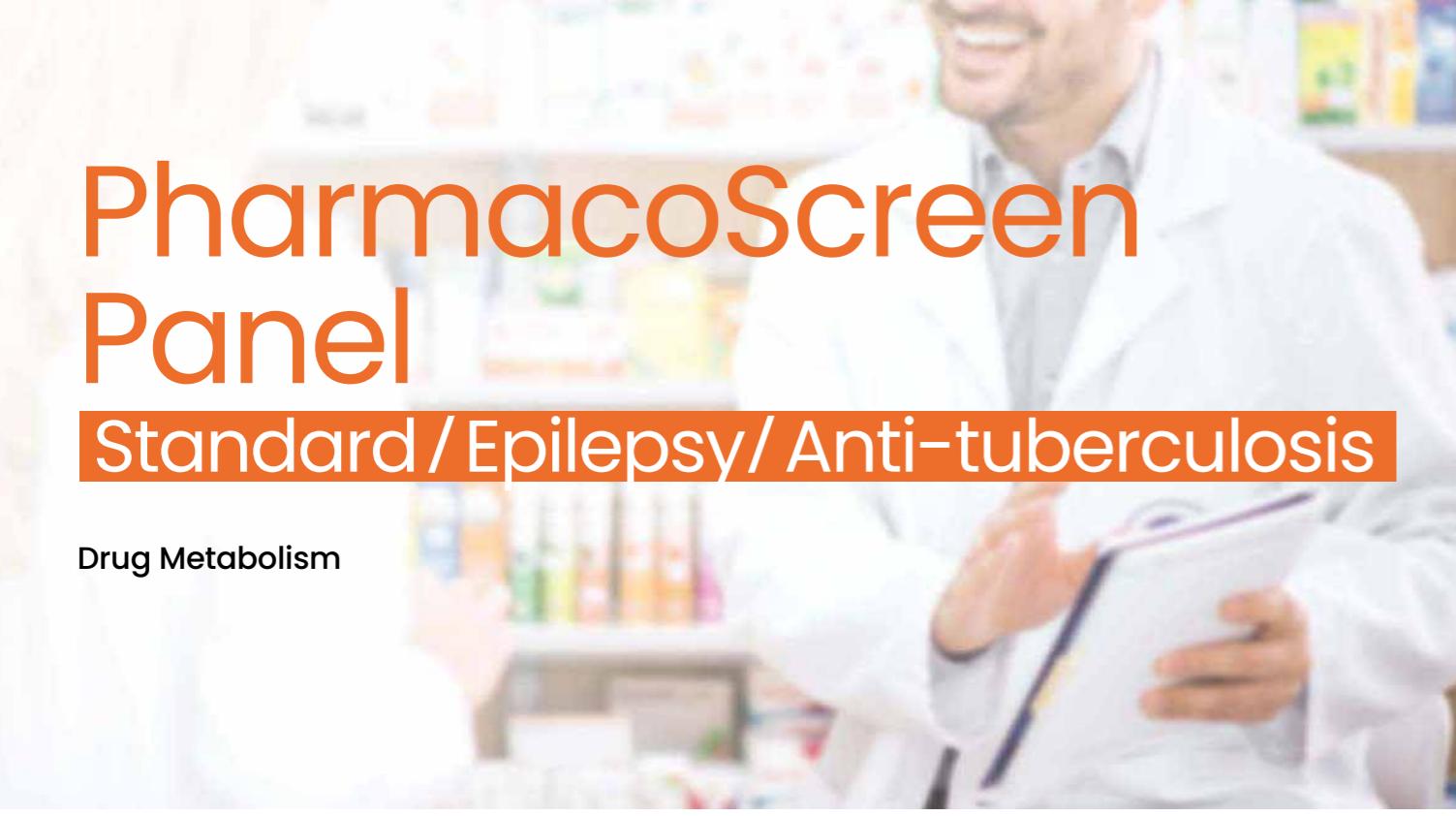


PharmacoScreen Panel

Standard / Epilepsy / Anti-tuberculosis

Drug Metabolism



DESCRIPTION

The main target of PharmacoScreen Panel is the genes associated with prescribed drugs of the corresponding diseases. The assay allows for precise selection and dosage of prescribed drugs, and detection of genetic variants associated with drug metabolism, epilepsy and anti-tuberculosis.

