



**ab173193 – Interferon-
gamma Receptor 1 (CD119)
Human SimpleStep ELISA[®]
Kit**

Instructions for Use

For the quantitative measurement of human Interferon-gamma Receptor 1 in cell and tissue extracts.

This product is for research use only and is not intended for diagnostic use.

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1. BACKGROUND

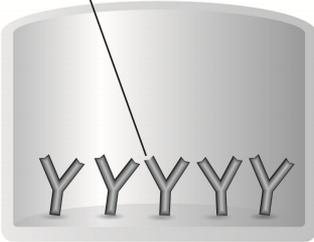
Interferon-gamma Receptor 1 (CD119) human *in vitro* SimpleStep ELISA® (Enzyme-Linked Immunosorbent Assay) kit is designed for the accurate quantitative measurement of Interferon-gamma Receptor 1 protein in cell lysates and tissue extracts.

The SimpleStep ELISA® employs an affinity tag labeled capture antibody and a reporter conjugated detector antibody which immunocapture the sample analyte in solution. This entire complex (capture antibody/analyte/detector antibody) is in turn immobilized via immunoaffinity of an anti-tag antibody coating the well. To perform the assay, samples or standards are added to the wells, followed by the antibody mix. After incubation, the wells are washed to remove unbound material. TMB substrate is added and during incubation is catalyzed by HRP, generating blue coloration. This reaction is then stopped by addition of Stop Solution completing any color change from blue to yellow. Signal is generated proportionally to the amount of bound analyte and the intensity is measured at 450 nm. Optionally, instead of the endpoint reading, development of TMB can be recorded kinetically at 600 nm.

Interferon gamma receptor 1 (IFNGR1) is a heterodimeric receptor that binds one interferon gamma dimer as a ligand. The receptor is a single-pass type I membrane protein present on the plasma membrane. A genetic variation in the IFNGR1 gene is associated with susceptibility to *Helicobacter pylori* infection. Defects in IFNGR1 are a cause of mendelian susceptibility to mycobacterial disease (MSMD); also known as familial disseminated atypical mycobacterial infection. This rare condition confers predisposition to illness caused by moderately virulent mycobacterial species, such as *Bacillus Calmette-Guerin* (BCG) vaccine and environmental non-tuberculous mycobacteria, and by the more virulent *Mycobacterium tuberculosis*.

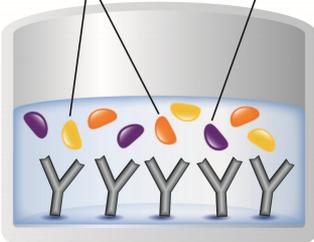
2. ASSAY SUMMARY

Immobilization Antibody



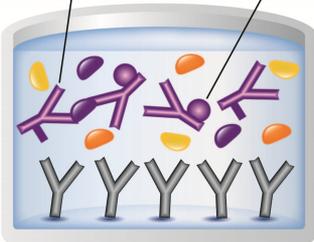
Remove appropriate number of antibody coated well strips. Equilibrate all reagents to room temperature. Prepare all reagents, samples, and standards as instructed.

Matrix Proteins Target Analyte



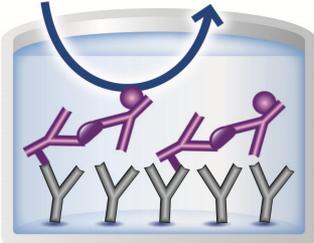
Add standard or sample to appropriate wells.

Capture Antibody Detector Antibody



Add Antibody Cocktail to all wells. Incubate at room temperature.

Substrate Color Development



Aspirate and wash each well. Add TMB Substrate to each well and incubate. Add Stop Solution at a defined endpoint. Alternatively, record color development kinetically after TMB substrate addition.

3. PRECAUTIONS

Please read these instructions carefully prior to beginning the assay.

All kit components have been formulated and quality control tested to function successfully as a kit. Modifications to the kit components or procedures may result in loss of performance.

4. STORAGE AND STABILITY

Store kit at 2-8°C immediately upon receipt.

