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First 10 reads from the fastq file (read 1 and read 2)

```
==> 1_HM3K5DMXX_CTCGTACG_AATCCGTT_L001_R1_001.fastq.gz <==
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10050:1047 1:N:0:CTCGTACGAATCCGTT
AGCATACCCTGGAGTGAGGTCGATGAGAGCTCAGGAGATGTTGACTCAGG
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF::FFF,F::,,F,,FF,,
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10086:1266 1:N:0:CTCGTACGAATCCGTT
TCGGAACCATCGATCAAGCTATCAACAAAACCCATAACAACTAATAAC
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF:FFFFFF::FFF,,F:,F:,FFFF,F:
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10113:24831 1:N:0:CTCGTACGAATCCGTT
AAAGCGTTGCGCGTAGGAACATACATGAAAGCCGATAGGGAACGGAATAG
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF::FF::F,F,,::,,F,,::F,,::,
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10140:26443 1:N:0:CTCGTACGAATCCGTT
TCATGAGGTCGGGAAACAGAGACGTGTCCGGCAAACTACAAAAACCAAA
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF:F:,F,,,,FF,,F,FFF,F:::,F
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10158:20369 1:N:0:CTCGTACGAATCCGTT
GTTCCCTGTGAGTCCGAGATCGCAATATGGAGGAGGGGCTGTGGTCTGGT
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF::F,F::,,:FFF:::,FF,F,,
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10167:24236 1:N:0:CTCGTACGAATCCGTT
GGTGTGCGAGGTCATCTGGTGCCTATCATAATTCTCCTATGGCCTCGTAG
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF:,F,,,,F,,,,,:::,,F,F
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10221:25676 1:N:0:CTCGTACGAATCCGTT
CATCGGGGAGTGATATCCGATGGAATGGGGTAAATCGCGAAGCTAAGGA
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF:F,,,,,:,,,,,F,,::,,FF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10312:12085 1:N:0:CTCGTACGAATCCGTT
CCCTACGACAACACAGAAGGCTGCGTATAAAAATAAACAACCAATAAA
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF::,,F,F,F::,,:F,,F,F,:F
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10312:9267 1:N:0:CTCGTACGAATCCGTT
ATTAAGCCAAAAGCTAGCGAGGATAGAGGTCCTAAGCGCTCACGTCGGCA
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF:,F::,,F,:F:F,FF,F,,,,,F:
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10321:29857 1:N:0:CTCGTACGAATCCGTT
CCCTGCGTTCTGTGCGACATCTAAGTATCACGAAAAAACCACCAACCA
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF:,F,,,,FF,,,:F::,,:::F
=====
```

FIG. 1

SUBSTITUTE SHEET (RULE 26)

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```
==> 1_HM3K5DMXX_CTCGTACG_AATCCGTT_L001_R1_001.fastq.gz <==
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10050:1047 2:N:0:CTCGTACGAATCCGTT
TCATCGACCTCACTCCAGGGTATGCTGACCTCACTCGCGACAAAAGAAAA
+
FFFFFFFFFFFFFFFFFFFFFFFFF,,F,,,,,:F:F,,,,F,,
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10086:1266 2:N:0:CTCGTACGAATCCGTT
GTTGATAGCTTGATCGATGGTCCGAACAAAAAAAAAAAACTAAAAATA
+
F:FFFFFFFF:FF::FFFFF:F:FF,FF:,FFFFF,FF,F,F,FF,,,
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10113:24831 2:N:0:CTCGTACGAATCCGTT
ATGTATGTTCTACGCGCAACGCTTTGAGGGGTGGTGC GGATTGGAAGTA
+
FF::FFFFFFFFFFFFFFFFFFFFF,,F,FF,,F,FF,F::,FF::,F,
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10140:26443 2:N:0:CTCGTACGAATCCGTT
CACGTCTCTGTTTCCCGACCTCATGACAACCCAAGAAACAAAAAAAAACA
+
FFFFFFFFFFFFFFFFFFFFFFFFF,F,,,F,,,,:,,,F,F,,,,F
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10158:20369 2:N:0:CTCGTACGAATCCGTT
ATTGCGATCTCGGACTCACAGGGAACGGGCGCGGTGGCGGGGGCGGGGGC
+
FFFFFFFFFFFFFFFFFFFFFFFFF,,F,,F,F,,F,,,,:F,:
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10167:24236 2:N:0:CTCGTACGAATCCGTT
ATAGGCACCAGATGACCTGCCACACCAATCAACGTAAAAACCAACCTAG
+
FFFFFFFFFFFFFFFFFFFFFFFFF,,,,,:F,,,,,:,,,,:F:
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10221:25676 2:N:0:CTCGTACGAATCCGTT
TTCCATCGGATATCACTCCCCGATGGTCTGTCTACAGGAGTAAGGCATGC
+
FFFFFFFFFFFFFFFFFFFFFFFFF,,,,,F,,,,,F,:,,,,:,
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10312:12085 2:N:0:CTCGTACGAATCCGTT
ACGCAGCCTTCTGTGTGTCGTAGGGGGCGCTAAGCGGCTCTTGCCAATA
+
FFFFFFFFFFFFFFFFFFFFFFFFF,:,,,,,F,F,,,,,:,,,F,
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10312:9267 2:N:0:CTCGTACGAATCCGTT
CTATCCTCGTAGCTTTTGCTTAATAAAAAAAAAACAAACAAAAAAAAA
+
FFFFFFFFFFFFFFFFFFFFFFFFF:FFFFFF:F,FFF,F::,F:::
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10321:29857 2:N:0:CTCGTACGAATCCGTT
ACTTAGATGTGCGACAGAACGCAGGGGGGCTCGGGAGCCATAGGTCGTCC
+
FFFFFFFFFFFFFFFFFFFFFFFFF,,,,:F,,F,:,,,,:,,,,F,
```

FIG. 1 (Cont.)

SUBSTITUTE SHEET (RULE 26)

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Trimmed Read 1

