

## Human Ubiquitin Ligases PCR Array

**Oncogenes & Tumor Suppressor Genes:** AMFR, ANAPC10, ANAPC11, ANAPC13, ANAPC4, ANAPC5, ANAPC7, APC2, BARD1, BIRC2 (c-IAP2), BIRC3 (c-IAP1), BIRC7, BRCA1, BTRC (b-TrCP), CBL, CBLB, CBLC, CBLL1, CDC16, CDC20, CDC23, CDC27, CDH1 (E- Cadherin), CUL7, FBXO5, FBXW5, FBXW7, MDM2, MDM4, RCHY1, RFWD2 (COP1), RNF139, SIAH1, SIAH2, SKP2, TRAF2, TRAF5, TRAF6, TRAF7, VHL, XIAP.

**HECT:** HACE1, HECTD1, HECTD3, HECW1, HERC1, HERC2, HERC3, HERC4, HERC5, HERC6, HUWE1, ITCH, NEDD4, NEDD4L, SMURF1, SMURF2, TRIP12, UBE3A, UBE3B, UBE3C, UBR5, WWP1.

**U-Box:** NOSIP, STUB1, UBE4A, UBE4B, WDSUB1.

**UBL:** PIAS1, PIAS2, PIAS4, RANBP2, RBX1, TOPORS, UHRF2.

**Single RING-Finger:**

BIRC/IAP: BIRC2 (c-IAP2), BIRC3 (c-IAP1), BIRC7, XIAP.

BRE1: RNF20, RNF40.

CBL: CBL, CBLB, CBLC, CBLL1.

Deltex: DTX3, DTX4, RNF146.

Goliath: RNF13, RNF128, RNF130, RNF167.

Makorin: MKRN1, MKRN2.

March: MARCH1, MARCH11, MARCH2, MARCH3, MARCH5, MARCH6, MARCH7, MARCH8.

MDM: MDM2, MDM4.

Mindbomb: MIB1, MIB2.

NFX: NFX1, NFXL1.

PDZRN: LNX1, PDZRN3, PDZRN4.

Pellino: PELI1, PELI2.

PEX: PEX2, PEX12.

Polycomb: BMI1 (PCGF4), PCGF2 (RNF110), PCGF3, PCGF5, RING1, RNF2.

Praja: PJA1, PJA2, RNF115, RNF126.

<u>RBR</u> : ANKIB1, ARIH1, ARIH2, PARK2, RBCK1, RNF14, RNF144A, RNF144B, RNF19A, RNF19B, RNF216, RNF31 (IRF9).
<u>RC3H</u> : RC3H1, RC3H2.
<u>RKHD</u> : MEX3A, MEX3C, MEX3D.







**Multi-Subunit RING-Finger Cullins & Adaptors:** ANAPC11, APC2, CUL1, CUL2, CUL3, CUL4A, CUL4B, CUL5, CUL7, DDB1, RBX1, RNF7, SKP1, TCEB1, TCEB2.