CRANIOFACIAL ANOMALIES PANEL DG 3.8.1 (191 GENES)

Gene	*Twist X2 covered >10x*	*Twist X2 covered >20x*	*WGS covered >10x*	*WGS covered >20x*	*Associated Phenotype description and OMIM disease ID*
ACP4	100.0%	100.0%	100.0%	99.8%	Amelogenesis imperfecta, type IJ, 617297
ACTG1	100.0%	100.0%	100.0%	99.8%	Deafness, autosomal dominant 20/26, 604717;Baraitser-Winter syndrome 2, 614583
ADAMTSL4	100.0%	100.0%	100.0%	99.6%	Ectopia lentis et pupillae, 225200;Ectopia lentis, isolated, autosomal recessive, 225100
ALX1	100.0%	100.0%	100.0%	99.0%	Frontonasal dysplasia 3, 613456
ALX3	100.0%	100.0%	100.0%	99.3%	Frontonasal dysplasia 1, 136760
ALX4	100.0%	100.0%	100.0%	99.3%	Parietal foramina 2, 609597;{Craniosynostosis 5, susceptibility to}, 615529;Frontonasal dysplasia 2, 613451
AMBN	100.0%	99.5%	100.0%	99.1%	Amelogenesis imperfecta, type IF, 616270
AMELX	100.0%	100.0%	98.9%	72.3%	Amelogenesis imperfecta, type 1E, 301200

AMER1	100.0%	100.0%	99.3%	79.1%	Osteopathia striata with cranial sclerosis, 300373
AMTN	100.0%	99.5%	100.0%	99.3%	?Amelogenesis imperfecta, type IIIB, 617607
ANKRD11	100.0%	100.0%	100.0%	98.8%	KBG syndrome, 148050
ARHGAP29	100.0%	100.0%	100.0%	98.7%	
AXIN2	100.0%	100.0%	100.0%	99.7%	Colorectal cancer, somatic, 114500;Oligodontia-colorectal cancer syndrome, 608615
BCOR	100.0%	99.8%	98.6%	77.1%	Microphthalmia, syndromic 2, 300166
BMP2	100.0%	100.0%	100.0%	99.2%	Short stature, facial dysmorphism, and skeletal anomalies with or without cardiac anomalies 1, 617877;Brachydactyly, type A2, 112600;{HFE hemochromatosis, modifier of}, 235200
BMP4	100.0%	100.0%	100.0%	99.7%	Orofacial cleft 11, 600625;Microphthalmia, syndromic 6, 607932
CCBE1	100.0%	100.0%	100.0%	99.9%	Hennekam lymphangiectasia-lymphedema syndrome 1, 235510
CDC45	100.0%	100.0%	100.0%	99.8%	Meier-Gorlin syndrome 7, 617063
CDON	100.0%	100.0%	100.0%	99.5%	Holoprosencephaly 11, 614226

CDSN	100.0%	100.0%	100.0%	99.8%	Hypotrichosis 2, 146520;Peeling skin syndrome 1, 270300
CHD7	100.0%	100.0%	100.0%	99.5%	Hypogonadotropic hypogonadism 5 with or without anosmia, 612370;CHARGE syndrome, 214800
COL11A1	100.0%	100.0%	100.0%	99.2%	Fibrochondrogenesis 1, 228520;Stickler syndrome, type II, 604841;Marshall syndrome, 154780;Deafness, autosomal dominant 37, 618533;{Lumbar disc herniation, susceptibility to}, 603932
COL11A2	100.0%	100.0%	100.0%	99.4%	Deafness, autosomal dominant 13, 601868;Otospondylomegaepiphyseal dysplasia, autosomal recessive, 215150;Fibrochondrogenesis 2, 614524;Deafness, autosomal recessive 53, 609706;Otospondylomegaepiphyseal dysplasia, autosomal dominant, 184840

COL2A1	100.0%	100.0%	100.0%	99.5%	?Vitreoretinopathy with phalangeal epiphyseal dysplasia, 619248;Czech dysplasia, 609162;Achondrogenesis, type II or hypochondrogenesis, 200610;Spondyloperipheral dysplasia, 271700;SMED Strudwick type, 184250;?Epiphyseal dysplasia, multiple, with myopia and deafness, 132450;SED congenita, 183900;Kniest dysplasia, 156550;Stickler syndrome, type I, nonsyndromic ocular, 609508;Osteoarthritis with mild chondrodysplasia, 604864;Stickler syndrome, type I, 108300;Platyspondylic skeletal dysplasia, Torrance type, 151210;Spondyloepiphyseal dysplasia, Stanescu type, 616583;Avascular necrosis of the femoral head, 608805;Legg-Calve-Perthes disease, 150600
COL9A1	100.0%	100.0%	100.0%	99.1%	Stickler syndrome, type IV, 614134;?Epiphyseal dysplasia, multiple, 6, 614135

