FUSIONPlex®

ARCHER®
Now part of
Integrated DNA Technologies

Get more information from a single assay.

FusionPlex assays enable simultaneous detection of fusions, splice variants, key SNV/Indels, and relative RNA expression from the same input.

Detection of multiple mutation types with FusionPlex

Fusions | Splicing | SNVs | Indels | Expression

Cancer is a complex disease to study with multiple important biomarkers; therefore, a comprehensive discovery method is critical. The desire to optimize cost efficiency coupled with the need to preserve precious tissue samples is driving researchers to seek solutions that do more with less. An effective research assay must be multiplexed, user-friendly, and able to detect fusions, splice variants, and key SNV/Indels from the same, often limited, input in parallel. For fusion detection, RNA is superior to DNA due to the inherent limitations associated with amplification and mapping of intronic sequences.

Archer's FusionPlex assays offer a scalable and easy-to-use solution for RNA-based sequencing that meets the research needs of every lab. With Anchored Multiplex PCR (AMP™) chemistry at the core and an integrated bioinformatic platform, FusionPlex targeted NGS assays offer streamlined fusion detection along with SNV/Indel calling from sample to data. Choose from a suite of thoughtfully designed catalog panels or customize to meet your exact needs. FusionPlex assays can be used stand-alone or paired with a VariantPlex™ assay to generate a comprehensive genomic profile.

FusionPlex NGS research assays offer advantages for customer workflows

	Simple, fast workflow	Known fusion detection	Novel fusion detection	Oncogenic isoform detection	Easy panel customization
FusionPlex® AMP™ chemistry (RNA)	✓	✓	✓	✓	✓
Hybrid capture (RNA)	✗[1]	✓	✓	✓	✗
Hybrid capture (DNA)	✗[1]	✓	!2	!4	✗
Opposing primer amplicon (RNA)	✓	✓	!3	!5	!

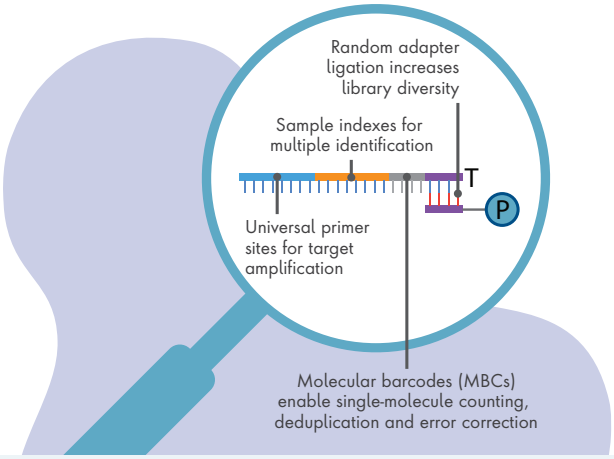
! *Indicates that the methodology may not be the best choice for optimal results*

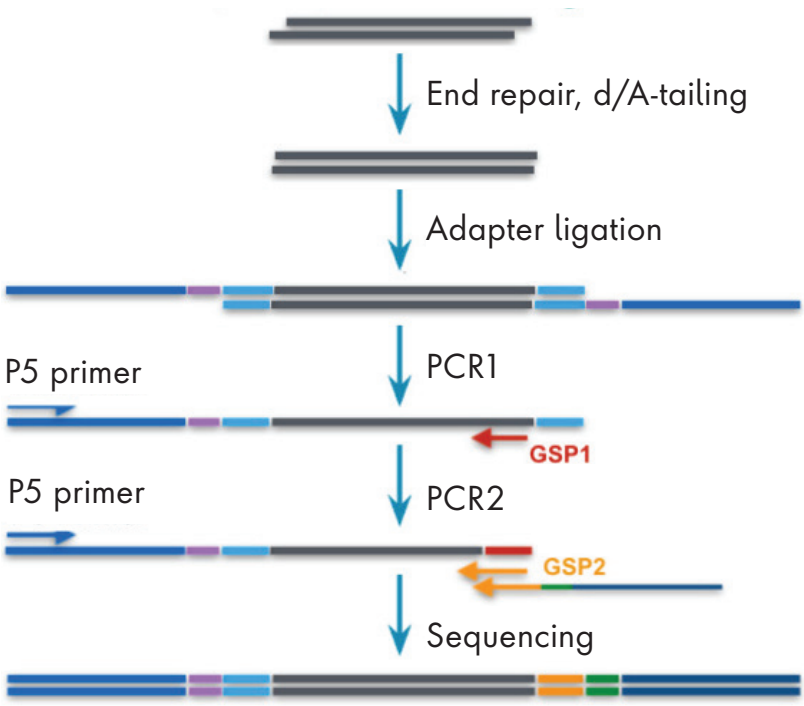
1. Complex library preparation processes (Hsiao *et al.* 2019)
2. Introns can be challenging to target and map reads to resulting in coverage gaps (Benayed *et al.* 2019, Davies *et al.* 2018)
3. Breakpoint-spanning reads are not sequenced; expression imbalance-based analyses can result in uncertainty (Vendrell *et al.* 2017)
4. Isoform expression cannot be evaluated using DNA input
5. Relative mRNA abundance cannot be confirmed without molecular barcodes (MBCs)

Engineered for reliability.

