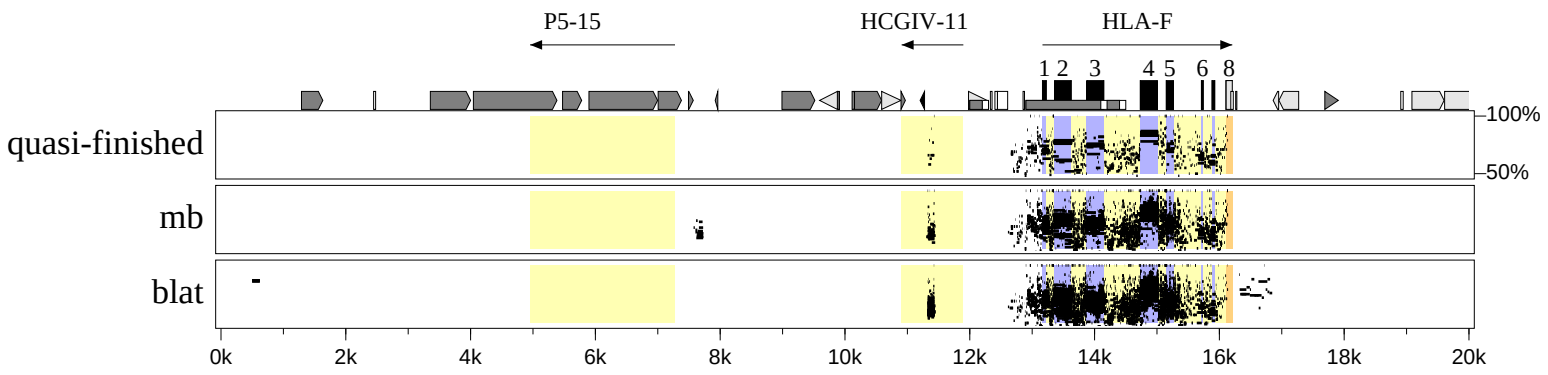
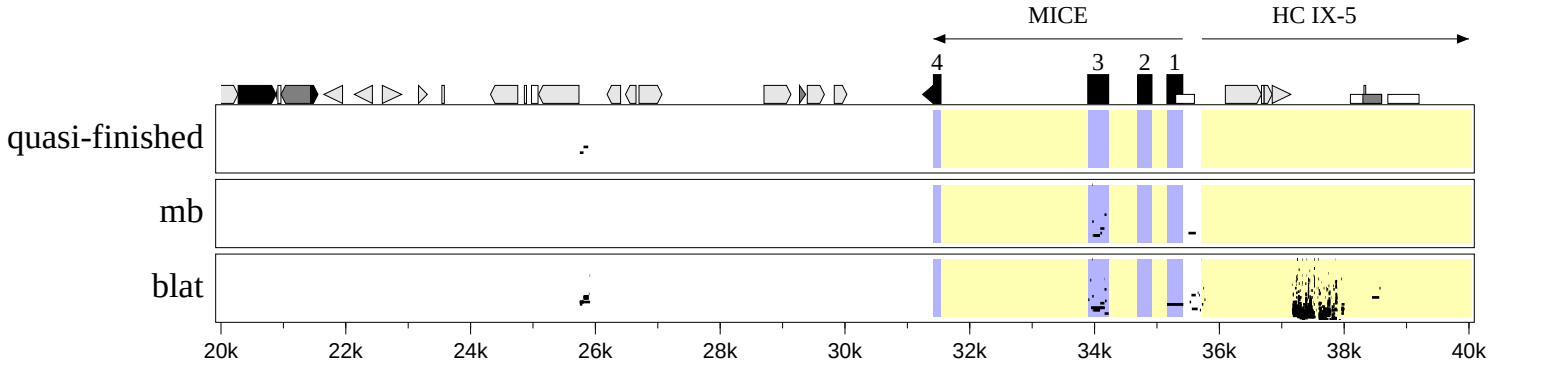
