

## Produktinformation



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# FastELISA™ sST2 (Human) ELISA Kit

Catalog Number KA7067

1 Kit

Version: 01

Intended for research use only

www.abnova.com



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#### Introduction

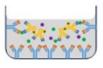
#### **Intended Use**

For research use only. Not intended for diagnostic.

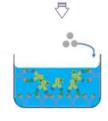
#### **Principle of the Assay**

The test principle applied in this kit is Sandwich enzyme immunoassay. The microtiter plate provided in this kit has been pre-coated with an antibody specific to Human sST2, and the Human sST2 standard plate wells that pre-coated using protein-related techniques are provided separately. Standard/Sample Diluent Buffer or samples are added to the appropriate microtiter plate wells, then added a HRP-conjugated antibody specific to Human sST2. After TMB substrate solution is added, only those wells that contain Human sST2 and HRP-conjugated antibody will exhibit a change in color. The enzyme-substrate reaction is terminated by the addition of sulphuric acid solution and the color change is measured spectrophotometrically at a wavelength of 450nm  $\pm$  10nm. The concentration of Human sST2 in the samples is then determined by comparing the OD of the samples to the standard curve.

#### **Assay Procedure Summary**



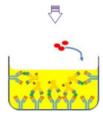
 After the kit is equilibrated at room temperature, add 50 μL Standard/Sample Diluent Buffer to each Standard well, and add 50 μL sample to the sample well. Immediately add 50 μL 1x HRP Conjugate Antibody Working Solution to each well, and incubate at 37 °C on Microplate oscillator for 60 minutes.



2. Discard the liquid in the plate.

Add 200 µL 1× Wash Buffer to each well, and wash the plate 5 times.

After pat it dry against clean absorbent paper, add 90 µL TMB Substrate Solution to each well, and incubate at 37°C for 20 minutes in the dark.



3. Add 50 µL Stop Solution to each well, shake plate on a plate shaker for 1 minute to mix.

Record the OD at 450 nm immediately and calculate the results.



#### General Information

#### **Materials Supplied**

#### List of components

Component	Amount	Storage condition	
Pre-Coated Microplate	8 x 12 strips	4°C / -20°C	
Standard Microplate	8 x 2 strips	4°C / -20°C	
HRP Conjugate Antibody (100x)	70 μL	4°C / -20°C (store in the dark)	
Standard/Sample Diluent Buffer	24 mL	4°C / -20°C	
HRP Conjugate Diluent	10 mL	4°C / -20°C	
Wash Buffer (25x)	24 mL	4°C / -20°C	
TMB Substrate Solution	12 mL	4°C / -20°C (store in the dark)	
Stop Reagent	7 mL	4°C / -20°C	
Plate Covers	2 pcs	4°C / -20°C	

#### Materials Required but not Supplied

- $\checkmark$  Microplate reader capable of measuring absorbance at 450  $\pm$  10 nm
- √ High-speed centrifuge
- ✓ Electro-heating standing-temperature cultivator and Microplate oscillator
- ✓ Absorbent paper
- ✓ Double distilled water or deionized water
- ✓ Single or multi-channel pipettes with high precision and disposable tips
- ✓ Precision pipettes to deliver 2 µL to 1 mL volumes

#### **Storage Instruction**

- ✓ If the kit is opened, store Standard Microplate at -20°C, the rest reagents at 4°C. If the kit is not used up in 1 week, please store Standard Microplate, Pre-Coated Microplate and HRP Conjugate Antibody at -20°C, the rest reagents at 4°C, please used up within 6 months.
  - \*If the kit is not opened, store the whole kit: 4°C (short time storage, valid for 6 months); -20°C (long-term storage, valid for 1 year). Avoid repeated freeze-thaw cycles.
- ✓ Do not use the kit beyond the expira.
- ✓ If the whole kit is stored at -20°C, place the kit at 4°C the day before the experiment.
- ✓ After opening the package, please check that all components are complete.



✓ The cap must be tightened to prevent evaporation and microbial contamination. The reagents volume is slightly more than the volume marked on labels, please use accurate measuring equipment and do not pour directly into the vial.

All kit components have been formulated and quality control tested to function successfully. Do not mix or substitute reagents or materials from other kits, detection effect of the kit will not be guaranteed if utilized separately or substituted.

