

Table S1. p53 binding partner conservation in vertebrates versus planarians versus *Drosophila*

Gene (vertebrates)	Planarian orthologs (number)?	TBLASTN: mouse to planarian	Fly orthologs (number)?	BLASTP: mouse to fly
Brca1	Maybe	10^{-5}	No	NA
Brca2	Yes	10^{-11}	No	NA
DNAPK	Yes	10^{-28}	No	NA
MDM2	None	NA	None	NA
MDM4	None	NA	None	NA
53bp1	None	NA	None	NA
53bp2	Yes (2×)	$10^{-28}, 10^{-39}$	Yes	10^{-80}
ATM	Yes	10^{-34}	Yes	10^{-134}
ATR	Yes	10^{-34}	Yes	0.0
Chk1	Yes	10^{-36}	Yes	10^{-122}
Chk2	Yes	10^{-44}	Yes	10^{-87}
Bcl-2/Bcl-xL	Yes (10×)	$\sim 10^{-12}$	Yes (2×)	$10^{-10}, 10^{-8}$
CyclinB1	Yes	10^{-19}	Yes	10^{-66}
Dp-1	Yes	10^{-23}	Yes	10^{-76}
E2F-1	Yes	10^{-37}	Yes	10^{-34}
HDAC1	Yes	10^{-176}	Yes	0.0
Nucleostemin	Yes	10^{-39}	Yes	10^{-71}
PTEN	Yes (2×)	$10^{-19}, 10^{-16}$	Yes	10^{-78}
Rad51	Yes	10^{-137}	Yes	10^{-127}
Rb1	Yes	10^{-46}	Yes (2×)	$10^{-87}, 10^{-30}$
Sirt1	Yes	10^{-88}	Yes	10^{-118}

Listed in the first column are a few of the best-known proteins that have been reported to bind to vertebrate p53. Columns two and four list whether or not each homolog exists in planarians or *Drosophila*, respectively. Columns three and five are the corresponding BLAST e-values when BLASTing the mouse sequence to either the translated planarian genome, or the protein annotations in flies, respectively. Note that protein BLASTs to a translated genome (TBLASTN) are expected to yield much lower BLAST scores owing to intron gaps, and thus are only weakly comparable to the BLASTP scores from flies. There are three genes (in blue) where the planarian gene complement is closer to that of vertebrates (not found in flies). Three genes (in red) are found in vertebrates but not shared by either planarians nor flies. The remaining genes (in black) are shared in all three groups, although most have not been tested to interact with invertebrate p53 homologs owing to the lack of tumor suppressor function of p53 in *Drosophila* and *C. elegans*. NA, not applicable.