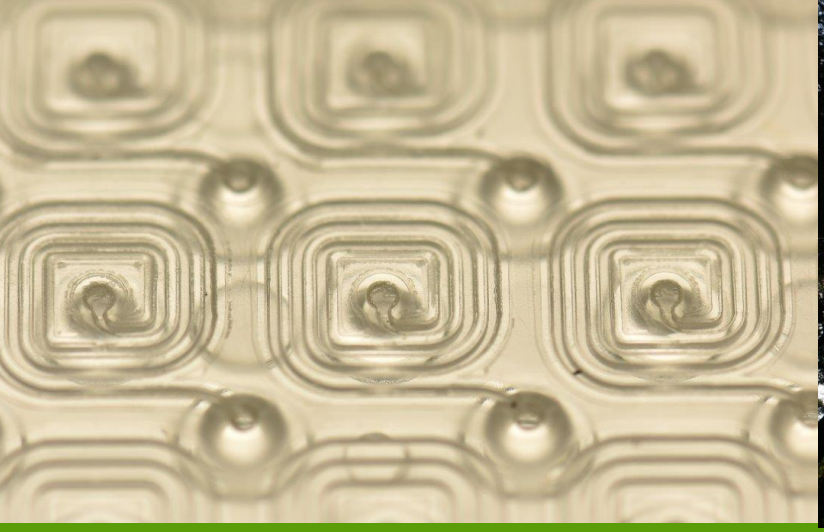
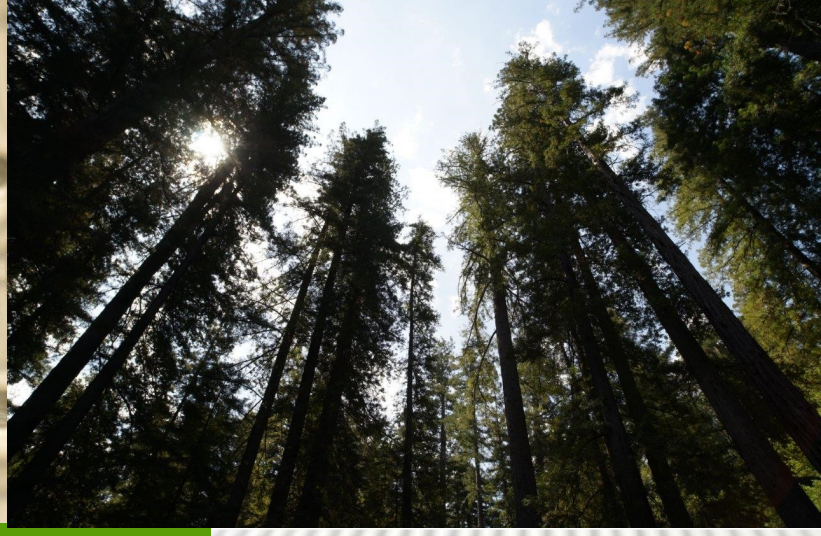




Adult Screening Exome Sequencing

&

Pharmacogenomic Test

Know Your Risk of Developing Genetic Disorders Including Cancers and Heart Diseases

Understand Your Reproductive Health

Learn About Your Drug Response to over 340 Medications

RAINBOW
GENOMICS

Message from the CEO

RAINBOW GENOMICS

The human genome consists of 3 billion nucleotides or “letters” of DNA. Only a small fraction, about 1.5% of the genome, contains genes that encode proteins, which control various functions in the body. Much of what we know about genetic disorders are based on these genes, or what we collectively called the exome. An exome contains more than 22,000 genes.

The Rainbow Adult Screening Exome Sequencing Test screens over 22,000 genes from the entire exome, and provides results that are based on clear medical evidence.

Most direct-to-consumer tests provide hundreds or even thousands of genetic findings that lack clinical utilities. Unlike these "recreational genetic tests", the Rainbow Adult Screening Exome Sequencing Test provides clinically- actionable results related to disorders for which your physicians can manage, treat or prevent:

1. **Your Health** - Your risk of developing genetic disorders in the future.

2. **Your Reproductive Health**

Your reproductive health risk, which is the risk of passing on genetic disorders to your children.

3. **Your Drug Response To Over 340 Medications**

4. **Heart Attack and Stroke Risk**

5. **Your Personal, One-Hour, Bilingual Genetic Counseling Session Included!**

By delivering clinically-actionable results, we enable your physicians to provide prevention strategies and personalized-care for you.

Daniel C. Siu
CEO
Rainbow Genomics

Your Health

The Adult Screening Exome Sequencing test screens over 22,000 genes from the entire exome, to determine your risk of developing a genetic disorder, which includes cancers, heart diseases, certain neurological disorders and numerous Mendelian and monogenic diseases. Data analysis and clinical interpretation is provided by Baylor Genetics.

Over 5,000 genetic disorders are known. Most of them are rare disorders. However, certain heart diseases and cancers have well-understood genetic associations. For example, about 5% of breast and colon cancers are known to be caused by genetics. Also, 1 out of 500 individuals carry mutations associated with cardiomyopathy.

This test determines the pathogenic and likely-pathogenic variants associated with genetic disorders. These are variants that have been reported in the scientific literature and are expected to increase the risk of developing a disorder.

Carrying a pathogenic mutation does not necessarily indicate that you will develop the disorder. The positive result can enable your physician to develop appropriate prevention strategy to mange your risk.

Because it is difficult to list thousands of genetic disorders screened by this test, at the end of this brochure, we provided some examples of cancers, heart diseases, neurological and syndromic disorders covered by this test.

* Cancers *Heart Diseases

Whole Exome Sequencing Test

Analyze 22,000 Genes

Your Reproductive Health

This test, similar to carrier testing, screens over 22,000 genes to determined pathogenic mutations associated with recessive disorders that can be passed on to your children. Data analysis and clinical interpretation is provided by Baylor Genetics.

Carrier screening determines if you may carry a genetic mutation that could cause a serious inherited disorder in your baby. Over 1,300 carrier status conditions are known. Many of these conditions are rare. And many of these conditions will not be detected by routine prenatal tests. Because these disorders are recessive, a baby must inherit a genetic variant from each parent to have the disease. If both parents are carriers, their child will have a 1 in 4 chance to be born with the disease.

Unlike many gene-panel test (includes 50-200 genes) developed by U.S. and European companies based on research using Caucasian patients, which may not include sufficient Asian genes, the Adult Screening Exome Sequencing test examines over 22,000 genes from the exome. We substantially reduces the risk of not testing genes that are specifically associated with Asian patients.

Note that this test cannot determine the carrier status of Fragile X, Spinal Muscular Atrophy (SMN) and Thalassaemias (HBA).

Because it is difficult to list all the carrier status conditions screened by this test, at the end of this brochure, we provided some examples of recessive disorders covered by this test.

Whole Exome Sequencing Test

Analyze 22,000 Genes

Your Drug Response to Over 340 Medications

ONEOME®

THE ONEOME®RIGHTMED® PHARMACOGENOMIC TEST*

Rainbow Genomics works closely with OneOme (Minneapolis, MN, U.S,) to provide comprehensive, clinically- actionable pharmacogenomic test to patients and physicians - The OneOme RightMed pharmacogenomic test.

Co-developed and exclusively licensed with Mayo Clinic (Rochester, MN, U.S.), OneOme provides a comprehensive solution that determines how patients' genes may affect their response to over 340 medications. OneOme analyzes a patient's genetic information and provides a validated clinical report to the provider.

