

## **Materials and methods**

### **Cell culture and transfection.**

The human osteosarcoma cell line U2OS, human cervical cancer cell line HeLa, mouse embryo fibroblast cell line NIH3T3, and human embryonic kidney HEK293T cell line were obtained from ATCC. The cells were cultured in DMEM (ThermoFisher Scientific) supplemented with 10% FBS and NEAA according to the provided protocol. For serum starvation, cells were cultured with DMEM without serum for several time points. For amino acids starvation, cells were cultured with medium without amino acids for 48h. For high salt treatment, cells were cultured with 190mM NaCl for 48h. For 1,6-hexanediol treatment, cells were treated with 10% 1,6-hexanediol for 2min at room temperature. Plasmids were transfected into cells using polyethyleneimine (PEI) according to the operation instructions.

### **Plasmid construction.**

ORFs were amplified by PCR from cDNA (derived from AML12 cells cells). The PCR products were digested with *Bam*HI (*Asc*I) and *Mlu*I and cloned into the retroviral vector Lv-EF1a-GFP-MCS-IRES-puro. For RNAi experiments, shRNA plasmids were constructed by cloning the target sequences to the pLKO.1-puro vector: GAAATTCCAGACAATGTT AGA (shKDM7A-1), GTATAACTTCCACATTACAGT (shKDM7A-2) and ACTCGACAC TATAGTATCTCA (shControl).

### **FRAP.**

The FRAP assay was performed in a live-cell chamber with confocal laser scanning microscopy. The bleaching duration was about 4 s in an area of one nuclear body. Images were captured at 1.3-s interval for 40 time points. The data were processed with LAS AF Lite.

### **Live-cell imaging.**

Live-cell imaging experiments were performed on a GE DeltaVision inverted microscope. Images of U2OS cells were captured every 10 min for a total of 10 h. The data were processed with the Volocity software.

### **Western blotting.**

Cells lysates were separated by SDS-PAGE and then transferred onto polyvinylidene fluoride (PVDF) membranes (Millipore). After washing and blocking, the membranes were incubated with primary antibodies as follows: anti- $\beta$ -actin (66009-1-Ig, Proteintech), anti-GAPDH (9600, AGOMA), anti-H3 (AF0009, Beyotime), anti-MCM7 (sc-9966, Santa Cruz) and anti-KDM7A (raised against amino acids 417-735 in rabbit, ABclonal). The blots were detected with HRP-coupled secondary antibodies.

### **Immunofluorescence.**

Immunofluorescence was performed as described elsewhere (Zhang et al., 2015). Besides those used for western blotting, other primary antibodies were: anti-SC35 (ab11826, Abcam), anti-PML (A1184, ABclonal; 05-718, Merck Millipore), anti-PSPC1 (SC-374387, Santa Cruz), anti-COIL (SC-55594, Santa Cruz), anti-Sam68 (sc-1238, Santa Cruz), anti-BMI1 (sc-390443, Santa Cruz) anti-C23 (10556-1-AP, Proteintech), anti-H3 (ab1791, Abcam) and MCM7 (sc-9966, Santa Cruz). The slides were assessed with a confocal laser scanning microscopy (Leica, SP5 and SP8).

### **Cell cycle assay.**

The samples were prepared with the cell cycle and apoptosis analysis kit (Beyotime), and then analyzed using a FACSCalibur flow cytometer (BD).

#### **TEM with HRP-DAB.**

The NIH3T3 cells and mouse testis (Department of Laboratory Animal Science provided guidance on the study protocol) were fixed with 4% formaldehyde and incubated with the KDM7A antibody. The primary antibody was detected using an HRP secondary antibody. Then, DAB (P0203, Beyotime) was used for the HRP staining, which is EM-visible. After that, the samples were prepared for conventional TEM. The sections were stained and imaged at the EM facility of ION (Institute of Neuroscience, Shanghai, China).

#### **Immunoprecipitation and mass spectrometry.**

The U2OS cells were transfected with GFP-only or GFP-KDM7A plasmids for 24 h and then harvested. The nuclear extracts were prepared from 20 million cells and were incubated with 20  $\mu$ L GFP-TRAP\_M (gtm-20, Chromotek) in 50 mM Tris HCl (pH 7.5), 125 mM NaCl, 0.2% NP-40, 5% glycerol, 1.5 mM MgCl<sub>2</sub>, and protease inhibitors. The LC-MS/MS experiments and data analysis were performed as described elsewhere (Zhang et al., 2015). The experiments were conducted using three biological replicates, and the proteins appeared three times in the GFP-KDM7A group but not more than once in the GFP-only group were considered as candidates. For IP/MS assay in HeLa cells under 0% FBS, cells were harvested after cultured in 0% FBS for 48h, with IgG as control. The proteins appeared more than two times in KDM7A group but not more than once in control group were considered as candidates.

#### **Protein purification.**

The KDM7A and C-terminal of KDM7A cDNA was cloned into the pCAG-6xHis-GFP-KDM7A plasmid and then transfected into HEK293T cells. The proteins were purified with Ni Aogarose 6 FF (AOGMA) with the AKTA system (GE Healthcare Life Sciences). The proteins were then concentrated in an Amicon Ultracel-50K spin concentrator and was exchanged to storage buffer [50 mM Tris-HCl( pH 7.5), 200 mM NaCl, 1 mM DTT, 10% glycerol]. The concentrated proteins were stored in -80°C freezer after flash freezing in liquid nitrogen.

#### **Liquid droplet assay.**

For the droplet assay, proteins were dropped on the living cell chamber at concentrations of 0.25, 0.5, 1, 2, 3  $\mu$ M in the reaction buffer [50 mM Tris-HCl (pH 7.5), 100 mM NaCl, 1 mM DTT], and then imaged with a confocal laser scanning microscopy (Leica, SP5). For DNA contained droplet assays, genomic DNA was extracted from NIH3T3 cells and was sheered by sonication to lengths within the range of 300-700 bp. DNA was added to the protein solution at different concentrations and then imaged with a confocal laser scanning microscope (Leica, SP5).

### Supplementary figure legends

#### **Fig. S1: KDM7A marks a type of nuclear bodies (K-bodies) in serum starved HeLa cells.**

(A) The separated images of co-staining of KDM7A and SC35, PSPC1, PML, Coilin, BMI1 and Sam68 in HeLa cells treated with 0% FBS for 48h, respectively, in Figure 1D. Scale bar, 10  $\mu$ m.

(B) Co-stain of KDM7A and Pol II in HeLa cells treated with 0% FBS for 48h. Scale bar, 10  $\mu$ m. Right, Relative fluorescence intensity of KDM7A and Pol II from a to b.

(C) Representative images of KDM7A in HeLa cells treated with amino acids starvation for 0h and 48h. Scale bar, 10  $\mu$ m.

(D) The sizes of KDM7A foci in HeLa cells under normal and amino acids starvation condition. 16-18 cells were analyzed. ns  $p > 0.05$  by unpaired t-test.

(E) Representative images of KDM7A in HeLa cells treated with 190mM NaCl for 0h and 48h. Scale bar, 10  $\mu$ m.

(F) The sizes of KDM7A foci in HeLa cells treated with 190mM NaCl for 0h and 48h. 16-20 cells were analyzed. \*\*\*\* $p < 0.0001$  by unpaired t-test.

#### **Fig.S2: KDM7A condensates in U2OS cells transfected with nGFP-KDM7A.**

(A) Western blot of H3K9me2 and H3K27me2 in Control and nGFP-KDM7A transfected 293T cells. H3 as the loading control.

(B) The localization of nGFP-KDM7A expressed in U2OS cells. Scale bar, 10  $\mu$ m.

(C) The validation of KDM7A antibody. Representative images of immunofluorescence with KDM7A antibody in U2OS cells transfected with nGFP-KDM7A. Right: Relative fluorescence intensity of nGFP-KDM7A and KDM7A antibody from a to b. Scale bar, 10  $\mu$ m.

(D) The separated images of U2OS cells transfected with nGFP-KDM7A and stained with SC35, PSPC1, PML, Coilin, BMI1 and Sam68 in Figure 1E. Scale bar, 10  $\mu$ m.

#### **Fig. S3: K-bodies interact with proteins associated with important biological processes.**

(A) Silver staining of SDS-PAGE gel separating proteins immunoprecipitated with GFP-trap in U2OS cells. GFP-only as the negative control.

(B) Clustering analysis of nGFP-KDM7A-associated proteins with normalized number of peptides detected by LC-MS. Three biological replicates were conducted for nGFP-KDM7A (K1-K3) and GFP-only (G1-G3), respectively.

(C) Gene Ontology (GO) analysis of biological processes of KDM7A-associated proteins in U2OS cells. The enriched terms are ranked by  $-\log_{10}$  (p values).

(D) Venn diagram of overlap proteins of KDM7A-associated proteins in HeLa cells under 0% FBS and U2OS cells transfected with nGFP-KDM7A.

#### **Fig. S4: KDM7A is partially required for the formation of MCM7 puncta.**

(A) The localization of KDM7A and HNRNPU in U2OS cells transfected with nGFP-KDM7A. Scale bar, 10  $\mu$ m. Right, relative fluorescence intensity of KDM7A and HNRNPU from a to b.

(B) Co-staining of KDM7A and MCM7 in shControl, shKDM7A-1 and shKDM7A-2 HeLa cells treated with 0% FBS for 48h. Scale bar, 10  $\mu$ m.

(C) The relative size of MCM7 foci in shControl, shKDM7A-1 and shKDM7A-2 HeLa cells

treated with 0% FBS for 48h. 15-16 cells were analyzed. \*\*\*\* $p < 0.0001$  by unpaired t-test.

(D) Western blot of KDM7A and MCM7 in shControl HeLa cells under 10% FBS and shControl, shKDM7A-1, shKDM7A-2 HeLa cells under 0% FBS, respectively. GAPDH as the loading control.

**Fig. S5: KDM7A condensates are surrounded by chromatin.**

(A) Representative results of immunofluorescence analysis with H3 antibody in KDM7A transfected (up) and control (down) cell. Scale bar, 10  $\mu\text{m}$ . Right, relative fluorescence intensity of H3 and KDM7A crossed by the arrow on the left.

**Fig. S6: K-bodies are formed by LLPS.**

(A) Schematic representation and representative images of the appearance process of K-bodies in the inducible U2OS cell line. Scale bar, 10  $\mu\text{m}$ .

(B) Representative images of U2OS cells transfected with FL or C-terminal nGFP-KDM7A, respectively. Scale bar, 10  $\mu\text{m}$ .

(C) Quantification of the number (left) and size (right) of granules formed by FL or C-terminal nGFP-KDM7A. A total of 11 cells about 200 nuclear bodies were counted for each group. \* $p < 0.05$ , \*\*\*\* $p < 0.0001$  by unpaired t-test.

(D) The N-terminal of KDM7A aggregates into the nucleoli as detected by C23 immunofluorescence. Scale bar, 10  $\mu\text{m}$ .

(E) A representative fusion event of K-bodies in the U2OS nucleus. Scale bar, 10  $\mu\text{m}$ .

(F) FRAP experiments of nGFP-KDM7A in vitro droplets. Left: Representative images of FRAP. Pink box shows the punctum undergoing bleaching, while the blue box shows a control area. Scale bar, 10  $\mu\text{m}$ . Right: Quantification of FRAP data for nGFP-KDM7A droplet. For both bleached area and unbleached control fluorescence intensities are normalized to the pre-bleach intensity. Data are plotted as the mean  $\pm$  s.d. (n=6).

(G) Droplet formation of purified nGFP-C-terminal using different protein concentrations in 75 mM NaCl. Scale bar, 10  $\mu\text{m}$ .

(H) Representative images of nGFP-KDM7A droplets by adding 0.25-2  $\mu\text{M}$  DNA (300-700 bp in length). NaCl, 50 mM; nGFP-KDM7A protein, 0.5  $\mu\text{M}$ . Scale bar, 10  $\mu\text{m}$ .

(I) FRAP experiment of nGFP-KDM7A in vitro condensates incubated with DNA. Left: Representative images of FRAP. Pink box shows the hollow sphere undergoing bleaching, while the blue box shows a control area. Scale bar, 10  $\mu\text{m}$ . Right: Quantification of FRAP data for nGFP-KDM7A condensates. For both bleached area and unbleached control fluorescence intensities are normalized to the pre-bleach intensity. Data are plotted as the mean  $\pm$  s.d. (n=6).

**Fig. S7: K-bodies exist in vivo.**

(A) The expression of KDM7A in several mouse tissues detected by western blotting.  $\beta$ -actin as loading control.

(B) Immunofluorescence with KDM7A antibody in mouse brain, muscle, and testis tissues. Blue is DAPI and red is endogenous KDM7A. Scale bar, 10  $\mu\text{m}$ .

(C) Representative IF images of KDM7A in 12-week-old mouse testis. Round sperms (RS) and elongating sperms (ES) are shown with white arrows. Scale bar, 10  $\mu\text{m}$ .

**Figure S1**

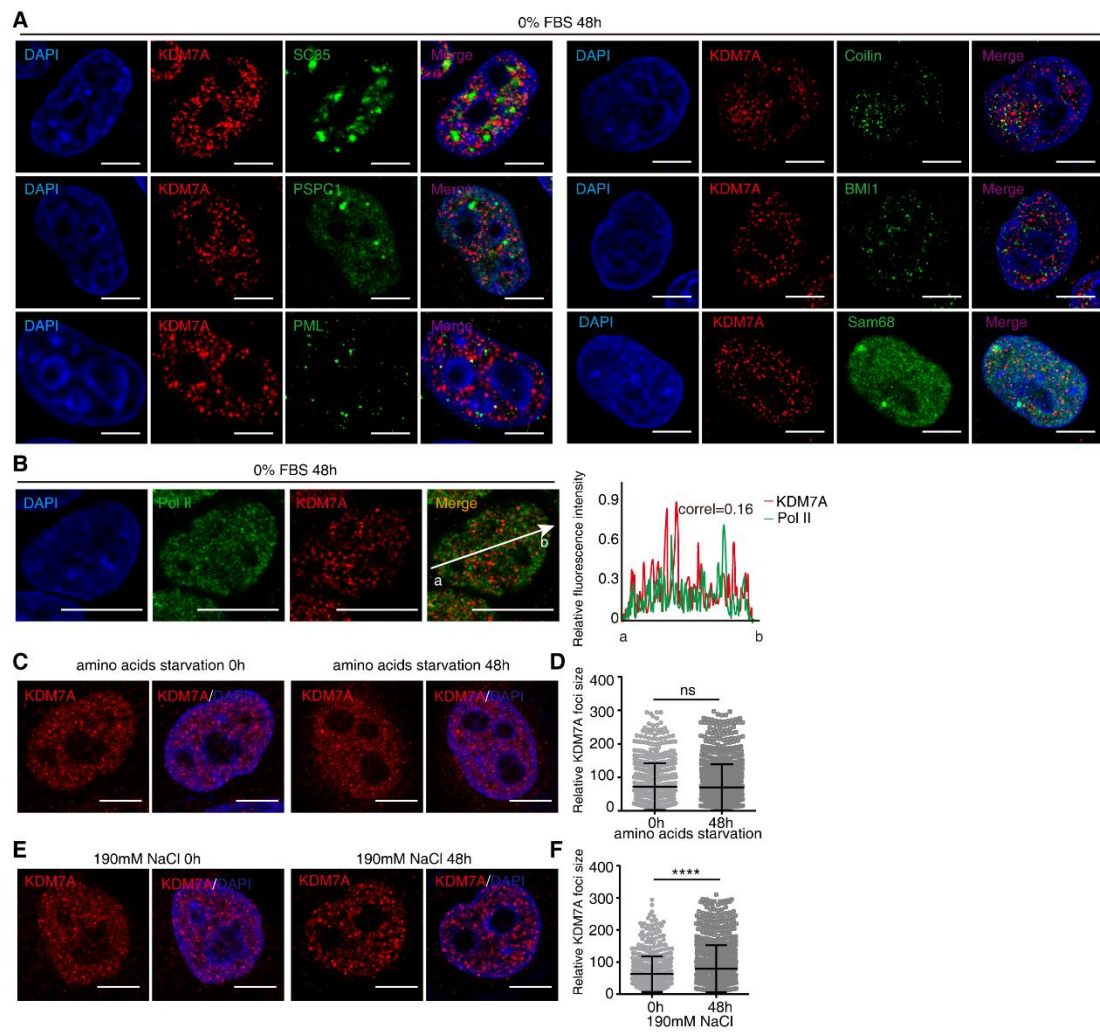
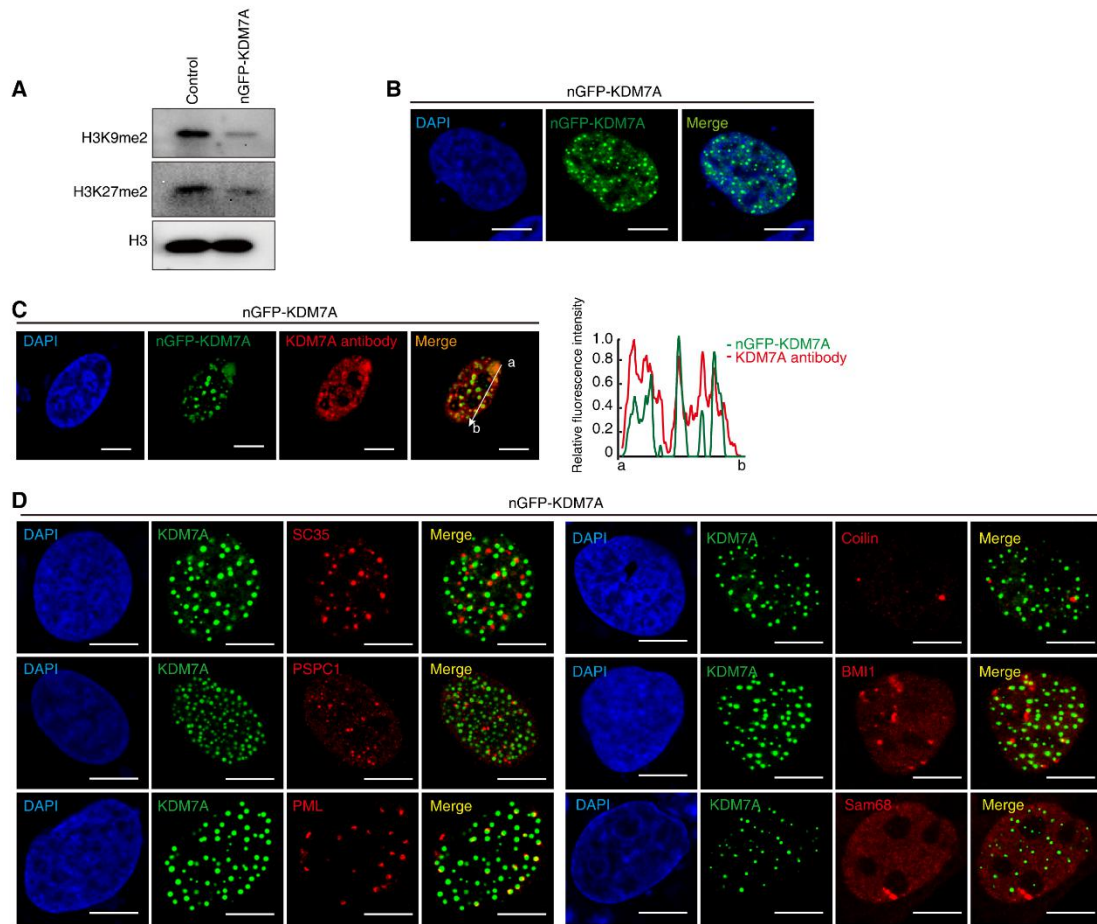
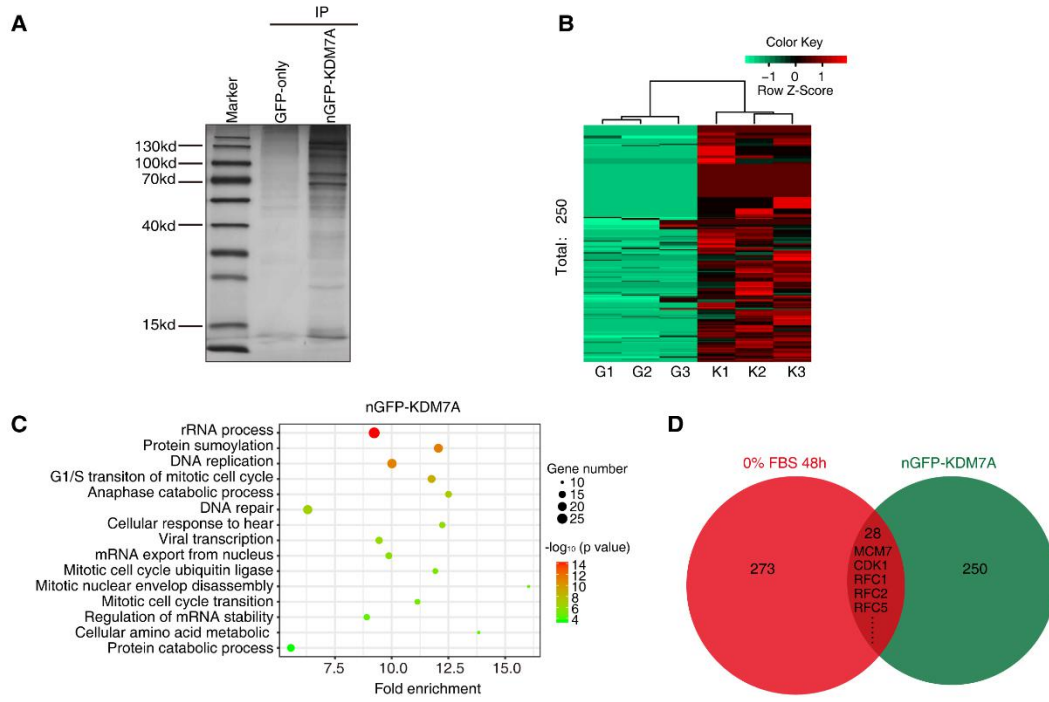


