

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 <i>Plex</i> Expanded Carrier GSP1, 8 reactions	dSA17627081	-20°C ± 10°C
VARIANT <i>Plex</i> Expanded Carrier GSP2, 8 reactions	dSA17627082	

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 <i>Plex</i> 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 <i>Plex</i> Expanded Carrier GSP2	4

Recommended PCR cycling

	Step	Temperature (°C)	Time	Cycles
First PCR reaction	1	95	3 min	1
	2	95	30 sec	
	3	60	10 sec	15
	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	
	3	60	10 sec	20†
	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 Variation** 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
<i>ABCD1</i>	NM_000033	1,2,3,4,5,6,7,8,9,10
<i>ABCD4</i>	NM_005050	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19
<i>ACAD8</i>	NM_014384	1,2,3,4,5,6,7,8,9,10,11
<i>ACADM</i>	NM_000016	1,3,4,5,6,7,8,9,10,11,12
<i>ACADM</i>	NM_001127328	2
<i>ACADM</i>	NM_001286043	5
<i>ACADS</i>	NM_000017	1,2,3,4,5,6,7,8,9,10
<i>ACADSB</i>	NM_001609	1,2,3,4,5,6,7,8,9,10,11
<i>ACADVL</i>	NM_000018	1,2,3,4,5,6,7,8,9,10,11,12,14,15,17,19,20
<i>ACADVL</i>	NM_001270447	1,2
<i>ACAT1</i>	NM_000019	1,2,3,4,5,6,7,8,9,10,11,12
<i>ACSF3</i>	NM_174917	3,4,5,6,7,8,9,10,11
<i>ADA</i>	NM_000022	1,2,3,4,5,6,7,8,9,10,11,12
<i>AHCY</i>	NM_000687	1,2,3,4,5,6,7,8,9,10
<i>ARG1</i>	NM_000045	1,2,4,5,6,7,8
<i>ARG1</i>	NM_001244438	3
<i>ASL</i>	NM_000048	3,4,5,6,7,8,9,10,11,12,13,14,15,16,17
<i>ASL</i>	NM_001024943	1
<i>ASPA</i>	NM_000049	1,2,3,4,5,6
<i>ASS1</i>	NM_000050	3,4,5,6,7,8,9,10,11,12,13,14,15,16
<i>AUH</i>	NM_001698	1,2,3,4,5,6,7,8,9,10
<i>BCKDHA</i>	NM_000709	1,2,3,4,5,6,7,8,9
<i>BCKDHB</i>	NM_000056	1,2,3,4,5,6,7,8,9
<i>BCKDHB</i>	NM_183050	10
<i>BLM</i>	NM_000057	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22
<i>BTD</i>	NM_000060	Alternate exon 1 (chr3:15643227-15643277),1,2,3,4

Gene	Accession	Exon
<i>BTBD</i>	NM_001281724	3
<i>CBS</i>	NM_000071	3,4,5,6,7,8,9,10,11,12,13,14,15,16,17
<i>CD320</i>	NM_016579	1,2,3,4,5
<i>CFTR</i>	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
<i>CFTR</i>	NM_000492	Select intronic variants
<i>CPT1A</i>	NM_001876	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19
<i>CPT2</i>	NM_000098	1,2,3,4,5
<i>CYP21A2</i>	NM_000500	1,2,3,4,5,6,7,8,9,10
<i>DBT</i>	NM_001918	1,2,3,4,5,6,7,8,9,10,11
<i>DLD</i>	NM_000108	1,2,3,4,5,6,7,8,9,10,11,12,13,14
<i>DNAJC19</i>	NM_145261	1,3,4,5,6
<i>DUOX2</i>	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
<i>ETFA</i>	NM_000126	1,2,3,4,5,6,7,8,9,10,11,12
<i>ETFB</i>	NM_001014763	1
<i>ETFB</i>	NM_001985	1,3,4,5,6
<i>ETFDH</i>	NM_004453	1,2,3,4,5,6,7,8,9,10,11,12,13
<i>FAH</i>	NM_000137	1,2,3,4,5,6,7,8,9,10,11,12,13,14
<i>FANCC</i>	NM_000136	Select hotspots, see target BED
<i>G6PC</i>	NM_000151	1,2,3,4,5
<i>G6PD</i>	NM_000402	1,2,4,5,6,7,8,9,10,11,12,13
<i>GAA</i>	NM_000152	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20
<i>GALC</i>	NM_000153	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17
<i>GALC</i>	NM_001201402	1
<i>GALE</i>	NM_000403	3,4,5,6,7,9,10,11,12
<i>GALK1</i>	NM_000154	1,2,3,4,5,6,7,8
<i>GALT</i>	NM_000155	1,2,3,5,6,7,8,9,10,11
<i>GBA</i>	NM_000157	1,2,3,4,5,6,7,8,9,10,11
<i>GCDH</i>	NM_000159	2,4,5,6,7,8,9,10,11,12
<i>GCH1</i>	NM_000161	1,2,3,4,5,6

