KH domain	GXXG sequence	Specific nucleic acids bound by the KH domain (5'-3')	References
Sam 68-KH	GPQG	UAAA	(1)
Vigilin (X. laevis)	Vigilin has 14 KH domains	(A)nCU and CU(A)n	(2)
Vigilin (M. musculus)	Vigilin has 14 KH domains	CHHC or CHYC ( $H = A/C/U$ and $Y = C/U$ )	(3)
SF1-KH	GPRG	UACUAAC	(4,5)
QKI-KH	GPRG	YUAAY(Y = C/U)	(6)
		NACUAAY-N(1-20)-UAAY $(Y = C/U)$	(7)
hnRNP K-KH3	GKGG	TCCC	(8,9)
FBP-KH3	GRNG	TTTT	(8,9)
FBP-KH4	GKGG	ATTC	(8,9)
PCBP1-KH3	GRQG	CUCUCCUUUCUUUUUUUUUUUUUCUUCCCUCCUA	(10)
PCBP2-KH1	GKKG	C rich (CCCT or ACCC)	(11)
PCBP2-KH3	GRQG	CCCT	(12)
Nova-2-KH3	GKGG	UCAC	(13)
NusA: KH1–KH2	GMRG (KH1); GRNG (KH2)	GAACUCAAUAG	(14)
KSRP-KH1	GRGG	UAUUUA	(15)
KSRP-KH2	GKGG	UAUUUA	(15)
KSRP-KH3	GRSG	UAUUUA	(15)
		AGGGU	(16-18)
KSRP-KH4	GRGG	UAUUUA	(15)

Table S1. Nucleic acids bound by KH domain

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Substrate name	Structure or description	Nucleotide sequence $(5' \rightarrow 3')$
ssDNA (30 mer)	Used as random sequence ssDNA in EMSA	DNA 30 mer: GAGCTACCAGCTACCCCGTATGTCAGAGAG
Fork dsDNA (30 bp)	5' 15 30 3'	Fork 30/15-T: TTTTTTTTTTTTTGGTGATGGTGTATTGAGT GGGATGCATGCA Fork 30/15-B: TGCATGCATCCCACTCAATACACCATCACCTT TTTTTTTTTT
Blunt-end dsDNA (30 bp)	5' <b>30</b> 3'	DNA 30 mer: GAGCTACCAGCTACCCCGTATGTCAGAGAG DNA 30 mer comp: CTCTCTGACATACGGGGTAGCTGGTAGCTC
ssRNA (30 mer)	Used as random sequence ssRNA in EMSA	RNA-30-mer: GAGCUACCAGCUACCCCGUAUGUCAGAGAG
30-bp blunt-end dsRNA	5' <mark>30</mark> 3'	RNA-30-mer: GAGCUACCAGCUACCCCGUAUGUCAGAGAG RNA-30mer-comp: CUCUCUGACAUACGGGGUAGCUGGUAGCUC
Forked dsRNA	5′ <sup>15</sup> 30 3′	Fork RNA-30/15-T: UUUUUUUUUUUUUUGGUGAUGGUGUAUUGAGU GGGAUGCAUGCA Fork RNA 30/15-B: UGCAUGCAUCCCACUCAAUACACCAUCACCUU UUUUUUUUUU
13-bp dsRNA with poly (A) 5' tail	5′ <u>15A</u> 3′ 3′5′	RNA-13 B(bottom strand): GCGUCUUUACGGU RNA-41B_15A (top strand): AAAAAAAAAAAAAAAAAAACCGUAAAGACGC
13-bp dsRNA with poly (U) 5' tail	5′ <u>15U</u> 3′ 3′5′	RNA-13 B(bottom strand): GCGUCUUUACGGU RNA-41B_15U (top strand): UUUUUUUUUUUUUUUUACCGUAAAGACGC
13-bp dsRNA with UUGU repeats 5' tail	5' UUGU 3' 3' 5'	RNA-13 B(bottom strand): GCGUCUUUACGGU RNA-28B_15UUGU (top strand): UGUUGUUGUUGUUGUACCGUAAAGACGC
20-bp dsDNA with poly (A) 3' tail	5′ 3′ 3′ 25A 5′	Fork 20/15-2 no T (top strand): GGTGATGGTGTATTGAGTGG Fork 20/25-1 A (bottom strand): CCACTCAATACACCATCACCAAAAAAAAAAAAAAAAAA
20-bp dsDNA with poly (T) 3' tail	3' 25T 5'	Fork 20/15-2 no T (top strand): GGTGATGGTGTATTGAGTGG Fork 20/25-1 T (bottom strand): CCACTCAATACACCATCACCTTTTTTTTTTTTTTTTTT
20-bp dsDNA with TTGT repeats 3' tail	3 <sup>'5'</sup> 3 <sup>'5'</sup> 25TTGT	Fork 20/15-2 no T (top strand): GGTGATGGTGTATTGAGTGG Fork 20/25-1 TTGT (bottom strand): CCACTCAATACACCATCACCTTGTTGTTGTTGTTGTTGT TGTTGT
dT <sub>8</sub>	Co-purified with DDX43 full-length protein	ТТТТТТТТ
$dT_{10}$	Used as ssDNA in NMR	ТТТТТТТТТТТ

## Table S2. DNA and RNA substrates and oligonucleotides used in this study

dT <sub>30</sub>	Used as ssDNA in EMSA	TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT
dA <sub>30</sub>	Used as ssDNA in EMSA	АААААААААААААААААААААААААААААА
dC <sub>30</sub>	Used as ssDNA in EMSA	ССССССССССССССССССССССССССССССССССССССС
rU <sub>30</sub>	Used as ssRNA in EMSA	ՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍՍ
dT <sub>5</sub>	Used as ssDNA in NMR	TTTTT
dA <sub>5</sub>	Used as ssDNA in NMR	ААААА
dC <sub>5</sub>	Used as ssDNA in NMR	CCCCC
dG <sub>5</sub>	Used as ssDNA in NMR	GGGGG
rU <sub>5</sub>	Used as ssRNA in NMR	UUUUU
MY_CTCTC	Used as ssDNA in NMR	CTCTC
MY_CACAC	Used as ssDNA in NMR	CACAC
MY_ATATA	Used as ssDNA in NMR	АТАТА
MY_CGCGC	Used as ssDNA in NMR	CGCGC
MY_ACCAC	Used as ssDNA in NMR	ACCAC
MY_ATTAT	Used as ssDNA in NMR	ATTAT
MY_GTTGT	Used as ssDNA in NMR	GTTGT
MY_AGAGA	Used as ssDNA in NMR	AGAGA
MY_TGTGT	Used as ssDNA in NMR	TGTGT
MY_GGTTG	Used as ssDNA in NMR	GGTTG
MY_GTTTG	Used as ssDNA in NMR	GTTTG