#### **Precautions for Use**

- 1. This kit is only used for lab research and development and should not be used for human or animals.
- 2. Reagents should be regarded as hazardous substances and should be handled carefully and correctly.
- 3. Gloves, lab coats, and goggles should always be worn to avoid skin and eyes coming into contact with Stop Solution and TMB. In case of contact, wash thoroughly with water.



#### **Assay Protocol**

#### **Reagent Preparation**

- 1. Bring all kit components and samples to room temperature (18-25°C) before use. Make sure all components are dissolved and mixed well before using the kit.
- 2. If the kit will not be used up in 1 time, please only take out strips and reagents for present experiment, and save the remaining strips and reagents as specified.
- 3. Dilute the 25× Wash Buffer into 1× Wash Buffer with double-distilled Water.
- 4. Samples are diluted with Standard & Sample Diluent according to pre-test or sample dilution Proposal.
- HRP Conjugate Antibody (1x): Briefly spin or centrifuge the stock HRP Conjugate Antibody before use. Before the experiment, the dosage required for the experiment (50 μL/ well, the actual configured total amount must be 50-100μL greater than the calculated value) was calculated, Dilute HRP Conjugate Antibody to the working concentration 100-fold with HRP Conjugate Diluent. The dilution principle is to take 1 μL concentrated HRP conjugated antibody and add it to 99 μL HRP Conjugate Diluent and mix well.
- TMB Substrate Solution:
   Aspirate the needed dosage of the solution with sterilized tips and do not dump the residual solution into the vial again.

#### Notes:

- 1. After receive the kit, please store the reagents according to the instructions. The plates can be disassembled to single strips. Please use it in batches on demands.
- 2. The test tubes, pipette tips and reagents used in the experiment are all disposable and are strictly prohibited from being reused; otherwise, the experiment results will be affected. Kit reagents of different batches cannot be mixed (except TMB, Washing Buffer and Stop Reagent).
- 3. The standard strips are provided separately that contains white solid standard. Re-seal the unused standard slats and place them at -20°C for use as soon as possible. Place the standard slats upwards as far as possible. When opening the cover, check whether there is a solid standard on the plug. If so, the solid standard needs to be moved into the corresponding well with a pipette.
- 4. If the Standard/Sample Diluent Buffer is added to the standard well, but the white solid standard on the wall is not dissolved, it is necessary to flush the diluent in the appropriate well with a pipette to completely dissolve the standard product.
- 5. HRP Conjugate Antibody is small in volume and may be scattered in various parts of the tube during transportation. Please centrifuge at 1000 × g for 1 minute before use. Then, carefully pipette 4-5 times to mix the Solution. Please configure the HRP Conjugate Antibody Working Solution according to the required amount, and use the corresponding Dilution Solution, cannot be mixed used.
- 6. When incubating protein and HRP conjugate antibody, it is necessary to use a micro-plate oscillator to oscillate the Microplate. If the plate is not oscillated, the reaction will be inadequate, and the OD value will



- decrease overall. The amplitude should not exceed half the height of the well, Too much oscillation would causes the background to rise.
- 7. Bring all reagents to room temperature (18-25°C) before use. If crystals form in the concentrate (25×), it is a normal phenomenon. Heat it to room temperature (the heating temperature should not exceed 40°C), gently Mix until crystals are completely dissolved.
- 8. Firstly, add the Standard/Sample Diluent Buffer to the required standard wells to dissolve the standard, and then add sample to the sample wells. The sample addition needs to be rapid. Each sample addition should preferably be controlled within 10 minutes. To ensure experimental accuracy, it is recommended to test duplicate wells, and when pipetting reagents, keep a consistent order of additions from 1 well to another, this will ensure the same incubation time for all wells.
- 9. During the washing process, the residual washing liquid in the reaction well should be patted dry on absorbent paper. Do not put the paper directly into the reaction well to absorb water. Before reading, pay attention to remove the residual liquid and fingerprints at the bottom, so as not to affect the microplate reader reading.
- 10. TMB Substrate Solution is light-sensitive, avoid prolonged exposure to light. Dispense the TMB Substrate Solution within 15 minutes following the washing of the microtiter plate. In addition, avoid contact between TMB Substrate Solution and metal to prevent color development. TMB is contaminated if it turns blue color before use and should be discarded. TMB is toxic, avoid direct contact with hands.
- 11. Bacterial or fungal contamination of either samples or reagents or cross-contamination, between reagents may cause erroneous results.



