

555 University Avenue Room 3416, Roy C. Hill Wing Tel: 416-813-7200 x1 Fax: 416-813-7732

**Genome Diagnostics** 

www.sickkids.ca/en/care-services/for-health-care-providers/lab-testing-services

For Canada Only Provincial Health Card #:

Issuing Province:

Parent's Name:

Patient Name:

MRN:

Address:

Preferred Name (if different): Date of Birth (DD/MM/YYYY):

Legal Sex: ☐Male ☐Female ☐Non-binary/U/X

Gender Identity): □Male □Female □Non-binary/U/X

Sex Assigned at Birth (if different): ☐Male ☐Female ☐ Unassigned

Version:

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Referring Physician (required):	Reason for Testing (required):		
Name:	☐ Diagnosis	Carrier testing	
Facility/Ward/Clinic ( <i>required</i> ):	☐ Familial mutation/variant analysis	Prenatal testing	
Address:	☐ Bank DNA only	☐ Variant re-assessment	
	☐ Parental sample		
Phone: Fax:	Other (Specify):		
Email address:	If expedited testing is requested, indi	cate reason:	
Signature:	☐ Pregnancy (Gestational age (weeks) ☐ Other (Specify):		
Copy Report To Another Healthcare Provider (all information is required):	Familial Mutation / Targeted Variant Analysis:  *If proband testing was performed elsewhere, a copy of the original report (all pages) is required. Send a positive control sample if available.		
Name:	Gene & NM #:		
Address:	Mutation/variant(s):		
Phone: Fax:			
Sample Information (required):	SickKids Pedigree/Family number:		
Date obtained (DD/MM/YYYY):Referring	Name of proband:		
Laboratory reference #:	Relationship to proband:		
Blood in EDTA (purple top tube): min. 4 mL (0.5-3 mL for newborns)  DNA: min.10 ug in low TE buffer (Source:)  * Unable to perform MLPA analysis on externally extracted DNA (contact lab)  Direct CVS: min. 10 mg direct villi  Cultured villi: 1 flask at 60-70% confluency and 1 flask at 80-90% confluency  Cultured amniocytes: 1 flask at 60-70% confluency and 1 flask at 80-90% confluency  Tissue (Source:)  Other (Specify:)  Closed consent:  (If checked, all remaining DNA will be discarded upon notification by the ordering physician that all DNA testing has been completed)	Name(s) & DOB of other submitted family members:  Clinical Diagnostics and Family History (required):  Draw or attach a pedigree and provide any relevant information below, including clinical and family history details, as this is important for accurate interpretation of results.		
Laboratory Use:			
Date (DD/MM/YYYY)   Time Received:	Ethnicity:		
h	Ordering Checklist:		
Lab/Order #:  Specimen type, amt & # of tubes:  Comments:  Pedigree/Family No./Patient/Order No/	□ Specimen tube labeled with at leas:     □ Completed test requisition form     Clinical information must be provide completed for all tests. Testing will provided.     □ Proband's report and positive controuched.     □ Completed billing form (page 6, if a)	led for all tests. Pages 4-5 must be not proceed until these are ol (familial/targeted variant testing only)	

SickKids THE HOSPITAL FOR Toronto, ON, M5G 1X8, Canada SICK CHILDREN Paediatric **Laboratory Medicine** 

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**Genome Diagnostics** 

(CLIA # 99D1014032)