Refer to list of materials supplied for storage conditions of individual components. Observe the storage conditions for individual prepared components in sections 9 & 10.

5. MATERIALS SUPPLIED

Item	Amount	Storage Condition (Before Preparation)
10X IFNGR1 Capture Antibody	600 µL	4°C
10X IFNGR1 Detector Antibody	600 µL	4°C
IFNGR1 Lyophilized Recombinant Protein	2 vials	4°C
Antibody Diluent 5B	6 mL	4°C
10X Wash Buffer PT	20 mL	4°C
5X Cell Extraction Buffer PTR	10 mL	4°C
50X Cell Extraction Enhancer Solution	1 mL	4°C
TMB Substrate	12 mL	4°C
Stop Solution	12 mL	4°C
Sample Diluent NS	12 mL	4°C
SimpleStep Pre-coated 96-Well Microplate (12 x 8 well strips)	96 Wells	4°C
Plate Seal	1	4°C

6. MATERIALS REQUIRED, NOT SUPPLIED

These materials are not included in the kit, but will be required to successfully utilize this assay:

- Microplate reader capable of measuring absorbance at 450 or 600 nm
- Method for determining protein concentration (BCA assay recommended)
- Deionized water
- PBS (1.4 mM KH₂PO₄, 8 mM Na₂HPO₄, 140 mM NaCl, 2.7 mM KCl, pH 7.4)
- Multi- and single-channel pipettes
- Tubes for standard dilution
- Plate shaker for all incubation steps
- Optional: Phenylmethylsulfonyl Fluoride (PMSF) (or other protease inhibitors)

7. LIMITATIONS

- Assay kit intended for research use only. Not for use in diagnostic procedures
- Do not mix or substitute reagents or materials from other kit lots or vendors. Kits are QC tested as a set of components and performance cannot be guaranteed if utilized separately or substituted

8. TECHNICAL HINTS

- Samples generating values higher than the highest standard should be further diluted in the appropriate sample dilution buffers
- Avoid foaming or bubbles when mixing or reconstituting components
- Avoid cross contamination of samples or reagents by changing tips between sample, standard and reagent additions
- Ensure plates are properly sealed or covered during incubation steps
- Complete removal of all solutions and buffers during wash steps is necessary to minimize background
- As a guide, typical ranges of sample concentration for commonly used sample types are shown below in Sample Preparation (section 11)
- All samples should be mixed thoroughly and gently
- Avoid multiple freeze/thaw of samples
- Incubate ELISA plates on a plate shaker during all incubation steps
- When generating positive control samples, it is advisable to change pipette tips after each step
- The provided 5X Cell Extraction Buffer contains phosphatase inhibitors. Protease inhibitors can be added if required
- The provided 50X Cell Extraction Enhancer Solution may precipitate when stored at +4°C. To dissolve, warm briefly at +37°C and mix gently. The 50X Cell Extraction Enhancer Solution can be stored at room temperature to avoid precipitation
- **This kit is sold based on number of tests. A ‘test’ simply refers to a single assay well. The number of wells that contain sample, control or standard will vary by product. Review the protocol completely to confirm this kit meets your requirements. Please contact our Technical Support staff with any questions**

9. REAGENT PREPARATION

- Equilibrate all reagents to room temperature (18-25°C) prior to use. The kit contains enough reagents for 96 wells. **The sample volumes below are sufficient for 48 wells (6 x 8-well strips); adjust volumes as needed for the number of strips in your experiment.**
- Prepare only as much reagent as is needed on the day of the experiment. Capture and Detector Antibodies have only been tested for stability in the provided 10X formulations.

9.1 1X Cell Extraction Buffer PTR

Prepare 1X Cell Extraction Buffer PTR by diluting 5X Cell Extraction Buffer PTR and 50X Cell Extraction Enhancer Solution to 1X with deionized water. To make 10 mL 1X Cell Extraction Buffer PTR combine 7.8 mL deionized water, 2 mL 5X Cell Extraction Buffer PTR and 200 μ L 50X Cell Extraction Enhancer Solution. Mix thoroughly and gently. If required protease inhibitors can be added.

