ab133113 – PPAR (alpha, delta, gamma) Transcription Factor Assay Kit

Instructions for Use

For the detection of specific transcription factor DNA binding activity in nuclear extracts and whole cell lysates.

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

ab133113 is a non-radioactive, sensitive method for detecting specific transcription factor DNA binding activity in nuclear extracts and whole cell lysates. A 96-well enzyme-linked immunosorbent assay (ELISA) replaces the cumbersome radioactive electrophoretic mobility shift assay (EMSA). A specific double stranded DNA (dsDNA) sequence containing the PPAR response element is immobilized onto the bottom of wells of a 96-well plate (see Figure 1). PPARs contained in a nuclear extract, bind specifically to the PPAR response element. PPAR alpha, delta, or gamma are detected by addition of specific primary antibodies directed against the individual PPARs. A secondary antibody conjugated to HRP is added to provide a sensitive colorimetric readout at 450 nm. ab133113 comes with a single plate that measures all three isoforms of PPAR alpha, delta, and gamma. There are enough reagents for one-third of a plate for each isoform.
Figure 1. Schematic of the Transcription Factor Binding Assay
2. Background

Peroxisome Proliferator-activated Receptors (PPARs) are ligand-activated transcription factors belonging to the large superfamily of nuclear receptors. They are activated by a variety of fatty acids and fatty acid derivatives such as prostaglandins and leukotrienes. PPARs play pivotal roles in the regulation of lipid metabolism and homeostasis and are important indirect as well as direct regulators of cellular insulin sensitivity. There are three major PPAR isotypes; PPAR alpha, PPAR gamma, and PPAR delta/beta which all bind to PPAR responsive elements (PPRE’s) as heterodimers with RXR, another member of the nuclear receptor superfamily. PPAR alpha primarily activates genes encoding proteins involved in fatty acid oxidation, while PPAR gamma primarily activates genes directly involved in lipogenic pathway and insulin signaling. Members of the PPAR family are important direct targets of many antidiabetic and hypolipidemic drugs.
3. Components and Storage

Kit components may be stored at -20°C prior to use. For long-term storage, the positive control should be thawed on ice, aliquoted at 20 µl/vial, and stored at -80°C. After use we recommend each kit component be stored according to the temperature listed below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transcription Factor Binding Assay Buffer (4X)</td>
<td>1 vial</td>
<td>4°C</td>
</tr>
<tr>
<td>Transcription Factor Reagent A</td>
<td>1 vial</td>
<td>-20°C</td>
</tr>
<tr>
<td>Transcription Factor Complete PPAR alpha Positive Control</td>
<td>1 vial</td>
<td>-80°C</td>
</tr>
<tr>
<td>Transcription Factor Complete PPAR delta Positive Control</td>
<td>1 vial</td>
<td>-80°C</td>
</tr>
<tr>
<td>Transcription Factor Complete PPAR gamma Positive Control</td>
<td>1 vial</td>
<td>-80°C</td>
</tr>
<tr>
<td>Transcription Factor Antibody Binding Buffer (10X)</td>
<td>1 vial</td>
<td>4°C</td>
</tr>
<tr>
<td>Transcription Factor Complete PPAR alpha Primary Antibody</td>
<td>1 vial</td>
<td>-20°C</td>
</tr>
<tr>
<td>Item</td>
<td>Quantity</td>
<td>Storage</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>----------</td>
<td>---------</td>
</tr>
<tr>
<td>Transcription Factor Complete PPAR delta Primary Antibody</td>
<td>1 vial</td>
<td>-20°C</td>
</tr>
<tr>
<td>Transcription Factor Complete PPAR gamma Primary Antibody</td>
<td>1 vial</td>
<td>-20°C</td>
</tr>
<tr>
<td>Wash Buffer Concentrate (400X)</td>
<td>1 vial</td>
<td>4°C</td>
</tr>
<tr>
<td>Polysorbate 20</td>
<td>1 vial</td>
<td>RT</td>
</tr>
<tr>
<td>Transcription Factor PPAR Competitor dsDNA</td>
<td>1 vial</td>
<td>-20°C</td>
</tr>
<tr>
<td>Transcription Factor Goat Anti-Rabbit HRP Conjugate</td>
<td>1 vial</td>
<td>-20°C</td>
</tr>
<tr>
<td>Transcription Factor PPAR 96-Well Strip Plate</td>
<td>1 plate</td>
<td>4°C</td>
</tr>
<tr>
<td>96-Well Cover Sheet</td>
<td>1 cover</td>
<td>RT</td>
</tr>
<tr>
<td>Transcription Factor Developing Solution</td>
<td>1 vial</td>
<td>4°C</td>
</tr>
<tr>
<td>Transcription Factor Stop Solution</td>
<td>1 vial</td>
<td>4°C</td>
</tr>
</tbody>
</table>
Materials Needed But Not Supplied

