Assisted Reproduction

Single-Cell Amplification for NGS

PGT-A

PGT-M

PGT-SR



CWBIO



ABOUT US

Founded in 2007, CoWin is a high-tech enterprise with independent intellectual property rights, focusing on the life sciences and molecular diagnostics fields. The company successfully went public on the STAR Market of the Shanghai Stock Exchange in 2022 (stock code: 688426). Our headquarters in Taizhou covers over 55,000 square meters, with two research and development centers in Taizhou and Beijing. With over 18 years of research and development experience in enzyme reagents, nucleic acid preservation, and sample preparation, CoWin specializes in the research, production, and sales of molecular detection products, as well as providing molecular detection services. CoWin is one of the few biotech companies in China that has achieved a complete business layout encompassing core aspects of molecular detection.

CoWin upholds the mission of " Make Every Life Healthy and Promising " and is dedicated to the independent research and development of enzyme material for molecular detection. Our key products include a variety of core enzymes for molecular detection, sample collection and stabilization tools, nucleic acid extraction kits, high-throughput sequencing kits, and research instruments.

CoWin Product Solution

Single Cell Isolation

↓

Single Cell Amplification

DOP-PCR
CWX401 Single Cell WGA Kit



MDA
CW2843 Single Cell WGA Kit (MDA)



↓

NGS Library Construction

Enzyme-Based Method
CW3048 CWseq Universal DirectFast DNA Library Prep Kit (Illumina&MGI)



Mechanical Fragmentation Method
CW3045 Fast DNA Library Prep Set for Illumina&MGI

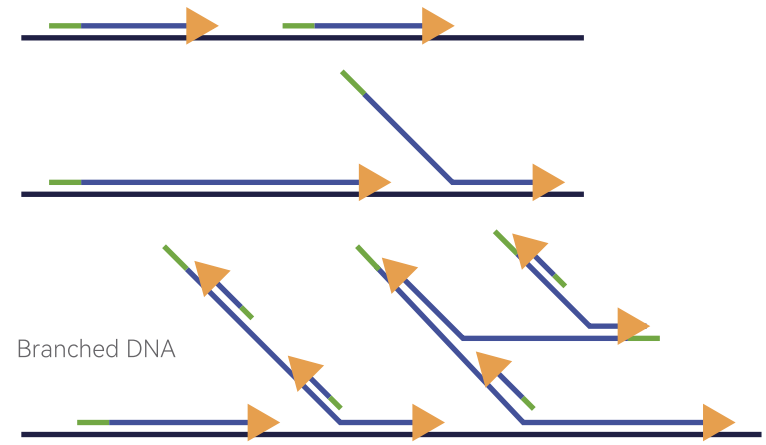


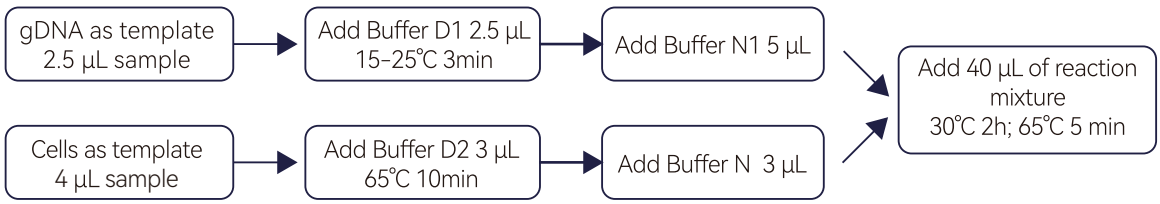
Single Cell Whole-Genome Amplification Kit

Cat. No.	Product Name	Feature
CWX401	Single Cell WGA Kit	DOP PCR-based single cell WGA kit, 200-1500 bp
CW2843	Single Cell WGA Kit（MDA）	MDA based single cell WGA kit, 2-100 kb

Single-Cell Amplification Principle

Single-Cell Whole Genome Amplification Kit





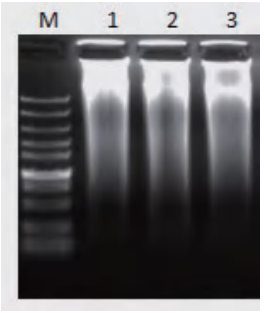
Product Advantages

- **Simple Operation and High Sensitivity**: A single cell or 15 pg of total DNA can be used as the starting template. The CW2843 offers a 2-hour amplification time.
- **High Uniformity**: Suitable for analyzing chromosomal copy number variations (CNVs) exceeding 4 Mb.
- **Accurate Analysis**: The Kit enables highly reproducible and precise analysis of single nucleotide variations (SNVs) and copy number variations (CNVs).