COL9A2	100.0%	100.0%	100.0%	99.5%	Epiphyseal dysplasia, multiple, 2, 600204;?Stickler syndrome, type V, 614284
COL9A3	100.0%	100.0%	100.0%	99.7%	{Intervertebral disc disease, susceptibility to}, 603932;Epiphyseal dysplasia, multiple, 3, with or without myopathy, 600969;Stickler syndrome, type VI, 620022
COLEC11	100.0%	100.0%	100.0%	100.0%	3MC syndrome 2, 265050
CTSK	100.0%	100.0%	100.0%	99.8%	Pycnodysostosis, 265800
CYP26B1	100.0%	100.0%	100.0%	99.7%	Craniosynostosis with radiohumeral fusions and other skeletal and craniofacial anomalies, 614416
DHODH	100.0%	100.0%	100.0%	100.0%	Miller syndrome, 263750
DISP1	100.0%	100.0%	100.0%	99.7%	
DLX3	100.0%	100.0%	100.0%	100.0%	Trichodontoosseous syndrome, 190320;Amelogenesis imperfecta, type IV, 104510
DLX4	100.0%	100.0%	100.0%	99.6%	?Orofacial cleft 15, 616788

DSPP	100.0%	100.0%	98.3%	96.1%	Dentinogenesis imperfecta, Shields type III, 125500;Dentinogenesis imperfecta, Shields type II, 125490;Dentin dysplasia, type II, 125420;Deafness, autosomal dominant 39, with dentinogenesis, 605594
EDA	100.0%	99.6%	97.9%	71.2%	Tooth agenesis, selective, X-linked 1, 313500;Ectodermal dysplasia 1, hypohidrotic, X-linked, 305100
EDAR	100.0%	100.0%	100.0%	99.7%	[Hair morphology 1, hair thickness], 612630;Ectodermal dysplasia 10A, hypohidrotic/hair/nail type, autosomal dominant, 129490;Ectodermal dysplasia 10B, hypohidrotic/hair/tooth type, autosomal recessive, 224900
EDARADD	100.0%	100.0%	100.0%	99.3%	Ectodermal dysplasia 11B, hypohidrotic/hair/tooth type, autosomal recessive, 614941;Ectodermal dysplasia 11A, hypohidrotic/hair/tooth type, autosomal dominant, 614940

EDN1	100.0%	100.0%	100.0%	99.1%	Question mark ears, isolated, 612798;Auriculocondylar syndrome 3, 615706
EDNRA	100.0%	100.0%	100.0%	99.4%	{Migraine, resistance to}, 157300;Mandibulofacial dysostosis with alopecia, 616367
EFNA4	100.0%	100.0%	100.0%	99.5%	
EFNB1	100.0%	99.9%	99.3%	79.3%	Craniofrontonasal dysplasia, 304110
EFTUD2	100.0%	100.0%	100.0%	99.6%	Mandibulofacial dysostosis, Guion-Almeida type, 610536
EIF4A3	100.0%	100.0%	100.0%	99.6%	Robin sequence with cleft mandible and limb anomalies, 268305
ENAM	100.0%	100.0%	100.0%	98.7%	Amelogenesis imperfecta, type IC, 204650;Amelogenesis imperfecta, type IB, 104500
ERF	100.0%	100.0%	100.0%	100.0%	Craniosynostosis 4, 600775;Chitayat syndrome, 617180
ESCO2	100.0%	100.0%	100.0%	98.7%	Juberg-Hayward syndrome, 216100;Roberts-SC phocomelia syndrome, 268300