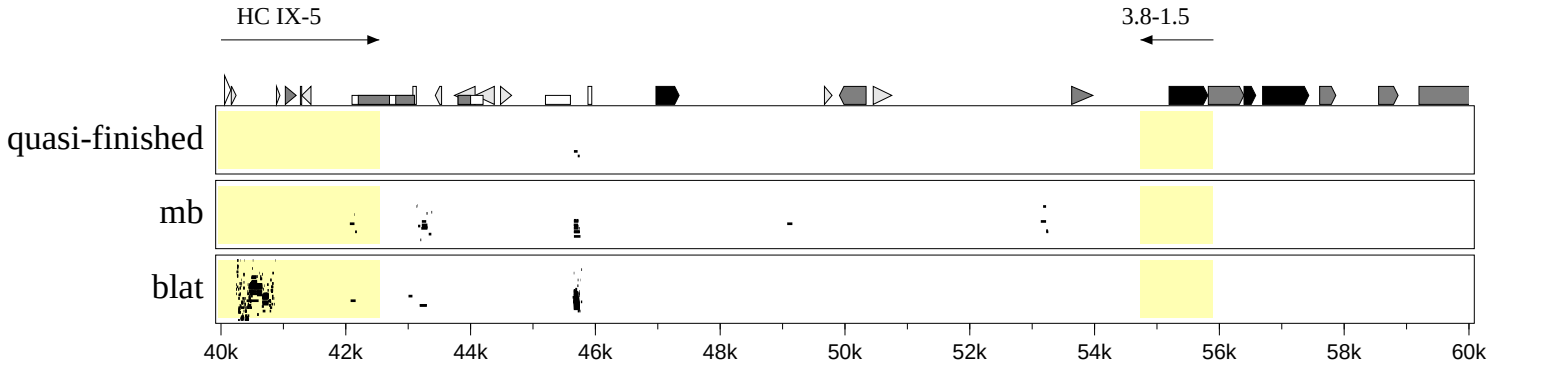
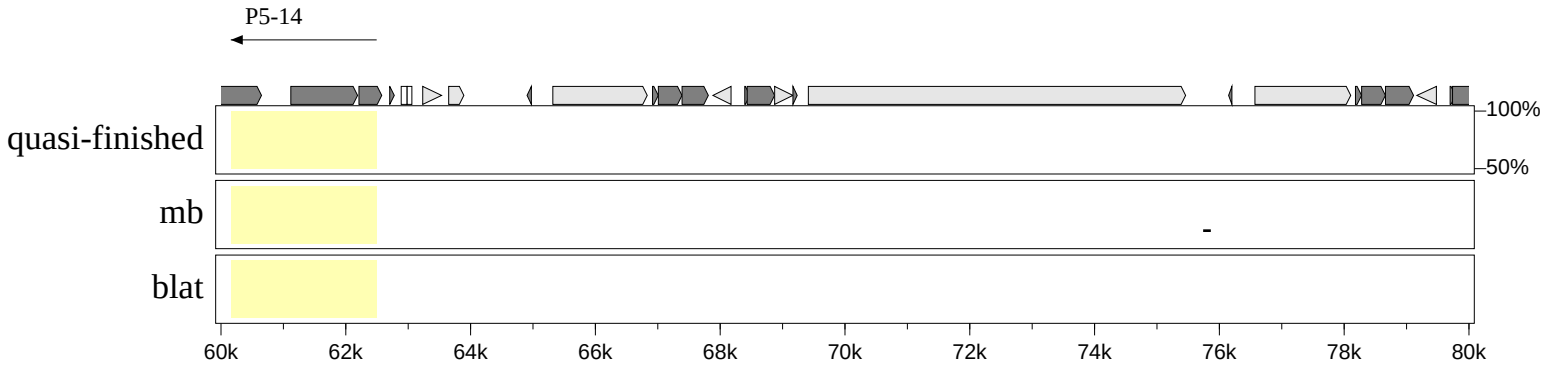