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#### LIST OF TESTS AVAILABLE BY DISEASE For prenatal testing and cases where a familial mutations/variant is known, include information on page 1 Connective Tissue Disease \* 22q11 Deletion Syndrome Clinical information must be provided on pages 4 and 5 22q11 deletion/duplication analysis (external DNA not accepted) If more than one panel is requested, rationale must be provided on page 5. **Angelman Syndrome** ☐ Ehlers Danlos Syndrome panel Methylation and deletion/duplication analysis (external DNA not accepted) Osteogenesis Imperfecta panel UPD15 analysis (please submit parental samples) Osteopetrosis and Disorders of Increased Bone Density panel Bone Involvement panel **Ashkenazi Jewish Carrier Screening** Deletion/duplication analysis Recurrent mutation analysis (7 diseases): Craniosynostosis Bloom syndrome, Canavan disease, Familial Dysautonomia, Fanconi Apert Syndrome (FGFR2 recurrent mutations analysis) Anemia Group C, Mucolipidosis Type IV, Niemann-Pick disease, Tay-Crouzon Syndrome (FGFR2, FGFR3 recurrent mutation analysis) Sachs disease Pfeiffer Syndrome (FGFR1, FGFR2, FGFR3 recurrent mutation analysis) ETHNICITY (required): Saethre-Chotzen Syndrome (TWIST1 sequence analysis and FGFR3 ☐ Ashkenazic ☐ Sephardic ☐ French Canadian ☐ Cajun recurrent mutation analysis) Non-Jewish ☐ Other\_ Non-Syndromic Craniosynostosis (FGFR3 recurrent mutation analysis) TWIST1 deletion/duplication analysis (external DNA not accepted) Autoinflammatory Disease \* Clinical information must be provided on pages 4 and 5 Cystic Fibrosis and/or CFTR-Related Disorders \*\* Autoinflammatory Diseases NGS panel Indication (provide additional clinical details on page 1 and/or pages 4-5): (excludes Recurrent Fever panel genes) ☐ Fetal echogenic bowel (ensure parental samples are linked to each other Recurrent Fever Syndrome NGS panel on both requisitions with at least two identifiers) Clinical diagnosis of cystic fibrosis MEFV (FMF), MVK, NLRP12, NLRP3, TNFRSF1A CFTR-related disorders Hemophagocytic Lymphohistiocytosis NGS panel ☐ C(B)AVD Aicardi-Goutieres Syndrome NGS panel Family history of cystic fibrosis ☐ Deletion/duplication analysis Positive newborn screen (ensure familial samples are linked to each other on all requisitions with at least two identifiers; send NSO report) **Becker Muscular Dystrophy** DMD deletion/duplication analysis (external DNA not accepted) Tests (indication specific): ☐ DMD sequence analysis CFTR recurrent mutation analysis **Beckwith-Wiedemann Syndrome** CFTR sequence analysis CFTR deletion/duplication analysis (external DNA not accepted) ☐ IC1 and IC2 methylation and 11p15 deletion/duplication analysis (external DNA not accepted) **Duchenne Muscular Dystrophy** UPD11 analysis (parental sample required) ☐ DMD deletion/duplication analysis (external DNA not accepted) CDKN1C sequence analysis DMD sequence analysis † No methylation analysis on CVS samples ☐ DMD mRNA analysis (contact the laboratory before ordering) **Bone Marrow Transplantation Fabry Disease** Post-transplant monitoring GLA sequence analysis GLA deletion/duplication analysis (external DNA not accepted) **Cancer Related Tests** GLA mRNA analysis (contact the laboratory before ordering) Li-Fraumeni Syndrome TP53 sequence analysis Fragile X Syndrome & FMR1-related disorders TP53 deletion/duplication analysis (external DNA not accepted) ☐ Fragile X syndrome Fragile X-associated primary ovarian insufficiency **Rhabdoid Tumour Predisposition Syndrome** Fragile X-associated tremor ataxia syndrome (FXTAS) SMARCB1 sequence analysis SMARCB1 deletion/duplication analysis (external DNA not accepted) Fragile X E Syndrome \*\*\* AFF2 trinucleotide repeat analysis (See testing requirements) **Congenital Muscular Dystrophies** Sequence analysis panel: FKTN (FCMD), FKRP, POMGnT1, POMT1, POMT2