Figure S2



**Figure S3**



**Figure S4**

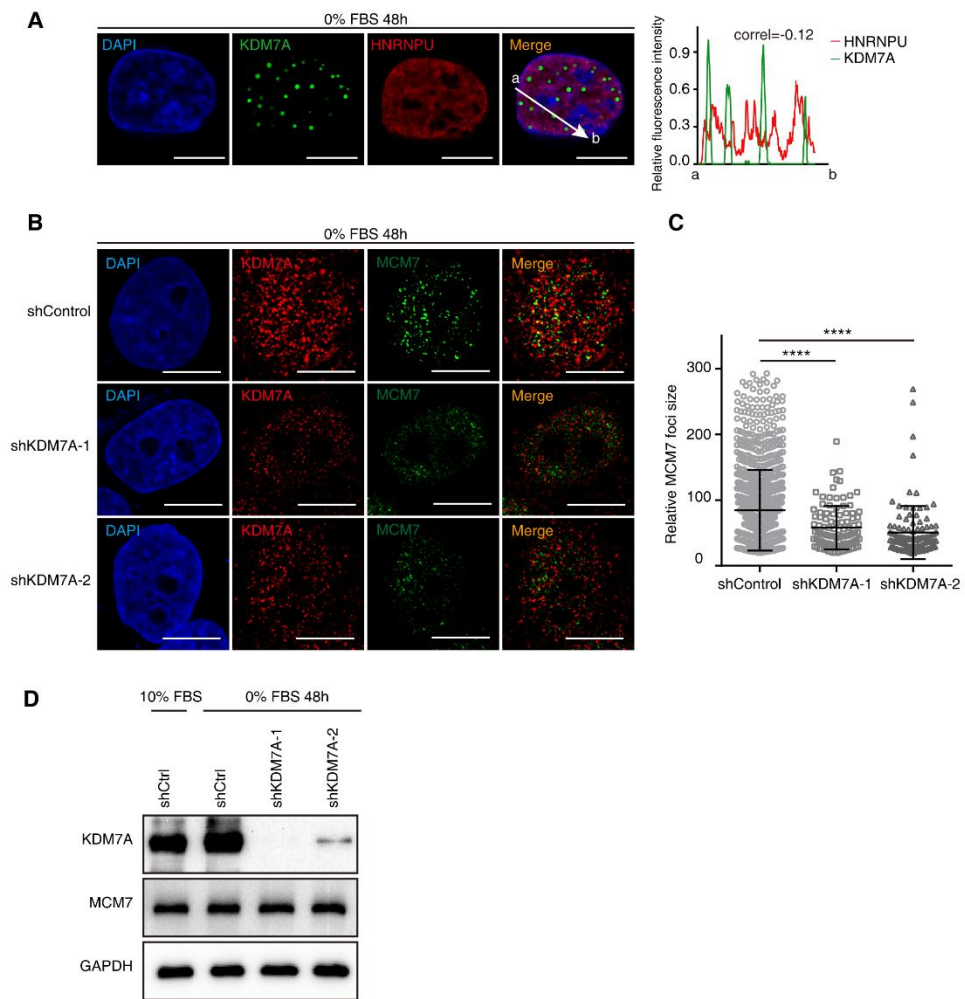
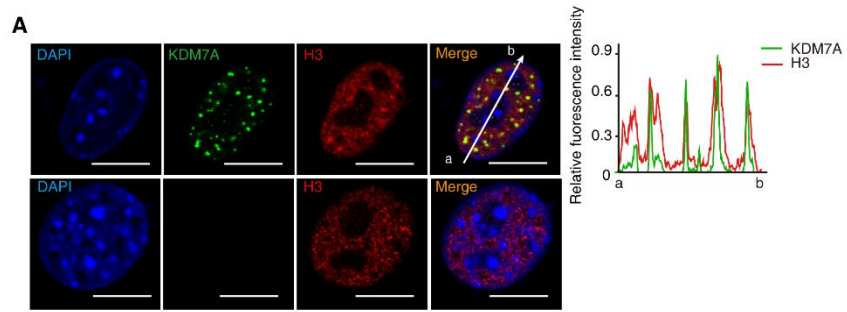
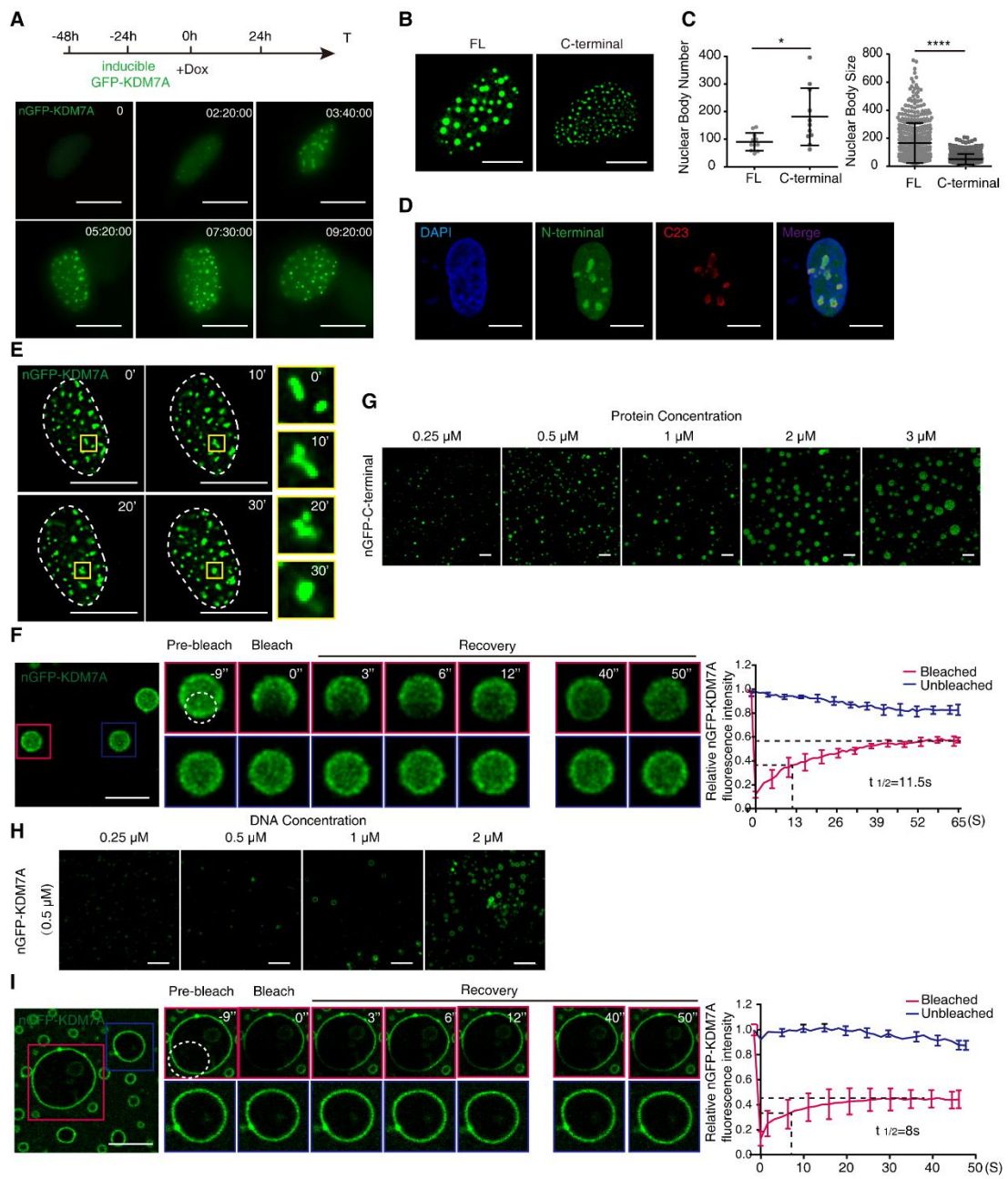


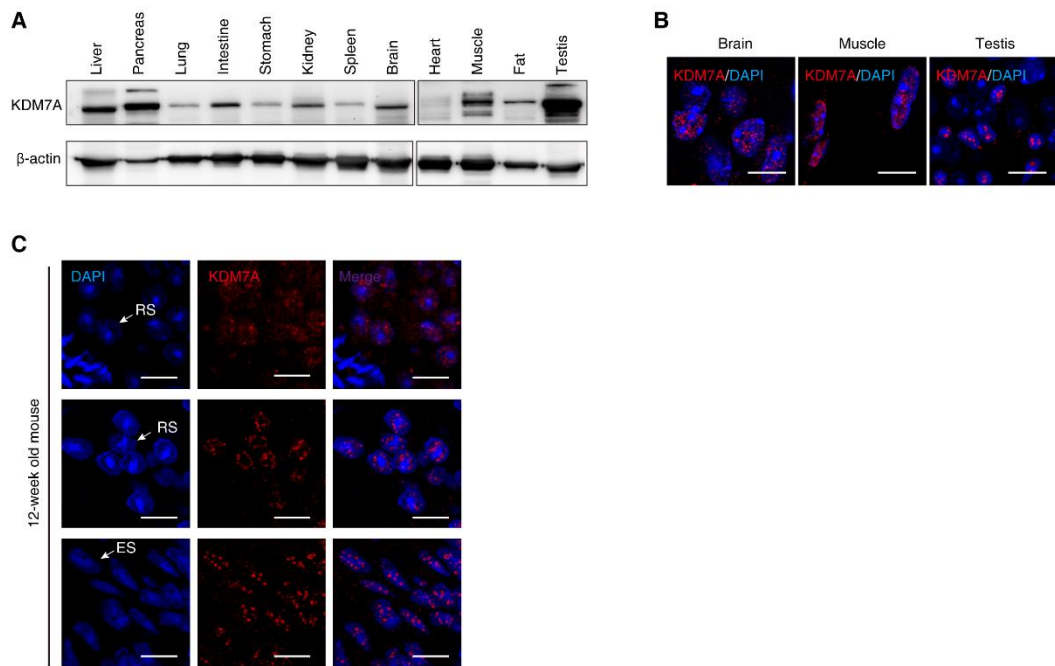
Figure S5



**Figure S6**



**Figure S7**



**Table S1. KDM7A associated proteins as identified by GFP-trap and mass spectrometry**

| Accession | Description  | nGFP-KDM7A (Score) |       |       | GFP-Only (Score) |       |       |
|-----------|--|--------------------|-------|-------|------------------|-------|-------|
|           |  | Rep 1              | Rep 2 | Rep 3 | Rep 1            | Rep 2 | Rep 3 |
| P33993    | DNA replication licensing factor MCM7 OS=Homo sapiens GN=MCM7 PE=1 SV=4 - [MCM7_HUMAN]                   | 628.7              | 721.8 | 719.1 | 0.0              | 0.0   | 0.0   |
| Q96DF8    | Protein DGCR14 OS=Homo sapiens GN=DGCR14 PE=1 SV=1 - [DGC14_HUMAN]                                       | 371.6              | 299.1 | 347.1 | 0.0              | 0.0   | 0.0   |
| P28070    | Proteasome subunit beta type-4 OS=Homo sapiens GN=PSMB4 PE=1 SV=4 - [PSB4_HUMAN]                         | 323.9              | 243.4 | 266.6 | 0.0              | 0.0   | 0.0   |
| Q96S55    | ATPase WRNIP1 OS=Homo sapiens GN=WRNIP1 PE=1 SV=2 - [WRIP1_HUMAN]  | 268.4              | 312.5 | 253.8 | 0.0              | 0.0   | 0.0   |
| P39748    | Flap endonuclease 1 OS=Homo sapiens GN=FEN1 PE=1 SV=1 - [FEN1_HUMAN]                                     | 252.8              | 187.3 | 132.6 | 0.0              | 0.0   | 0.0   |
| Q15773    | Myeloid leukemia factor 2 OS=Homo sapiens GN=MLF2 PE=1 SV=1 - [MLF2_HUMAN]                               | 250.2              | 174.1 | 135.8 | 0.0              | 0.0   | 0.0   |
| Q7L590    | Protein MCM10 homolog OS=Homo sapiens GN=MCM10 PE=1 SV=2 - [MCM10_HUMAN]                                 | 232.7              | 283.1 | 259.5 | 0.0              | 0.0   | 0.0   |
| P04792    | Heat shock protein beta-1 OS=Homo sapiens GN=HSPB1 PE=1 SV=2 - [HSPB1_HUMAN]                             | 231.7              | 247.8 | 189.9 | 0.0              | 0.0   | 0.0   |
| Q16576    | Histone-binding protein RBBP7 OS=Homo sapiens GN=RBBP7 PE=1 SV=1 - [RBBP7_HUMAN]                         | 230.4              | 211.9 | 186.9 | 0.0              | 0.0   | 0.0   |
| P68371    | Tubulin beta-4B chain OS=Homo sapiens GN=TUBB4B PE=1 SV=1 - [TBB4B_HUMAN]                                | 229.5              | 290.2 | 197.0 | 0.0              | 0.0   | 0.0   |
| Q04323    | UBX domain-containing protein 1 OS=Homo sapiens GN=UBXN1 PE=1 SV=2 - [UBXN1_HUMAN]                       | 221.1              | 128.3 | 151.5 | 0.0              | 0.0   | 0.0   |
| P20618    | Proteasome subunit beta type-1 OS=Homo sapiens GN=PSMB1 PE=1 SV=2 - [PSB1_HUMAN]                         | 203.5              | 213.4 | 178.0 | 0.0              | 0.0   | 0.0   |
| Q9Y2X9    | Zinc finger protein 281 OS=Homo sapiens GN=ZNF281 PE=1 SV=1 - [ZN281_HUMAN]                              | 196.3              | 131.1 | 162.4 | 0.0              | 0.0   | 0.0   |
| P42771    | Cyclin-dependent kinase inhibitor 2A, isoforms 1/2/3 OS=Homo sapiens GN=CDKN2A PE=1 SV=2 - [CD2A1_HUMAN] | 196.1              | 105.3 | 38.0  | 0.0              | 0.0   | 0.0   |
| Q6PD62    | RNA polymerase-associated protein CTR9 homolog OS=Homo sapiens GN=CTR9 PE=1 SV=1 - [CTR9_HUMAN]          | 190.1              | 130.4 | 109.4 | 0.0              | 0.0   | 0.0   |
| O75925    | E3 SUMO-protein ligase PIAS1 OS=Homo sapiens GN=PIAS1 PE=1 SV=2 - [PIAS1_HUMAN]                          | 187.8              | 139.2 | 38.2  | 0.0              | 0.0   | 0.0   |
| O75190    | DnaJ homolog subfamily B member 6 OS=Homo sapiens GN=DNAJB6 PE=1 SV=2 - [DNJB6_HUMAN]                    | 187.6              | 202.0 | 138.7 | 0.0              | 0.0   | 0.0   |
| O75419    | Cell division control protein 45 homolog OS=Homo sapiens GN=CDC45 PE=1 SV=1 -                            | 176.4              | 131.4 | 129.7 | 0.0              | 0.0   | 0.0   |

