

# NF-E2 Consensus and Mutant Oligonucleotides

## BACKGROUND

Electrophoretic mobility shift assays (EMSAs), also known as gel shift assays, provide a relatively straightforward and sensitive method for studying binding interactions between transcription factors and consensus DNA binding elements. For such studies, DNA probes are provided as double-stranded oligonucleotides designed with 5' OH blunt ends to facilitate labeling to high specific activity with polynucleotide kinase. These are constructed both with specific DNA binding consensus sequences for various transcription factors and as control or "mutant" probes in which one or more nucleotides mapping within the consensus binding site has been substituted.

## REFERENCES

1. Dignam, J.D., et al. 1983. Accurate transcription initiation by RNA polymerase II in a soluble extract from isolated mammalian nuclei. *Nucleic Acids Res.* 11: 1475-1489.
2. Murre, C., et al. 1991. B cell- and myocyte-specific E2-box-binding factors contain E12/E47-like subunits. *Mol. Cell. Biol.* 11: 1156-1160.
3. Andrews, N.C., et al. 1993. Erythroid transcription factor NF-E2 is a haematopoietic-specific basic-leucine zipper protein. *Nature* 362: 722-728.

## GEL SHIFT ASSAYS

For gel shift analysis, prepare nuclear extracts following the method of Dignam, et al (1).

- **NOTE:** Spin oligonucleotide vial before opening. Product may be lodged in vial cap.
- Label oligonucleotide probe (TransCruz™ Gel Shift Oligonucleotides) with [ $\gamma$ -<sup>32</sup>P]-ATP to 50,000 cpm/ng by using polynucleotide kinase.
- Prepare gel shift reaction buffer as follows: 10 mM Tris (Tris: sc-3715), pH 7.5, 50 mM NaCl (NaCl: sc-29108, 1 mM dithiothreitol (DTT: sc-29089), 1 mM EDTA (EDTA: sc-29092), 5% glycerol (glycerol: sc-29095).
- Prepare 20  $\mu$ l reaction mixture containing 3-10  $\mu$ g nuclear extract and 1  $\mu$ g poly dl-dC in gel shift reaction buffer. Add 0.5 ng labeled oligonucleotide probe and incubate for 20 minutes at room temperature. This constitutes the control sample for detection of DNA-protein complexes (2).
- To detect an antibody supershift or block of the DNA-protein complex, prepare reaction mixture as described above, also adding 1-2  $\mu$ l of the appropriate TransCruz™ Gel Supershift antibody per 20  $\mu$ l of reaction volume. Antibody is normally added subsequent to addition of labeled oligonucleotide probe, but result may be improved by adding antibody prior to probe. Incubate at 4° C for 1 hour to overnight, or at room temperature for 15-45 minutes.
- Resolve DNA-protein complexes by electrophoresis (25-35 ma) through a 4% polyacrylamide gel containing 50 mM Tris, pH 7.5, 0.38 M glycine (glycine: sc-29096) and 2 mM EDTA. Dry the gel and visualize by autoradiography.

## RESEARCH USE

For research use only, not for use in diagnostic procedures.

## PRODUCT

**NF-E2 CONSENSUS OLIGONUCLEOTIDE:** sc-2527

- binding site for erythroid transcription factor NF-E2 (3)

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5' - TGG GGA ACC TGT GCT GAG TCA CTG GAG - 3'
3' - ACC CCT TGG ACA CGA CTC AGT GAC CTC - 5'
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**NF-E2 MUTANT OLIGONUCLEOTIDE:** sc-2528

- identical to sc-2527 with the exception of a "GA" → "AG" substitution in the DNA binding region (3)

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5' - TGG GGA ACC TGT GCT AGG TCA CTG GAG - 3'
3' - ACC CCT TGG ACA CGA TCC AGT GAC CTC - 5'
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## SELECT PRODUCT CITATIONS

1. Yamada, T., et al. 1998. Reduction of DNA binding activity of the GATA-1 transcription factor in the apoptotic process induced by overexpression of PU.1 in murine erythroleukemia cells. *Exp. Cell Res.* 245: 186-194.
2. Hayasaka, H., et al. 2005. FRNK, the autonomously expressed C-terminal region of focal adhesion kinase, is uniquely regulated in vascular smooth muscle: analysis of expression in transgenic mice. *J. Cell. Biochem.* 95: 1248-1263.
3. Narasimhan, M., et al. 2011. Overexpression of Nrf2 protects cerebral cortical neurons from ethanol-induced apoptotic death. *Mol. Pharmacol.* 80: 988-999.

## STORAGE

Store at -20° C; stable for one year from the date of shipment.

**NOTE:** Spin oligonucleotide vial before opening. Product may be lodged in vial cap.

## PROTOCOLS

See our web site at [www.scbt.com](http://www.scbt.com) for detailed protocols and support products.