EYA1	100.0%	100.0%	100.0%	99.6%	Branchiootic syndrome 1, 602588;Branchiootorenal syndrome 1, with or without cataracts, 113650;Anterior segment anomalies with or without cataract, 602588;?Otofaciocervical syndrome, 166780
EZH2	100.0%	100.0%	100.0%	99.6%	Weaver syndrome, 277590
FAM20A	100.0%	100.0%	100.0%	99.5%	Amelogenesis imperfecta, type IG (enamel-renal syndrome), 204690
FAM83H	100.0%	100.0%	100.0%	100.0%	Amelogenesis imperfecta, type IIIA, 130900
FGD1	99.9%	99.5%	98.6%	75.4%	Intellectual developmental disorder, X-linked syndromic 16, 305400;Aarskog-Scott syndrome, 305400
FGF10	99.9%	99.3%	100.0%	99.5%	LADD syndrome 3, 620193;Aplasia of lacrimal and salivary glands, 180920
FGF3	100.0%	100.0%	100.0%	98.8%	Deafness, congenital with inner ear agenesis, microtia, and microdontia, 610706
FGF8	100.0%	100.0%	100.0%	99.7%	Hypogonadotropic hypogonadism 6 with or without anosmia, 612702
FGF9	100.0%	100.0%	100.0%	100.0%	Multiple synostoses syndrome 3, 612961

FGFR1	100.0%	100.0%	100.0%	99.8%	Pfeiffer syndrome, 101600;Hypogonadotropic hypogonadism 2 with or without anosmia, 147950;Jackson-Weiss syndrome, 123150;Hartsfield syndrome, 615465;Trigonocephaly 1, 190440;Osteoglophonic dysplasia, 166250;Encephalocraniocutaneous lipomatosis, somatic mosaic, 613001

FGFR2	100.0%	100.0%	100.0%	99.5%	Bent bone dysplasia syndrome, 614592;LADD syndrome 1, 149730;Antley-Bixler syndrome without genital anomalies or disordered steroidogenesis, 207410;Jackson-Weiss syndrome, 123150;Gastric cancer, somatic, 613659;Craniofacial-skeletal-dermatologic dysplasia, 101600;Apert syndrome, 101200;Pfeiffer syndrome, 101600;?Scaphocephaly, maxillary retrusion, and impaired intellectual development, 609579;Beare-Stevenson cutis gyrata syndrome, 123790;Crouzon syndrome, 123500;Saethre-Chotzen syndrome, 101400;Scaphocephaly and Axenfeld-Rieger anomaly, ;Craniosynostosis, nonspecific,

FGFR3	100.0%	100.0%	100.0%	100.0%	Muenke syndrome, 602849;SADDAN, 616482;Hypochondroplasia, 146000;Thanatophoric dysplasia, type II, 187601;Nevus, epidermal, somatic, 162900;CATSHL syndrome, 610474;Thanatophoric dysplasia, type I, 187600;Spermatocytic seminoma, somatic, 273300;Bladder cancer, somatic, 109800;LADD syndrome 2, 620192;Achondroplasia, 100800;Cervical cancer, somatic, 603956;Colorectal cancer, somatic, 114500;Crouzon syndrome with acanthosis nigricans, 612247

FLNA	100.0%	99.9%	99.7%	83.8%	Otopalatodigital syndrome, type II, 304120;Intestinal pseudoobstruction, neuronal, 300048;Cardiac valvular dysplasia, X-linked, 314400;?FG syndrome 2, 300321;Melnick-Needles syndrome, 309350;Terminal osseous dysplasia, 300244;Congenital short bowel syndrome, 300048;Otopalatodigital syndrome, type I, 311300;Heterotopia, periventricular, 1, 300049;Frontometaphyseal dysplasia 1, 305620
FLNB	100.0%	100.0%	100.0%	99.7%	Larsen syndrome, 150250;Atelosteogenesis, type I, 108720;Atelosteogenesis, type III, 108721;Spondylocarpotarsal synostosis syndrome, 272460;Boomerang dysplasia, 112310
FOXC1	100.0%	100.0%	100.0%	97.2%	Axenfeld-Rieger syndrome, type 3, 602482;Anterior segment dysgenesis 3, multiple subtypes, 601631
FOXE1	100.0%	100.0%	100.0%	99.2%	Bamforth-Lazarus syndrome, 241850;{Thyroid cancer, nonmedullary, 4}, 616534

GDF3	100.0%	100.0%	100.0%	99.5%	Klippel-Feil syndrome 3, autosomal dominant, 613702;Microphthalmia, isolated, with coloboma 6, 613703;Microphthalmia, isolated 7, 613704
GDF6	100.0%	100.0%	100.0%	99.7%	Microphthalmia with coloboma 6, digenic, 613703;Microphthalmia, isolated 4, 613094;Leber congenital amaurosis 17, 615360;Multiple synostoses syndrome 4, 617898;Klippel-Feil syndrome 1, autosomal dominant, 118100
GJA1	100.0%	100.0%	100.0%	99.3%	Erythrokeratodermia variabilis et progressiva 3, 617525;Craniometaphyseal dysplasia, autosomal recessive, 218400;Oculodentodigital dysplasia, 164200;Palmoplantar keratoderma with congenital alopecia, 104100;Syndactyly, type III, 186100;Oculodentodigital dysplasia, autosomal recessive, 257850