Alternative – 50X Cell Extraction Enhancer Solution may be added to Cell Extraction Buffer after extraction of cells or tissue. Refer to note in Section 19.

9.2 1X Wash Buffer PT

Prepare 1X Wash Buffer PT by diluting 10X Wash Buffer PT with deionized water. To make 50 mL 1X Wash Buffer PT combine 5 mL 10X Wash Buffer PT with 45 mL deionized water. Mix thoroughly and gently.

9.3 Antibody Cocktail

Prepare Antibody Cocktail by diluting in Antibody Diluent 5B. To make 3 mL of the Antibody Cocktail combine 300 μ L 10X Capture Antibody and 300 μ L 10X Detector Antibody with 2.4 mL Antibody Diluent 5B. Mix thoroughly and gently.

10. STANDARD PREPARATION

Prepare serially diluted standards immediately prior to use. Always prepare a fresh set of positive controls for every use.

The following table describes the preparation of a standard curve for duplicate measurements (recommended).

- 10.1 **IMPORTANT:** If the protein standard vial has a volume identified on the label, reconstitute the IFNGR1 standard by adding that volume of water indicated on the label. Alternatively, if the vial has a mass identified, reconstitute the IFNGR1 standard by adding 250 μL water. Hold at room temperature for 3 minutes and mix gently. This is the 200 ng/mL **Stock Standard** Solution (see table below).
- 10.2 Label eight tubes with numbers 1 – 8.
- 10.3 Add 200 μL 1X Cell Extraction Buffer into tube numbers 2 -8.
- 10.4 Prepare 100 ng/mL **Standard #1** by adding 150 μL of the 200 ng/mL Stock Standard Solution to 150 μL of 1X Cell Extraction Buffer to tube #1. Mix thoroughly and gently.
- 10.5 Prepare **Standard #2** by transferring 100 μL from Standard #1 to tube #2. Mix thoroughly and gently.
- 10.6 Prepare **Standard #3** by transferring 100 μL from Standard #2 to tube #3. Mix thoroughly and gently.
- 10.7 Using the table below as a guide, repeat for tubes #4 through #7.
- 10.8 **Standard #8** contains no protein and is the Blank control.

ASSAY PREPARATION

Standard #	Sample to Dilute	Volume to Dilute (μL)	Volume of Diluent (μL)	Starting Conc. (ng/mL)	Final Conc. (ng/mL)
1	Stock	150	150	200	100
2	Standard #1	100	200	100	33.3
3	Standard #2	100	200	33.3	11.1
4	Standard #3	100	200	11.1	3.7
5	Standard #4	100	200	3.7	1.23
6	Standard #5	100	200	1.23	0.41
7	Standard #6	100	200	0.41	0.14
8 (Blank)	none	0	200	0	0



11. SAMPLE PREPARATION

TYPICAL SAMPLE DYNAMIC RANGE	
Sample Type	Range (µg/mL)
MCF7	8 – 500
T47D	8 – 750
MDA-MB-231	8 – 200
HL-60	8 – 1,000
Jurkat	8 – 1,000
Human Heart Homogenate	8 – 1,000

11.1 Preparation of extracts from cell pellets

- 11.1.1 Collect non-adherent cells by centrifugation or scrape to collect adherent cells from the culture flask. Typical centrifugation conditions for cells are 500 x g for 5 minutes at 4°C.
- 11.1.2 Rinse cells twice with PBS.
- 11.1.3 Solubilize pellet at 2×10^7 cell/mL in chilled 1X Cell Extraction Buffer PTR.
- 11.1.4 Incubate on ice for 20 minutes.
- 11.1.5 Centrifuge at 18,000 x g for 20 minutes at 4°C.
- 11.1.6 Transfer the supernatants into clean tubes and discard the pellets.
- 11.1.7 Assay samples immediately or aliquot and store at -80°C. The sample protein concentration in the extract may be quantified using a protein assay.
- 11.1.8 Dilute samples to desired concentration in 1X Cell Extraction Buffer PTR.