Product Performance

High Sensitivity

(1) The products were amplified with gDNA and single cells of tumor cells as templates, CoW- in's Single Cell WGA Kit was used to compare the amplification effect with the same kit of company A.The data comparison is as follows:



1: Company A's Kit- amplification with Single-Cell
2: CoWin's Kit - amplification with Single-Cell
3: CoWin's Kit - amplification with gDNA

(2) The yield of amplification products (reaction time 2h)was detected by using gDNA with different input amounts as templates, and the amplification products were detected by qPCR :

Template Input Amount	1ng	0.5ng	0.1ng	0.05ng
Amplification Product Concentration(ng/uL)	656.5	624.0	614.3	624.0
Amplification Product Yield (ug)	32.8	31.2	30.7	31.2

No.	1ng	0.5ng	0.1ng	0.05ng	SC-NTC	PC	NC
Primer 1	25.2	25.7	26.1	26.4	37.5	25.0	N/A
Primer 2	26.5	26.4	27.7	27.0	39.7	26.0	38.8
Primer 3	26.4	26.3	26.7	27.1	N/A	25.7	N/A
Primer 4	26.9	27.3	26.9	27.8	34.5	26.0	34.7
Primer 5	25.6	25.7	26.3	25.7	39.1	25.3	N/A
Primer 6	25.9	25.8	26.2	27.7	32.4	24.5	32.7
Primer 7	25.1	25.1	25.9	25.4	N/A	25.0	38.8
Primer 8	27.2	27.2	28.2	27.4	N/A	25.6	N/A
Mean CT Value	26.1	26.2	26.8	26.8	—	25.4	—

(3) The products were amplified with gDNA and single cells of tumor cells as templates, CoWin's Single Cell WGA Kit was used to compare the amplification effect with company A, and CoWin's library preparation kit was used for database construction.The data comparison is as follows:

① CoWin's Kit-single cell amplification product as a template

② Company A's Kit single cell amplification product as a template

③ Control-Tumor cells gDNA as a template

Chr	Start	End	Ref	Alt	DP	AD	Freq	MuType	Gene	Accession	Exon	CDSMutation	AAMutation
chr4	55141055	55141055	A	G	124763	124556	99.83%	synonymous SNV	PDGFRA	NM_006206	exon12	c.1701A>G	p.P567P
chr17	7579472	7579472	G	C	237655	236767	99.63%	nonsynonymous SNV	TP53	NM_001126118	exon3	c.98C>G	p.P33R
chr5	112175770	112175770	G	A	560217	557656	99.54%	synonymous SNV	APC	NM_000038	exon16	c.4479G>A	p.T1493T
chr12	25380275	25380275	T	A	67244	66547	98.96%	nonsynonymous SNV	KRAS	NM_033360	exon3	c.183A>T	p.Q61H
chr19	1207021	1207021	C	T	28104	26461	94.15%	stopgain	STK11	NM_000455	exon1	c.109C>T	p.Q37X
chr11	534242	534242	A	G	15577	14552	93.42%	synonymous SNV	HRAS	NM_001130442	exon2	c.81T>C	p.H27H
chr3	178936091	178936091	G	A	25851	12673	49.02%	nonsynonymous SNV	PIK3CA	NM_006218	exon10	c.1633G>A	p.E545K
chr5	170837552	170837552	T	G	195706	3009	1.54%	nonsynonymous SNV	NPM1	NM_199185	exon10	c.781T>G	p.W261G
Chr	Start	End	Ref	Alt	DP	AD	Freq	MuType	Gene	Accession	Exon	CDSMutation	AAMutation
chr4	55141055	55141055	A	G	150763	150489	99.82%	synonymous SNV	PDGFRA	NM_006206	exon12	c.1701A>G	p.P567P
chr17	7579472	7579472	G	C	966636	962952	99.62%	nonsynonymous SNV	TP53	NM_001126118	exon3	c.98C>G	p.P33R
chr5	112175770	112175770	G	A	496937	494415	99.49%	synonymous SNV	APC	NM_000038	exon16	c.4479G>A	p.T1493T
chr12	25380275	25380275	T	A	70831	69765	98.50%	nonsynonymous SNV	KRAS	NM_033360	exon3	c.183A>T	p.Q61H
chr19	1207021	1207021	C	T	225570	221173	98.05%	stopgain	STK11	NM_000455	exon1	c.109C>T	p.Q37X
chr11	534242	534242	A	G	13870	12133	87.48%	synonymous SNV	HRAS	NM_001130442	exon2	c.81T>C	p.H27H
chr3	178936091	178936091	G	A	27184	14365	52.84%	nonsynonymous SNV	PIK3CA	NM_006218	exon10	c.1633G>A	p.E545K
chr17	7578408	7578408	C	T	511792	34915	6.82%	synonymous SNV	TP53	NM_0011276699	exon1	c.45G>A	p.R15R
chr5	170837552	170837552	T	G	323647	5310	1.64%	nonsynonymous SNV	NPM1	NM_199185	exon10	c.781T>G	p.W261G
chr5	112175634	112175634	C	G	180247	2812	1.56%	nonsynonymous SNV	APC	NM_000038	exon16	c.4343C>G	p.T1448S
Chr	Start	End	Ref	Alt	DP	AD	Freq	MuType	Gene	Accession	Exon	CDSMutation	AAMutation
chr4	55141055	55141055	A	G	107893	107676	99.80%	synonymous SNV	PDGFRA	NM_006206	exon12	c.1701A>G	p.P567P
chr17	7579472	7579472	G	C	309458	308019	99.54%	nonsynonymous SNV	TP53	NM_001126118	exon3	c.98C>G	p.P33R
chr5	112175770	112175770	G	A	370052	368112	99.48%	synonymous SNV	APC	NM_000038	exon16	c.4479G>A	p.T1493T
chr12	25380275	25380275	T	A	60113	59163	98.42%	nonsynonymous SNV	KRAS	NM_033360	exon3	c.183A>T	p.Q61H
chr19	1207021	1207021	C	T	189902	186877	98.41%	stopgain	STK11	NM_000455	exon1	c.109C>T	p.Q37X
chr11	534242	534242	A	G	16959	15834	93.37%	synonymous SNV	HRAS	NM_001130442	exon2	c.81T>C	p.H27H
chr3	178936091	178936091	G	A	67237	32423	48.22%	nonsynonymous SNV	PIK3CA	NM_006218	exon10	c.1633G>A	p.E545K
chr7	5542430	5542430	G	A	28209	3025	10.72%	nonsynonymous SNV	EGFR	NM_005228	exon19	c.2200G>A	p.E734K
chr5	112175634	112175634	C	G	139042	4961	3.57%	nonsynonymous SNV	APC	NM_000038	exon16	c.4343C>G	p.T1448S
chr5	170837552	170837552	T	G	566344	8904	1.57%	nonsynonymous SNV	NPM1	NM_199185	exon10	c.781T>G	p.W261G
chr3	178936092	178936092	A	C	67238	1042	1.55%	nonsynonymous SNV	PIK3CA	NM_006218	exon10	c.1634A>C	p.E545A
chr17	7577049	7577049	G	A	130426	1975	1.51%	nonsynonymous SNV	TP53	NM_0011276699	exon4	c.412C>T	p.H138Y

Conclusion: Compared with similar products, CoWin's Single Cell WGA Kit has excellent amplification performance, high sensitivity and amplification yield. It can effectively detect SNV mutations in tumor cells.