Imprecise medication can cause delay of effective treatment, re-hospitalization, adverse events, and increased mortality. Recent U.S. studies have shown that response rates for many drugs are only between 50-75%. Also, adverse drug reactions (ADRs) are the 4th leading cause of death annually in the U.S.

The test aims to reduce adverse drug reactions, increase drug effectiveness and prevent unintended interactions between drugs.

Comprehensive. Includes 22 genes, 340+ common medications, and 28 medical conditions

Credible. Uses clinical evidence curated with Mayo Clinic from FDA label information, Clinical Pharmacogenetics Implementation Consortium, and other professional guidelines and scientific studies

In addition to drug metabolizing profiles, the RightMed test also categorizes drug results into a simple format:

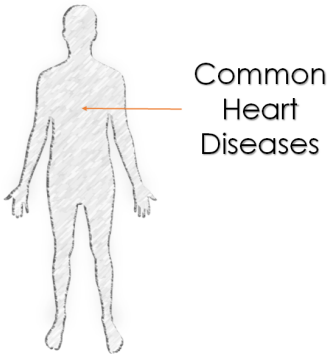
- Minimal gene-drug interaction
- Moderate gene-drug interaction
- Major gene-drug interaction

OneOme RightMed Test

Includes over 340 Medications

* The RightMed Test is only available in Hong Kong and Japan

Your Heart Attack and Ischemic Stroke Risk



Myocardial Infarction (Heart Attack)

A heart attack occurs when the flow of blood to the heart is blocked, most often by a build-up of fat, cholesterol and other substances, which forms a plaque in the coronary arteries. The interrupted blood flow can damage the heart muscle. A heart attack, also called a myocardial infarction (MI), can be fatal. Both environmental and genetic factors contribute to the risk of having a heart attack.

The MI Risk Assessment Test determines the genotypes of two risk markers located at chromosome 9p21. These two single nucleotide polymorphisms, or SNPs, associate with increased risks for development of MI and coronary heart disease. The risk associations have been replicated in over 20 populations with over 20,000 myocardial infarction patients and 40,000 controls, including over 5000 Chinese, Japanese, Koreans and other East Asian patients.

Atrial Fibrillation (Ischemic Stroke)

Atrial fibrillation (AF) is an irregular and often rapid heart rate that can increase your risk of stroke, heart failure and other heart-related complications. Episodes of atrial fibrillation can lead to blood clots forming in the heart that may circulate to other organs and lead to blocked blood flow (ischemia). A study of 471,446 Chinese individuals over 11 years, showed that the prevalence of AF increased 20 folds. The lifetime risk was approximately one in five among Chinese.

The AF Risk Assessment Test determines the genotypes of two risk markers located at chromosome 4q25 near transcription factor PITX2. In numerous studies with over 10,000 patients and 30,000 controls, the 4q25 risk association has been confirmed in Caucasian, Japanese, Chinese and Korean populations.

Clinical interpretation is provided by the Rainbow's clinical team in Japan.

Sanger Sequencing Test

Analyze 4 SNPs

Genetic Testing for Your Symptoms

Over 5000 Mendelian and monogenic disorders are known. If you currently have a family history, or symptoms of a condition that may have a genetic origin, your physician can provide the clinical information when ordering the test. Data analysis and clinical interpretation will be provided by Baylor Genetics to determine a genetic cause of your symptoms.

This analysis covers mutations associated with pathogenic and likely-pathogenic variants, as well as variants of uncertain clinical significance.

The result is included as part of the physician report issued by a U.S. board-certified medical director from Baylor Genetics.

Bilingual genetic counseling provided by U.S. certified genetic counselors is included.

In addition, we also provide physician consultation. This is provided by U.S. board certified physician specialists through live-video-conferencing sessions.

Whole Exome Sequencing Test

Analyze 22,000 Genes

Your Personal Genetic Counseling Session

Provided by U.S. Certified Genetic Counselors from *Baylor College of Medicine*

Genetic Counseling for Patients

Rainbow Genomics provides a variety of bilingual-genetic counseling services to our patients, in Mandarin, Cantonese, Japanese and English. Included with our tests, Baylor College of Medicine's Consultagene program delivers email-, phone- or video-conferencing-based genetic counseling to each patient. U.S.-certified genetic counselors from Baylor College of Medicine (BCM) will provide the services to ensure high quality and effective patient support.

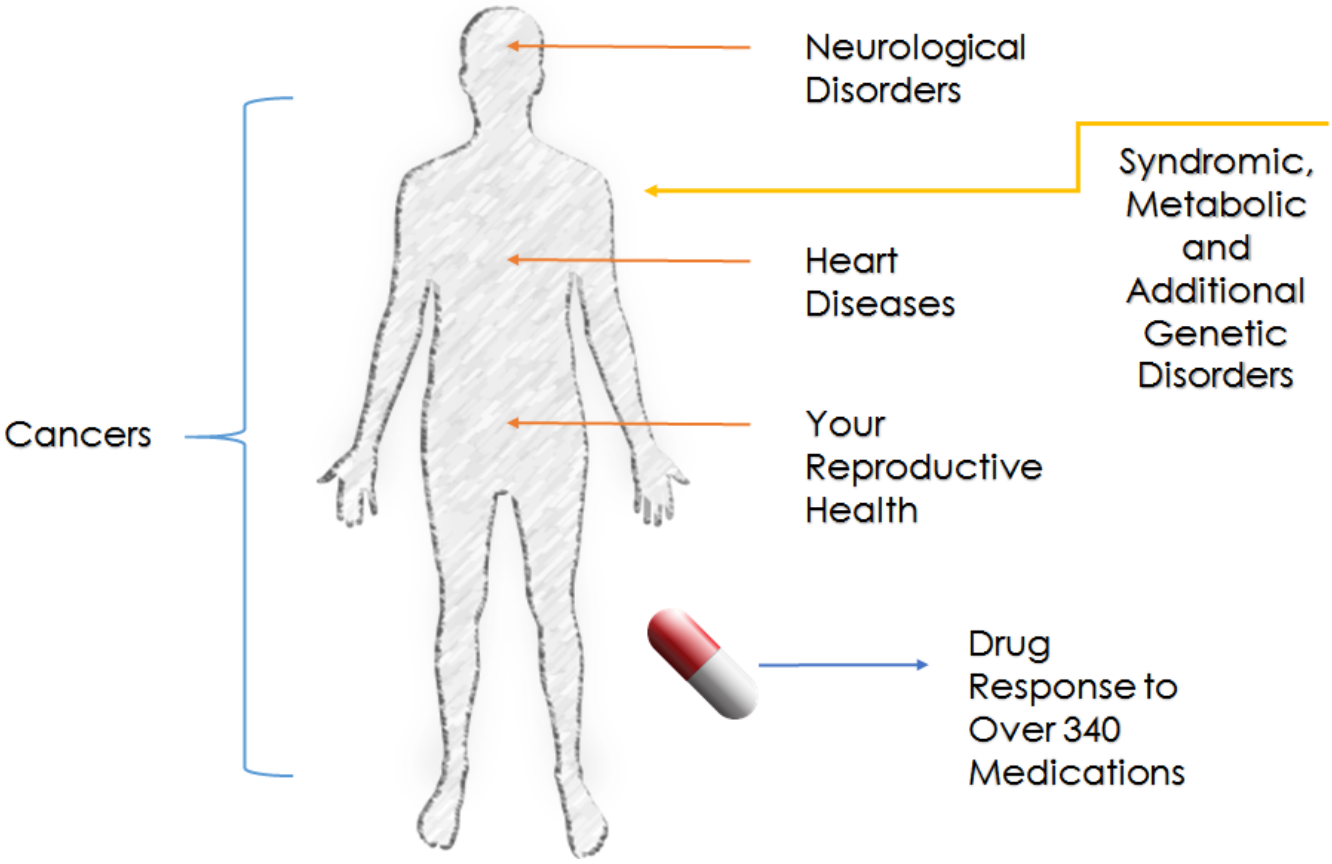
For more information, please visit https://www.consultagene.org

