Electronic Supplementary Information (ESI)

Electrospun nanofibrous membranes incorporating imidazole-appended *p*-phenylene-Cu(II) ensemble as a fluoroprobe for detection of His-proteins

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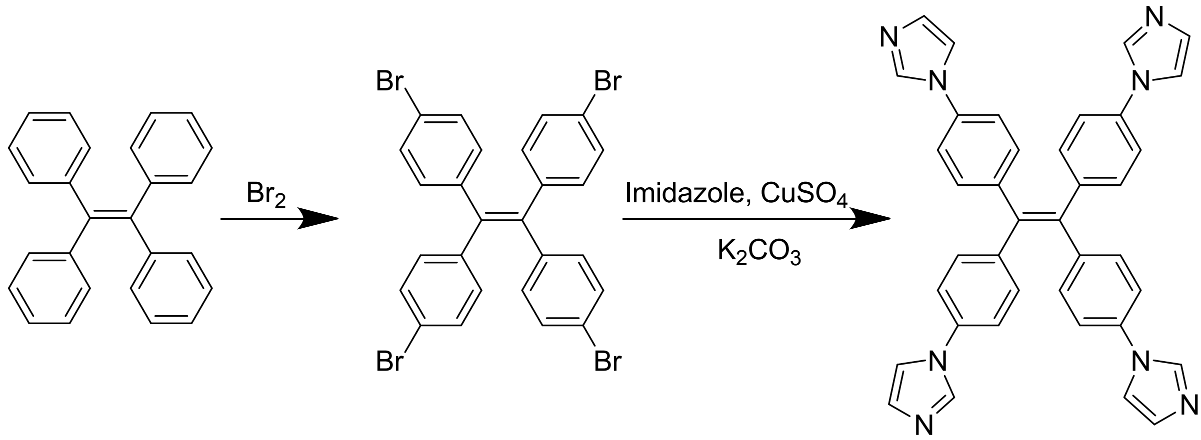

Scheme S1. Synthetic route of compound **1**.