- A plate reader capable of measuring absorbance at 450 nm.
- Adjustable pipettes and a repeat pipettor.
- A source of UltraPure water or HPLC-grade water are acceptable.
- 300 nM dithiothreitol (DTT).
- Buffers for preparation of nuclear extracts

Note: The components in each kit lot have been quality tested.
4. Pre-Assay Preparation

A. Sample Buffer Preparation

PBS (10X)

Dissolve 80 g NaCl, 2.0 g KCl, 14.4 g Na$_2$HPO$_4$, and 2.4 g KH$_2$PO$_4$ in 800 ml distilled H$_2$O.

Adjust pH to 7.4 with HCl

Adjust volume to 1 L with H$_2$O

PBS (1X)

Dilute 100 ml of 10X stock with 900 ml distilled H$_2$O

Nuclear Extraction Phosphatase Inhibitor Cocktail (50X)

1 M NaF, 0.05 M β-glycerophosphate, and 0.05 M Na$_3$OV$_4$

Store at -80°C

PBS/Phosphatase Inhibitor Solution

Add 200 μl of 50X Phosphatase Inhibitor Solution to 10 ml of 1X PBS, mix well, and keep on ice. Make fresh daily.
Nuclear Extraction Protease Inhibitor Cocktail (100X)

10 mM AEBSF

0.5 mM Bestatin

0.2 mM Leupeptin Hemisulfate Salt

0.15 mM E-64

0.1 mM Pepstatin A

0.008 mM Aprotinin from Bovine Lung Made in DMSO, store at -80°C

Nuclear Extraction Hypotonic Buffer (10X)

100 mM HEPES, pH 7.5, containing 40 mM NaF, 100 μM Na2MoO4, and 1 mM EDTA. Store at 4°C

Complete Extraction Hypotonic Buffer (1X)

Prepare as outlined in Table 1. The phosphatase and protease inhibitors lose activity shortly after dilution; therefore any unused 1X Complete Extraction Hypotonic Buffer should be discarded.
Complete Extraction Hypotonic Buffer (1X)

Prepare as outlined in Table 1.

<table>
<thead>
<tr>
<th>Reagent</th>
<th>150 mm plate ~1.5 x 10^7 cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypotonic Buffer (10X)</td>
<td>100 µl</td>
</tr>
<tr>
<td>Phosphatase Inhibitors (50X)</td>
<td>20 µl</td>
</tr>
<tr>
<td>Protease Inhibitors (100X)</td>
<td>10 µl</td>
</tr>
<tr>
<td>Distilled Water</td>
<td>870 µl</td>
</tr>
<tr>
<td>Total Volume</td>
<td>1000 µl</td>
</tr>
</tbody>
</table>

Table 1. Preparation of Complete Extraction Hypotonic Buffer.

Nonidet P-40 Assay Reagent (10%)

Nonidet P-40 or suitable substitute at a concentration of 10% (v/v) in H_2O. Store at room temperature

Nuclear Extraction Buffer (2X)

20 mM HEPES, pH 7.9, containing, 0.2 mM EDTA, 3 mM MgCl_2, 840 mM NaCl, and 20% glycerol (v/v). Store at 4°C
Complete Nuclear Extraction Buffer (1X)

Prepare as outlined in Table 2. Some of the phosphatase and protease inhibitors lose activity shortly after dilution; therefore any remaining 1X Extraction Buffer should be discarded.