11.2 Preparation of extracts from adherent cells by direct lysis (alternative protocol)

- 11.2.1 Remove growth media and rinse adherent cells 2 times in PBS.
- 11.2.2 Solubilize the cells by addition of chilled 1X Cell Extraction Buffer PTR directly to the plate (use 750 μ L - 1.5 mL 1X Cell Extraction Buffer PTR per confluent 15 cm diameter plate).
- 11.2.3 Scrape the cells into a microfuge tube and incubate the lysate on ice for 15 minutes.
- 11.2.4 Centrifuge at 18,000 x g for 20 minutes at 4°C.
- 11.2.5 Transfer the supernatants into clean tubes and discard the pellets.
- 11.2.6 Assay samples immediately or aliquot and store at -80°C. The sample protein concentration in the extract may be quantified using a protein assay.
- 11.2.7 Dilute samples to desired concentration in 1X Cell Extraction Buffer PTR.

11.3 Preparation of extracts from tissue homogenates

- 11.3.1 Tissue lysates are typically prepared by homogenization of tissue that is first minced and thoroughly rinsed in PBS to remove blood (dounce homogenizer recommended).
- 11.3.2 Homogenize 100 to 200 mg of wet tissue in 500 μ L - 1 mL of chilled 1X Cell Extraction Buffer PTR. For lower amounts of tissue adjust volumes accordingly.
- 11.3.3 Incubate on ice for 20 minutes.
- 11.3.4 Centrifuge at 18,000 x g for 20 minutes at 4°C.
- 11.3.5 Transfer the supernatants into clean tubes and discard the pellets.

- 11.3.6 Assay samples immediately or aliquot and store at -80°C . The sample protein concentration in the extract may be quantified using a protein assay.
- 11.3.7 Dilute samples to desired concentration in 1X Cell Extraction Buffer PTR.

12. PLATE PREPARATION

- The 96 well plate strips included with this kit are supplied ready to use. It is not necessary to rinse the plate prior to adding reagents
- Unused plate strips should be immediately returned to the foil pouch containing the desiccant pack, resealed and stored at 4°C
- For each assay performed, a minimum of two wells must be used as the zero control
- For statistical reasons, we recommend each sample should be assayed with a minimum of two replicates (duplicates)
- Differences in well absorbance or “edge effects” have not been observed with this assay

13. ASSAY PROCEDURE

- **Equilibrate all materials and prepared reagents to room temperature prior to use.**
- **It is recommended to assay all standards, controls and samples in duplicate.**
 - 13.1 Prepare all reagents, working standards, and samples as directed in the previous sections.
 - 13.2 Remove excess microplate strips from the plate frame, return them to the foil pouch containing the desiccant pack, reseal and return to 4°C storage.
 - 13.3 Add 50 µL of all samples and standards to appropriate wells.
 - 13.4 Add 50 µL of the Antibody Cocktail to each well.
 - 13.5 Seal or cover plate and incubate for 1 hour at room temperature on a plate shaker set to 400 rpm.
 - 13.6 Wash each well with 3 x 350 µL 1X Wash Buffer PT. Wash by aspirating or decanting from wells then dispensing 350 µL 1X Wash Buffer PT into each well. Complete removal of liquid at each step is essential for good performance. After the last wash invert the plate and blot it against clean paper towels to remove excess liquid.
 - 13.7 Add 100 µL of TMB Development Solution to each well and incubate for 10 minutes in the dark on a plate shaker set to 400 rpm.

Given variability in laboratory environmental conditions, optimal incubation time may vary between 5 and 20 minutes.

Note: The addition of Stop Solution will change the color from blue to yellow and enhance the signal intensity about 3X. To avoid signal saturation, proceed to the next step before the high concentration of the standard reaches a blue color of O.D.600 equal to 1.0.
 - 13.8 Add 100 µL of Stop Solution to each well. Shake plate on a plate shaker for 1 minute to mix. Record the OD at 450 nm. This is an endpoint reading.

