ESTRADIOL KITS

PROTOCOL

Part # 62ESTPEG & 62ESTPEH

Test size#: 500 tests (62ESTPEG) and 10,000 tests (62ESTPEH) - assay volume: 20 µL

Revision: 05-July 2021

Store at: 2-8°C (62ESTPEG); -60°C or below (62ESTPEH)

For research use only. Not for use in diagnostic procedures.

ASSAY PRINCIPLE

This kit is intended for the simple and rapid quantification of Native Estradiol produced by cells in buffered solution or in cell culture supernatants and offers a fast alternative to ELISA.

The detection principle of this kit is based on HTRF® technology (Homogeneous Time-Resolved Fluorescence). As shown in Figure 1, Estradiol is detected in a competitive assay by using anti Estradiol antibody labeled with Europium cryptate (donor), and Estradiol labeled with XL665 (acceptor).

When the dyes are in close proximity, the excitation of the donor with a light source (laser or flash lamp) triggers a Fluorescence Resonance Energy Transfer (FRET) towards the acceptor, which in turn fluoresces at a specific wavelength (665 nm). The Estradiol present in the sample competes with the binding between the two HTRF detection solutions and thereby prevents FRET from occurring. The specific signal is inversely proportional to the Estradiol concentration.

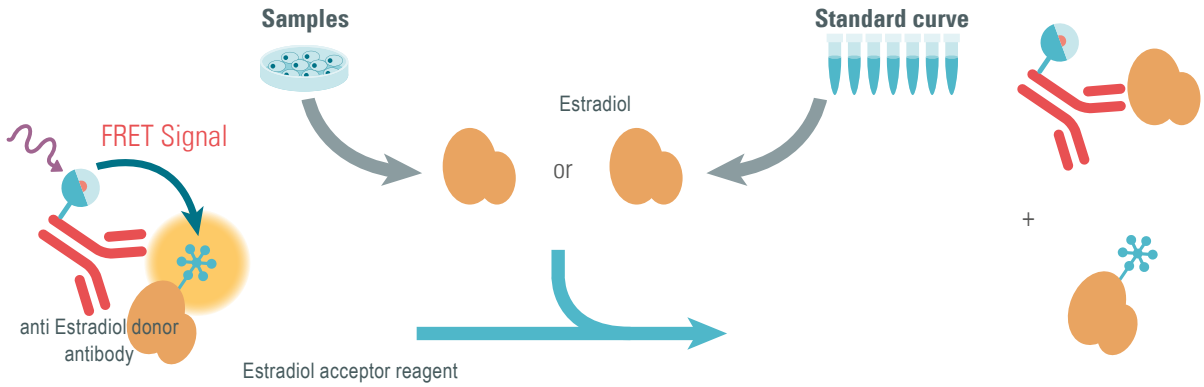
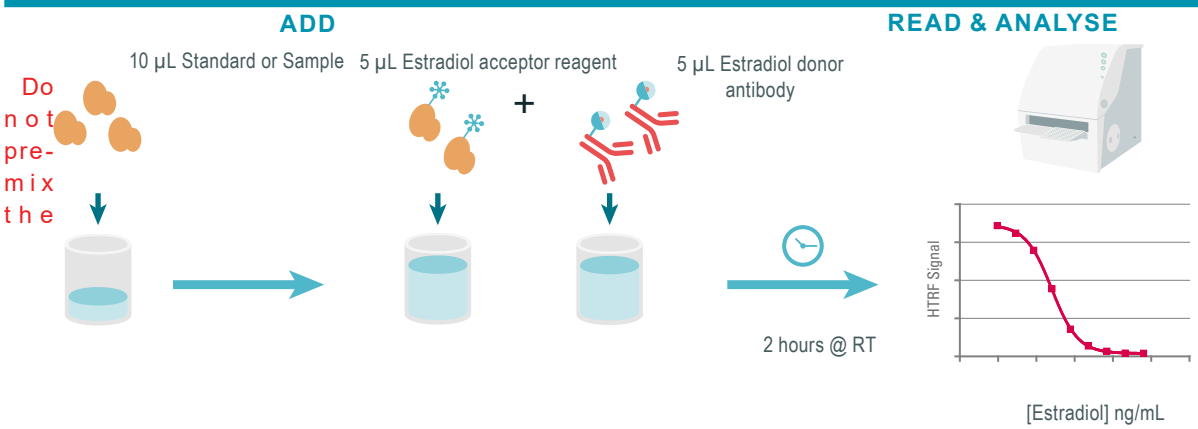


Figure 1: Principle of HTRF Estradiol competitive assay.