P5-15
HCGIV-11
HLA-F
1 2 3 4 5 6 8
100%
50%
quasi-finished
mb
blat
0k
2k
4k
6k
8k
10k
12k
14k
16k
18k
20k


MICE
HC IX-5
4 3 2 1
quasi-finished
mb
blat
20k
22k
24k
26k
28k
30k
32k
34k
36k
38k
40k


HC IX-5
3.8-1.5
quasi-finished
mb
blat
40k
42k
44k
46k
48k
50k
52k
54k
56k
58k
60k


P5-14
quasi-finished
mb
blat
100%
50%
60k
62k
64k
66k
68k
70k
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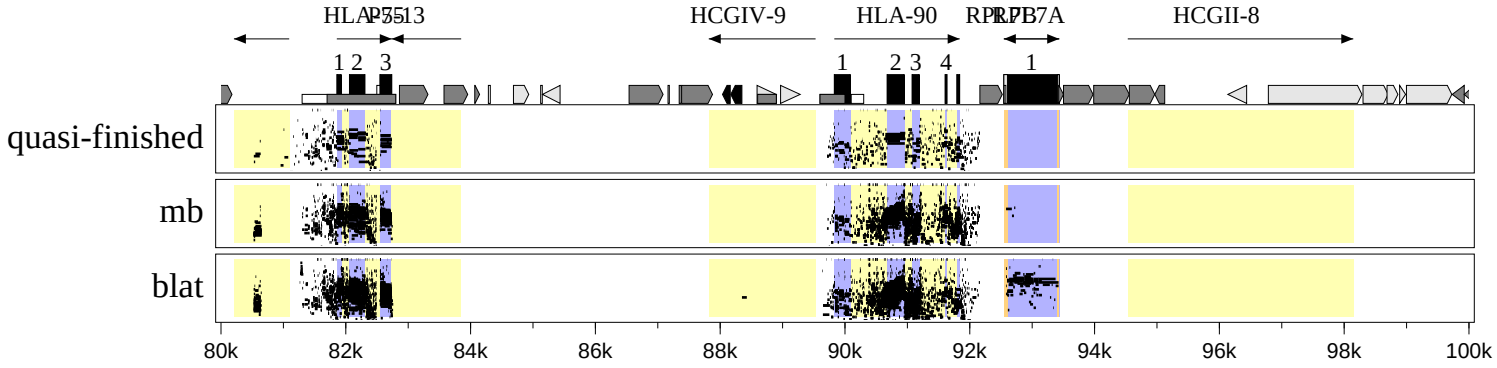
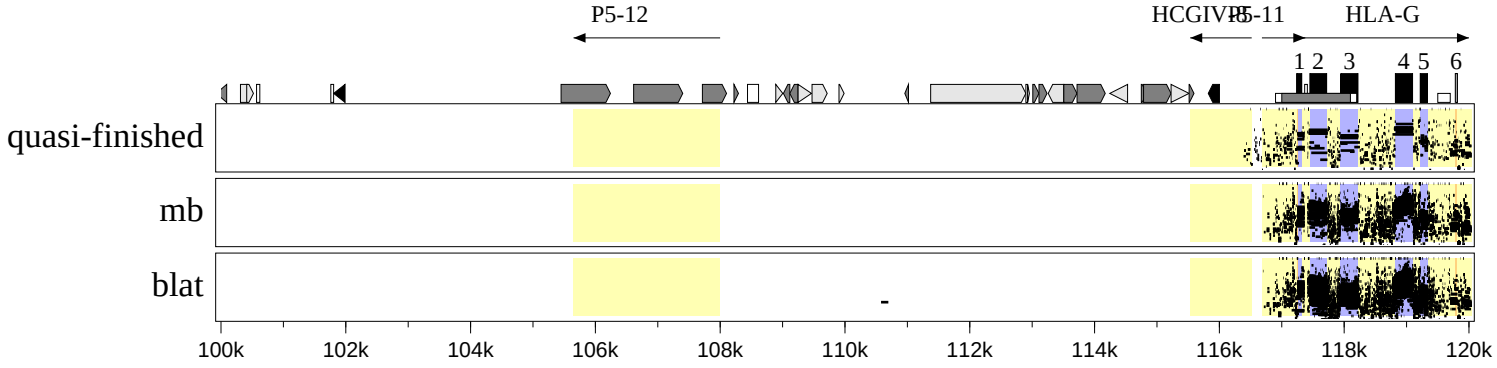
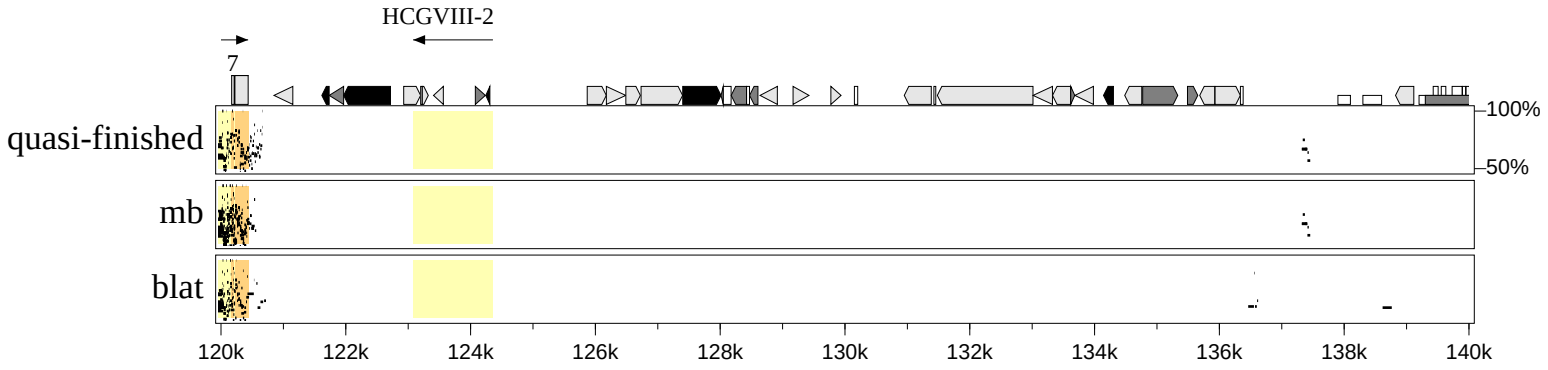
74k
76k
78k
80k