Physician Consultation - Peer-to-Peer Discussions

Rainbow Genomics also delivers two levels of support for ordering physicians to enhance their ability to provide the best care to their patients. Baylor Genetics' certified genetic counselors will provide email-based consultation to physicians. For clinicians who desire in-depth discussions of a patient's case, BCM Consultagene program provides a peer-to-peer consultation, an one-hour, video-conferencing delivered directly by Baylor's physicians. The ordering clinician, their collaborators and associated health care providers are all welcome to participate.

NOTE: The genetic counseling session focuses on your health, your reproductive health and symptom-associated diagnostic reports, and does not include counseling on pharmacogenomics results.

Summary: We Test The Following Conditions

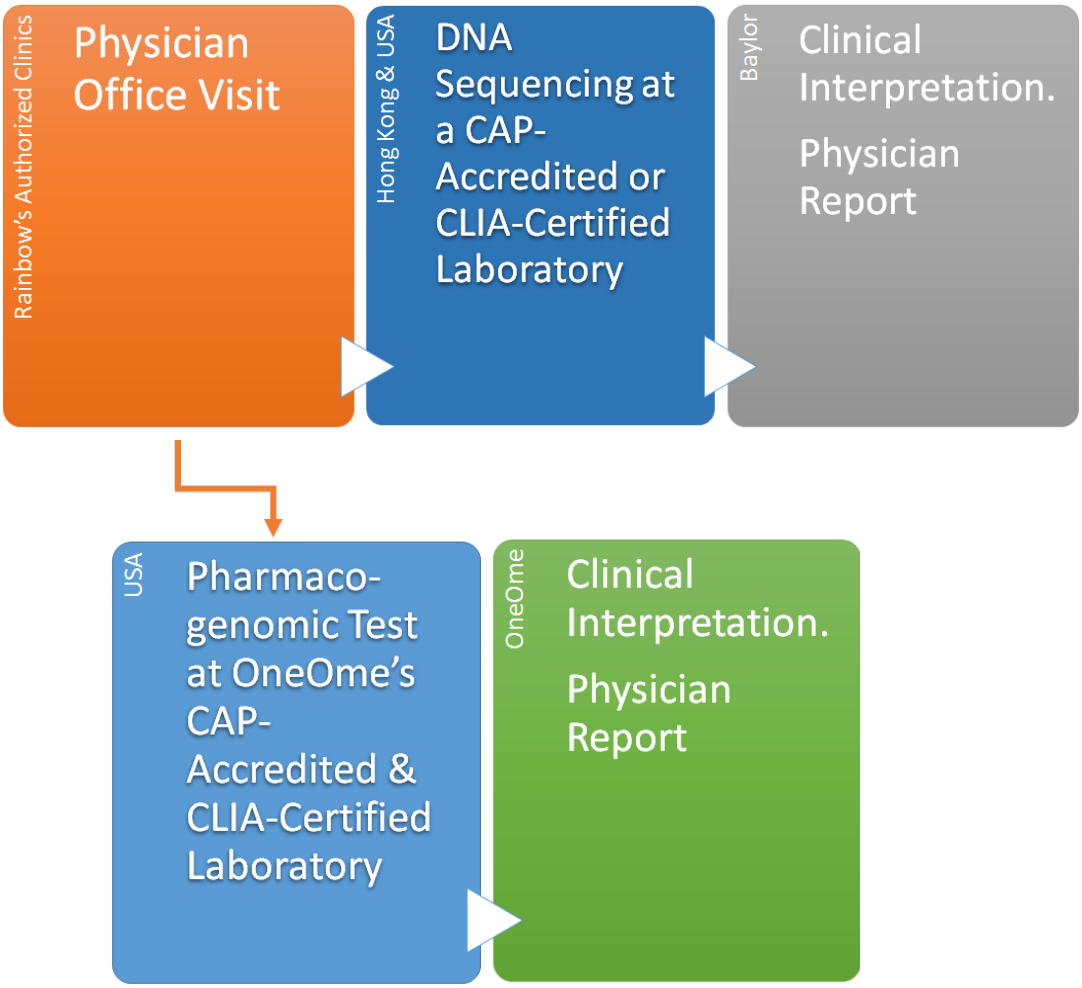


How It Works

The process starts with a physician office visit at a Rainbow-authorized clinic. The clinician will order the test for the patient. Your DNA sample will be sequenced at a CAP-accredited or CLIA-certified laboratory. Data will be analyzed and clinically interpreted under ACMG guidelines by Baylor Genetics, and a physician report will be issued by a Baylor Genetics board-certified medical director.

During the office visit, your physician will also collect a small amount of your saliva for the Oneome RightMed test. The sample will be sent to Oneome's CAP-accredited and CLIA-certified clinical testing laboratory. Oneome clinical team will perform the testing, analysis and issue a physician report.

- Patient data privacy – Rainbow follows the US Health Insurance Portability and Accountability Act (HIPAA) privacy rules, established to protect the confidentiality of patients' individually identifiable health information.



RAINBOW GENOMICS

Specific for Asians

Rainbow Genomics also partners with the genome medicine centers at Saitama and Juntendo Medical Universities, Japan, to provide double clinical interpretation for Asian patients including Chinese and Japanese. Specifically, test results with unusual Asian genetic variations may be further analyzed by their bioinformatics and clinical teams to assure highly-accurate test report is delivered for every patient.

Is the Rainbow Adult Screening Exome Test Right for You?

Even if you have genetic mutations including pathogenic or likely-pathogenic variants, or such mutation exists in your family, it does not necessarily mean that you will develop genetic disorders. Counseling by a certified genetic counselor is critical for you to understand the implications of carrying certain genetic variants. The Rainbow Adult Screening Exome Sequencing test may be right for you if -

- You are healthy and would like to understand your future risk of developing genetic disorders including hereditary cancers and heart diseases.
- You are planning to have children and would like to understand your risk of passing on a genetic disorder to your children
- You would like to understand your drug response to over 340 medications

This test may not be right for you if -

- You already have severe symptoms and you would like to determine the genetic cause. For example, you have already been diagnosed with cancer. You and your physician would like to determine the genetic etiology of the cancer, that is, if the cancer is familial in nature (a hereditary form of cancer). In this case, you should consider ordering the Rainbow High-Risk Cancer test.
- You and your physician are looking for an exhaustive diagnostic genetic test. For example, if your child is suffering from muscular dystrophy symptoms and your physician would like to determine a genetic cause. You should consider ordering the Rainbow Pediatric Care test which will analyze the entire 22,000 genes of your child's exome to determine causative mutations, using pathogenic and likely-pathogenic variants, as well as variants of uncertain clinical significance.

