Microplate instruments, assays, and accessories guide

Everything you need for your microplate assays

ThermoFisher SCIENTIFIC

A one-stop solution for your microplate needs

Whether you are conducting fluorescent, luminescent, or colorimetric studies, our high-quality microplates, microplate readers, and assays work together to deliver reliable, accurate results—quickly—so you can focus on your research.

Thermo Scientific™ Nunc™ cell culture plates
Choose from a wide selection of surface modifications and formats for a variety of 2D and 3D cell-based assays.

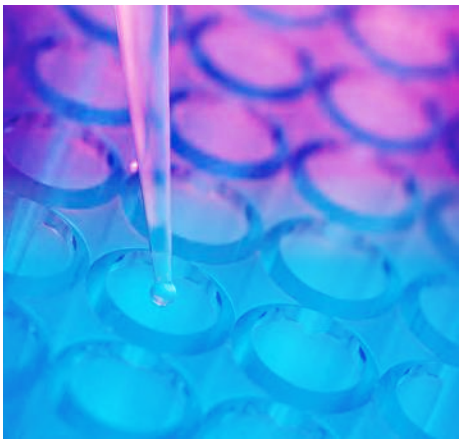
Nunc™ black and white polystyrene plates
Get optimal performance with minimal background and crosstalk between wells for maximal signal detection.

Nunc™ Edge™ plates
Minimize evaporation concerns for live cell assays with long incubations.

To find the Nunc plate that best suits your needs, go to
thermofisher.com/cellcultureplates

Contents

Cell health and imaging assays



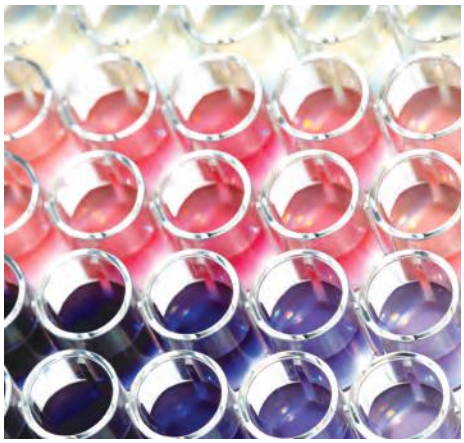
Fluorescence microplate assays

Combining the sensitivity of a fluorescence-based assay with a microplate format enables a rapid, quantitative readout suitable for high-throughput analysis. We offer a diverse selection of probes and assays for the analysis of cell viability, proliferation, cytotoxicity, apoptosis, ion flux, generation of reactive oxygen species, and various enzymatic activities. In a microplate well, the fluorescent signal can be generated within whole cells, in cell lysates, or in purified enzyme preparations and may then be analyzed by measuring fluorescence intensity from the well without the need for cellular imaging. Additionally, these products have been validated on multiple instrument platforms including microplate readers.

For more information, go to **thermofisher.com/microplate-fluor-assays**

Choose from our comprehensive portfolio of Invitrogen™ microplate assays for cell health and imaging.