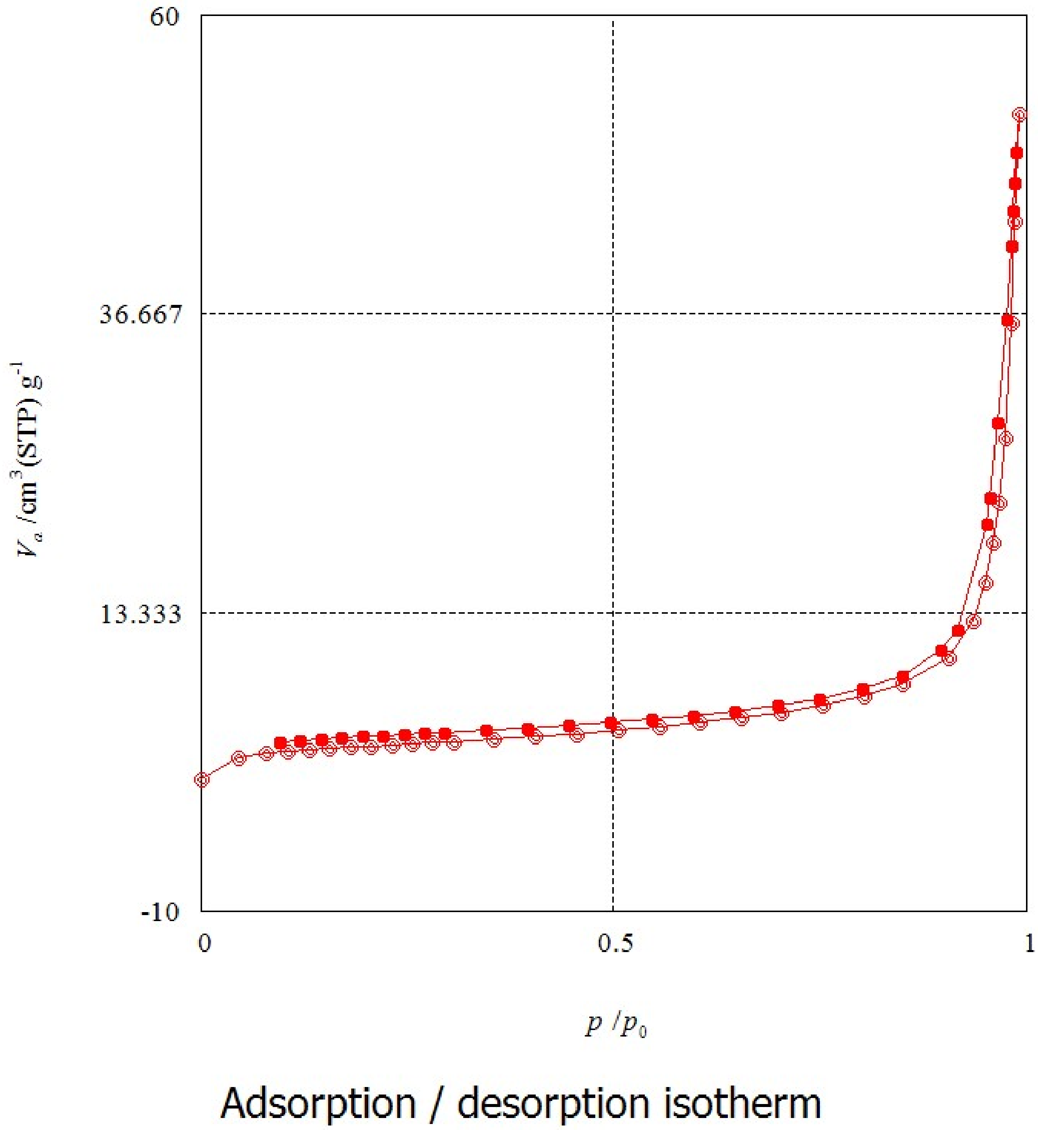

Fig. S1 Nitrogen adsorption-desorption isotherms for the; (–•–) IP-Cu-NM (PMMA: 10 wt%, **1**: 0.025 g, Cu^{2+}: 1 equiv.) at 77K.