## Table S3. Primers used in this study

DDX43-KH-F- Ndel (74 aa)       ACGT <u>CATATGCCGCTGTGTTTGCTTT</u> GAAG       Forward primer to PCR amplify DDX43 KH domain (74 aa) for cloning in <i>Ndel</i> site of pET28a vector         DDX43-KH-R- Shol (74 aa)       GCATCTCGAAGTGTAATTGTAATTTT CCTC       Reverse primer to PCR amplify DDX43 gene KH domain (74 aa) for cloning in <i>Xhol</i> site of pET28a vector         DDX43- AGTCCATATGAGAGGTGGTCGCGCGG AGC       AGTCCATATGAGAGGTGGTCGCTGGA ACTC       Forward primer to PCR amplify DDX43 gene KH tAl26aa-Nde1-F         AGTCCATATGAGCACTCTAGGCCCCCG       Forward primer to PCR amplify DDX43 gene KH tAl26aa-Nde1-F       AGTC         DDX43- Mde1-F       CATC       126 for cloning in <i>Ndel</i> site of pET28a vector         DDX43-KH89- Nde1-R       CATGCTCGAGTCATTCTGAATTGTAA ACTGCTCGAGTCATTCTGAATTGTAA Reverse primer to PCR amplify DDX43 KH8 9a an for cloning in <i>Ndel</i> site of pET28a vector         DDX43-KH89- Nde1-R       CATGCTCGAGTCATTCTGAATTGTAA Reverse primer to PCR amplify DDX43 KH8 9a an for cloning in <i>Xhol</i> site of pET28a vector         DDX43-KH80- ATAGACAATTTTGTAAATGACTCAA Reverse primer to PCR amplify DDX43 KH8 9a an fragment for cloning in <i>Xhol</i> site of pET28a vector         DDX43-KH80- ATAGACAATTTGGACTACAAAGACCATGAC       SRFLAG coding sequence. Annealed with 3XFLAG-F and cloned into <i>Hmal</i> III and <i>EcoR</i> I site fTCAAGGATGACAGTGACTACTACAAAGACCATGAC         SAFLAG-F       AGCTTATGGACTTGCACGTCATCATACAA ACAGAGTGCACCTTGTCATCGTCAT       SPLAG coding sequence. Annealed with 3XFLAG-R         ACTACTCCGAGTCTTGCACCTGCACCCCCTCTC       SPLAG coding in <i>Hnal</i> III and <i>EcoR</i>	Primer	Sequence (5'-3')	Used in this study
Ndel (74 aa)       GAAG       domain (74 aa)       for cloning in Ndel site of pET28a         DDX43-KH-R. Xhol (74 aa)       GCATCTCGAGTTCTGAATTGTAATTTT CTTC       Reverse primer to PCR amplify DDX43 gene KH domain (74 aa)       for cloning in Ndel site of pET28a         DDX43- KH126aa-Xho1-F       GAGGC       an or cloning in Ndel site of pET28a vector         DDX43- KH126aa-Xho1-R       CGATC       corcomagin in Ndel site of pET28a vector         DDX43- KH126aa-Xho1-R       CGATC       corcomagin in Ndel site of pET28a vector         DDX43- KH89aa- Nde1-F       AGTCCTCTAGGCACTCTAGGCCCCCGG       Forward primer to PCR amplify DDX43 KH-80 aa for cloning in Ndel site of pET28a vector         DDX43-KH80aa- Xho1-R       ATACACATTTGTAAATGACCGA       Reverse primer to PCR amplify DDX43 gene KH state of pET28a vector         DDX43-KH80aa- Xho1-R       GCATG       fragment for cloning in Ndel site of pET28a vector         DX43-KH80aa- Xho1-R       GCATG       fragment for cloning in Ndel site of pET28a vector         3RFLAG-F       AGCTTATGGACTACAAAGACCATGCAG GGTGATTATAAGGATGACTACTAGCACTGGAG       apres primer to DCR amplify DDX43 KH 80 aa fragment for cloning in Ndel site of pET28a vector         3XFLAG-F       AGCTTATGGACTACAAAGACCATGGAG       apres primer to DCR amplify DDX43 KH 80 aa fragment for cloning in Ndel site of pET28a vector         3XFLAG-F       AGCTTATGGACTTGCATCGTGATCACTGGAG       aprebN3.0 vector	DDX43-KH-F-	ACGT <u>CATATG</u> CCGCTGTGTTTTGCTTT	Forward primer to PCR amplify DDX43 KH
vector         DDX43-KH-G       GCATCTCGAGTTCTGAATTGTAATTTT       Reverse primer to PCR amplify DDX43 gene KH domain (74 aa) for cloning in Xhol site of pET28a vector         DDX43-       AGTCCATATGAGAGGTGGTCGCTGGA       Forward primer to PCR amplify DDX43 KH-126 aa for cloning in Ndel site of pET28a vector         DDX43-       ACTCCTCGAGTCAATCTATCAATGGC       Reverse primer to PCR amplify DDX43 gene KH         K1126aa-Xhol-R       CGATC       Forward primer to PCR amplify DDX43 gene KH         Mdel-F       AGGCC       for cloning in Xhol site of pET28a vector         DDX43-KH89-       CATOCTCGAGGTCATTCTGAATTGTAA       Reverse primer to PCR amplify DDX43 gene KH         Xhol-R       TTTTC       Reverse primer to PCR amplify DDX43 gene KH         Xhol-R       TTTTC       Reverse primer to PCR amplify DDX43 kH 80 aa         TACGCACAATTTTGTAAATGACCGAA       Reverse primer to PCR amplify DDX43 kH 80 aa       fragment for cloning in Xhol site of pET28a vector         DX43-KH80a-       ATAGACAATTTTGTAAAGACCATGAA       SRLAG-Goding sequence. Annealed with       sdig with primer DDX43-KH80aa-Nde1-F)         XhLAG-R       AGCTATTGACACTGACATGACAATGACAATGAA       SRLAG-R and cloned into HindIII and EccRI site         GGTGATTATGACTACGAGTGCACCTTGTCATCCTTG       SRLAG-R and cloned into HindIII and EccRI site         pcDNA3-DDX43-       ACTAGGTCGCCACCATTGGTCATCCTGA	NdeI (74 aa)	GAAG	domain (74 aa) for cloning in NdeI site of pET28a
DDX43-KH-R- Xhol (74 aa)       GCATC <u>TCGAG</u> TTCTGAATTGTAATTTT CTTC       Reverse primer to PCR amplify DDX43 gene KH domain (74 aa) for cloning in <i>Xhol</i> site of pET28a vector         DDX43- KH126aa-Xhol-R       AGTCCATATGAGAGGTGGTCGCTGGA GGC       Forward primer to PCR amplify DDX43 gene KH 126 for cloning in <i>Xhol</i> site of pET28a vector         DDX43- KH126aa-Xhol-R       CGATC       Reverse primer to PCR amplify DDX43 gene KH 126 for cloning in <i>Xhol</i> site of pET28a vector         DDX43-KH89a- Ndel-F       AATTCATATGACCTCTAGGCCCCCGG       Forward primer to PCR amplify DDX43 gene KH 89 aa for cloning in <i>Xhol</i> site of pET28a vector         DDX43-KH89a- Nhol-R       CATGCCTCGAGTCATTCTGAATTGTAA TTTTC       Reverse primer to PCR amplify DDX43 gene KH 89 aa for cloning in <i>Xhol</i> site of pET28a vector         DDX43-KH80a- Xhol-R       CATGGCCGAGTCATTTGTGAACTGCAA GCTTATGGACTACAAAGACCATGCA GCTGATTATAAAGATCATGACCATGAC GCTGATTATAAAGATCATGACCATGAC GCTGATTATAAAGATCATGACCATGAC GCTGATTATAAAGATCATGACCATGAC GCTGATTATAAAGATCATGACCATGAC GCTGATGATGTCATGAGTCCTTGATGCACTCTG TACAAGGATGACGATGGACAAGTGAGA GCATGCAGTGTCATGATCCTTGATGACCCTG CCGTCATGGTGTTGTGAGCCCCATGACC TAGGCCCCCCGGAG       SXFLAG-R and cloned into <i>Hind</i> III and <i>EcoRI</i> site of pcDNA3.0 vector         pcDNA3-DDX43 KH89-Hind3-F       CATGCGGCGCCCCCGGAGCACCATGGCC TCGAGGTCGTGGTGGTGCC CCGGAGTGGTGGTGGGTC       Reverse primer with to PCR amplify DDX43 KH 89 aa fragment for cloning in <i>Hind</i> III site of pcDNA3.0 vector         pDNA3-SHIAF       GACTGACGCACCTGTGCATGCATG ACTAGCCCCCCGGAGCCACTTGCTGCA CCGGTCGTGGTGGTGGGTC       PDX43-KH-810         DDX43-KH89- Nthol-R <td></td> <td></td> <td>vector</td>			vector