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Hereditary Hearing Loss *  Clinical information must be provided on pages 4 and 5  When the Common and Non-Syndromic Hearing Loss Panel is requested, STRC dosage is tested.  Common and Non-Syndromic Hearing Loss panel  Usher Syndrome panel  Stickler Syndrome panel  Alport Syndrome, Treacher Collins Syndrome, Waardenburg Syndrome  Deletion/duplication analysis  Hereditary Hemorrhagic Telangiectasia  ACVRL1 sequence analysis  BNG sequence analysis  Hereditary Spastic Paraplegia *  Clinical information must be provided on pages 4 and 5  Comprehensive HSP (AR/AD/XL) panel including deletion/duplication analysis  Identity Testing  Zygosity studies  Maternal cell contamination studies (maternal sample required)  Neurofibromatosis type 1/Legius syndrome *  Clinical information must be provided on pages 4 and 5  NF1 sequence analysis  NF1 deletion/duplication analysis (external DNA not accepted)  SPRED1 sequence analysis  SPRED1 deletion/duplication analysis (external DNA not accepted)	Noonan Syndrome and RASopathies * Clinical information must be provided on pages 4 and 5 Noonan Syndrome and RASopathies panel Deletion/duplication analysis for SPRED1 only (external DNA not accepted) Prader-Willi Syndrome Methylation and deletion/duplication analysis (external DNA not accepted) UPD15 analysis (parental samples required)  Renal Diseases Atypical Hemolytic Uremic Syndrome / Membranoproliferative Glomerulonephritis sequence analysis Focal Segmental Glomerulosclerosis sequence analysis Focal Segmental Glomerulosclerosis sequence analysis (external DNA not accepted) UPD7 analysis (parental samples required)  Shwachman-Diamond Syndrome SBDS sequence analysis and GPC3 and GPC4 deletion/duplication analysis (external DNA not accepted) Shwachman-Diamond Syndrome GPC3 sequence analysis and GPC3 and GPC4 deletion/duplication analysis (external DNA not accepted)  Skeletal Dysplasia Achondroplasia (FGFR3 recurrent mutation analysis) Hypochondroplasia (FGFR3 recurrent mutation analysis) Thanatophoric Dysplasia (FGFR3 recurrent mutation analysis) Thanatophoric Dysplasia (FGFR3 recurrent mutation analysis) Spinal and Bulbar Muscular Atrophy AR trinucleotide repeat analysis  Spinal Muscular Atrophy SMM1 and SMN2 deletion/duplication analysis (external DNA not accepted)  X-Inactivation Analysis Other (PRIOR APPROVAL REQUIRED; CONTACT LABORATORY):		
*Next-Generation Sequencing (NGS) testing will only be initiated if the	** For information on the testing algorithm for Cystic Fibrosis, visit		

clinical information sections (pages 4-5) are completed. For more information on our Next-Generation Sequencing (NGS) panels, including the list of genes tested, visit our website: www health-care- providers/lab-testing-services

https://www.sickkids.ca/en/care-services/for-health-care-providers/lab-tests/244-Cystic-Fibrosis/ on our website

\*\*\* For information on the testing requirement for Fragile X E, visit the

Specimen Requirements section for Fragile X E Syndrome on our website:



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DISEASE SPECIFIC FEATURES				
Autoinflammatory Disorders (RFS/AID/HLH/AGS)  Abnormal inflammatory response Fevers Arthritis Pulmonary complications Gastrointestinal irritation Hepatosplenomegaly Lymphadenopathy Hemophagocytosis Oral ulcers Rash, specify: Ocular inflammation specify: Edema (periorbital, optic disk) Vision loss Other:	Hearing Loss  Age of onset: Sensorineural hearing loss Conductive hearing loss Mixed hearing loss Bilateral Syndromic Non-syndromic Ear anomalies Ear tags Eye anomalies Renal anomalies White forelock Cardiac anomalies Hirschsprung disease Other:	□ Extensor plantar reflex     □ Other:     □ The following investigations are required before molecular testing of HSP is undertaken:     □ MRI − Brain and spinal cord     □ Biochemical testing - Vitamin B12, vitamin E, very long chain fatty acids, lysosomal work-up, plasma amino acids and serum lipoprotein analysis (as	Neurofibromatosis type 1 (NF1) / Legius Syndrome  The patient meets the NIH criteria for a clinical diagnosis of NF1 (>2 of the clinical features below).  Café-au-lait macules  > 6 CALS (#:)  Neurofibromas, ≥ 2 or ≥ 1 Plexiform  Freckling, axillary or inguinal  Optic glioma  ≥ 2 Lisch nodules (iris hamartomas)  Osseous lesion (type:)  First degree relative diagnosed with NF1 by above criteria  Other:  The patient does not meet the NIH diagnostic criteria for NF1.  Rationale for testing must be provided	
Connective Tissue Disorders (CTD)  Ehlers Danlos Syndrome (EDS)  Indicate the suspected clinical diagnosis in th patient:  Classic Vascular  Kyphoscoliotic Other:  Note: Genetic testing is not offered for joint hypermobility alone. If testing is requested for j hypermobility, provide rationale on page 5.  Check applicable CTD features below.  Osteopetrosis and Disorders of Increased Bone Density Check applicable CTD features below.  CTD Related Clinical Features:  Joint hypermobility: Beighton score:  Arterial aneurysms, dissection or rupture  Intestinal rupture  Molluscoid pseudotumors  Subcutaneous spheroids  Loose/stretchable skin  Smooth/velvety skin  Widened atrophic scars	rationale for testing must be prov     Fetal findings on anatomy ultrasc     Fractures with minimal or no trau     other known disorders of bone m     Vertebral fractures     Dentinogenesis imperfecta	h one of the test indications below, vided on page 5. cound consistent with OI. cound in the absence of metabolism.  I gene analysis only will be performed — low.	Rationale for testing must be provided on page 5.  Noonan Syndrome and RASopathies  Increased nuchal translucency Developmental delay Characteristic facies Broad or webbed neck Heart defect (specify:) Hypertrophic cardiomyopathy Short stature (%ile:) Pectus deformity Lymphatic dysplasias Characteristic hematological abnormality (specify:) Other RASopathy features (specify:) For postnatal patients: The patient must present with ≥ 2 of the above features for molecular testing to be undertaken.	
Draw or attach a pedigree and provide any releven	FAMILY HISTOR		curate interpretation of results.	

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Unassigned Gender Identity): □Male □Female □Non-binary/U/X MRN: Parent's Name: Address:

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ADDITIONAL RELEVANT CLINICAL INFORMATION				
Previous Genetic Testing				
☐ No ☐ Yes – Test Results:				
Yes - Test Results:				
GENE	ERAL CLINICAL FEATURES			
Perinatal history	Gastroschisis/omphalocele Gastrointestinal reflux Pyloric stenosis Tracheoesophageal fistula Hepatic failure Chronic intestinal pseudo-obstr. Hirschsprung disease Recurrent vomiting Chronic diarrhea Constipation Other:  Genitourinary abnormalities Ambiguous genitalia Cryptorchidism Hypospadias Hydronephrosis Kidney malformation Renal agenesis Proximal renal tubulopathy Other:  Endocrine Diabetes mellitus Type 1 Diabetes mellitus Type 2 Hypothyroidism Hypoparathyroidism Hypoparathyroidism	Neurological/Muscular		

SickKids

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#### **BILLING FORM**

Patient Name:

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Completion of Billing Form NOT required for patients with an Ontario Health Card Number.

The hospital, referring laboratory, referring physician, or a patient/guardian will be billed for the services rendered, upon direction from the referring physician.