<table>
<thead>
<tr>
<th>Reagent</th>
<th>150 mm plate ~1.5 x 10^7 cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear Extraction Buffer (2X)</td>
<td>75 µl</td>
</tr>
<tr>
<td>Protease Inhibitors (100X)</td>
<td>1.5 µl</td>
</tr>
<tr>
<td>Phosphatase Inhibitors (50X)</td>
<td>3.0 µl</td>
</tr>
<tr>
<td>DTT (10 mM)</td>
<td>15 µl</td>
</tr>
<tr>
<td>Distilled Water</td>
<td>55.5 µl</td>
</tr>
<tr>
<td>Total Volume</td>
<td>150 µl</td>
</tr>
</tbody>
</table>

Table 2. Preparation of Complete Nuclear Extraction Buffer
B. Purification of Cellular Nuclear Extracts

The procedure described below can be used for a 15 ml cell suspension grown in a T75 flask or adherent cells (100 mm dish 80-90% confluent) where 10^7 cells yields approximately 50 μg of nuclear protein.

1. Collect ~10^7 cells in pre-chilled 15 ml tubes.

2. Centrifuge suspended cells at 300 x g for five minutes at 4°C.

3. Discard the supernatant. Resuspend cell pellet in 5 ml of ice-cold PBS/Phosphatase Inhibitor Solution and centrifuge at 300 x g for five minutes at 4°C. Repeat one time.

4. Discard the supernatant. Add 500 μl ice-cold 1X Hypotonic buffer. Mix gently by pipetting and transfer resuspended pellet to a pre-chilled 1.5 ml microcentrifuge tube.

5. Incubate cells on ice for 15 minutes allowing cells to swell.

6. Add 100 μl of 10% Nonidet P-40 (or suitable substitute). Mix gently by pipetting.

7. Centrifuge for 30 seconds (pulse spin) at 4°C in a microcentrifuge. Transfer the supernatant which
contains the cytosolic fraction to a new tube and store at -80°C.

8. Resuspend the pellet in 100 μl ice-cold Complete Nuclear Extraction Buffer (1X) (with protease and phosphatase inhibitors). Vortex 15 seconds at highest setting then gently rock the tube on ice for 15 minutes using a shaking platform. Vortex sample for 30 seconds at highest setting and gently rock for an additional 15 minutes.

9. Centrifuge at 14,000 x g for 10 minutes at 4°C. The supernatant contains the nuclear fraction. Aliquot to clean chilled tubes, flash freeze and store at -80°C. Avoid freeze/thaw cycles. The extracts are ready to use in the assay.

10. Keep a small aliquot of the nuclear extract to quantitate the protein concentration.

C. Reagent Preparation

Transcription Factor Antibody Binding Buffer (10X)

One vial contains 3 ml of a 10X stock of Transcription Factor Antibody Binding Buffer (ABB) to be used for diluting the primary and secondary antibodies. To prepare 1X ABB,
dilute 1:10 by adding 27 ml of UltraPure water. Store at 4°C for up to six months.

**Wash Buffer Concentrate (400X)**

One vial contains 5 ml of 400X Wash Buffer. Dilute the contents of the vial to a total volume of 2 liters with UltraPure water and add 1 ml of Polysorbate 20.

*NOTE: Polysorbate 20 is a viscous liquid and cannot be measured by a pipette. A positive displacement device such as a syringe should be used to deliver small quantities accurately.*

A smaller volume of Wash Buffer Concentrate can be prepared by diluting the Wash Buffer Concentrate 1:400 and adding Polysorbate 20 (0.5 ml/liter of Wash Buffer). Store at 4°C for up to two months.

**Transcription Factor Binding Assay Buffer (4X)**

One vial contains 3 ml of a 4X stock of Transcription Factor Binding Assay Buffer (TFB). Prepare Complete Transcription Factor Binding Assay Buffer (CTFB) immediately prior to use in 1.5 ml centrifuge tubes or 15 ml conical tubes as outlined in Table 3. This buffer is now referred to as CTFB. *It is recommended that the CTFB be used the same day it is prepared.*
Prepare Complete Transcription Factor Binding Assay Buffer (CTFB) as outlined in Table 3.