Xhol (74 aa)       CTTC       domain (74 aa) for cloning in Xhol site of pET28a vector         DDX43- KH126aa-Nde1-F       AGTCCATATGAGAGGTGGTCGCTGGA GAGGC       Forward primer to PCR amplify DDX43 kH-126 aa for cloning in Xhol site of pET28a vector         DDX43- KH126aa-Xho1-R       CGATC       126 for cloning in Xhol site of pET28a vector         DDX43-KH89aa AGCC       AATTCATATGACCTCTAGGCCCCGGG       Forward primer to PCR amplify DDX43 gene KH         Abd1-F       AGGCC       for cloning in Ndel site of pET28a vector         DDX43-KH89aa       ATATCATATGACCTCTGGAATTGTAA       Reverse primer to PCR amplify DDX43 gene KH         Xho1-R       TTTC       89 aa for cloning in Ndel site of pET28a vector         DDX43-KH80aa-       ATAGACAATTITGTAAATGACTCGA       Reverse primer to PCR amplify DDX43 KH 80 aa fragment for cloning in Xhol site of pET28a vector         DDX43-KH80aa-       AGCTATATGAAGACAAGGACATGGA       SXFLAG coding sequence. Annealed with         XSFLAG-F       AGCTATGGACTACTAAGAGCACATGGAG       SXFLAG coding sequence. Annealed with         XSFLAG-R       AATTCGAAGTGGTCATGATACAAGGACAGTGAGA       Gord pEN3.0 vector         ZXFLAG-R       AATTCGAAGCTGCGCCACCATGACAT       Forward primer to PCR amplify DDX43 KH-89 aa         RTB9-Hind3-F       CTAGCCCGCGCACCATTGCATCGTCA       Forward primer to PCR amplify DDX43 KH-89 aa         RTAGAAGTGGTCAT	DDX43-KH-R-	GCAT <u>CTCGAG</u> TTCTGAATTGTAATTTT	Reverse primer to PCR amplify DDX43 gene KH
Vector         DDX43-       AGTCCATATGAGAGGTGGTCGCTGAA         KH126aa-Nde1-F       GAGGC         aa for cloning in Ndel site of pET28a vector         DDX43-       ACTGCTCGAGTCAATCTATCAATGC         Reverse primer to PCR amplify DDX43 gene KH         KH126aa-Xho1-R       CGATC         DDX43-KH89aa-       ATATCATATGACCTCTAGGCCCCCGG         Forward primer to PCR amplify DDX43 gene KH         Xho1-R       TTTTC         DDX43-KH89aa-       AGGCC         AGGCA       Reverse primer to PCR amplify DDX43 gene KH         Xho1-R       TTTTC         DDX43-KH80aa-       ATAGACAATTTGTAAATGACTCGA         Reverse primer to PCR amplify DDX43 gene KH         Xho1-R       GCATG         GGTGATTATGGACTACAAAGACCATGAC         SRFLAG-F       AGCTTATGGACTACAAAGACCATGAC         AGTCCAAGGATGACAAGAGCAATGAC       SRFLAG coding sequence. Annealed with         XXFLAG-R       AATTCCACTGTGCAGCACCACAGACC       SRFLAG coding sequence. Annealed with         TAACGAAGTGCCCCCGCACCACTGACC       GreDNA3.0 vector       GpDNA3.0 vector         SXFLAG-R       ACTGAAGCTACCATGGCCACCACTGACC       Forward primer to PCR amplify DDX43 KH-89 aa         fragment for cloning in <i>Hind</i> III and <i>EcoRI</i> site       fop cDNA3.	XhoI (74 aa)	CTTC	domain (74 aa) for cloning in <i>Xho</i> I site of pET28a
DDX43- KH126aa-Xho1-R     AGTCCATATGAGAGGTGGTCGCTGGA ACTGCTCGAGTCAATCTATCAATGGC     Forward primer to PCR amplify DDX43 KH-126 a for cloning in <i>Ndel</i> site of pET28a vector       DDX43-KH89aa- Xho1-R     ATACATATGACCTCTAGGCCCCGG     Forward primer to PCR amplify DDX43 gene KH 126 for cloning in <i>Ndel</i> site of pET28a vector       DDX43-KH89aa- Xho1-R     ATACATATGACCTCTGAGTCATTGTAA     Reverse primer to PCR amplify DDX43 gene KH 89 aa for cloning in <i>Ndel</i> site of pET28a vector       DDX43-KH89a- Xho1-R     ATTGCACATTGTGAATTGTAA     Reverse primer to PCR amplify DDX43 gene KH 89 aa for cloning in <i>Ndel</i> site of pET28a vector       DDX43-KH80aa- Xho1-R     ATGGCACATCTAAAGGACATGGAC GGTGATTATAAAGATCATGACATCGA     Reverse primer to PCR amplify DDX43 KH 80 aa fragment for cloning in <i>Ndol</i> site of pET28a vector       3xFLAG-F     AGCTTATGGACTACAAAGGACATGGAC GGTGATTATAAAGATCATGCACATCGA     3xFLAG-R and cloned into <i>HindIII and EcoRI</i> site of pcDNA3.0 vector       3XFLAG-R     AATTCCACTGTGCATCGTGACCTTGT AATCCACGTGCATGACATGA			vector
KH126aa-Nde1-F       GAGGC       aa for cloning in Nde1 site of pET28a vector         DDX43-       ACTGCTCGAGTCAATCTATCAATGGC       Reverse primer to PCR amplify DDX43 gene KH         Nde1-F       AGGCC       for cloning in Nde1 site of pET28a vector         DDX43-KH89aa       ATATCATATGACCTCTAGGCCCCGG       Forward primer to PCR amplify DDX43 kH-89 aa         DDX43-KH89a       CATGCTCGAGTCATTCTGAATTGTAA       Reverse primer to PCR amplify DDX43 kH 80 aa         TATAGCATATTTGTTAAATGACTCGA       Reverse primer to PCR amplify DDX43 kH 80 aa         Xho1-R       GCATG       using with primer DDX43-KH80aa         TATAGCAATTTTGTAAATGACTCGA       Reverse primer to PCR amplify DDX43 kH 80 aa         ATAGCAATGCATGACAAGAGCACTGAC       GGGTGATTATAAAGATCATGACATGACAG       SxFLAG coding sequence. Annealed with         3xFLAG-F       AGCTTATGGACTACAAAGACCATGAC       SxFLAG coding sequence. Annealed with       SxFLAG coding sequence. Annealed with         3xFLAG-R       AATTCTCACTTGTCATCGTCACCTCTG       3xFLAG coding sequence. Annealed with       SxFLAG coding sequence. Annealed with         3xFLAG-R       AATTCTCACTTGTCATCGTCACCATGACCT       of pcDNA3.0 vector       sxFLAG coding in HindIII site of pcDNA3.0         PcDNA3-DDX43-       ACTGAAGCTACCTTGTCATCGTCA       of pcDNA3.0 vector       pcDNA3-RH89         DDX43-KH89-F       CAT	DDX43-	AGTCCATATGAGAGGTGGTCGCTGGA	Forward primer to PCR amplify DDX43 KH-126
DDX43     ACTGCTCGAGTCAATCTATCAATGGC     Reverse primer to PCR amplify DDX43 gene KH       KH126aa-Xho1-R     CGATC     Forward primer to PCR amplify DDX43 KH-89 aa       Mde1-F     AGGCC     Forward primer to PCR amplify DDX43 KH-89 aa       Mde1-F     AGGC     Forward primer to PCR amplify DDX43 KH-89 aa       DDX43-KH89-     CATGCTCGAGTCATTCTGAATTGTAA     Reverse primer to PCR amplify DDX43 KH 80 aa       TAGACAATTTTGTTAAATGACCCGA     Reverse primer to PCR amplify DDX43 KH 80 aa       Yaba     GCATG     fragment for cloning in Xhol site of pET28a vector       Using with primer DDX43-KH89aa-Nde1-F)     SXFLAG-F     AGCTTATGGACTACAAAGACCATGAC       GGTGATTATAAAGATCATGACCATGAC     SXFLAG-R and cloned into HindIII and EcoRI site       TTACAAGGATGACGATGACCATGACCATGAC     SXFLAG-F and cloned into HindIII and EcoRI site       TAATCGATGTCATGTCATGATCTTATAACA     SXFLAG-F and cloned into HindIII and EcoRI site       CGTCATGGTCTTGTAGTCCCATA     forward primer to PCR amplify DDX43 KH-89 aa       TAATCGACGGCCACCATGGCCACCATGGCCT     fragment for cloning in XhoI site of pcDNA3.0       Vector     CCGTCATGGTCCTTGTAGTCATGGTCTTG       pcDNA3-FLAG     ACTACTCGAGGTCACTTGTCATCGTCG       pcDNA3-FLAG     ACTACTCGAGGTCACTTGTCATCGTCGT       pcDNA3-FLAG     ACTACTCGAGGTCACTTGTCATGGTCTTGTAGTCTTA	KH126aa-Nde1-F	GAGGC	aa for cloning in NdeI site of pET28a vector