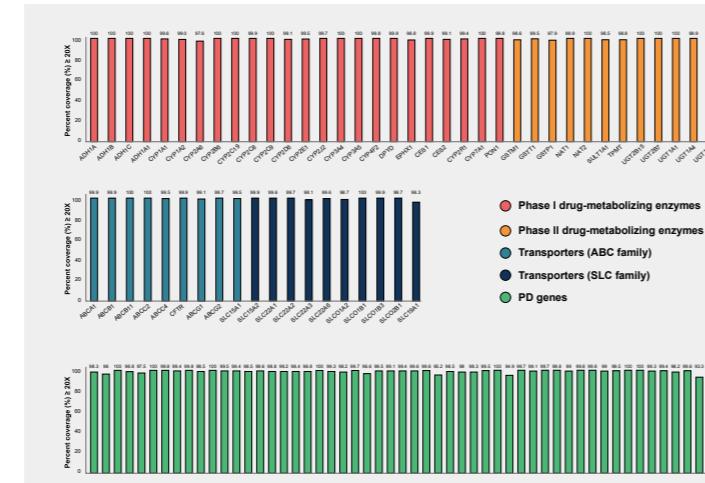
KEY FEATURES

1. Assess extensive target regions associated with pharmacogenomics	Target over 120 genes associated with pharmacokinetics and pharmacodynamics
2. Validated panel performance	Collaborated with 4 major university hospitals on a government project Complete validation for clinical application
3. Flexible panel contents	PharmacoScreen Panels for drug metabolism, epilepsy, and anti-tuberculosis.

PANEL PERFORMANCE

The panel performance test resulted in 99.9% specificity and 99.7% sensitivity.

- 1.1 Phase I/II drug-metabolizing enzyme (Drug metabolism)
- 1.2 ABC & SLC family transporter genes (Drug effect)
- 1.3 Pharmacodynamics genes (Drug biochemical and physiological)
- 1.4 Modifier genes (Drug ADME enhancement)



PACKAGE COMPOSITION

Package name	Compositions		Package option	Options	
Target Enrichment	Target capture Probe	-	Pooling method	Single Reaction	Pre-capture Pooling
Standard	Target Enrichment reagents	Library prep Kit	Library Preparation kits	Standard Kit	EP-kit
All-In-One		Beads / Polymerase	Hybridization Enhancer	Included	Not included

PharmacoScreen Standard

DESCRIPTION

One of the major problems of organ transplantation is tissue damage by rejection and relapse of the disease after transplantation. Although applying immunosuppressive drugs can prevent rejection, determining the proper dosage of immunosuppressive drugs for an individual patient is challenging. The PharmacoScreen Standard Panel is an NGS assay, designed to assess 122 genes associated with pharmacogenomics, including drug metabolism (Phase I, II), Transporters (ABC and SLC families), and Parkinson's disease-related genes (PD genes). The panel is not limited to 122 genes, and more genes of interest can be added through our Gene Add-on service.

SPECIFICATION

Gene count*	283 genes
Covered region	Whole CDS, UTR (-50 bp, +10 bp)
Target Size	634 kb
Mutation Type	SNV, Indel, CNV
Sample type (amount)	Blood (> 50 ng of fragmented DNA)
Platform	All sequencers from Illumina, Thermo Fisher, MGI, PacBio, and Oxford Nanopore
Sensitivity / Specificity	100% / 94.5%
Bioinformatics pipeline	Primary, Secondary and Tertiary analysis result (FASTQ to VCF, VCF to Clinical report)
Publications	Targeted Next-Generation Sequencing for Comprehensive Genetic Profiling of Pharmacogenes, Clinical Pharmacology & Therapeutics, 2016

* Gene Add-On Service: Genes can be added by customer's request

GENE LIST

- Phase I drug-metabolizing enzymes
- Phase II drug-metabolizing enzymes
- ▲ Transporters (ABC family)
- ▲ Transporters (SLC family)
- PD genes
- ◆ Modifier genes