Applications	Fluorescence assays
Apoptosis	• CellEvent Caspase-3/7 Green Detection Reagent (Cat. No. C10723, C10423) • EnzChek Caspase-3 Assay Kit #1, Z-DEVD-AMC Substrate (Cat. No. E13183) • EnzChek Caspase-3 Assay Kit #2, Z-DEVD-R110 Substrate (Cat. No. E13184)
Calcium ion indicators	• Fluo-4 AM (Cat. No. F1242) • Fluo-4 Direct (Cat. No. F10471) • Fluo-4 NW Calcium Assay (Cat. No. F36206)
dsDNA assays	• Quant-iT PicoGreen dsDNA Assay Kit (Cat. No. P11496) • Quant-iT dsDNA Assay Kit, high sensitivity (Cat. No. Q33120) • Quant-iT dsDNA Assay Kit, broad range (Cat. No. Q33130)
Metabolic (cholesterol)	• Amplex Red Cholesterol Assay Kit (Cat. No. A12216)
Metabolic (glucose)	• Amplex Red Glucose/Glucose Oxidase Assay Kit (Cat. No. A22189)
Proliferation	**DNA content measurement:** • CyQUANT Cell Proliferation Assay Kit (Cat. No. C7026) • CyQUANT NF Cell Proliferation Assay Kit (Cat. No. C35006) • CyQUANT Direct Cell Proliferation Assay Kit (Cat. No. C35011) **New DNA synthesis:** • Click-iT EdU Alexa Fluor 488 HCS Assay (Cat. No. C10350) • Click-iT EdU Alexa Fluor 555 HCS Assay (Cat. No. C10352) • Click-iT EdU Alexa Fluor 594 HCS Assay (Cat. No. C10354) • Click-iT EdU Alexa Fluor 647 HCS Assay (Cat. No. C10356) • Click-iT EdU Microplate Assay (Cat. No. C10214)
Protein assays	• Quant-iT Protein Assay Kit (Cat. No. Q33210)
Reactive oxygen species	• CellROX Green Reagent (Cat. No. C10444) • CellROX Deep Red Reagent (Cat. No. C10422)
RNA assays	• Quant-iT RiboGreen RNA Assay Kit (Cat. No. R11490)
ssDNA assays	• Quant-iT OliGreen ssDNA Reagent (Cat. No. O7582) • Quant-iT OliGreen ssDNA Assay Kit (Cat. No. O11492)
Viability	• alamarBlue Cell Viability Reagent (Cat. No. DAL1025, DAL1100) • PrestoBlue Cell Viability Reagent (Cat. No. A13261, A13262) • LIVE/DEAD Viability/Cytotoxicity Kit (Cat. No. L3224)



Absorbance microplate assays

For more than 30 years, absorbance-based detection has been the preferred mode of choice for many microplate-based assays, such as ELISA, protein, and nucleic acid quantitation or enzymatic assays. A light source is illuminated through a sample and a light detector measures how much of the initial light is transmitted through the sample. Many absorbance assays use a chromogenic substrate, which, upon enzymatic conversion to the final product, results in a compound that will absorb light at a specific wavelength. Absorbance assays are popular because of their ease of use, cost-effectiveness, and superior well-to-well reproducibility. Additionally, the color change associated with absorbance assays can help confirm the progression of the enzymatic reaction.

For more information, go to **thermofisher.com/elisa**, **thermofisher.com/cytotoxicity**, or **thermofisher.com/microplate-cell-viability**

Choose from our portfolio of reliable absorbance microplate assays.

Applications	Absorbance assays
Cytotoxicity	• Pierce LDH Cytotoxicity Assay (Cat. No. 88953, 88954) • Vybrant Cytoxicity Assay Kit (G6PD Release Assay) (Cat. No. V23111)
Viability	• CyQUANT XTT Cell Viability Assay (Cat. No. X12223) • Vybrant MTT Cell Viability Assay (Cat. No. V13154)

Luminescence microplate assays

Luminescence microplate assays utilize a biochemical or chemical reaction to generate photons that are detected by a photomultiplier tube (PMT) or charge couple device (CCD) present within the plate reader. Typically the full spectrum of signal from luminescence assays is collected, and measurement is not restricted to particular wavelengths. Luminescence assays are desired because of assay sensitivity and the resulting large dynamic range.

For more information, go to **thermofisher.com/luciferase**

Choose from our portfolio of Thermo Scientific™ luminescence microplate assays.