PROTOCOL AT A GLANCE



XL665 and Cryptate solutions prior to dispensing.

Make sure to use the set-up for Eu Cryptate.

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MATERIALS PROVIDED:

KIT COMPONENTS	500 TESTS * CAT # 62ESTPEG	10,000 TESTS * CAT # 62ESTPEH
Estradiol Standard Lyophilized	1 vial Concentrated Estradiol	1 vial Concentrated Estradiol
anti Estradiol antibody Eu Cryptate antibody	1 vial Lyophilized	1 vial - 1 mL Frozen - 50X
Estradiol XL665 reagent	1 vial Lyophilized	1 vial - 1 mL Frozen - 50X
Diluent ** ready-to-use	1 vial 20 mL	1 vial 20 mL
Detection buffer *** ready to use	1 vial 1 mL	1 vial 5 mL

* When used as advised, the two available kit sizes will provide sufficient reagents for 500 tests and 10,000 tests respectively in 20 µL final volume.. Assay volumes can be adjusted proportionally to run the assay in 96 or 1536 well microplates.
** Medium like cell culture medium can be an alternative to the diluent.
*** The Detection buffer is used to prepare working solutions of acceptor and donor reagents.

PURCHASE SEPARATELY:

- HTRF®-Certified Reader. Make sure the setup for Eu Cryptate is used.

For a list of HTRF-compatible readers and set-up recommendations, please visit cisbio.com/compatible-readers

- Small volume (SV) detection microplates - Use white plate only..

For more information about microplate recommendations, please visit our website at: cisbio.com/microplates-recommendations

STORAGE AND STABILITY

Store the kit 62ESTPEG at 2-8°C and the kit 62ESTPEH at -60°C or below.

Under proper storage conditions, reagents are stable until the expiry date indicated on the label.

Reagents

If lyophilized, reconstituted reagents, antibodies, and standard stock solutions may be frozen and thawed only once. To avoid freeze/thaw cycles, it is recommended to dispense remaining stock solutions into disposable plastic vials for storage at -60°C or below (Can be stored 7 days at 4°C) .

REAGENT PREPARATION

BEFORE YOU BEGIN:

- It is very important to prepare reagents in the specified buffers. The use of an incorrect diluent may affect reagent stability and assay results.
- Before use, allow Diluent and Detection buffer to warm up at room temperature and homogenize them with a vortex.
- Antibody solutions must be prepared in individual vials and can be mixed prior to dispensing.
- Estradiol standards (for standard curve) must be prepared in diluent or in the same medium as the samples.

TAKE CARE TO PREPARE STOCK AND WORKING SOLUTIONS ACCORDING TO THE DIRECTIONS FOR THE KIT SIZE YOU HAVE PURCHASED.

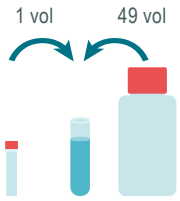
TO PREPARE REAGENT STOCK SOLUTIONS:

500 TESTS KIT - 62ESTPEG		10,000 TESTS KIT - 62ESTPEH	
anti Estradiol antibody Eu Cryptate antibody			
Reconstitute the anti Estradiol antibody Eu Cryptate antibody with 2.5 mL detection buffer. Mix gently. This ready to use 1X stock solution can be frozen and stored at -60°C or below. It can be stored unfrozen 7 days at 4°C.			Thaw the anti Estradiol antibody Eu Cryptate antibody . Mix gently. This 50X stock solution can be frozen and stored at -60°C or below. It can be stored unfrozen 7 days at 4°C.
Estradiol XL665 reagent			
Reconstitute the Estradiol XL665 reagent with 2.5 mL detection buffer. Mix gently. This ready to use 1X stock solution can be frozen and stored at -60°C or below. It can be stored unfrozen 7 days at 4°C.			Thaw the Estradiol XL665 reagent . Mix gently. This 50X stock solution can be frozen and stored at -60°C or below. It can be stored unfrozen 7 days at 4°C.
Estradiol Standard			
Reconstitute the Estradiol Standard with distilled water in order to obtain a 100 ng/mL stock solution. See instructions on vial label for reconstitution volume. Mix gently after reconstitution. This stock solution is stable 2 days at 4°C. It can be frozen and stored at -60°C or below and thawed once only.			Reconstitute the Estradiol Standard with distilled water in order to obtain a 100 ng/mL stock solution. See instructions on vial label for reconstitution volume. Mix gently after reconstitution. This stock solution is stable 2 days at 4°C. It can be frozen and stored at -60°C or below and thawed once only.
Diluent			
The diluent is ready-to-use			The diluent is ready-to-use
Detection buffer			
The Detection buffer is ready-to-use.			The Detection buffer is ready-to-use.

TO PREPARE ANTIBODY WORKING SOLUTIONS:

Each well requires 5 µL anti Estradiol antibody Eu Cryptate antibody and 5 µL Estradiol XL665 reagent.

Prepare the two solutions in separate vials.

500 TESTS KIT - 62ESTPEG		10,000 TESTS KIT - 62ESTPEH	
anti Estradiol antibody Eu Cryptate antibody			
After reconstitution, the Estradiol Eu Cryptate antibody is ready to use.			Dilute 50-fold the stock solution of Estradiol Eu Cryptate antibody with detection buffer e.g. take 1 mL of Eu Cryptate antibody stock solution and add it to 49 mL of detection buffer.
Estradiol XL665 reagent			
After reconstitution, the Estradiol XL665 reagent is ready to use.			Dilute 50-fold the stock solution of Estradiol XL665 reagent with detection buffer e.g. take 1 mL of Eu Cryptate antibody stock solution and add it to 49 mL of detection buffer.
Antibody mix			
Do not pre-mix the XL665 and the Eu Cryptate solutions prior to dispensing.			

TO PREPARE STANDARD WORKING SOLUTIONS:

- Each well requires 10 µL of standard.
- Dilute the standard stock solution serially with diluent
- In order to check for a potential interference effect from your own assay buffer when using the assay for the first time, we highly recommend the parallel preparation of a standard curve in your own supplemented cell culture medium and in diluent .
- In order to counteract any standard sticking, we recommend changing tips between each dilution.

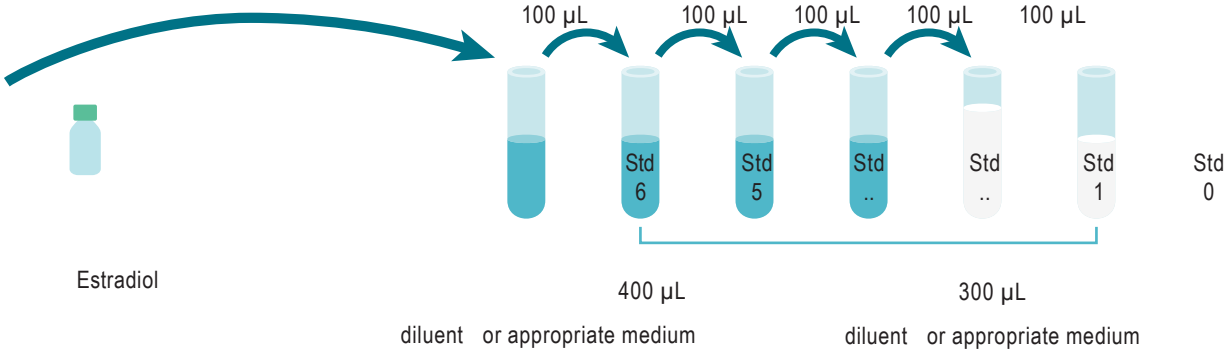
A recommended standard dilution procedure is listed and illustrated below:

Dilute the standard stock solution 5-fold with diluent to prepare high standard (Std 6): e.g. take 100 µL of standard stock solution and add it to 400 µL of diluent . Mix gently.