<table>
<thead>
<tr>
<th>Component</th>
<th>Volume/Well</th>
<th>Volume/Strip</th>
<th>Volume/96-well plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>UltraPure Water</td>
<td>73 µl</td>
<td>584 µl</td>
<td>7008 µl</td>
</tr>
<tr>
<td>Transcription Factor Binding</td>
<td>25 µl</td>
<td>200 µl</td>
<td>2400 µl</td>
</tr>
<tr>
<td>Assay Buffer (4X)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reagent A</td>
<td>1 µl</td>
<td>8 µl</td>
<td>96 µl</td>
</tr>
<tr>
<td>300 mM DTT</td>
<td>1 µl</td>
<td>8 µl</td>
<td>96 µl</td>
</tr>
<tr>
<td>Total Required</td>
<td>100 µl</td>
<td>800 µl</td>
<td>9600 µl</td>
</tr>
</tbody>
</table>

Table 3. Preparation of Complete Transcription Factor Binding Assay Buffer.
Transcription Factor PPAR alpha, delta, gamma Positive Controls

One vial contains 50 μl of clarified cell lysate. These lysates serve as a positive control for PPAR alpha, delta, and gamma, respectively; it is not intended for plate to plate comparisons. The Positive Control provided is sufficient for 5 reactions and will provide a strong signal (>0.5 AU at 450 nm) when used at 10 μl/well. When using this Positive Control, a decrease in signal may occur with repeated freeze/thaw cycles. It is recommended that the Positive Control be aliquoted at 25 μl per vial and stored at -80°C to avoid loss in signal from repeated freeze/thaw cycles.
5. Assay Protocol

A. Summary

Note: This procedure is provided as a quick reference for experienced users. Follow the detailed procedure when initially performing the assay.

Prepare CTFB as directed in the Pre-Assay Preparation section.

↓

Add CTFB to Blk and NSB wells.

↓

Add Competitor dsDNA (optional) to appropriate wells.

↓

Add positive control to appropriate wells.

↓

Add sample containing PPAR alpha, delta, and/or gamma to appropriate wells.

↓

Incubate overnight at 4°C without agitation.
Wash each well 5 times with 1X wash buffer.

↓

Add diluted PPAR alpha, delta, and/or gamma Primary Antibody to each well (except blk wells).

↓

Incubate at RT without agitation.

↓

Wash each well 5 times with 1X Wash Buffer.

↓

Add diluted Goat Anti-Mouse HRP Conjugate (except Blk wells).

↓

Incubate at RT without agitation.

↓

Wash each well 5 times with 1X Wash Buffer.

↓

Add Developing Solution to wells.
Incubate 15 to 45 minutes with gentle agitation.

↓

Add Stop Solution to wells.

↓

Measure the absorbance.
B. Plate Setup

There is no specific pattern for using the wells on the plate. A typical layout of PPAR Positive Control (PC), Competitor dsDNA (C1), and samples of nuclear extracts (S1-S44) to be measured in duplicate is given below in Figure 2.

![Sample plate format](image)

- S1-S44 – Sample Wells
- NSB – Non-specific Binding Wells
- PC – Positive Control Wells
- Blk – Blank Wells
- C1 – Competitor dsDNA Wells

**Figure 2. Sample plate format**
**Pipetting Hints:**

- Use different tips to pipette each reagent.

- Before pipetting each reagent, equilibrate the pipette tip in that reagent (i.e., slowly fill the tip and gently expel the contents, repeat several times).

- Do not expose the pipette tip to the reagent(s) already in the well.

**General Information:**

- It is not necessary to use all the wells on the plate at one time; however a Positive Control should be run every time.

- For each plate or set of strips it is recommended that two Blk, two Non-Specific Binding (NSB), and two PC wells be included.
C. Performing the Assay

Binding of active PPAR alpha, delta, and/or gamma to the consensus sequence

1. Equilibrate the plate and buffers to room temperature prior to opening. Remove the plate from the foil and select the number of strips needed. The 96-well plate supplied with this kit is ready to use.