KH126aa-Xh01-R       CGATC       126 for cloning in Xhol site of pET28a vector         DDX43-KH89aa       ATATCATATGACCTCTAGGCCCCGG       Forward primer to PCR amplify DDX43 KH-89 aa         Mol-R       CATGCTCGAGTCATTCTGAATTGTAA       Reverse primer to PCR amplify DDX43 gene KH         89 aa for cloning in Xhol site of pET28a vector       By aa for cloning in Xhol site of pET28a vector         DDX43-KH80aa-       ATAGACAATTTTGTAAATGACTCGA       Reverse primer to PCR amplify DDX43 gene KH         SMA1-R       GCATG       Reverse primer to PCR amplify DDX43 gene KH         SMA1-R       GCATG       Reverse primer to PCR amplify DDX43 gene KH         SMALAG-F       AGCTTATGAACAATTGACATCGA       Reverse primer to PCR amplify DDX43 gene KH         SMFLAG-F       AGCTTATGAACTACAAGACCATGAC       SMFLAG-R and cloned into HindIII and EcoRI site         GTGATTATAAAGACTATGCATCATCATCGTCATCGTCA       SMFLAG-R and cloned into HindIII and EcoRI site         TACCAAGATGACCATGCACCTGCCACCATGACCT       SMFLAG-F and cloned into HindIII and EcoRI site         SMFLAG-R       ACTACTCGAGTCACTTGTCATCGTCAT       SMFLAG-F and cloned into HindIII and EcoRI site         pDNA3-DX43-KH89-       ACTACTCGAGTCACTTGTCATCGTCA       Forward primer to PCR amplify DDX43 KH-89 aa         rgament for cloning in Ahol site of pEDNA3.0       vector       rector         pDNA3-FLA	DDX43-	ACTGCTCGAGTCAATCTATCAATGGC	Reverse primer to PCR amplify DDX43 gene KH
DDX43-KH89aa.       ATATCATATGACCTCTAGGCCCCCGG       Forward primer to PCR amplify DDX43 KH-89 aa         Ndel-F       AGGCC       for cloning in Ndel site of pET28a vector         DDX43-KH89a       ATAGACAATTTIGTAAATGACTGA       Reverse primer to PCR amplify DDX43 gene KH         Xhol-R       TTTTC       Reverse primer to PCR amplify DDX43 KH 80 aa         DDX43-KH80aa       ATAGACAATTTIGTAAATGACTGA       Reverse primer to PCR amplify DDX43 KH 80 aa         ArGACAATTTGTAAAGACCATGAC       GCATG       stpLAG-F       AGCTTATGGACTACAAAGACCATGAC         MAGACA       GAGATGATGACAAGAGCATGACAGAGGACAACAGTGAG       of pcDNA3-KH89aa-Ndel-F)         3XFLAG-F       AGCTTATGGACTACAAAGACCATGAC       3XFLAG-R and cloned into HindIII and EcoRI site         TACAAGGATGACGATGACGATGACAGTGAC       SXFLAG-F and cloned into HindIII and EcoRI site         TCACAGGTCCTTGTGATCCTTGTAGTCCATCATCG       SXFLAG-F and cloned into HindIII and EcoRI site         TCAGAGCTTGCCGCCCCCGGAG       Forward primer to PCR amplify DDX43 KH-89 aa         KH89-Hind3-F       CTGAGGCCCCCCGGAG       Forward primer to PCR amplify DDX43 KH-89 aa         YEAAS-KH89-       ACTACTCCGAGTCACTTGTCATCGTCA       Forward primer to PCR amplify DDX43 KH-89 aa         YEAAS-KH49-       CCTGACGCGCCCCCGGAG       Reverse primer with to PCR amplify DDX43 KH-89 aa         YEAAS-KH489-	KH126aa-Xho1-R	CGATC	126 for cloning in <i>Xho</i> I site of pET28a vector
Ndel-F   AGGCC   for cloning in <i>Xhal</i> site of pET28a vector     DDX43-KH89-   CATGCTCGAGTCATTCTGAATTGTAA   Reverse primer to PCR amplify DDX43 gene KH     Xhol-R   TTTTC   89 aa for cloning in <i>Xhal</i> site of pET28a vector     DDX43-KH80aa-   ATAGACAATTTTGTTAAATGACTCGA   Reverse primer to PCR amplify DDX43 KH 80 aa     fragment for cloning in <i>Xhal</i> site of pET28a vector   using with primer DDX43-KH89aa- <i>Ndel</i> -F)     3xFLAG-F   AGCTTATGACTACAAGACCATGAC   3XFLAG-R and cloned into <i>Hind</i> III and <i>EcoRI</i> site     GGGATTATAAAGATCATGACATCGTCATCGTCA   3XFLAG-R and cloned into <i>Hind</i> III and <i>EcoRI</i> site     TTACAAGGATGACGATGACAACTGACAT   3XFLAG-G and gequence. Annealed with     TAATCGATGTCATGGTCATGGTCATCGTCA   3XFLAG coding sequence. Annealed with     CGGTCATGGTCATGGTCATGATCATTAATCA   3XFLAG-G and cloned into <i>Hind</i> III and <i>EcoRI</i> site     cCGTCATGGTCTTGCAGGTCACCTTGCACGTCACT   Forward primer to PCR amplify DDX43 KH-89 aa     fragment for cloning in <i>Hind</i> III site of pcDNA3.0   vector     pcDNA3-FLAG-   ACTACTCGAGGTCACTTGCATGGTCATGATCTTA     ADX43-KH89-   CCAGGTCATGGAGTCACTGGCATGACATGACTTTA     Nhol-R   TAATCACCGGTCATGGTCATGGTCATGATCGTCA     PCDNA3-FLAG-   ACTACTCGATGATCATGGACTGTCAA     PCDX43-A81I-F-   GAAGAGCCACTTTGTTGGCAGCGATA     new   TCGGTCGTGGTGGGTC     DDX43-A81I-F-   GAAGAGCCACCTTTGTTGGCGGGGTAA <t< td=""><td>DDX43-KH89aa-</td><td>ATATCATATGACCTCTAGGCCCCCGG</td><td>Forward primer to PCR amplify DDX43 KH-89 aa</td></t<>	DDX43-KH89aa-	ATATCATATGACCTCTAGGCCCCCGG	Forward primer to PCR amplify DDX43 KH-89 aa
DDX43-KH89-     CATGCTCGAGTCATTCTGAATTGTAA     Reverse primer to PCR amplify DDX43 gene KH       Xhol-R     TTTC     89 aa for cloning in Xhol site of pET28a vector       DDX43-KH80aa-     ATAGACAATTTTGTTAAATGACTCGA     Reverse primer to PCR amplify DDX43 KH 80 aa       Xhol-R     GCATG     Reverse primer to PCR amplify DDX43 KH 80 aa       3xFLAG-F     AGCTTATGGACTACAAAGACCATGAC     SFLAG coding sequence. Annealed with       3XFLAG-R     AATTCTCACTGTGCATCGTCATCGACACTGA     SFLAG coding sequence. Annealed with       3XFLAG-R     AATTCTCACTGTGCATCGTGCATCCTTG     3XFLAG-F and cloned into HindIII and EcoRI site       pcDNA3-DDX43-     CCGTCATGGTCATTGTCATCGTCATCCTTG     3XFLAG-F and cloned into HindIII and EcoRI site       pcDNA3-DDX43-     CTGAGCCCCCGGAG     Forward primer to PCR amplify DDX43 KH 89 aa       KH89-Hind3-F     CTAGGCCCCCGGAG     Forward primer to PCR amplify DDX43 KH 89 aa       pcDNA3-FLAG-     ACTACTCGAGTCATTGTCATGGTCATTGATGTCATGTCA	Nde1-F	AGGCC	for cloning in <i>Nde</i> I site of pET28a vector
Xhol-R   FTTC   89 aa for cloning in Xhol site of pET28a vector     DDX43-KH80aa- Xhol-R   ATAGACAATTTGTTAAATGACTCGA   Reverse primer to PCR amplify DDX43 KH 80 aa     fragment for cloning in Xhol site of pET28a vector   (using with primer DDX43-KH89aa-Mel-F)     3xFLAG-F   AGCTTATGGACTACAAAGACCATGAC   3xFLAG-R and cloned into HindIII and EcoRI site     TTACAAGGATGACGATGACAAGTGAC   3xFLAG-R and cloned into HindIII and EcoRI site     TAATCGATGTCATGGTCATCGTCATCGTCAT   5xFLAG-ca and cloned into HindIII and EcoRI site     CCGTCATGGTCTTGCAGCGCCACCATGAC   7cPDNA3-DV43-     KH89-Hind3-F   CTAGGCCCCCGGAG     rpcDNA3-FLAG-   ACTACTCGAGTGATCATGATCATTA     pcDNA3-FLAG-   ACTACTCGAGTGATCATGATCATTGATCATCG     pcDNA3-FLAG-   ACTACTCGAGTGACATGGACATGATCAT     pcDNA3-FLAG-   ACTACTCGAGTGACATGGATCATCATCA     pcDNA3-FLAG-   ACTACTCGAGTGATGATCATGATCAT     pcDNA3-FLAG-   ACTACTCGAGTGATGATGATCATGATCAT     pcDNA3-FLAG-   ACTACTCGAGTGATGGCATGATAA     pcTGGATGATGATGGGGGGC   Reverse primer with to PCR amplify DDX43 KH     DDX43-A811-F-   GAAGACCACTTTGTGGCATCGTAA     rGGTGGTGGTGGGGGGC   DDX43-KH-A811     DDX43-A811-F-   GAAGAGCCACTTTGTGGCGGGGGTAA     rCGGTCGTGGTGGGGGGC   DDX43-KH-A811     DDX43-A816-F   GAAGAGCCACTTTGTGGCGGGGGTAA     rCGGTCGTGGTGGGGGGC   DD	DDX43-KH89-	CATG <u>CTCGAG</u> TCATTCTGAATTGTAA	Reverse primer to PCR amplify DDX43 gene KH