● ADH1A	● GSTM1	▲ ABCA1	■ ACE	■ ADRB1	■ KCNH2	◆ AHR
● ADH1B	● GSTP1	▲ ABCB1	■ ADRB2	■ ALOX5	■ LDLR	◆ KCNJ11
● ADH1C	● GSTT1	▲ ABCB11	■ BRCA1	■ APOA1	■ MAOA	◆ NR1I3
● ALDH1A1	● NAT1	▲ ABCC2	■ COMT	■ ARID5B	■ NR3C2	◆ NR1I2
● CES1	● NAT2	▲ ABCC3	■ DRD2	■ BDNF	■ NTRK2	◆ POR
● CES2	● SULT1A1	▲ ABCC4	■ F5	■ CACNA1C	■ PEAR1	◆ SOD2
● CYP1A1	● TPMT	▲ ABCC7	■ HMGCR	■ CPS1	■ PTGS1	
● CYP1A2	● UGT1A1	▲ ABCG1	■ MTHFR	■ CRHR1	■ PTGS2	
● CYP2A6	● UGT1A4	▲ ABCG2	■ NQO1	■ DBH	■ RYR1	
● CYP2B6	● UGT1A9	▲ SLC10A1	■ P2RY1	■ DRD1	■ RYR2	
● CYP2C19	● UGT1A10	▲ SLC15A1	■ P2RY12	■ EGFR	■ SCN1A	
● CYP2C8	● UGT2B15	▲ SLC15A2	■ PTGIS	■ ESR1	■ SCN2A	
● CYP2C9	● UGT2B7	▲ SLC19A1	■ SCN5A	■ FKBP5	■ SLC47A1	
● CYP2D6		▲ SLC22A1	■ TYMS	■ GLCCI1	■ SLC47A2	
● CYP2E1		▲ SLC22A2	■ VDR	■ GRK4	■ SLC6A3	
● CYP2J2		▲ SLC22A3	■ VKORC1	■ GRK5	■ SLC6A4	
● CYP2R1		▲ SLC22A4		■ G6PD	■ TBXAS1	
● CYP3A4		▲ SLC22A5		■ HTR1A		
● CYP3A5		▲ SLC22A6		■ HTR2A		
● CYP4F2		▲ SLC22A8				
● CYP7A1		▲ SLC22A11				
● DPYD		▲ SLC22A12				
● EPHX1		▲ SLCO1A2				
● PON1		▲ SLCO1B1				
		▲ SLCO1B3				
		▲ SLCO2B1				

