Table S1- Cancer predisposition genes that are widely used in a test by PreventionGenetics for pediatric genetic testing and their association with genetic cancer clinical conditions.

|  |  |  |
| --- | --- | --- |
|  | **Gene** | **Conditions/Phenotypes** |
| 1 | [*ALK* (2p23.2-23.1)](https://www.ncbi.nlm.nih.gov/gtr/genes/238/) | [Neuroblastoma, susceptibility to, 3](https://www.ncbi.nlm.nih.gov/gtr/conditions/C2751681/) |
| 2 | [*ANKRD26* (10p12.1)](https://www.ncbi.nlm.nih.gov/gtr/genes/22852/) | [Thrombocytopenia 2](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1861185/) |
| 3 | [*APC* (5q22.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/324/) | [Desmoid disease, hereditary](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1851124/) |
|  |  | [Familial adenomatous polyposis 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C2713442/) |
| 4 | [*ATM* (11q22.3)](https://www.ncbi.nlm.nih.gov/gtr/genes/472/) | [Ataxia-telangiectasia syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0004135/) |
| 5 | [*AXIN2* (17q24.1)](https://www.ncbi.nlm.nih.gov/gtr/genes/8313/) | [Oligodontia-cancer predisposition syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1837750/) |
| 6 | [*BAP1* (3p21.1)](https://www.ncbi.nlm.nih.gov/gtr/genes/8314/) | [BAP1-related tumor predisposition syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C3280492/) |
| 7 | [*BLM* (15q26.1)](https://www.ncbi.nlm.nih.gov/gtr/genes/641/) | [Bloom syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0005859/) |
| 8 | [*BMPR1A* (10q23.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/657/) | [Generalized juvenile polyposis/juvenile polyposis coli](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1868081/) |
|  |  | [Polyposis syndrome, hereditary mixed, 2](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1864730/) |
| 9 | [*CDC73* (1q31.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/79577/) | [Parathyroid carcinoma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0687150/) |
| 10 | [*CDKN1C* (11p15.4)](https://www.ncbi.nlm.nih.gov/gtr/genes/1028/) | [Beckwith-Wiedemann syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0004903/) |
| 11 | *C*[*EBPA* (19q13.11)](https://www.ncbi.nlm.nih.gov/gtr/genes/1050/) | [Acute myeloid leukemia](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0023467/) |
| 12 | [*DDX41* (5q35.3)](https://www.ncbi.nlm.nih.gov/gtr/genes/51428/) | [DDX41-related hematologic malignancy predisposition syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C4225174/) |
| 13 | [*DICER1* (14q32.13)](https://www.ncbi.nlm.nih.gov/gtr/genes/23405/) | [Euthyroid goiter](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0302859/) |
|  |  | [Rhabdomyosarcoma, embryonal, 2](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1867234/) |
|  |  | [DICER1 syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C3839822/) |
| 14 | [*DIS3L2* (2q37.1)](https://www.ncbi.nlm.nih.gov/gtr/genes/129563/) | [Perlman syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0796113/) |
| 15 | [*EPCAM* (2p21)](https://www.ncbi.nlm.nih.gov/gtr/genes/4072/) | [Lynch syndrome 8](https://www.ncbi.nlm.nih.gov/gtr/conditions/C2750471/) |
| 16 | [*ETV6* (12p13.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/2120/) | [Acute myeloid leukemia](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0023467/) |
|  |  | [Thrombocytopenia 5](https://www.ncbi.nlm.nih.gov/gtr/conditions/C4015537/) |
| 17 | [*EXT1* (8q24.11)](https://www.ncbi.nlm.nih.gov/gtr/genes/2131/) | [Multiple congenital exostoses](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0015306/), type 1 |
| 18 | [EXT2 (11p11.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/2132/) | [Exostoses, multiple, type 2](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1851413/) |
| 19 | [*FH* (1q43)](https://www.ncbi.nlm.nih.gov/gtr/genes/2271/) | [Hereditary leiomyomatosis and renal cell cancer](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1708350/) |
| 20 | [*GATA2* (3q21.3)](https://www.ncbi.nlm.nih.gov/gtr/genes/2624/) | [Acute myeloid leukemia](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0023467/) |
| 21 | [*GPC3* (Xq26.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/2719/) | [Wilms tumor 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/CN033288/) |
|  |  | [Simpson-Golabi-Behmel syndrome type 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0796154/) |
| 22 | [*HRAS* (11p15.5)](https://www.ncbi.nlm.nih.gov/gtr/genes/3265/) | [Costello syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0587248/) |
| 23 | [*KIF1B* (1p36.22)](https://www.ncbi.nlm.nih.gov/gtr/genes/23095/) | [Neuroblastoma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0027819/) |
|  |  | [Pheochromocytoma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0031511/) |