DDX43-KH80aa- Xho1-R     ATAGACAATTTTGTTAAATGACTCGA     Reverse primer to PCR amplify DDX43 KH 80 aa       SxFLAG-F     AGCTTATGGACTACAAAGACCATGAC     3xFLAG-Galing sequence. Annealed with       3xFLAG-R     AGCTTATGGACTACAAAGACCATGAC     3xFLAG-coding sequence. Annealed with       3xFLAG-R     AATTCTCACTTGTCATCGTCATCCTCG     3xFLAG coding sequence. Annealed with       3xFLAG-R     AATTCTCACTTGTCATCGTCATCCTCG     3xFLAG coding sequence. Annealed with       3xFLAG-R     AATTCTCACTTGTCATGACCATACCATA     of pcDNA3.0 vector       pcDNA3-DDX43-     ACTGAAGCTTGCCGCCACCATGACCT     Forward primer to PCR amplify DDX43 KH-89 aa       fragment for cloning in <i>Hind</i> III site of pcDNA3.0 vector     reagment for cloning in <i>Hind</i> III site of pcDNA3.0 vector       pcDNA3-FLAG-     ACTACTCGAGTCACTTGTCATCGTCAT     Reverse primer with to PCR amplify DDX43 KH-89 aa       fragment for cloning in <i>Xhol</i> site of pcDNA3.0 vector     rector     vector       pDX43-KH89-     ACTACTCGAGTCACTTGTCATCGTCAT     Reverse primer with to PCR amplify DDX43 KH       Nh1-R     AACAAGCCACTTTGTTGCATCGTCAT     sp fragment for cloning in <i>Xhol</i> site of pcDNA3.0 vector       DDX43-A81I-F-     GAAGAGCCACTTTGTTGCACCGC     Reverse primer for site-directed mutagenesis of       DDX43-A81I-F-     GACCACCACCACGATTACCAGAGCC     Forward primer for site-directed mutagenesis of	Xho1-R	ТТТТС	89 aa for cloning in <i>Xho</i> I site of pET28a vector
Xhol-RGCATGfragment for cloning in Xhol site of pE128a vector (using with primer DDX43-KH89aa-Nde1-F)3xFLAG-FAGCTTATGGACTACAAAAGACCATGAC GGTGATTATAAAGATCATGACATCGA TACAAGGATGACGATGACAAGTGAG ATTCTACATCGTGTGTGTCATCGTCATCGTCAT CCTGTCATGGTCATGGTCATCGTCATCGTCAT CCGTCATGGTCTTGTAGTCCATCA CCGTCATGGTCTTGTAGTCCATCA CCGTCATGGTCTTGTAGTCCATCA CCGTCGTGGTGGTCCATGGTCATCGTCAT CCGTCGTAGTCGCCCCCCCCACCATGACCT Forward primer to PCR amplify DDX43 KH-89 aa (vectorxKH89-Hind3-FCTAGGCCCCCGGAG CCAGGACGTCACCATGGTCATGGTCATGGTCATGGTCATGGTCATGAGTCATGAGTCA CCTGGTAGTCATGATCGTCATGAGTCATGAGTCATGAGTCA TCGTAGTCATGATCGATGTCATGATCGATG CCTGGTAATCGATGTCATGATCGATG TCGTAATCGATGTCATGATCGTCAT CCTGGTAGTCGAGTCATGTCATGAGTCAT TCGAAATTGTAATTTCTTCDDX43-KH89- TCCGGTCGTGGGGGGTC CDX43-KH89- TCCGGTCGTGGTGGGGGTC CDX43-KH1-FGAACGAGCACCTTTGTTGGCATCGTCA Forward primer for site-directed mutagenesis of new TCGGTCGTGGTGGGGGTC TCGGTCGTGGTGGGGGTCDDX43-A811-F- GAACAAGCGACCTTTGTTGGCGGGAAA TCGGTCGTGGTGGGGGTCGACCACCACCACGACCGATTACCGACC Forward primer for site-directed mutagenesis of DDX43-KH-881GDDX43-A815-F GAACGACCACCTTGTGTGGCGGCAA ACCAACAGGGCTCTTCForward primer for site-directed mutagenesis of DDX43-KH-881SDDX43-G87D-F AACAAAGTGGCTCTTCDDX43-KH-A81SDDX43-G87D-F AACAAAGTGGCTCTTCForward primer for site-directed mutagenesis of DDX43-G87D-FDDX43-G87D-F AACGAAGGGGACCTTACCCACGACCReverse primer for site-directed mutagenesis of DDX43-G87D-FDDX43-G87D-F AACGAAGGGAAGGAACATATGCCCACGACCReverse primer for site-directed mutagenesis of DDX43-G87D-FDDX43-G87D-FGAACGAGGAGAGGACCATACGACCA AACGAAGGGCACCTTACCCAGACCReverse p	DDX43-KH80aa-	ATAGACAATTTTGTTAAATGACTCGA	Reverse primer to PCR amplify DDX43 KH 80 aa
3xFLAG-FAGCTTATGGACTACAAAGACCATGAC GGTGATTATAAAGATCATGACAAGACCATGAC AGCTATGGACGATGACGATGACGATGACAAGGACA AGCAAAGGATGACGATGACGATGACAAGTGAG OF pCDNA3.0 vector3xFLAG-R and cloned into HindIII and EcoRI site of pCDNA3.0 vector3XFLAG-RAATTCTCACTTGTCATCGTCATCCTTG CCGTCATGGTCTTTGTAGACCATGACAATGAC CCGTCATGGTCTTTGTAGATCTTATAATCA CCGTCATGGTCTTTGTAGACCATGACAT CCGTCATGGTCTTTGTAGATCCATA CCGTCATGGTCCTTGGTAGCCACATGACCAT CCAGGCCCCCGGAGSxFLAG-F and cloned into HindIII and EcoRI site of pcDNA3.0 vectorpcDNA3-DDX43-ACTGAAGCTTGCCGCCACCATGACCT CTAGGCCCCCGGAGForward primer to PCR amplify DDX43 KH-89 an fragment for cloning in HindIII site of pcDNA3.0 vectorpcDNA3-FLAG- DDX43-KH89- Xho1-RACTACTCGAGTCACTTGTCATCGTCA TCCTGTAATCGATGTCATCGTCT TCTGAATTGTAATTTTCTTCReverse primer with to PCR amplify DDX43 KH 89 fragment for cloning in Xhol site of pcDNA3.0 vectorDDX43-A81I-F- newGAAGAGCCACTTTGTGGCACTGAAC TCGGTCGTGGGGGTCForward primer for site-directed mutagenesis of DDX43-KH-A811DDX43-A81I-F- GAAGAGCCACTTTGTGGCGGGTCGAAGAGCCACTTTGTGGCGGGTA DDX43-KH-A811Forward primer for site-directed mutagenesis of DDX43-KH-A816DDX43-A81G-R GACCACCACCACGACCGATTACCCACCC ACCAAAGTGGCTCTTCForward primer for site-directed mutagenesis of DDX43-KH-A816DDX43-A81S-FGAAGAGCCACTTTGTGGCCGGGTA ACCAACGTGGTGGTCCForward primer for site-directed mutagenesis of DDX43-KH-A816DDX43-A81S-R GACCACCACCACGACCGATTACCCACCC ACCAACGTGGTGGTCCCCCCCForward primer for site-directed mutagenesis of DDX43-KH-A818DDX43-A81S-RGAACCACCACCACGACCGATTACCCACCCC ACCAACGGTGGTGCCForward primer for site-directed mutagenesis o	Xho1-R	GCATG	fragment for cloning in <i>Xhol</i> site of pE128a vector
3xFLAG-FAGCTIATAGGACIACAAAGACCATGAC GGTGATTATAAAGATCATGACATCGA GGTGATTATAAAGATCATGACATCGA SXFLAG-R and cloned into HindIII and EcoRI site of pcDNA3.0 vector3XFLAG-RAATTCTCACTTGTCATCGTCATCGTCG TAATCGATGTCATGATCATGACCATAGAC CCGTCATGGTCTTGTGATCCATA GCGTCATGGTCTTGTGATCCATA CCGTCATGGTCTTGTGATCCATA GPCDNA3-DDX43- KH89-Hind3-FACTGAAGCTTGCCGCCACCATGACCT CTAGGCCCCCGGAG CTAGGCCCCCGGAGForward primer to PCR amplify DDX43 KH-89 aa fragment for cloning in HindIII site of pcDNA3.0 vectorpcDNA3-FLAG- DDX43-KH89- Xho1-RACTACTCGAGTCATCGTCATCGTCA TATCACCGTCATGGTCATGGTCATGGTCTTTGTAGTCCT TCGGATTGTAATCGATGTCATGGTCTTTGTGGCACCGTAA FORWARD primer for site-directed mutagenesis of DDX43-A811-F- GAAGAGCCACCTTGTGGGGGGCCForward primer for site-directed mutagenesis of DDX43-A811-F- GAAGAGCCACCTTGTGTGGGGGGCCDDX43-A811-F- Rew GACCACCACCACGACCGACTCAGCCCCCCCCCCCCCCCC			(using with primer DDX43-KH89aa-Nde1-F)
GGTGATTATATAGATCATGACATCGASAFLAG-RSAFLAG-RSAFLAG-R3XFLAG-RAATTCTCACTTGTCATCGTCATCGTCG3xFLAG coding sequence. Annealed with TAATCGATGTCATGGTCATGATCATTATAATCA CCGTCATGGTCTTTGTAGTCCATA3xFLAG-F and cloned into HindIII and EcoRI site of pcDNA3.0 vectorpcDNA3-DDX43-ACTGAAGCTTGCCGCCACCATGACCTForward primer to PCR amplify DDX43 KH-89 aa VectorkH89-Hind3-FCTAGGCCCCCGGAGFragment for cloning in HindIII site of pcDNA3.0 vectorpcDNA3-FLAG- DDX43-KH89-ACTAACTCGAGTCACTTGTCATCGTCA TCCTTGTAATCGATGTCATGGTCTTTGTAGTCT TAATCACCGTCATGGTCTTTGTAGTCAT TCGTGAATTGTAATTGTCATCGTCAReverse primer with to PCR amplify DDX43 KH 	3XFLAG-F	AGCITATGGACTACAAAGACCATGAC	3xFLAG coding sequence. Annealed with
3XFLAG-RAATTCTCACTGTCACTGATCATCGTGA3xFLAG coding sequence. Annealed with 3XFLAG-F and cloned into HindIII and EcoRI site of pcDNA3.0 vectorpcDNA3-DDX43- RKH89-Hind3-FACTGAAGCTTGCCGCACCACCATGACCT CTAGGCCCCGGAGForward primer to PCR amplify DDX43 KH-89 aa fragment for cloning in HindIII site of pcDNA3.0 vectorpcDNA3-FLAG- DDX43-KH89- Xho1-RACTACTCGAGTCACTTGTCATCGTCA TCTGAATGTAATTGATCTTGTGAGTCTTT TCTGAATGTAATTGTCTReverse primer with to PCR amplify DDX43 KH 89 fragment for cloning in Xhol site of pcDNA3.0 vectorDDX43-KH89- Xho1-RACTACTCGAGTCACTTGTCATGATCTTTA TAATCACCGTCATGGTCATGTGAGTCT TCTGAATTGTAATTGTTCTCReverse primer with to PCR amplify DDX43 KH 89 fragment for cloning in Xhol site of pcDNA3.0 vector with a 3xFLAG tagDDX43-A811-F- newGAAGAGCCACTTTGTTGGCATCGTAA TCGGTCGTGGTGGGTCForward primer for site-directed mutagenesis of DDX43-KH-A811DDX43-A816-FGAAGAGCCACTTTGTTGGCGGGGGTAA ACAAAGTGGCTCTTCForward primer for site-directed mutagenesis of DDX43-KH-A81GDDX43-A818-FGAACGACCACTTTGTTGGCCCGGGGTAA ACCAACGTGGTGGGGCCForward primer for site-directed mutagenesis of DDX43-KH-A816DDX43-A818-FGAACCACCACCACGACCGATTACCCCGCC ACCACCACGACCGATTACCCGGCCReverse primer for site-directed mutagenesis of DDX43-KH-A818DDX43-G87D-FGAACCACCACGACCGATTACCCAGACC AAAGAAGTGGCTCTTCDDX43-G154DDDX43-G87D-FGTAATCGTCGTGGTGACCCACACACC AAAGAATForward primer for site-directed mutagenesis of DDX43-G154DDDX43-G87D-FGTAATCGTCGTGGTGACCCACACACC AAAGAAGTGGCTCTACCACACAC AAAGAAGTGGCTCTTCDDX43-G154DDDX43-G87D-FGTAATCGTCGTGGTGACCC			SAFLAG-K and cloned into <i>Hind</i> ill and <i>EcoR</i> I site