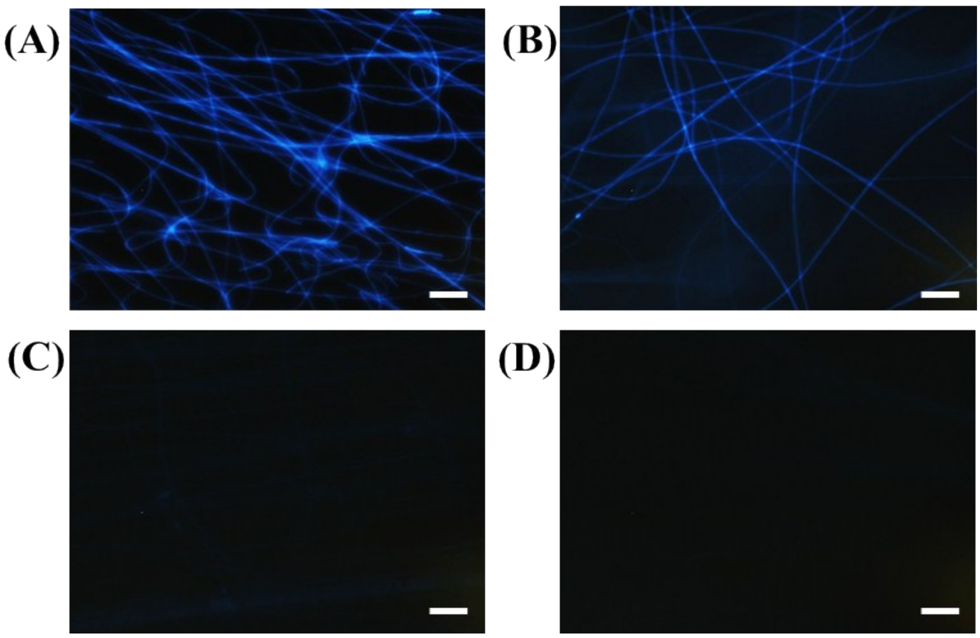

Fig. S2 Fluorescence microscopic images of IP-Cu-doped single PMMA nanofiber (PMMA: 10 wt%, **1**: 0.025 g) prepared with different concentrations of $Cu(NO_3)_2$: (A) 0 equivalent, (B) 0.66 equivalent, (C) 1.0 equivalent, and (D) 1.5 equivalent. Scale bars are 20 μm.

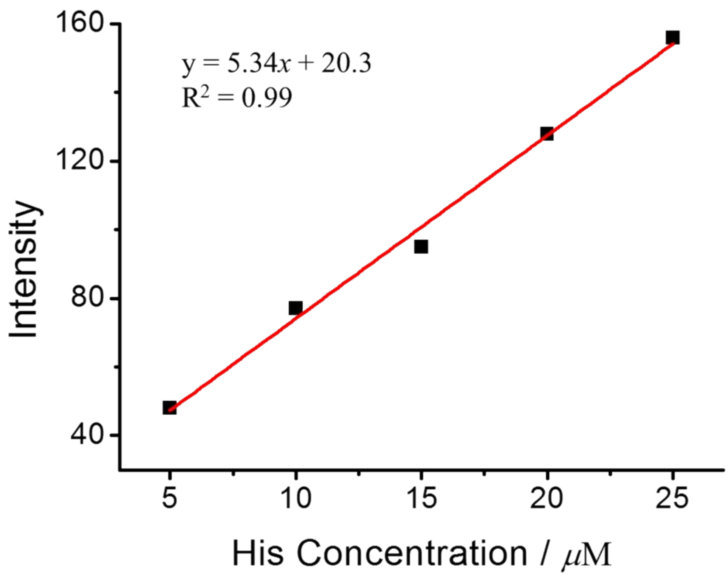

Fig. S3 Plot of fluorescence intensity against various histidine concentration (0~25 μM).

