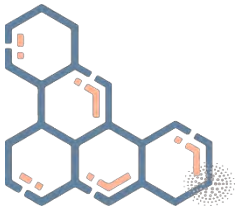
Congenital Disorders of Glycosylation

Precision Panel



Overview

Congenital Disorders of Glycosylation (CDG) are a group of rapidly expanding metabolic disorders that arise due to abnormal protein or lipid glycosylation. There are difficulties trying to diagnose them because they broadly affect many organs and functions, demonstrating a clinical heterogeneity. These phenotypically diverse disorders present as clinical syndromes affecting multiple systems including the central nervous system, muscle function, transport, regulation, immunity, endocrine system, and coagulation. Over 150 different CDGs have been and those affecting N-glycosylation are the most common type.

The Igenomix Congenital Disorders of Glycosylation Precision Panel can be used to make an accurate and directed diagnosis ultimately leading to a better management and prognosis of the disease. It provides a comprehensive analysis of the genes involved in this disease using next-generation sequencing (NGS) to fully understand the spectrum of relevant genes involved.

Indications

The Igenomix Congenital Disorders of Glycosylation Precision Panel is indicated for those patients with a clinical suspicion or diagnosis with or without the following manifestations:

- Low muscle tone or floppiness
- Failure to thrive
- Gross developmental delay
- Liver disease
- Abnormal bleeding or blood clotting
- Misaligned or crossed eyes
- Seizures
- Stroke-like episodes

Clinical Utility

The clinical utility of this panel is:

- The genetic and molecular confirmation for an accurate clinical diagnosis of a symptomatic patient.
- Early initiation of treatment with a multidisciplinary team in the form of nutritional therapy, transplantation, activated sugars, gene therapy and pharmacological chaperones.

- Risk assessment and genetic counselling of asymptomatic family members according to the mode of inheritance.
- Improvement of delineation of genotype-phenotype correlation given the clinical and genetically heterogenous profile of CDGs.

