**Junction alignments for mouse data using STAR**

STAR aligner (version 2.5.4b) [1] was used. STAR references were generated using RefSeq mm10 GFF3 annotations, and a maximum junction overhang size of 40 bp either side of the junction was set for the creation of STAR's splice junction database, analogous to that of the junction catalog used by Event Analysis. To ensure that comparisons between STAR and Event Analysis were appropriate, STAR alignment parameters were also set to mimic those used by Bowtie: reads were aligned to the mm10 genome using the alignment mode “EndToEnd” to eliminate soft-clipping, minimum allowable read junction overhang was set to 16 bp, up to three mismatches were allowed per alignment, and no multimapping alignments were reported. STAR was also tested allowing multimapping reads.

**Junction alignments for mouse data using SOAP2**

Reference indices for SOAP2 (v2.21; [2]) were generated for the complete junction catalog using the command “2bwt-builder”. RNA-seq reads were then aligned to the junction catalog using SOAP2, reporting the best possible alignment (-M 4), and allowing up to 3 mismatches (-v 3) and no repeat hits (-r 0).

**Junction comparisons**

Junctions were converted from the STAR naming convention to the AStalavista naming convention using the format (chromosome, last position of donor exon, first position of acceptor exon, strand). Junctions were classified into several groups following the convention of SQANTI [3]:

1. “annotated junctions”, which are those present in known RefSeq transcripts;
2. “novel in catalog (NIC)/unannotated”, where the donor and acceptor sites are present in the RefSeq annotation but the junction between them is not present in any RefSeq transcripts;
3. “novel not in catalog (NNC), novel donor and acceptor”, where neither the donor and acceptor sites are present in the annotation;
4. “NNC, novel donor, acceptor in catalog”, where acceptor site is present in the annotation but the donor site is novel;
5. “NNC, donor in catalog, novel acceptor”, where donor site is present in the annotation but the acceptor site is novel; and, “NNC, donor and acceptor in catalog”, where both the donor and acceptor sites are present in the annotation but are from different genes.

Several levels of expression were examined:

1. “detected” : at least 1 read in a least 1 sample aligned to the junction;
2. “supported, APN>0” where the average depth per nucleotide (APN) of the junction in both mouse NPC replicates was greater than 0;
3. “supported, APN≥2” where junction APN in both mouse NPC replicates was greater than or equal to 2;
4. “supported, APN≥5” where junction APN in both mouse NPC replicates was greater than or equal to 5;
5. “supported, APN≥10” where junction APN in both mouse NPC replicates was greater than or equal to 10.

**Results summary:**

For annotated junctions present in the PacBio data Event Analysis (EA) using Bowtie as the aligner (referred to as EA+Bowtie through the remainder of this text) detects 4,685 more of these junctions than STAR (Table S3.2). When SOAP2 is used as the aligner for Event Analysis (referred to as EA+SOAP2 through the remainder of this text), the number of junctions is comparable to STAR (Table S3.2), but less than when EA is used with Bowtie. When allowing STAR to report multimapped alignments, EA+Bowtie detects 1,360 more junctions than STAR.

In the "no multimapping" mode, STAR detects 15 junctions that EA does not (Table S3.2). These are complex multi-junction scenarios that include microexons (i.e. the read maps to a microexon at either both of its adjoining junctions, or to a junction on one side of the microexon and to the intron on the other). Three of these 15 have at least one read in both NPC replicates (Table S3.2).

Junctions detected in the PacBio data can be used to estimate the ability of an approach to detect true positives. For novel junctions present in PacBio data (NIC, NNC junctions), STAR (when no multimapped alignments are allow) detects 229 of the 536 NIC PacBio junctions, and 270 when multimappers are allowed. EA+Bowtie detects 321 NIC junctions, while EA+SOAP2 identifies 236 of the 536 NIC PacBio junctions. All of the STAR junctions are a subset of the EA+Bowtie junctions(Table S3.2).

On the other hand, STAR detects 654 of the 3,691 NNC PacBio junctions while Event Analysis, as expected, detects none of these (Table S3.2). While it appears STAR detects more novel junctions overall (Table S3.2), we also note that most of novel junctions detected are not supported. Only four of the 654 novel junctions detected by STAR have PacBio read support (Table S3.4). In contrast, 67 of the NIC junctions detected by EA + Bowtie (71 novel junctions detected when EA+SOAP2 is used as the aligner) have sufficient short read support at this detection threshold (Table S3.4).