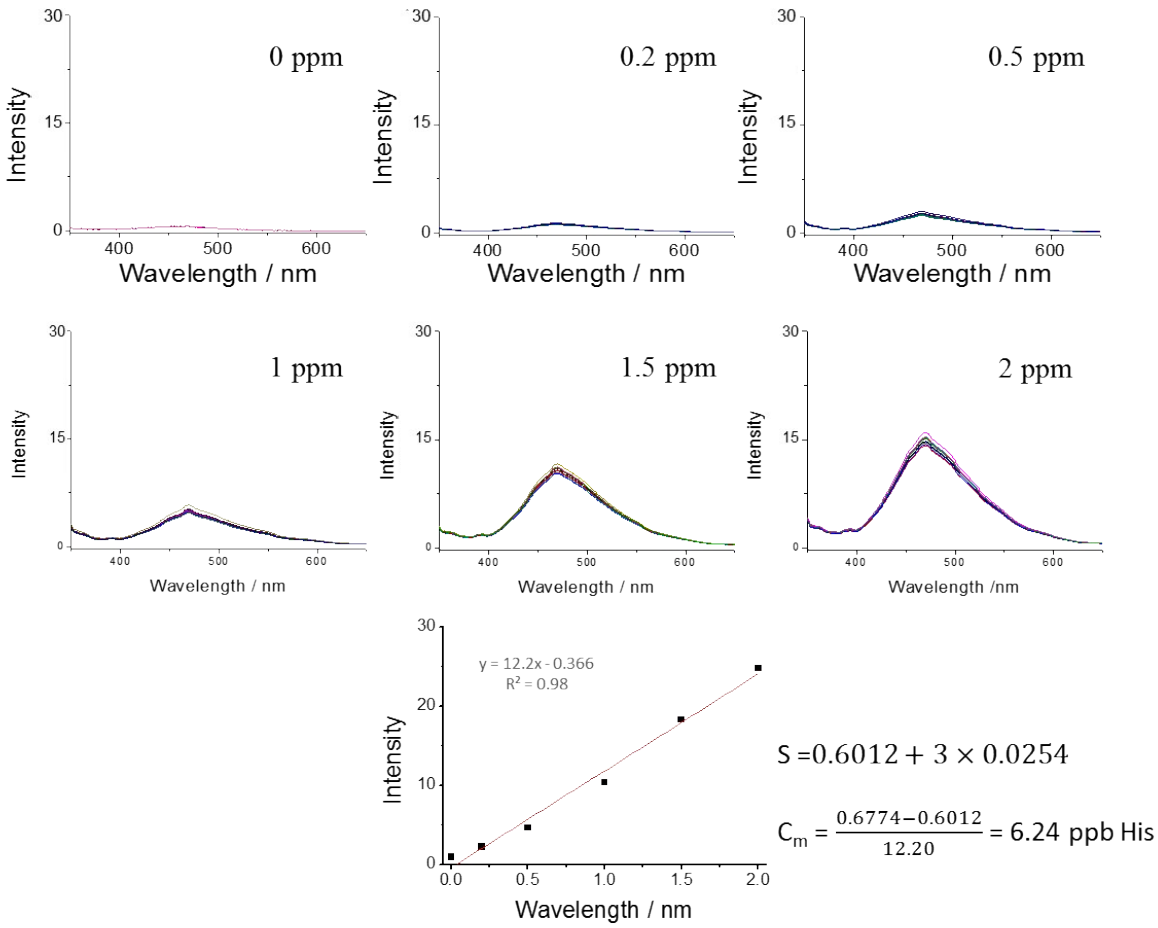

Fig. S4 Fluorescence spectra of IP-Cu-NM (PMMA: 10 wt%, **1**: 0.025 g, Cu^{2+}: 1 equiv.) with various concentrations of His (0 ~2.0 ppm) for measuring limit of detection.