Use the high standard (Std 6) to prepare the standard curve using 1/4 serial dilutions as follows:

- Dispense 300 µL of diluent in each vial from Std 5 to Std 0.
- Add 100 µL of standard to 300 µL of diluent , mix gently and repeat the 1/4 serial dilution to make standard solutions: std6, std5, std4, std3, std2, std1.

This will create 6 standards for the analyte. Std 0 (Positive control) is diluent or appropriate culture medium alone.



STANDARD	SERIAL DILUTIONS	ESTRADIOL WORKING SOLUTION (ng/mL)
Standard Stock solution	Reconstituted lyophilisate	100
Standard 6	100µl reconstituted standard + 400µL Diluent	20
Standard 5	100 µL standard 6 + 300 µL Diluent	5
Standard 4	100 µL standard 5 + 300 µL Diluent	1.25
Standard 3	100 µL standard 4 + 300 µL Diluent	0.312
Standard 2	100 µL standard 3 + 300 µL Diluent	0.078
Standard 1	100 µL standard 2 + 300 µL Diluent	0.019
Standard 0	300 µL Diluent	0

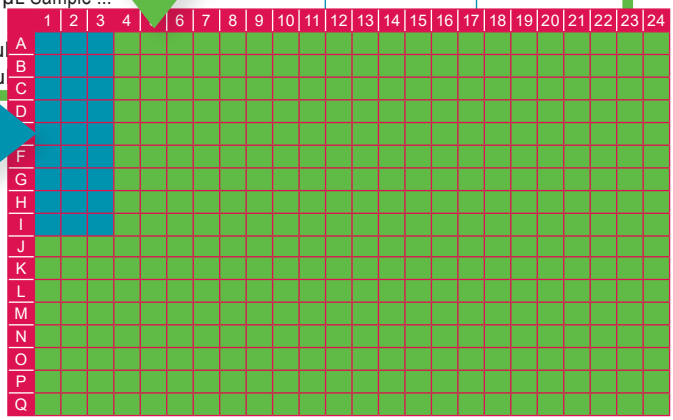
TO PREPARE SAMPLES:

- Each well requires 10 µL of sample.
- Just after their collection, put the samples at 4°C and test them immediately. For later use, samples should be dispensed into disposable plastic vials and stored at -60°C or below. Avoid multiple freeze/thaw cycles.
- Samples with a concentration above the highest standard (Std 6) must be diluted diluent or in your appropriate sample medium.

ASSAY PROTOCOL

	Negative control or Cryptate control	Standard (Std 0 - Std 6)	Samples
Step 1 	Dispense 10 µL of diluent into each negative control well	Dispense 10 µL of each Estradiol standard (Std 0 - Std 6) into each standard well	Dispense 10 µL of each sample into each sample well
Step 2 	Add 5 µL of Detection buffer to all negative control wells	Add 5 µL Estradiol acceptor reagent working solution to all wells	
Step 3 	Add 5 µL Estradiol donor antibody working solution to all wells		
Step 4 	Seal the plate and incubate 2 hours @ RT		
Step 5	Remove the plate sealer and read on an HTRF® compatible reader		