About Baylor Genetics

Baylor Genetics has been helping healthcare providers solve the most complex cases for over 39 years and we are proud to be affiliated with the #1 NIH-funded genetics program at the Baylor College of Medicine.

By bridging academic and operational excellence, Baylor Genetics offers the medical community a vast testing menu, access to experts, and the confidence to provide patients with answers. We deliver the most thorough interpretations, helping healthcare providers solve the most complex cases. Baylor Genetics is located in Houston's Texas Medical Center with over 200 employees, over 3,000 tests available to clients in all 50 states and in 16 countries. Our lab is well-equipped with cutting-edge diagnostic equipment, allowing us to efficiently generate the most accurate clinical genetic data. Through rigorous quality assurance, daily and monthly conferences, and close relationships with clinical partners, Baylor Genetics continuously improves diagnostic precision.

About OneOme

OneOme was established by Invenshure and Mayo Clinic to provide a comprehensive, cost-effective pharmacogenomic solution integrated into patients' everyday clinical care. OneOme's key product offering is the RightMed® pharmacogenomic test, a physician-ordered genetic test that predicts how a patient's DNA and current prescriptions may affect their response to medications. The analysis is provided to the physician in the form of static and interactive reports that identifies which prescription drugs are — or aren't — likely to work. This information can help providers make better prescription decisions, protect patients from adverse drug reactions and drug ineffectiveness, and reduce healthcare costs.

Our mission is to deliver the most cost-effective, comprehensive, clinically actionable pharmacogenomic (PGx) testing and tools for all providers and patients worldwide.

About Consultagene

What is Consultagene?

A multimedia educational, genetic counseling and genetic services resource. The online experience includes:

- Educational videos
- Pamphlets and web-based resources
- Convenient client/patient scheduling
- User-friendly pedigree and risk assessment tools
- Access to tele-genetic counseling services

Who is Consultagene?

As a product of the Department of Molecular and Human Genetics at Baylor College of Medicine in collaboration with Baylor Genetics, Consultagene leverages the intellectual capital of the department's faculty, 180 members strong, and healthcare providers. This group includes the following:

- Over 30 board-certified genetic counselors
- 25 clinical & medical biochemical geneticists with expertise in adult, prenatal, and pediatric genetics, neurogenetics, cardiovascular, cancer and metabolic genetics, skeletal dysplasias, and connective tissue and mitochondrial disorders
- Over 25 board-certified diagnostic laboratory directors

Available Services -

Education

Access educational videos, pamphlets, and web-based resources that are personally selected by experts to fit your situation and your genetic health concerns.

Genetic Counseling

In-depth counseling with one of our certified genetic counselors through our secure, self-scheduled portal to answer your genetic health questions and to connect you with the next steps.

Family History

Start mapping your family history to complete the story of your genetics and understand its relevance to your family health concerns.

Genetic Testing

We are partnered with state-of-the-art genetic testing services to provide you and your healthcare team access to the appropriate tests to answer your questions.

Your Health

Examples of Heart Diseases, Syndromic and Neurological Disorders Screened

Heart Diseases

Hypertrophic cardiomyopathy (HCM)
Pulmonary Arterial Hypertension
Catecholaminergic polymorphic ventricular tachycardia (CPVT)
Long QT syndrome (LQTS)
Short QT syndrome (SQTS)
Arrhythmogenic right ventricular cardiomyopathy (ARVC)
Dilated cardiomyopathy (DCM)
Thoracic Aortic Aneurysm and Dissection and Related Disorders
Sudden Cardiac Arrest (SCA)
Hereditary Hemorrhagic Telangiectasia (HHT)
Familial Hypercholesterolemia , & genetic forms of high blood pressure and cholesterol

Syndromic Disorders

Duchenne Muscular Dystrophy
Limb-Girdle Muscular Dystrophy
Congenital Musculary Dystrophy
Neuromuscular Disease
Noonan Syndrome
Costello Syndrome
Cardiofaciocutaneous Syndrome
Multiple Lentigines Syndrome
Neurofibromatosis 1
Suspected RAS pathway syndrome

Neurological Disorders

Early-onset Alzheimer’s disease
Parkinson's disease
Dementia
Frontotemporal dementia
Inherited prion diseases
Amyotrophic lateral sclerosis

Common Cardiovascular Conditions

Heart Attack
Ischemic Stroke

Cancers

Examples of Cancer Types

Breast	Ovarian	Colorectal	Lung	Prostate
Uterine	Gastric	Pancreatic	Thyroid	Central & Peripheral Nervous System
Melanoma	Renal	Urinary Track	Paraganglioma	Pheochromocytoma
Brain	Sarcoma	Neuroendocrine	Leukemia	Myelodysplastic Syndrome

Examples of Specific Cancers

Ataxia-telangiectasia (A-T)	Lynch syndrome – also known as hereditary non-polyposis colorectal cancer (HNPCC)
Bloom syndrome	Melanoma-pancreatic cancer syndrome (M-PCS)
Carney complex	Multiple endocrine neoplasia type 1 (MEN1)
Costello syndrome	Multiple endocrine neoplasia type 2 (MEN2)
Cowden and Cowden-like syndrome	MUTYH-associated polyposis (MAP)
DICER1 syndrome	Neurofibromatosis type 1 (NF1)
Dyskeratosis congenita	Neurofibromatosis type 2 (NF2)
Familial acute myeloid leukemia (AML) syndrome	Nevoid basal cell carcinoma – also known as Gorlin syndrome
Familial adenomatous polyposis (FAP)	Nijmegen breakage syndrome (NBS)
Familial gastrointestinal stromal tumors (GIST)	Oligodontia-colorectal cancer syndrome
Familial neuroblastoma	Hereditary paraganglioma-pheochromocytoma
Familial platelet disorder with propensity to myeloid malignancy (FPD/AML)	Perlman syndrome
GATA2 deficiency	Peutz-Jeghers syndrome (PJS)
Hereditary breast and ovarian cancer syndrome (HBOC)	Retinoblastoma
Hereditary diffuse gastric cancer (HGDC)	Rhabdoid tumor predisposition syndrome (RTPS)
Hereditary Lung Cancer	Simpson-Golabi-Behmel syndrome (SGBS)
Hereditary papillary renal cell carcinoma	Tuberous sclerosis complex (TSC)
Hereditary paraganglioma-pheochromocytoma syndrome (PGL/PCC)	von Hippel-Lindau syndrome (VHL)
Juvenile polyposis syndrome (JPS)	Werner syndrome
Li-Fraumeni syndrome (LFS)	Wilms tumor-related conditions