Gene	Accession	Exon
<i>GJB2</i>	NM_004004	2
<i>GJB3</i>	NM_001005752	2
<i>GJB6</i>	NM_006783	3
<i>GLA</i>	NM_000169	1,2,3,4,5,6,7
<i>GNMT</i>	NM_018960	1,2,3,4,5,6
<i>HADH</i>	NM_001184705	7
<i>HADH</i>	NM_005327	1,2,3,4,5,6,7,8
<i>HADHA</i>	NM_000182	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20
<i>HADHB</i>	NM_000183	2,3,4,5,6,7,8,9,10,11,13,14,15,16
<i>HADHB</i>	NM_001281513	4
<i>HBA1</i>	NM_000558	1,2,3
<i>HBA2</i>	NM_000517	1,2,3
<i>HBB</i>	NM_000518	1,2,3
<i>HCFC1</i>	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
<i>HEXA</i>	NM_000520	1,2,3,4,5,6,7,8,9,10,11,12,13,14
<i>HLCS</i>	NM_000411	4,5,6,7,8,9,10,11,12
<i>HMGCL</i>	NM_000191	1,2,3,4,5,6,7,8,9
<i>HPD</i>	NM_002150	1,3,4,5,6,7,8,9,10,11,12,13,14
<i>HSD17B10</i>	NM_004493	1,2,3,4,5,6
<i>IDUA</i>	NM_000203	1,2,3,4,5,6,8,9,10,11,12,13,14
<i>IKBKAP</i>	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
<i>IL2RG</i>	NM_000206	1,2,3,4,5,6,7,8
<i>IVD</i>	NM_002225	1,2,3,4,5,6,7,8,9,10,11,12
<i>LMBRD1</i>	NM_018368	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16
<i>MAT1A</i>	NM_000429	1,2,3,4,5,6,7,8,9
<i>MCCC1</i>	NM_020166	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19
<i>MCCC2</i>	NM_022132	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17
<i>MCEE</i>	NM_032601	1,2,3
<i>MCOLN1</i>	NM_020533	1,2,3,4,5,6,7,8,9,10,11,12,13,14

Gene	Accession	Exon
<i>MLYCD</i>	NM_012213	1,2,3,4,5
<i>MMAA</i>	NM_172250	2,3,4,5,6,7
<i>MMAB</i>	NM_052845	1,2,3,4,5,6,7,8,9
<i>MMACHC</i>	NM_015506	1,2,3,4
<i>MMADHC</i>	NM_015702	2,3,4,5,6,7,8
<i>MTHFR</i>	NM_005957	2,3,4,5,6,7,8,9,10,11,12
<i>MTR</i>	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
<i>MTRR</i>	NM_002454	3,4,5,6,7,8,9,10,11,12,13,14,15
<i>MTRR</i>	NM_024010	1,2
<i>MUT</i>	NM_000255	2,3,4,5,6,7,8,9,10,11,12,13
<i>NPC1</i>	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
<i>NPC2</i>	NM_006432	1,2,3,4,5
<i>OPA3</i>	NM_001017989	2
<i>OPA3</i>	NM_025136	1,2
<i>OTC</i>	NM_000531	1,2,3,4,5,6,7,8,9,10
<i>PAH</i>	NM_000277	1,2,3,4,5,6,7,8,9,10,11,12,13
<i>PAX8</i>	NM_003466	2,3,4,5,6,7,8,9,10,11,12
<i>PCBD1</i>	NM_000281	1,2,3,4
<i>PCCA</i>	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
<i>PCCB</i>	NM_000532	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15
<i>PCCB</i>	NM_001178014	4
<i>PTS</i>	NM_000317	1,2,3,4,5,6
<i>QDPR</i>	NM_000320	1,2,3,4,5,6,7
<i>SLC22A5</i>	NM_001308122	2
<i>SLC22A5</i>	NM_003060	1,2,3,4,5,6,7,8,9,10
<i>SLC25A13</i>	NM_001160210	10
<i>SLC25A13</i>	NM_014251	1,2,3,4,5,6,7,8,9,11,12,13,14,15,16,17,18
<i>SLC25A20</i>	NM_000387	1,2,3,4,5,6,7,8,9
<i>SLC26A4</i>	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
<i>SLC5A5</i>	NM_000453	1,2,3,4,5,6,7,8,9,11,12,13,14,15
<i>SMPD1</i>	NM_000543	1,2,3,4,5,6
<i>TAT</i>	NM_000353	2,3,4,5,6,7,8,9,10,11,12
<i>TAZ</i>	NM_000116	1,2,3,4,5,6,8,9,10,11
<i>TCN2</i>	NM_000355	1,2,3,4,5,6,7,8,9
<i>TG</i>	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
<i>THRA</i>	NM_003250	2,3,4,5,6,7,8,10
<i>THRA</i>	NM_199334	9
<i>THRB</i>	NM_000461	3,4,5,6,7,8,9,10
<i>TPO</i>	NM_000547	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17
<i>TSHB</i>	NM_000549	2
<i>TSHB</i>	NM_001277991	1
<i>TSHR</i>	NM_000369	1,2,3,4,5,6,7,8,9,10
<i>TSHR</i>	NM_001142626	9

Genes targeted for CNV

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

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

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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.