Applications	Luminescence assays
Reporter gene (Firefly)	• Pierce Firefly Luciferase One-Step Glow Assay Kit (Cat. No. 16196, 16197) • Pierce Firefly Luciferase Flash Assay Kit (Cat. No. 16174, 16175)
Reporter gene (Renilla)	• Pierce Renilla Luciferase Glow Assay Kit (Cat. No. 16166, 16167) • Pierce Renilla Luciferase Flash Assay Kit (Cat. No. 16164, 16165)
Reporter gene (TurboLuc)	• TurboLuc Luciferase One-Step Glow Assay Kit (Cat. No. 88263, 88264)

Microplate readers

Thermo Scientific™ microplate readers provide flexibility, performance, and ease of use for a variety of microplate assays. Whether you need to measure fluorescence, absorbance, luminescence, or time-resolved fluorescence, or perform AlphaScreen™ assays, we offer a microplate reader solution to meet the needs of your specific workflow. With a portfolio of dedicated and modular, upgradeable multimode readers, we also have solutions that fit your current budget with options to meet your lab's future needs.

Thermo Scientific plate readers have a number of features to help you save time and maximize productivity, including:

- Auto-calibration
- Easy export to Microsoft™ Excel™ format
- Automation readiness with robot compatibility
- No limit to the number of computers on which you can install our intuitive Thermo Scientific™ SkanIt™ Software
- Ready-to-use protocols available in an extensive online protocol library

Considerations	Multiskan™ FC photometer	Multiskan™ Sky scanning photometer	
Applications	Absorbance		
Wavelength range (nm)	340–850	200–1,000	
Wavelength selection	Filters	Monochromator	
Plate format	96 wells (384 wells optional)	µDrop™ Plate/96 wells/ 384 wells	
Incubation	Optional	Yes	
Shaking	Yes	Yes	
Dispensers	No	No	
Top/bottom reading	NA	NA	
Cuvettes	No	Optional	
Gas control module	No	No	
			

* Third dispenser requires additional installation.

** Instruments with bottom-read capabilities feature multi-location reads per well.

For more information, go to **thermofisher.com/platereaders**

	Fluoroskan™ fluorometer	Luminoskan™ luminometer	Fluoroskan™ FL fluorometer and luminometer	Varioskan™ LUX scanning multimode reader
	Fluorescence	Luminescence	Fluorescence, luminescence	Absorbance, fluorescence Optional: time-resolved fluorescence (TRF), luminescence, AlphaScreen readout
	Excitation: 320–700; emission: 360–800	270–670	Fluorescence: excitation: 320–700; emission: 360–670 Luminescence: 270–670	Absorbance and fluorescence excitation: 200–1,000 nm Fluorescence emission: 370–840 nm Luminescence: 360–670 nm TRF excitation: fixed to 334 nm (spectral scanning 200–840 nm) TRF emission: 400–700 nm (spectral scanning 270–840 nm) AlphaScreen excitation: fixed to 680 nm AlphaScreen emission: 400–660 nm
	Filters	Not required for most applications Filters can be used when necessary	Filters	Monochromator for UV-Vis absorbance and fluorescence intensity; Filters for luminescence, TRF, AlphaScreen assays
	6–384 wells	6–384 wells	6–384 wells	6–1,536 wells (fluorometry, TRF, luminometry, AlphaScreen assays) µDrop Plate/6–384 wells (absorbance)
	Yes	Yes	Yes	Yes
	Yes	Yes	Yes	Yes
	Optional (to three)*	Optional (to three)*	Optional (to three)*	Optional (to two)
	Top/bottom**	Top	Top/bottom**	Top (standard) Bottom (optional)**
	No	No	No	With µDrop Plate
	No	No	No	Optional
				

Request a quote at **thermofisher.com/platereaderquote**

SkanIt Software

The intuitive interface of our updated SkanIt Software will guide you through the measurement process to help you get the results you need. SkanIt Software is available in two editions. The Research Edition is for scientists working in life science research, and the Drug Discovery Edition provides features to help you comply with the requirements of FDA 21 CFR Part 11.

SkanIt Software makes microplate reading easy

SkanIt Software provides excellent usability and flexibility, even for the most challenging microplate assays. This software offers visual workflow setup and effortless data reduction and exporting.