| 24 | [*MAX* (14q23.3)](https://www.ncbi.nlm.nih.gov/gtr/genes/4149/) | [Pheochromocytoma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0031511/) |
| 25 | [*MEN1* (11q13.1)](https://www.ncbi.nlm.nih.gov/gtr/genes/4221/) | [Multiple endocrine neoplasia, type 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0025267/) |
| 26 | [*MLH1* (3p22.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/4292/) | [Turcot syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C5399763/) |
|  |  | [Muir-Torré syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1321489/) |
|  |  | [Colorectal cancer, hereditary nonpolyposis, (Lynch syndrome) type 2](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1333991/) |
| 27 | [*MSH2* (2p21-16.3)](https://www.ncbi.nlm.nih.gov/gtr/genes/4436/) | [Lynch syndrome type 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C2936783/) |
|  |  | [Turcot syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C5399763/) |
|  |  | [Muir-Torré syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1321489/) |
| 28 | [*MSH6* (2p16.3)](https://www.ncbi.nlm.nih.gov/gtr/genes/2956/) | [Turcot syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C5399763/) |
|  |  | [Lynch syndrome type 5](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1833477/) |
| 29 | [*NBN* (8q21.3)](https://www.ncbi.nlm.nih.gov/gtr/genes/4683/) | [Microcephaly, normal intelligence and immunodeficiency](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0398791/) (Nijmegen breakage syndrome) |
|  |  | [Acute lymphoid leukemia](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0023449/) |
| 30 | [*NF1* (17q11.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/4763/) | [Neurofibromatosis, familial spinal](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1834235/) |
|  |  | [Neurofibromatosis, type 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0027831/) |
|  |  | [Neurofibromatosis-Noonan syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C2931482/) |
| 31 | [*NF2* (22q12.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/4771/) | [Familial meningioma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C3551915/) |
|  |  | [Neurofibromatosis, type 2](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0027832/) |
|  |  | [Schwannomatosis 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C4048809/) |
| 32 | [*PHOX2B* (4p13)](https://www.ncbi.nlm.nih.gov/gtr/genes/8929/) | [Neuroblastoma, susceptibility to, 2](https://www.ncbi.nlm.nih.gov/gtr/conditions/C2751682/) |
| 33 | [*PMS2* (7p22.1)](https://www.ncbi.nlm.nih.gov/gtr/genes/5395/) | [Turcot syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C5399763/) |
|  |  | [Lynch syndrome type 4](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1838333/) |
| 34 | [*POT1* (7q31.33)](https://www.ncbi.nlm.nih.gov/gtr/genes/25913/) | [Melanoma, cutaneous malignant, susceptibility to, 10](https://www.ncbi.nlm.nih.gov/gtr/conditions/C4014476/) |
|  |  | [Glioma susceptibility 9](https://www.ncbi.nlm.nih.gov/gtr/conditions/C4225278/) |
| 35 | [*PRKAR1A* (17q24.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/5573/) | [Carney complex, type 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C2607929/) |
|  |  | [Pigmented nodular adrenocortical disease, primary, 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1864846/) |
|  |  | [Familial atrial myxoma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C2931787/) |
| 36 | [*PTCH1* (9q22.32)](https://www.ncbi.nlm.nih.gov/gtr/genes/5727/) | [Gorlin syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0004779/) |
| 37 | [*PTCH2* (1p34.1)](https://www.ncbi.nlm.nih.gov/gtr/genes/8643/) | [Gorlin syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0004779/) |
| 38 | [*PTEN* (10q23.31)](https://www.ncbi.nlm.nih.gov/gtr/genes/5728/) | [Familial meningioma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C3551915/) |
|  |  | [Cowden syndrome 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/CN072330/) |
| 39 | [*RB1* (13q14.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/5925/) | [Retinoblastoma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0035335/) |
| 40 | [*REST* (4q12)](https://www.ncbi.nlm.nih.gov/gtr/genes/5978/) | [Wilms tumor 6](https://www.ncbi.nlm.nih.gov/gtr/conditions/C3891301/) |
| 41 | [*RET* (10q11.21)](https://www.ncbi.nlm.nih.gov/gtr/genes/5979/) | [Multiple endocrine neoplasia, type 2b](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0025269/) |
|  |  | [Pheochromocytoma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0031511/) |
|  |  | [Familial medullary thyroid carcinoma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1833921/) |
|  |  | [Multiple endocrine neoplasia, type 2a](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0025268/) |
| 42 | [*RUNX1* (21q22.12)](https://www.ncbi.nlm.nih.gov/gtr/genes/861/) | [Hereditary thrombocytopenia and hematological cancer predisposition syndrome associated with RUNX1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1832388/) |
