

**Table S1.** A localization screen of human DUBs.

<i><b>DUBs</b></i>	<i><b>Localization</b></i>
BRCC3	nuclear and reticular
COPS5	nuclear and reticular
COPS6	nuclear and diffused cytoplasmic
EIF3F	diffused cytoplasmic
EIF3H	nuclear and reticular
PRPF8*	nuclear and aggregate
PSMD14	not expressed
PSMD7	nuclear and diffused cytoplasmic
STAMBP	not expressed
STAMBPL1	nuclear and reticular
ATXN3	not expressed
JOSD1	not expressed
TAF1D	nuclear
OTUB1	nuclear and reticular
OTUB2	not expressed
OTUD4	nuclear and diffused cytoplasmic
OTUD6B	nuclear and reticular
PARP11	not expressed
TNFAIP3-short	mitochondria and diffused cytoplasmic
TNFAIP3-long	not expressed
BAP1	nuclear and reticular
UCHL1	nuclear and reticular
UCHL3	nuclear and reticular
PAN2	nuclear and reticular
USP1	nuclear
USP2	nuclear and reticular
USP3	nuclear and aggregate
USP4	nuclear and diffused cytoplasmic
USP5	nuclear and diffused cytoplasmic
USP6	nuclear and mitochondrial
USP8	not expressed
USP10	not expressed
USP12	right
USP13	nuclear and aggregate
USP14	nuclear and reticular
USP15	diffused cytoplasmic
USP16	diffused cytoplasmic

USP18	nuclear
USP19*	aggregates
USP20	nuclear and reticular
USP21	aggregates
USP22	nuclear and aggregate
USP25	diffused cytoplasmic and aggregate
USP26	nuclear and diffused cytoplasmic
USP28	nuclear and reticular
USP29	nuclear
USP30	mitochondria
USP32	not expressed
USP33	not expressed
USP35	mitochondria
USP36*	nuclear
USP37	nuclear
USP38	nuclear and reticular
USP39	nuclear
USP44	nuclear and diffused cytoplasmic
USP45	nuclear and reticular
USP46	not expressed
USP47	nuclear and diffused cytoplasmic
USP48	nuclear and reticular
USP49	nuclear
USP50	diffused cytoplasmic and reticular
USP53	nuclear and aggregates
USP54	nuclear and reticular

A library containing the ORFs of 63 human DUBs was expressed in COS7 cells. Three DUBs labelled with \* are N-terminally tagged with GFP. The other DUBs are C-terminally tagged with GFP. The localization of DUBs was categorized as nuclear, diffused cytoplasmic, reticular, mitochondria, aggregates, or not expressed. To visualize mitochondria, cells were fixed and stained with mouse anti-ATP5A1 and rabbit anti-GFP antibodies.