#### **Sample Preparation & Storage**

Equilibrate all materials and prepared reagents to room temperature prior to use. Prior to use, mix all reagents thoroughly taking care not to create any foam within the vials.

The user should calculate the possible amount of the samples used in the whole test. Please reserve sufficient samples in advance.

Please predict the concentration before assaying. If values for these are not within the range of the Standard curve, users must determine the optimal sample dilutions for their particular experiments.

#### Serum

Samples should be collected into a serum separator tube. After clotting for 2 hours at room temperature or overnight at 4°C, and then centrifuging at 1000 × g for 20 minutes. Assay freshly prepared serum immediately or store samples in aliquot at -20°C or -80°C for later use. Avoid repeated freeze-thaw cycles.

#### Plasma

Collect plasma using EDTA or heparin as an anticoagulant. Centrifuge samples at 1000 × g and 2-8°C for 15 minutes within 30 minutes of collection. Remove plasma and assay immediately or store samples in aliquot at -20°C or -80°C for later use. Avoid repeated freeze-thaw cycles.

#### • Tissue homogenates

The preparation of tissue homogenates will vary depending upon tissue type.

- 1. Rinse the tissues in pre-cooled PBS to completely remove excess blood, and weigh them before homogenization.
- 2. Mince the tissues to small pieces and homogenized them in fresh lysis buffer (different lysis buffer needs to be chosen based on subcellular location of the target protein) (PBS can be used as the lysis buffer of most tissues) (w:v = 1:9, e.g. 900 μL lysis buffer is added in 100 mg tissue sample) with a glass homogenizer on ice (micro tissue grinders, too).
- 3. Ultrasound the obtained suspension with an ultrasonic cell disrupter until the solution is clear.
- 4. Then, centrifuge the homogenates for 5 minutes at 10000 × g and collect the supernatant and assay immediately or store in aliquots at ≤ -20°C.

Note: Tissue homogenates are recommended to be tested for protein concentration at the same time to obtain a more accurate concentration of the test substance per mg of protein. For protein detection, you can purchase our product: BC016, BCA Protein concentration determination kit.

#### Cell lysates

Cells need to be lysed before assaying according to the following directions.

- 1. Adherent cells should be washed by pre-cooled PBS gently, and then be detached with trypsin, and collect them by centrifugation at 1000 × g for 5 minutes (suspension cells can be collected by centrifugation directly).
- 2. Wash cells 3 times in pre-cooled PBS.
- 3. Then, resuspend the cells in fresh lysis buffer with concentration of 10 7 cells/mL. If it is necessary,



the cells could be subjected to ultrasonication until the solution is clear.

4. Centrifuge at 1500 × g for 10 minutes at 2-8°C to remove cellular debris. Assay immediately or store in aliquots at ≤ -20°C.

#### Urine

Collect the first urine of the day (mid-stream) and discharge it directly into a sterile container. Centrifuge to remove particulate matter, assay immediately or aliquot and store at ≤ -20°C. Avoid repeated freeze-thaw cycles.

#### Saliva

Collect saliva using a collection device or equivalent. Centrifuge samples at  $1000 \times g$  at 2-8°C for 15 minutes. Remove particulates and assay immediately or store samples in aliquot at  $\leq -20$ °C. Avoid repeated freeze-thaw cycles.

#### Feces

Dry feces were collected as much as possible, weighing more than 50 mg. The feces were washed three times with PBS (w:v = 1:9, e.g. 900  $\mu$ L lysis buffer is added in 100 mg feces), sonicated (or mashed) and centrifuged at 5000×g for 10 minutes, where the supernatant was collected for testing.

- Cell culture supernatants and other biological fluids
   Centrifuge samples at 1000 × g for 20 minutes. Collect the supernatant and assay immediately or store samples in aliquot at -20°C or -80°C for later use. Avoid repeated freeze-thaw cycles.
- Cerebrospinal fluid (CSF)
   Remove particulates by centrifugation and assay immediately or aliquot and store samples at ≤-20°C.
   Avoid repeated freeze-thaw cycles.