Next-generation sequencing

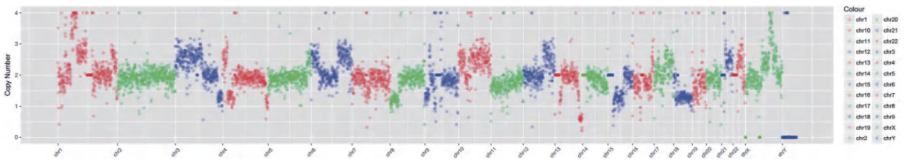
Cat. No.	Product Name	Feature
CW3048	CWseq Universal DirectFast DNA Library Prep Kit (Illumina & MGI)	Enzyme-based DNA library construction
CW3045	Fast DNA Library Prep Set for Illumina&MGI	Universal DNA library construction
CW3084	CWseq® Unique Dual Index Primer Kit for Illumina (Plates)	UDI Primers Set 1-Set 4 for illumima
CW3091	CWseq® Unique Dual Index Primers Set 5-Set 8 for Illumina (Plates)	UDI Primers Set 5-Set 8 for illumima
CW3079	NGS Combinatorial Dual Index Primers Kit for Illumina (Set II)	CDI Primers for illumima
CW3082	CWseq UDB Primer Kit for MGI (Plates)	UDB Primers for MGI

Product Performance

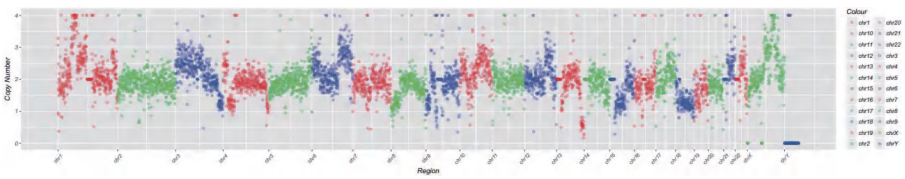
High Accuracy

(1) The products were amplified with single cells of tumor cells as templates, after amplification by CoWin's Single Cell WGA Kit, three types of CoWin's lilbrary preparation kits were used to build libraries for the amplified products. The CNV detection was as follows:

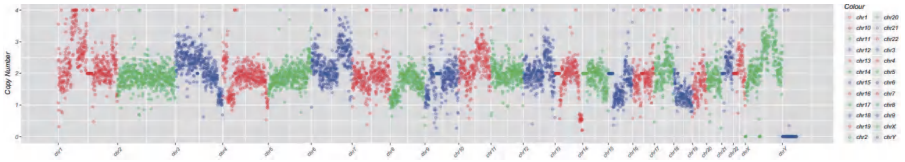
① DNA library preparation kit by mechanical fragmentation method



② DNA library preparation kit by firagmentation enzymatic method

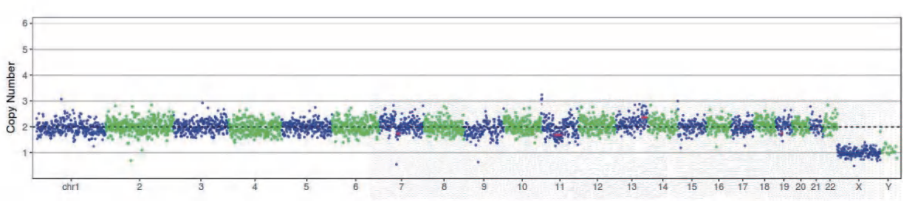


③ DNA library preparation kit by Tn5 transposase method

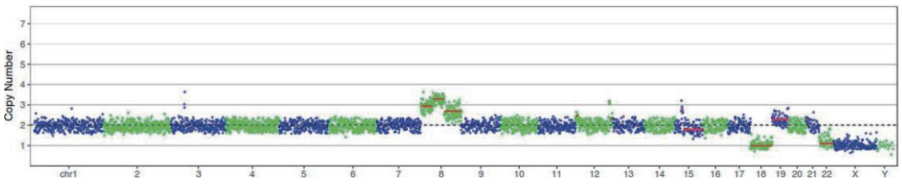


(2) For different types of samples, CoWin's Single Cell WGA Kit and library preparation kit were used for detection. The CNV detection is as follows:

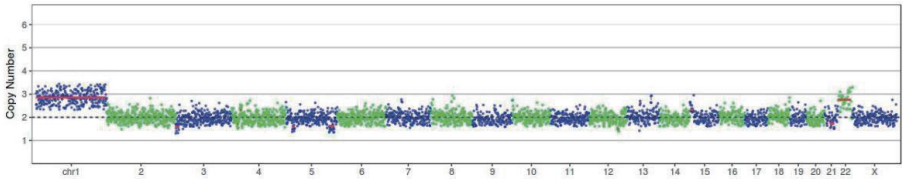
① Normal Sample



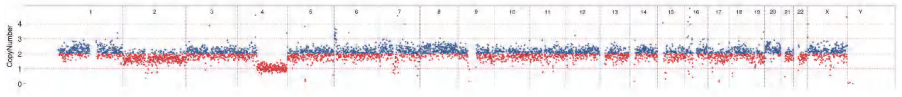
② Abnormal Sample 1



③ Abnormal Sample 2



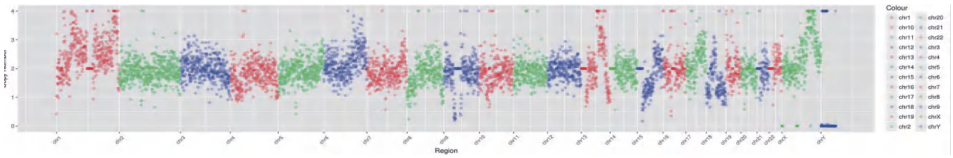
④ Abnormal Sample 3



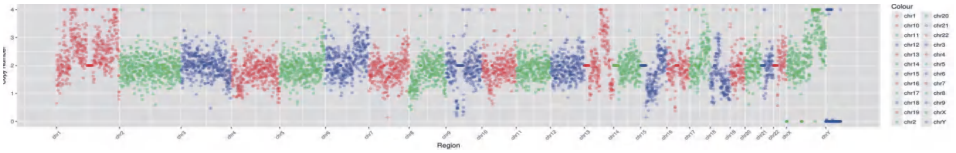
(3) The products were amplified with gDNA and single cells of tumor cells as templates. The database was buit with CoWin's library preparation kit. MGI analyzed the copy number variation. Compared with company B, the data analysis is as follows:

Sample ID	Raw data	Q30	R1_gc	R2_gc	Reads number	Mapped	Rmdup	Perfect
gDNA template, CW-1	1935700200(1.94G)	86.54%	42.77%	42.05%	18458220	92.45%	99.05%	80.67%
gDNA template, CW-2	1237126600(1.24G)	87.19%	42.14%	42.19%	11792100	93.83%	99.26%	81.84%
gDNA template, B	2076679800(2.08G)	87.20%	42.04%	42.26%	19732120	93.45%	98.90%	77.88%
cell template, CW-1	1881487200(1.88G)	86.89%	41.82%	42.09%	18006210	93.88%	98.69%	81.70%
cell template, Cw-2	2022866400(2.02G)	87.39%	41.92%	42.24%	19319880	94.03%	98.81%	81.73%
cell template, B	1307065400(1.31G)	87.48%	41.55%	41.73%	12466744	94.32%	98.85%	81.31%

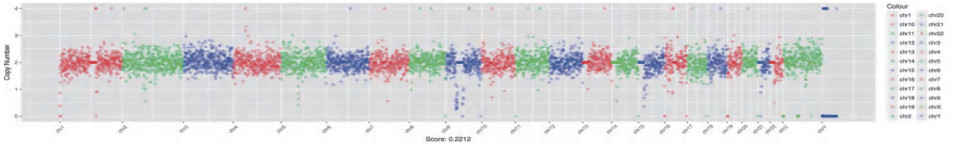
① Company B's Kit-Copy number analysis of gDNA sample



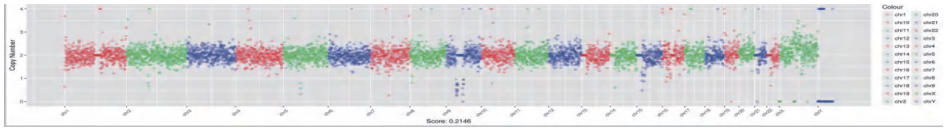
② CoWin's Kit- Copy number analysis of gDNA sample



③ Company B's Kit-Copy number analysis of single cell sample



④ CoWin's Kit- Copy number analysis of single cell sample



Conclusion: Compared with similar products, CoWin's Single Cell WGA Kit can meet the requirements of detecting the insertion or deletion of fragments > 4 Mb, which has high reproducibility and accuracy.

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