HLA-90
HCGIV-9
HCGII-8
1 2 3
1
2 3 4
1
quasi-finished
mb
blat
80k
82k
84k
86k
88k
90k
92k
94k
96k
98k
100k


P5-12
HLA-G
1 2 3
4 5 6
quasi-finished
mb
blat
100k
102k
104k
106k
108k
110k
112k
114k
116k
118k
120k


HCGVIII-2
7
quasi-finished
mb
blat
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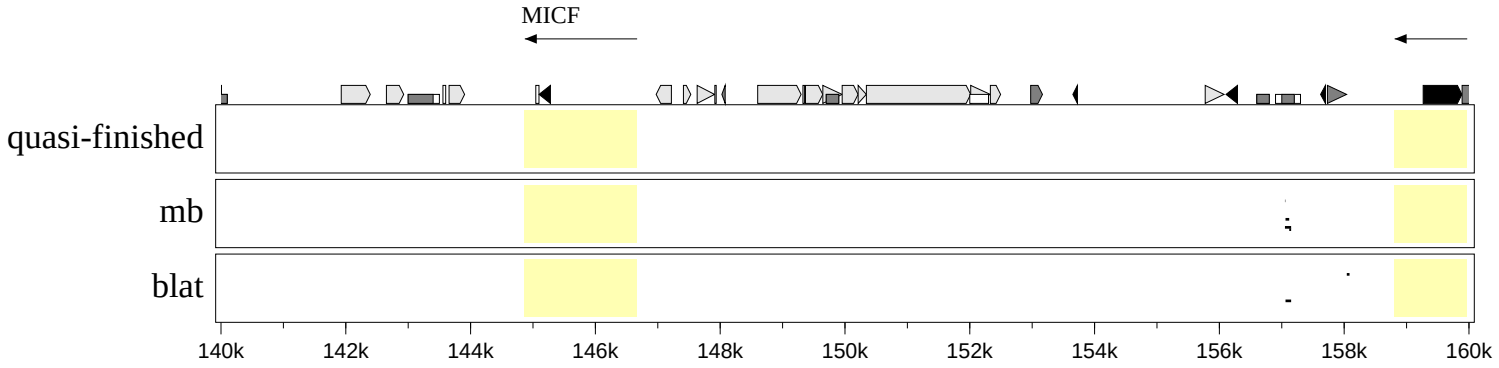
50%
120k
122k
124k
126k
128k
130k
132k
134k
136k
138k
140k