ASSAY PROCEDURE

Alternative to 13.7 – 13.8: Instead of the endpoint reading at 450 nm, record the development of TMB Substrate kinetically. Immediately after addition of TMB Development Solution begin recording the blue color development with elapsed time in the microplate reader prepared with the following settings:

Mode:	Kinetic
Wavelength:	600 nm
Time:	up to 20 min
Interval:	20 sec - 1 min
Shaking:	Shake between readings

Note that an endpoint reading can also be recorded at the completion of the kinetic read by adding 100 μ L Stop Solution to each well and recording the OD at 450nm.

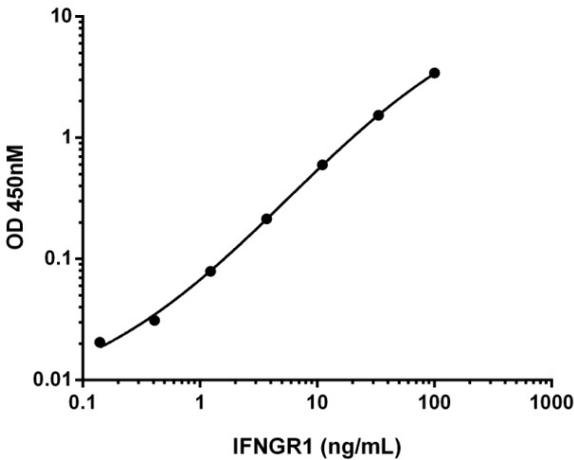
13.9 Analyze the data as described below.

14. CALCULATIONS

Subtract average zero standard from all readings. Average the duplicate readings of the positive control dilutions and plot against their concentrations. Draw the best smooth curve through these points to construct a standard curve. Most plate reader software or graphing software can plot these values and curve fit. A four parameter algorithm (4PL) usually provides the best fit, though other equations can be examined to see which provides the most accurate (e.g. linear, semi-log, log/log, 4 parameter logistic). Interpolate protein concentrations for unknown samples from the standard curve plotted. Samples producing signals greater than that of the highest standard should be further diluted and reanalyzed, then multiplying the concentration found by the appropriate dilution factor.

15. TYPICAL DATA

TYPICAL STANDARD CURVE – Data provided for **demonstration purposes only**. A new standard curve must be generated for each assay performed.



Standard Curve Measurements			
Conc. (ng/mL)	O.D. 450 nm		Mean O.D.
	1	2	
0	0.066	0.066	0.066
0.14	0.074	0.074	0.074
0.41	0.093	0.094	0.093
1.23	0.131	0.130	0.130
3.7	0.241	0.238	0.240
11.1	0.560	0.546	0.553
33.3	1.419	1.415	1.417
100	3.518	3.504	3.511

Figure 1. Example of typical IFNGR1 standard curve. The IFNGR1 standard curve was prepared as described in Section 10. Raw data values are shown in the table. Background-subtracted data values (mean +/- SD) are graphed.

16. TYPICAL SAMPLE VALUES

SENSITIVITY –

The calculated minimal detectable (MDD) dose is 140 pg/mL. The MDD was determined by calculating the mean of zero standard replicates (n=31) and adding 2 standard deviations then interpolating the corresponding concentrations.

RECOVERY –

(Sample spiking in representative sample matrices)

Sample Type	Average % Recovery	Range %
50% Cell Culture Media	84	80 - 94
10% Human Serum	82	72 - 87
10% Human Plasma	78	73 - 85

LINEARITY OF DILUTION –

		Sample Diluent	Conditioned Media	Human Serum	Human Plasma
undiluted	IFNGR1 (ng/mL)	52.7	49.2	45.8	44.8
	Average (%)	100	100	100	100
1:2	IFNGR1 (ng/mL)	28.4	27.5	25.9	26.3
	Average	108	112	113	117
1:4	IFNGR1 (ng/mL)	15.8	15.7	14.5	14.3
	Average	120	128	127	128
1:8	IFNGR1 (ng/mL)	7.3	7.1	7.6	7.1
	Average	111	116	133	126
1:16	IFNGR1 (ng/mL)	3.9	3.7	3.7	3.2
	Average	117	119	129	114

PRECISION –

Mean coefficient of variations of interpolated values from 3 concentrations of Human Heart Homogenates within the working range of the assay.

