

U-Blot® Phospho-RNA Polymerase II CTD Repeat YSPTSPS (Ser2) Rabbit mAb (WT9095)

User Manual

General Information

Product name	U-Blot® Phospho-RNA Polymerase II CTD Repeat YSPTSPS (Ser2) Rabbit mAb
Product No.	WT9095
Clonality	Recombinant monoclonal
Clone Number	W-R66
Alternative name	POLR2, RNA polymerase II largest subunit

Key Features

Target	Phospho-RNA Polymerase II CTD Repeat YSPTSPS (Ser2)
Reactivity	Human, Mouse, Rat
Applications	WB, IHC-P, ChIP
MW(Calculated)	217 kDa
MW(Observed)	270 kDa
Host Species	Rabbit
Isotype	IgG
Conjugate	Unconjugated
Modification	Phosphorylation
Modification Site	Ser2
Purification	Protein A affinity purification
Immunogen	Polypeptide
Specificity	Specific for RNA Polymerase II only when phosphorylated at Ser2 of the CTD repeat

Storage Information

Storage

Store at -20°C. Avoid repeated freeze-thaw cycles

Stability

Stable for 12 months from date of receipt / reconstitution.

Formulation

PBS, Glycerol, BSA

Product Usage Information

Applications	Dilution	Recommended Species
WB	1:1000	Mouse, Rat
IHC-P	1:2000	Human, Mouse, Rat
ChIP	6 µg/2×10 ⁶ cells	Human

Target Information

Gene name

POLR2A

Protein name

DNA-directed RNA polymerase II subunit RPB1

Organism

Human

Gene ID

5430

SwissProt

P24928

RNA polymerase II (RNAPII) is a large multi-protein complex that functions as a DNA-dependent RNA polymerase, catalyzing the transcription of DNA into RNA using the four ribonucleoside triphosphates as substrates. The largest subunit, RNAPII subunit B1 (Rpb1), also known as RNAPII subunit A (POLR2A), contains a unique heptapeptide sequence (Tyr1,Ser2,Pro3,Thr4,Ser5,Pro6,Ser7), which is repeated up to 52 times in the carboxy-terminal domain (CTD) of the protein. This CTD heptapeptide repeat is subject to multiple post translational modifications, which dictate the functional state of the polymerase complex. Phosphorylation of the CTD during the active transcription cycle integrates transcription with chromatin remodeling and nascent RNA processing by regulating the recruitment of chromatin modifying enzymes and RNA processing proteins to the transcribed gene.

Background

During transcription initiation, RNAPII contains a hypophosphorylated CTD and is recruited to gene promoters through interactions with DNA-bound transcription factors and the Mediator complex. The escape of RNAPII from gene promoters requires phosphorylation at Ser5 by CDK7, the catalytic subunit of transcription factor IIH (TFIIH). Phosphorylation at Ser5 mediates the recruitment of RNA capping enzymes, in addition to histone H3 Lys4 methyltransferases, which function to regulate transcription initiation and chromatin structure. After promoter escape, RNAPII proceeds down the gene to an intrinsic pause site, where it is halted by the negative elongation factors NELF and DSIF. At this point, RNAPII is unstable and frequently aborts transcription and dissociates from the gene. Productive transcription elongation requires phosphorylation at Ser2 by CDK9, the catalytic subunit of the positive transcription elongation factor P-TEFb. Phosphorylation at Ser2 creates a stable transcription elongation complex and facilitates recruitment of RNA splicing and polyadenylation factors, in addition to histone H3 Lys36 methyltransferases, which function to promote elongation-compatible chromatin. Ser2/Ser5-phosphorylated RNAPII then transcribes the entire length of the gene to the 3' end, where transcription is terminated. RNAPII dissociates from the DNA and is recycled to the hypophosphorylated form by various CTD phosphatases.

Cellular Localization

Cytoplasm, Nucleus

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