GJB6	100.0%	100.0%	100.0%	99.8%	Ectodermal dysplasia 2, Clouston type, 129500;Deafness, autosomal dominant 3B, 612643;Deafness, autosomal recessive 1B, 612645;Deafness, digenic GJB2/GJB6, 220290
GLI2	100.0%	100.0%	100.0%	99.9%	Culler-Jones syndrome, 615849;Holoprosencephaly 9, 610829
GLI3	100.0%	100.0%	100.0%	99.8%	Greig cephalopolysyndactyly syndrome, 175700;Polydactyly, postaxial, types A1 and B, 174200;Pallister-Hall syndrome, 146510;Polydactyly, preaxial, type IV, 174700
GNAI3	100.0%	100.0%	100.0%	99.3%	Auriculocondylar syndrome 1, 602483
GNPTAB	100.0%	100.0%	100.0%	99.1%	Mucolipidosis III alpha/beta, 252600;Mucolipidosis II alpha/beta, 252500
GPR68	100.0%	100.0%	100.0%	100.0%	Amelogenesis imperfecta, hypomaturation type, IIA6, 617217
GRHL3	100.0%	100.0%	100.0%	99.7%	van der Woude syndrome 2, 606713

GSC	100.0%	100.0%	100.0%	99.3%	Short stature, auditory canal atresia, mandibular hypoplasia, skeletal abnormalities, 602471
HOXA2	100.0%	100.0%	100.0%	99.6%	Microtia with or without hearing impairment (AD), 612290;?Microtia, hearing impairment, and cleft palate (AR), 612290
HUWE1	100.0%	99.8%	98.7%	76.2%	Intellectual developmental disorder, X-linked syndromic, Turner type, 309590
HYAL2	100.0%	100.0%	100.0%	99.9%	
IFT122	100.0%	100.0%	100.0%	99.6%	Cranioectodermal dysplasia 1, 218330
IFT43	100.0%	100.0%	100.0%	99.6%	?Cranioectodermal dysplasia 3, 614099;?Retinitis pigmentosa 81, 617871;Short-rib thoracic dysplasia 18 with polydactyly, 617866
IFT88	100.0%	100.0%	100.0%	99.2%	

IKBKG	99.9%	98.4%	99.1%	80.1%	Incontinentia pigmenti, 308300;Ectodermal dysplasia and immunodeficiency 1, 300291;Immunodeficiency 33, 300636;Autoinflammatory disease, systemic, X-linked, 301081
IL11RA	100.0%	100.0%	100.0%	99.7%	Craniosynostosis and dental anomalies, 614188
IL6ST	100.0%	100.0%	100.0%	99.3%	Hyper-IgE syndrome 4A, autosomal dominant, with recurrent infections, 619752;Stuve-Wiedemann syndrome 2, 619751;Hyper-IgE syndrome 4B, autosomal recessive, with recurrent infections, 618523;?Immunodeficiency 94 with autoinflammation and dysmorphic facies, 619750
IMPAD1	100.0%	100.0%	100.0%	99.9%	Chondrodysplasia with joint dislocations, GPAPP type, 614078
INTU	100.0%	100.0%	100.0%	98.7%	?Orofaciodigital syndrome XVII, 617926;?Short-rib thoracic dysplasia 20 with polydactyly, 617925

IRF6	100.0%	100.0%	100.0%	99.6%	{Orofacial cleft 6}, 608864;Popliteal pterygium syndrome 1, 119500;van der Woude syndrome 1, 119300
ITGB6	100.0%	100.0%	100.0%	99.6%	Amelogenesis imperfecta, type IH, 616221
KAT6B	100.0%	100.0%	100.0%	99.3%	SBBYSS syndrome, 603736;Genitopatellar syndrome, 606170
KDF1	100.0%	100.0%	100.0%	99.9%	?Ectodermal dysplasia 12, hypohidrotic/hair/tooth/nail type, 617337
KDM1A	100.0%	100.0%	100.0%	99.3%	Cleft palate, psychomotor retardation, and distinctive facial features, 616728
KDM6A	100.0%	99.9%	98.5%	73.8%	Kabuki syndrome 2, 300867
KLK4	100.0%	100.0%	100.0%	99.6%	Amelogenesis imperfecta, type IIA1, 204700
KMT2D	100.0%	100.0%	100.0%	99.6%	Branchial arch abnormalities, choanal atresia, athelia, hearing loss, and hypothyroidism syndrome, 620186;Kabuki syndrome 1, 147920
KREMEN1	100.0%	100.0%	100.0%	99.7%	Ectodermal dysplasia 13, hair/tooth type, 617392