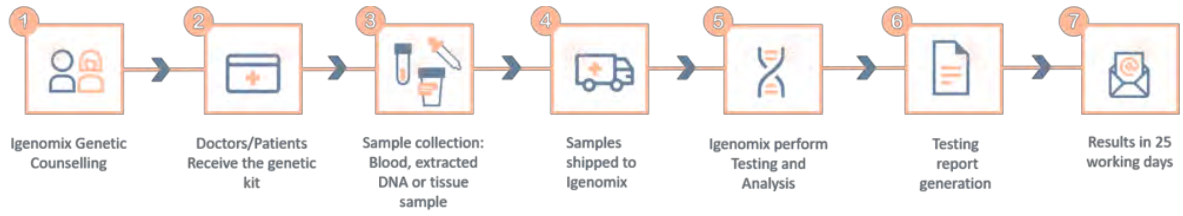
Genes & Diseases

GENE	OMIM DISEASES	INHERITANCE*	% GENE COVERAGE (20X)	HGMD**
ALG1	Congenital Disorder Of Glycosylation	AR	100	46 of 46
ALG11	Congenital Disorder Of Glycosylation	AR	99.91	19 of 19
ALG12	Congenital Disorder Of Glycosylation	AR	100	17 of 17
ALG13	Epileptic Encephalopathy, Intellectual Disability	X,XR,XD,G	99.62	-
ALG14	Myasthenic Syndrome With Glycosylation Defect	AR	99.99	7 of 7
ALG2	Congenital Disorder Of Glycosylation, Myasthenic Syndrome	AR	99.61	7 of 7
ALG3	Congenital Disorder Of Glycosylation	AR	99.2	25 of 25
ALG6	Congenital Disorder Of Glycosylation	AR	99.91	24 of 24
ALG8	Congenital Disorder Of Glycosylation, Polycystic Liver Disease	AD,AR	99.5	22 of 22
ALG9	Congenital Disorder Of Glycosylation, Polycystic Kidney Disease	AR	99.99	6 of 6
ATP6AP2	Congenital Disorder Of Glycosylation, Mental Retardation, Parkinsonism With Spasticity	X,XR,G	100	-
ATP6V0A2	Cutis Laxa, Wrinkly Skin Syndrome, Congenital Disorder Of Glycosylation	AR	99.99	55 of 55
ATP6V1A	Cutis Laxa, Epileptic Encephalopathy	AD,AR	99.98	9 of 9
ATP6V1E1	Cutis Laxa, Congenital Disorder Of Glycosylation	AR	100	2 of 2
B4GALT1	Congenital Disorder Of Glycosylation	AR	99.97	3 of 3
CAD	Epileptic Encephalopathy	AR	100	12 of 12
CCDC115	Congenital Disorder Of Glycosylation	AR	100	4 of 4
COG1	Congenital Disorder Of Glycosylation	AR	99.91	3 of 3
COG2	Congenital Disorder Of Glycosylation	AR	96.97	4 of 4
COG4	Congenital Disorder Of Glycosylation, Saul-Wilson Syndrome	AD,AR	100	5 of 5
COG5	Congenital Disorder Of Glycosylation	AR	100	19 of 19
COG6	Congenital Disorder Of Glycosylation, Shaheen Syndrome, Hypohidrosis-Enamel Hypoplasia-Palmoplantar Keratoderma-Intellectual Disability Syndrome	AR	100	13 of 13
COG7	Congenital Disorder Of Glycosylation	AR	99.94	6 of 6
COG8	Congenital Disorder Of Glycosylation	AR	100	8 of 8
CRPPA	Limb-Girdle Muscular Dystrophy, Walker-Warburg Syndrome	AR	97.69	-
DAG1	Limb-Girdle Muscular Dystrophy, Muscle-Eye-Brain Disease, Walker-Warburg Syndrome	AR	99.98	9 of 9
DDOST	Congenital Disorder Of Glycosylation	AR	100	2 of 2
DOLK	Congenital Disorder Of Glycosylation, Dilated Cardiomyopathy	AR	99.98	13 of 13
DPAGT1	Congenital Disorder Of Glycosylation, Myasthenic Syndrome	AR	100	41 of 41
DPM1	Congenital Disorder Of Glycosylation	AR	97.25	9 of 9
DPM2	Congenital Disorder Of Glycosylation, Congenital Muscular Dystrophy With Intellectual Disability And Severe Epilepsy	AR	99.87	2 of 2
DPM3	Congenital Disorder Of Glycosylation, Lind-Girdle Muscular Dystrophy	AR	100	4 of 4
FCSK	Congenital Disorder Of Glycosylation	AR	97.99	-