MICF
quasi-finished
mb
blat
140k
142k
144k
146k
148k
150k
152k
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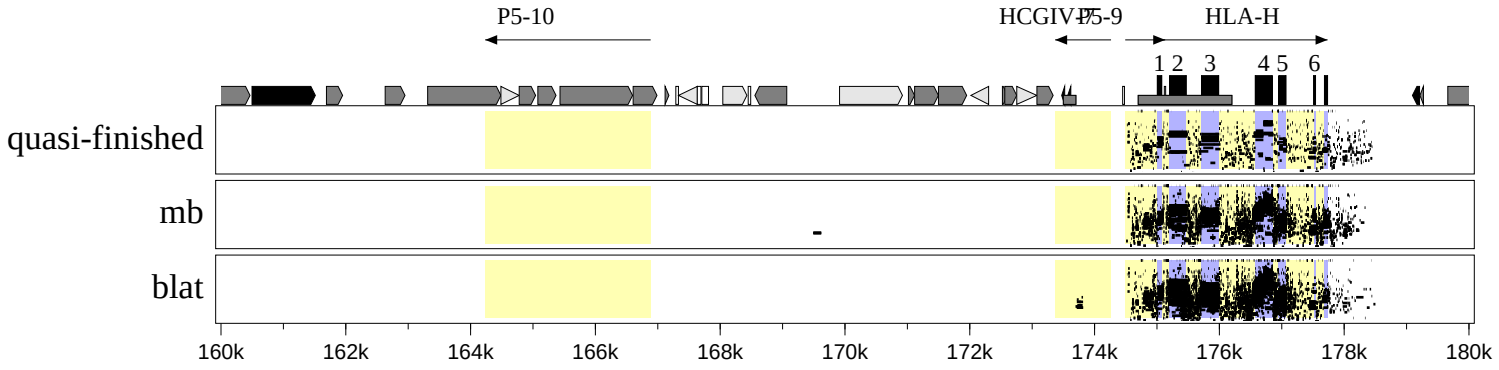