- Extensive SkanIt Cloud Library of ready-made protocols
- Intuitive user interface simplifies measurement setup
- Virtual pipette tool makes it easy to define samples-to-plate layout
- Visual tools and instructional pictures guide users through every step
- Built-in calculation options ease data processing
- Single-click data export to Excel software
- Several file formats for data export available: .xlsx, .pdf, .xml, and .txt
- Manual or automatic data export to any location
- Automatic emailing of result report after a run is complete
- No limit on the number of licenses; install the software on as many computers as needed
- No annual fee to use the software
- Measurement data continuously saved to the database, helping prevent data loss due to interruptions such as power outage or accidental aborting

For more information, go to
thermofisher.com/skanit

Varioskan LUX Multimode Microplate Reader highlight

Designed to suit a wide variety of needs, the Varioskan LUX Multimode Microplate Reader provides a flexible range of measurement modes. The instrument simplifies measurement setup with automatic dynamic range selection, and its smart safety controls help you avoid experimental errors. The Varioskan LUX multimode reader raises the bar for reliability and ease.

- Five detection modes: absorbance, fluorescence, luminescence, time-resolved fluorescence (TRF), and AlphaScreen modules
- Five measurement modes: endpoint, kinetic, spectral, multipoint, and kinetic spectra
- Spectral scanning for assay optimization
- Simultaneous dispensing and measurement of fast reactions right from the start
- Integrated gas module for control of CO_2 and O_2
- Extensive library of prebuilt protocols available online

For more information, go to
thermofisher.com/varioskanlux

Wellwash Versa Microplate Washer

Wash 96- or 384-well plates securely with the Thermo Scientific™ Wellwash™ Versa Microplate Washer, an easy-to-use, automation-ready microplate-strip washer for routine ELISA applications. Designed for high performance and versatility, enjoy the ease of use and convenience of a graphical interface, local language version, and USB port.

See more at **thermofisher.com/wellwash**

ELISA platforms

ELISAs are popular for protein quantitation because of their ease of use and the rapid and consistent results they provide, which are easy to analyze. Our ELISA kits are developed to meet industry-standard specifications, including standard calibration, precision, sensitivity, specificity, recovery, lot-to-lot consistency, linearity, and parallelism.

Rigorous assay verification of ELISA kits helps ensure consistent, reliable results.

Specification	Description	What does it mean for you?
Standard calibration	Calibrated to National Institute for Biological Standards and Control (NIBSC), if available	Allows accurate quantitation and consistent standard of reference across multiple platforms
Precision	Average inter-assay CV <10%; avg. intra-assay CV <10%	Consistent results
Sensitivity	Relevant levels of protein are detected for specific assay type	Enables detection of low levels of protein
Specificity	Cross-reactivity tests are performed with similar analytes	Helps to ensure accurate measurement of the protein of interest
Recovery	Buffers are optimized to minimize matrix effects	Helps to ensure accurate quantitation of samples within a complex matrix, including serum and plasma
Lot-to-lot consistency	In-house controls are tested to evaluate whether the data fall/are within set ranges	Helps to ensure consistent results with new lots
Linearity of dilution	Linear results over the quantitative range of the assay	Serial dilutions of samples are quantitated accurately
Parallelism	Recombinant protein standards mimic native proteins	Samples can be measured with confidence

Find out more about our testing standards at **thermofisher.com/elisastandards**

Choose from a variety of Invitrogen™ ELISA kits, including complete, ready-to-use kits and preoptimized reagents to make your own assay.

Ready-to-use, validated kits	Measure phosphospecific proteins	Reduce steps and hands-on time	Coat it yourself and keep costs low
Invitrogen™ coated ELISA kits	Invitrogen™ phosphospecific coated ELISA kits	Invitrogen™ instant ELISA kits	Invitrogen™ uncoated ELISA kits
Highly verified ELISA kits with precoated plates provide lower inter- and intra-assay variability with ready-to-use reagents to help ensure consistent data	Designed to deliver accurate, sensitive, and fast protein quantitation of total and phosphorylated, modified, or cleavage site–specific proteins in a broad range of sample types	Simply add sample to perform 1-wash, 1-hour ELISA; these kits come with most assay components already added and lyophilized to the bottom of the 96-well plate	These include all reagents required to prepare and run the ELISA, including ELISA-optimized matched antibody pairs, standards, detection reagents, coating buffers, sample diluent, and substrate solution

