

**Supplemental Table S7 | Newborn screening gene panels, versions 1-4.**

GENE NAME HGNC symbol	Disease group NBS	Core US NBS	NBS disorder, Norway 2019	NBSv1	NBSv2	NBSv3	NBSv4
<i>ABCD1</i>	Core US NBS genes	Core US NBS			2	3	4
<i>ACAD8</i>	IEM				2	3	4
<i>ACADM</i>	small panel IEM	Core US NBS	MCAD	1	2	3	4
<i>ACADS</i>	IEM				2	3	4
<i>ACADSB</i>	IEM				2	3	4
<i>ACADVL</i>	small panel IEM	Core US NBS	VLCAD	1	2	3	4
<i>ACAT1</i>	small panel IEM	Core US NBS	BKT	1	2	3	4
<i>ADA</i>	SCID and T cell defects	Core US NBS	SCID and IEM	1	2	3	4
<i>ADK</i>	IEM				2	3	4
<i>AHCY</i>	IEM				2	3	4
<i>AK2</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>ALDH7A1</i>	IEM+				2	3	4
<i>ALDOB</i>	IEM+					3	4
<i>ALPL</i>	IEM+				2	3	4
<i>ARG1</i>	IEM Extended US NBS				2	3	4
<i>ARPC1B</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>ARSA</i>	Lysosomal	Core US NBS			2	3	4
<i>ARSB</i>	IEM+						4
<i>ASL</i>	Core US NBS genes	Core US NBS			2	3	4
<i>ASS1</i>	Core US NBS genes	Core US NBS			2	3	4
<i>ATM</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>ATP5D = ATP5F1D</i>	IEM+					3	4
<i>BCKDHA</i>	small panel IEM	Core US NBS	MSUD	1	2	3	4
<i>BCKDHB</i>	small panel IEM	Core US NBS	MSUD	1	2	3	4
<i>BCKDK</i>	IEM+				2	3	4
<i>BCL11B</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>BLNK</i>	Antibody deficiency, low KRECs				2	3	4
<i>BTD</i>	small panel IEM	Core US NBS	BTD	1	2	3	4
<i>BTK</i>	Antibody deficiency, low KRECs				2	3	4
<i>CBS</i>	small panel IEM	Core US NBS	HCY	1	2	3	4
<i>CD247/CD3Z</i>	CID/NBS+		SCID/CID		2	3	4
<i>CD3D</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>CD3E</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>CD3G</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>CD40LG</i>	Antibody deficiency, low KRECs				2	3	4
<i>CD79A</i>	Antibody deficiency, low KRECs				2	3	4
<i>CD79B</i>	Antibody deficiency, low KRECs				2	3	4
<i>CD8A</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>CDC42</i>	CID/NBS+		SCID/CID			3	4
<i>CDCA7</i>	Low T cells		SCID/CID				4
<i>CFTR</i>	CF	Core US NBS	CF	1	2	3	4
<i>CHD7</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>CORO1A</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>CPS1</i>	IEM+				2	3	4
<i>CPT1A</i>	small panel IEM		CPT1	1	2	3	4