Of the 67,213 annotated junctions present in the PacBio data, EA+Bowtie finds support (average of 2 reads or more) for 51,439 of these junctions, while EA+SOAP2 finds support for 47,646 junctions and STAR finds support for 1,752 (or 3,474 when allowing multimappers). At higher levels of expression (average of 5 or more reads) EA+Bowtie finds 40,462 annotated junctions, EA+SOAP2 finds 33,651 annotated junctions, and STAR finds 439 annotated junctions (1,112 annotated junctions when allowing multimapped alignments; Tables S3.5 and S3.6).

EA+Bowtie mapping to the comprehensive catalog detects 14,521 already annotated junctions present in both NPC samples with at least two reads that are not detected in the PacBio data (13,557 junctions detected for EA+SOAP2); only 343 of these are supported at the same level by STAR. Requiring more support (at least 5 reads) the catalog detects up to 57 times as many already annotated junctions (6,818 vs 119, EA+Bowtie vs STAR without multimappers), or 17 times as many (6,818 vs 407) when STAR allows multimappers.

For junctions without PacBio supporting reads: EA+Bowtie detects 17,198 annotated junctions that STAR does not (7,789 when STAR allows multimapped alignments), while STAR detects 89 annotated junctions not detected by EA (Table S3.7). As in the annotated junctions from the PacBio data, these STAR-only junctions involve complex multi-junction scenarios and microexons. STAR also detects 15,868 NNC junctions that EA cannot, and all but three do not have support (Tables S3.7 and S3.8). We note that SOAP2 detects fewer non-PacBio junctions than either EA+Bowtie or STAR (Tables S3.7, Tables S3.8 and S3.9)

For NIC junctions without PacBio supporting reads, EA+Bowtie detects 12,630 NIC junctions, while EA+SOAP2 and STAR detect 4,536 and 3,486 NIC junctions, respectively (Table S3.7). At a support level of APN ≥ 2 (Table S3.8), 419 NIC junctions detected with EA+Bowtie are retained and 361 NIC junctions are retained when EA+SOAP2 is used; all of the STAR junctions however fall under this level of support.

**STAR compared to Event Analysis (PacBio junctions):**

**Table S3.1. Summary of PacBio junctions**

|  |  |
| --- | --- |
| **Junction type** | **Count** |
| Annotated | 67,213 |
| Novel in catalog (NIC)/unannotated | 536 |
| Novel not in catalog (NNC)/novel | 3,691 |

**Table S3.2. PacBio junctions detected by Event Analysis and STAR with at least one mapped read (values in parenthesis indicate STAR junctions allowing for multimapped alignments)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Junction type** | **PacBio Junctions** | **Total** | | | **Detected** | | | | | | |
|
| **Catalog** | **STAR** | **Catalog ∩ STAR** | **Catalog + Bowtie** | **Catalog + SOAP2** | **STAR** | **Bowtie ∩ SOAP2** | **Bowtie ∩ STAR** | **SOAP2 ∩ STAR** | **Bowtie ∩ SOAP2 ∩ STAR** |
| Annotated junction | 67,213 | 67,213 | 60,202  (63,512) | 60,202 (63,512) | 64,872 | 60,810 | 60,202  (63,512) | 58,708 | 60,187  (63,512) | 58,037  (60,327) | 58,035  (60,327) |
| NNC, novel donor and acceptor | 1,763 | 0 | 119  (166) | 0  (0) | 0 | 0 | 119  (166) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, novel donor, acceptor in catalog | 962 | 0 | 259  (316) | 0  (0) | 0 | 0 | 259  (316) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor in catalog, novel acceptor | 928 | 0 | 261  (310) | 0  (0) | 0 | 0 | 261  (310) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor and acceptor in catalog | 38 | 0 | 15  (18) | 0  (0) | 0 | 0 | 15  (18) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NIC, donor and acceptor in catalog | 536 | 536 | 229  (270) | 229  (270) | 321 | 236 | 229  (270) | 176 | 229  (270) | 206  (223) | 206  (223) |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Junction type** | **PacBio Junctions** | **Total** | | | **Supported (APN>0)** | | | | | | |
|
| **Catalog** | **STAR** | **Catalog ∩ STAR** | **Catalog + Bowtie** | **Catalog + SOAP2** | **STAR** | **Bowtie ∩ SOAP2** | **Bowtie ∩ STAR** | **SOAP2 ∩ STAR** | **Bowtie ∩ SOAP2 ∩ STAR** |
| Annotated junction | 67,213 | 67,213 | 60,202  (63,512) | 60,202 (63,512) | 61,024 | 57,655 | 53,081  (58,263) | 56,914 | 53,067  (58,169) | 52,142  (58,169) | 52,139  (58,169) |
| NNC, novel donor and acceptor | 1,763 | 0 | 119  (166) | 0  (0) | 0 | 0 | 60  (102) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, novel donor, acceptor in catalog | 962 | 0 | 259  (316) | 0  (0) | 0 | 0 | 128  (162) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor in catalog, novel acceptor | 928 | 0 | 261  (310) | 0  (0) | 0 | 0 | 109  (157) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor and acceptor in catalog | 38 | 0 | 15  (18) | 0  (0) | 0 | 0 | 9  (10) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NIC, donor and acceptor in catalog | 536 | 536 | 229  (270) | 229  (270) | 197 | 179 | 114  (151) | 154 | 114  (151) | 113  (151) | 113  (151) |