SAFLAG-RAATTCTACTTGTCATCGTCATCGTCATCOTCATCOTCATA COURS TAATCGATGTCATGATCTTTATATCA SXFLAG-F and cloned into HindIII and EcoRI site of pcDNA3.0 vectorpcDNA3-DDX43- KH89-Hind3-FACTGAAGCTTGCCGCCACCATGACCT CTAGGCCCCCGGAGForward primer to PCR amplify DDX43 KH-89 aa fragment for cloning in HindIII site of pcDNA3.0 vectorpcDNA3-FLAG- DDX43-KH89- Xho1-RACTACTCGAGTCACTTGTCATCGTCA TCATCACCGTCATGGTCATGGTCATGATCTTTA ATCACCGTCATGGTCATGGTCATGATCTTA TCTGATTGTAATTTCTTCReverse primer with to PCR amplify DDX43 KH 89 fragment for cloning in XhoI site of pcDNA3.0 vectorDDX43-A81I-F- newGAAGAGCCACTTTGTTGGCATCGTCA TCGGTCGTGGTGGGGTCForward primer for site-directed mutagenesis of DDX43-KH-A811DDX43-A81I-F- newGAAGAGCCACTTTGTTGGCGGGGAAA TCGGTCGTGGTGGGGGTCForward primer for site-directed mutagenesis of DDX43-KH-A816DDX43-A81G-FGAACAAAGTGGCTCTTC CACACAAGTGGCTCTTCDDX43-KH-A816DDX43-A81G-RGACCCACCACGACCGATTACCCCGCC ACCAACAGTGGCTCTCReverse primer for site-directed mutagenesis of DDX43-KH-A816DDX43-A81S-FGAAGAGCCACTTTGTTGGCGTGGGAAA TCGGTCGTGGTGGGGTCForward primer for site-directed mutagenesis of DDX43-KH-A818DDX43-A81S-FGAAGAGCCACTTTGTTGGCTCGGGAAA ACAAAGTGGCTCTTCForward primer for site-directed mutagenesis of DDX43-KH-A818DDX43-G87D-FGTAATCGGTCGTGGTGAGTATACCCACGACC AACAAAGTGGCTCTTCReverse primer for site-directed mutagenesis of DDX43-G87D-FDDX43-G87D-FGTAATCGGTCGTGGGGACATTACCCACGACC AACAAAGTGGCTCTTCPDX43-G154DDDX43-G87D-FGTAATCGGTCGTGGGGACATATGGAT AAGAATForward primer to PCR amplify SELEX library </td <td>2VELAC D</td> <td></td> <td>or pedina sequence. Annealed with</td>	2VELAC D		or pedina sequence. Annealed with
TARCOALGICATOATCTTTGTAGTCCATASAFLAG-F and clone into Humani and EDAT sitepcDNA3-DDX43- KH89-Hind3-FACTGAAGCTTGCCGCCACCATGACCT CTAGGCCCCCGGAGForward primer to PCR amplify DDX43 KH-89 aa fragment for cloning in HindIII site of pcDNA3.0 vectorpcDNA3-FLAG- DDX43-KH89- Xho1-RACTACTCGAGTCACTTGTCATCGTCAT TAATCACCGTCATGGTCTTTGTAGTCTT TCGTGAATTGTAATTCTTCReverse primer with to PCR amplify DDX43 KH 89 fragment for cloning in Xhol site of pcDNA3.0 vectorDDX43-KH89- Xho1-RTCCTTGTAATCGATGTCATGATCTTTA TAATCACCGTCATGGTCTTGTGGCATCGTA TCGGTCGTGGTGGGGTCForward primer for site-directed mutagenesis of DDX43-A811-R- GACCCACCACGACCGACTTACGATGCC ACAAAGTGGCTCTTCForward primer for site-directed mutagenesis of DDX43-KH-A811DDX43-A81G-FGAAGAGCCACTTTGTTGGCGGGGTAA TCGGTCGTGGTGGGGTCForward primer for site-directed mutagenesis of DDX43-KH-A816DDX43-A81G-RGACCCACCACGACCGATTACCCGCC ACCAAAGTGGCTCTTCReverse primer for site-directed mutagenesis of DDX43-KH-A816DDX43-A81S-FGAAGAGCCACTTTGTTGGCGCGGTAA TCGGTCGTGGTGGGTCForward primer for site-directed mutagenesis of DDX43-KH-A816DDX43-G87D-FGAACAAAGTGGCTCTTC AACAAAGTGGCTCTTCDDX43-KH-A81SDDX43-G87D-FGTAATCGGTGGTGGACTCAAAAAT AAGAATForward primer for site-directed mutagenesis of DDX43-G87D-RDDX43-G87D-RATCGTTTATTTTTGAGTCACCGACCC AACAAGTGGCTCTTAForward primer for site-directed mutagenesis of DDX43-G154DDDX43-G87D-RATCGTTGTAGTGGTGACTCAAAAAT AAGAAATForward primer for site-directed mutagenesis of DDX43-G154DDDX43-G87D-RATCGTTTATTTTTTTTGAGTCACCAGACC AAGAGAGAGAGAGACATATGAT <td>JAFLAU-K</td> <td></td> <td>2XELAG could sequence. Annealed with 2XELAG E and along into HindIII and EaoPL site</td>	JAFLAU-K		2XELAG could sequence. Annealed with 2XELAG E and along into HindIII and EaoPL site
DecondationContent of the periversion of the			of pcDNA3 0 vector
JEDIMIS JDATSACTORACCT HOCCOCCACCATORCCTForward primer for for kit anpiny DDATS KIPS and fragment for cloning in <i>Hind</i> III site of pcDNA3.0 vectorpcDNA3-FLAG- DDX43-KH89- 	pcDNA3_DDX/3_	ACTGAAGCTTGCCGCCACCATGACCT	Forward primer to PCR amplify DDX/3 KH-89 aa
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DDX43-A81S-R     GACCCACCACGACCGATTACCGAGCC     Reverse primer for site-directed mutagenesis of       AACAAAGTGGCTCTTC     DDX43- KH-A8SI       DDX43-G87D-F     GTAATCGGTCGTGGTGACTCAAAAAT     Forward primer for site-directed mutagenesis of       DDX43-G87D-R     AAAGAAT     DDX43-G154D       DDX43-G87D-R     ATTCTTTATTTTGAGTCACCACGACC     Reverse primer for site-directed mutagenesis of       DDX43-G154D     DDX43-G154D     DDX43-G154D       MY-Forward     TAGGGAAGAGAAGGACATATGAT     Forward primer to PCR amplify SELEX library			DDX43-KH-A81S
AACAAAGIGGCICTIC     DDX43- KH-A8SI       DDX43-G87D-F     GTAATCGGTCGTGGTGACTCAAAAAT     Forward primer for site-directed mutagenesis of       DDX43-G87D-R     ATTCTTTATTTTTGAGTCACCACGACC     Reverse primer for site-directed mutagenesis of       DDX43-G87D-R     ATTCTTTATTTTGAGTCACCACGACC     Reverse primer for site-directed mutagenesis of       DDX43-G87D-R     ATTCTTTATTTTGAGTCACCACGACC     Reverse primer for site-directed mutagenesis of       DDX43-G154D     DDX43-G154D       MY-Forward     TAGGGAAGAGAAGGACATATGAT     Forward primer to PCR amplify SELEX library	DDX43-A81S-R	GACCCACCACGACCGATTACCGAGCC	Reverse primer for site-directed mutagenesis of
DDX43-G87D-F     GTAATCGGTCGTGGTGACTCAAAAAT     Forward primer for site-directed mutagenesis of       DDX43-G87D-R     ATTCTTTATTTTTGAGTCACCACGACC     Reverse primer for site-directed mutagenesis of       DDX43-G87D-R     ATTCTTTATTTTGAGTCACCACGACC     Reverse primer for site-directed mutagenesis of       DDX43-G87D-R     ATTCTTTATTTTGAGTCACCACGACC     Reverse primer for site-directed mutagenesis of       DDX43-G154D     DDX43-G154D       MY-Forward     TAGGGAAGAGAAGGACATATGAT     Forward primer to PCR amplify SELEX library			DDX43- KH-A8SI
AAAGAA1   DDX45-G154D     DDX43-G87D-R   ATTCTTTATTTTGAGTCACCACGACC   Reverse primer for site-directed mutagenesis of GATTAC     MY-Forward   TAGGGAAGAGAAGGACATATGAT   Forward primer to PCR amplify SELEX library	DDX43-G8/D-F	GIAAICGGICGIGGIGACICAAAAAI	Forward primer for site-directed mutagenesis of
DDX45-G8/D-R     ATTCLTTATTTTGAGTCACCACGACC     Reverse primer for site-directed mutagenesis of       GATTAC     DDX43-G154D       MY-Forward     TAGGGAAGAGAAGGACATATGAT     Forward primer to PCR amplify SELEX library	DDV42 C07D D		DDX43-GI34D December animate for site dimental mente sono sis of
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salaction primer	wiii-rorward	IAUUUAAUAUAUAUUAUAIAIUAI	rotward primer to PCK ampility SELEA norary
Solution primer   Insert (20 intranuouil sequence)     MV Payorsa   TCAACTCCTCATCTACTACTCAA   Payorsa primer to DCP amplify SELEV library	MV Poverse		Deverse primer to DCD applify SELEV library
selection primer (20 nt random sequence)	selection primer		insert (20 nt random sequence)