LAMB3	100.0%	100.0%	100.0%	99.7%	Epidermolysis bullosa, junctional 1B, severe, 226700;Epidermolysis bullosa, junctional 1A, intermediate, 226650;Amelogenesis imperfecta, type IA, 104530
LRP2	100.0%	100.0%	100.0%	99.6%	Donnai-Barrow syndrome, 222448
LRP6	100.0%	100.0%	100.0%	99.7%	{Coronary artery disease, autosomal dominant, 2}, 610947;Tooth agenesis, selective, 7, 616724
LTBP3	100.0%	100.0%	100.0%	99.5%	Dental anomalies and short stature, 601216;Geleophysic dysplasia 3, 617809
MASP1	100.0%	100.0%	100.0%	99.8%	3MC syndrome 1, 257920
MED12	100.0%	99.8%	98.2%	71.9%	Lujan-Fryns syndrome, 309520;Ohdo syndrome, X-linked, 300895;Hardikar syndrome, 301068;Opitz-Kaveggia syndrome, 305450
MEGF8	100.0%	100.0%	99.9%	99.0%	Carpenter syndrome 2, 614976
MEIS2	100.0%	100.0%	100.0%	99.7%	Cleft palate, cardiac defects, and impaired intellectual development, 600987
MEOX1	100.0%	100.0%	100.0%	99.5%	Klippel-Feil syndrome 2, 214300

MID1	99.6%	99.1%	98.6%	76.3%	Opitz GBBB syndrome, 300000
MITF	99.9%	99.7%	100.0%	99.5%	Waardenburg syndrome, type 2A, 193510;{Melanoma, cutaneous malignant, susceptibility to, 8}, 614456;Tietz albinism-deafness syndrome, 103500;COMMAD syndrome, 617306
MMP20	100.0%	100.0%	100.0%	99.3%	Amelogenesis imperfecta, type IIA2, 612529
MN1	100.0%	100.0%	100.0%	100.0%	CEBALID syndrome, 618774;Meningioma, 607174
MSX1	100.0%	100.0%	100.0%	99.4%	Tooth agenesis, selective, 1, with or without orofacial cleft, 106600;Ectodermal dysplasia 3, Witkop type, 189500;Orofacial cleft 5, 608874
MSX2	100.0%	100.0%	100.0%	99.8%	Parietal foramina with cleidocranial dysplasia, 168550;Craniosynostosis 2, 604757;Parietal foramina 1, 168500
NAA10	100.0%	100.0%	98.9%	74.0%	Microphthalmia, syndromic 1, 309800;Ogden syndrome, 300855

NECTIN1	100.0%	100.0%	100.0%	99.8%	Cleft lip/palate-ectodermal dysplasia syndrome, 225060;Orofacial cleft 7, 225060
NFKBIA	100.0%	100.0%	100.0%	99.4%	Ectodermal dysplasia and immunodeficiency 2, 612132
NIPBL	100.0%	100.0%	100.0%	99.4%	Cornelia de Lange syndrome 1, 122470
NOG	100.0%	100.0%	100.0%	99.8%	Symphalangism, proximal, 1A, 185800;Brachydactyly, type B2, 611377;Stapes ankylosis with broad thumbs and toes, 184460;Tarsal-carpal coalition syndrome, 186570;Multiple synostoses syndrome 1, 186500
NSD1	100.0%	100.0%	100.0%	99.3%	Sotos syndrome, 117550
ODAPH	100.0%	100.0%	100.0%	99.2%	Amelogenesis imperfecta, type IIA4, 614832
OFD1	100.0%	100.0%	97.9%	69.5%	Simpson-Golabi-Behmel syndrome, type 2, 300209;?Retinitis pigmentosa 23, 300424;Orofaciodigital syndrome I, 311200;Joubert syndrome 10, 300804