|        |   |       |       |       |     |     |     |
|--------|---|-------|-------|-------|-----|-----|-----|
|        | [CDC45_HUMAN]   |       |       |       |     |     |     |
| P28066 | Proteasome subunit alpha type-5 OS=Homo sapiens GN=PSMA5 PE=1 SV=3 - [PSA5_HUMAN]                                 | 167.5 | 106.8 | 184.2 | 0.0 | 0.0 | 0.0 |
| P06493 | Cyclin-dependent kinase 1 OS=Homo sapiens GN=CDK1 PE=1 SV=3 - [CDK1_HUMAN]  | 166.5 | 202.3 | 216.9 | 0.0 | 0.0 | 0.0 |
| P55072 | Transitional endoplasmic reticulum ATPase OS=Homo sapiens GN=VCP PE=1 SV=4 - [TERA_HUMAN]                         | 163.4 | 114.2 | 45.0  | 0.0 | 0.0 | 0.0 |
| P08238 | Heat shock protein HSP 90-beta OS=Homo sapiens GN=HSP90AB1 PE=1 SV=4 - [HS90B_HUMAN]                              | 156.5 | 123.3 | 88.1  | 0.0 | 0.0 | 0.0 |
| O75694 | Nuclear pore complex protein Nup155 OS=Homo sapiens GN=NUP155 PE=1 SV=1 - [NU155_HUMAN]                           | 154.2 | 90.3  | 157.1 | 0.0 | 0.0 | 0.0 |
| Q86Y56 | HEAT repeat-containing protein 2 OS=Homo sapiens GN=HEATR2 PE=1 SV=4 - [HEAT2_HUMAN]                              | 153.3 | 164.5 | 118.5 | 0.0 | 0.0 | 0.0 |
| P49720 | Proteasome subunit beta type-3 OS=Homo sapiens GN=PSMB3 PE=1 SV=2 - [PSB3_HUMAN]                                  | 148.8 | 102.4 | 187.1 | 0.0 | 0.0 | 0.0 |
| O43242 | 26S proteasome non-ATPase regulatory subunit 3 OS=Homo sapiens GN=PSMD3 PE=1 SV=2 - [PSMD3_HUMAN]                 | 145.5 | 91.1  | 76.5  | 0.0 | 0.0 | 0.0 |
| O96000 | NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 10 OS=Homo sapiens GN=NDUFB10 PE=1 SV=3 - [NDUBA_HUMAN] | 142.2 | 105.6 | 34.9  | 0.0 | 0.0 | 0.0 |
| P61956 | Small ubiquitin-related modifier 2 OS=Homo sapiens GN=SUMO2 PE=1 SV=3 - [SUMO2_HUMAN]                             | 137.0 | 138.7 | 96.9  | 0.0 | 0.0 | 0.0 |
| Q99956 | Dual specificity protein phosphatase 9 OS=Homo sapiens GN=DUSP9 PE=1 SV=1 - [DUS9_HUMAN]                          | 135.7 | 169.8 | 76.0  | 0.0 | 0.0 | 0.0 |
| P49368 | T-complex protein 1 subunit gamma OS=Homo sapiens GN=CCT3 PE=1 SV=4 - [TCPG_HUMAN]                                | 127.4 | 94.2  | 85.5  | 0.0 | 0.0 | 0.0 |
| P35251 | Replication factor C subunit 1 OS=Homo sapiens GN=RFC1 PE=1 SV=4 - [RFC1_HUMAN]                                   | 127.4 | 39.8  | 65.7  | 0.0 | 0.0 | 0.0 |
| Q9H0U9 | Testis-specific Y-encoded-like protein 1 OS=Homo sapiens GN=TSPYL1 PE=1 SV=3 - [TSYL1_HUMAN]                      | 127.3 | 159.4 | 122.4 | 0.0 | 0.0 | 0.0 |
| P35453 | Homeobox protein Hox-D13 OS=Homo sapiens GN=HOXD13 PE=1 SV=3 - [HXD13_HUMAN]                                      | 124.5 | 94.6  | 68.3  | 0.0 | 0.0 | 0.0 |
| Q9Y4R8 | Telomere length regulation protein TEL2 homolog OS=Homo sapiens GN=TELO2 PE=1 SV=2 - [TELO2_HUMAN]                | 123.3 | 139.1 | 142.5 | 0.0 | 0.0 | 0.0 |
| Q6PJG6 | BRCA1-associated ATM activator 1 OS=Homo  | 120.7 | 172.1 | 123.7 | 0.0 | 0.0 | 0.0 |

|        |  |       |       |       |     |     |     |
|--------|--|-------|-------|-------|-----|-----|-----|
|        | sapiens GN=BRAT1 PE=1 SV=2 -<br>[BRAT1_HUMAN]  |       |       |       |     |     |     |
| P08758 | Annexin A5 OS=Homo sapiens GN=ANXA5 PE=1<br>SV=2 - [ANXA5_HUMAN]   | 119.0 | 108.9 | 88.8  | 0.0 | 0.0 | 0.0 |
| Q8WV22 | Non-structural maintenance of chromosomes<br>element 1 homolog OS=Homo sapiens<br>GN=NSMCE1 PE=1 SV=5 - [NSE1_HUMAN] | 116.7 | 122.0 | 87.5  | 0.0 | 0.0 | 0.0 |
| P49721 | Proteasome subunit beta type-2 OS=Homo<br>sapiens GN=PSMB2 PE=1 SV=1 - [PSB2_HUMAN]                                  | 114.2 | 145.7 | 106.2 | 0.0 | 0.0 | 0.0 |
| Q6NSI4 | Uncharacterized protein CXorf57 OS=Homo<br>sapiens GN=CXorf57 PE=1 SV=2 -<br>[CX057_HUMAN]                           | 112.5 | 70.8  | 118.6 | 0.0 | 0.0 | 0.0 |
| Q96GA3 | Protein LTV1 homolog OS=Homo sapiens<br>GN=LTV1 PE=1 SV=1 - [LTV1_HUMAN]   | 108.0 | 55.4  | 73.3  | 0.0 | 0.0 | 0.0 |
| Q8WXF1 | Paraspeckle component 1 OS=Homo sapiens<br>GN=PSPC1 PE=1 SV=1 - [PSPC1_HUMAN]  | 107.8 | 92.2  | 27.3  | 0.0 | 0.0 | 0.0 |
| Q9NRX1 | RNA-binding protein PNO1 OS=Homo sapiens<br>GN=PNO1 PE=1 SV=1 - [PNO1_HUMAN]   | 107.2 | 102.6 | 83.0  | 0.0 | 0.0 | 0.0 |
| P17987 | T-complex protein 1 subunit alpha OS=Homo<br>sapiens GN=TCP1 PE=1 SV=1 - [TCPA_HUMAN]                                | 105.6 | 210.6 | 166.7 | 0.0 | 0.0 | 0.0 |
| O95816 | BAG family molecular chaperone regulator 2<br>OS=Homo sapiens GN=BAG2 PE=1 SV=1 -<br>[BAG2_HUMAN]                    | 104.6 | 38.3  | 77.8  | 0.0 | 0.0 | 0.0 |
| Q6P1K2 | Polyamine-modulated factor 1 OS=Homo sapiens<br>GN=PMF1 PE=1 SV=2 - [PMF1_HUMAN]                                     | 102.6 | 52.9  | 62.7  | 0.0 | 0.0 | 0.0 |
| P63104 | 14-3-3 protein zeta/delta OS=Homo sapiens<br>GN=YWHAZ PE=1 SV=1 - [1433Z_HUMAN]                                      | 102.4 | 73.6  | 88.8  | 0.0 | 0.0 | 0.0 |
| Q9NRZ9 | Lymphoid-specific helicase OS=Homo sapiens<br>GN=HELLS PE=1 SV=1 - [HELLS_HUMAN]                                     | 101.0 | 41.5  | 60.4  | 0.0 | 0.0 | 0.0 |
| Q02241 | Kinesin-like protein KIF23 OS=Homo sapiens<br>GN=KIF23 PE=1 SV=3 - [KIF23_HUMAN]                                     | 100.9 | 58.0  | 60.1  | 0.0 | 0.0 | 0.0 |
| Q9Y314 | Nitric oxide synthase-interacting protein<br>OS=Homo sapiens GN=NOSIP PE=1 SV=1 -<br>[NOSIP_HUMAN]                   | 99.7  | 106.2 | 75.6  | 0.0 | 0.0 | 0.0 |
| Q9NYZ3 | G2 and S phase-expressed protein 1 OS=Homo<br>sapiens GN=GTSE1 PE=1 SV=3 -<br>[GTSE1_HUMAN]                          | 99.0  | 74.1  | 142.5 | 0.0 | 0.0 | 0.0 |
| Q9UMY1 | Nucleolar protein 7 OS=Homo sapiens GN=NOL7<br>PE=1 SV=2 - [NOL7_HUMAN]  | 98.7  | 68.7  | 53.0  | 0.0 | 0.0 | 0.0 |
| Q15019 | Septin-2 OS=Homo sapiens GN=SEPT2 PE=1<br>SV=1 - [SEPT2_HUMAN]   | 98.5  | 55.0  | 138.4 | 0.0 | 0.0 | 0.0 |
| P40937 | Replication factor C subunit 5 OS=Homo sapiens<br>GN=RFC5 PE=1 SV=1 - [RFC5_HUMAN]                                   | 98.1  | 118.5 | 42.2  | 0.0 | 0.0 | 0.0 |

|        |   |      |       |       |     |     |     |
|--------|---|------|-------|-------|-----|-----|-----|
| Q14974 | Importin subunit beta-1 OS=Homo sapiens<br>GN=KPNB1 PE=1 SV=2 - [IMB1_HUMAN]                              | 97.9 | 113.5 | 107.1 | 0.0 | 0.0 | 0.0 |
| Q9Y371 | Endophilin-B1 OS=Homo sapiens GN=SH3GLB1<br>PE=1 SV=1 - [SHLB1_HUMAN]                                     | 95.2 | 114.7 | 127.5 | 0.0 | 0.0 | 0.0 |
| Q6W2J9 | BCL-6 corepressor OS=Homo sapiens GN=BCOR<br>PE=1 SV=1 - [BCOR_HUMAN]                                     | 95.2 | 44.3  | 89.4  | 0.0 | 0.0 | 0.0 |
| Q01082 | Spectrin beta chain, non-erythrocytic 1 OS=Homo<br>sapiens GN=SPTBN1 PE=1 SV=2 -<br>[SPTB2_HUMAN]         | 94.6 | 136.1 | 37.9  | 0.0 | 0.0 | 0.0 |
| P55854 | Small ubiquitin-related modifier 3 OS=Homo<br>sapiens GN=SUMO3 PE=1 SV=2 -<br>[SUMO3_HUMAN]               | 94.5 | 78.8  | 106.9 | 0.0 | 0.0 | 0.0 |
| O60493 | Sorting nexin-3 OS=Homo sapiens GN=SNX3<br>PE=1 SV=3 - [SNX3_HUMAN]                                       | 93.7 | 103.5 | 22.0  | 0.0 | 0.0 | 0.0 |
| P12277 | Creatine kinase B-type OS=Homo sapiens<br>GN=CKB PE=1 SV=1 - [KCRB_HUMAN]                                 | 91.8 | 199.5 | 165.7 | 0.0 | 0.0 | 0.0 |
| P62191 | 26S protease regulatory subunit 4 OS=Homo<br>sapiens GN=PSMC1 PE=1 SV=1 - [PRS4_HUMAN]                    | 91.7 | 91.0  | 40.7  | 0.0 | 0.0 | 0.0 |
| P48444 | Coatomer subunit delta OS=Homo sapiens<br>GN=ARCN1 PE=1 SV=1 - [COPD_HUMAN]                               | 90.8 | 82.0  | 61.6  | 0.0 | 0.0 | 0.0 |
| O14965 | Aurora kinase A OS=Homo sapiens GN=AURKA<br>PE=1 SV=2 - [AURKA_HUMAN]                                     | 90.1 | 70.6  | 68.4  | 0.0 | 0.0 | 0.0 |
| Q5SY16 | Polynucleotide 5'-hydroxyl-kinase NOL9<br>OS=Homo sapiens GN=NOL9 PE=1 SV=1 -<br>[NOL9_HUMAN]             | 90.0 | 41.8  | 53.4  | 0.0 | 0.0 | 0.0 |
| Q9UPP1 | Histone lysine demethylase PHF8 OS=Homo<br>sapiens GN=PHF8 PE=1 SV=3 - [PHF8_HUMAN]                       | 89.1 | 153.2 | 272.0 | 0.0 | 0.0 | 0.0 |
| Q9BXK1 | Krueppel-like factor 16 OS=Homo sapiens<br>GN=KLF16 PE=1 SV=1 - [KLF16_HUMAN]                             | 87.1 | 83.3  | 61.1  | 0.0 | 0.0 | 0.0 |
| O00231 | 26S proteasome non-ATPase regulatory subunit<br>11 OS=Homo sapiens GN=PSMD11 PE=1 SV=3 -<br>[PSD11_HUMAN] | 87.1 | 99.2  | 70.9  | 0.0 | 0.0 | 0.0 |
| Q9BSV6 | tRNA-splicing endonuclease subunit Sen34<br>OS=Homo sapiens GN=TSEN34 PE=1 SV=1 -<br>[SEN34_HUMAN]        | 86.3 | 66.7  | 69.9  | 0.0 | 0.0 | 0.0 |
| P25789 | Proteasome subunit alpha type-4 OS=Homo<br>sapiens GN=PSMA4 PE=1 SV=1 - [PSA4_HUMAN]                      | 85.6 | 86.4  | 80.0  | 0.0 | 0.0 | 0.0 |
| Q86U38 | Nucleolar protein 9 OS=Homo sapiens GN=NOP9<br>PE=1 SV=1 - [NOP9_HUMAN]                                   | 85.4 | 75.8  | 42.7  | 0.0 | 0.0 | 0.0 |
| Q8IY67 | Ribonucleoprotein PTB-binding 1 OS=Homo<br>sapiens GN=RAVER1 PE=1 SV=1 -<br>[RAVR1_HUMAN]                 | 84.9 | 185.8 | 151.6 | 0.0 | 0.0 | 0.0 |
| Q15475 | Homeobox protein SIX1 OS=Homo sapiens<br>GN=SIX1 PE=1 SV=1 - [SIX1_HUMAN]                                 | 83.3 | 122.9 | 69.2  | 0.0 | 0.0 | 0.0 |