**Table S3.3. PacBio junctions detected by Event Analysis and STAR with read support at APN>0 (values in parenthesis indicate STAR junctions allowing for multimapped alignments)**

**Table S3.4. PacBio junctions detected by Event Analysis and STAR with read support at APN≥2 (values in parenthesis indicate STAR junctions allowing for multimapped alignments)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Junction type** | **PacBio Junctions** | **Total** | | | **Supported (APN≥2)** | | | | | | |
|
| **Catalog** | **STAR** | **Catalog ∩ STAR** | **Catalog + Bowtie** | **Catalog + SOAP2** | **STAR** | **Bowtie ∩ SOAP2** | **Bowtie ∩ STAR** | **SOAP2 ∩ STAR** | **Bowtie ∩ SOAP2 ∩ STAR** |
| Annotated junction | 67,213 | 67,213 | 60,202  (63,512) | 60,202 (63,512) | 51,439 | 47,646 | 1,752  (3,474) | 46,708 | 1,752  (3,473) | 1,741  (3,437) | 1,741  (3,437) |
| NNC, novel donor and acceptor | 1,763 | 0 | 119  (166) | 0  (0) | 0 | 0 | 2  (3) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, novel donor, acceptor in catalog | 962 | 0 | 259  (316) | 0  (0) | 0 | 0 | 0  (1) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor in catalog, novel acceptor | 928 | 0 | 261  (310) | 0  (0) | 0 | 0 | 1  (2) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor and acceptor in catalog | 38 | 0 | 15  (18) | 0  (0) | 0 | 0 | 1  (1) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NIC, donor and acceptor in catalog | 536 | 536 | 229  (270) | 229  (270) | 67 | 71 | 0  (1) | 58 | 0  (1) | 0  (1) | 0  (1) |

**Table S3.5. PacBio junctions detected by Event Analysis and STAR with read support at APN≥5 (values in parenthesis indicate STAR junctions allowing for multimapped alignments)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Junction type** | **PacBio Junctions** | **Total** | | | **Supported (APN≥5)** | | | | | | |
|
| **Catalog** | **STAR** | **Catalog ∩ STAR** | **Catalog + Bowtie** | **Catalog + SOAP2** | **STAR** | **Bowtie ∩ SOAP2** | **Bowtie ∩ STAR** | **SOAP2 ∩ STAR** | **Bowtie ∩ SOAP2 ∩ STAR** |
| Annotated junction | 67,213 | 67,213 | 60,202  (63,512) | 60,202 (63,512) | 40,462 | 33,651 | 439  (1,112) | 33,288 | 439  (1,111) | 437  (1,105) | 437  (1,104) |
| NNC, novel donor and acceptor | 1,763 | 0 | 119  (166) | 0  (0) | 0 | 0 | 1  (2) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, novel donor, acceptor in catalog | 962 | 0 | 259  (316) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor in catalog, novel acceptor | 928 | 0 | 261  (310) | 0  (0) | 0 | 0 | 0  (1) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor and acceptor in catalog | 38 | 0 | 15  (18) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NIC, donor and acceptor in catalog | 536 | 536 | 229  (270) | 229  (270) | 30 | 25 | 0  (1) | 22 | 0  (1) | 0  (1) | 0  (1) |