<i>CPT2</i>	small panel IEM		CPT2	1	2	3	4
<i>CTNBL1</i>	Antibody deficiency, low KRECs					3	4
<i>CYP11A1</i>	small panel IEM				2	3	4
<i>CYP17A1</i>	small panel IEM		CAH	1	2	3	4
<i>CYP21A2</i>	CAH	Core US NBS	CAH		2		4
<i>DBT</i>	small panel IEM	Core US NBS	MSUD	1	2	3	4
<i>DCLRE1C</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>DKC1</i>	CID				2	3	4
<i>DLD</i>	small panel IEM	Core US NBS	MSUD	1	2	3	4
<i>DMD</i>	Other				2	3	4
<i>DNAJC12</i>	IEM+		PKU differential			3	4
<i>DNAJC21</i>	SCID and T cell defects, pancytopenia		SCID/CID				4
<i>DNMT3B</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>DOCK2</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>DOCK8</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>EFL1 (=EFTUD1)</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>EPG5</i>	Low T cells		SCID/CID				4
<i>ERCC6L2</i>	Low T cells		SCID/CID				4
<i>ETFA</i>	small panel IEM	Core US NBS	GA2	1	2	3	4
<i>ETFB</i>	small panel IEM	Core US NBS	GA2	1	2	3	4
<i>ETFDH</i>	small panel IEM	Core US NBS	GA2	1	2	3	4
<i>EXTL3</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>FAH</i>	small panel IEM	Core US NBS	TYR1	1	2	3	4
<i>FOXE1 (TITF2)</i>	Other, congenital hypothyreosis, Syndromal CH		CH			3	4
<i>FOXN1</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>G6PD</i>	Other anemia					3	4
<i>GAA</i>	Core US NBS genes	Core US NBS			2	3	4
<i>GALE</i>	IEM Extended US NBS				2	3	4
<i>GALK1</i>	IEM Extended US NBS				2	3	4
<i>GALNS</i>	IEM+						4
<i>GALT</i>	Core US NBS genes	Core US NBS			2	3	4
<i>GAMT</i>	IEM+				2		4
<i>GATA2</i>	CID				2	3	4
<i>GATM</i>	IEM+				2	3	4
<i>GCDH</i>	small panel IEM	Core US NBS	GA1	1	2	3	4
<i>GCH1</i>	DOPA-responsive dystonia, with or without hyperphenylalaninemia		PKU differential				4
<i>GINS1</i>	Low T cells		SCID/CID				4
<i>HADHA</i>	small panel IEM		TFP/LCHAD	1	2	3	4
<i>HADHB</i>	small panel IEM	Core US NBS	TFP	1	2	3	4
<i>HBB</i>	Core US NBS genes	Core US NBS			2	3	4
<i>HLCS</i>	small panel IEM		HCS	1	2	3	4
<i>HMGCL</i>	IEM+	Core US NBS	HMGCL		2	3	4
<i>HMGCS2</i>	IEM+				2	3	4
<i>HPD</i>	IEM Extended US NBS				2	3	4
<i>ICOSL</i>	Low T cells		SCID/CID				4
<i>IDS</i>	IEM+						4
<i>IDUA</i>	IEM+	Core US NBS			2		4
<i>IGHM</i>	Antibody deficiency, low KRECs				2	3	4

<i>IGLL1</i>	Antibody deficiency, low KRECs				2	3	4
<i>IKBKB</i>	CID/NBS+		SCID/CID		2	3	4
<i>IKBKG</i>	CID/NBS+		SCID/CID			3	4
<i>IKZF1</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>IL21</i>	Antibody deficiency, low KRECs						4
<i>IL2RB</i>	SCID and T cell defects					3	4
<i>IL2RG</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>IL7R</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>IVD</i>	small panel IEM	Core US NBS	IVA	1	2	3	4
<i>JAK3</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>KRAS</i>	CID/NBS+		SCID/CID			3	4
<i>LAT</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>LCK</i>	CID/NBS+		SCID/CID		2	3	4
<i>LCRB</i>	Core US NBS genes,	Core US NBS			2		4
<i>LIG1</i>	Low T cells						4
<i>LIG4</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>LMBRD1</i>	IEM+		MMA	1	2	3	4
<i>LRRC8A</i>	Antibody deficiency, low KRECs				2	3	4
<i>LYST</i>	CID/NBS+		SCID/CID		2	3	4
<i>MAGT1</i>	Low T cells						4
<i>MAP3K14</i>	Antibody deficiency, low KRECs						4
<i>MAT1A</i>	IEM				2	3	4
<i>MC2R</i>	small panel IEM		CAH		2	3	4
<i>MCCC1</i>	Core US NBS genes	Core US NBS			2	3	4
<i>MCCC2</i>	Core US NBS genes	Core US NBS			2	3	4
<i>MMAA</i>	small panel IEM	Core US NBS	MMA	1	2	3	4
<i>MMAB</i>	small panel IEM	Core US NBS	MMA	1	2	3	4
<i>MMACHC</i>	small panel IEM		MMA/HCY	1	2	3	4
<i>MMADHC</i>	small panel IEM		MMA/HCY	1	2	3	4
<i>MMUT</i>	small panel IEM	Core US NBS	MMA	1	2	3	4
<i>MTHFD1</i>	Low T cells						4
<i>MTHFR</i>	IEM (large gene)				2	3	4
<i>MTR</i>	IEM (large gene)		HCY	1	2	3	4
<i>MTRR</i>	IEM (large gene)				2	3	4
<i>NADK2</i>	IEM				2	3	4
<i>NAGLU</i>	IEM+						4
<i>NAGS</i>	IEM+				2	3	4
<i>NBN</i>	CID/NBS+		SCID/CID		2	3	4
<i>NFKB2</i>	Antibody deficiency, low KRECs						4
<i>NHEJ1</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>NKX2-1</i>	congenital hypothyreosis (AD), and differential CF/CID		CH			3	4
<i>NPC1</i>	Lysosomal				2	3	4
<i>NPC2</i>	Lysosomal				2	3	4
<i>NRAS</i>	CID/NBS+		SCID/CID			3	4
<i>OTC</i>	IEM+				2	3	4
<i>PAH</i>	small panel IEM	Core US NBS	PKU	1	2	3	4
<i>PAX1</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>PCBD1</i>	IEM+				2	3	4
<i>PCCA</i>	small panel IEM	Core US NBS	PA	1	2	3	4
<i>PCCB</i>	small panel IEM	Core US NBS	PA	1	2	3	4