Try our enhanced search tool at **thermofisher.com/elisa**

Colorimetric and fluorometric protein and peptide assays

We offer numerous colorimetric assays for detection and quantitation of total protein that can be utilized in both tube and microplate formats. Thermo Scientific™ Pierce™ protein assays provide exceptional accuracy, compatibility, and broad applicability that enable most laboratory protein samples to be determined with ease. We also offer easy-to-use colorimetric or fluorescent peptide assays that are designed specifically to improve the sensitivity and reproducibility of peptide mixture quantitation.

Highlights:

- **Wide selection**—multiple assays to choose from based on your sample composition
- **Simple format**—many assays are in "mix and read" format; others have a short incubation time
- **Minimal sample requirement**—most assays require 10 µL of sample in the microplate format

Working ranges for Thermo Scientific™ protein and peptide assays.

Reagent	Protocol used	Assay incubation time (min)	Estimated working range
Pierce Rapid Gold BCA Assay	Standard tube or microplate	5	20–2,000 µg/mL
BCA Protein Assay	Standard tube or microplate	30	20–2,000 µg/mL
	Enhanced tube		5–250 µg/mL
Micro BCA Protein Assay	Standard tube	60	0.5–20 µg/mL
	Standard microplate		2–40 µg/mL
BCA Protein Assay—Reducing Agent Compatible	Standard tube or microplate	45	125–2,000 µg/mL
Pierce 660 nm Protein Assay	Standard tube	5	25–2,000 µg/mL
	Standard microplate		50–2,000 µg/mL
Pierce Detergent Compatible Bradford Assay	Standard tube	10	100–1,500 µg/mL
	Standard microplate		2–25 µg/mL
Coomassie Plus (Bradford) Assay	Standard tube or microplate	10	100–1,500 µg/mL
	Microtube or microplate		1–25 µg/mL
Coomassie (Bradford) Protein Assay	Standard tube or microplate	10	100–1,500 µg/mL
	Microtube or microplate		1–25 µg/mL
Modified Lowry Protein Assay	Standard protocol	10 and 30	1–1,500 µg/mL
	Standard microplate		10–1,500 µg/mL
Pierce Fluorometric Peptide Assay	Standard microplate	5	5–1,000 µg/mL
Pierce Colorimetric Peptide Assay	Standard microplate	30	25–1,000 µg/mL

The accuracy of BCA, the speed of Bradford

The Thermo Scientific™ Pierce™ Rapid Gold BCA Protein Assay is a new formulation that provides all the benefits of our trusted BCA assay. It offers the same excellent linearity in a reduced incubation time, enabling you to accurately measure your protein solutions in minutes at room temperature (RT).

Highlights:

- **Fast**—assay results in 5 minutes at room temperature
- **Accurate**—low coefficient of variation (CV) and excellent linearity
- **Convenient**—simple, easy-to-perform assay
- **Flexible**—compatible with detergent