|        |  |      |       |       |     |     |     |
|--------|--|------|-------|-------|-----|-----|-----|
| O43175 | D-3-phosphoglycerate dehydrogenase OS=Homo sapiens GN=PHGDH PE=1 SV=4 - [SERA_HUMAN]                           | 82.4 | 37.3  | 41.4  | 0.0 | 0.0 | 0.0 |
| Q99832 | T-complex protein 1 subunit eta OS=Homo sapiens GN=CCT7 PE=1 SV=2 - [TCPH_HUMAN]                               | 82.0 | 69.1  | 21.1  | 0.0 | 0.0 | 0.0 |
| P19388 | DNA-directed RNA polymerases I, II, and III subunit RPABC1 OS=Homo sapiens GN=POLR2E PE=1 SV=4 - [RPAB1_HUMAN] | 79.9 | 94.8  | 60.1  | 0.0 | 0.0 | 0.0 |
| P63165 | Small ubiquitin-related modifier 1 OS=Homo sapiens GN=SUMO1 PE=1 SV=1 - [SUMO1_HUMAN]                          | 79.3 | 79.6  | 41.7  | 0.0 | 0.0 | 0.0 |
| Q9GZM3 | DNA-directed RNA polymerase II subunit RPB11-b1 OS=Homo sapiens GN=POLR2J2 PE=1 SV=2 - [RPB1B_HUMAN]           | 78.8 | 69.3  | 67.1  | 0.0 | 0.0 | 0.0 |
| P33991 | DNA replication licensing factor MCM4 OS=Homo sapiens GN=MCM4 PE=1 SV=5 - [MCM4_HUMAN]                         | 78.8 | 43.8  | 40.6  | 0.0 | 0.0 | 0.0 |
| Q8N726 | Cyclin-dependent kinase inhibitor 2A, isoform 4 OS=Homo sapiens GN=CDKN2A PE=1 SV=2 - [CD2A2_HUMAN]            | 77.7 | 126.9 | 149.8 | 0.0 | 0.0 | 0.0 |
| Q5JTH9 | RRP12-like protein OS=Homo sapiens GN=RRP12 PE=1 SV=2 - [RRP12_HUMAN]  | 77.3 | 94.1  | 18.0  | 0.0 | 0.0 | 0.0 |
| Q9Y5Q9 | General transcription factor 3C polypeptide 3 OS=Homo sapiens GN=GTF3C3 PE=1 SV=1 - [TF3C3_HUMAN]              | 76.4 | 70.4  | 63.7  | 0.0 | 0.0 | 0.0 |
| P49643 | DNA primase large subunit OS=Homo sapiens GN=PRIM2 PE=1 SV=2 - [PRI2_HUMAN]                                    | 76.1 | 39.0  | 84.1  | 0.0 | 0.0 | 0.0 |
| P29590 | Protein PML OS=Homo sapiens GN=PML PE=1 SV=3 - [PML_HUMAN]   | 76.1 | 75.6  | 62.5  | 0.0 | 0.0 | 0.0 |
| Q9Y3I1 | F-box only protein 7 OS=Homo sapiens GN=FBXO7 PE=1 SV=1 - [FBX7_HUMAN]   | 75.2 | 143.8 | 99.2  | 0.0 | 0.0 | 0.0 |
| P11802 | Cyclin-dependent kinase 4 OS=Homo sapiens GN=CDK4 PE=1 SV=2 - [CDK4_HUMAN]                                     | 74.5 | 66.4  | 42.9  | 0.0 | 0.0 | 0.0 |
| Q15126 | Phosphomevalonate kinase OS=Homo sapiens GN=PMVK PE=1 SV=3 - [PMVK_HUMAN]                                      | 72.3 | 68.3  | 48.0  | 0.0 | 0.0 | 0.0 |
| Q9H992 | E3 ubiquitin-protein ligase MARCH7 OS=Homo sapiens GN=MARCH7 PE=1 SV=1 - [MARH7_HUMAN]                         | 72.1 | 79.1  | 55.5  | 0.0 | 0.0 | 0.0 |
| P17482 | Homeobox protein Hox-B9 OS=Homo sapiens GN=HOXB9 PE=1 SV=2 - [HXB9_HUMAN]                                      | 71.4 | 49.9  | 62.9  | 0.0 | 0.0 | 0.0 |
| Q9HCK8 | Chromodomain-helicase-DNA-binding protein 8 OS=Homo sapiens GN=CHD8 PE=1 SV=5 - [CHD8_HUMAN]                   | 69.2 | 176.4 | 125.2 | 0.0 | 0.0 | 0.0 |
| Q9P2E9 | Ribosome-binding protein 1 OS=Homo sapiens GN=RRBP1 PE=1 SV=4 - [RRBP1_HUMAN]                                  | 68.7 | 59.8  | 76.6  | 0.0 | 0.0 | 0.0 |

|        |   |      |       |       |     |     |     |
|--------|---|------|-------|-------|-----|-----|-----|
| P00374 | Dihydrofolate reductase OS=Homo sapiens<br>GN=DHFR PE=1 SV=2 - [DYR_HUMAN]                                      | 68.2 | 96.4  | 51.4  | 0.0 | 0.0 | 0.0 |
| Q9P287 | BRCA2 and CDKN1A-interacting protein OS=Homo sapiens<br>GN=BCCIP PE=1 SV=1 - [BCCIP_HUMAN]                      | 68.2 | 52.0  | 56.1  | 0.0 | 0.0 | 0.0 |
| P35548 | Homeobox protein MSX-2 OS=Homo sapiens<br>GN=MSX2 PE=1 SV=3 - [MSX2_HUMAN]                                      | 68.1 | 65.6  | 67.9  | 0.0 | 0.0 | 0.0 |
| Q5SSJ5 | Heterochromatin protein 1-binding protein 3<br>OS=Homo sapiens GN=HP1BP3 PE=1 SV=1 -<br>[HP1B3_HUMAN]           | 67.1 | 67.9  | 49.4  | 0.0 | 0.0 | 0.0 |
| Q6P2C8 | Mediator of RNA polymerase II transcription<br>subunit 27 OS=Homo sapiens GN=MED27 PE=1<br>SV=1 - [MED27_HUMAN] | 66.4 | 71.2  | 63.7  | 0.0 | 0.0 | 0.0 |
| P46779 | 60S ribosomal protein L28 OS=Homo sapiens<br>GN=RPL28 PE=1 SV=3 - [RL28_HUMAN]                                  | 66.0 | 68.6  | 44.5  | 0.0 | 0.0 | 0.0 |
| P00492 | Hypoxanthine-guanine phosphoribosyltransferase<br>OS=Homo sapiens GN=HPRT1 PE=1 SV=2 -<br>[HPRT_HUMAN]          | 65.4 | 47.9  | 104.8 | 0.0 | 0.0 | 0.0 |
| Q96P11 | Putative methyltransferase NSUN5 OS=Homo sapiens<br>GN=NSUN5 PE=1 SV=2 -<br>[NSUN5_HUMAN]                       | 64.4 | 39.6  | 20.4  | 0.0 | 0.0 | 0.0 |
| Q00013 | 55 kDa erythrocyte membrane protein OS=Homo sapiens<br>GN=MPP1 PE=1 SV=2 - [EM55_HUMAN]                         | 63.7 | 64.4  | 35.3  | 0.0 | 0.0 | 0.0 |
| Q9Y285 | Phenylalanine--tRNA ligase alpha subunit<br>OS=Homo sapiens GN=FARSA PE=1 SV=3 -<br>[SYFA_HUMAN]                | 63.5 | 103.9 | 84.5  | 0.0 | 0.0 | 0.0 |
| Q8TBK6 | Zinc finger CCHC domain-containing protein 10<br>OS=Homo sapiens GN=ZCCHC10 PE=2 SV=1 -<br>[ZCH10_HUMAN]        | 63.1 | 72.5  | 49.8  | 0.0 | 0.0 | 0.0 |
| Q96IY1 | Kinetochore-associated protein NSL1 homolog<br>OS=Homo sapiens GN=NSL1 PE=1 SV=3 -<br>[NSL1_HUMAN]              | 62.4 | 79.8  | 54.5  | 0.0 | 0.0 | 0.0 |
| Q8WUU5 | GATA zinc finger domain-containing protein 1<br>OS=Homo sapiens GN=GATAD1 PE=1 SV=1 -<br>[GATD1_HUMAN]          | 62.2 | 85.2  | 63.8  | 0.0 | 0.0 | 0.0 |
| Q9ULX3 | RNA-binding protein NOB1 OS=Homo sapiens<br>GN=NOB1 PE=1 SV=1 - [NOB1_HUMAN]                                    | 61.7 | 80.7  | 32.2  | 0.0 | 0.0 | 0.0 |
| P27694 | Replication protein A 70 kDa DNA-binding subunit<br>OS=Homo sapiens GN=RPA1 PE=1 SV=2 -<br>[RFA1_HUMAN]         | 61.6 | 105.5 | 44.7  | 0.0 | 0.0 | 0.0 |
| Q86X53 | Glutamate-rich protein 1 OS=Homo sapiens<br>GN=ERIC1 PE=1 SV=1 - [ERIC1_HUMAN]                                  | 60.1 | 65.1  | 24.1  | 0.0 | 0.0 | 0.0 |
| P52701 | DNA mismatch repair protein Msh6 OS=Homo sapiens<br>GN=MSH6 PE=1 SV=2 - [MSH6_HUMAN]                            | 59.8 | 30.3  | 41.8  | 0.0 | 0.0 | 0.0 |

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|--------|---|------|-------|-------|-----|-----|-----|
| Q92620 | Pre-mRNA-splicing factor ATP-dependent RNA helicase PRP16 OS=Homo sapiens GN=DHX38 PE=1 SV=2 - [PRP16_HUMAN]            | 59.7 | 71.7  | 35.0  | 0.0 | 0.0 | 0.0 |
| Q96J01 | THO complex subunit 3 OS=Homo sapiens GN=THOC3 PE=1 SV=1 - [THOC3_HUMAN]  | 59.6 | 55.3  | 52.5  | 0.0 | 0.0 | 0.0 |
| Q9BTT0 | Acidic leucine-rich nuclear phosphoprotein 32 family member E OS=Homo sapiens GN=ANP32E PE=1 SV=1 - [AN32E_HUMAN]       | 59.6 | 81.1  | 78.1  | 0.0 | 0.0 | 0.0 |
| P62899 | 60S ribosomal protein L31 OS=Homo sapiens GN=RPL31 PE=1 SV=1 - [RL31_HUMAN]   | 59.6 | 97.3  | 43.7  | 0.0 | 0.0 | 0.0 |
| P12004 | Proliferating cell nuclear antigen OS=Homo sapiens GN=PCNA PE=1 SV=1 - [PCNA_HUMAN]                                     | 59.1 | 44.1  | 62.6  | 0.0 | 0.0 | 0.0 |
| Q99986 | Serine/threonine-protein kinase VRK1 OS=Homo sapiens GN=VRK1 PE=1 SV=1 - [VRK1_HUMAN]                                   | 58.9 | 57.2  | 61.5  | 0.0 | 0.0 | 0.0 |
| Q8NFB4 | Nucleoporin Nup37 OS=Homo sapiens GN=NUP37 PE=1 SV=1 - [NUP37_HUMAN]  | 58.4 | 34.6  | 44.1  | 0.0 | 0.0 | 0.0 |
| Q9UGL1 | Lysine-specific demethylase 5B OS=Homo sapiens GN=KDM5B PE=1 SV=3 - [KDM5B_HUMAN]                                       | 58.0 | 96.5  | 75.9  | 0.0 | 0.0 | 0.0 |
| O95071 | E3 ubiquitin-protein ligase UBR5 OS=Homo sapiens GN=UBR5 PE=1 SV=2 - [UBR5_HUMAN]                                       | 57.8 | 77.2  | 32.6  | 0.0 | 0.0 | 0.0 |
| Q8IUF8 | Bifunctional lysine-specific demethylase and histidyl-hydroxylase MINA OS=Homo sapiens GN=MINA PE=1 SV=1 - [MINA_HUMAN] | 55.9 | 81.6  | 77.5  | 0.0 | 0.0 | 0.0 |
| P47914 | 60S ribosomal protein L29 OS=Homo sapiens GN=RPL29 PE=1 SV=2 - [RL29_HUMAN]   | 55.5 | 61.6  | 56.9  | 0.0 | 0.0 | 0.0 |
| Q9BTE7 | DCN1-like protein 5 OS=Homo sapiens GN=DCUN1D5 PE=1 SV=1 - [DCNL5_HUMAN]  | 55.0 | 82.1  | 73.8  | 0.0 | 0.0 | 0.0 |
| O75792 | Ribonuclease H2 subunit A OS=Homo sapiens GN=RNASEH2A PE=1 SV=2 - [RNH2A_HUMAN]   | 53.7 | 86.8  | 111.2 | 0.0 | 0.0 | 0.0 |
| Q14166 | Tubulin--tyrosine ligase-like protein 12 OS=Homo sapiens GN=TTL12 PE=1 SV=2 - [TTL12_HUMAN]                             | 53.3 | 60.5  | 24.8  | 0.0 | 0.0 | 0.0 |
| Q99615 | DnaJ homolog subfamily C member 7 OS=Homo sapiens GN=DNAJC7 PE=1 SV=2 - [DNJC7_HUMAN]                                   | 53.2 | 44.3  | 38.9  | 0.0 | 0.0 | 0.0 |
| P46736 | Lys-63-specific deubiquitinase BRCC36 OS=Homo sapiens GN=BRCC3 PE=1 SV=2 - [BRCC3_HUMAN]                                | 52.8 | 103.9 | 75.0  | 0.0 | 0.0 | 0.0 |
| P28340 | DNA polymerase delta catalytic subunit OS=Homo sapiens GN=POLD1 PE=1 SV=2 - [DPOD1_HUMAN]                               | 52.7 | 24.7  | 40.4  | 0.0 | 0.0 | 0.0 |
| P49770 | Translation initiation factor eIF-2B subunit beta OS=Homo sapiens GN=EIF2B2 PE=1 SV=3 - [EI2BB_HUMAN]                   | 52.3 | 78.3  | 53.7  | 0.0 | 0.0 | 0.0 |

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|--------|---|------|-------|------|-----|-----|-----|
| P33981 | Dual specificity protein kinase TTK OS=Homo sapiens GN=TTK PE=1 SV=2 - [TTK_HUMAN]                              | 51.7 | 61.7  | 33.5 | 0.0 | 0.0 | 0.0 |
| Q9Y3A2 | Probable U3 small nucleolar RNA-associated protein 11 OS=Homo sapiens GN=UTP11L PE=1 SV=2 - [UTP11_HUMAN]       | 51.7 | 54.4  | 62.1 | 0.0 | 0.0 | 0.0 |
| Q9HAF1 | Chromatin modification-related protein MEAF6 OS=Homo sapiens GN=MEAF6 PE=1 SV=1 - [EAF6_HUMAN]                  | 51.3 | 71.0  | 68.3 | 0.0 | 0.0 | 0.0 |
| Q9BSM1 | Polycomb group RING finger protein 1 OS=Homo sapiens GN=PCGF1 PE=1 SV=2 - [PCGF1_HUMAN]                         | 51.1 | 72.3  | 52.9 | 0.0 | 0.0 | 0.0 |
| P12814 | Alpha-actinin-1 OS=Homo sapiens GN=ACTN1 PE=1 SV=2 - [ACTN1_HUMAN]  | 51.0 | 43.6  | 71.6 | 0.0 | 0.0 | 0.0 |
| P04818 | Thymidylate synthase OS=Homo sapiens GN=TYMS PE=1 SV=3 - [TYSY_HUMAN]   | 50.9 | 50.3  | 88.6 | 0.0 | 0.0 | 0.0 |
| Q96ST3 | Paired amphipathic helix protein Sin3a OS=Homo sapiens GN=SIN3A PE=1 SV=2 - [SIN3A_HUMAN]                       | 50.9 | 74.0  | 24.9 | 0.0 | 0.0 | 0.0 |
| Q5W0B1 | RING finger protein 219 OS=Homo sapiens GN=RNF219 PE=1 SV=1 - [RN219_HUMAN]                                     | 50.5 | 67.0  | 43.6 | 0.0 | 0.0 | 0.0 |
| Q7Z7K6 | Centromere protein V OS=Homo sapiens GN=CENPV PE=1 SV=1 - [CENPV_HUMAN]   | 49.8 | 139.9 | 78.0 | 0.0 | 0.0 | 0.0 |
| Q6DK11 | 60S ribosomal protein L7-like 1 OS=Homo sapiens GN=RPL7L1 PE=1 SV=1 - [RL7L_HUMAN]                              | 49.2 | 50.9  | 41.4 | 0.0 | 0.0 | 0.0 |
| P05386 | 60S acidic ribosomal protein P1 OS=Homo sapiens GN=RPLP1 PE=1 SV=1 - [RLA1_HUMAN]                               | 48.7 | 48.8  | 48.7 | 0.0 | 0.0 | 0.0 |
| Q99598 | Translin-associated protein X OS=Homo sapiens GN=TSNAX PE=1 SV=1 - [TSNAX_HUMAN]                                | 48.2 | *     | 36.4 | 0.0 | 0.0 | 0.0 |
| Q14781 | Chromobox protein homolog 2 OS=Homo sapiens GN=CBX2 PE=1 SV=2 - [CBX2_HUMAN]                                    | 47.8 | 47.6  | 27.0 | 0.0 | 0.0 | 0.0 |
| P60174 | Triosephosphate isomerase OS=Homo sapiens GN=TP11 PE=1 SV=3 - [TPIS_HUMAN]                                      | 47.4 | 48.5  | 45.8 | 0.0 | 0.0 | 0.0 |
| P36543 | V-type proton ATPase subunit E 1 OS=Homo sapiens GN=ATP6V1E1 PE=1 SV=1 - [VATE1_HUMAN]                          | 47.4 | 38.1  | 76.1 | 0.0 | 0.0 | 0.0 |
| Q9H147 | Deoxynucleotidyltransferase terminal-interacting protein 1 OS=Homo sapiens GN=DNTTIP1 PE=1 SV=2 - [TDIF1_HUMAN] | 47.0 | 30.5  | 85.2 | 0.0 | 0.0 | 0.0 |
| P08243 | Asparagine synthetase [glutamine-hydrolyzing] OS=Homo sapiens GN=ASNS PE=1 SV=4 - [ASNS_HUMAN]                  | 46.4 | 39.6  | 76.6 | 0.0 | 0.0 | 0.0 |
| Q9BQA1 | Methylosome protein 50 OS=Homo sapiens GN=WDR77 PE=1 SV=1 - [MEP50_HUMAN]                                       | 46.3 | 46.2  | 46.5 | 0.0 | 0.0 | 0.0 |
| P32969 | 60S ribosomal protein L9 OS=Homo sapiens GN=RPL9 PE=1 SV=1 - [RL9_HUMAN]  | 45.8 | 52.4  | 36.6 | 0.0 | 0.0 | 0.0 |

