

HIF-1 α 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

- 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.
- 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.
- Zervos, A.S., et al. 1993. Mx1, a protein that specifically interacts with Max to bind Myc-Max recognition sites. *Cell* 72: 223-232.

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 [32 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 μ l reaction mixture containing 3-10 μ g nuclear extract and 1 μ g poly dI-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 μ l of the appropriate TransCruz™ Gel Supershift antibody per 20 μ 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.

PRODUCT

Myc-Max CONSENSUS OLIGONUCLEOTIDE: sc-2509

- binding site for Max-Max homodimers, Mad-Max heterodimers and Myc-Max heterodimers (3)

```

5[]- GGA AGC AGA C CA CGT G GT CTG CTT CC - 3[]
3[]- CCT TCG TCT G GT GCA C CA GAC GAA GG - 5[]
  
```

MYC-MAX MUTANT OLIGONUCLEOTIDE: sc-2510

- identical to sc-2509 with the exception of a "TG" \rightarrow "GA" substitution in the Myc-Max DNA binding motif (3)

```

5[]- GGA AGC AGA C CA CG G A GT CTG CTT CC - 3[]
3[]- CCT TCG TCT G GT GCC T CA GAC GAA GG - 5[]
  
```

SELECT PRODUCT CITATIONS

- Dong, Z., et al. 2005. Modulation of differentiation-related gene 1 expression by cell cycle blocker mimosine, revealed by proteomic analysis. *Mol. Cell. Proteomics* 4: 993-1001.
- Kim, K.S., et al. 2006. A novel role of hypoxia-inducible factor in cobalt chloride- and hypoxia-mediated expression of IL-8 chemokine in human endothelial cells. *J. Immunol.* 177: 7211-7224.
- Mojsilovic-Petrovic, J., et al. 2007. Hypoxia-inducible factor-1 (HIF-1) is involved in the regulation of hypoxia-stimulated expression of monocyte chemoattractant protein-1 (MCP-1/CCL2) and MCP-5 (Ccl12) in astrocytes. *J. Neuroinflammation* 4: 12.
- Palladino, M.A., et al. 2012. Myeloid cell leukemia-1 (Mc1-1) is a candidate target gene of hypoxia-inducible factor-1 (HIF-1) in the testis. *Reprod. Biol. Endocrinol.* 10: 104.
- Hota, K.B., et al. 2012. Neuroglobin regulates hypoxic response of neuronal cells through Hif-1 α - and Nrf2-mediated mechanism. *J. Cereb. Blood Flow Metab.* 32: 1046-1060.
- Bondeva, T., et al. 2013. Advanced glycosylated end-products affect HIF-transcriptional activity in renal cells. *Mol. Endocrinol.* 27: 1918-1933.
- Mitra, R., et al. 2013. Negative regulation of NEP expression by hypoxia. *Prostate* 73: 706-714.

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.

RESEARCH USE

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

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.