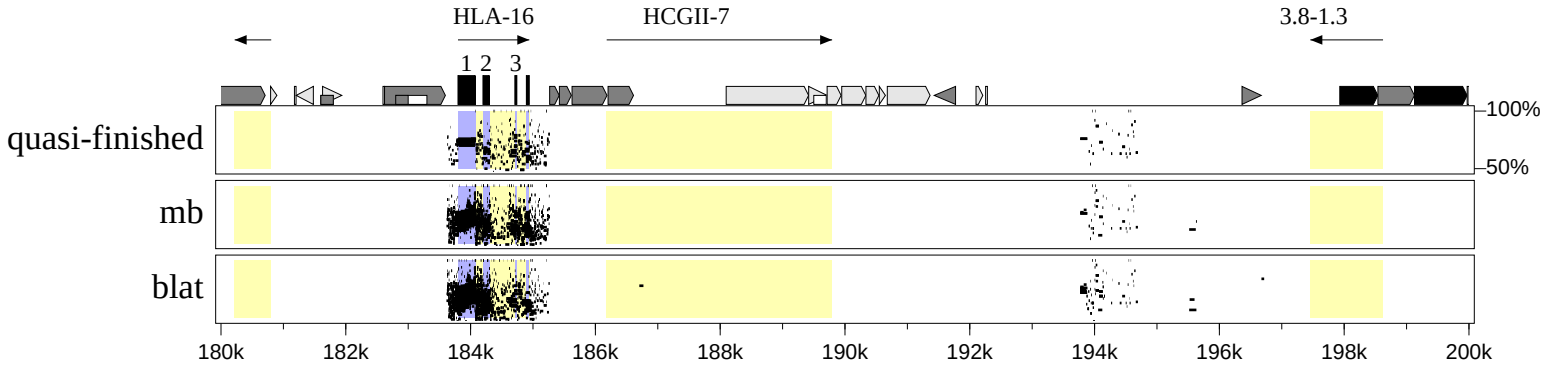
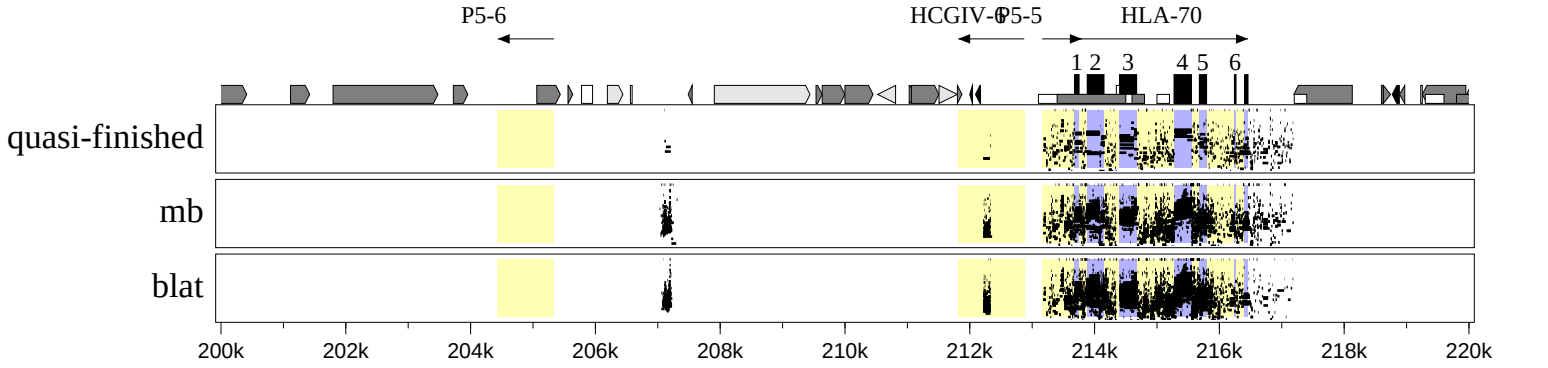
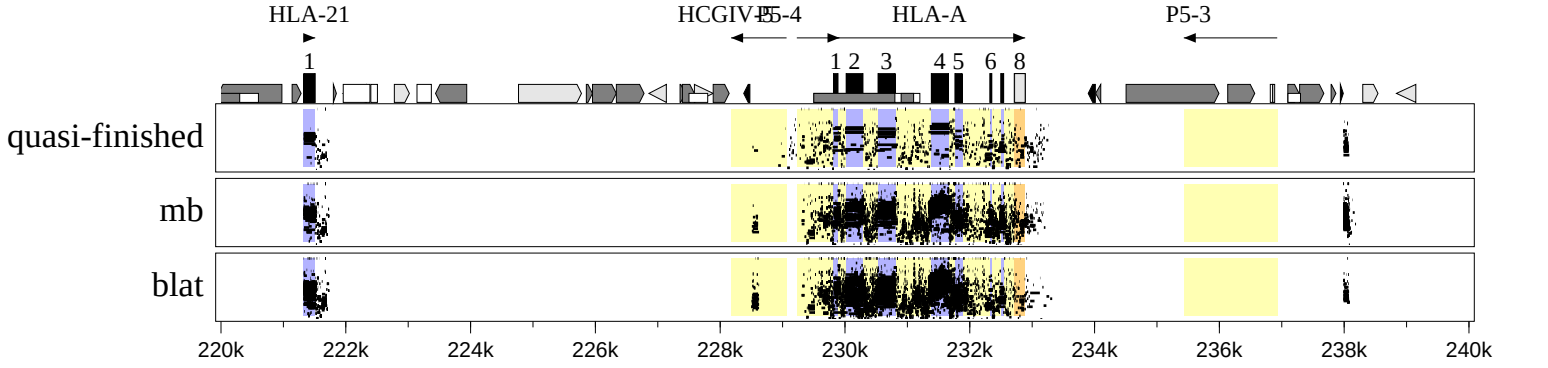
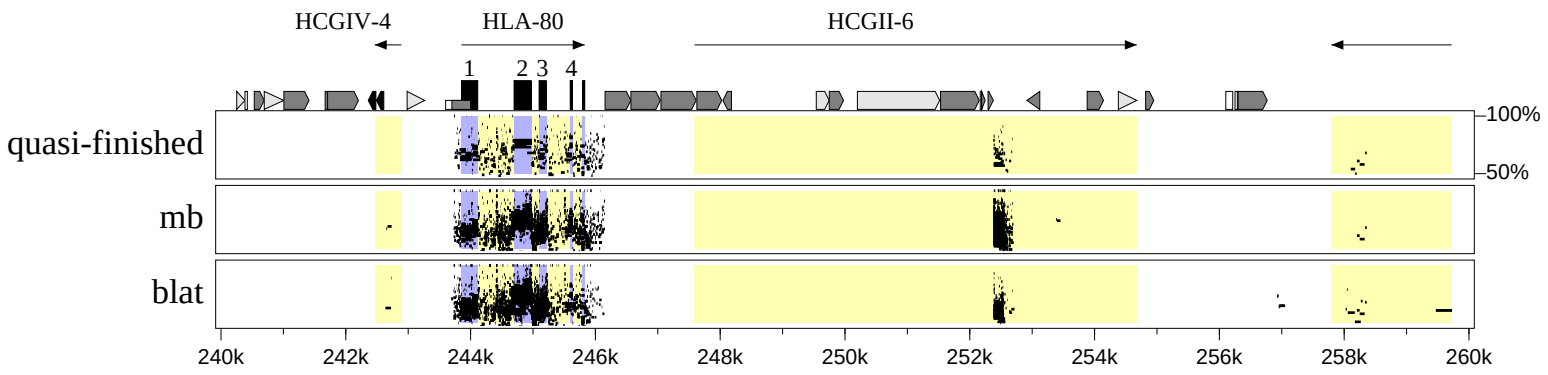
156k
158k
160k


