VARIANT*Plex* Expanded Carrier Panel

Description

The VARIANT*Plex* Expanded Carrier panel is a balanced pool of gene-specific primer (GSP) oligonucleotides that is optimized for use with VARIANT*Plex* reagents and molecular barcode (MBC) adapters to produce targeted NGS libraries. This product insert should be used in conjunction with VARIANT*Plex* standard protocol (RA-DOC-057).

Description	Part number	Storage
VARIANT*Plex* Expanded Carrier GSP1, 8 reactions	cSA17627081	–20°C ± 10°C
VARIANT*Plex* Expanded Carrier GSP2, 8 reactions	cSA17627082	

Required reagent volumes

Protocol reference	Protocol Step	Reagent	Volume per reaction (µL)
A	Adapter Ligation	10mM Tris-HCl pH 8.0	18
B	First PCR	VARIANT*Plex* Expanded Carrier GSP1	4
C	First PCR	Purified DNA	16
D	First PCR	10mM Tris-HCl pH 8.0	18
E	Second PCR	Purified DNA	16
F	Second PCR	VARIANT*Plex* Expanded Carrier GSP2	4

Recommended PCR cycling

	Step	Temperature (°C)	Time	Cycles
First PCR reaction	**1**	95	3 min	1
	2	95	30 sec	15
	3	60	10 sec	
	4	61	5 min (100% ramp rate)	
	5	72	3 min	1
	6	4	Hold	1
Second PCR reaction	**1**	95	3 min	1
	2	95	30 sec	20†
	3	60	10 sec	
	4	65	5 min (100% ramp rate)	
	5	72	3 min	1
	6	4	Hold	1

†The number of PCR2 cycles may be decreased if you regularly experience library yields greater than 200 nM.

Recommended reads and multiplexing

VARIANT*Plex* Expanded Carrier libraries should be sequenced to a minimum of **1.5M reads**. Starting read depth recommendations for standard profiling may be adjusted based on user needs.

Archer™ Analysis settings

Sequencing data should be processed using Archer Analysis (v7.0, or greater). The VARIANT*Plex* Expanded Carrier panel requires selection of the ***SNV/Indel, Structural Variation, and Copy Number Variantion*** pipelines, found under the ***DNA*** Input Type (see the Archer Analysis User Guide for more details on setting up your analysis). Selection of the DNA Target Coverage pipeline is optional.

Processing of VARIANT*Plex* Expanded Carrier libraries requires a one-time upload of the Panel GTF. When performing DNA Target Coverage analysis, users must also select a Region

of Interest BED file. Users may optionally add a Targeted Mutations VCF file for targeted SNV/Indel detection. Files can be obtained by contacting archer-tech@idtdna.com

Assay targets

Gene	Accession	Exon
ABCD1	NM_000033	1,2,3,4,5,6,7,8,9,10
ABCD4	NM_005050	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19
ACAD8	NM_014384	1,2,3,4,5,6,7,8,9,10,11
ACADM	NM_000016	1,3,4,5,6,7,8,9,10,11,12
ACADM	NM_001127328	2
ACADM	NM_001286043	5
ACADS	NM_000017	1,2,3,4,5,6,7,8,9,10
ACADSB	NM_001609	1,2,3,4,5,6,7,8,9,10,11
ACADVL	NM_000018	1,2,3,4,5,6,7,8,9,10,11,12,14,15,17,19,20
ACADVL	NM_001270447	1,2
ACAT1	NM_000019	1,2,3,4,5,6,7,8,9,10,11,12
ACSF3	NM_174917	3,4,5,6,7,8,9,10,11
ADA	NM_000022	1,2,3,4,5,6,7,8,9,10,11,12
AHCY	NM_000687	1,2,3,4,5,6,7,8,9,10
ARG1	NM_000045	1,2,4,5,6,7,8
ARG1	NM_001244438	3
ASL	NM_000048	3,4,5,6,7,8,9,10,11,12,13,14,15,16,17
ASL	NM_001024943	1
ASPA	NM_000049	1,2,3,4,5,6
ASS1	NM_000050	3,4,5,6,7,8,9,10,11,12,13,14,15,16
AUH	NM_001698	1,2,3,4,5,6,7,8,9,10
BCKDHA	NM_000709	1,2,3,4,5,6,7,8,9
BCKDHB	NM_000056	1,2,3,4,5,6,7,8,9
BCKDHB	NM_183050	10
BLM	NM_000057	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22
BTD	NM_000060	Alternate exon 1 (chr3:15643227-15643277),1,2,3,4