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|--------|--|------|------|------|-----|-----|-----|
| P36542 | ATP synthase subunit gamma, mitochondrial<br>OS=Homo sapiens GN=ATP5C1 PE=1 SV=1 -<br>[ATPG_HUMAN]   | 45.6 | 56.2 | 30.6 | 0.0 | 0.0 | 0.0 |
| P36639 | 7,8-dihydro-8-oxoguanine triphosphatase<br>OS=Homo sapiens GN=NUDT1 PE=1 SV=3 -<br>[8ODP_HUMAN]  | 45.4 | 49.8 | 45.6 | 0.0 | 0.0 | 0.0 |
| P26641 | Elongation factor 1-gamma OS=Homo sapiens<br>GN=EEF1G PE=1 SV=3 - [EF1G_HUMAN]   | 45.2 | 63.4 | 60.4 | 0.0 | 0.0 | 0.0 |
| P05198 | Eukaryotic translation initiation factor 2 subunit 1<br>OS=Homo sapiens GN=EIF2S1 PE=1 SV=3 -<br>[IF2A_HUMAN]                                | 45.0 | 97.5 | 67.6 | 0.0 | 0.0 | 0.0 |
| O43251 | RNA binding protein fox-1 homolog 2 OS=Homo<br>sapiens GN=RBFOX2 PE=1 SV=3 -<br>[RFOX2_HUMAN]  | 44.0 | 95.9 | 65.3 | 0.0 | 0.0 | 0.0 |
| O43913 | Origin recognition complex subunit 5 OS=Homo<br>sapiens GN=ORC5 PE=1 SV=1 - [ORC5_HUMAN]   | 43.6 | 70.6 | 59.2 | 0.0 | 0.0 | 0.0 |
| Q13724 | Mannosyl-oligosaccharide glucosidase OS=Homo<br>sapiens GN=MOGS PE=1 SV=5 - [MOGS_HUMAN]   | 43.5 | 49.4 | 58.1 | 0.0 | 0.0 | 0.0 |
| Q9H0E2 | Toll-interacting protein OS=Homo sapiens<br>GN=TOLLIP PE=1 SV=1 - [TOLIP_HUMAN]  | 42.6 | 42.8 | 47.3 | 0.0 | 0.0 | 0.0 |
| P19623 | Spermidine synthase OS=Homo sapiens GN=SRM<br>PE=1 SV=1 - [SPEE_HUMAN]   | 42.4 | 36.8 | 37.2 | 0.0 | 0.0 | 0.0 |
| Q5TA45 | Integrator complex subunit 11 OS=Homo sapiens<br>GN=CPSF3L PE=1 SV=2 - [INT11_HUMAN]   | 42.4 | 40.6 | 45.6 | 0.0 | 0.0 | 0.0 |
| Q14738 | Serine/threonine-protein phosphatase 2A 56 kDa<br>regulatory subunit delta isoform OS=Homo<br>sapiens GN=PPP2R5D PE=1 SV=1 -<br>[2A5D_HUMAN] | 41.9 | 37.8 | 32.7 | 0.0 | 0.0 | 0.0 |
| Q9Y4C2 | Protein FAM115A OS=Homo sapiens<br>GN=FAM115A PE=1 SV=3 - [F115A_HUMAN]  | 41.3 | 52.6 | 57.7 | 0.0 | 0.0 | 0.0 |
| Q5SRE5 | Nucleoporin NUP188 homolog OS=Homo sapiens<br>GN=NUP188 PE=1 SV=1 - [NU188_HUMAN]  | 41.1 | 47.4 | 47.2 | 0.0 | 0.0 | 0.0 |
| Q8NCN4 | E3 ubiquitin-protein ligase RNF169 OS=Homo<br>sapiens GN=RNF169 PE=1 SV=2 -<br>[RN169_HUMAN]   | 40.6 | 55.7 | 39.9 | 0.0 | 0.0 | 0.0 |
| Q92979 | Ribosomal RNA small subunit methyltransferase<br>NEP1 OS=Homo sapiens GN=EMG1 PE=1 SV=4 -<br>[NEP1_HUMAN]                                    | 40.3 | 62.9 | 55.2 | 0.0 | 0.0 | 0.0 |
| Q86U06 | Probable RNA-binding protein 23 OS=Homo<br>sapiens GN=RBM23 PE=1 SV=1 -<br>[RBM23_HUMAN]   | 40.2 | 77.2 | 64.6 | 0.0 | 0.0 | 0.0 |
| Q9Y617 | Phosphoserine aminotransferase OS=Homo<br>sapiens GN=PSAT1 PE=1 SV=2 - [SERC_HUMAN]  | 39.4 | 46.6 | 32.1 | 0.0 | 0.0 | 0.0 |

|        |  |      |      |       |     |     |     |
|--------|--|------|------|-------|-----|-----|-----|
| Q14692 | Ribosome biogenesis protein BMS1 homolog<br>OS=Homo sapiens GN=BMS1 PE=1 SV=1 -<br>[BMS1_HUMAN]              | 39.2 | 80.8 | 50.7  | 0.0 | 0.0 | 0.0 |
| Q13309 | S-phase kinase-associated protein 2 OS=Homo sapiens GN=SKP2 PE=1 SV=2 - [SKP2_HUMAN]                         | 39.1 | 44.5 | 45.9  | 0.0 | 0.0 | 0.0 |
| Q9BQ52 | Zinc phosphodiesterase ELAC protein 2 OS=Homo sapiens GN=ELAC2 PE=1 SV=2 - [RNZ2_HUMAN]                      | 38.6 | 26.9 | 53.5  | 0.0 | 0.0 | 0.0 |
| Q12769 | Nuclear pore complex protein Nup160 OS=Homo sapiens GN=NUP160 PE=1 SV=3 -<br>[NU160_HUMAN]                   | 38.3 | 26.0 | 45.0  | 0.0 | 0.0 | 0.0 |
| P61160 | Actin-related protein 2 OS=Homo sapiens GN=ACTR2 PE=1 SV=1 - [ARP2_HUMAN]                                    | 38.1 | 52.5 | 53.2  | 0.0 | 0.0 | 0.0 |
| Q8WTT2 | Nucleolar complex protein 3 homolog OS=Homo sapiens GN=NOC3L PE=1 SV=1 -<br>[NOC3L_HUMAN]                    | 37.0 | 52.5 | 52.6  | 0.0 | 0.0 | 0.0 |
| Q13112 | Chromatin assembly factor 1 subunit B OS=Homo sapiens GN=CHAF1B PE=1 SV=1 -<br>[CAF1B_HUMAN]                 | 33.9 | 51.7 | 58.1  | 0.0 | 0.0 | 0.0 |
| P57678 | Gem-associated protein 4 OS=Homo sapiens GN=GEMIN4 PE=1 SV=2 - [GEM14_HUMAN]                                 | 33.4 | 70.8 | 40.1  | 0.0 | 0.0 | 0.0 |
| O95478 | Ribosome biogenesis protein NSA2 homolog<br>OS=Homo sapiens GN=NSA2 PE=1 SV=1 -<br>[NSA2_HUMAN]              | 33.1 | 62.7 | 61.8  | 0.0 | 0.0 | 0.0 |
| Q99959 | Plakophilin-2 OS=Homo sapiens GN=PKP2 PE=1 SV=2 - [PKP2_HUMAN]   | 32.7 | 61.4 | 40.5  | 0.0 | 0.0 | 0.0 |
| P17980 | 26S protease regulatory subunit 6A OS=Homo sapiens GN=PSMC3 PE=1 SV=3 -<br>[PRS6A_HUMAN]                     | 32.4 | 23.4 | 60.9  | 0.0 | 0.0 | 0.0 |
| P82930 | 28S ribosomal protein S34, mitochondrial<br>OS=Homo sapiens GN=MRPS34 PE=1 SV=2 -<br>[RT34_HUMAN]            | 31.8 | 42.8 | 38.9  | 0.0 | 0.0 | 0.0 |
| Q14669 | E3 ubiquitin-protein ligase TRIP12 OS=Homo sapiens GN=TRIP12 PE=1 SV=1 -<br>[TRIPC_HUMAN]                    | 31.8 | 73.1 | 74.4  | 0.0 | 0.0 | 0.0 |
| Q96HA7 | Tonsoku-like protein OS=Homo sapiens GN=TONSL PE=1 SV=2 - [TONSL_HUMAN]                                      | 30.9 | 25.7 | 82.8  | 0.0 | 0.0 | 0.0 |
| Q6NXE6 | Armadillo repeat-containing protein 6 OS=Homo sapiens GN=ARMC6 PE=1 SV=2 -<br>[ARMC6_HUMAN]                  | 30.9 | 78.0 | 123.1 | 0.0 | 0.0 | 0.0 |
| Q9UKF6 | Cleavage and polyadenylation specificity factor subunit 3 OS=Homo sapiens GN=CPSF3 PE=1 SV=1 - [CPSF3_HUMAN] | 30.3 | 25.6 | 46.3  | 0.0 | 0.0 | 0.0 |
| Q9BWN1 | Proline-rich protein 14 OS=Homo sapiens GN=PRR14 PE=1 SV=1 - [PRR14_HUMAN]                                   | 29.5 | 52.0 | 38.5  | 0.0 | 0.0 | 0.0 |

|        |  |       |       |       |       |     |     |
|--------|--|-------|-------|-------|-------|-----|-----|
| Q12789 | General transcription factor 3C polypeptide 1<br>OS=Homo sapiens GN=GTF3C1 PE=1 SV=4 -<br>[TF3C1_HUMAN]        | 28.6  | 79.8  | 38.7  | 0.0   | 0.0 | 0.0 |
| P11474 | Steroid hormone receptor ERR1 OS=Homo<br>sapiens GN=ESRRA PE=1 SV=3 - [ERR1_HUMAN]                             | 28.0  | 24.8  | 43.1  | 0.0   | 0.0 | 0.0 |
| O94761 | ATP-dependent DNA helicase Q4 OS=Homo<br>sapiens GN=RECQL4 PE=1 SV=1 -<br>[RECQ4_HUMAN]                        | 27.7  | 32.9  | 28.0  | 0.0   | 0.0 | 0.0 |
| Q9H0W9 | Ester hydrolase C11orf54 OS=Homo sapiens<br>GN=C11orf54 PE=1 SV=1 - [CK054_HUMAN]                              | 27.0  | 23.9  | 21.0  | 0.0   | 0.0 | 0.0 |
| O15145 | Actin-related protein 2/3 complex subunit 3<br>OS=Homo sapiens GN=ARPC3 PE=1 SV=3 -<br>[ARPC3_HUMAN]           | 26.5  | 88.4  | 24.6  | 0.0   | 0.0 | 0.0 |
| O95707 | Ribonuclease P protein subunit p29 OS=Homo<br>sapiens GN=POP4 PE=1 SV=2 - [RPP29_HUMAN]                        | 25.3  | 25.6  | 27.8  | 0.0   | 0.0 | 0.0 |
| Q99575 | Ribonucleases P/MRP protein subunit POP1<br>OS=Homo sapiens GN=POP1 PE=1 SV=2 -<br>[POP1_HUMAN]                | 24.3  | 30.0  | 66.2  | 0.0   | 0.0 | 0.0 |
| Q53H80 | Akirin-2 OS=Homo sapiens GN=AKIRIN2 PE=1<br>SV=2 - [AKIR2_HUMAN]   | 21.7  | 33.3  | 27.1  | 0.0   | 0.0 | 0.0 |
| Q9H3M7 | Thioredoxin-interacting protein OS=Homo sapiens<br>GN=TXNIP PE=1 SV=1 - [TXNIP_HUMAN]                          | 21.7  | 60.5  | 54.5  | 0.0   | 0.0 | 0.0 |
| Q96T88 | E3 ubiquitin-protein ligase UHRF1 OS=Homo<br>sapiens GN=UHRF1 PE=1 SV=1 -<br>[UHRF1_HUMAN]                     | 181.3 | 192.4 | 146.1 | 137.4 | 0.0 | 0.0 |
| Q9BQG0 | Myb-binding protein 1A OS=Homo sapiens<br>GN=MYBBP1A PE=1 SV=2 - [MBB1A_HUMAN]                                 | 148.0 | 348.2 | 246.4 | 78.8  | 0.0 | 0.0 |
| Q9NXF1 | Testis-expressed sequence 10 protein OS=Homo<br>sapiens GN=TEX10 PE=1 SV=2 - [TEX10_HUMAN]                     | 102.4 | 100.5 | 57.9  | 67.3  | 0.0 | 0.0 |
| P47755 | F-actin-capping protein subunit alpha-2 OS=Homo<br>sapiens GN=CAPZA2 PE=1 SV=3 -<br>[CAZA2_HUMAN]              | 68.8  | 53.1  | 58.8  | 62.4  | 0.0 | 0.0 |
| Q9NRL2 | Bromodomain adjacent to zinc finger domain<br>protein 1A OS=Homo sapiens GN=BAZ1A PE=1<br>SV=2 - [BAZ1A_HUMAN] | 54.7  | 139.0 | 107.4 | 59.5  | 0.0 | 0.0 |
| Q5RKV6 | Exosome complex component MTR3 OS=Homo<br>sapiens GN=EXOSC6 PE=1 SV=1 -<br>[EXOS6_HUMAN]                       | 39.5  | 43.1  | 50.6  | 53.7  | 0.0 | 0.0 |
| P56182 | Ribosomal RNA processing protein 1 homolog A<br>OS=Homo sapiens GN=RRP1 PE=1 SV=1 -<br>[RRP1_HUMAN]            | 71.7  | 65.6  | 147.7 | 46.2  | 0.0 | 0.0 |
| Q96EK4 | THAP domain-containing protein 11 OS=Homo<br>sapiens GN=THAP11 PE=1 SV=2 -<br>[THA11_HUMAN]                    | 66.5  | 70.4  | 57.2  | 40.9  | 0.0 | 0.0 |

|        |   |       |       |       |      |       |     |
|--------|---|-------|-------|-------|------|-------|-----|
| Q13257 | Mitotic spindle assembly checkpoint protein<br>MAD2A OS=Homo sapiens GN=MAD2L1 PE=1<br>SV=1 - [MD2L1_HUMAN]   | 32.2  | 96.0  | 68.0  | 32.5 | 0.0   | 0.0 |
| Q8IZL8 | Proline-, glutamic acid- and leucine-rich protein 1<br>OS=Homo sapiens GN=PELP1 PE=1 SV=2 -<br>[PELP1_HUMAN]  | 98.3  | 140.9 | 61.5  | 29.3 | 0.0   | 0.0 |
| Q9Y4C8 | Probable RNA-binding protein 19 OS=Homo<br>sapiens GN=RBM19 PE=1 SV=3 -<br>[RBM19_HUMAN]                      | 33.4  | 81.3  | 98.5  | 26.6 | 0.0   | 0.0 |
| Q92621 | Nuclear pore complex protein Nup205 OS=Homo<br>sapiens GN=NUP205 PE=1 SV=3 -<br>[NU205_HUMAN]                 | 58.0  | 61.2  | 40.9  | 25.7 | 0.0   | 0.0 |
| O14744 | Protein arginine N-methyltransferase 5 OS=Homo<br>sapiens GN=PRMT5 PE=1 SV=4 -<br>[ANM5_HUMAN]                | 21.5  | 75.7  | 24.7  | 0.0  | 0.0   | 0.0 |
| P55795 | Heterogeneous nuclear ribonucleoprotein H2<br>OS=Homo sapiens GN=HNRNPH2 PE=1 SV=1 -<br>[HNRH2_HUMAN]         | 426.3 | 384.7 | 486.9 | 0.0  | 213.8 | 0.0 |
| Q08170 | Serine/arginine-rich splicing factor 4 OS=Homo<br>sapiens GN=SRSF4 PE=1 SV=2 - [SRSF4_HUMAN]                  | 78.6  | 75.9  | 122.5 | 0.0  | 179.5 | 0.0 |
| Q13148 | TAR DNA-binding protein 43 OS=Homo sapiens<br>GN=TARDBP PE=1 SV=1 - [TADBP_HUMAN]                             | 90.2  | 190.4 | 189.2 | 0.0  | 104.5 | 0.0 |
| Q9Y262 | Eukaryotic translation initiation factor 3 subunit L<br>OS=Homo sapiens GN=EIF3L PE=1 SV=1 -<br>[EIF3L_HUMAN] | 117.0 | 110.5 | 134.7 | 0.0  | 101.9 | 0.0 |
| O00303 | Eukaryotic translation initiation factor 3 subunit F<br>OS=Homo sapiens GN=EIF3F PE=1 SV=1 -<br>[EIF3F_HUMAN] | 39.3  | 88.6  | 105.9 | 0.0  | 81.0  | 0.0 |
| Q9BYG3 | MKI67 FHA domain-interacting nucleolar<br>phosphoprotein OS=Homo sapiens GN=NIFK<br>PE=1 SV=1 - [MK67I_HUMAN] | 182.4 | 216.6 | 195.6 | 0.0  | 79.4  | 0.0 |
| Q6RFH5 | WD repeat-containing protein 74 OS=Homo<br>sapiens GN=WDR74 PE=1 SV=1 -<br>[WDR74_HUMAN]                      | 109.4 | 98.7  | 81.2  | 0.0  | 66.3  | 0.0 |
| Q7L0Y3 | Mitochondrial ribonuclease P protein 1 OS=Homo<br>sapiens GN=TRMT10C PE=1 SV=2 -<br>[MRRP1_HUMAN]             | 111.6 | 142.1 | 68.1  | 0.0  | 59.2  | 0.0 |
| P98175 | RNA-binding protein 10 OS=Homo sapiens<br>GN=RBM10 PE=1 SV=3 - [RBM10_HUMAN]                                  | 53.4  | 93.6  | 119.7 | 0.0  | 58.9  | 0.0 |
| Q5C9Z4 | Nucleolar MIF4G domain-containing protein 1<br>OS=Homo sapiens GN=NOM1 PE=1 SV=1 -<br>[NOM1_HUMAN]            | 55.0  | 38.7  | 47.1  | 0.0  | 53.7  | 0.0 |
| Q9BQ67 | Glutamate-rich WD repeat-containing protein 1<br>OS=Homo sapiens GN=GRWD1 PE=1 SV=1 -                         | 85.0  | 49.1  | 65.2  | 0.0  | 50.4  | 0.0 |