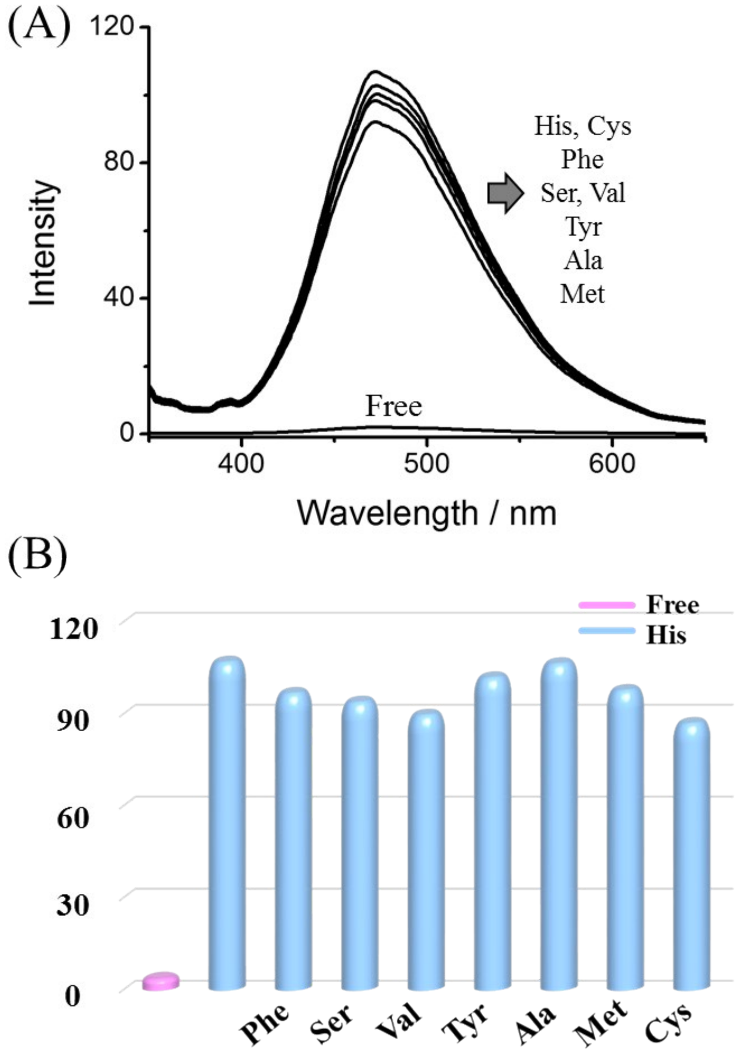

Fig. S5 (A) Fluorescence spectra of IP-Cu-NM upon addition of histidine in binary systems. (B) Fluorescence intensity changes of IP-Cu-NM (PMMA: 10 wt%, **1**: 0.025 g, Cu^{2+}: 1 equiv.) by dropping a mixture of histidine (15 μM) and various amino acids (15 μM).

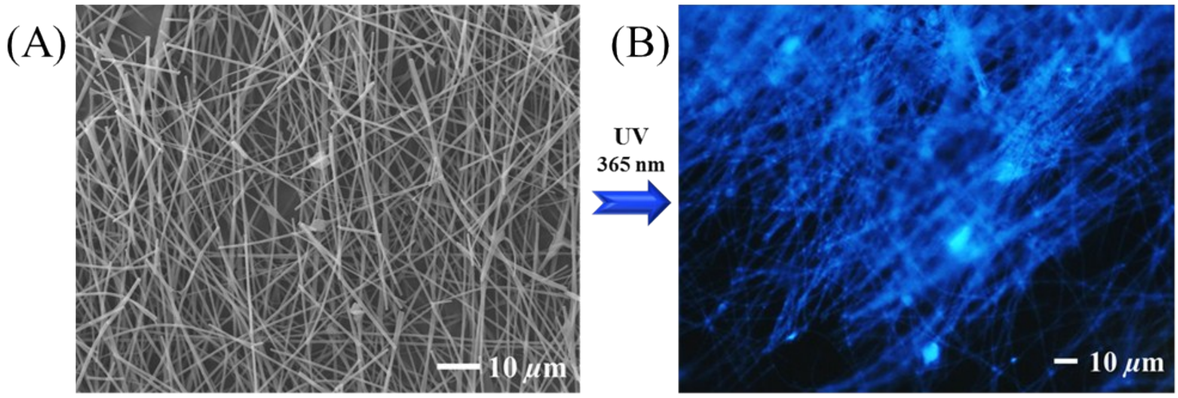

Fig. S6 SEM image of (A) IP-Cu-NM after dropping His(15 μM) and (B) its fluorescence microscopic image (right).