Your Reproductive Health

- 17-Beta-Hydroxysteroid Dehydrogenase Type III Deficiency
- 3-Hydroxy-3-Methylglutaryl CoA (HMG-CoA) lyase Deficiency
- 3-Methylcrotonyl-CoA Carboxylase Deficiency, MCCC1 Related
- 3-Methylcrotonyl-CoA Carboxylase Deficiency, MCCC2 Related
- 3-phosphoglycerate dehydrogenase deficiency (PHGDH)
- 46, XY Disorder of Sex Development
- 6-Pyruvoyl-Tetrahydropterin Synthase Deficiency
- Abetalipoproteinaemia (MTTP)
- Adenosine Deaminase Deficiency (ADA)
- Adenylosuccinate lyase deficiency
- Adrenal Hypoplasia Congenita, X-Linked
- Adrenoleukodystrophy (ABCD1)
- Agammaglobulinemia, X-linked 1 (BTK)
- Agenesis of the Corpus Callosum with Peripheral Neuropathy (Andermann Syndrome)
- Alpha-1 Antitrypsin Deficiency
- Alpha-1-Antitrypsin Deficiency (SERPINA1)
- Alpha-Mannosidosis
- Alpha-Mannosidosis (MAN2B1)
- Alpha-thalassemia X-linked intellectual disability (ATRX)
- Alport syndrome (COL4A3)
- Androgen Insensitivity Syndrome
- Angelman syndrome (UBE3A)
- Angelman-like syndrome
- Antithrombin III Deficiency
- Argininosuccinate Lyase Deficiency (ASL)
- ARSACS (SACS)
- Arthrogryposis, mental retardataion and seizures (SLC35A3)
- Aspartylglucosaminuria (AGA)
- Ataxia with Vitamin E Deficiency (TTPA)
- Ataxia-Telangiectasia (ATM)
- Atelosteogenesis Type 2 (SLC26A2)
- Atypical Rett syndrome
- Autosomal dominant childhood onset epilepsy
- Autosomal dominant lateral temporal lobe epilepsy
- Autosomal dominant mental retardation
- Autosomal Recessive Congenital Ichthyosis, TGM1 Related (TGM1)
- Autosomal Recessive Deafness 1A
- Autosomal Recessive Deafness 23
- Autosomal Recessive Deafness 2B
- Autosomal Recessive Deafness 4, with Enlarged Vestibular Aqueduct
- Autosomal Recessive Polycystic Kidney Disease (PKHD1)
- Autosomal Recessive Spastic Ataxia of Charlevoix-Saguenay
- Bardet-Biedl syndrome (BBS2)
- Bardet-Biedl Syndrome: BBS1 Related (BBS1)
- Bardet-Biedl Syndrome: BBS10 Related (BBS10)
- Benign familial infantile seizures
- Benign familial neonatal seizures
- BH4-Deficient Hyperphenylalaninemia A (PTS)
- Biotinidase Deficiency (BTD)
- Bjornstad Syndrome
- Bloom Syndrome (BLM)
- Canavan Disease (ASPA)
- Carnitine deficiency, systemic primary (SLC22A5)
- Carnitine Palmitoyltransferase IA Deficiency (CPT1A)
- Carnitine Palmitoyltransferase II Deficiency (CPT2)
- Cartilage-Hair Hypoplasia (RMRP)
- Centronuclear Myopathy, X-Linked
- cerebral creatine deficiency syndrome
- cerebral folate deficiency
- Cerebrotendinous Xanthomatosis (CYP27A1)
- Childhood Absence Epilepsy
- Chronic Granulomatous Disease
- Chronic granulomatous disease, X-linked (CYBB)

Citrin Deficiency (SLC25A13)
Citrullinemia Type I (ASS1)
CLN2 disease
COACH Syndrome, CC2D2A-Related
COACH Syndrome, TMEM67-Related
Combined Pituitary Hormone Deficiency, PROP1-Related
Congenital Adrenal Hyperplasia,11-Beta-Hydroxylase Deficiency
Congenital Amegakaryocytic Thrombocytopenia (MPL)
congenital disorder of glycosylation type 1s
Congenital Disorder of Glycosylation: Type Ia (PMM2)
Congenital Disorder of Glycosylation: Type Ib (MPI)
Congenital Myasthenic Syndrome, CHRNE-Related (CHRNE)
Congenital Myasthenic Syndrome, DOK7-Related (DOK7)
Congenital Myasthenic Syndrome, RAPSN-Related (RAPSN)
congenital Rett syndrome
Congenital Myasthenic Syndrome, CHAT-Related (CHAT)
cortical dysplasia-focal epilepsy syndrome (CDFES)
Crigler-Najjar Syndrome (UGT1A1)
Cystic Fibrosis (CFTR)
Cystinosis (CTNS)
D-Bifunctional Protein Deficiency (HSD17B4)
Dihydrolipoamide Dehydrogenase Deficiency (DLD)
Dihydropyrimidine Dehydrogenase Deficiency (DPYD)
Dravet syndrome
Duchenne/Becker Muscular Dystrophy (DMD)
Dyskeratosis congenita (RTEL1)
Dystrophinopathies
Early infantile epileptic encephalopathy (EIEE)
Ehlers-Danlos syndrome VIIc (ADAMTS2)
Ellis-van Creveld Syndrome
Encephalopathy, MECP2-Related Severe Neonatal
Ethylmalonic Encephalopathy (ETHE1)
Fabry Disease
Factor V Leiden Thrombophilia

Factor XI Deficiency
Familial Dysautonomia (IKBKAP)
Familial Hyperinsulinism (ABCC8)
Familial Mediterranean Fever
familial paroxysmal kinesigenic dyskinesia
Fanconi Anaemia (FANCC)
Fanconi Anemia, Complementation Group A
Fanconi Anemia, Complementation Group C
Fukuyama Congenital Muscular Dystrophy (FKTN)
Fumarase Hydratase Deficiency (FH)
Galactosemia
Galactosemia (GALT)
Gaucher Disease (GBA)
Generalized epilepsy with febrile seizures plus (GEFS+)
Gitelman Syndrome
Glass syndrome
Glucose-6-Phosphate Dehydrogenase Deficiency (G6PD)
GLUT1 deficiency syndrome
Glutaric Acidemia I (GCDH)
Glutaricacidemia Type I
Glycine encephalopathy (AMT)
Glycine encephalopathy (GLDC)
Glycogen Storage Disease Type Ia
Glycogen Storage Disease Type Ib
Glycogen Storage Disease Type II
Glycogen Storage Disease Type II (Pompe Disease) (GAA)
Glycogen Storage Disease Type III (AGL)
Glycogen Storage Disease: Type Ia (G6PC)
Glycogen Storage Disease: Type Ib (SLC37A4)
GM1-gangliosidosis (GLB1)
GRACILE syndrome (BCS1L)
Hemophagocytic Lymphohistiocytosis, Familial 2
Hemophagocytic Lymphohistiocytosis, Familial 3