|        |  |       |       |       |     |      |     |
|--------|--|-------|-------|-------|-----|------|-----|
|        | [GRWD1_HUMAN]  |       |       |       |     |      |     |
| Q00059 | Transcription factor A, mitochondrial OS=Homo sapiens GN=TFAM PE=1 SV=1 - [TFAM_HUMAN]   | 48.2  | 23.6  | 39.5  | 0.0 | 49.7 | 0.0 |
| P35250 | Replication factor C subunit 2 OS=Homo sapiens GN=RFC2 PE=1 SV=3 - [RFC2_HUMAN]  | 21.2  | 69.4  | 44.0  | 0.0 | 49.0 | 0.0 |
| Q5UIP0 | Telomere-associated protein RIF1 OS=Homo sapiens GN=RIF1 PE=1 SV=2 - [RIF1_HUMAN]  | 32.1  | 38.6  | 74.6  | 0.0 | 48.8 | 0.0 |
| Q9NV31 | U3 small nucleolar ribonucleoprotein protein IMP3 OS=Homo sapiens GN=IMP3 PE=1 SV=1 - [IMP3_HUMAN]   | 65.8  | 30.1  | 117.6 | 0.0 | 47.5 | 0.0 |
| Q9Y6V7 | Probable ATP-dependent RNA helicase DDX49 OS=Homo sapiens GN=DDX49 PE=1 SV=1 - [DDX49_HUMAN]   | 85.4  | 73.0  | 50.1  | 0.0 | 44.7 | 0.0 |
| P46783 | 40S ribosomal protein S10 OS=Homo sapiens GN=RPS10 PE=1 SV=1 - [RS10_HUMAN]  | 134.3 | 212.3 | 230.3 | 0.0 | 43.4 | 0.0 |
| O15381 | Nuclear valosin-containing protein-like OS=Homo sapiens GN=NVL PE=1 SV=1 - [NVL_HUMAN]   | 181.7 | 239.9 | 251.3 | 0.0 | 39.5 | 0.0 |
| Q8IWA0 | WD repeat-containing protein 75 OS=Homo sapiens GN=WDR75 PE=1 SV=1 - [WDR75_HUMAN]   | 125.7 | 189.0 | 191.3 | 0.0 | 38.0 | 0.0 |
| Q86W42 | THO complex subunit 6 homolog OS=Homo sapiens GN=THOC6 PE=1 SV=1 - [THOC6_HUMAN]   | 91.6  | 136.5 | 142.0 | 0.0 | 37.5 | 0.0 |
| Q7Z3B4 | Nucleoporin p54 OS=Homo sapiens GN=NUP54 PE=1 SV=2 - [NUP54_HUMAN]   | 23.9  | 34.8  | 31.3  | 0.0 | 37.5 | 0.0 |
| P42285 | Superkiller viralicidic activity 2-like 2 OS=Homo sapiens GN=SKIV2L2 PE=1 SV=3 - [SK2L2_HUMAN]   | 89.7  | 60.6  | 61.0  | 0.0 | 36.8 | 0.0 |
| Q969G3 | SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily E member 1 OS=Homo sapiens GN=SMARCE1 PE=1 SV=2 - [SMCE1_HUMAN] | 90.7  | 50.7  | 60.0  | 0.0 | 36.7 | 0.0 |
| O00566 | U3 small nucleolar ribonucleoprotein protein MPP10 OS=Homo sapiens GN=MPHOSPH10 PE=1 SV=2 - [MPP10_HUMAN]  | 49.7  | 112.9 | 89.9  | 0.0 | 34.8 | 0.0 |
| Q96P16 | Regulation of nuclear pre-mRNA domain-containing protein 1A OS=Homo sapiens GN=RPRD1A PE=1 SV=1 - [RPR1A_HUMAN]                                    | 123.5 | 77.5  | 48.0  | 0.0 | 34.7 | 0.0 |
| Q96BK5 | PIN2/TERF1-interacting telomerase inhibitor 1 OS=Homo sapiens GN=PINX1 PE=1 SV=2 - [PINX1_HUMAN]   | 25.2  | 40.7  | 38.2  | 0.0 | 34.5 | 0.0 |
| P62841 | 40S ribosomal protein S15 OS=Homo sapiens GN=RPS15 PE=1 SV=2 - [RS15_HUMAN]  | 62.5  | 108.9 | 39.3  | 0.0 | 33.6 | 0.0 |

|        |   |        |        |        |     |      |       |
|--------|---|--------|--------|--------|-----|------|-------|
| Q8NFH3 | Nucleoporin Nup43 OS=Homo sapiens GN=NUP43 PE=1 SV=1 - [NUP43_HUMAN]  | 79.3   | 29.7   | 110.5  | 0.0 | 32.1 | 0.0   |
| O75817 | Ribonuclease P protein subunit p20 OS=Homo sapiens GN=POP7 PE=1 SV=2 - [POP7_HUMAN]                         | 67.2   | 62.5   | 83.3   | 0.0 | 32.0 | 0.0   |
| P60228 | Eukaryotic translation initiation factor 3 subunit E OS=Homo sapiens GN=EIF3E PE=1 SV=1 - [EIF3E_HUMAN]     | 231.0  | 304.8  | 210.2  | 0.0 | 30.2 | 0.0   |
| Q92785 | Zinc finger protein ubi-d4 OS=Homo sapiens GN=DPF2 PE=1 SV=2 - [REQU_HUMAN]                                 | 62.7   | 126.8  | 156.5  | 0.0 | 28.9 | 0.0   |
| Q9BX40 | Protein LSM14 homolog B OS=Homo sapiens GN=LSM14B PE=1 SV=1 - [LS14B_HUMAN]                                 | 20.4   | 44.7   | 56.8   | 0.0 | 27.7 | 0.0   |
| Q9Y3T9 | Nucleolar complex protein 2 homolog OS=Homo sapiens GN=NOC2L PE=1 SV=4 - [NOC2L_HUMAN]                      | 71.1   | 70.0   | 85.6   | 0.0 | 25.8 | 0.0   |
| P49736 | DNA replication licensing factor MCM2 OS=Homo sapiens GN=MCM2 PE=1 SV=4 - [MCM2_HUMAN]                      | 53.8   | 64.2   | 54.0   | 0.0 | 25.7 | 0.0   |
| Q8WUM0 | Nuclear pore complex protein Nup133 OS=Homo sapiens GN=NUP133 PE=1 SV=2 - [NU133_HUMAN]                     | 343.3  | 368.1  | 146.5  | 0.0 | 25.6 | 0.0   |
| Q08J23 | tRNA (cytosine(34)-C(5))-methyltransferase OS=Homo sapiens GN=NSUN2 PE=1 SV=2 - [NSUN2_HUMAN]               | 168.1  | 118.1  | 61.6   | 0.0 | 21.8 | 0.0   |
| Q6ZMT4 | Lysine-specific demethylase 7A OS=Homo sapiens GN=KDM7A PE=1 SV=2 - [KDM7A_HUMAN]                           | 1678.6 | 1955.0 | 1401.1 | 0.0 | 0.0  | 129.5 |
| Q14683 | Structural maintenance of chromosomes protein 1A OS=Homo sapiens GN=SMC1A PE=1 SV=2 - [SMC1A_HUMAN]         | 32.0   | 96.5   | 43.7   | 0.0 | 0.0  | 72.0  |
| Q9Y5B9 | FACT complex subunit SPT16 OS=Homo sapiens GN=SUPT16H PE=1 SV=1 - [SP16H_HUMAN]                             | 77.2   | 163.4  | 110.6  | 0.0 | 0.0  | 50.4  |
| Q9UQE7 | Structural maintenance of chromosomes protein 3 OS=Homo sapiens GN=SMC3 PE=1 SV=2 - [SMC3_HUMAN]            | 118.5  | 190.6  | 38.2   | 0.0 | 0.0  | 43.3  |
| Q08945 | FACT complex subunit SSRP1 OS=Homo sapiens GN=SSRP1 PE=1 SV=1 - [SSRP1_HUMAN]                               | 345.5  | 342.2  | 211.4  | 0.0 | 0.0  | 37.4  |
| Q9UBQ5 | Eukaryotic translation initiation factor 3 subunit K OS=Homo sapiens GN=EIF3K PE=1 SV=1 - [EIF3K_HUMAN]     | 64.4   | 100.3  | 57.8   | 0.0 | 0.0  | 36.1  |
| P63244 | Guanine nucleotide-binding protein subunit beta-2-like 1 OS=Homo sapiens GN=GNB2L1 PE=1 SV=3 - [GBLP_HUMAN] | 381.0  | 321.9  | 206.5  | 0.0 | 0.0  | 32.6  |
| Q8NI27 | THO complex subunit 2 OS=Homo sapiens GN=THOC2 PE=1 SV=2 - [THOC2_HUMAN]                                    | 88.0   | 104.1  | 87.4   | 0.0 | 0.0  | 32.3  |
| Q9ULX6 | A-kinase anchor protein 8-like OS=Homo sapiens GN=AKAP8L PE=1 SV=3 - [AKP8L_HUMAN]                          | 53.1   | 61.6   | 38.4   | 0.0 | 0.0  | 31.8  |

|        |  |       |       |      |     |     |      |
|--------|--|-------|-------|------|-----|-----|------|
| Q14331 | Protein FRG1 OS=Homo sapiens GN=FRG1 PE=1<br>SV=1 - [FRG1_HUMAN]                                       | 49.6  | 38.6  | 42.7 | 0.0 | 0.0 | 29.1 |
| Q13601 | KRR1 small subunit processome component<br>homolog OS=Homo sapiens GN=KRR1 PE=1<br>SV=4 - [KRR1_HUMAN] | 55.7  | 35.4  | 66.4 | 0.0 | 0.0 | 26.4 |
| Q9GZS1 | DNA-directed RNA polymerase I subunit RPA49<br>OS=Homo sapiens GN=POLR1E PE=1 SV=2 -<br>[RPA49_HUMAN]  | 123.9 | 132.1 | 96.9 | 0.0 | 0.0 | 25.8 |
| P78549 | Endonuclease III-like protein 1 OS=Homo sapiens<br>GN=NTHL1 PE=1 SV=2 - [NTHL1_HUMAN]                  | 113.0 | 97.2  | 44.0 | 0.0 | 0.0 | 23.9 |
| Q6SPF0 | Atherin OS=Homo sapiens GN=SAMD1 PE=1<br>SV=1 - [SAMD1_HUMAN]  | 30.6  | 41.4  | 61.5 | 0.0 | 0.0 | 20.3 |
| O14744 | Protein arginine N-methyltransferase 5 OS=Homo<br>sapiens GN=PRMT5 PE=1 SV=4 -<br>[ANM5_HUMAN]         | 21.5  | 75.7  | 24.7 | 0.0 | 0.0 | 0.0  |

**Table S2. Proteome of endogenous KDM7A in HeLa cells under 0% FBS condition**

| Accession | Description  | KDM7A (iBAQ) |          |          | IgG (iBAQ) |       |       |
|-----------|--|--------------|----------|----------|------------|-------|-------|
|           |  | Rep 1        | Rep 2    | Rep 3    | Rep 1      | Rep 2 | Rep 3 |
| P10412    | H14_HUMAN Histone H1.4                                     | 12981000     | 25846000 | 14598000 | 0          | 0     | 0     |
| Q99878    | H2A1J_HUMAN Histone H2A type 1-J                           | 11121000     | 897460   | 0        | 0          | 0     | 0     |
| Q92686    | NEUG_HUMAN Neurogranin                                     | 10055000     | 10260000 | 0        | 0          | 0     | 0     |
| P62987    | RL40_HUMAN Ubiquitin-60S ribosomal protein L40             | 9890700      | 15897000 | 20985000 | 3995800    | 0     | 0     |
| P07910    | HNRPC_HUMAN Heterogeneous nuclear ribonucleoproteins C1/C2 | 7002700      | 12954000 | 10341000 | 0          | 0     | 0     |
| Q96PK6    | RBM14_HUMAN RNA-binding protein 14                         | 5848100      | 6722400  | 5850000  | 157110     | 0     | 0     |
| Q99880    | H2B1L_HUMAN Histone H2B type 1-L                           | 5511000      | 2190900  | 2606700  | 5764300    | 0     | 0     |
| P09651    | ROA1_HUMAN Heterogeneous nuclear ribonucleoprotein A1      | 5161500      | 13559000 | 9240700  | 0          | 0     | 0     |
| P35579    | MYH9_HUMAN Myosin-9  | 5094400      | 10264000 | 6130600  | 0          | 0     | 0     |
| P38159    | RBMX_HUMAN RNA-binding motif protein, X chromosome         | 4931600      | 7996700  | 5255500  | 0          | 0     | 0     |
| O75367    | H2AY_HUMAN Core histone macro-H2A.1                        | 4568900      | 17588000 | 5852000  | 0          | 0     | 0     |
| P07305    | H10_HUMAN Histone H1.0                                     | 4558500      | 9918600  | 26612000 | 0          | 0     | 0     |
| P02545    | LMNA_HUMAN Prelamin-A/C                                    | 3865300      | 5679300  | 2757800  | 0          | 62354 | 0     |
| P52272    | HNRPM_HUMAN Heterogeneous nuclear ribonucleoprotein M      | 3738600      | 4523400  | 2154400  | 0          | 0     | 0     |
| P60842    | IF4A1_HUMAN Eukaryotic initiation factor 4A-I              | 3321300      | 4577500  | 2819600  | 0          | 0     | 0     |
| Q00839    | HNRPU_HUMAN Heterogeneous nuclear ribonucleoprotein U      | 3210400      | 10499000 | 7112200  | 328200     | 0     | 0     |
| P06748    | NPM_HUMAN Nucleophosmin                                    | 3069600      | 0        | 2902900  | 238410     | 0     | 0     |
| P22626    | ROA2_HUMAN Heterogeneous nuclear ribonucleoproteins A2/B1  | 2632500      | 8189500  | 3749500  | 0          | 0     | 0     |
| P22087    | FBRL_HUMAN rRNA 2-O-methyltransferase fibrillarin          | 2572300      | 3485000  | 2447900  | 0          | 0     | 0     |
| P05141    | ADT2_HUMAN ADP/ATP translocase 2                           | 2528600      | 3051900  | 2929900  | 0          | 0     | 0     |
| Q92522    | H1X_HUMAN Histone H1x                                      | 2353400      | 7508800  | 5010200  | 0          | 0     | 0     |
| P52597    | HNRPF_HUMAN Heterogeneous nuclear ribonucleoprotein F      | 2316800      | 2876000  | 4900700  | 0          | 0     | 0     |
| P81605    | DCD_HUMAN Dermcidin  | 2131900      | 0        | 1191600  | 28171000   | 0     | 0     |
| Q08211    | DHX9_HUMAN ATP-dependent RNA helicase A                    | 1851100      | 2681100  | 1838700  | 0          | 0     | 0     |
| P17844    | DDX5_HUMAN Probable ATP-dependent RNA helicase DDX5        | 1746200      | 1049600  | 1283300  | 0          | 0     | 0     |
| P11021    | BIP_HUMAN Endoplasmic reticulum                            | 1682100      | 2940000  | 2123600  | 0          | 0     | 0     |

|        |  |         |         |         |         |       |   |
|--------|--|---------|---------|---------|---------|-------|---|
|        | chaperone BiP  |         |         |         |         |       |   |
| Q9NR30 | DDX21_HUMAN Nucleolar RNA helicase 2                                 | 1669200 | 3146200 | 2148900 | 0       | 0     | 0 |
| P46087 | NOP2_HUMAN Probable 28S rRNA (cytosine(4447)-C(5))-methyltransferase | 1652900 | 2586300 | 2161600 | 0       | 0     | 0 |
| P09874 | PARP1_HUMAN Poly [ADP-ribose] polymerase 1                           | 1620600 | 4164300 | 3075700 | 0       | 0     | 0 |
| P08238 | HS90B_HUMAN Heat shock protein HSP 90-beta                           | 1495100 | 2108400 | 783220  | 0       | 0     | 0 |
| Q12905 | ILF2_HUMAN Interleukin enhancer-binding factor 2                     | 1278800 | 2057500 | 1163500 | 0       | 0     | 0 |
| P06493 | CDK1_HUMAN Cyclin-dependent kinase 1                                 | 1253800 | 1227100 | 1182800 | 0       | 0     | 0 |
| O94875 | SRBS2_HUMAN Sorbin and SH3 domain-containing protein 2               | 1232400 | 1767400 | 1078900 | 0       | 0     | 0 |
| Q14980 | NUMA1_HUMAN Nuclear mitotic apparatus protein 1                      | 1146700 | 2290100 | 1056400 | 0       | 0     | 0 |
| P12814 | ACTN1_HUMAN Alpha-actinin-1  | 1066100 | 1868900 | 956870  | 0       | 0     | 0 |
| P55795 | HNRH2_HUMAN Heterogeneous nuclear ribonucleoprotein H2               | 1038300 | 1841300 | 1158100 | 0       | 0     | 0 |
| O00571 | DDX3X_HUMAN ATP-dependent RNA helicase DDX3X                         | 1034000 | 2184500 | 685990  | 53961   | 0     | 0 |
| P61978 | HNRPK_HUMAN Heterogeneous nuclear ribonucleoprotein K                | 987300  | 1308200 | 1064800 | 0       | 87690 | 0 |
| P56537 | IF6_HUMAN Eukaryotic translation initiation factor 6                 | 964350  | 1538900 | 666790  | 0       | 0     | 0 |
| P51659 | DHB4_HUMAN Peroxisomal multifunctional enzyme type 2                 | 963630  | 722320  | 813210  | 0       | 0     | 0 |
| O00567 | NOP56_HUMAN Nucleolar protein 56                                     | 872250  | 2046800 | 727370  | 0       | 0     | 0 |
| O43795 | MYO1B_HUMAN Unconventional myosin-Ib                                 | 855070  | 1599600 | 942190  | 0       | 0     | 0 |
| P26373 | RL13_HUMAN 60S ribosomal protein L13                                 | 851040  | 464890  | 508890  | 0       | 0     | 0 |
| P11388 | TOP2A_HUMAN DNA topoisomerase 2-alpha                                | 837090  | 1206800 | 939260  | 0       | 0     | 0 |
| P35580 | MYH10_HUMAN Myosin-10  | 826690  | 2511700 | 756860  | 0       | 0     | 0 |
| P04406 | G3P_HUMAN Glyceraldehyde-3-phosphate dehydrogenase                   | 809270  | 5008400 | 745850  | 1654400 | 0     | 0 |
| P62917 | RL8_HUMAN 60S ribosomal protein L8                                   | 804450  | 2850700 | 1108700 | 0       | 0     | 0 |
| P62701 | RS4X_HUMAN 40S ribosomal protein S4, X isoform                       | 789750  | 1503100 | 912730  | 0       | 0     | 0 |
| P19338 | NUCL_HUMAN Nucleolin   | 756760  | 1246900 | 721610  | 0       | 0     | 0 |
| Q9UHB6 | LIMA1_HUMAN LIM domain and actin-binding protein 1                   | 745710  | 590600  | 428520  | 0       | 0     | 0 |
| Q8IVT2 | MISP_HUMAN Mitotic interactor and                                    | 738490  | 601530  | 324070  | 0       | 0     | 0 |

