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Supplementary Table 1. Genes included on targeted panels by laboratory

Laboratory	Panel description	No. of genes included	Disorders*	**Genes**
Laboratory 1	Non-immune hydrops	87	RASopathies, skeletal dysplasias, metabolic disorders, arthrogryposes, multiple congenital anomaly syndromes	ALG1, ALG9, ASAH1, BRAF, CANT1, CBL, CCBE1, CDAN1, CHRNA1, CHRND, CHRNG, CLCNKA, CLCNKB, COL2A1, CTSA, DHCR7, FAT4, FGFR3, FOXC2, FOXP3, G6PD, GALNS, GATA1, GBA, GBE1, GLA, GLB1, GNPTAB, GUSB, HADHA, HADHB, HRAS, IDUA, KAT6B, KIAA0586, KIF23, KLF1, KMT2D, KRAS, LBR, LIPA, LZTR1, MAP2K1, MAP2K2, MID1, MVK, NEU1, NPC1, NRAS, PEX1, PEX10, PEX12, PEX13, PEX14, PEX16, PEX19, PEX26, PEX3, PEX5, PEX6, PIEZO1, PIGA, PKLR, PMM2, PTH1R, PTPN11, RAF1, RASA1, RIT1, RPL11, RPL35A, RPL5, RPS10, RPS17, RPS19, RPS24, RPS26, SEC23B, SHOC2, SLC17A5, SMPD1, SOS1, SOS2, SOX18, SUMF1, UROS, WDR35
	RASopathy	23	RASopathies	A2ML1, BRAF, CABIN1, CBL, HRAS, KAT6B, KRAS, LZTR1, MAP2K1, MAP2K2, NF1, NF2, NRAS, NSUN2, PTPN11, RAF1, RASA2, RIT1, RRAS, SHOC2, SOS1, SOS2, SPRED1
Laboratory 2	Fetal hydrops	66	RASopathies	AHCY, ALG1, ASAH1, BRAF, CBL, CCBE1, CTSA, DHCR7, EBP, FH, FLT4, FOXC2, FOXP3, GALNS, GBA, GBE1, GLA, GLB1, GLE1, GNPTAB, GUSB, HADHA, HBA1, HBA2, HBZ, HRAS, IDUA, KLF1, KRAS, LARS2, LBR, LIPA, LZTR1, MAP2K1, MAP2K2, NEU1, NPC1, NRAS, PEX1, PEX10, PEX11B, PEX12, PEX13, PEX14, PEX16, PEX19, PEX2, PEX26, PEX3, PEX5, PEX6, PEX7, PIEZO1, PMM2, PTPN11, RAF1, RIT1, SGPL1, SHOC2, SLC17A5, SMPD1, SOS1, SOS2, SUMF1, TALDO1,

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				UROS
	RASopathy	19	RASopathies	A2ML1, BRAF, CBL, HRAS, KRAS, LZTR1, MAP2K1, MAP2K2, NF1, NRAS, PPP1CB, PTPN11, RAF1, RASA2, RIT1, SHOC2, SOS1, SOS2, SPRED1
Laboratory 3	Non-immune hydrops	148	RASopathies, skeletal dysplasias, metabolic disorders, congenital anemias, arthrogryposes, multiple congenital anomaly syndromes	ACAD9, ADAMTS3, AHCY, ALG1, ALG12, ALG8, ALG9, ALPK3, ASAH1, BRAF, BSND, CANT1, CBL, CCBE1, CDAN1, CELSR1, CEP55, CHD7, CHRNA1, CHRND, CHRNG, COG6, COL2A1, CTSA, DHCR24, DHCR7, DNAH9, EBP, ENPP1, EPHB4, FAT4, FGFR3, FIG4, FLT4, FOXC2, FOXP3, FRAS1, FREM2, G6PD, GAA, GALC, GALNS, GATA1, GBA, GBE1, GLA, GLB1, GLUL, GNPTAB, GRIP1, GUSB, HADH, HADHA, HADHB, HBA1, HBA2, HRAS, IDUA, KAT6B, KCNJ1, KCNJ2, KDM6A, KIAA0586, KIF23, KLF1, KLHL40, KMT2D, KRAS, LBR, LIPA, LZTR1, MAP2K1, MAP2K2, MGAT2, MID1, MVK, MYH3, MYOM1, MYRF, NEB, NEK1, NEU1, NEXN, NPC1, NPC2, NRAS, PEX1, PEX10, PEX12, PEX13, PEX14, PEX16, PEX19, PEX2, PEX26, PEX3, PEX5, PEX6, PEX7, PHGDH, PEIZO1, PIGA, PKLR, PMM2, PSAT1, PTH1R, PTPN11, RAF1, RASA1, RIT1, RPL11, RPL15, RPL27, RPL35A, RPL5, RPS10, RPS17, RPS19, RPS24, RPS26, RPS27, RPS29, RPS7, RYR1, SCN5A, SEC23B, SF3B4, SGPL1, SHOC2, SLC12A1, SLC17A5, SLC22A5, SLC26A2, SMPD1, SOS1, SOS2, SOX18, STAT3, SUMF1, SUZ12, TALDO1, TAPT1, TAZ, TRIP11, UROS, WAC, WDR35, ZEB2
	RASopathy	20	RASopathies	A2ML1, BRAF, CBL, HRAS, KRAS, LZTR1, MAP2K1, MAP2K2, MAP3K8, NF1, NRAS, PTPN11, RAF1, RASA2, RIT1, RRAS, SHOC2, SOS1, SOS2, SPRY1
Laboratory 4	Metabolic non-	51	Metabolic disorders only; cases not	AHCY, ALG1, ALG12, ALG8, ALG9, ARSB, ASAH1, CTSA, DHCR7, G6PD, GAA, GALC, GALNS, GBE1, GLB1,

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	immune fetal hydrops		associated with malformations	GLUL, GNPTAB, GUSB, HADH, HADHA, HADHB, IDUA, LIPA, MVK, NEU1, NPC1, NPC2, PEX1, PEX10, PEX12, PEX13, PEX14, PEX16, PEX19, PEX2, PEX26, PEX3, PEX5, PEX6, PEX7, PHGDH, PIGA, PMM2, PSAT1, SLC17A5, SLC22A5, SLC26A2, SMPD1, SUMF1, TAZ, TRIP11
Laboratory 5	Prenatal Noonan syndrome	19	RASopathies	A2ML1, BRAF, CBL, HRAS, KRAS, LZTR1, MAP2K1, MAP2K2, MRAS, NRAS, PTPN11, RAF1, RASA2, RIT1, RRAS, SHOC2, SOS1, SOS2, SPRED1
Laboratory 6	Prenatal Noonan spectrum disorders	11	RASopathies	BRAF, HRAS, KRAS, MAP2K1, MAP2K2, NRAS, PTPN11, RAF1, RIT1, SHOC2, SOS1
Laboratory 7	Noonan spectrum disorders	16	RASopathies	BRAF, CBL, HRAS, KRAS, LZTR1, MAP2K1, MAP2K2, NRAS, PTPN11, RAF1, RASA2, RIT1, SHOC2, SOS1, SOS2, SPRED1

*Disorders covered as described on laboratory website.

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