- Hemophagocytic Lymphohistiocytosis, Familial 4
- Hemophagocytic Lymphohistiocytosis, Familial 5
- Hemophilia A
- Hemophilia B
- Hereditary Fructose Intolerance (ALDOB)
- Hereditary Motor and Sensory Neuropathy with Agenesis of the Corpus Callosum (SLC12A6)
- Herlitz Junctional Epidermolysis Bullosa, LAMA3-related
- Herlitz Junctional Epidermolysis Bullosa, LAMB3-related
- Herlitz Junctional Epidermolysis Bullosa, LAMC2-related
- Herlitz Junctional Epidermolysis Bullosa: LAMA3 Related (LAMA3)
- Herlitz Junctional Epidermolysis Bullosa: LAMB3 Related (LAMB3)
- Herlitz Junctional Epidermolysis Bullosa: LAMC2 Related (LAMC2)
- Hermansky-Pudlak Syndrome 1
- Hermansky-Pudlak Syndrome 3
- Hermansky-Pudlak Syndrome: HPS3 Related (HPS3)
- Hexosaminidase A Deficiency (Including Tay-Sachs Disease)
- HFE-associated Hereditary Hemochromatosis
- Homocystinuria Caused by Cystathione Beta-Synthase Deficiency (CBS)
- Homocystinuria Caused by Cystathionine Beta-synthase Deficiency
- Hyperornithinemia-Hyperammonemia-Homocitrullinuria (HHH)
- Hyperornithinemia-Hyperammonemia-Homocitrullinuria Syndrome
- hyperphosphatasia with intellectual disability syndrome
- Hypohidrotic Ectodermal Dysplasia, EDAR-Related
- Hypohidrotic Ectodermal Dysplasia, X-Linked
- Hypophosphatasia (ALPL)
- Hypophosphatasia, Autosomal Recessive
- idiopathic generalized epilepsy
- Inclusion Body Myopathy 2 (GNE)
- Infantile neuroaxonal dystrophy 1 (PLA2G6)
- intellectual disability
- intractable childhood epilepsy with generalized tonic-clonic seizures
- Isovaleric Acidemia (IVD)
- Joubert Syndrome 2
- Joubert Syndrome 3
- Joubert Syndrome 5
- Joubert Syndrome 6
- Joubert Syndrome 9
- Joubert Syndrome, TMEM216 Related (TMEM216)
- juvenile myoclonic epilepsy
- Juvenile Nephronophthisis (NPHP1)
- Kleefstra syndrome
- Kohlschütter-Tönz syndrome
- Koolen-de Vries syndrome
- Krabbe Disease (GALC)
- Leber Congenital Amaurosis 10
- Leigh Syndrome: French-Canadian Type (LRPPRC)
- Leukoencephalopathy with Vanishing White Matter, EIF2B5 Related (EIF2B5)
- Limb-Girdle Muscular Dystrophy 2I
- Limb-Girdle Muscular Dystrophy, Type 2A (CAPN3)
- Limb-Girdle Muscular Dystrophy, Type 2C (SGCG)
- Limb-Girdle Muscular Dystrophy, Type 2D (SGCA)
- Lipoamide Dehydrogenase Deficiency
- Llimb-Girdle Muscular Dystrophy, Type 2E (SGCB)
- Long Chain 3-Hydroxyacyl-CoA Dehydrogenase Deficiency
- Lowe syndrome (OCRL)
- Lysinuric Protein Intolerance (SLC7A7)
- Maple Syrup Urine Disease Type 1A
- Maple Syrup Urine Disease Type 1B
- Maple Syrup Urine Disease Type 3
- Maple Syrup Urine Disease Type 1B
- Maple syrup urine disease, type II (DBT)
- Maple Syrup Urine Disease: Type 1A (BCKDHA)
- Maple Syrup Urine Disease: Type 1B (BCKDHB)
- Meckel Syndrome 2
- Meckel Syndrome 3
- Meckel Syndrome 4

MECP2 duplication syndrome (MECP2)
Medium Chain Acyl-CoA Dehydrogenase Deficiency (ACADM)
MEF2C-related intellectual disability
Megalencephalic Leukoencephalopathy with Subcortical Cysts, MLC1 Related (MLC1)
Megalencephalic Leukoencephalopathy with Subcortical Cysts
Metachromatic Leukodystrophy (ARSA)
Methylmalonic Acidemia, MCEE-Related
Methylmalonic Acidemia, MMAA-Related
Methylmalonic Acidemia, MMAB-Related
Methylmalonic Acidemia, MUT-Related
Methylmalonic Aciduria and Homocystinuria cblC Type
Methylmalonic Aciduria and Homocystinuria cblD Type
Methylmalonic Aciduria and Homocystinuria: Type cblC (MMACHC)
microcephaly, epilepsy, and diabetes syndrome (MEDS)
Mild Hyperhomocysteinemia Caused by MTHFR Deficiency
Mitochondrial Complex III Deficiency Nuclear Type 1
Mowat-Wilson syndrome
MTHFR Deficiency
Mucolipidosis II (GNPTAB)
Mucolipidosis IV (MCOLN1)
Mucopolysaccharidosis Type I (IDUA)
Mucopolysaccharidosis Type IIIB (Sanfilippo Syndrome)
Mucopolysaccharidosis, Type IIIA (Sanfilippo Syndrome A) (SGSH)
multiple congenital anomalies-hypotonia-seizures syndrome 1 (MCAHS1)
Multiple sulphatase deficiency (SUMF1)
Muscle-Eye-Brain Disease (POMGNT1)
Nemaline Myopathy 2
Nemaline Myopathy: NEB Related (NEB)
neonatal-lethal rigidity and multifocal seizure syndrome (RFMSL)
Nephronophthisis 11
Nephrotic Syndrome, NPHS1-Related
Nephrotic Syndrome: Type 1 (NPHS1)
Nephrotic Syndrome: Type2 (NPHS2)

Neuronal ceroid lipofuscinosis
Neuronal Ceroid Lipofuscinosis, CLN3-Related (CLN3)
Neuronal Ceroid Lipofuscinosis, CLN5-Related (CLN5)
Neuronal Ceroid Lipofuscinosis, CLN6-Related (CLN6)
Neuronal Ceroid Lipofuscinosis, CLN8-Related (CLN8)
Neuronal Ceroid Lipofuscinosis, PPT1-Related (PPT1)
Neuronal Ceroid Lipofuscinosis, TPP1-Related (TPP1)
Neuronal Ceroid-Lipofuscinoses 1
Neuronal Ceroid-Lipofuscinoses 2
Neuronal Ceroid-Lipofuscinoses 3
Neuronal Ceroid-Lipofuscinoses 4A/6
Neuronal Ceroid-Lipofuscinoses 5
Neuronal Ceroid-Lipofuscinoses 7
NGLY1-congenital disorder of glycosylation
Niemann-Pick Disease Type A
Niemann-Pick Disease Type B
Niemann-Pick Disease Type C1
Niemann-Pick Disease Type C2
Niemann-Pick Disease, Type A (SMPD1)
Niemann-Pick Disease, Type C (NPC1)
Niemann-Pick Disease, SMPD1-associated
Nijmegen Breakage Syndrome (NBN)
Nonsyndromic Hearing Loss and Deafness, DFNB1: GJB2 related (GJB2)
Nonsyndromic Hearing Loss and Deafness: DFNB1: GJB6 related (GJB6)
Northern Epilepsy
Ocular Albinism, X-Linked
Oculocutaneous Albinism Type 1
Oculocutaneous Albinism Type 2
Oculocutaneous Albinism Type 3
Oculocutaneous Albinism Type 4
Oculocutaneous Albinism Type 7
Ohtahara syndrome
Ornithine transcarbamylase deficiency (OTC)