   NOTE: If you are not using all of the strips at once, place the unused strips back in the plate packet and store at 2-4°C. Be sure that the packet is sealed with the desiccant inside.

2. Prepare the CTFB as outlined in Table 3.

3. Add appropriate amount of reagent(s) listed below to the designated wells as follows:

   **Blk** - add 100 μl of CTFB to designated wells.

   **NSB** - add 100 μl of CTFB to designated wells. Do not add samples or Positive Control to these wells.

   **C1** - Add 80 μl of CTFB prior to adding 10 μl of Transcription Factor PPAR Competitor dsDNA to designated wells. Add 10 μl of control cell lysate, or unknown sample.

   NOTE: Competitor dsDNA must be added prior to adding the positive control or nuclear extracts.
**S1-S44** - Add 90 μl of CTFB followed by 10 μl of Nuclear Extract to designated wells. A protocol for isolation of nuclear extracts is given in Section 4.

**PC** - Add 90 μl of CTFB followed by 10 μl of Positive Control to appropriate wells.

4. Use the cover provided to seal the plate. Incubate overnight at 4°C or one hour at room temperature without agitation (incubation for one hour will result in a less sensitive assay).

5. Empty the wells and wash five times with 200 μl of 1X Wash Buffer. After each wash empty the wells in the sink.

After the final wash (wash #5), tap the plate on a paper towel to remove any residual Wash Buffer.
Addition of Transcription Factor PPAR Primary Antibody

1. Dilute the Transcription Factor PPAR Primary Antibody 1:100 in 1X ABB as outlined in Table 4. Add 100 µl of diluted PPAR Primary Antibodies to each well except the Blk wells.

<table>
<thead>
<tr>
<th>Component</th>
<th>Volume/Well</th>
<th>Volume/Strip</th>
<th>Volume/ 96-well plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1X ABB</td>
<td>99 µl</td>
<td>792 µl</td>
<td>9504 µl</td>
</tr>
<tr>
<td>PPAR Primary Antibody</td>
<td>1 µl</td>
<td>8 µl</td>
<td>96 µl</td>
</tr>
<tr>
<td>Total Required</td>
<td>100 µl</td>
<td>800 µl</td>
<td>9600 µl</td>
</tr>
</tbody>
</table>

Table 4. Dilution of Primary Antibody.

2. Use the adhesive cover provided to seal the plate.

3. Incubate the plate for one hour at room temperature without agitation.

4. Empty the wells and wash each well five times with 200 µl of 1X Wash Buffer. After each wash, empty the contents of the plate into the sink. After the final wash (wash #5), tap the plate three to five times on a paper towel to remove any residual Wash Buffer.
Addition of the Transcription Factor Goat Anti-Rabbit HRP Conjugate

1. Dilute the Transcription Factor Goat Anti-Rabbit HRP Conjugate 1:100 in 1X ABB as outlined in Table 5 below. Add 100 μl of diluted secondary antibody to each well except the Blk wells.

<table>
<thead>
<tr>
<th>Component</th>
<th>Volume/Well</th>
<th>Volume/Strip</th>
<th>Volume/ 96-well plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1X ABB</td>
<td>99 μl</td>
<td>792 μl</td>
<td>9504 μl</td>
</tr>
<tr>
<td>Goat Anti-Mouse HRP Conjugate</td>
<td>1 μl</td>
<td>8 μl</td>
<td>96 μl</td>
</tr>
<tr>
<td>Total Required</td>
<td>100 μl</td>
<td>800 μl</td>
<td>9600 μl</td>
</tr>
</tbody>
</table>

Table 5. Dilution of Secondary Antibody

2. Use the adhesive cover provided to seal the plate.

3. Incubate for one hour at room temperature without agitation.

4. Empty the wells and wash five times with 200 μl of 1X Wash Buffer. After each wash, empty the contents of the plate into the sink. After the final wash (wash #5), tap the plate three to five times on a paper towel to remove any residual Wash Buffer.
Develop and Read the Plate:

1. To each well being used add 100 μl of Transcription Factor Developing Solution which has been equilibrated to room temperature.