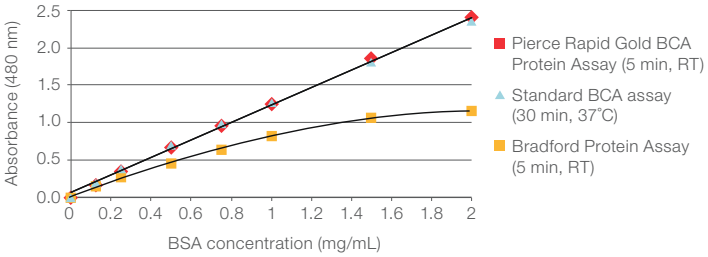


Figure 1. The Pierce Rapid Gold BCA Protein Assay provides the accuracy of our original BCA assay with the speed of the Bradford assay. The standard curves for three assays (Pierce Rapid BCA Gold, BCA, and Bio-Rad™ Bradford protein assays) were produced from purified BSA in 0.9% saline (0–2 mg/mL). All assays were conducted according to the manufacturer's protocol in a microplate format. For the BCA assay, 25 µL of the BSA sample was added to 200 µL of the BCA working reagent and incubated for 30 minutes at 37°C. For the Pierce Rapid Gold BCA Protein Assay, 20 µL of the BSA sample was added to 200 µL of the Rapid Gold BCA working reagent and incubated at room temperature for 5 minutes. For the Bradford assay, 10 µL of the BSA sample was added to 200 µL of the Bradford reagents and incubated at room temperature for 5 minutes.

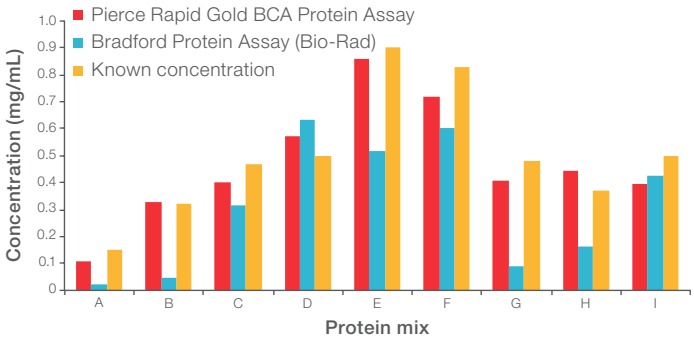
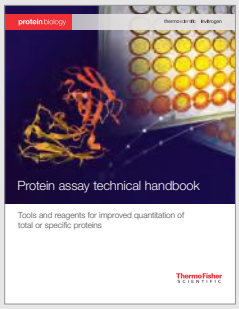


Figure 2. Accuracy of the Pierce Rapid Gold BCA Protein Assay and Bradford Protein Assay with known protein mixes. Both assays were conducted according to the respective manufacturers' protocols, in a microplate format. For the Bradford assay, 10 µL of the BSA sample was added to 200 µL of the Bradford working reagent and incubated at room temperature for 5 minutes. For the Pierce Rapid Gold BCA Protein Assay, 20 µL of sample was added to 200 µL of Rapid Gold BCA working reagent and incubated at room temperature for 5 minutes. Known concentrations were based on manufacturers' indicated concentrations and confirmed by absorbance at 280 nm.



Download the protein assay technical handbook to help select the appropriate assay method based on the assay time, sensitivity, compatibility, standard curve linearity, and protein-to-protein variation. Learn about our wide range of colorimetric (copper- or dye-based) and fluorescent protein assays, as well as our more specialized assays to quantify peptides, antibodies, protein modifications, or functional (enzymatic) classes of proteins. Discover tools and strategies to help optimize your protein quantitation assays to help ensure more accurate downstream results.

