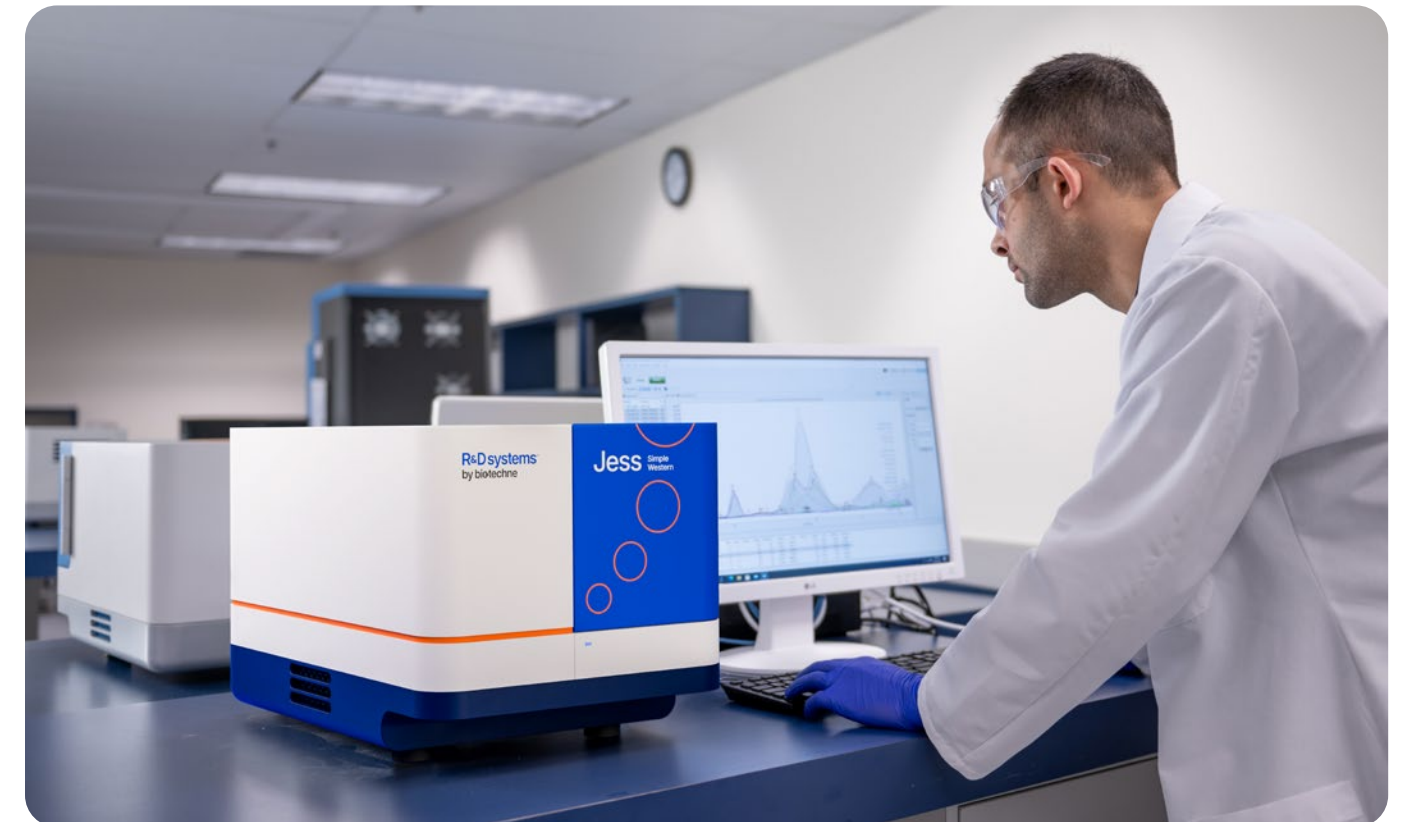


Figure 8. Jess's imaging system allows for imaging of traditional western blotting using chemiluminescence detection.



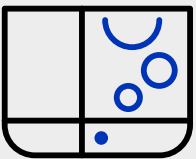
AAVs 12 Animal Models Antibody-Drug Conjugates Biomarkers

Bioprocess Biodistribution Bioprocess Impurity Detection

Bispecific Antibodies Cancer Biology CAR-T Cell Therapy

Cell Lysates Cell Signaling Pathways Cell & Gene Therapy

Clinical Biomarkers Clinical Trials CRISPR/Cas9 DC50

Extracellular Vesicles  Dose-Response Curves

Discovery **Simple Western Applications** Gene Editing

Exosomes

Gene Therapy Glycosylation

High-throughput Screening Host Cell Proteins Immune Cell Therapy

Immuno-Oncology Induced Proximity Infectious Disease

iPSCs Lead Optimization Lead Selection Lipid Nanoparticles

LOD/LOQ Mesenchymal Stem Cells Monoclonal Antibodies

Metabolism Muscular Dystrophy Multi-Antigen Serology Assays

Neuroscience Pharmacokinetics Organoids Patient Samples

Hear From Your Peers



With the Jess, we've been able to expand the scope of research significantly. This opens up whole new avenues and possibilities for biomarker discovery and therapeutic signaling.