|        |  |        |         |         |       |   |         |
|--------|--|--------|---------|---------|-------|---|---------|
|        | substrate of PLK1  |        |         |         |       |   |         |
| P38646 | GRP75_HUMAN Stress-70 protein, mitochondrial                               | 737090 | 792390  | 313880  | 62317 | 0 | 0       |
| Q99848 | EBP2_HUMAN Probable rRNA-processing protein EBP2                           | 734100 | 488260  | 1046400 | 0     | 0 | 0       |
| P47755 | CAZA2_HUMAN F-actin-capping protein subunit alpha-2                        | 697960 | 471470  | 90748   | 0     | 0 | 0       |
| Q15717 | ELAV1_HUMAN ELAV-like protein 1  | 682340 | 1084300 | 533820  | 0     | 0 | 0       |
| Q5SSJ5 | HP1B3_HUMAN Heterochromatin protein 1-binding protein 3                    | 658280 | 1231700 | 892030  | 0     | 0 | 0       |
| P0DMV9 | HS71B_HUMAN Heat shock 70 kDa protein 1B                                   | 634460 | 641230  | 525760  | 0     | 0 | 0       |
| P14625 | ENPL_HUMAN Endoplasmic reticulum protein                                   | 624250 | 2330200 | 878970  | 0     | 0 | 0       |
| Q16891 | MIC60_HUMAN MICOS complex subunit MIC60                                    | 620730 | 1015200 | 591350  | 0     | 0 | 0       |
| P0CW18 | PRS56_HUMAN Serine protease 56   | 597440 | 1147100 | 959020  | 0     | 0 | 0       |
| P12268 | IMDH2_HUMAN Inosine-5-monophosphate dehydrogenase 2                        | 593720 | 961400  | 627150  | 40603 | 0 | 0       |
| Q99959 | PKP2_HUMAN Plakophilin-2   | 593550 | 1138100 | 598210  | 0     | 0 | 0       |
| P08254 | MMP3_HUMAN Stromelysin-1   | 590910 | 0       | 1174400 | 0     | 0 | 2230500 |
| P14866 | HNRPL_HUMAN Heterogeneous nuclear ribonucleoprotein L                      | 586160 | 1137100 | 229110  | 0     | 0 | 0       |
| O95425 | SVIL_HUMAN Supervillin   | 582240 | 689260  | 514740  | 0     | 0 | 0       |
| P13639 | EF2_HUMAN Elongation factor 2  | 521000 | 1215000 | 622900  | 42152 | 0 | 0       |
| Q86V81 | THOC4_HUMAN THO complex subunit 4  | 515590 | 2007200 | 1047900 | 0     | 0 | 0       |
| Q13813 | SPTN1_HUMAN Spectrin alpha chain, non-erythrocytic 1                       | 510720 | 642220  | 533130  | 0     | 0 | 0       |
| Q12906 | ILF3_HUMAN Interleukin enhancer-binding factor 3                           | 502400 | 1450200 | 515350  | 0     | 0 | 0       |
| P46439 | GSTM5_HUMAN Glutathione S-transferase Mu 5                                 | 494670 | 792390  | 548480  | 0     | 0 | 0       |
| O43175 | SERA_HUMAN D-3-phosphoglycerate dehydrogenase                              | 493030 | 269050  | 122910  | 0     | 0 | 0       |
| P62753 | RS6_HUMAN 40S ribosomal protein S6   | 473720 | 1290900 | 444990  | 0     | 0 | 0       |
| Q01082 | SPTB2_HUMAN Spectrin beta chain, non-erythrocytic 1                        | 465340 | 527650  | 464960  | 0     | 0 | 0       |
| P62140 | PP1B_HUMAN Serine/threonine-protein phosphatase PP1-beta catalytic subunit | 448060 | 771030  | 446180  | 0     | 0 | 0       |
| P52907 | CAZA1_HUMAN F-actin-capping protein subunit alpha-1                        | 443400 | 944790  | 562000  | 0     | 0 | 0       |
| Q9H6F5 | CCD86_HUMAN Coiled-coil domain-containing protein 86                       | 440520 | 3090600 | 1625500 | 0     | 0 | 0       |

|        |   |        |         |         |        |   |   |
|--------|---|--------|---------|---------|--------|---|---|
| Q15366 | PCBP2_HUMAN Poly(rC)-binding protein 2                                | 435350 | 1565200 | 534450  | 0      | 0 | 0 |
| P11387 | TOP1_HUMAN DNA topoisomerase 1  | 428420 | 937900  | 441790  | 0      | 0 | 0 |
| P67809 | YBOX1_HUMAN Nuclease-sensitive element-binding protein 1              | 424210 | 673190  | 208140  | 0      | 0 | 0 |
| P10809 | CH60_HUMAN 60 kDa heat shock protein, mitochondrial                   | 419180 | 618070  | 454140  | 0      | 0 | 0 |
| P51991 | ROA3_HUMAN Heterogeneous nuclear ribonucleoprotein A3                 | 408390 | 2778100 | 2101500 | 0      | 0 | 0 |
| P43243 | MATR3_HUMAN Matrin-3  | 400970 | 1326800 | 899710  | 0      | 0 | 0 |
| P46013 | KI67_HUMAN Proliferation marker protein Ki-67                         | 390170 | 620150  | 608040  | 0      | 0 | 0 |
| Q9NVI7 | ATD3A_HUMAN ATPase family AAA domain-containing protein 3A            | 384250 | 966670  | 739470  | 0      | 0 | 0 |
| P38919 | IF4A3_HUMAN Eukaryotic initiation factor 4A-III                       | 375300 | 427610  | 443050  | 0      | 0 | 0 |
| Q07955 | SRSF1_HUMAN Serine/arginine-rich splicing factor 1                    | 370500 | 736780  | 584720  | 0      | 0 | 0 |
| P14923 | PLAK_HUMAN Junction plakoglobin                                       | 366990 | 689140  | 437010  | 729120 | 0 | 0 |
| Q8TDN6 | BRX1_HUMAN Ribosome biogenesis protein BRX1 homolog                   | 352670 | 750450  | 467240  | 0      | 0 | 0 |
| O95816 | BAG2_HUMAN BAG family molecular chaperone regulator 2                 | 350300 | 1150700 | 994760  | 0      | 0 | 0 |
| P49327 | FAS_HUMAN Fatty acid synthase   | 348800 | 490960  | 356980  | 0      | 0 | 0 |
| Q14126 | DSG2_HUMAN Desmoglein-2   | 339700 | 446200  | 222550  | 0      | 0 | 0 |
| Q99714 | HCD2_HUMAN 3-hydroxyacyl-CoA dehydrogenase type-2                     | 323800 | 278710  | 0       | 0      | 0 | 0 |
| Q9Y2Q3 | GSTK1_HUMAN Glutathione S-transferase kappa 1                         | 321720 | 432830  | 412170  | 0      | 0 | 0 |
| Q15233 | NONO_HUMAN Non-POU domain-containing octamer-binding protein          | 308150 | 701930  | 833170  | 0      | 0 | 0 |
| P39023 | RL3_HUMAN 60S ribosomal protein L3                                    | 303580 | 551740  | 347760  | 0      | 0 | 0 |
| Q96HS1 | PGAM5_HUMAN Serine/threonine-protein phosphatase PGAM5, mitochondrial | 294760 | 598400  | 287740  | 0      | 0 | 0 |
| Q9H0A0 | NAT10_HUMAN RNA cytidine acetyltransferase                            | 290930 | 414670  | 181750  | 0      | 0 | 0 |
| P33993 | MCM7_HUMAN DNA replication licensing factor MCM7                      | 285510 | 444920  | 112960  | 0      | 0 | 0 |
| P42704 | LPPRC_HUMAN Leucine-rich PPR motif-containing protein, mitochondrial  | 276800 | 285700  | 308670  | 0      | 0 | 0 |
| O43143 | DHX15_HUMAN Pre-mRNA-splicing factor ATP-dependent RNA helicase DHX15 | 276420 | 764680  | 182600  | 0      | 0 | 0 |

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|--------|--|--------|---------|--------|---|---|---|
| Q8N3V7 | SYNPO_HUMAN Synaptopodin   | 274180 | 654250  | 267410 | 0 | 0 | 0 |
| Q9NX63 | MIC19_HUMAN MICOS complex subunit<br>MIC19   | 272850 | 1678400 | 292260 | 0 | 0 | 0 |
| P14618 | KPYM_HUMAN Pyruvate kinase PKM   | 267910 | 480670  | 260510 | 0 | 0 | 0 |
| Q9BY77 | PDIP3_HUMAN Polymerase<br>delta-interacting protein 3  | 265270 | 591620  | 93358  | 0 | 0 | 0 |
| P63244 | RACK1_HUMAN Receptor of activated<br>protein C kinase 1  | 256680 | 411430  | 119620 | 0 | 0 | 0 |
| Q16629 | SRSF7_HUMAN Serine/arginine-rich<br>splicing factor 7  | 248160 | 341030  | 288400 | 0 | 0 | 0 |
| P12956 | XRCC6_HUMAN X-ray repair<br>cross-complementing protein 6  | 237240 | 479370  | 266730 | 0 | 0 | 0 |
| P35659 | DEK_HUMAN Protein DEK  | 230500 | 1419600 | 258250 | 0 | 0 | 0 |
| Q8WXI9 | P66B_HUMAN Transcriptional repressor<br>p66-beta   | 226790 | 120590  | 190040 | 0 | 0 | 0 |
| Q14974 | IMB1_HUMAN Importin subunit beta-1   | 226490 | 257790  | 0      | 0 | 0 | 0 |
| P11586 | C1TC_HUMAN C-1-tetrahydrofolate<br>synthase, cytoplasmic   | 225720 | 390040  | 229830 | 0 | 0 | 0 |
| Q9UN86 | G3BP2_HUMAN Ras GTPase-activating<br>protein-binding protein 2   | 225070 | 231610  | 0      | 0 | 0 | 0 |
| Q9BQG0 | MBB1A_HUMAN Myb-binding protein 1A   | 215310 | 245560  | 315860 | 0 | 0 | 0 |
| P40938 | RFC3_HUMAN Replication factor C subunit<br>3   | 213400 | 255320  | 266360 | 0 | 0 | 0 |
| P43405 | KSYK_HUMAN Tyrosine-protein kinase SYK   | 211470 | 0       | 344830 | 0 | 0 | 0 |
| Q6YN16 | HSDL2_HUMAN Hydroxysteroid<br>dehydrogenase-like protein 2   | 209800 | 414480  | 190640 | 0 | 0 | 0 |
| Q9UQ35 | SRRM2_HUMAN Serine/arginine repetitive<br>matrix protein 2   | 204580 | 324720  | 196070 | 0 | 0 | 0 |
| P31689 | DNJA1_HUMAN DnaJ homolog subfamily A<br>member 1   | 204150 | 228420  | 201070 | 0 | 0 | 0 |
| P21333 | FLNA_HUMAN Filamin-A   | 199990 | 257820  | 210820 | 0 | 0 | 0 |
| Q14103 | HNRPD_HUMAN Heterogeneous nuclear<br>ribonucleoprotein D0  | 198000 | 378980  | 281940 | 0 | 0 | 0 |
| Q02878 | RL6_HUMAN 60S ribosomal protein L6   | 195910 | 674170  | 390550 | 0 | 0 | 0 |
| Q9NYL9 | TMOD3_HUMAN Tropomodulin-3   | 189570 | 495740  | 351810 | 0 | 0 | 0 |
| O60264 | SMCA5_HUMAN SWI/SNF-related<br>matrix-associated actin-dependent<br>regulator of chromatin subfamily A<br>member 5 | 188380 | 325680  | 193290 | 0 | 0 | 0 |
| O43390 | HNRPR_HUMAN Heterogeneous nuclear<br>ribonucleoprotein R   | 169800 | 350720  | 408300 | 0 | 0 | 0 |
| P35249 | RFC4_HUMAN Replication factor C subunit  | 165780 | 1014700 | 320010 | 0 | 0 | 0 |

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|--------|---|--------|--------|--------|---|---|---|
|        | 4   |        |        |        |   |   |   |
| Q14244 | MAP7_HUMAN Ensconsin  | 163840 | 839550 | 328670 | 0 | 0 | 0 |
| P62995 | TRA2B_HUMAN Transformer-2 protein homolog beta  | 161560 | 310360 | 0      | 0 | 0 | 0 |
| Q15645 | PCH2_HUMAN Pachytene checkpoint protein 2 homolog                                       | 160470 | 515240 | 0      | 0 | 0 | 0 |
| P56182 | RRP1_HUMAN Ribosomal RNA processing protein 1 homolog A                                 | 159190 | 115810 | 145080 | 0 | 0 | 0 |
| P18124 | RL7_HUMAN 60S ribosomal protein L7  | 157330 | 330090 | 302730 | 0 | 0 | 0 |
| P35250 | RFC2_HUMAN Replication factor C subunit 2   | 157000 | 201230 | 340140 | 0 | 0 | 0 |
| P34897 | GLYM_HUMAN Serine hydroxymethyltransferase, mitochondrial                               | 152110 | 124930 | 300600 | 0 | 0 | 0 |
| Q9NVP1 | DDX18_HUMAN ATP-dependent RNA helicase DDX18  | 146560 | 419890 | 273150 | 0 | 0 | 0 |
| O15213 | WDR46_HUMAN WD repeat-containing protein 46   | 145040 | 72416  | 0      | 0 | 0 | 0 |
| P11498 | PYC_HUMAN Pyruvate carboxylase, mitochondrial   | 143830 | 277740 | 178210 | 0 | 0 | 0 |
| Q9H307 | PININ_HUMAN Pinin   | 139290 | 262970 | 0      | 0 | 0 | 0 |
| Q07666 | KHDR1_HUMAN KH domain-containing, RNA-binding, signal transduction-associated protein 1 | 139080 | 0      | 223100 | 0 | 0 | 0 |
| Q9UJZ1 | STML2_HUMAN Stomatatin-like protein 2, mitochondrial                                    | 138130 | 178460 | 106580 | 0 | 0 | 0 |
| P23396 | RS3_HUMAN 40S ribosomal protein S3  | 136980 | 396430 | 198570 | 0 | 0 | 0 |
| O75390 | CISY_HUMAN Citrate synthase, mitochondrial  | 136520 | 614880 | 236830 | 0 | 0 | 0 |
| P18887 | XRCC1_HUMAN DNA repair protein XRCC1  | 130790 | 220870 | 147310 | 0 | 0 | 0 |
| P42166 | LAP2A_HUMAN Lamina-associated polypeptide 2, isoform alpha                              | 130250 | 476500 | 158050 | 0 | 0 | 0 |
| P49790 | NU153_HUMAN Nuclear pore complex protein Nup153   | 130100 | 150480 | 52522  | 0 | 0 | 0 |
| Q99459 | CDC5L_HUMAN Cell division cycle 5-like protein  | 124350 | 86884  | 0      | 0 | 0 | 0 |
| O43865 | SAHH2_HUMAN S-adenosylhomocysteine hydrolase-like protein 1                             | 123420 | 215790 | 136650 | 0 | 0 | 0 |
| O00116 | ADAS_HUMAN Alkyldihydroxyacetonephosphate synthase, peroxisomal                         | 122230 | 80850  | 68424  | 0 | 0 | 0 |
| P33992 | MCM5_HUMAN DNA replication licensing factor MCM5  | 117410 | 149640 | 67449  | 0 | 0 | 0 |

|        |  |        |         |        |   |   |   |
|--------|--|--------|---------|--------|---|---|---|
| Q14684 | RRP1B_HUMAN Ribosomal RNA processing protein 1 homolog B                               | 116310 | 290610  | 0      | 0 | 0 | 0 |
| O43707 | ACTN4_HUMAN Alpha-actinin-4  | 114120 | 215530  | 93161  | 0 | 0 | 0 |
| O00303 | EIF3F_HUMAN Eukaryotic translation initiation factor 3 subunit F                       | 112890 | 150140  | 103590 | 0 | 0 | 0 |
| P47756 | CAPZB_HUMAN F-actin-capping protein subunit beta                                       | 112390 | 1348100 | 339650 | 0 | 0 | 0 |
| P04843 | RPN1_HUMAN Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit 1    | 111220 | 139560  | 138570 | 0 | 0 | 0 |
| Q16643 | DREB_HUMAN Drebrin   | 110360 | 225880  | 170400 | 0 | 0 | 0 |
| P49916 | DNL13_HUMAN DNA ligase 3   | 103240 | 203300  | 123560 | 0 | 0 | 0 |
| P51648 | AL3A2_HUMAN Fatty aldehyde dehydrogenase   | 102010 | 173020  | 0      | 0 | 0 | 0 |
| P55265 | DSRAD_HUMAN Double-stranded RNA-specific adenosine deaminase                           | 101200 | 123010  | 37017  | 0 | 0 | 0 |
| P11940 | PABP1_HUMAN Polyadenylate-binding protein 1  | 99111  | 267240  | 156480 | 0 | 0 | 0 |
| Q9BVP2 | GNL3_HUMAN Guanine nucleotide-binding protein-like 3                                   | 98873  | 503800  | 365000 | 0 | 0 | 0 |
| Q15269 | PWP2_HUMAN Periodic tryptophan protein 2 homolog                                       | 98123  | 70076   | 0      | 0 | 0 | 0 |
| Q9H0S4 | DDX47_HUMAN Probable ATP-dependent RNA helicase DDX47                                  | 97389  | 163290  | 132120 | 0 | 0 | 0 |
| Q8TEM1 | PO210_HUMAN Nuclear pore membrane glycoprotein 210                                     | 95299  | 271420  | 69850  | 0 | 0 | 0 |
| Q8TDM6 | DLG5_HUMAN Disks large homolog 5   | 94470  | 130610  | 46036  | 0 | 0 | 0 |
| P26599 | PTBP1_HUMAN Polypyrimidine tract-binding protein 1                                     | 93769  | 112360  | 90306  | 0 | 0 | 0 |
| P07199 | CENPB_HUMAN Major centromere autoantigen B   | 92902  | 61710   | 0      | 0 | 0 | 0 |
| Q14697 | GANAB_HUMAN Neutral alpha-glucosidase AB   | 90901  | 316260  | 0      | 0 | 0 | 0 |
| Q71RC2 | LARP4_HUMAN La-related protein 4   | 87611  | 136530  | 121450 | 0 | 0 | 0 |
| P46940 | IQGA1_HUMAN Ras GTPase-activating-like protein IQGAP1                                  | 86227  | 318190  | 108130 | 0 | 0 | 0 |
| Q9Y2W1 | TR150_HUMAN Thyroid hormone receptor-associated protein 3                              | 85653  | 284680  | 101700 | 0 | 0 | 0 |
| Q96JB3 | HIC2_HUMAN Hypermethylated in cancer 2 protein   | 83346  | 146180  | 0      | 0 | 0 | 0 |
| O60568 | PLOD3_HUMAN Multifunctional procollagen lysine hydroxylase and glycosyltransferase LH3 | 83025  | 115080  | 70712  | 0 | 0 | 0 |