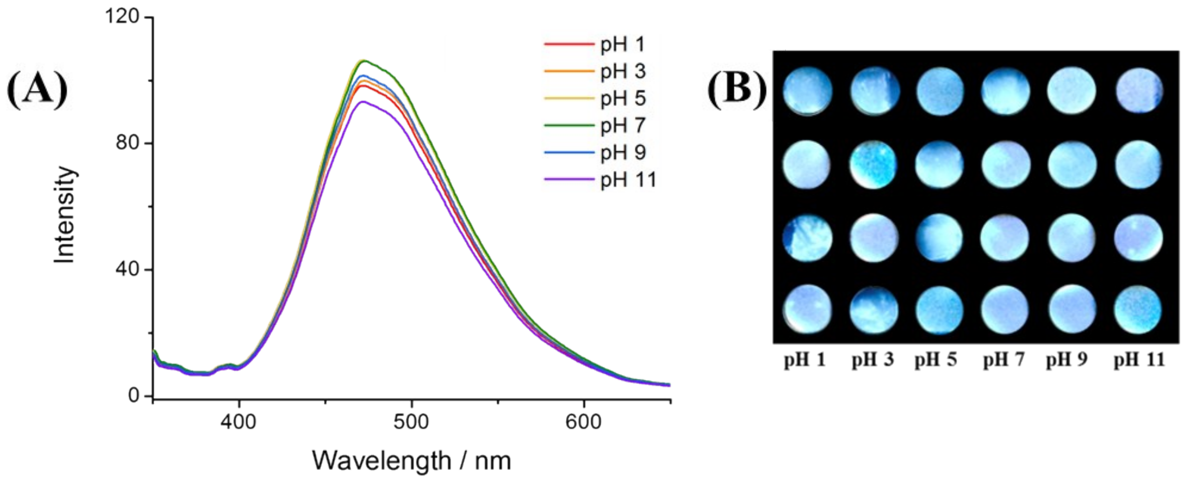

Fig. S7 (A) Fluorescence spectra of IP-Cu-NM (PMMA: 10 wt%, **1**: 0.025 g, Cu^{2+}: 1 equiv.) upon addition of histidine aqueous solution(15 μM) at various pH values. (B) Fluorescence photograph of histidine aqueous solution at various pH onto IP-Cu-NM (PMMA: 10 wt%, **1**: 0.025 g, Cu^{2+}: 1 equiv.) after microarray treatment.

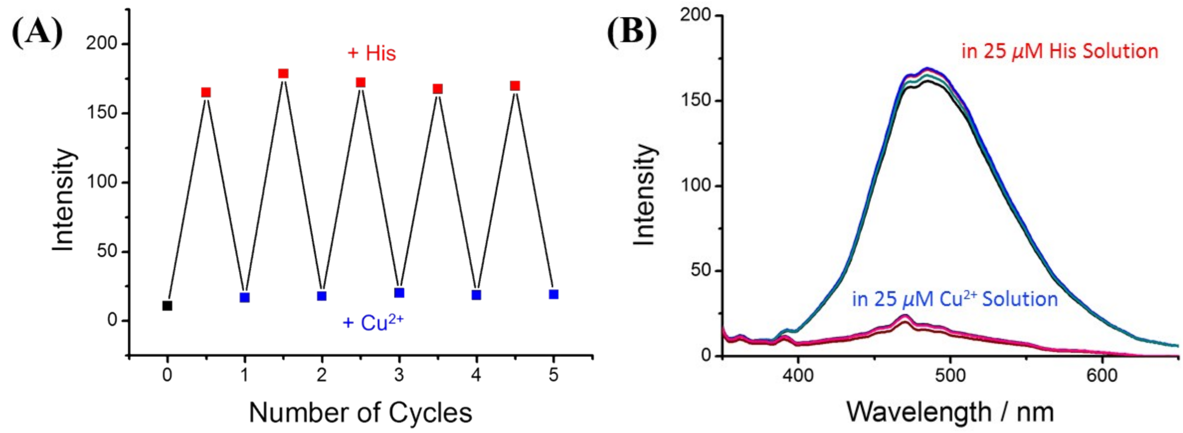

Fig. S8 (A) Graph of fluorescence intensity against cycle number to highlight the reversible switching behavior of IP-Cu-NM (PMMA: 10 wt%, **1**: 0.025 g, Cu^{2+}: 1 equiv.) with cycling different solution. (B) Fluorescence spectra of IP-Cu-NM measured by cycling two different solutions (25 μM histidine, 25 μM $Cu(NO_3)_2$).