OTX2	100.0%	100.0%	100.0%	99.6%	Retinal dystrophy, early-onset, with or without pituitary dysfunction, 610125;Pituitary hormone deficiency, combined, 6, 613986;Microphthalmia, syndromic 5, 610125
P4HB	100.0%	100.0%	100.0%	99.9%	Cole-Carpenter syndrome 1, 112240
PAX3	100.0%	99.8%	100.0%	99.4%	Craniofacial-deafness-hand syndrome, 122880;Waardenburg syndrome, type 3, 148820;Waardenburg syndrome, type 1, 193500;Rhabdomyosarcoma 2, alveolar, 268220
PAX6	100.0%	100.0%	100.0%	98.4%	Optic nerve hypoplasia, 165550;Cataract with late-onset corneal dystrophy, 106210;?Coloboma, ocular, 120200;?Coloboma of optic nerve, 120430;Aniridia, 106210;Anterior segment dysgenesis 5, multiple subtypes, 604229;?Morning glory disc anomaly, 120430;Foveal hypoplasia 1, 136520;Keratitis, 148190
PAX7	100.0%	100.0%	100.0%	99.5%	Congenital myopathy 19, 618578;Rhabdomyosarcoma 2, alveolar, 268220

PAX9	100.0%	100.0%	100.0%	99.6%	Tooth agenesis, selective, 3, 604625
PGM1	94.0%	94.0%	100.0%	99.2%	Congenital disorder of glycosylation, type It, 614921
PITX2	100.0%	100.0%	100.0%	99.5%	Ring dermoid of cornea, 180550;Axenfeld-Rieger syndrome, type 1, 180500;Anterior segment dysgenesis 4, 137600
PLCB4	100.0%	99.9%	100.0%	99.3%	Auriculocondylar syndrome 2B, 620458;Auriculocondylar syndrome 2A, 614669
POLR1C	83.3%	83.2%	100.0%	99.8%	Leukodystrophy, hypomyelinating, 11, 616494;Treacher Collins syndrome 3, 248390
POLR1D	100.0%	100.0%	100.0%	99.7%	Treacher Collins syndrome 2, 613717
POR	100.0%	100.0%	100.0%	100.0%	Antley-Bixler syndrome with genital anomalies and disordered steroidogenesis, 201750;Disordered steroidogenesis due to cytochrome P450 oxidoreductase, 613571
PORCN	100.0%	99.8%	99.0%	75.5%	Focal dermal hypoplasia, 305600
PRRX1	100.0%	100.0%	100.0%	99.5%	Agnathia-otocephaly complex, 202650

PTCH1	100.0%	100.0%	100.0%	99.4%	Basal cell nevus syndrome 1, 109400;Basal cell carcinoma, somatic, 605462;Holoprosencephaly 7, 610828
PTH1R	100.0%	100.0%	100.0%	99.7%	Metaphyseal chondrodysplasia, Murk Jansen type, 156400;Eiken syndrome, 600002;Failure of tooth eruption, primary, 125350;Chondrodysplasia, Blomstrand type, 215045
RAB23	100.0%	100.0%	100.0%	98.9%	Carpenter syndrome, 201000
RAD21	100.0%	100.0%	100.0%	99.4%	Cornelia de Lange syndrome 4, 614701;?Mungan syndrome, 611376
RBM10	100.0%	99.9%	98.8%	79.1%	TARP syndrome, 311900
RECQL4	100.0%	100.0%	100.0%	100.0%	Baller-Gerold syndrome, 218600;Rothmund-Thomson syndrome, type 2, 268400;RAPADILINO syndrome, 266280
RIPK4	100.0%	100.0%	100.0%	99.9%	CHAND syndrome, 214350;Popliteal pterygium syndrome, Bartsocas-Papas type 1, 263650
RNU12-2P					

RUNX2	100.0%	100.0%	100.0%	98.8%	Metaphyseal dysplasia with maxillary hypoplasia with or without brachydactyly, 156510;Cleidocranial dysplasia, forme fruste, with brachydactyly, 119600;Cleidocranial dysplasia, forme fruste, dental anomalies only, 119600;Cleidocranial dysplasia, 119600
SALL1	100.0%	100.0%	100.0%	99.5%	Townes-Brocks syndrome 1, 107480;Townes-Brocks branchiootorenal-like syndrome, 107480
SALL4	100.0%	100.0%	100.0%	99.7%	?IVIC syndrome, 147750;Duane-radial ray syndrome, 607323
SATB2	100.0%	99.7%	100.0%	99.4%	Glass syndrome, 612313
SCARF2	100.0%	100.0%	100.0%	98.3%	Van den Ende-Gupta syndrome, 600920
SEC24D	100.0%	99.9%	100.0%	99.6%	Cole-Carpenter syndrome 2, 616294
SEMA3E	100.0%	100.0%	100.0%	99.7%	
SF3B2	100.0%	100.0%	100.0%	99.2%	Craniofacial microsomia, 164210
SF3B4	100.0%	100.0%	100.0%	99.7%	Acrofacial dysostosis 1, Nager type, 154400
SH3BP2	99.9%	99.4%	100.0%	99.5%	Cherubism, 118400