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|--------|--|-------|--------|--------|---|---|---|
| O14974 | MYPT1_HUMAN Protein phosphatase 1 regulatory subunit 12A           | 82921 | 287640 | 96846  | 0 | 0 | 0 |
| Q9H0D6 | XRN2_HUMAN 5-3 exoribonuclease 2                                   | 81020 | 326420 | 152390 | 0 | 0 | 0 |
| P31153 | METK2_HUMAN S-adenosylmethionine synthase isoform type-2           | 80734 | 219310 | 114850 | 0 | 0 | 0 |
| P25205 | MCM3_HUMAN DNA replication licensing factor MCM3                   | 80495 | 221350 | 0      | 0 | 0 | 0 |
| P35251 | RFC1_HUMAN Replication factor C subunit 1                          | 78829 | 64915  | 115290 | 0 | 0 | 0 |
| P23921 | RIR1_HUMAN Ribonucleoside-diphosphate reductase large subunit      | 75753 | 230970 | 99336  | 0 | 0 | 0 |
| P07900 | HS90A_HUMAN Heat shock protein HSP 90-alpha                        | 72216 | 86787  | 0      | 0 | 0 | 0 |
| Q7KZF4 | SND1_HUMAN Staphylococcal nuclease domain-containing protein 1     | 71003 | 142990 | 67186  | 0 | 0 | 0 |
| Q13435 | SF3B2_HUMAN Splicing factor 3B subunit 2                           | 68809 | 181070 | 36259  | 0 | 0 | 0 |
| Q00610 | CLH1_HUMAN Clathrin heavy chain 1                                  | 64733 | 78314  | 52786  | 0 | 0 | 0 |
| Q9BZE4 | NOG1_HUMAN Nucleolar GTP-binding protein 1                         | 64486 | 650720 | 513370 | 0 | 0 | 0 |
| Q12788 | TBL3_HUMAN Transducin beta-like protein 3                          | 64293 | 52795  | 28418  | 0 | 0 | 0 |
| P01024 | CO3_HUMAN Complement C3  | 63547 | 50313  | 0      | 0 | 0 | 0 |
| Q9UIG0 | BAZ1B_HUMAN Tyrosine-protein kinase BAZ1B                          | 63203 | 135840 | 69042  | 0 | 0 | 0 |
| Q8NI36 | WDR36_HUMAN WD repeat-containing protein 36                        | 61670 | 74340  | 23932  | 0 | 0 | 0 |
| P51116 | FXR2_HUMAN Fragile X mental retardation syndrome-related protein 2 | 61085 | 114380 | 221660 | 0 | 0 | 0 |
| Q15029 | U5S1_HUMAN 116 kDa U5 small nuclear ribonucleoprotein component    | 59485 | 158450 | 48841  | 0 | 0 | 0 |
| Q99590 | SCAFB_HUMAN Protein SCAF11   | 59241 | 34216  | 0      | 0 | 0 | 0 |
| Q96GQ7 | DDX27_HUMAN Probable ATP-dependent RNA helicase DDX27              | 58516 | 195860 | 127700 | 0 | 0 | 0 |
| P56192 | SYMC_HUMAN Methionine--tRNA ligase, cytoplasmic                    | 58047 | 129100 | 110550 | 0 | 0 | 0 |
| Q9NW13 | RBM28_HUMAN RNA-binding protein 28                                 | 54405 | 271460 | 78016  | 0 | 0 | 0 |
| P50991 | TCPD_HUMAN T-complex protein 1 subunit delta                       | 54183 | 120290 | 65922  | 0 | 0 | 0 |
| Q9Y5B9 | SP16H_HUMAN FACT complex subunit SPT16                             | 53644 | 227030 | 69410  | 0 | 0 | 0 |
| Q8WYP5 | ELYS_HUMAN Protein ELYS  | 52507 | 192690 | 50772  | 0 | 0 | 0 |
| Q14966 | ZN638_HUMAN Zinc finger protein 638                                | 49804 | 81488  | 53384  | 0 | 0 | 0 |

|        |   |        |        |        |        |   |   |
|--------|---|--------|--------|--------|--------|---|---|
| P17858 | PFKAL_HUMAN ATP-dependent<br>6-phosphofructokinase, liver type                                  | 48961  | 320260 | 0      | 0      | 0 | 0 |
| Q6ZRV2 | FA83H_HUMAN Protein FAM83H  | 45629  | 159800 | 55504  | 0      | 0 | 0 |
| P54886 | P5CS_HUMAN<br>Delta-1-pyrroline-5-carboxylate synthase  | 41280  | 29062  | 40468  | 0      | 0 | 0 |
| Q9NY93 | DDX56_HUMAN Probable ATP-dependent<br>RNA helicase DDX56  | 40986  | 106670 | 0      | 0      | 0 | 0 |
| Q15154 | PCM1_HUMAN Pericentriolar material 1<br>protein   | 30847  | 34203  | 0      | 0      | 0 | 0 |
| Q99832 | TCPH_HUMAN T-complex protein 1 subunit<br>eta   | 30527  | 23387  | 86933  | 0      | 0 | 0 |
| Q14690 | RRP5_HUMAN Protein RRP5 homolog   | 29058  | 161880 | 0      | 0      | 0 | 0 |
| Q13085 | ACACA_HUMAN Acetyl-CoA carboxylase 1  | 25670  | 10796  | 9743   | 0      | 0 | 0 |
| Q02880 | TOP2B_HUMAN DNA topoisomerase 2-beta  | 24144  | 227530 | 92293  | 0      | 0 | 0 |
| Q7Z2W4 | ZCCHV_HUMAN Zinc finger CCCH-type<br>antiviral protein 1  | 24098  | 0      | 45848  | 0      | 0 | 0 |
| P48681 | NEST_HUMAN Nestin   | 23513  | 57119  | 0      | 0      | 0 | 0 |
| O75369 | FLNB_HUMAN Filamin-B  | 23393  | 41285  | 16552  | 0      | 0 | 0 |
| Q9H8H2 | DDX31_HUMAN Probable ATP-dependent<br>RNA helicase DDX31  | 21215  | 0      | 22707  | 0      | 0 | 0 |
| P58107 | EPIPL_HUMAN Epiplakin   | 20125  | 96022  | 42310  | 0      | 0 | 0 |
| Q7L2E3 | DHX30_HUMAN ATP-dependent RNA<br>helicase DHX30   | 19607  | 108830 | 20453  | 0      | 0 | 0 |
| P49750 | YLPM1_HUMAN YLP motif-containing<br>protein 1   | 18460  | 13947  | 0      | 0      | 0 | 0 |
| Q8WWI1 | LMO7_HUMAN LIM domain only protein 7  | 18380  | 89939  | 62435  | 0      | 0 | 0 |
| Q14204 | DYHC1_HUMAN Cytoplasmic dynein 1<br>heavy chain 1   | 7867.2 | 21154  | 0      | 0      | 0 | 0 |
| O14639 | ABLM1_HUMAN Actin-binding LIM protein<br>1  | 0      | 87604  | 61315  | 0      | 0 | 0 |
| O43159 | RRP8_HUMAN Ribosomal RNA-processing<br>protein 8  | 0      | 89673  | 87899  | 0      | 0 | 0 |
| O76021 | RL1D1_HUMAN Ribosomal L1<br>domain-containing protein 1   | 0      | 499410 | 74041  | 0      | 0 | 0 |
| P04181 | OAT_HUMAN Ornithine aminotransferase,<br>mitochondrial  | 0      | 222450 | 172740 | 0      | 0 | 0 |
| P04792 | HSPB1_HUMAN Heat shock protein beta-1   | 0      | 265010 | 121090 | 339220 | 0 | 0 |
| P06576 | ATPB_HUMAN ATP synthase subunit beta,<br>mitochondrial  | 0      | 202150 | 129200 | 248930 | 0 | 0 |
| P08559 | ODPA_HUMAN Pyruvate dehydrogenase E1<br>component subunit alpha, somatic form,<br>mitochondrial | 0      | 107760 | 143110 | 0      | 0 | 0 |

|        |  |   |         |         |       |   |   |
|--------|--|---|---------|---------|-------|---|---|
| P17066 | HSP76_HUMAN Heat shock 70 kDa protein 6                                      | 0 | 364120  | 296650  | 0     | 0 | 0 |
| P22314 | UBA1_HUMAN Ubiquitin-like modifier-activating enzyme 1                       | 0 | 71597   | 63373   | 0     | 0 | 0 |
| P27635 | RL10_HUMAN 60S ribosomal protein L10   | 0 | 1844800 | 1239400 | 0     | 0 | 0 |
| P35998 | PRS7_HUMAN 26S proteasome regulatory subunit 7                               | 0 | 85337   | 29544   | 0     | 0 | 0 |
| P40937 | RFC5_HUMAN Replication factor C subunit 5                                    | 0 | 320380  | 90758   | 0     | 0 | 0 |
| P45880 | VDAC2_HUMAN Voltage-dependent anion-selective channel protein 2              | 0 | 765380  | 580130  | 0     | 0 | 0 |
| P47914 | RL29_HUMAN 60S ribosomal protein L29   | 0 | 1277200 | 845290  | 0     | 0 | 0 |
| P50990 | TCPQ_HUMAN T-complex protein 1 subunit theta                                 | 0 | 213200  | 30967   | 0     | 0 | 0 |
| P53396 | ACLY_HUMAN ATP-citrate synthase  | 0 | 41152   | 53905   | 0     | 0 | 0 |
| P61353 | RL27_HUMAN 60S ribosomal protein L27   | 0 | 866760  | 339230  | 0     | 0 | 0 |
| P62191 | PRS4_HUMAN 26S proteasome regulatory subunit 4                               | 0 | 125130  | 102430  | 0     | 0 | 0 |
| P62241 | RS8_HUMAN 40S ribosomal protein S8   | 0 | 1448200 | 467970  | 0     | 0 | 0 |
| P62424 | RL7A_HUMAN 60S ribosomal protein L7a   | 0 | 2727300 | 1143600 | 0     | 0 | 0 |
| P62906 | RL10A_HUMAN 60S ribosomal protein L10a                                       | 0 | 4657200 | 1836200 | 0     | 0 | 0 |
| P78347 | GTF2I_HUMAN General transcription factor II-I                                | 0 | 151350  | 75647   | 0     | 0 | 0 |
| P78527 | PRKDC_HUMAN DNA-dependent protein kinase catalytic subunit                   | 0 | 27283   | 20556   | 0     | 0 | 0 |
| Q02978 | M2OM_HUMAN Mitochondrial 2-oxoglutarate/malate carrier protein               | 0 | 574920  | 485760  | 0     | 0 | 0 |
| Q06210 | GFPT1_HUMAN Glutamine--fructose-6-phosphate aminotransferase [isomerizing] 1 | 0 | 25089   | 23821   | 0     | 0 | 0 |
| Q13148 | TADBP_HUMAN TAR DNA-binding protein 43                                       | 0 | 541700  | 276590  | 0     | 0 | 0 |
| Q13200 | PSMD2_HUMAN 26S proteasome non-ATPase regulatory subunit 2                   | 0 | 86475   | 59336   | 0     | 0 | 0 |
| Q13247 | SRSF6_HUMAN Serine/arginine-rich splicing factor 6                           | 0 | 248690  | 100050  | 0     | 0 | 0 |
| Q13547 | HDAC1_HUMAN Histone deacetylase 1  | 0 | 224350  | 166730  | 0     | 0 | 0 |
| Q14498 | RBM39_HUMAN RNA-binding protein 39   | 0 | 65048   | 62714   | 59025 | 0 | 0 |
| Q15365 | PCBP1_HUMAN Poly(rC)-binding protein 1                                       | 0 | 796460  | 522630  | 0     | 0 | 0 |
| Q15393 | SF3B3_HUMAN Splicing factor 3B subunit 3                                     | 0 | 128520  | 37819   | 0     | 0 | 0 |

|        |  |   |        |          |         |   |   |
|--------|--|---|--------|----------|---------|---|---|
| Q15424 | SAFB1_HUMAN Scaffold attachment factor B1                          | 0 | 182050 | 0        | 0       | 0 | 0 |
| Q15517 | CDSN_HUMAN Corneodesmosin  | 0 | 0      | 0        | 725290  | 0 | 0 |
| Q49A26 | GLYR1_HUMAN Putative oxidoreductase GLYR1                          | 0 | 50906  | 0        | 0       | 0 | 0 |
| Q562R1 | ACTBL_HUMAN Beta-actin-like protein 2                              | 0 | 0      | 69910000 | 0       | 0 | 0 |
| Q5BKZ1 | ZN326_HUMAN DBIRD complex subunit ZNF326                           | 0 | 132860 | 0        | 0       | 0 | 0 |
| Q5T280 | CI114_HUMAN Putative methyltransferase C9orf114                    | 0 | 107210 | 0        | 0       | 0 | 0 |
| Q5T3J3 | LRIF1_HUMAN Ligand-dependent nuclear receptor-interacting factor 1 | 0 | 380350 | 0        | 0       | 0 | 0 |
| Q6GYQ0 | RGPA1_HUMAN Ral GTPase-activating protein subunit alpha-1          | 0 | 0      | 66439    | 0       | 0 | 0 |
| Q6PL18 | ATAD2_HUMAN ATPase family AAA domain-containing protein 2          | 0 | 84876  | 30809    | 0       | 0 | 0 |
| Q6UWP8 | SBSN_HUMAN Suprabasin  | 0 | 0      | 0        | 1609800 | 0 | 0 |
| Q6WCQ1 | MPRIP_HUMAN Myosin phosphatase Rho-interacting protein             | 0 | 228010 | 47116    | 0       | 0 | 0 |
| Q7Z7K6 | CENPV_HUMAN Centromere protein V                                   | 0 | 471380 | 505360   | 0       | 0 | 0 |
| Q86U42 | PABP2_HUMAN Polyadenylate-binding protein 2                        | 0 | 353980 | 110180   | 0       | 0 | 0 |
| Q86V48 | LUZP1_HUMAN Leucine zipper protein 1                               | 0 | 0      | 73244    | 0       | 0 | 0 |
| Q86XI8 | ZSWM9_HUMAN Uncharacterized protein ZSWIM9                         | 0 | 0      | 0        | 198290  | 0 | 0 |
| Q8IZL8 | PELP1_HUMAN Proline-, glutamic acid- and leucine-rich protein 1    | 0 | 130090 | 0        | 0       | 0 | 0 |
| Q8N556 | AFAP1_HUMAN Actin filament-associated protein 1                    | 0 | 0      | 209440   | 0       | 0 | 0 |
| Q8NDH6 | ICA1L_HUMAN Islet cell autoantigen 1-like protein                  | 0 | 0      | 0        | 0       | 0 | 0 |
| Q8TDD1 | DDX54_HUMAN ATP-dependent RNA helicase DDX54                       | 0 | 186170 | 102270   | 0       | 0 | 0 |
| Q92616 | GCN1_HUMAN eIF-2-alpha kinase activator GCN1                       | 0 | 67879  | 11830    | 0       | 0 | 0 |
| Q99729 | ROAA_HUMAN Heterogeneous nuclear ribonucleoprotein A/B             | 0 | 441790 | 316100   | 0       | 0 | 0 |
| Q9H7B2 | RPF2_HUMAN Ribosome production factor 2 homolog                    | 0 | 610120 | 237680   | 0       | 0 | 0 |
| Q9NWH9 | SLTM_HUMAN SAFB-like transcription modulator                       | 0 | 410880 | 124210   | 0       | 0 | 0 |
| Q9UKM9 | RALY_HUMAN RNA-binding protein Raly                                | 0 | 134690 | 95658    | 0       | 0 | 0 |

|        |   |   |         |        |   |   |   |
|--------|---|---|---------|--------|---|---|---|
| Q9ULW0 | TPX2_HUMAN Targeting protein for Xklp2                    | 0 | 61976   | 64138  | 0 | 0 | 0 |
| Q9Y2R4 | DDX52_HUMAN Probable ATP-dependent RNA helicase DDX52     | 0 | 86060   | 163340 | 0 | 0 | 0 |
| Q9Y2X3 | NOP58_HUMAN Nucleolar protein 58                          | 0 | 1709200 | 68555  | 0 | 0 | 0 |
| Q9Y5Q9 | TF3C3_HUMAN General transcription factor 3C polypeptide 3 | 0 | 48118   | 27435  | 0 | 0 | 0 |