- Invoices are sent upon completion of each test/service.
- · Invoices are itemized and include the date of service, patient name, CPT code, test name and charge.
- Contact SickKids' Genome Diagnostics Laboratory at 416-813-7200 x1 with billing inquiries.

### How to complete the Billing Form:

- · Referring Physician completes the appropriate section below to specify billing method.
- · Send requisition and completed "Billing Form" with specimen.

Section 1: Complete to have the Healthcare Provider billed:	
Referring Laboratory's Reference #:	
Billing address of hospital, referring laboratory, clinic, referring physician, or requisition):	medical group (if different from
Name:	
Address:	
City: Prov/State:	
Postal/Zip Code:Country:	
Contact Name:Contact Teleph	one #:
Section 2: Complete to have Patient/Guardian billed directly:	
If electing to have patient/guardian billed:	
<ul> <li>Patient/Guardian billing information below must be com</li> </ul>	plete; otherwise, the healthcare provider will be billed.
<ul> <li>Advise the patient/guardian to expect a bill from the Ge</li> </ul>	nome Diagnostics laboratory.
<ul> <li>The patient's valid credit card information must be prov</li> </ul>	ided.
<ul> <li>Unfortunately, personal checks are not accepted as a r</li> </ul>	nethod of payment.
<ul> <li>In this case, the patient/guardian is solely responsi</li> </ul>	ble for the charges.
Send bill to (check one):	☐ Guardian
Method of Payment (check one):	☐ MasterCard ☐ Visa
Name as it appears on credit card:	
Credit card #:	
Expiry date on credit card:	
Signature of credit card holder (Required):	
Mailing Address of Patient/Guardian (if different from requisition):	Additional Contact Information
Name:	Patient's phone # with area code:
Address:	
Apt. #:	-or-
City:Prov/State:	Guardian's phone # with area code:
Postal/Zip Code:Country:	



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#### **LIST OF GENES BY TEST**

## **Autoinflammatory Diseases (sequencing and dosage** available)

## Recurrent Fever Syndromes panel (5 genes)

MEFV, MVK, NLRP12, NLRP3, TNFRSF1A

#### **Autoinflammatory Diseases panel (25 genes)**

ARPC1B, CARD14, CDC42, CECR1 (ADA2), COPA, ELANE, IL1RN, IL36RN, LACC1, LPIN2, NLRC4, NOD2, OTULIN, PLCG2, POMP, PSMB8, PSTPIP1, RAB27A, RBCK1, RIPK1, SH3BP2, SLC29A3, TMEM173 (STING1), TNFAIP3, TRNT1

#### Hemophagocytic Lymphohistiocytosis panel (16 genes)

AP3B1, BLOC1S6, CD27, ITK, LYST, NLRC4, PRF1, CD70, RAB27A, SH2D1A, SLC7A7, STX11, STXBP2, UNC13D, XIAP, MAGT1

#### Aicardi-Goutières Syndrome panel (7 genes)

ADAR, IFIH1, RNASEH2A, RNASEH2B, RNASEH2C, SAMHD1, TREX1

## **Connective Tissue Disease (sequencing and dosage** available)

#### **Ehlers Danlos Syndrome panel (22 genes)**

ACTA2, ADAMTS2, ATP7A, B4GALT7 (no dosage), CHST14, COL3A1, COL5A1, COL5A2, COL1A1, COL1A2, DSE, FBN2, FKBP14, PLOD1, PRDM5, SLC39A13, SMAD3, TGFB2, TGFBR1, TNXB, TGFBR2, ZNF469

#### Osteogenesis Imperfecta panel (20 genes)

ALPL, BMP1, COL1A1, COL1A2, CRTAP, FKBP10, IFITM5, LRP5, MBTPS2, P3H1, PLOD2, PLS3, PPIB, SERPINF1, SERPINH1, SP7, SPARC, TMEM38B, WNT1, XYLT2