Patented Anchored Multiplex PCR (AMP) target enrichment chemistry provides robust detection of oncogenic drivers.

- Optimized for FFPE samples
- Known and novel fusion detection
- Molecular barcode (MBC)-driven error correction and unique molecule identification

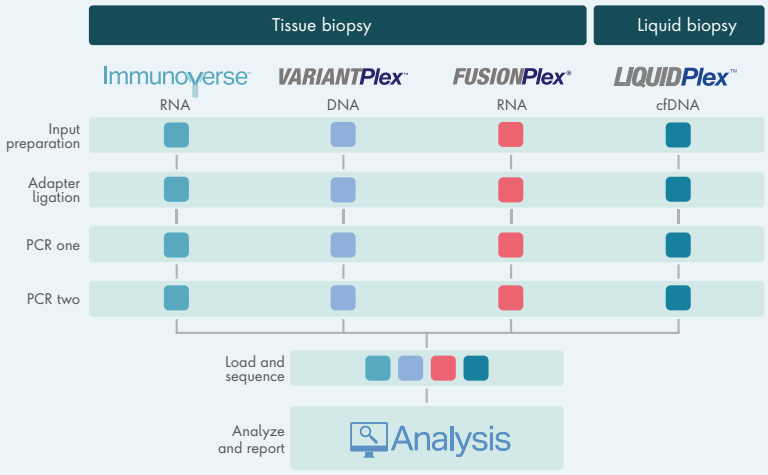




Surprisingly simple NGS workflow.

Designed with simplicity in mind, Archer makes it easy to implement NGS research assays in your lab.

- 1.5 day library prep with minimal hands-on time
- Input requirements as low as 10 ng RNA
- Lyophilized reagents to minimize error and eliminate the need for master mixes
- Single-use reactions reduce contamination
- Parallel workflow for RNA, DNA, and ctDNA analysis



One powerful platform. Endless potential.

All FusionPlex assays are supported by an integrated analysis platform, Archer® Analysis, providing a turnkey solution to complex genomic problems.

- Simple and intuitive web-based interface
- In-line visualization for clear reporting
- Access to Quiver, our curated database of known fusion events
- Integrates LIMS data and third party providers
- Deploys securely to a cloud or local server

For Research Use Only. *Not for use in diagnostic procedures.*

Introducing Archer's newest FusionPlex panel

Now with expanded SNV/Indel content

FUSIONPlex®
Core Solid Tumor

FusionPlex Core Solid Tumor is optimized for expanded SNV/Indel detection

AKT1	*DDR2*	*FGFR2*	*IDH1*	*MAP3K8*	*NTRK3*	*PRKCA*	*TRIM11*
ALK	*DNAJB1*	*FGFR3*	*IDH2*	*MET*	*NUTM1*	*PRKCB*	
AXL	*EGFR*	*GNA11*	*KEAP1*	*MYB*	*PAX8*	*RAF1*	
BRAF	*ERBB2*	*GNAQ*	*KIT*	*MYBL1*	*PDGFRA*	*RET*	
BRD3	*ERBB4*	*GNAS*	*KRAS*	*NRAS*	*PIK3CA*	*ROS1*	
BRD4	*ERG*	*H3F3A*	*LTK*	*NRG1*	*POLD1*	*STK11*	
CTNNB1	*ESR1*	*HIST1H3B*	*MAP2K1*	*NTRK1*	*POLE*	*TMPRSS2*	
CYSLTR2	*FGFR1*	*HRAS*	*MAP3K3*	*NTRK2*	*PPARG*	*TP53*	

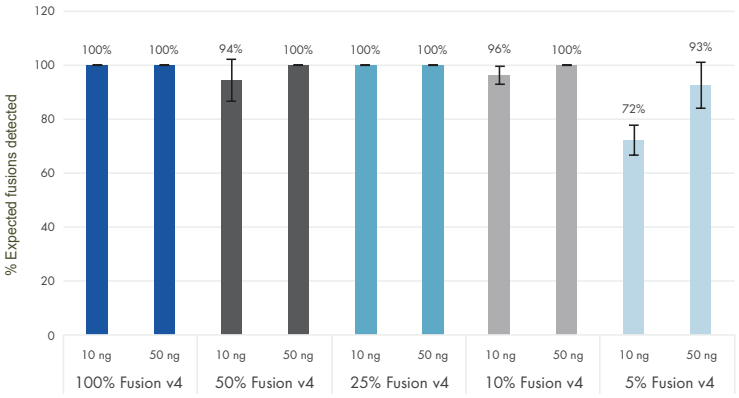
SNV/Indel targets

Sensitive fusion detection from samples with low tumor content

Fusion and oncogenic isoform detection in FFPE reference material at low input masses

- ≥95% of expected fusions & oncogenic isoforms detected from 50 ng of 10% fusion-positive input.