	Intra-Assay	Inter-Assay
n=	9	3
CV (%)	4.9	6.2

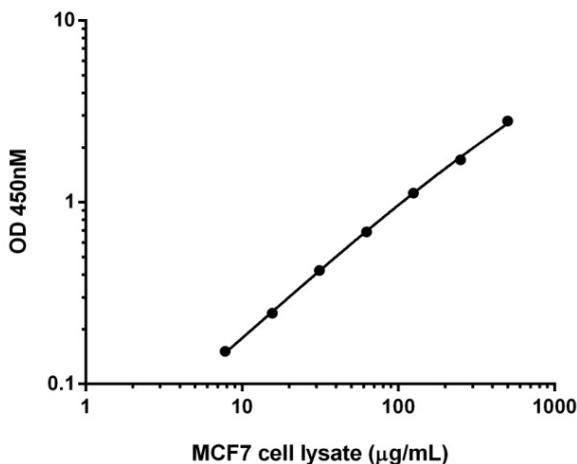


Figure 2. Titration of MCF7 cell lysate within the working range of the assay. Background subtracted data from triplicate measurements are plotted.

17. ASSAY SPECIFICITY

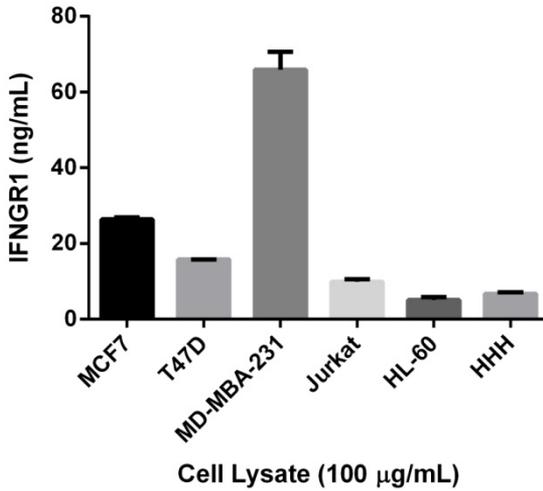


Figure 3. Quantification of IFNGR1 expression in different mammalian cell lines. Interpolated values of IFNGR1 are plotted for the indicated cell lines based on a lysate concentration of 100 μ g/mL.

18. SPECIES REACTIVITY

This kit detects IFNGR1 in human cell and tissue extracts.

Serum and plasma samples have not been tested with this kit.

Please contact our Technical Support team for more information.

19. TROUBLESHOOTING

Problem	Cause	Solution
Difficulty pipetting lysate; viscous lysate.	Genomic DNA solubilized	Prepare 1X Cell Extraction Buffer PTR (without enhancer). Add enhancer to lysate after extraction.
Poor standard curve	Inaccurate Pipetting	Check pipettes
	Improper standard dilution	Prior to opening, briefly spin the stock standard tube and dissolve the powder thoroughly by gentle mixing
Low Signal	Incubation times too brief	Ensure sufficient incubation times; increase to 2 or 3 hour standard/sample incubation
	Inadequate reagent volumes or improper dilution	Check pipettes and ensure correct preparation
	Incubation times with TMB too brief	Ensure sufficient incubation time until blue color develops prior addition of Stop solution
Large CV	Plate is insufficiently washed	Review manual for proper wash technique. If using a plate washer, check all ports for obstructions.
	Contaminated wash buffer	Prepare fresh wash buffer
Low sensitivity	Improper storage of the ELISA kit	Store your reconstituted standards at -80°C, all other assay components 4°C. Keep TMB substrate solution protected from light.
Precipitate in Diluent	Precipitation and/or coagulation of components within the Diluent.	Precipitate can be removed by gently warming the Diluent to 37°C.

20. NOTES

Technical Support

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