```
==> 1_HM3K5DMXX_CTCGTACG_AATCCGTT.fastq1.trimmed <==  
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10050:1047 1:N:0:CTCGTACGAATCCGTT  
AGCATACCCCTGGAGTGAGGTCGATGAG  
+  
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF,  
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10086:1266 1:N:0:CTCGTACGAATCCGTT  
TCGGAACCATCGATCAAGCTATCAACA  
+  
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF:FFFFFFFF  
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10113:24831 1:N:0:CTCGTACGAATCCGTT  
AAAGCGTTGCGCGTAGGAACATACATG  
+  
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF::FF:  
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10140:26443 1:N:0:CTCGTACGAATCCGTT  
TCATGAGGTCGGGAAACAGAGACGTGT  
+  
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF:F:  
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10158:20369 1:N:0:CTCGTACGAATCCGTT  
GTTCCCTGTGAGTCCGAGATCGCAATA  
+  
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF,  
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10167:24236 1:N:0:CTCGTACGAATCCGTT  
GGTGTGCGAGGTCATCTGGTGCCTATC  
+  
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF:,F,  
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10221:25676 1:N:0:CTCGTACGAATCCGTT  
CATCGGGGAGTGATATCCGATGGAAT  
+  
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF:  
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10312:12085 1:N:0:CTCGTACGAATCCGTT  
CCCTACGACAACACAGAAGGCTGCGTA  
+  
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF:  
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10312:9267 1:N:0:CTCGTACGAATCCGTT  
ATTAAGCCAAAAGCTAGCGAGGATAG  
+  
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF:,F  
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10321:29857 1:N:0:CTCGTACGAATCCGTT  
CCCTGCGTTCTGTGCGACATCTAAGTA  
+  
FFFFFFFFFFFFFFFFFFFFFFFFFFFFF:  
=====
```

FIG. 2A**SUBSTITUTE SHEET (RULE 26)**

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Trimmed Read 2

```
==> 1_HM3K5DMXX_CTCGTACG_AATCCGTT.fastq2.trimmed <==
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10050:1047 2:N:0:CTCGTACGAATCCGTT
TCATCGACCTCACTCCAGGGTATGCT
+
FFFFFFFFFFFFFFFFFFFFFFFF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10086:1266 2:N:0:CTCGTACGAATCCGTT
GTTGATAGCTTGATCGATGGTTCCGAA
+
F:FFFFFFFF:,FF:::FFFFF:F:FF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10113:24831 2:N:0:CTCGTACGAATCCGTT
ATGTATGTTCTCTACGCGCAACGCTTTG
+
FF::FFFFFFFFFFFFFFFFFFFF,
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10140:26443 2:N:0:CTCGTACGAATCCGTT
CACGTCTCTGTTTCCCGACCTCATGAC
+
FFFFFFFFFFFFFFFFFFFFFFFF,
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10158:20369 2:N:0:CTCGTACGAATCCGTT
ATTGCGATCTCGGACTCACAGGGAACG
+
FFFFFFFFFFFFFFFFFFFFFFFF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10167:24236 2:N:0:CTCGTACGAATCCGTT
ATAGGCACCAGATGACCTGCGACACCA
+
FFFFFFFFFFFFFFFFFFFFFFFF,
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10221:25676 2:N:0:CTCGTACGAATCCGTT
TTCCATCGGATATCACTCCCCCGATG
+
FFFFFFFFFFFFFFFFFFFFFFFF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10312:12085 2:N:0:CTCGTACGAATCCGTT
ACGCAGCCTTCTGTGTTGTCGTAGGGG
+
FFFFFFFFFFFFFFFFFFFFFFFF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10312:9267 2:N:0:CTCGTACGAATCCGTT
CTATCCTCGCTAGCTTTTGGCTTAATA
+
FFFFFFFFFFFFFFFFFFFFFFFF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10321:29857 2:N:0:CTCGTACGAATCCGTT
ACTTAGATGTCGCACAGAACGCAGGGG
+
FFFFFFFFFFFFFFFFFFFFFFFF,
=====
```

FIG. 2B**SUBSTITUTE SHEET (RULE 26)**

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Stitched