SHH	100.0%	100.0%	100.0%	98.7%	Microphthalmia with coloboma 5, 611638;Schizencephaly, 269160;Single median maxillary central incisor, 147250;Holoprosencephaly 3, 142945
SIX1	100.0%	100.0%	100.0%	99.0%	Deafness, autosomal dominant 23, 605192;Branchiootic syndrome 3, 608389
SIX3	100.0%	100.0%	100.0%	98.9%	Schizencephaly, 269160;Holoprosencephaly 2, 157170
SIX5	100.0%	100.0%	100.0%	98.4%	Branchiootorenal syndrome 2, 610896
SKI	100.0%	99.9%	100.0%	98.6%	Shprintzen-Goldberg syndrome, 182212
SLC24A4	100.0%	100.0%	100.0%	99.6%	[Skin/hair/eye pigmentation 6, blond/brown hair], 210750;Amelogenesis imperfecta, type IIA5, 615887;[Skin/hair/eye pigmentation 6, blue/green eyes], 210750

SLC26A2	100.0%	100.0%	100.0%	99.4%	Epiphyseal dysplasia, multiple, 4, 226900;De la Chapelle dysplasia, 256050;Diastrophic dysplasia, 222600;Diastrophic dysplasia, broad bone-platyspondylic variant, 222600;Achondrogenesis Ib, 600972;Atelosteogenesis, type II, 256050
SMAD6	100.0%	100.0%	100.0%	99.4%	Aortic valve disease 2, 614823;{Radioulnar synostosis, nonsyndromic}, 179300;{Craniosynostosis 7, susceptibility to}, 617439
SMC1A	100.0%	99.8%	98.5%	73.6%	Cornelia de Lange syndrome 2, 300590;Developmental and epileptic encephalopathy 85, with or without midline brain defects, 301044
SMC3	100.0%	100.0%	100.0%	99.1%	Cornelia de Lange syndrome 3, 610759
SMO	100.0%	100.0%	100.0%	99.8%	Pallister-Hall-like syndrome, 241800;Basal cell carcinoma, somatic, 605462;Curry-Jones syndrome, somatic mosaic, 601707

SMOC2	100.0%	100.0%	100.0%	99.7%	Dentin dysplasia, type I, with microdontia and misshapen teeth, 125400
SNAI2	100.0%	100.0%	100.0%	99.7%	
SOX10	100.0%	100.0%	100.0%	99.9%	Waardenburg syndrome, type 4C, 613266;PCWH syndrome, 609136;Waardenburg syndrome, type 2E, with or without neurologic involvement, 611584
SOX6	99.8%	99.3%	100.0%	99.5%	Tolchin-Le Caignec syndrome, 618971
SOX9	100.0%	100.0%	100.0%	99.8%	Campomelic dysplasia with autosomal sex reversal, 114290;Acampomelic campomelic dysplasia, 114290;Campomelic dysplasia, 114290
SPECC1L	100.0%	100.0%	100.0%	99.4%	Teebi hypertelorism syndrome 1, 145420;?Facial clefting, oblique, 1, 600251
SUMO1	71.0%	71.0%	100.0%	98.8%	?Orofacial cleft 10, 613705
TBX1	97.7%	95.5%	100.0%	97.6%	Tetralogy of Fallot, 187500;DiGeorge syndrome, 188400;Conotruncal anomaly face syndrome, 217095;Velocardiofacial syndrome, 192430

TBX22	99.4%	98.1%	99.3%	77.8%	Cleft palate with ankyloglossia, 303400;?Abruzzo-Erickson syndrome, 302905
TCF12	100.0%	100.0%	100.0%	99.6%	Craniosynostosis 3, 615314;Hypogonadotropic hypogonadism 26 with or without anosmia, 619718
TCOF1	100.0%	100.0%	100.0%	99.5%	Treacher Collins syndrome 1, 154500
TFAP2A	100.0%	100.0%	99.9%	96.2%	Branchiooculofacial syndrome, 113620
TGFBR1	100.0%	100.0%	100.0%	99.4%	{Multiple self-healing squamous epithelioma, susceptibility to}, 132800;Loeys-Dietz syndrome 1, 609192
TGFBR2	100.0%	100.0%	100.0%	99.1%	Loeys-Dietz syndrome 2, 610168;Colorectal cancer, hereditary nonpolyposis, type 6, 614331;Esophageal cancer, somatic, 133239
TGIF1	100.0%	100.0%	100.0%	99.3%	Holoprosencephaly 4, 142946
TLK2	100.0%	100.0%	100.0%	99.4%	Intellectual developmental disorder, autosomal dominant 57, 618050