<i>PGM3</i>	SCID and IEM		SCID and IEM	1	2	3	4
<i>PHGDH</i>	IEM+				2	3	4
<i>PIK3CD</i>	SCID and IEM		SCID and IEM	1	2	3	4
<i>PIK3R1</i>	Antibody deficiency, low KRECs				2	3	4
<i>PLPBP</i>	IEM+						4
<i>PNP</i>	SCID and IEM		SCID and IEM	1	2	3	4
<i>PNPO</i>	IEM+						4
<i>POR</i>	CAH		CAH	1	2	3	4
<i>PRKDC</i>	CID/NBS+		SCID/CID		2	3	4
<i>PSAP</i>	Lysosomal				2	3	4
<i>PSAT1</i>	IEM+				2	3	4
<i>PSPH</i>	IEM+				2	3	4
<i>PTPRC (=CD45)</i>	CID/NBS+		SCID/CID		2	3	4
<i>PTS</i>	IEM+				2	3	4
<i>QDPR</i>	IEM+				2	3	4
<i>RAC2</i>	CID/NBS+		SCID/CID	1	2	3	4
<i>RAG1</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>RAG2</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>RECQL4</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>RLTPR (=CARMIL2)</i>	CID/NBS+		SCID/CID		2	3	4
<i>RMRP</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>SBDS</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>SLC16A1</i>	IEM+				2	3	4
<i>SLC22A5</i>	small panel IEM	Core US NBS	CUD	1	2	3	4
<i>SLC25A13</i>	IEM				2	3	4
<i>SLC25A15</i>	IEM+				2	3	4
<i>SLC25A20</i>	small panel IEM		CACT	1	2	3	4
<i>SLC46A1</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>SLC52A2</i>	IEM+				2	3	4
<i>SLC52A3</i>	IEM+				2	3	4
<i>SLC6A8</i>	IEM+				2	3	4
<i>SMARCAL1</i>	CID/NBS+		SCID/CID		2	3	4
<i>SMN1</i>	Core US NBS genes	Core US NBS		1	2		4
<i>SMN2</i>	Core US NBS genes	Core US NBS			2		4
<i>SPINK5</i>	SCID and T cell defects		SCID/CID		2	3	4
<i>STAT5B</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>STIM1</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>TAT</i>	IEM+				2	3	4
<i>TBX1</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>TCF3</i>	Antibody deficiency, low KRECs				2		4
<i>TP63</i>	CID/NBS+		SCID/CID		2	3	4
<i>TPP1</i>	IEM+						4
<i>TRNT1</i>	Antibody deficiency, low KRECs						4
<i>TTC7A</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>UNC119</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>WAS</i>	CID/NBS+				2	3	4
<i>ZAP70</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>ZBTB24</i>	SCID and T cell defects		SCID/CID	1	2	3	4
<i>SLC5A5</i>	Congenital hypothyreosis		CH			3	4
<i>TG</i>	Congenital hypothyreosis		CH			3	4
<i>NKX2-5</i>	Congenital hypothyreosis		CH			3	4
<i>THRA</i>	Congenital hypothyreosis		CH			3	4

<i>PAX8</i>	Congenital hypothyreosis		CH			3	4
<i>TSHR</i>	Congenital hypothyreosis		CH			3	4
<i>DUOXA2</i>	Congenital hypothyreosis		CH			3	4
<i>IYD</i>	Congenital hypothyreosis		CH			3	4
<i>TSHB</i>	Congenital hypothyreosis		CH			3	4
<i>PROP1</i>	Congenital hypothyreosis		CH			3	4
<i>TPO</i>	Congenital hypothyreosis		CH			3	4
<i>SLC26A4</i>	Congenital hypothyreosis		CH			3	4
<i>POU1F1</i>	Congenital hypothyreosis		CH			3	4
<i>IGSF1</i>	Congenital hypothyreosis		CH			3	4
<i>CDCA8</i>	Congenital hypothyreosis		CH			3	4
<i>NTN1</i>	Congenital hypothyreosis		CH			3	4
<i>UBR1</i>	Congenital hypothyreosis		CH			3	4
<i>JAG1</i>	Congenital hypothyreosis		CH			3	4
<i>DUOX2</i>	Congenital hypothyreosis		CH			3	4
<i>FOXE1 (TTF2)</i>	Congenital hypothyreosis		CH			3	4
<i>GLIS3</i>	Congenital hypothyreosis		CH			3	4