**Table S3.6. PacBio junctions detected by Event Analysis and STAR with read support at APN≥10 (values in parenthesis indicate STAR junctions allowing for multimapped alignments)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Junction type** | **PacBio Junctions** | **Total** | | | **Supported (APN≥10)** | | | | | | |
|
| **Catalog** | **STAR** | **Catalog ∩ STAR** | **Catalog + Bowtie** | **Catalog + SOAP2** | **STAR** | **Bowtie ∩ SOAP2** | **Bowtie ∩ STAR** | **SOAP2 ∩ STAR** | **Bowtie ∩ SOAP2 ∩ STAR** |
| Annotated junction | 67,213 | 67,213 | 60,202  (63,512) | 60,202 (63,512) | 30,136 | 24,077 | 147  (441) | 23,880 | 147  (441) | 146  (438) | 146  (438) |
| NNC, novel donor and acceptor | 1,763 | 0 | 119  (166) | 0  (0) | 0 | 0 | 0  (1) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, novel donor, acceptor in catalog | 962 | 0 | 259  (316) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor in catalog, novel acceptor | 928 | 0 | 261  (310) | 0  (0) | 0 | 0 | 0  (1) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor and acceptor in catalog | 38 | 0 | 15  (18) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NIC, donor and acceptor in catalog | 536 | 536 | 229  (270) | 229  (270) | 14 | 12 | 0  (0) | 10 | 0  (0) | 0  (0) | 0  (0) |

***Note: Of the 38 NNC junctions where donor and acceptor are both in the catalog, the donor and acceptor exons are from different genes. These could be indicative of fusion transcripts or, more likely, incomplete annotations***

**STAR and Event Analysis junctions (non-PacBio junctions):**

Note: “Catalog” and “STAR” counts are not mutually exclusive. “Catalog ∩ STAR” is the overlap between “Catalog” and “STAR” counts.

**Table S3.7. Non-PacBio junctions detected by Event Analysis and STAR with at least one mapped read (values in parenthesis indicate STAR junctions allowing for multimapped alignments)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Total** | | | **Detected** | | | | | | | |
| **Junction type** | **Catalog** | **STAR** | **Catalog ∩ STAR** | **Catalog + Bowtie** | **Catalog + SOAP2** | **STAR** | **Bowtie ∩ SOAP2** | **Bowtie ∩ STAR** | **SOAP2 ∩ STAR** | **Bowtie ∩ SOAP2 ∩ STAR** |
| Annotated junction | 217,376 | 47,221 (56,514) | 47,221  (56,514) | 64,303 | 45,949 | 47,194  (56,514) | 45,564 | 47,105  (56,514) | 40,623  (44,495) | 40,604  (44,495) |
| NNC, novel donor and acceptor | 0 | 15,868  (29,038) | 0  (0) | 0 | 0 | 15,868  (29,038) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, novel donor, acceptor in catalog | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor in catalog, novel acceptor | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor and acceptor in catalog | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NIC, donor and acceptor in catalog | 2,422,692 | 3,488  (4,763) | 3,488  (4,763) | 12,630 | 4,536 | 3,486  (4,763) | 3,837 | 3,471  (4,763) | 2,700  (3,127) | 2,698  (3,127) |

**Table S3.8. Non-PacBio junctions detected by Event Analysis and STAR with read support at APN>0 (values in parenthesis indicate STAR junctions allowing for multimapped alignments)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Total** | | | **Supported (APN>0)** | | | | | | |
| **Junction type** | **Catalog** | **STAR** | **Catalog ∩ STAR** | **Catalog + Bowtie** | **Catalog + SOAP2** | **STAR** | **Bowtie ∩ SOAP2** | **Bowtie ∩ STAR** | **SOAP2 ∩ STAR** | **Bowtie ∩ SOAP2 ∩ STAR** |
| Annotated junction | 217,376 | 47,221 (56,514) | 47,221  (56,514) | 36,127 | 35,085 | 22,895  (30,216) | 28,932 | 22,849  (29,879) | 22,076  (26,850) | 22,069  (26,729) |
| NNC, novel donor and acceptor | 0 | 15,868  (29,038) | 0  (0) | 0 | 0 | 1,933  (4,088) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, novel donor, acceptor in catalog | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor in catalog, novel acceptor | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor and acceptor in catalog | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NIC, donor and acceptor in catalog | 2,422,692 | 3,488  (4,763) | 3,488  (4,763) | 2,786 | 2,968 | 619  (938) | 1,150 | 618  (922) | 593  (792) | 593  (791) |