#### Osteopetrosis and Disorders of Increased Bone Density panel (10 genes)

CA2, CLCN7, LRP5, OSTM1, PLEKHM1, SNX10, TCIRG1, TNFRSF11A, TNFRSF11B, TNFSF11

#### **Bone Involvement panel (40 genes)**

ARSL, CBS, COL11A1, COL11A2, COL2A1, COL9A1, COL9A2, COL9A3, COMP, DDR2, DYM, EBP, EIF2AK3, FBN1, FBN2, FGFR3, FLNB, HSPG2, IFT122, IFT43, IFT80, LBR, LIFR, MATN3, NEK1, NKX3-2, NSDHL, PEX7, PTH1R, SHOX, SLC26A2, SLC35D1, SLC39A13, SOX9, TRAPPC2, TRIP11, TRPV4, TTC21B, WDR19, WDR35

## Hereditary Hearing Loss (seguencing and dosage available)

Version:

#### Common and Non-Syndromic Hearing Loss panel (58 genes)

ACTG1, ADGRV1, CDH23, CHD7, CLDN14, COCH, DFNA5, DFNB59, DIAPH1, ESPN, ESRRB, EYA1, EYA4, GJB2, GJB6, GIPC3, GPSM2, GRHL2, GRXCR1, HGF, ILDR1, KCNQ1, KCNQ4, KCNE1, LHFPL5, LOXHD1, LRTOMT, MARVELD2, MYH14, MYH9, MYO15A, MYO3A, MYO6, MYO7A, OTOA, OTOF, OTOG, OTOGL, PCDH15, POU3F4, POU4F3, PRPS1, PTPRQ, RDX, SERPINB6, SIX1, SLC17A8, SLC26A4, SMPX, STRC, TECTA, TMC1, TMIE, TMPRSS3, TPRN, TRIOBP, USH2A, WFS1

## **Usher Syndrome panel (11 genes)**

ADGRV1, CDH23, CIB2, CLRN1, MYO7A, PCDH15, PDZD7, USH1C, USH1G, USH2A, WHRN

#### Stickler Syndrome panel (5 genes)

COL11A1, COL11A2, COL2A1, COL9A1, COL9A2

#### Alport Syndrome panel (3 genes)

COL4A3, COL4A4, COL4A5

Syndromic Hearing Loss - Treacher Collins syndrome, **Waardenburg syndrome, Norrie syndrome panel (7 genes)** EDN3, EDNRB, MITF, NDP, PAX3, SOX10, TCOF1

## Hereditary Spastic Paraplegia (sequencing and dosage available)

## Comprehensive HSP (AR/AD/XL) panel (67 genes)

ABCD1, ADAR, ALDH18A1, ALS2, AP4B1, AP4E1, AP4M1, AP4S1, AP5Z1, ATL1, ATP13A2, B4GALNT1, BSCL2, C19orf12, CAPN1, CPT1C, CYP2U1, CYP7B1, DDHD1, DDHD2, ERLIN1, ERLIN2, FA2H, FAR1, FARS2, GBA2, HACE1, HPDL, HSPD1, IBA57, IFIH1, KIDINS220, KIF1A, KIF1C, KIF5A, L1CAM, MAG, MTRFR, NIPA1, NT5C2, PCYT2, PLP1, PNPLA6, POLG, POLR3A, POLR3B, REEP1, REEP2, RNF170, RTN2, SACS, SELENOI, SETX, SLC16A2, SPART, SPAST, SPG11, SPG21, SPG7, TECPR2, TFG, TUBB4A, UBAP1, UCHL1, VPS13D, WASHC5, ZFYVE26

#### Noonan Syndrome (sequencing only) (15 genes)

BRAF, CBL, HRAS, KRAS, LZTR1, MAP2K1, MAP2K2, NRAS, PTPN11, RAF1, RIT1, SHOC2, SOS1, SOS2, SPRED1-Dosage **ONLY for SPRED1**