	1	2	3	4	5	6
A	10 µL diluent (Negative control) 5 µL 5 µL Estradiol donor antibody	Repeat Well A1	Repeat Well A1	10 µL Sample 1 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well A4	Repeat Well A4
B	10 µL Std 0 (Positive control) 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well B1	Repeat Well B1	10 µL Sample 2 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well B4	Repeat Well B4
C	10 µL Std 1 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well C1	Repeat Well C1	10 µL Sample 3 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well C4	Repeat Well C4
D	10 µL Std 2 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well D1	Repeat Well D1	10 µL Sample ... 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well D4	Repeat Well D4
E	10 µLStd ... 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well E1	Repeat Well E1	10 µL Sample ... 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well E4	Repeat Well E4
F	10 µL Std ... 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well F1	Repeat Well F1	10 µL Sample ... 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well F4	Repeat Well F4
G	10 µL Std ... 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well G1	Repeat Well G1	10 µL Sample ... 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well G4	Repeat Well G4
H	10 µL Std ... 5 µL Estradiol acceptor reagent 5 µL Estradiol donor antibody	Repeat Well H1	Repeat Well H1	10 µL Sample ... 5 µL 5 µL		



DATA REDUCTION

1. Calculate the ratio of the acceptor and donor emission signals for each individual well.

$$\text{Ratio} = \frac{\text{Signal 665 nm}}{\text{Signal 620 nm}} \times 10^4$$

2. Calculate the % CVs. The mean and standard deviation can then be worked out from ratio replicates.

$$\text{CV (\%)} = \frac{\text{Standard deviation}}{\text{Mean Ratio}} \times 100$$

3. Calculate the % delta F which reflects the signal to background of the assay. The negative control plays the role of an internal assay control. Delta F is used for the comparison of day to day runs of the same assay.

$$\text{delta F (\%)} = \frac{\text{Ratio Standard or sample - Ratio Negative Control}}{\text{Ratio Negative Control}} \times 100$$

For more information about data reduction, please visit http://www.cisbio.com/htrf-ratio-and-data-reduction

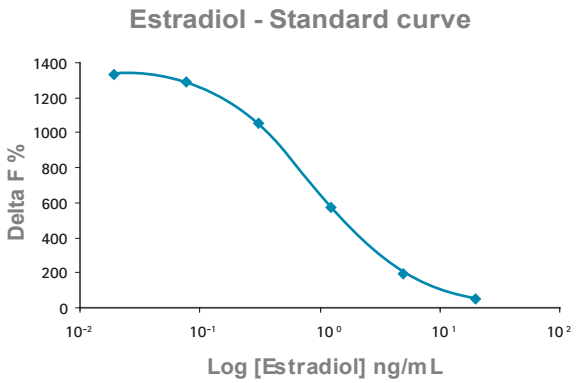
RESULTS

This data must not be substituted for the data obtained in the laboratory and should be considered only as an example.

Results may vary from one HTRF® compatible reader to another.

The assay standard curve is created by plotting delta F% versus the analyte concentration.

	Ratio (1)	CV (2)	Delta F% (3)
Negative control	366	1.5%	
Std 0 – Positive control	5,471	0.4%	1,395%
Std 1 - 0.019 ng/mL	5,250	0.8%	1,334%
Std 2 - 0.078 ng/mL	5,103	1.6%	1,294%
Std 3 - 0.312 ng/mL	4,226	1.2%	1,055%
Std 4 -1.25 ng/mL	2,479	3%	577%
Std 5 - 5 ng/mL	1,073	0.9%	193%
Std 6 - 20 ng/mL	560	4%	53%



ANALYTICAL CHARACTERISTICS

DETECTION LIMIT AND CONVERSION TO NMOL/L

The minimum detectable dose of estradiol is 0.019 ng/ml (dose of mean zero - 2SD). Estradiol concentrations in ng/mL can easily be converted to nmol/l using the following formula : 1 ng/mL = 3.67 nmol/L.

CROSS-REACTIVITY

	Cross-reactivity (%)		Cross-reactivity (%)
Estradiol	100	Tamoxifen	0.007
Estradiol 3 glucuronide	58.1	17 a Estradiol	0.006
Estradiol 3 sulfate	12.3	Progesterone	0.002
17 a Ethynylestradiol	0.65	Estrone 3 sulfate	0.002
Estrone	0.4	Corticosterone	<0.001
Estriol	0.3	Cortisone	<0.001
estosterone	0.2	Cortisol	<0.001
Danazol	0.02		

FOR MORE INFORMATION
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