#### √ Sample Dilution Proposal

Normal Human serum and plasma samples are recommended for 1:5 testing.

#### Notes:

- Samples to be used within 5 days may be stored at 4°C, otherwise samples must be stored at -20°C (≤ 1 month) or -80°C (≤ 2 months) to avoid loss of bioactivity and contamination. Avoid repeated freeze-thaw cycles.
- 2. The sample should be clear and transparent, and the suspended matter should be removed by centrifugation. Sample hemolysis will influence the result, so it should not be used.
- 3. When performing the assay, bring samples to room temperature.
- 4. If the concentration of the test material in your sample is higher than that of the Standard product, please make the appropriate multiple dilutions according to the actual situation (it is recommended to do preliminary experiment to determine the dilution ratio.



#### **Assay Procedure**

Before the experiment starts, all reagents should be balanced to room temperature, and all reagents should be prepared in advance. When diluting the reagent or sample, it is necessary to mix, and try to avoid foaming when mixing. If the sample concentration is too high, dilute it with a sample diluent to make the sample conform to the detection range of the kit.

- 1. Place the labeled standard strip in the frame of the Microplate, add 50µL Standard/Sample Diluent Buffer to each standard well, add 50µL sample to the sample wells (if the sample needs to be diluted, please refer to the sample dilution suggestion), pay attention to no bubbles, add the sample to the bottom of the Microplate well when adding the sample, do not touch the wall of the well. Then, each well was immediately added with 50µL HRP conjugate antibody working solution (*Note: The tips don't touch the liquid in the wells when adding HRP conjugate antibody working solution*), cover the microplate with Plate Cover and oscillate the Microplate with the oscillator at 500 RPM (other horizontal oscillators should adjust their own speed to ensure that the solution per well did not exceed half height of the wells and could be mixed), and incubated at 37°C for 60 minutes.
- 2. Discard the liquid in the wells and wash the plate 5 times. Wash each well with 200µL of washing solution, soak for 1-2 minutes each time, and shake off the liquid in the plate (or wash the plate with a plate washer). After the last wash, pat the plate dry on absorbent paper.
- 3. Add 90 μL of TMB Substrate Solution to each well. Cover with a new Plate Cover. Incubate for 20 minutes at 37°C (Don't exceed 30 minutes) in the dark. The liquid will turn blue by the addition of TMB Substrate Solution. Preheat the Microplate Reader for about 15 minutes before OD measurement.
- 4. Add 50 μL of Stop Reagent to each well. The liquid will turn yellow by the addition of Stop Reagent. Mix the liquid by tapping the side of the plate. If color change does not appear uniform, gently tap the plate to ensure thorough mixing. The insertion order of the Stop Reagent should be the same as that of the TMB Substrate Solution.
- 5. Wipe off any drop of water and fingerprint on the bottom of the plate and confirm there is no bubble on the surface of the liquid. Then, run the microplate reader and conduct measurement at 450 nm immediately.

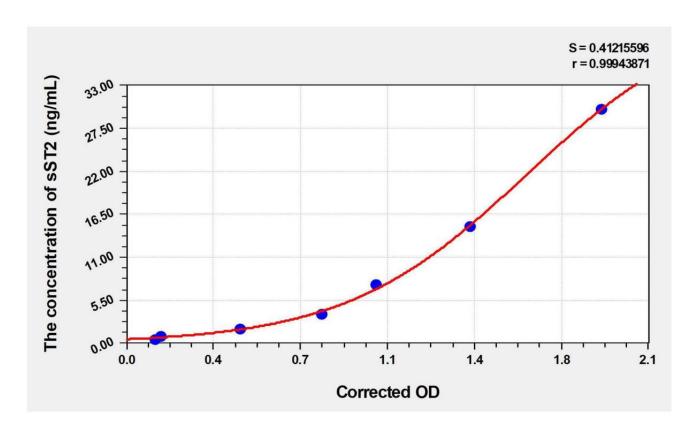


#### **Data Analysis**

#### **Calculation of Results**

Average the duplicate readings for each Standard, Control, and Samples and subtract the average zero Standard optical density. Construct a Standard curve with the Human sST2 concentration on the y-axis and absorbance on the x-axis, and draw a best fit curve through the points on the graph. If samples have been diluted, the concentration read from the Standard curve must be multiplied by the dilution factor. Using some plot software, for instance, curve expert.