**Figure S1. Summary of KH domain containing human proteins.** A total of 40 human proteins contain KH domain(s). The KH domain region and protein function are adapted from Uniprot (www.uniprot.org/) and GeneCards (www.genecards.org) respectively. All proteins can bind RNA, which is not shown in the function. The DDX43 and DDX53 are highlighted in green. For the paralogs such as FUBP1 and FUBP3; FXR1, FXR2, and FMRP; MEX3A, MEX3B, MEX3C, and MEX3D; KHDRBS1, KHDRBS2, and KHDRBS3; PCBP1, PCBP2, PCBP3, and PCBP4; IGF2BP1, IGF2BP2, and IGF2BP3; NOVA1 and NOVA2, only one of them is shown.



**Figure S2. Purification of KH domain proteins.** (A-C) Chromatographic profiles of recombinant KH domain proteins eluting from a Sephacryl S-100 column (left) and SDS-PAGE analysis of the eluted fractions (right). M, marker. (**D**) SDS-PAGE analysis of the expression and purification of DDX43-KH-80 protein (left) and Western blotting using an anti-His antibody (right).



Figure S3. EMSA of DDX43 KH-74 and -89 proteins binding with different substrates. Representative EMSA images of increasing protein concentration  $(0-9.6 \,\mu\text{M})$  of DDX43 KH domain proteins, 74aa (A) and 89aa (B), binding with 0.5 nM of indicated substrates. DNA is in black, RNA in gray.



**Figure S4. Representative images of filter binding assays**. <sup>32</sup>P-labeled oligo or substrate (0.5 nM) was incubated with DDX43-KH 126 protein (0, 0.3, 0.6, 1.2, 2.4, 4.8, 9.6  $\mu$ M) at 37°C for 30 min, then passed through a nitrocellulose membrane. After washing, bound radioactivity was visualized using a PharosFX Imager. Each sample has two repeats.



**Figure S5.** <sup>1</sup>H-<sup>15</sup>N HSQC spectra of apo KH-126 and -89 proteins that have His tag. (A and B) <sup>1</sup>H-<sup>15</sup>N HSQC spectra of KH-126 protein (A) and KH-89 protein (B). (C) Overlay of <sup>1</sup>H-<sup>15</sup>N HSQC spectra of the KH-126 (blue) and KH-89 (pink) proteins.