Gene	Accession	Exon
BTD	NM_001281724	3
CBS	NM_000071	3,4,5,6,7,8,9,10,11,12,13,14,15,16,17
CD320	NM_016579	1,2,3,4,5
CFTR	NM_000492	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27
CFTR	NM_000492	Select intronic variants
CPT1A	NM_001876	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19
CPT2	NM_000098	1,2,3,4,5
CYP21A2	NM_000500	1,2,3,4,5,6,7,8,9,10
DBT	NM_001918	1,2,3,4,5,6,7,8,9,10,11
DLD	NM_000108	1,2,3,4,5,6,7,8,9,10,11,12,13,14
DNAJC19	NM_145261	1,3,4,5,6
DUOX2	NM_014080	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31, 32,33,34
ETFA	NM_000126	1,2,3,4,5,6,7,8,9,10,11,12
ETFB	NM_001014763	1
ETFB	NM_001985	1,3,4,5,6
ETFDH	NM_004453	1,2,3,4,5,6,7,8,9,10,11,12,13
FAH	NM_000137	1,2,3,4,5,6,7,8,9,10,11,12,13,14
FANCC	NM_000136	Select hotspots, see target BED
G6PC	NM_000151	1,2,3,4,5
G6PD	NM_000402	1,2,4,5,6,7,8,9,10,11,12,13
GAA	NM_000152	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20
GALC	NM_000153	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17
GALC	NM_001201402	1
GALE	NM_000403	3,4,5,6,7,9,10,11,12
GALK1	NM_000154	1,2,3,4,5,6,7,8
GALT	NM_000155	1,2,3,5,6,7,8,9,10,11
GBA	NM_000157	1,2,3,4,5,6,7,8,9,10,11
GCDH	NM_000159	2,4,5,6,7,8,9,10,11,12
GCH1	NM_000161	1,2,3,4,5,6

Gene	Accession	Exon
GJB2	NM_004004	2
GJB3	NM_001005752	2
GJB6	NM_006783	3
GLA	NM_000169	1,2,3,4,5,6,7
GNMT	NM_018960	1,2,3,4,5,6
HADH	NM_001184705	7
HADH	NM_005327	1,2,3,4,5,6,7,8
HADHA	NM_000182	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20
HADHB	NM_000183	2,3,4,5,6,7,8,9,10,11,13,14,15,16
HADHB	NM_001281513	4
HBA1	NM_000558	1,2,3
HBA2	NM_000517	1,2,3
HBB	NM_000518	1,2,3
HCFC1	NM_005334	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26
HEXA	NM_000520	1,2,3,4,5,6,7,8,9,10,11,12,13,14
HLCS	NM_000411	4,5,6,7,8,9,10,11,12
HMGCL	NM_000191	1,2,3,4,5,6,7,8,9
HPD	NM_002150	1,3,4,5,6,7,8,9,10,11,12,13,14
HSD17B10	NM_004493	1,2,3,4,5,6
IDUA	NM_000203	1,2,3,4,5,6,8,9,10,11,12,13,14
IKBKAP	NM_003640	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37
IL2RG	NM_000206	1,2,3,4,5,6,7,8
IVD	NM_002225	1,2,3,4,5,6,7,8,9,10,11,12
LMBRD1	NM_018368	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16
MAT1A	NM_000429	1,2,3,4,5,6,7,8,9
MCCC1	NM_020166	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19
MCCC2	NM_022132	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17
MCEE	NM_032601	1,2,3
MCOLN1	NM_020533	1,2,3,4,5,6,7,8,9,10,11,12,13,14

Gene	Accession	Exon
MLYCD	NM_012213	1,2,3,4,5
MMAA	NM_172250	2,3,4,5,6,7
MMAB	NM_052845	1,2,3,4,5,6,7,8,9
MMACHC	NM_015506	1,2,3,4
MMADHC	NM_015702	2,3,4,5,6,7,8
MTHFR	NM_005957	2,3,4,5,6,7,8,9,10,11,12
MTR	NM_000254	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33
MTRR	NM_002454	3,4,5,6,7,8,9,10,11,12,13,14,15
MTRR	NM_024010	1,2
MUT	NM_000255	2,3,4,5,6,7,8,9,10,11,12,13
NPC1	NM_000271	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25
NPC2	NM_006432	1,2,3,4,5
OPA3	NM_001017989	2
OPA3	NM_025136	1,2
OTC	NM_000531	1,2,3,4,5,6,7,8,9,10
PAH	NM_000277	1,2,3,4,5,6,7,8,9,10,11,12,13
PAX8	NM_003466	2,3,4,5,6,7,8,9,10,11,12
PCBD1	NM_000281	1,2,3,4
PCCA	NM_000282	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24
PCCB	NM_000532	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15
PCCB	NM_001178014	4
PTS	NM_000317	1,2,3,4,5,6
QDPR	NM_000320	1,2,3,4,5,6,7
SLC22A5	NM_001308122	2
SLC22A5	NM_003060	1,2,3,4,5,6,7,8,9,10
SLC25A13	NM_001160210	10
SLC25A13	NM_014251	1,2,3,4,5,6,7,8,9,11,12,13,14,15,16,17,18
SLC25A20	NM_000387	1,2,3,4,5,6,7,8,9
SLC26A4	NM_000441	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21