**Table S3.9. Non-PacBio junctions detected by Event Analysis and STAR with read support at APN≥2 (values in parenthesis indicate STAR junctions allowing for multimapped alignments)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Total** | | | **Supported (APN≥2)** | | | | | | |
| **Junction type** | **Catalog** | **STAR** | **Catalog ∩ STAR** | **Catalog + Bowtie** | **Catalog + SOAP2** | **STAR** | **Bowtie ∩ SOAP2** | **Bowtie ∩ STAR** | **SOAP2 ∩ STAR** | **Bowtie ∩ SOAP2 ∩ STAR** |
| Annotated junction | 217,376 | 47,221 (56,514) | 47,221  (56,514) | 14,521 | 13,557 | 343  (818) | 11,791 | 343  (816) | 334  (782) | 334  (780) |
| NNC, novel donor and acceptor | 0 | 15,868  (29,038) | 0  (0) | 0 | 0 | 3  (18) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, novel donor, acceptor in catalog | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor in catalog, novel acceptor | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor and acceptor in catalog | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NIC, donor and acceptor in catalog | 2,422,692 | 3,488  (4,763) | 3,488  (4,763) | 419 | 361 | 0  (0) | 196 | 0  (0) | 0  (0) | 0  (0) |

**Table S3.10. Non-PacBio junctions detected by Event Analysis and STAR with read support at APN≥5 (values in parenthesis indicate STAR junctions allowing for multimapped alignments)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Total** | | | **Supported (APN≥5)** | | | | | | |
| **Junction type** | **Catalog** | **STAR** | **Catalog ∩ STAR** | **Catalog + Bowtie** | **Catalog + SOAP2** | **STAR** | **Bowtie ∩ SOAP2** | **Bowtie ∩ STAR** | **SOAP2 ∩ STAR** | **Bowtie ∩ SOAP2 ∩ STAR** |
| Annotated junction | 217,376 | 47,221 (56,514) | 47,221  (56,514) | 6,818 | 5,015 | 119  (407) | 4,789 | 119  (407) | 118  (398) | 118  (398) |
| NNC, novel donor and acceptor | 0 | 15,868  (29,038) | 0  (0) | 0 | 0 | 2  (12) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, novel donor, acceptor in catalog | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor in catalog, novel acceptor | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor and acceptor in catalog | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NIC, donor and acceptor in catalog | 2,422,692 | 3,488  (4,763) | 3,488  (4,763) | 136 | 82 | 0  (0) | 61 | 0  (0) | 0  (0) | 0  (0) |

**Table S3.11. Non-PacBio junctions detected by Event Analysis and STAR with read support at APN≥10 (values in parenthesis indicate STAR junctions allowing for multimapped alignments)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Total** | | | **Supported (APN≥10)** | | | | | | |
| **Junction type** | **Catalog** | **STAR** | **Catalog ∩ STAR** | **Catalog + Bowtie** | **Catalog + SOAP2** | **STAR** | **Bowtie ∩ SOAP2** | **Bowtie ∩ STAR** | **SOAP2 ∩ STAR** | **Bowtie ∩ SOAP2 ∩ STAR** |
| Annotated junction | 217,376 | 47,221 (56,514) | 47,221  (56,514) | 3,903 | 2,973 | 39  (213) | 2,900 | 39  (212) | 39  (210) | 39  (210) |
| NNC, novel donor and acceptor | 0 | 15,868  (29,038) | 0  (0) | 0 | 0 | 0  (6) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, novel donor, acceptor in catalog | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor in catalog, novel acceptor | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NNC, donor and acceptor in catalog | 0 | 0  (0) | 0  (0) | 0 | 0 | 0  (0) | 0 | 0  (0) | 0  (0) | 0  (0) |
| NIC, donor and acceptor in catalog | 2,422,692 | 3,488  (4,763) | 3,488  (4,763) | 57 | 37 | 0  (0) | 28 | 0  (0) | 0  (0) | 0  (0) |

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