Concentration (ng/mL)	OD	Corrected OD
30	2.035	2.035
15	1.502	1.502
7.5	1.115	1.115
3.75	0.892	0.892
1.88	0.563	0.563
0.94	0.239	0.239
0.47	0.213	0.213
0	0.096	0.096



Note: this graph is for reference only



- Sensitivity: 0.25 ng/mL

- Detection range: 0.47-30 ng/mL

- Specificity: This assay has high sensitivity and excellent specificity for detection of Human sST2. No significant cross-reactivity or interference between Human sST2 and analogues was observed.

Please refer to the outer packaging label of the kit for the specific shelf life.

#### ✓ Precision:

Intra-assay Precision (Precision within an assay): CV% < 8%

Three samples of known concentration were tested twenty times on 1 plate to assess intra-assay precision. Inter-assay Precision (precision between assays): CV% < 10%

Three samples of known concentration were tested in forty separate assays to assess inter-assay precision.

#### ✓ Recovery

Matrices listed below were spiked with certain level of recombinant Human sST2 and the recovery rates were calculated by comparing the measured value to the expected amount of Human sST2 in samples.

Matrix	Recovery Range (%)	Average Recovery (%)	
Serum (n=5)	95-108	101	
EDTA plasma (n=5)	80-95	87	
Heparin plasma (n=5)	82-97	89	

#### ✓ Linearity

The linearity of the kit was assayed by testing samples spiked with appropriate concentration of Human sST2 and their serial dilutions. The results were demonstrated by the percentage of calculated concentration to the expectd.

Sample	Serum (n=5)	EDTA plasma (n=5)	Heparin plasma (n=5)
1:2	90-99%	88-99%	87-96%
1:4	83-97%	81-93%	82-95%
1:8	81-103%	89-97%	93-102%
1:16	89-101%	85-94%	87-96%



### Resources

## **Analysis of Common Problems and Causes of ELISA Experiment**

## High background/non-specific staining

Description of	Possible reason	Recommendations and precautions
results		·
After termination,	The yellowing of the whole plate	Check the components and lot numbers of the
the whole plate	may be caused by wrong	reagents before the experiment, and confirm
results show a	addition of other reagents	that all components belong to the corresponding
uniform yellow		kit. Reagents from different kits or different lot
or light color; or the		numbers cannot be mixed.
Standard	ELISA plate was not washed	Make sure that the same amount of Washing
curve is linear but	sufficiently	Solution is added to each microwell during the
the background is		washing process. After washing, press the ELISA
too high		plate firmly on the absorbent paper to remove the
		residual buffer
	Incubation time too long	Please strictly follow the steps of the manual
	Streptavidin-HRP contaminates	When absorbing different reagents, the tips
	the tip and TMB container or	should be replaced. When configuring different
	positive control contaminates	reagent components, different storage vessels
	the Pre-coated Microplate	should be used. Please use a pipette during
		operation.
	Streptavidin-HRP concentration	Check whether the concentration calculation is
	too high	correct or use after further dilution.
	Substrate exposure or	Store in the dark at all times before adding
	contamination prior to use	substrate.
	Color development time is too	Please strictly follow the steps of the manual.
	long	
	The wrong filter was used when	When TMB is used as the substrate, the
	the absorbance value was read	absorbance should be read at 450 nm.

## NO color plate

Description of results	Possible reason	Recommendations and
		precautions
After the color development	Mixed use of component reagents	Please read labels clearly when
step, all wells of the ELISA plate		preparing or using
are colorless; the positive	In the process of plate washing	Confirm that the container holding
control is not obvious	and sample addition, the enzyme	the ELISA plate does not contain



marker is contaminated and	enzyme inhibitors (such as NaN3,
inactivated, and loses its ability to	etc.), and confirm that the
catalyze the color developing	container for preparing the Wash
agent	Solution has been washed.
Missing a reagent or a step	Review the manual in detail and
	strictly follow the operating steps