|  |  | [Acute myeloid leukemia](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0023467/) |
| 43 | [*SAMD9L* (7q21.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/219285/) | [Ataxia-pancytopenia syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1327919/) |
| 44 | [*SDHA* (5p15.33)](https://www.ncbi.nlm.nih.gov/gtr/genes/6389/) | [Paragangliomas 5](https://www.ncbi.nlm.nih.gov/gtr/conditions/C3279992/) |
| 45 | [*SDHAF2* (11q12.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/54949/) | [Paragangliomas 2](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1866552/) |
| 46 | [*SDHB* (1p36.13)](https://www.ncbi.nlm.nih.gov/gtr/genes/6390/) | [Paragangliomas 4](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1861848/) |
|  |  | [Pheochromocytoma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0031511/) |
|  |  | Cowden syndrome |
| 47 | [*SDHC* (1q23.3)](https://www.ncbi.nlm.nih.gov/gtr/genes/6391/) | [Paragangliomas 3](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1854336/) |
| 48 | [*SDHD* (11q23.1)](https://www.ncbi.nlm.nih.gov/gtr/genes/6392/) | [Pheochromocytoma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0031511/) |
|  |  | [Carcinoid tumor of intestine](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0349535/) |
|  |  | [Paragangliomas 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C3494181/) |
|  |  | Cowden syndrome |
| 49 | [*SMAD4* (18q21.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/4089/) | [Generalized juvenile polyposis/juvenile polyposis coli](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1868081/) |
|  |  | [Juvenile polyposis/hereditary hemorrhagic telangiectasia syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1832942/) |
| 50 | [*SMARCA4* (19p13.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/6597/) | [Rhabdoid tumor predisposition syndrome 2](https://www.ncbi.nlm.nih.gov/gtr/conditions/C2750074/) |
| 51 | [*SMARCB1* (22q11.23)](https://www.ncbi.nlm.nih.gov/gtr/genes/6598/) | [Schwannomatosis 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C4048809/) |
| 52 | [*SMARCE1* (17q21.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/6605/) | [Familial meningioma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C3551915/) |
| 53 | [*SRP72* (4q12)](https://www.ncbi.nlm.nih.gov/gtr/genes/6731/) | [Autosomal dominant aplasia and myelodysplasia](https://www.ncbi.nlm.nih.gov/gtr/conditions/C3808553/) |
| 54 | [*STK11* (19p13.3)](https://www.ncbi.nlm.nih.gov/gtr/genes/6794/) | [Peutz-Jeghers syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0031269/) |
| 55 | [*SUFU* (10q24.32)](https://www.ncbi.nlm.nih.gov/gtr/genes/51684/) | [Gorlin syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0004779/) |
|  |  | [Familial meningioma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C3551915/) |
| 56 | [*TERC* (3q26.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/7012/) | [Dyskeratosis congenita, autosomal dominant 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C4551974/) |
| 57 | [*TERT* (5p15.33)](https://www.ncbi.nlm.nih.gov/gtr/genes/7015/) | [Acute myeloid leukemia](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0023467/) |
|  |  | [Dyskeratosis congenita, autosomal dominant 2](https://www.ncbi.nlm.nih.gov/gtr/conditions/C3151443/) |
| 58 | [*TMEM127* (2q11.2)](https://www.ncbi.nlm.nih.gov/gtr/genes/55654/) | [Pheochromocytoma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0031511/) |
| 59 | [*TP53* (17p13.1)](https://www.ncbi.nlm.nih.gov/gtr/genes/7157/) | [Adrenocortical carcinoma, hereditary](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1859972/) |
|  |  | [Li-Fraumeni syndrome 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1835398/) |
|  |  | [Choroid plexus papilloma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0205770/) |
|  |  | [Basal cell carcinoma, susceptibility to, 7](https://www.ncbi.nlm.nih.gov/gtr/conditions/C3553606/) |
| 60 | [*TRIP13* (5p15.33)](https://www.ncbi.nlm.nih.gov/gtr/genes/9319/) | [Mosaic variegated aneuploidy syndrome 3](https://www.ncbi.nlm.nih.gov/gtr/conditions/C4539839/) |
| 61 | [*TSC1* (9q34.13)](https://www.ncbi.nlm.nih.gov/gtr/genes/7248/) | [Tuberous sclerosis 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1854465/) |
| 62 | [*TSC2* (16p13.3)](https://www.ncbi.nlm.nih.gov/gtr/genes/7249/) | [Tuberous sclerosis 2](https://www.ncbi.nlm.nih.gov/gtr/conditions/C1860707/) |
| 63 | [*VHL* (3p25.3)](https://www.ncbi.nlm.nih.gov/gtr/genes/7428/) | [Pheochromocytoma](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0031511/) |
|  |  | [von Hippel-Lindau syndrome](https://www.ncbi.nlm.nih.gov/gtr/conditions/C0019562/) |
| 64 | [*WT1* (11p13)](https://www.ncbi.nlm.nih.gov/gtr/genes/7490/) | [Wilms tumor 1](https://www.ncbi.nlm.nih.gov/gtr/conditions/CN033288/) |