**Supplementary file 1**. 139 genes in the multigene panel.

AIP, ALK APC, ATM, ATR AXIN2, BAP1, BRAD1, BLM, BMPR1A, BRCA1, BRCA2, BRIP1, BUB1B, CBL, CDC73, CDH1, CDK4, CDKN1B, CDKN1C, CDKN2A, CEBPA, CHEK1, CHEK2, CYLD, DDB2, DICER1, DIS3L2, EGFR, ELANE, EPCAM, ERCC1, ERCC2, ERCC3, ERCC4, ERCC5, EXT1, EXT2, EZH2, FANCA, FANCB, FANCC, FANCD2, FANCE, FANCF, FANCG, FANCI, FANCL, FANCM, FAS, FH, FLCN, GAINT12, GATA2, GEN1, GJB2, GPC3, GREM1, HMBS, HNF1A, HOXB13, HRAS, KIT, LAPS1, MAX, MC1R, MEN1, MET, MITF, MLH1, MLH3, MRE11A, MSH2, MSH6, MTAP, MTUS1, MUTYH, NBN, NF1, NF2, NSD1, NTRK1, PALB2, PALLD, PDGFRA, PHOX2B, PMS1, PMS2, POLD1, POLE, POLH, PPM1D, PRKAR1A, PRSS1, PTCH1, PTCH2, PTEN, PTPN11, RAD50, RAD51B, RAD51C, RAD51D, RB1, RECQL, RECQL4, RET, RHBDF2, RUNX1, SBDS, SDHA, SDHAF2, SDHB, SDHC, SDHD, SLX4, SMAD4, SMARCA4, SMARCB1, SMARCE1, SOS1, STAT3, STK11, SUFU, TERT, TGFBR1, TMEM127, TP53, TSC1, TSC2, UROD, USHBP1, VEGFA, VHL, WRN, WT1, XPA, XPC, XRCC2, ZMAT3.