TP63	100.0%	99.9%	100.0%	99.7%	Premature ovarian failure 21, 620311;Ectrodactyly, ectodermal dysplasia, and cleft lip/palate syndrome 3, 604292;Hay-Wells syndrome, 106260;Split-hand/foot malformation 4, 605289;Orofacial cleft 8, 618149;Rapp-Hodgkin syndrome, 129400;ADULT syndrome, 103285;Limb-mammary syndrome, 603543
TRAF6	100.0%	100.0%	100.0%	99.4%	
TSHZ1	100.0%	100.0%	100.0%	99.5%	Aural atresia, congenital, 607842
TSPEAR	100.0%	100.0%	100.0%	99.6%	Tooth agenesis, selective, 10, 620173;?Deafness, autosomal recessive 98, 614861;Ectodermal dysplasia 14, hair/tooth type with or without hypohidrosis, 618180
TWIST1	100.0%	100.0%	100.0%	98.8%	Craniosynostosis 1, 123100;Robinow-Sorauf syndrome, 180750;Sweeney-Cox syndrome, 617746;Saethre-Chotzen syndrome with or without eyelid anomalies, 101400
UBB	100.0%	100.0%	100.0%	98.9%	

VAX1	99.9%	99.1%	100.0%	96.3%	?Microphthalmia, syndromic 11, 614402
WDR19	100.0%	100.0%	100.0%	99.0%	Nephronophthisis 13, 614377;Cranioectodermal dysplasia 4, 614378;Senior-Loken syndrome 8, 616307;Short-rib thoracic dysplasia 5 with or without polydactyly, 614376;?Spermatogenic failure 72, 619867
WDR35	100.0%	100.0%	100.0%	99.7%	Short-rib thoracic dysplasia 7 with or without polydactyly, 614091;Cranioectodermal dysplasia 2, 613610
WDR72	96.8%	96.8%	100.0%	99.4%	Amelogenesis imperfecta, type IIA3, 613211
WNT10A	100.0%	100.0%	100.0%	99.7%	Schopf-Schulz-Passarge syndrome, 224750;Tooth agenesis, selective, 4, 150400;Ectodermal dysplasia 16 (odontoonychodermal dysplasia), 257980
WNT10B	100.0%	100.0%	100.0%	99.9%	Tooth agenesis, selective, 8, 617073;Split-hand/foot malformation 6, 225300
ZEB2	96.8%	96.7%	100.0%	99.3%	Mowat-Wilson syndrome, 235730

ZIC1	100.0%	100.0%	100.0%	99.8%	?Craniosynostosis 6, 616602;Structural brain anomalies with impaired intellectual development and craniosynostosis, 618736
ZIC2	100.0%	99.9%	100.0%	98.3%	Holoprosencephaly 5, 609637

Gene symbols used follow HGCN guidelines: Gray KA, Yates B, Seal RL, Wright MW, Bruford EA. Nucleic Acids Res. 2015 Jan 43(Database issue):D1079-85.
TWIST X2 Covered 10x describes the percentage of a gene's coding sequence that is covered at least 10x when analyzed by WES using TWIST X2 chemistry.
TWIST X2 Covered 20x describes the percentage of a gene's coding sequence that is covered at least 20x when analyzed by WES using TWIST X2 chemistry.
srWGS GRCh38 Covered 10x describes the percentage of a gene's coding sequence that is covered at least 10x when analyzed by WGS mapped against GRCh38.
srWGS GRCh38 Covered 20x describes the percentage of a gene's coding sequence that is covered at least 20x when analyzed by WGS mapped against GRCh38.
non-protein coding genes are covered, but as coverage statistics are based on protein coding regions, statistics could not be generated.
OMIM release used for OMIM disease identifiers and descriptions : March 17th, 2023.
This list is accurate for panel version DG 3.8.1

Ad 1. "No OMIM phenotype" signifies a gene without a current OMIM association Ad 2. OMIM phenotype descriptions between {} signify risk factors