PCDH15-related Disorders
Pendred Syndrome (SLC26A4)
PEX1-related Zellweger Syndrome Spectrum
Phelan-McDermid syndrome
Phenylalanine Hydroxylase Deficiency (PAH)
Phenylketonuria
Pitt-Hopkins syndrome
PKHD1-related Autosomal Recessive Polycystic Kidney Disease
POLG-Related Disorders (POLG)
Polyglandular Autoimmune Syndrome Type 1
Pompe Disease
PPT1-related Neuronal Ceroid Lipofuscinosis
Primary Carnitine Deficiency
Primary Hyperoxaluria: Type 1 (AGXT)
Primary Hyperoxaluria: Type 2 (GRHPR)
Primary Congenital Glaucoma (CYP1B1)
Progressive Familial Intrahepatic Cholestasis Type 2
Progressive microcephaly with seizures and cerebral and cerebellar atrophy
Progressive myoclonic epilepsy
PROP1-Related Combined Pituitary Hormone Deficiency (PROP1)
Propionic Acidemia, PCCA Related (PCCA)
Propionic Acidemia, PCCB Related (PCCB)
Protein C Deficiency
Prothrombin Thrombophilia
Pseudocholinesterase Deficiency
Pycnodysostosis (CTSK)
pyridoxal 5'-phosphate dependent epilepsy
pyridoxine-dependent epilepsy
Pyruvate Carboxylase Deficiency (PC)
Pyruvate Dehydrogenase Complex Deficiency
Recessive Multiple Epiphyseal Dysplasia
Retinitis pigmentosa, autosomal recessive (DHDDS)
Rett syndrome

Rhizomelic Chondrodysplasia Punctata: Type 1 (PEX7)
Salla Disease (SLC17A5)
Sandhoff Disease (HEXB)
SCN8A-related early infantile epileptic encephalopathy
Segawa Syndrome
Severe Combined Immunodeficiency, Athabascan type
Severe combined immunodeficiency, X-linked (IL2RG)
Sjogren-Larsson Syndrome (ALDH3A2)
Smith-Lemli-Opitz Syndrome (DHCR7)
Steroid-resistant Nephrotic Syndrome
succinic semialdehyde dehydrogenase (SSADH) deficiency
sudden unexpected death in epilepsy (SUDEP)
Sulfate Transporter-related Osteochondrodysplasia
Tay-Sachs Disease (HEXA)
TPP1-related Neuronal Ceroid Lipofuscinosis
tuberous sclerosis complex (TSC)
Tyrosine Hydroxylase Deficiency (TH)
Tyrosinemia: Type I (FAH)
Usher Syndrome Type 3
Usher Syndrome: Type IB (MYO7A)
Usher Syndrome: Type IC (USH1C)
Usher Syndrome: Type ID (CDH23)
Usher Syndrome: Type IF (PCDH15)
Usher Syndrome: Type IIA (USH2A)
Usher Syndrome: Type IIIA (CLRN1)
Very Long-Chain Acyl-CoA Dehydrogenase Deficiency
West syndrome
Wilson Disease (ATP7B)
Wiskott-Aldrich syndrome (WAS)
X-linked Juvenile Retinoschisis
Zellweger Spectrum Disorders: PEX1 Related (PEX1)
Zellweger Syndrome (PEX2)

Drug Response - OneOme RightMed Test Drug List

RightMed® pharmacogenomic drug list

The OneOme RightMed PGx test is a provider-ordered comprehensive pharmacogenomic test of 22-genes that covers more than 340 prescription medications. These medications are used for treating common medical indications:

Acute migraine, Allergies, Alzheimer's disease, Anticoagulation, Antiplatelet therapy, Arrhythmias, Bacterial infection, Benign prostatic hyperplasia, Cancer, Chronic hepatitis C, Depression/anxiety, Diabetes, Fungal infection, Gastroesophageal reflux disease, Gout, HIV infection, Hypercholesterolemia, Hypertension, Immunosuppression, Migraine prophylaxis, Overactive bladder, Pain, Parkinson's disease, Psychosis, Rheumatoid arthritis, Seizure, Sleep disorders, Smoking cessation

GENOTYPE-DERIVED DRUGS

The following tables list drugs that will be binned according to an individual patient's genotype and the drug interaction determined by the RightMed PGx test. Binning consists of major, moderate, and minimal gene-drug interactions.

ALLERGY
Loratadine

ANALGESIC / ANESTHESIOLOGY
Alfentanil
Buprenorphine
Carisoprodol
Codeine*
Cyclobenzaprine
Fentanyl
Hydrocodone
Methadone
Midazolam
Oxycodone
Tramadol*

ANTI-INFLAMMATORY
Celecoxib
Diclofenac
Flurbiprofen
Meloxicam
Piroxicam

ANTICOAGULANT / ANTIPLATELET
Apixaban
Cilostazol
Clopidogrel*
Ticagrelor
Warfarin

CARDIOVASCULAR
Aliskiren
Amiodarone
Amlodipine
Atorvastatin
Azilsartan**
Carvedilol
Clonidine
Diltiazem
Disopyramide
Dofetilide
Dronedarone
Eplerenone
Felodipine
Flecainide
Fluvastatin
Guanabenz
Irbesartan
Labetalol
Lidocaine
Lomitapide
Losartan
Lovastatin
Metoprolol
Nifedipine
Nisoldipine
Pravastatin
Procainamide
Propafenone
Propranolol
Quinidine
Ranolazine
Simvastatin
Timolol
Verapamil

DIETARY
Caffeine

ENDOCRINOLOGY
Chlorpropamide
Ethinyl estradiol
Glimepiride
Glipizide
Glyburide
Nateglinide
Tolbutamide

GASTROENTEROLOGY
Aprepitant
Dexlansoprazole
Dolasetron
Esomeprazole
Lansoprazole
Omeprazole
Ondansetron
Pantoprazole
Rabeprazole

GENETIC DISEASE
Eliglustat
Ivacaftor

IMMUNOSUPPRESSION
Azathioprine**
Cyclosporine
Everolimus
Sirolimus
Tacrolimus

INFECTIOUS DISEASE
Atazanavir
Atovaquone/Proguanil*
Clarithromycin
Darunavir
Delavirdine
Efavirenz
Erythromycin
Fosamprenavir**
Indinavir
Isavuconazole**
Itraconazole
Ivermectin
Ketoconazole
Maraviroc
Mefloquine
Nelfinavir
Nevirapine
Peginterferon alfa-2a-containing regimens
Peginterferon alfa-2b-containing regimens
Quinidine
Quinine
Ritonavir
Saquinavir
Simeprevir
Telithromycin
Terbinafine
Tipranavir
Voriconazole

NEUROLOGY
Brivaracetam
Clobazam
Dextromethorphan/Quinidine
Donepezil
Eletriptan
Ethosuximide
Frovatriptan
Nicotine
Rasagiline
Tetrabenazine
Zonisamide

ONCOLOGY
Axitinib
Belinostat
Bortezomib
Bosutinib
Brentuximab vedotin
Cabazitaxel
Capecitabine**
Crizotinib
Dasatinib
Docetaxel
Enzalutamide
Erlotinib
Etoposide
Everolimus
Exemestane
Fluorouracil**
Gefitinib
Ifosfamide*
Imatinib
Irinotecan
Ixabepilone
Lapatinib
Mercaptopurine**
Methotrexate
Nilotinib
Paclitaxel
Pazopanib
Ponatinib
Regorafenib
Ruxolitinib
Sorafenib
Sunitinib
Tamoxifen*
Temsirolimus
Teniposide
Thioguanine**
Trabectedin
Vemurafenib
Vincristine
Vinorelbine