Reference materials used: (1) Seraseq® FFPE Fusion RNA Reference Material v4 (0710-0496), (Background) Seraseq® FFPE WT (DNA/RNA) Reference Material (0710-0137); n = 3 per input mass, per dilution.



Sensitive SNV/Indel detection from RNA with high concordance to DNA

Libraries were generated from FFPE-derived TNA using RNA-based FusionPlex and DNA-based VariantPlex assays.

93 SNV/Indels with ≥5% VAF were identified by the DNA-based assay.

- RNA:DNA concordance was 85.7% for 32 poor quality samples and 100% for 47 moderate quality samples.

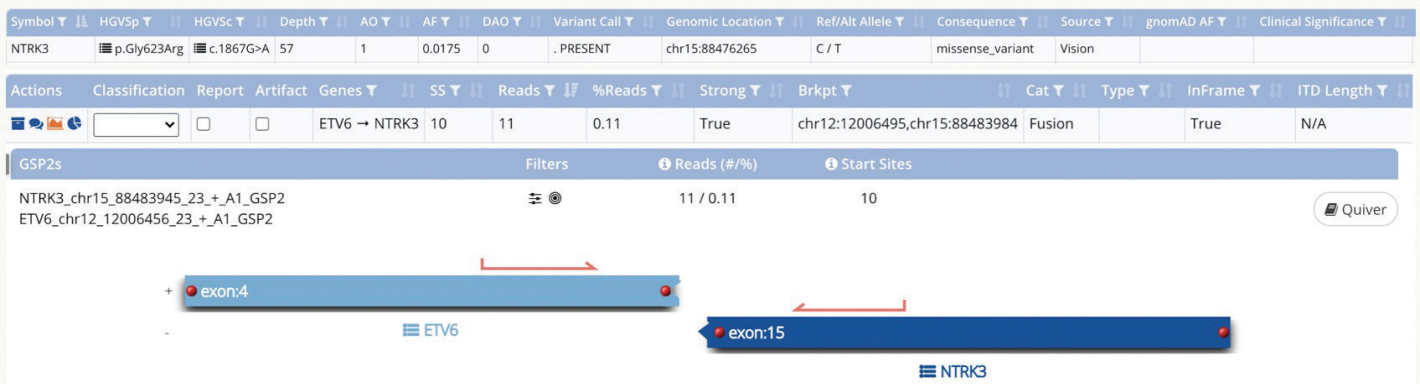
	42 variants detected in 32/42 poor quality* samples								51 variants detected in 47/51 moderate quality* samples							
Gene	**TOTAL**	*EGFR*	*ERBB2*	*FGFR3**	*KRAS*	*MET*	*NRAS*	*PIK3CA*	**TOTAL**	*BRAF*	*EGFR*	*ESR1*	*MET*	*PDGFRA*	*RAF1*	*RET*
# DNA variant (VariantPlex)	**42**	6	1	5	21	5	1	3	**51**	4	6	1	4	34	1	1
# RNA variant (FusionPlex)	**36**	6	1	1*	21	4	1	2	**51**	4	6	1	4	34	1	1
Concordance (%)	**85.7%**	100%	100%	20%	100%	80%	100%	67%	**100%**	100%	100%	100%	100%	100%	100%	100%

**Quality assessments for RNA are based on in-line PreSeq® RNA QC scores. Overall quality assessments are based on library complexity (total unique fragments).*

Fusion and SNV/Indel detection from the same TNA input

FusionPlex research assays conserve precious tissue by providing a comprehensive genomic profile from a single TNA input. SNVs that confer resistance to tyrosine kinase inhibitors were identified in *NTRK* fusion positive FFPE tissue.

NTRK fusion	*NTRK* resistance mutation (SNV)	Expressed SNV AF (%)
ETV6:NTRK3	*NTRK3* G623R (chr15:88476265 C>T)	0.39%
ETV6:NTRK3	*NTRK3* G623R (chr15:88476265 C>T)	1.75%
ETV6:NTRK3	*NTRK3* G623R (chr15:88476265 C>T)	0.39%



Thoughtfully designed catalog assays plus easy customization to meet your research needs

Compatible with Illumina® and Ion Torrent™ sequencers

Assays	Illumina catalog #	Ion Torrent catalog #
FusionPlex Core Solid Tumor	AB0145	AB0146
FusionPlex Lung v2	AB0135	AB0136
FusionPlex Pan Solid Tumor v2	AB0137	AB0138
FusionPlex Sarcoma v2	AB0133	AB0134
FusionPlex Myeloid	AB0015	AB0016
FusionPlex Pan Heme	AB0017	AB0018
FusionPlex Heme v2	AB0011	AB0012
FusionPlex ALL	AB0013	AB0014
FusionPlex Lymphoma	AB0019	AB0020

Custom: Design your own panel or add to an existing product. It's your panel, your way.

ASSAY MARKETPLACE

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or email us at **sales@archerdx.com**