PharmacoScreen Panel Standard	ABCA1	ABCB1	ABCB11	ABC84	ABC87	ABCC1	ABCC2	ABCC3	ABCC4	ABCC5	ABCC6	ABCC8	ABCC9	ABCG1	ABCG2
	ABP1	ACE	ADH1A	ADH1B	ADHIC	ADH4	ADH5	ADH6	ADH7	ADRBI	ADRB2	AHR	AKAP9	ALB	ALDH1A1
	ALDH2	ALDH3A1	ALDH3A2	ALOX5	AOX1	APOA1	APOA2	ARID5B	ARNT	ARSA	ATP7A	ATP7B	BDNF	BRCA1	CASP
	CACNA1C	CBR1	CBR3	CDA	CES1	CES2	CFTR	CHST1	CHST10	CHST11	CHST13	CHST2	CHST3	CHST4	CHST5
	CHST6	CHST7	CHST8	CHST9	COMT	CPS1	CRHR1	CROT	CYP1A1	CYP1B1	CYP1B2	CYP17A1	CYP19A1	CYP1A1	CYP1A2
	CYP1B1	CYP2A1	CYP2A2	CYP2A4I	CYP26A1	CYP26C1	CYP27A1	CYP2A13	CYP2A6	CYP2A7	CYP2B6	CYP2B7P1	CYP2C18	CYP2C19	
	CYP2C8	CYP2C9	CYP2D6	CYP2E1	CYP2F1	CYP2J2	CYP2R1	CYP3A1	CYP3A4	CYP3A43	CYP3A5	CYP3A7	CYP46A1	CYP4A11	
	CYP4B1	CYP4F11	CYP4F2	CYP4F3	CYP4F8	CYP4Z1	CYP5A1	CYP7A1	CYP7B1	CYP8B1	DBH	DCK	DPYD	DRD1	
	DRD2	EGFR	EPHX1	EPHX2	ESR1	F5	FAAH	FKBP5	FMO1	FMO2	FMO3	FMO4	FMO5	FMO6	G6PD
	GLCCI1	GRK4	GRK5	GSTA1	GSTA2	GSTA3	GSTA4	GSTA5	GSTM1	GSTM2	GSTM3	GSTM4	GSTM5	GSTO1	GSTP1
	GSTM1	GSTM2	GSTM3	GSTM4	GSTM5	GSTM6	GSTM7	GSTM8	GSTM9	GSTM10	GSTM11	GSTM12	GSTM13	GSTM14	GSTM15
	GSTM16	GSTM17	GSTM18	GSTM19	GSTM20	GSTM21	GSTM22	GSTM23	GSTM24	GSTM25	GSTM26	GSTM27	GSTM28	GSTM29	GSTM30
	GSTM31	GSTM32	GSTM33	GSTM34	GSTM35	GSTM36	GSTM37	GSTM38	GSTM39	GSTM40	GSTM41	GSTM42	GSTM43	GSTM44	GSTM45
	GSTM46	GSTM47	GSTM48	GSTM49	GSTM50	GSTM51	GSTM52	GSTM53	GSTM54	GSTM55	GSTM56	GSTM57	GSTM58	GSTM59	GSTM60
	GSTM61	GSTM62	GSTM63	GSTM64	GSTM65	GSTM66	GSTM67	GSTM68	GSTM69	GSTM70	GSTM71	GSTM72	GSTM73	GSTM74	GSTM75
	GSTM76	GSTM77	GSTM78	GSTM79	GSTM80	GSTM81	GSTM82	GSTM83	GSTM84	GSTM85	GSTM86	GSTM87	GSTM88	GSTM89	GSTM90
	GSTM91	GSTM92	GSTM93	GSTM94	GSTM95	GSTM96	GSTM97	GSTM98	GSTM99	GSTM100	GSTM101	GSTM102	GSTM103	GSTM104	GSTM105
	GSTM106	GSTM107	GSTM108	GSTM109	GSTM110	GSTM111	GSTM112	GSTM113	GSTM114	GSTM115	GSTM116	GSTM117	GSTM118	GSTM119	GSTM120
	GSTM121	GSTM122	GSTM123	GSTM124	GSTM125	GSTM126	GSTM127	GSTM128	GSTM129	GSTM130	GSTM131	GSTM132	GSTM133	GSTM134	GSTM135
	GSTM136	GSTM137	GSTM138	GSTM139	GSTM140	GSTM141	GSTM142	GSTM143	GSTM144	GSTM145	GSTM146	GSTM147	GSTM148	GSTM149	GSTM150
	GSTM151	GSTM152	GSTM153	GSTM154	GSTM155	GSTM156	GSTM157	GSTM158	GSTM159	GSTM160	GSTM161	GSTM162	GSTM163	GSTM164	GSTM165
	GSTM166	GSTM167	GSTM168	GSTM169	GSTM170	GSTM171	GSTM172	GSTM173	GSTM174	GSTM175	GSTM176	GSTM177	GSTM178	GSTM179	GSTM180
	GSTM181	GSTM182	GSTM183	GSTM184	GSTM185	GSTM186	GSTM187	GSTM188	GSTM189	GSTM190	GSTM191	GSTM192	GSTM193	GSTM194	GSTM195
	GSTM196	GSTM197	GSTM198	GSTM199	GSTM200	GSTM201	GSTM202	GSTM203	GSTM204	GSTM205	GSTM206	GSTM207	GSTM208	GSTM209	GSTM210
	GSTM211	GSTM212	GSTM213	GSTM214	GSTM215	GSTM216	GSTM217	GSTM218	GSTM219	GSTM220	GSTM221	GSTM222	GSTM223	GSTM224	GSTM225
	GSTM226	GSTM227	GSTM228	GSTM229	GSTM230	GSTM231	GSTM232	GSTM233	GSTM234	GSTM235	GSTM236	GSTM237	GSTM238	GSTM239	GSTM240
	GSTM241	GSTM242	GSTM243	GSTM244	GSTM245	GSTM246	GSTM247	GSTM248	GSTM249	GSTM250	GSTM251	GSTM252	GSTM253	GSTM254	GSTM255
	GSTM256	GSTM257	GSTM258	GSTM259	GSTM260	GSTM261	GSTM262	GSTM263	GSTM264	GSTM265	GSTM266	GSTM267	GSTM268	GSTM269	GSTM270
	GSTM271	GSTM272	GSTM273	GSTM274	GSTM275	GSTM276	GSTM277	GSTM278	GSTM279	GSTM280	GSTM281	GSTM282	GSTM283	GSTM284	GSTM285
	GSTM286	GSTM287	GSTM288	GSTM289	GSTM290	GSTM291	GSTM292	GSTM293	GSTM294	GSTM295	GSTM296	GSTM297	GSTM298	GSTM299	GSTM300
	GSTM301	GSTM302	GSTM303	GSTM304	GSTM305	GSTM306	GSTM307	GSTM308	GSTM309	GSTM310	GSTM311	GSTM312	GSTM313	GSTM314	GSTM315
	GSTM316	GSTM317	GSTM318	GSTM319	GSTM320	GSTM321	GSTM322	GSTM323	GSTM324	GSTM325	GSTM326	GSTM327	GSTM328	GSTM329	GSTM330
	GSTM331	GSTM332	GSTM333	GSTM334	GSTM335	GSTM336	GSTM337	GSTM338	GSTM339	GSTM340	GSTM341	GSTM342	GSTM343	GSTM344	GSTM345
	GSTM346	GSTM347	GSTM348	GSTM349	GSTM350	GSTM351	GSTM352	GSTM353	GSTM354	GSTM355	GSTM356	GSTM357	GSTM358	GSTM359	GSTM360
	GSTM361	GSTM362	GSTM363	GSTM364	GSTM365	GSTM366	GSTM367	GSTM368	GSTM369	GSTM370	GSTM371	GSTM372	GSTM373	GSTM374	GSTM375
	GSTM376	GSTM377	GSTM378	GSTM379	GSTM380	GSTM381	GSTM382	GSTM383	GSTM384	GSTM385	GSTM386	GSTM387	GSTM388	GSTM389	GSTM390
	GSTM391	GSTM392	GSTM393	GSTM394	GSTM395	GSTM396	GSTM397	GSTM398	GSTM399	GSTM400	GSTM401	GSTM402	GSTM403	GSTM404	GSTM405
	GSTM406	GSTM407	GSTM408	GSTM409	GSTM410	GSTM411	GSTM412	GSTM413	GSTM414	GSTM415	GSTM416	GSTM417	GSTM418	GSTM419	GSTM420
	GSTM421	GSTM422</td													