Gene	Accession	Exon
SLC5A5	NM_000453	1,2,3,4,5,6,7,8,9,11,12,13,14,15
SMPD1	NM_000543	1,2,3,4,5,6
TAT	NM_000353	2,3,4,5,6,7,8,9,10,11,12
TAZ	NM_000116	1,2,3,4,5,6,8,9,10,11
TCN2	NM_000355	1,2,3,4,5,6,7,8,9
TG	NM_003235	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48
THRA	NM_003250	2,3,4,5,6,7,8,10
THRA	NM_199334	9
THRB	NM_000461	3,4,5,6,7,8,9,10
TPO	NM_000547	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17
TSHB	NM_000549	2
TSHB	NM_001277991	1
TSHR	NM_000369	1,2,3,4,5,6,7,8,9,10
TSHR	NM_001142626	9

Genes targeted for CNV

ABCD1	*CBS*	*GALT*	*HSD17B10*	*NPC1*	*TG*
ABCD4	*CD320*	*GBA*	*IDUA*	*NPC2*	*THRA*
ACAD8	*CFTR*	*GCDH*	*IKBKAP*	*OPA3*	*THRB*
ACADM	*CPT1A*	*GCH1*	*IL2RG*	*OTC*	*TPO*
ACADS	*CPT2*	*GJB2*	*IVD*	*PAH*	*TSHB*
ACADSB	*CYP21A2*	*GJB3*	*LMBRD1*	*PAX8*	*TSHR*
ACADVL	*DBT*	*GJB6*	*MAT1A*	*PCBD1*	*TAZ*
ACAT1	*DLD*	*GLA*	*MCCC1*	*PCCA*	*TCN2*
ACSF3	*DNAJC19*	*GNMT*	*MCCC2*	*PCCB*	
ADA	*DUOX2*	*HADH*	*MCEE*	*PTS*	
AHCY	*ETFA*	*HADHA*	*MCOLN1*	*QDPR*	
ARG1	*ETFB*	*HADHB*	*MLYCD*	*SLC22A5*	
ASL	*ETFDH*	*HBA1*	*MMAA*	*SLC25A13*	
ASPA	*FAH*	*HBA2*	*MMAB*	*SLC25A20*	
ASS1	*G6PC*	*HBB*	*MMACHC*	*SLC26A4*	
AUH	*G6PD*	*HCFC1*	*MMADHC*	*SLC5A5*	
BCKDHA	*GAA*	*HEXA*	*MTHFR*	*SMN1*	
BCKDHB	*GALC*	*HLCS*	*MTR*	*SMN2*	
BLM	*GALE*	*HMGCL*	*MTRR*	*SMPD1*	
BTD	*GALK1*	*HPD*	*MUT*	*TAT*	

Please contact archer-tech@idtdna.com to inquire about enabling additional genes for CNV detection.

SNPs and sites targeted for sample tracking

rs560681	rs430046	rs987640	rs10776839	rs12393891
rs740598	rs8078417	rs6444724	rs6530357	chrX:4429309
rs1498553	rs9951171	rs6811238	rs5971553	chrX:11314433
rs10773760	rs576261	rs13182883	rs5953060	chrY:6738552
rs1058083	rs1109037	rs214955	rs6524626	chrY:19490214
rs4530059	rs1523537	rs321198	rs5940270	
rs1821380	rs221956	rs4606077	rs722847	

SNPs may be used in combination to uniquely tag and track samples over time. Contact archer-tech@idtdna.com for further details.

Limitations of use

For research use only. Not for use in diagnostic procedures. Unless otherwise agreed to in writing, IDT does not intend these products to be used in clinical applications and does not warrant their fitness or suitability for any clinical diagnostic use. Purchaser is solely responsible for all decisions regarding the use of these products and any associated regulatory or legal obligations.

Safety data sheets pertaining to this product are available upon request.

Revision History

Document Number	Date	Description of change
RA-DOC-040/REV01	June 2023	Initial release
RA-DOC-040/REV02	November 2023	Updated First and Second PCR cycling conditions to include separate anneal and extended steps. Updated reagent in step A under “Required reagent volumes” section. Updated branding.
RA-DOC-030/REV03	February 2025	Updated part numbers.