Dr. Sanooj Soni
Clinical Associate Professor in Critical and Perioperative Care, Imperial College London and Honorary Consultant in Intensive Care Medicine and Anaesthetics, Hammersmith Hospital London



Jess is faster and more reliable in terms of quantification and allows us to use low sample volumes, for example, difficult-to-obtain samples such as iPSC-derived neurons.

Dr. Tatiana Rosado Rosenstock
Principal Scientist, Sygnature Discovery



Simple Western allowed us to confidently identify and validate multiple circulating forms of neprilysin. That clarity was essential for explaining why different immunoassays produce conflicting results—and for advancing biomarker research toward real clinical impact.

Dr. Oi Wah Liew
Senior Scientist and Group Leader, Cardiovascular Research Institute (CVRI), Yong Loo Lin School of Medicine, National University of Singapore



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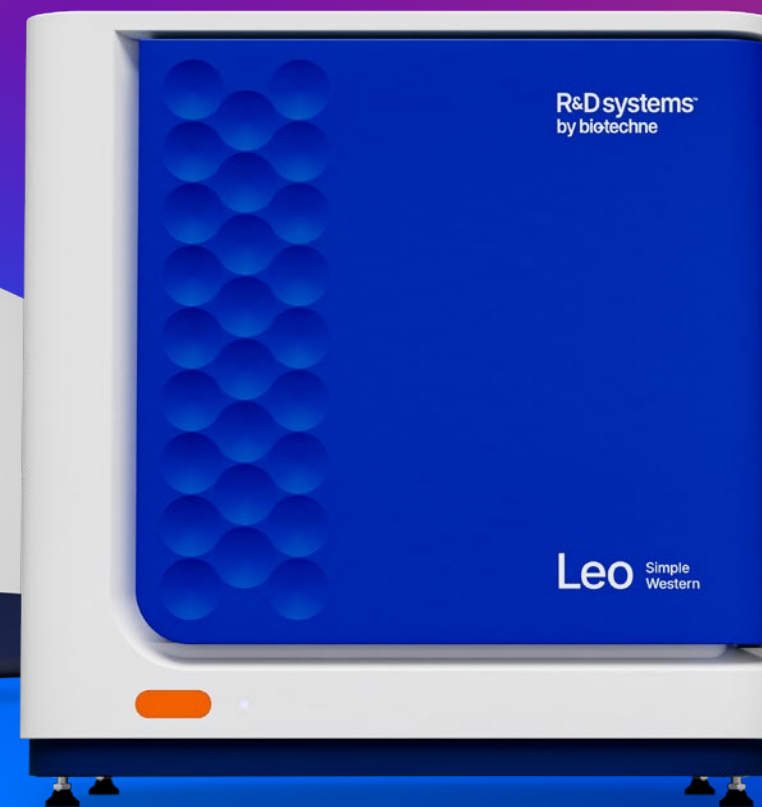
Instrument Specifications

Description	Chemiluminescence Detection	Total Protein with Chemiluminescence Detection	Fluorescence Detection
Sample required*	0.3-1.2 µg	0.3-1.2 µg	2-4 µg
Volume required	3 µL/well		
Size range	Molecular weight (MW) ladder ranges from 2-440 kDa		
Sizing CV	<10%		
Intra-assay CV	<15%		
Inter-assay CV	<20%*	N/A	<20%
Resolution (± percent difference in MW)	± 10% for MW >20 kDa ± 15-20% for MW <20 kDa		
Quantitation CV	<20% (chemiluminescence and fluorescence)		
Dynamic range	3-4 logs	2-3 logs	3-4 logs
Sensitivity	Low pg	ng	High pg
Capillary	5 cm, 100 µm, 400 nL		
Runtime	<3 hours RePlex: 5 hours		
Capillaries per run	13 or 25		
Weight	23 kg (50 lbs)		
Dimensions (closed)	0.33 m x 0.36 m x 0.52 m (1.07' x 1.15' x 1.71')		
Power	US/CAN 120 V AC, 60 hz, 4.2 amps Europe 240 AC, 50 Hz, 2.1 amps Japan 100 AC, 50/60 Hz, 5.0 amps		
Operating temperature	18-24 °C		
Operating humidity	20-60% relative, non-condensing		

+ Sample Required is 3 µL/well

* Inter-assay CV is calculated with normalization to the system control protein

** Percent peak area



Simple Western Instruments



Jess

The simple way to experience powerful multiplex western results.



Leo

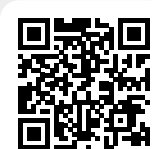
The simple way to maximize throughput for quantitative western results.



Abby

The simple way to faster publication-ready western results.

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