2. Incubate the plate for 15 to 45 minutes at room temperature with gentle agitation protected from light. Allow the wells to turn medium to dark blue prior to adding Transcription Factor Stop Solution. (This reaction can be monitored by taking absorbance measurements at 655 nm prior to stopping the reactions; An OD655 of 0.4-0.5 yields an OD450 of approximately 1). Monitor development of sample wells to ensure adequate color development prior to stopping the reaction. NOTE: Do not overdevelop; however Positive Control wells may need to overdevelop to allow adequate color development in sample wells.

3. Add 100 μl of Stop Solution per well being used. The solution within the wells will change from blue to yellow after adding the Stop Solution.

4. Read absorbance at 450 nm within five minutes of adding the Stop Solution. Blank the plate reader according to the manufacturer’s requirements using the blank wells.
6. Data Analysis

A. Performance Characteristics

Figure 3. Schematic of the Transcription Factor Binding Assay.

PPAR α
Increasing amounts of positive control (total lysate) are assayed for PPAR alpha, delta, and gamma DNA-binding activity using ab133113.

B. Interferences

The following reagents were tested for interference in the assay.

<table>
<thead>
<tr>
<th>Reagent</th>
<th>Will Interfere (Yes or No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGTA (≤ mM)</td>
<td>No</td>
</tr>
<tr>
<td>EDTA (≤0.5 mM)</td>
<td>No</td>
</tr>
<tr>
<td>ZnCl (any concentration)</td>
<td>Yes</td>
</tr>
<tr>
<td>DTT (between 1 and 5 mM)</td>
<td>No</td>
</tr>
<tr>
<td>Dimethylsulfoxide (≤1.5%)</td>
<td>No</td>
</tr>
</tbody>
</table>
## 7. Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Recommended Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No signal or weak signal in all wells</strong></td>
<td>A. Omission of key reagent</td>
<td>A. Check that all reagents have been added and in the correct order.</td>
</tr>
<tr>
<td></td>
<td>B. Plate reader settings not correct</td>
<td>Perform the assay using the positive control.</td>
</tr>
<tr>
<td></td>
<td>C. Reagent/reagents expired</td>
<td>B. Check wavelength setting on plate reader and change to 450 nm.</td>
</tr>
<tr>
<td></td>
<td>D. Salt concentrations affected binding between DNA and protein</td>
<td>C. Check expiration date on reagents.</td>
</tr>
<tr>
<td></td>
<td>E. Developing reagent not added to correct volume</td>
<td>D. Reduce the amount of nuclear extract used in the assay, or reduce the amount of salt in the nuclear extracts (alternatively can perform buffer exchange)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>E. Pre-warm the Developing Solution to room temperature prior to use</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F. Check pipettes to ensure correct amount of developing solution was added to wells</td>
</tr>
<tr>
<td>High signal in all wells</td>
<td>A. Incorrect dilution of antibody (too high)</td>
<td>A. Check antibody dilutions and use amounts outlined in instructions</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------------------------------</td>
<td>------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>B. Improper/inadequate washing of wells</td>
<td>B. Follow the protocol for washing wells using the correct number of times and volumes</td>
</tr>
<tr>
<td></td>
<td>C. Over-developing</td>
<td>C. Decrease the incubation time when using the developing reagent.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High background (NSB)</th>
<th>Incorrect dilution of antibody (too high)</th>
<th>Check antibody dilutions and use amounts outlined in the instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak signal in sample wells</td>
<td>A. Sample concentration is too low</td>
<td>A. Increase the amount of nuclear extract used. Loss of signal can occur with multiple freeze/thaw cycles of the sample. Prepare fresh nuclear extracts and aliquot as outlined in product insert</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>B. Incorrect dilution of antibody</td>
<td>B. Check antibody dilutions and use amounts outlined in the instructions</td>
</tr>
<tr>
<td></td>
<td>C. Salt concentrations affecting binding between DNA and protein</td>
<td>C. Reduce the amount of nuclear extract used in the assay or reduce the amount of salt in the nuclear extracts (alternatively can perform buffer exchange)</td>
</tr>
</tbody>
</table>
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