Download the free handbook at **thermofisher.com/protein-assay-handbook**

To find out more, go to **thermofisher.com/proteinassays**

Ordering information

Product	Quantity	Cat. No.
Protein and peptide quantitation assays		
Pierce Rapid Gold BCA Protein Assay Kit	500 mL	A53225
Pierce BCA Protein Assay Kit	1 L	23227
Pierce Micro BCA Protein Assay Kit	500 mL	23235
Pierce BCA Protein Assay Kit—Reducing Agent Compatible	275 mL	23250
Pierce 660 nm Protein Assay Kit	450 mL	22662
Pierce Detergent Compatible Bradford Assay Kit	450 mL	23246
Pierce Coomassie Plus (Bradford) Assay Kit	950 mL	23236
Pierce Coomassie (Bradford) Protein Assay Kit	950 mL	23200
Pierce Modified Lowry Protein Assay Kit	530 mL	23240
Pierce Quantitative Fluorometric Peptide Assay	500 assays	23290
Pierce Quantitative Colorimetric Peptide Assay	500 assays	23275
Pierce Bovine Serum Albumin Standard, Prediluted Set	7 x 3.5 mL	23208
Pierce Albumin Standard Ampules, 2 mg/mL	10 x 1 mL	23209
Pierce Bovine Gamma Globulin Standard Ampules, Prediluted Set	7 x 3.5 mL	23213
To view additional products, go to **thermofisher.com/proteinassays**		
ELISA kits		
STAT3 (Phospho) [pY705] Multispecies ELISA Kit	96 tests	KHO0481
Insulin Human ELISA Kit	96 tests	KAQ1251
Amyloid beta 40 Human ELISA Kit	96 tests	KHB3481
	192 tests	KHB3482
Amyloid beta 42 Human ELISA Kit	96 tests	KHB3441
	192 tests	KHB3442
IFN gamma Human ELISA Kit	480 tests	KHC4021C
Amyloid beta 42 Human ELISA Kit, Ultrasensitive	96 tests	KHB3544
IgG Subclass Human ELISA Kit	192 tests	991000
IFN gamma Human Uncoated ELISA Kit	1,920 tests	88-7316-77
Tau (Total) Human ELISA Kit	192 tests	KHB0042

Product	Quantity	Cat. No.
IFN gamma Human ELISA Kit	480 tests	EHIFNG5
Rapid ELISA Mouse mAb Isotyping Kit	60 tests	37503
TNF alpha Mouse Uncoated ELISA Kit	960 tests	88-7324-88
Tau (Total) Human ELISA Kit	96 tests	KHB0041
IFN gamma Human Uncoated ELISA Kit	960 tests	88-7316-88
SAA Livestock ELISA Kit	96 tests	KAA0021
Epo Human ELISA Kit, Short Incubation	960 tests	BMS2035TEN
IL-6 Human ELISA Kit, High Sensitivity	96 tests	BMS213HS
TNF alpha Human Uncoated ELISA Kit	960 tests	88-7346-88
IL-6 Mouse Uncoated ELISA Kit	960 tests	88-7064-88
IFN gamma Mouse Uncoated ELISA Kit	960 tests	88-7314-88
TNF alpha Mouse Uncoated ELISA Kit	1,920 tests	88-7324-77
Amyloid beta 42 Mouse ELISA Kit	96 tests	KMB3441
IL-1 beta Mouse Uncoated ELISA Kit	960 tests	88-7013-88
Tau (Phospho) [pS396] Human ELISA Kit	96 tests	KHB7031
TNF alpha Human ELISA Kit	96 tests	KHC3011
alpha Synuclein Human ELISA Kit	96 tests	KHB0061
IFN alpha Mouse ELISA Kit	960 tests	BMS6027TEN
TNF alpha Human Instant ELISA Kit	128 tests	BMS223INST
IL-2 Human Instant ELISA Kit	128 tests	BMS221INST
CD27 (Soluble) Human Instant ELISA Kit	128 tests	BMS286INST
G-CSF Human Instant ELISA Kit	128 tests	BMS2001INST
CXCL10 Human Instant ELISA Kit	128 tests	BMS284INST
IL-6 Human Instant ELISA Kit	128 tests	BMS213INST
IL-18 Human Instant ELISA Kit	128 tests	BMS267INST
IL-1 beta Human Instant ELISA Kit	128 tests	BMS224INST
c-Myc (Total) Human ELISA Kit	96 tests	KHO2041
Tau (Phospho) [pT181] Human ELISA Kit	96 tests	KHO0631
AMPK alpha-1,2 (Phospho) [pT172] Human ELISA Kit	96 tests	KHO0651
CREB (Phospho) [pS133] Human ELISA Kit	96 tests	KHO0241
FAK (Phospho) [pY397] Human ELISA Kit	96 tests	KHO0441
AKT (Phospho) [pS473] Human ELISA Kit	96 tests	KHO0111
PRAS40 (Phospho) [pT246] Human ELISA Kit	96 tests	KHO0421
To view additional products, go to **thermofisher.com/ELISA**		

Find out more at **thermofisher.com**

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