Light color		
Description of results	Possible reason	Recommendations and precautions
The Standard is normal, the	The sample uses NaN₃	Samples cannot use NaN₃
color of the sample is light	preservative, which inhibits the	
	reaction of the enzyme	
	The sample to be tested may	In case of doubt, please test again.
	not contain strong positive	
	samples, so the result may be	
	normal	
The visual result is normal,	Wrong filter used for	When TMB is used as the substrate, the
but the reading value of the	absorbance reading	absorbance should be read at 450 nm.
microplate reader is low		
The color of all the plate is	No microplate oscillator is sed	A microplate oscillator is required
light		
	Insufficient incubation time	Timer accurate timing
	Insufficient color reaction	Usually 15 - 30 minutes
	The number of washings	Reduce the impact of washing, dilute the
	increases, and the dilution	concentrated lotion and washing time
	ratio of the concentrated lotion	according to the manual, and accurately
	does not meet the	record the washing times and dosage.
	requirements	
All wells, including	Distilled water quality problem	The prepared lotion must be tested to see
Standard and		if the pH value is neutral.
Samples, are lighter in	In the process of plate washing	Confirm that the container holding the
color	and sample addition, the	ELISA plate does not contain enzyme
	enzyme marker is	inhibitors (such as NaN3, etc.), confirm
	contaminated and inactivated,	that the container for preparing the
	and loses its ability to catalyze	Washing Solution has been washed, and
	the color developing agent.	confirm that the purified water for preparing
		the Washing Solution meets the
		requirements and is not contaminated.
	The kit has expired or been	Please use it within the expiration and
	I	ı



	improperly stored	store it in accordance with the storage		
	improperty decrea	conditions recommended in the manual to		
		avoid contamination.		
	Decreate and consider an act			
	Reagents and samples are not	All reagents and samples should be		
	equilibrated before use	equilibrated at room temperature for about		
		30 minutes.		
	Insufficient suction volume of	To calibrate the pipette, the tips should be		
	the pipette, too fast discharge	matched, each time the tips should fit		
	of pipetting suction, too much	tightly, the pipetting should not be too fast,		
	liquid hanging on the inner wall	and the discharge should be complete.		
	of the tip or the inner wall is	The inner wall of the tips should be clean,		
	not clean.	and it is best to use it once.		
	Incubation temperature	Keep the temperature constant to avoid		
	constant temperature effect is	the local temperature being too high or too		
	not good	low		
	When adding liquid, too much	When adding liquid, the tip should try to		
	remains on the medial wall of	add liquid along the bottom of the medial		
	wells	wall of wells without touching the bottom of		
		the hole.		
	Reuse of consumables	The tips should be replaced when different		
		reagents are drawn, and different storage		
		vessels should be used when configuring		
Poor repeatability		different reagent components.		
		Be careful when operating, be careful not		
		to touch the bottom and wipe the bottom of		
		the microplate to remove dirt or		
	The bottom of the microwell is	fingerprints.		
	scratched or there is dirt	Technical repetition of the same sample for		
		3 times, including more than 2 approximate		
		values.		
	Cross-contamination during	Try to avoid cross-contamination when		
The color of	sample addition	adding samples		
The color of	Cross-contamination from	When washing the plates by hand, the first		
plate is chaotic	manual plate washing	3 injections of the lotion should be		
and irregular		discarded immediately, and the soaking		
		time should be set for the next few times to		
		reduce cross-contamination.		
	Cross-contamination	Use a suitable absorbent paper towel		
	when clapping	when clapping the plate, do not pat		



The color of plate is chaotic and irregular	The liquid filling head of the plate washer is blocked, resulting in unsatisfactory liquid addition or large residual amount of liquid suction, resulting in the color of plate is chaotic and irregular Incomplete centrifugation of the sample, resulting in coagulation in the reaction well or interference of sediment or residual cellular components	irrelevant substances into the well of the plate, and try not to pat in the same position to avoid cross-contamination.  Unblock the liquid addition head, so that each well is filled with washing liquid when washing the plate and the residual amount should be small when aspirating liquid.  Serum plasma should be fully centrifuged at 3000 rpm for more than 6 minutes
	The sample is stored for too long time, resulting in contamination.  Incorrect preparation of	Samples should be kept fresh or stored at low temperature to prevent contamination  Please configure according to the protocol
	Washing Solution or direct misuse of concentrated Washing Solution	



### **Plate Layout**

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