```
==> 1_HM3K5DMXX_CTCGTACG_AATCCGTT.fastq.stitched <==
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10050:1047 1:N:0:CTCGTACGAATCCGTT
AGCATACCCTGGAGTGAGGTCGATGA
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10086:1266 1:N:0:CTCGTACGAATCCGTT
TCGGAACCATCGATCAAGCTATCAAC
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10113:24831 1:N:0:CTCGTACGAATCCGTT
AAAGCGTTGCGCGTAGGAACATACAT
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFF::FF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10140:26443 1:N:0:CTCGTACGAATCCGTT
TCATGAGGTCGGGAAACAGAGACGTG
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10158:20369 1:N:0:CTCGTACGAATCCGTT
GTTCCCTGTGAGTCCGAGATCGCAAT
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10167:24236 1:N:0:CTCGTACGAATCCGTT
GGTGTGCGAGGTCATCTGGTGCCTAT
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10221:25676 1:N:0:CTCGTACGAATCCGTT
CATCGGGGGAGTGATATCCGATGGAA
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10312:12085 1:N:0:CTCGTACGAATCCGTT
CCCTACGACAACACAGAAGGCTGCGT
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10312:9267 1:N:0:CTCGTACGAATCCGTT
ATTAAGCCAAAAGCTAGCGAGGATAG
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFF
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10321:29857 1:N:0:CTCGTACGAATCCGTT
CCCTGCGTTCTGTGCGACATCTAAGT
+
FFFFFFFFFFFFFFFFFFFFFFFFFFFF
=====
```

FIG. 3**SUBSTITUTE SHEET (RULE 26)**

==> 1 HM3K5DMXX CTCGTACG AATCCGTT.matched <==				
read	target	umi	hd	barcode
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10050:1047	1:N:0:CTCGTACGAATCCGTT			RNA26582
AGCATACCTGGAG	0	TGAGGTCGATGA		
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10113:24831	1:N:0:CTCGTACGAATCCGTT			RNA23577
AAAGCGTTCCGCGT	0	AGGAACATACAT		
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10140:26443	1:N:0:CTCGTACGAATCCGTT			RNA33721
TCATGAGTCCGGA	0	AACAGAGACGTG		
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10158:20369	1:N:0:CTCGTACGAATCCGTT			RNA34087
GTTCCCTGTGAGTC	0	CGAGATCGCAAT		
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10221:25676	1:N:0:CTCGTACGAATCCGTT			RNA33669
CATCGGGGAGTGA	0	TATCCGATGGAA		
@A00764:HM3K5DMXX200208:HM3K5DMXX:1:1101:10312:12085	1:N:0:CTCGTACGAATCCGTT			RNA34456
CCCTACGACAACAC	0	AGAGGCTGCGT		

FIG. 4

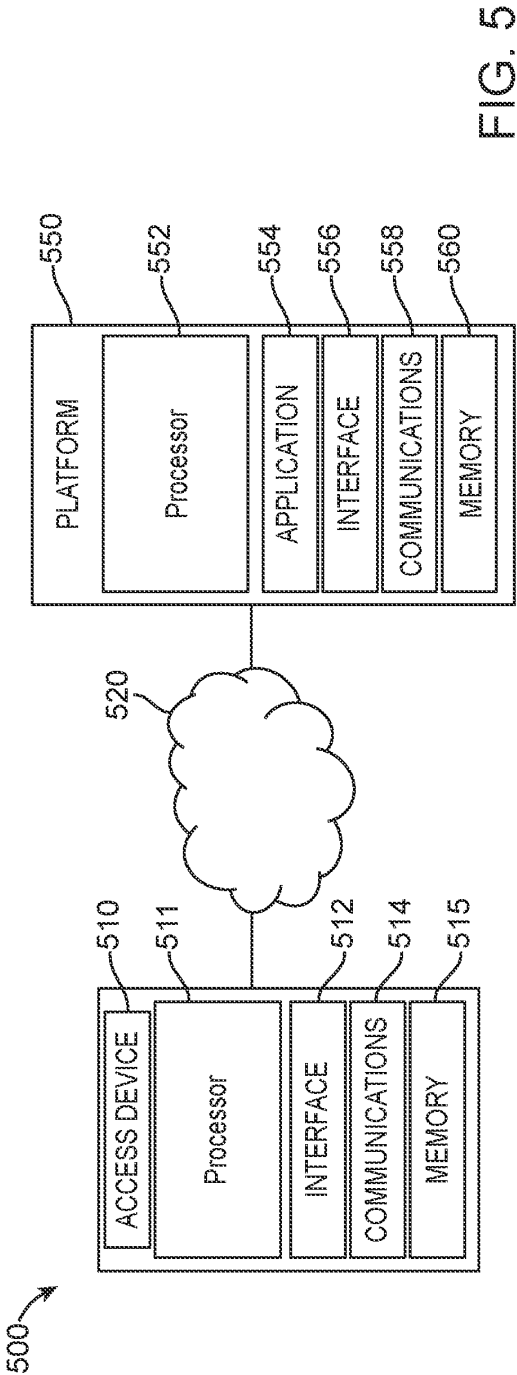


FIG. 5