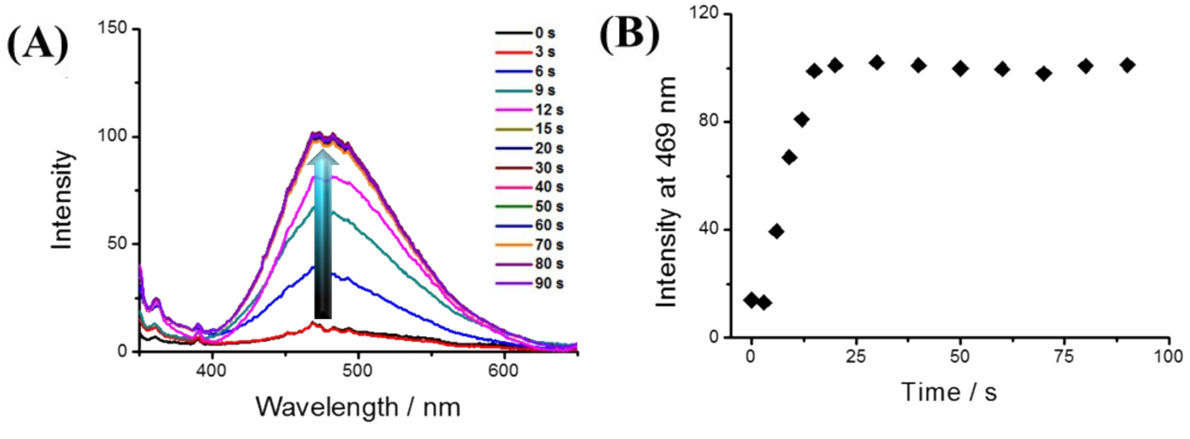

Fig. S9 (A) Fluorescence spectra of IP-Cu-NM (PMMA: 10 wt%, **1**: 0.025 g, Cu^{2+}: 1 equiv.) with His(15 μM) according to response time. (B) Plot of fluorescent intensity change of IP-Cu-NM according to response time at 469 nm.

Table S1 Proteins sequences used in this study.