PSYCHIATRY
Alprazolam
Amitriptyline
Aripiprazole
Asenapine
Atomoxetine
Brexpiprazole
Bupropion
Buspirone
Citalopram
Clomipramine
Clozapine
Desipramine
Diazepam
Doxepin
Duloxetine
Escitalopram
Flibanserin
Fluoxetine
Fluvoxamine
Haloperidol
Iloperidone
Imipramine
Levomilnacipran
Lurasidone
Mirtazapine
Nefazodone
Nortriptyline
Olanzapine
Paroxetine
Perphenazine
Pimozide
Protriptyline
Quetiapine
Risperidone
Sertraline
Thioridazine
Trazodone
Trimipramine
Venlafaxine
Vilazodone
Vortioxetine

PULMONARY
Dextromethorphan
Indacaterol
Salmeterol
Sildenafil
Tadalafil

RHEUMATOLOGY
Cevimeline
Colchicine
Methotrexate
Tofacitinib

SLEEP MEDICINE
Armodafinil
Eszopiclone
Modafinil
Ramelteon
Triazolam
Zolpidem

UROLOGY
Darifenacin
Fesoterodine**
Finasteride
Oxybutynin
Sildenafil
Tadalafil
Tamsulosin
Tolterodine
Vardenafil

***CYP ACTIVATED PRODRUGS:** These drugs must be metabolized by CYP enzymes into their pharmacologically active form.

****NON-CYP ACTIVATED PRODRUGS:** These drugs are converted to their pharmacologically active form through processes independent of CYP involvement.

IMPACT OF METABOLIC STATUS ON DRUG ACTIVITY

METABOLIC STATUS	PRODRUGS	ACTIVE DRUGS
Rapid and ultrarapid metabolizers	May cause side effects or toxicity	May lack efficacy
Normal metabolizers	Presumed normal level of drug activity	Presumed normal level of drug activity
Intermediate metabolizers	May have reduced efficacy	May cause side effects or toxicity
Poor metabolizers	May lack efficacy	May cause side effects or toxicity

DRUGS WITH LIMITED GENETIC IMPACT

Pharmacogenomic testing is not relevant in informing a prescription decision for all medications. The genes tested on the RightMed pharmacogenomic test will not yield meaningful information for these medications because these medications have been shown to be unaffected by any known, clinically relevant genetic variants at this time. For more information on these medications, see oneome.com/limited-pgx-drugs.

The following table lists drugs available in our online RightMed® Advisor, which includes information on their classification and drug-to-drug interactions.

ALLERGY
Desloratadine
Phenylephrine

ANALGESIC / ANESTHESIOLOGY
Dexmedetomidine
Hydromorphone
Naloxone
Naltrexone

ANTICOAGULANT /ANTI-PLATELET
Dalteparin
Enoxaparin
Heparin
Prasugrel
Tirofiban

ANTIDOTE
Sodium nitrite
Succimer

CARDIOVASCULAR
Alirocumab
Atenolol
Benazepril
Chlorthalidone
Colesevelam
Digoxin
Enalapril
Ezetimibe
Fenofibric acid
Fosinopril
Furosemide
Gemfibrozil
Hydrochlorothiazide
Lisinopril
Nitroglycerin
Perindopril
Ramipril
Rosuvastatin
Sotalol
Spironolactone
Telmisartan

ENDOCRINOLOGY
Exenatide
Ibandronate
Insulin aspart
Insulin aspart protamine/ Insulin aspart
Insulin aspart/ Insulin degludec
Insulin degludec
Insulin detemir
Insulin glargine
Insulin glulisine
Insulin lispro
Insulin lispro protamine/ Insulin lispro
Insulin NPH
Insulin NPH/Insulin regular
Insulin regular
Insulin regular (oral inhalation)
Levothyroxine
Metformin
Pamidronate
Propylthiouracil
Risedronate
Vasopressin

GASTROENTEROLOGY
Adalimumab
Certolizumab pegol
Infliximab

GENETIC DISEASE
Sapropterin
Sodium phenylbutyrate
Velaglucerase alfa

HEMATOLOGY
Darbepoetin alfa
Decitabine
Epoetin alfa

IMMUNOSUPPRESSION
Mycophenolate

INFECTIOUS DISEASE
Atovaquone
Cefdinir
Ceftriaxone
Fluconazole
Flucytosine
Levofloxacin
Meropenem
Moxifloxacin
Nitrofurantoin
Nystatin
Piperacillin
Posaconazole
Ribavirin
Sofosbuvir
Sulfadiazine
Vancomycin
Zanamivir

NEUROLOGY
Gabapentin
Interferon beta-1a
Interferon beta-1b
Levetiracetam
Memantine
Pramipexole
Pregabalin
Rivastigmine
Topiramate
Vigabatrin

ONCOLOGY
Afatinib
Alemtuzumab
Asparaginase
Bevacizumab
Bleomycin
Carboplatin
Cetuximab
Fulvestrant
Ibritumomab
Lenalidomide
Leucovorin calcium
Obinutuzumab
Ofatumumab
Oxaliplatin
Panitumumab
Pemetrexed
Pertuzumab
Rituximab
Temozolomide
Thalidomide
Trastuzumab

PSYCHIATRY
Desvenlafaxine
Lithium
Milnacipran
Paliperidone
Varenicline

PULMONARY
Albuterol
Levalbuterol
Montelukast
Tiotropium

RHEUMATOLOGY
Adalimumab
Belimumab
Certolizumab pegol
Etanercept
Infliximab
Probenecid

SLEEP MEDICINE
Temazepam
Zaleplon

Limitations of the Test

- This test cannot detect common pathogenic variants for Fragile X, Spinal Muscular Atrophy (SMN) and Thalassaemias (HBA).
- This test cannot reliably detect CNVs, variants in repetitive regions and pseudogene regions.
- Comprehensive analysis of NEB, GJB6, NPHP1, MECP2 and CLN3 genes may require CNV analysis. This test may not reliably detect all the CNVs in these genes.
- This test may not provide detection of certain genes or portions of certain genes due to local sequence characteristics or the presence of closely related pseudogenes. Gross deletions or duplications, changes from repetitive sequences may not be accurately identified by this methodology.
- This test is designed to detect single nucleotide variants (SNVs) and small deletions and insertions less than 10 base pairs (<10 bp). It has not been validated to detect exon-level deletions and duplications longer than 10 base pairs (>10 bp).
- For conditions associated with "Your Health", the test reports only mutations associated with pathogenic and likely-pathogenic variants. Variants of uncertain clinical significance (VUS) will not be reported
- For conditions associated with "Your Reproductive Health", the test reports only recessive disorder-related mutations associated with pathogenic and likely-pathogenic variants. Variants of uncertain clinical significance (VUS) will not be reported
- For reporting associated with your symptoms or family history, findings supported by pathogenic variants, likely-pathogenic mutations, and variants of uncertain clinical significance (VUS) will be reported.
- For clinical limitation of the OneOme RightMed pharmacogenomic test, please see www.oneome.com/coverage

About Rainbow Genomics

Rainbow Genomics is a Hong Kong and US-based genomics health company providing genetic tests, personalized risk assessment and health management programs for Asian patients. Our diagnostic tests, clinical interpretation and physician reporting are developed specifically for Asian patients based on their specific genetics. After we have delivered a physician report to each patient, physician consultation is provided, to assure that doctors and health-care professionals can take full advantage of our clinically-actionable reports to provide optimal care for their patients.

Contact Us

For more information or to order our tests, please email us at info@rainbowgenomics.com. We will provide a list of authorized clinics and hospitals where you can arrange to visit a physician for a consultation.

 Info@rainbowgenomics.com

 www.rainbowgenomics.com

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