PharmacoScreen

Anti-tuberculosis

DESCRIPTION

The PharmacoScreen Anti-tuberculosis Panel assesses genes associated with liver injury. Drug-induced liver injury (DILI), which is an important cause of acute liver failure, can be a threat to a patient and a common reason why some drug development projects are discontinued. According to a spontaneous reporting database from a research network of pharmacovigilance institutions in Korea, anti-tuberculosis drugs are reported to be the most common factor that leads to DILI demanding precise and personalized medicine.

SPECIFICATION

Gene count*	132 genes
Covered regions	Whole CDS + UTR (-50 bp, +10 bp)
Target size	186 kb
Mutation type	SNV, Indel, CNV
Sample type (amount)	Blood (> 50 ng of fragmented DNA)
Platform	All sequencers from Illumina, Thermo Fisher, MGI, PacBio, and Oxford Nanopore
Bioinformatics pipeline	Primary, Secondary and Tertiary analysis result (FASTQ to VCF, VCF to Clinical report)

* Gene Add-On Service: Genes can be added by customer's request

GENE LIST

PharmacoScreen Panel Anti-tuberculosis	ABHD5	ADA	ADORA2A	ALAS1	ALPK2	ANO10	ASAHI	BACHI	BAX	BCL2	BTLA	CARD8	CASPI
	CASP3	CASP8	CASP9	CAT	CCL2	CD274	CD276	CD28	CD40	CD40LG	CD80	CD86	CPA6
	CTLA4	CYBA	DDX10	DPP4	ENTPD1	FAHD2A	FAS	FASLG	FBXW8	FOXP3	GCLC	GCLM	GGT1
	GPX1	GPX3	GPX4	GSR	GSS	GSTAI	GSTA2	GSTA3	GSTA4	GSTA5	GSTK1	GSTM2	GSTM3
	GSTM4	GSTM5	GSTO1	GSTO2	GSTT2	GSTZ1	HAVCR2	HIFIA	HMOX1	HMOX2	HSPAIL	ICOS	ICOSLG
	IDO1	IDO2	IFNG	IFNGR1	IFNGR2	IL10	IL10RA	IL12A	IL12B	IL12RB1	IL12RB2	IL17A	IL17RA
	IL18	IL18RI	IL18RAP	IL1A	IL1B	IL1R1	IL4	IL4R	IL6	IL6R	KCNNE3	KCNIP3	KEAP1
	KSR2	LAG3	LGALS9	MAFK	MIR4272	MPO	NFE2L2	NLRP3	NOS1	NOS2	NOS3	NT5E	PDCD1
	PDCD1G2	PLXNA4	POLD3	PROM2	PSD3	SOD1	SOD3	SRXN1	STAT3	TGFBI	TGFBR1	THSD7B	TNFRSF4
	TNF	TNFAIP3	TNFRSF14	TNFRSF1A	TNFRSF1B	TNFRSF9	TNFSF10	TNFSF14	TNFSF4	TNFSF9	TRIM43	TXNRD1	USP44
	VTCN1	ZNF804B											