PROTEIN	SEQUENCE
ALDOLASE (158 KDA)	Fructose-1,6-Bisphosphate Aldolase From Rabbit Muscle In Complex With A C-Terminal Peptide Of Wiskott-Aldrich Syndrome Protein. PHSHPALTPEQKKELSDIAHRIVAPGKGILAADESTGSIAKRLQSIGTENTEENRRFYR QLLLTADDRVNPCIGGVILFHETLYQKADDGRPFPQVIKSKGGVVGIKVDKGVVPLA GTNGETTTQGLDGLSERCAQYKKDGADFAKWRCVLKIGEHTPSALAIMENANVLA RYASICQQNGIVPIVEPEILPDGDHDLKRCQYVTEKVLAAVYKALSDHHIYLEGTLLK PNMVTPGHACTQKYSHEEIAMATVTALRRTVPPAVTGVTFLSGGQSEEEASINLNAI NKCPLLKPWALTFSYGRALQASALKAWGGKKENLKAAQEEYVKRALANSLACQG KYTPSGQAGAAASESLFISNHAY
RIBONUCLEA SE A (13.7 KDA)	ribonuclease A, partial [Bos taurus] PSLGKETAAAKFERQHMDSSTSAASSSNYCNQMMKSRNLTKDRCKPVNTFVHESLA DVQAVCSQKNVACKNGQTNCYQSYSTMSITDCRETGSSKYPNCAYKTTQANKHIIV ACEGNPYVPVHFDASV
FERRITIN (440 KDA)	Tetragonal Crystal Structure Of Native Horse Spleen Ferritin. SSQIRQNYSTEVEAAVNRLVNLYLRASYTYLSLGFYFDRDDVALEGVCHFFRELAEE KREGAERLLKMQNQRGGRALFQDLQKPSQDEWGTTLDAMKAAIVLEKSLNQALLD LHALGSAQADPHLCDFLESHFLDEEVKLIKKMGDHLTNIQRLVGSQAGLGEYLFERL TLKHD
THYROGLOB ULIN (669 KDA)	thyroglobulin precursor [Bos taurus] MALALWVFGLLDLICLASANIFEYQVDAQPLRPCELQRERAFLKREDYVPQCAEDG SFQTVQCGKDGASCWCVDADGREVPGSRQPGRPAACLSFCQLQKQQILLSSYINSTA TSYLPQCQDSGDYSPVQCDLRRRQCWCVDAEGMEVYGTRQQGRPARCPRSCEIRN RRLLHGVGDRSPPQCSPDGAFRPVQCKLVNTTDMMIFDLVHSYSRFPDAFVTFSSFR SRFPEVSGYCYCADSQGRELAETGLELLLDEIYDTIFAGLDLASTFAETTLYRILQRRF LAVQLVISGRFRCPTKCEVERFAATSFRHPYVPSCHPDGEYQAAQCQQGGPCWCVD SRGQEIPGTRQRGEPPSCAEDQSCPSERRRAFSRLRFGPSGYFSRRSLLLAPEEGPVSQ RFARFTASCPPSIKELFLDSGIFQPMLQGRDTRFVAPESLKEAIRGLFPSRELARLALQ FTTNAKRLQQNLFGGRFLVKVGQFNLSGALGTRGTFNFSHFFQQLGLPGFQDGRAL ADLAKPLSVGLNSNPASEAPKASKIDVALRKPVVGSFGFEVNLQENQNALQFLSSFL ELPEFLLFLQHAISVPEDIARDLGDVMEMVFSSQGCGQAPGSLFVPACTAEGSYEEV QCFAGDCWCVDAQGRELAGSRVRGGRPRCPTECEKQRARMQSLLGSQPAGSSLFVP ACTSKGNFLPVQCFNSECYCVDTEGQPIPGTRSALGEPKKCPSPCQLQAERAFLGTV RTLVSNPSTLPALSSIYIPQCSASGQWSPVQCDGPPEQAFEWYERWEAQNSAGQALT PAELLMKIMSYREAASRNFRLFIQNLYEAGQQGIFPGLARYSSFQDVPVSVLEGNQT QPGGNVFLEPYLFWQILNGQLDRYPGPYSDFSAPLAHFDLRSCWCVDEAGQKLEGT RNEPNKVPACPGSCEEVKLRVLQFIREAEEIVTYSNSSRFPLGESFLAAKGIRLTDEEL AFPPLSPSRETFLEKFLSGSDYAIRLAAQSTFDFYQRRLVTLAESPRAPSPVWSSAYLP QCDAFGGWEPVQCHAATGHCWCVDGKGEYVPTSLTARSRQIPQCPTSCERLRASGL LSSWKQAGVQAEPSPKDLFIPTCLETGEFARLQASEAGTWCVDPASGEGVPPGTNSS AQCPSLCEVLQSGVPSRRTSPGYSPACRAEDGGFSPVQCDPAQGSCWCVLGSGEEVP GTRVAGSQPACESPQCPLPFSVADVAGGAILCERASGLGAAAGQRCQLRCSQGYRS AFPPEPLLCSVQRRRWESRPPQPRACQRPQFWQTLQTQAQFQLLLPLGKVCSADYSG LLLAFQVFLLDELTARGFCQIQVKTAGTPVSIPVCDDSSVKVECLSRERLGVNITWKL QLVDAPPASLPDLQDVEEALAGKYLAGRFADLIQSGTFQLHLDSKTFSADTSIRFLQG DRFGTSPRTQFGCLEGFGRVVAASDASQDALGCVKCPEGSYFQDEQCIPCPAGFYQE QAGSLACVPCPEGRTTVYAGAFSQTHCVTDCQKNEVGLQCDQDSQYRASQRDRTS GKAFCVDGEGRRLPWTEAEAPLVDAQCLVMRKFEKLPESKVIFSADVAVMVRSEVP GSESSLMQCLADCALDEACGFLTVSTAGSEVSCDFYAWASDSIACTTSGRSEDALGT SQATSFGSLQCQVKVRSREGDPLAVYLKKGQEFTITGQKRFEQTGFQSALSGMYSPV TFSASGASLAEVHLFCLLACDHDSCCDGFILVQVQGGPLLCGLLSSPDVLLCHVRDW

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