FKRP	Limb-Girdle Muscular Dystrophy, Muscle-Eye-Brain Disease, Walker-Warburg Syndrome	AR	99.9	157 of 157
FKTN	Cardiomyopathy, Lind-Girdle Muscular Dystrophy, Dilated Cardiomyopathy, Muscle-Eye-Brain Disease, Walker-Warburg Syndrome	AR	98	54 of 56
FUT8	Congenital Disorder Of Glycosylation	AR	99.73	4 of 4
GALNT2	Congenital Disorder Of Glycosylation	AR	99.7	7 of 7
GFPT1	Myasthenic Syndrome, Limb-Girdle Muscular Dystrophy	AR	100	57 of 57
GMPPB	Limb-Girdle Muscular Dystrophy, Myasthenic Syndrome, Muscle-Eye-Brain Disease	AR	99.95	53 of 53
LARGE1	Limb-Girdle Muscular Dystrophy, Muscle-Eye-Brain Disease, Walker-Warburg Syndrome	AR	100	-
MAGT1	Congenital Disorder Of Glycosylation, Immunodeficiency, Neoplasia	X,XR,G	100	-
MAN1B1	Mental Retardation, Congenital Disorder Of Glycosylation	AR	99.97	29 of 30
MGAT2	Congenital Disorder Of Glycosylation	AR	97.19	5 of 5
MOGS	Congenital Disorder Of Glycosylation	AR	100	10 of 10
MPDU1	Congenital Disorder Of Glycosylation	AR	100	7 of 7
MPI	Congenital Disorder Of Glycosylation	AR	100	20 of 20
NGLY1	Congenital Disorder Of Glycosylation, Alacrimia-Choreoathetosis-Liver Dysfunction Syndrome	AR	99.8	28 of 28
NUS1	Congenital Disorder Of Glycosylation, Mental Retardation, Undetermined Early-Onset Epileptic Encephalopathy	AD,AR	99.62	22 of 23
PGM1	Congenital Disorder Of Glycosylation	AR	99.96	38 of 40
PGM3	Immunodeficiency	AR	99.99	17 of 17
PIGG	Mental Retardation, Wolf-Hirschhorn Syndorme	AR	99.86	6 of 6
PIGL	Zunich Neuroectodermal Syndrome, Chime Syndrome, Hyperphosphatasia-Intellectual Disability Syndrome	AR	86	11 of 13
PIGN	Fryns Syndrome, Multiple Congenital Anomalies-Hypotonia-Seizures Syndrome	AR	93.97	36 of 39
PIGT	Multiple Congenital Anomalies-Hypotonia-Seizures Syndrome, Hemoglobinuria	AD,AR	100	15 of 15
PMM2	Congenital Disorder Of Glycosylation	AR	100	127 of 129
POMGNT1	Limb-Girdle Muscular Dystrophy, Retinitis Pigmentosa, Muscle-Eye-Brain Disease, Walker-Warburg Syndrome	AR	99.91	82 of 83
POMK	Limb-Girdle Muscular Dystrophy, Walker-Warburg Syndrome	AR	99.99	8 of 8
POMT1	Limb-Girdle Muscular Dystrophy, Muscle-Eye-Brain Disease, Walker-Warburg Syndrome	AR	100	105 of 105
POMT2	Limb-Girdle Muscular Dystrophy, Muscle-Eye-Brain Disease, Walker-Warburg Syndrome	AR	100	74 of 74
RFT1	Congenital Disorder Of Glycosylation	AR	99.98	18 of 18
SLC35A1	Congenital Disorder Of Glycosylation	AR	100	6 of 6
SLC35A2	Congenital Disorder Of Glycosylation	X,XD,G	99.97	-
SLC35C1	Congenital Disorder Of Glycosylation	AR	99.73	8 of 8
SLC39A8	Congenital Disorder Of Glycosylation	AR	99.89	7 of 7
SRD5A3	Congenital Disorder Of Glycosylation, Kahrizi Syndrome	AR	100	15 of 15
SSR4	Congenital Disorder Of Glycosylation	X,XR,G	100	-
STT3A	Congenital Disorder Of Glycosylation	AR	99.95	4 of 4
STT3B	Congenital Disorder Of Glycosylation	AR	98.71	5 of 5
TMEM165	Congenital Disorder Of Glycosylation	AR	93.69	4 of 5
TMEM199	Congenital Disorder Of Glycosylation	AR	100	5 of 5

*Inheritance: AD: Autosomal Dominant; AR: Autosomal Recessive; X: X linked; XLR: X linked Recessive; Mi: Mitochondrial; Mu: Multifactorial.
**Number of clinically relevant mutations according to HGMD

Methodology



Contact us

Call +34 963 905 310 or send an email to supportspain@igenomix.com for any of the following objectives:

- Get more information about the test.
- Request your kit.
- Request a pick up of the kit after collecting the sample.

References

1. Ng, B. G., & Freeze, H. H. (2018). Perspectives on Glycosylation and Its Congenital Disorders. *Trends in genetics : TIG*, *34*(6), 466–476. https://doi.org/10.1016/j.tig.2018.03.002
2. Scott, K., Gadomski, T., Kozicz, T., & Morava, E. (2014). Congenital disorders of glycosylation: new defects and still counting. *Journal of inherited metabolic disease*, *37*(4), 609–617. https://doi.org/10.1007/s10545-014-9720-9
3. Verheijen, J., Tahata, S., Kozicz, T., Witters, P., & Morava, E. (2020). Therapeutic approaches in Congenital Disorders of Glycosylation (CDG) involving N-linked glycosylation: an update. *Genetics in medicine : official journal of the American College of Medical Genetics*, *22*(2), 268–279. https://doi.org/10.1038/s41436-019-0647-2
4. Bogdańska, A., & Tylki-Szymańska, A. (2020). Wrodzone zaburzenia glikozylacji białek – stale powiększająca się grupa chorób metabolicznych [Congenital disorders of glycosylation - constantly growing group of metabolic diseases]. *Postepy biochemii*, *66*(3), 213–228. https://doi.org/10.18388/pb.2020_345
5. Gilfix B. M. (2019). Congenital disorders of glycosylation and the challenge of rare diseases. *Human mutation*, *40*(8), 1010–1012. https://doi.org/10.1002/humu.23829
6. Jaeken J. (2013). Congenital disorders of glycosylation. *Handbook of clinical neurology*, *113*, 1737–1743. https://doi.org/10.1016/B978-0-444-59565-2.00044-7