

## Human Molecular Toxicology PathwayFinder PCR Array

**Apoptosis:** ABL1, AKT1, APAF1, BAD, BAK1, BAX, BCL2, BCL2L1 (BCL-X), BCL2L11, BID, BIRC3 (c-IAP1), CASP1 (ICE), CASP3, CASP7, CASP8 (FLICE), CASP9, CD40 (TNFRSF5), CD40LG (TNFSF5), CFLAR (CASPER), FADD, FAS (TNFRSF6), FASLG (TNFSF6), GADD45A, MCL1, TNF, TNFRSF10A, TNFRSF10B (DR5), TNFRSF1A, TNFSF10 (TRAIL), TP53, XIAP.

**Necrosis:** ATP6V1G2, BMF, CCDC103, CD300LD, CLEC18A, COMMD4, CYLD, DEFB1, DPYSL4, EIF5B, FOXI1, GALNT5, GRB2, HOXA3, HSPBAP1, JPH3, KCNIP1, MAG, NUDT13, OR10J3, PARP2, PVR, RAB25, S100A7A, SPATA2, SYCP2, TMEM57, TNFAIP8L1, TNFRSF1A, TXNL4B.

**DNA Damage & Repair:** APEX1, ATM, ATR, BRCA1, BRCA2, CDKN1A (p21CIP1/WAF1), CHEK1, CHEK2 (RAD53), DDIT3 (GADD153/CHOP), ERCC1, ERCC2 (XPD), ERCC3 (XPB), ERCC5, ERCC6, GADD45A, LIG4, MDM2, MGMT (AGT), MLH1, MSH2, OGG1, PARP1 (ADPRT1), PCNA, PRKDC, RAD51, TP53, XPA, XPC, XRCC1, XRCC5.

**Mitochondrial Energy Metabolism:** ACLY, ACO1, ACO2, COX6B1, COX8A, CS, CYC1, DLD, DLST, FH, IDH1, IDH2, IDH3A, IDH3B, IDH3G, MDH1, MDH1B, MDH2, OGDH, SDHA, SDHB, SDHC, SDHD, SUCLA2, SUCLG1, SUCLG2, UCP1, UCP2, UCP3.

**Fatty Acid Metabolism ( $\beta$ -Oxidation):** ACAA1, ACAA2, ACAD11, ACAD9, ACADL, ACADM, ACADS, ACADSB, ACADVL, ACAT1, ACAT2, ACOT1, ACOT12, ACOT6, ACOT7, ACOT8, ACOT9, ACOX1, ACOX2, ACOX3, BDH2, CPT1A, CPT1B, CPT2, CRAT, CROT, DECR1, ECHS1, EHHADH, GCDH, HADHA.

**Oxidative Stress & Antioxidant Response:** AASS, CAT, CTSB, DHCR24, DUOX1, DUOX2, EPX, GPX1, GPX2, GPX3, GPX4, GPX5, GPX6, GPX7, IDH1, MPO, NQO1, NUDT1, NUDT15, PPP1R15B, PRDX1, PRDX2, PRDX6 (AOP2), SOD1, TPO, TXNIP, TXNRD2, UCP3.

**Heat Shock Response:** CRYAA, CRYAB, DNAJA1, DNAJA2, DNAJA3, DNAJB1, DNAJB6, DNAJC3, DNAJC5, DNAJC6, HSF1 (TCF5), HSF2, HSP90AA1, HSP90AB1, HSP90B1 (TRA1), HSPA1A, HSPA1B, HSPA1L, HSPA2, HSPA4 (HSP70), HSPA5 (GRP78), HSPA8, HSPA9, HSPB1 (HSP27), HSPB2, HSPB6, HSPB8, HSPD1, HSPE1, HSPH1 (HSP105), TCP1.

**ER Stress & Unfolded Protein Response:** AMFR, ATF4, ATF6, BAX, DDIT3, DERL1, EDEM1, EDEM3, EIF2AK3, ERN2, ERO1L, ERO1LB, FBXO6, GADD45A, HERPUD1, HTRA2, HTRA4, MBTPS1, MBTPS2, NPLOC4, NUCB1, OS9, PFDN5, SEC62, SEL1L, SELS, SERP1, SYVN1, UBE2G2, UBE2J2, UBXN4, VCP, XBP1.

**Cytochrome P450s & Phase I Drug Metabolism:** CYP1A1, CYP1A2, CYP2B6, CYP2C19, CYP2C9, CYP2D6, CYP2E1, CYP3A4, ESD, FMO2, FMO3, FMO4, FMO5, MAOA, MAOB.

**Steatosis:** ACACA, ADK, ALDH2, AQP4, CD36, COMT, CYP2E1, CYP7B1, DNM1, ENO1, FAS, FASN, GPD1, HAAO, HADHB, KHK, LMNA, LPL, LY6D, MAPK8 (JNK1), MTPP, PCCA, PNPLA3, PPARA, RETN, SCD, SREBF1, SYT1, TFF3, VCP.

**Cholestasis:** ABCB1, ABCB4, ABCC1 (MRP1), ABCC2 (MRP2), ABCC3 (MRP3), APOE, ATP8B1, CYP3A4, CYP7A1, DLAT, ESR1 (ERa), HLA-DRB1, ICAM1, IL10, IL1B, IL2, IL6, JAG1, MPO, NR1H4, NUP210, OSTALPHA, OSTBETA, PDYN, RDX, SLC10A1, TGFB1, TNF.

**Phospholipidosis:** ABCB1 (MDR1), ALDH1A1, ASAH1, ASNS, CES2, CTSB, EPHX1, FABP1, FXC1 (TIMM10B), GSTM4, HPN, INHBE, LSS, MANBA, MLX, MRPS18B, NR0B2, POR, S100A8, SC4MOL, SERPINA3, SLC2A3, SLCO1A2, SMPD1, STBD1, TAGLN, UGT1A1, UGT2A1, UGT2B4, WIP1.

**Immunotoxicity:** ADH1C, AHR, AHSG, ALB, APOA5, APOF, C3, C9, CASP3, CD19, CD4, CD44, CD80, CD86, CD8A, CTSE, CYP1A1, CYP3A4, CYP3A4, EP300, F2, FABP1, FAS, GPT, GSTA3, HPX, HRG, HSPA5, IFNA1, IFNG, IL10, IL13, IL1A, IL1B, IL2, IL4, IL5, IL6, ITGAX, KLF1, LYZ, LYZ, METAP2, MKI67, NFKB1, NR5A2, PON1, POU3F3, PTGS2 (COX2), PTPRC, SOD1, TNF, TRIM10, UBQLN2.