**Figure S6. Purification of His tag cleaved DDX43 KH-89 protein for NMR analysis.** (A) SDS-PAGE analysis of the eluted KH-89 fractions from a Ni-NTA affinity column by imidazole. M, marker; 1-10, fractions. (B) SDS-PAGE analysis of thrombin-cleaved and uncleaved KH-89 proteins. (C) Chromatographic profile of thrombin-cleaved KH-89 protein eluting from a Sephacryl S-100 column. (D) SDS-PAGE analysis of the KH-89 protein peaks eluted from the gel filtration chromatography in panel C.



Figure S7

E	E		
E	GXXG	_	A81 G87
Homo sapiens	VG <mark>A</mark> VIGRG <mark>G</mark> SKIK	hnRNP K (1	) AG <mark>A</mark> VI <b>G</b> KG <mark>G</mark> KNIKAL
Macaca mulatta	VG <mark>A</mark> VIGRG <mark>G</mark> SKIK	hnRNP K (2	) AG <mark>G</mark> II <b>G</b> VK <mark>G</mark> AKIKEL
Pan troglodytes	VG <mark>A</mark> VIGRG <mark>G</mark> SKIK	hnRNP K (3	) AG <mark>S</mark> II <b>G</b> KG <mark>G</mark> QRIKQI
Rattus norvegicus	VG <mark>A</mark> VIGRG <mark>G</mark> SKIR	FMR-1 (1	) MG <mark>L</mark> AI <b>G</b> TH <mark>G</mark> ANIQQA
Mus musculus	VG <mark>A</mark> VIGRG <mark>G</mark> SKIR	FMR-1 (2	) VG <mark>K</mark> VI <b>G</b> KN <mark>G</mark> KLIQEI
Felis catus	VG <mark>A</mark> VIGRG <mark>G</mark> SKIK	NOVA (1	) AG <mark>S</mark> II <b>G</b> KG <mark>G</mark> QTIVQL
Bos Taurus	VG <mark>A</mark> VIGRG <mark>G</mark> SNIK	NOVA (2	) AG <mark>L</mark> II <b>G</b> KG <mark>G</mark> ATVKAV
Ovis aries	VG <mark>A</mark> VIGRG <mark>G</mark> SNIK	NOVA (3	) VG <mark>A</mark> IL <b>G</b> KG <mark>G</mark> KTLVEY
Anolis caroli nensis	VG <mark>A</mark> LIGRG <mark>G</mark> SRIK	SF1	VG <mark>L</mark> LI <b>G</b> PR <mark>G</mark> NTLKNI
Piliocolobus tephrosceles	VG <mark>A</mark> VIGRG <mark>G</mark> SKIK	<u>DDX43</u>	VG <mark>A</mark> VI <b>G</b> RG <mark>G</mark> SKIKNI
Microtus ochrogaster	VG <mark>A</mark> VIGRG <mark>G</mark> SKIR	KHDR1	VG <mark>K</mark> IL <b>G</b> PQ <mark>G</mark> NTIKRL
Urocitellus parryii	VG <mark>A</mark> VIGRG <mark>G</mark> SKIK	DDX53	VG <mark>V</mark> VI <b>G</b> YS <mark>G</mark> SKIKDL
Bos indicus x Bos Taurus	VG <mark>A</mark> VIGRG <mark>G</mark> SNIK	TDRKH	VG <mark>R</mark> II <b>G</b> RG <mark>G</mark> ETIRSI
Lagenorhynchus obliguidens	s VG <mark>A</mark> VIGRG <mark>G</mark> SKIK	KSRP	VG <mark>V</mark> VI <b>G</b> RS <mark>G</mark> EMIKKI
Acinonyx jubatus	VG <mark>A</mark> VIGRG <mark>G</mark> SKIK	PCBP2	CG <mark>S</mark> LI <b>G</b> KG <mark>G</mark> CKIKEI
Zalophus californianus	VG <mark>A</mark> VIGRG <mark>G</mark> SKIK	AKAP149	VG <mark>R</mark> LI <b>G</b> KQ <mark>G</mark> RYVSFL
Ursus arctos horribilis	VG <mark>A</mark> VIGRGGSKIK	ANKHD1	VS <mark>R</mark> IM <b>G</b> RG <mark>G</mark> CNITAI
	A81 G87	RS3	TQ <mark>N</mark> VL <b>G</b> EK <mark>G</mark> RRIREL
		FUBP1	VG <mark>L</mark> II <b>G</b> RG <mark>G</mark> EQINKI
		IF2B3	AG <mark>R</mark> VI <b>G</b> KG <mark>G</mark> KTVNEL
		M3XC	VG <mark>l</mark> VV <b>G</b> PK <mark>G</mark> ATIKRI
		VIGILIN	HK <mark>F</mark> LI <b>G</b> KG <mark>G</mark> GKIRKV
		ANKRD17	IS <mark>R</mark> VI <b>G</b> RG <mark>G</mark> CNINAI
			GXXG

Figure S7. Nucleic acid bind to the same amino acids in the KH domain, especially A81 and G87. (A-D) Combined chemical shift change  $(\Delta\delta)$  as a function of KH-89 (200  $\mu$ M) residue number observed for dT<sub>5</sub>(A), dC<sub>5</sub>(B), rU<sub>5</sub>(C) and dT<sub>10</sub> (D) oligonucleotide (400  $\mu$ M) binding. (E) Amino acids A81 and G87 are conserved in DDX43 proteins from different eukaryotes. (F) Alignment of the GXXG motifs from DDX43 and other known human KH domains, showing G87 is conserved, but not A81.



Figure S8. Purification of DDX43 KH-A81S, -A81G, and -A81I proteins. (A and B) SDS-PAGE analysis of the expression and purification of KH-A81S (A) and -A81G (B), and gel filtration profiles. His tag was cleaved by thrombin. M, marker. (C and D) SDS-PAGE analysis of the expression and purification of the KH-A81I protein (left) and Western blotting using an anti-His antibody (right) in KH-89aa (C) and KH-126aa (D) constructs.



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**Figure S10. Identification of DDX43 KH domain bound DNA by ChIP–seq method.** (A) Top three motif sequences obtained by the ChIP-Seq method. (B) Distribution of DDX43 KH domain peaks across the human genome. (C-E) Distribution of gene ontology terms among the annotated sequences for biological process (C), molecular function (D), and cellular component (E).



**Figure S11. Identification of DDX43 KH domain bound RNA by CLIP–seq method.** (A) Top two motif sequences obtained by the CLIP-Seq method. (B) Distribution of DDX43 KH domain peaks across the human genome. (C-E) Distribution of gene ontology terms among the annotated sequences for biological process (C), molecular function (D), and cellular component (E).

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Figure S12. <sup>1</sup>H-<sup>15</sup>N HSQC spectrum of the DDX43 KH-89 protein with indicated oligonucleotide (ranged 40-1000  $\mu$ M). (A) <sup>1</sup>H-<sup>15</sup>N HSQC spectrum of the DDX43-KH-89 protein (200  $\mu$ M) with the indicated oligonucleotide (ranged 40-1000  $\mu$ M). Insets show the enlarged view of the chemical shifts for residues G84 and G87. (B) Combined chemical shift change ( $\Delta\delta$ ) plotted as a function of different oligonucleotides concentration (0.0-1000  $\mu$ M) at 200  $\mu$ M DDX43 KH-89 protein for residue G84.



Figure S13. Representative images of helicase kinetic time course assays. DDX43 protein (WT, A81G, A81S or G87D, 2  $\mu$ M) was incubated with 0.5 nM of 13-bp duplex RNA with 5' tail of polyA (A), polyU (B), UUGU repeats (C), or 20-bp duplex DNA with 5' tail of polyA (D), polyT (E), TTGT repeats (F), for 0, 2.5, 5, 7.5, 15, 30, and 45 min. NE, no enzyme. The triangle indicates heat denatured RNA or DNA substrate control.



Figure S14. Mutated alanine (A81) or glycine (G87) affects DDX43 in unwinding processivity. (A and C) Representative images of helicase reactions performed by incubating 0.5 nM of 13-bp duplex RNA with 5' tail of UUGU repeats (A) or 20-bp duplex DNA with 3' tail of TTGT repeats (C) with increasing protein concentrations (0–2  $\mu$ M) at 37 °C for 15 min. (B and D) Quantitative analysis of A and C respectively. NE, no enzyme; filled triangle, heated sample. Data are presented as mean  $\pm$  S.D, n = 3.



Figure S15. Western blot analysis of DDX43-KH-89 expression in HEK293T cells using an anti-FLAG antibody. M, marker.