P5-10
HCGIV-7
P5-9
HLA-H
1 2 3 4 5 6
quasi-finished
mb
blat
160k
162k
164k
166k
168k
170k
172k
174k
176k
178k
180k


HLA-16
HCGII-7
3.8-1.3
1 2 3
quasi-finished
mb
blat
100%
50%
180k
182k
184k
186k
188k
190k
192k
194k
196k
198k
200k


P5-6
HCGIV-6
P5-5
HLA-70
1 2 3 4 5 6
quasi-finished
mb
blat
200k
202k
204k
206k
208k
210k
212k
214k
216k
218k
220k


HLA-21
HCGIV-5
P5-4
HLA-A
P5-3
1
1 2 3 4 5 6 8
quasi-finished
mb
blat
220k
222k
224k
226k
228k
230k
232k
234k
236k
238k
240k


HCGIV-4
HLA-80
HCGII-6
1
2 3
4
quasi-finished
mb
blat
100%
50%
240k
242k
244k
246k
248k
250k
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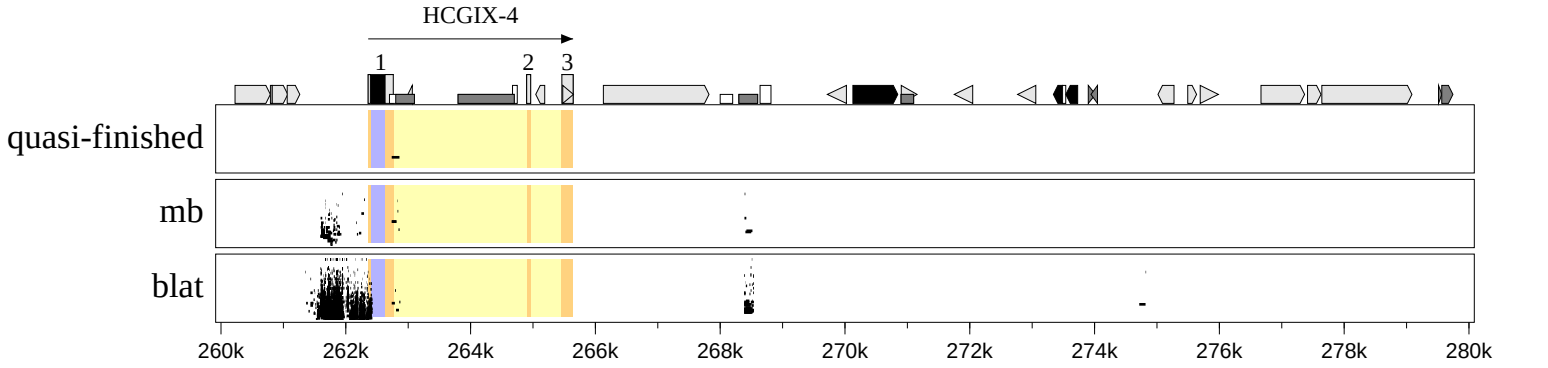
254k
256k
258k
260k


HCGIX-4
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2
3
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mb
blat
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264k
266k
268k
270k
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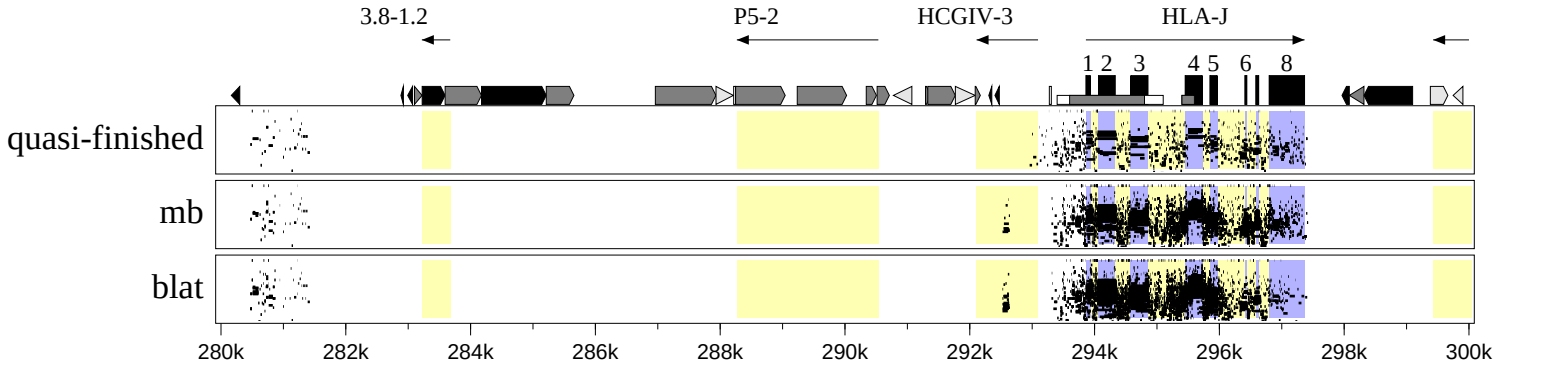
276k
278k
280k


3.8-1.2
P5-2
HCGIV-3
HLA-J
1 2
3
4 5
6
8
quasi-finished
mb
blat
280k
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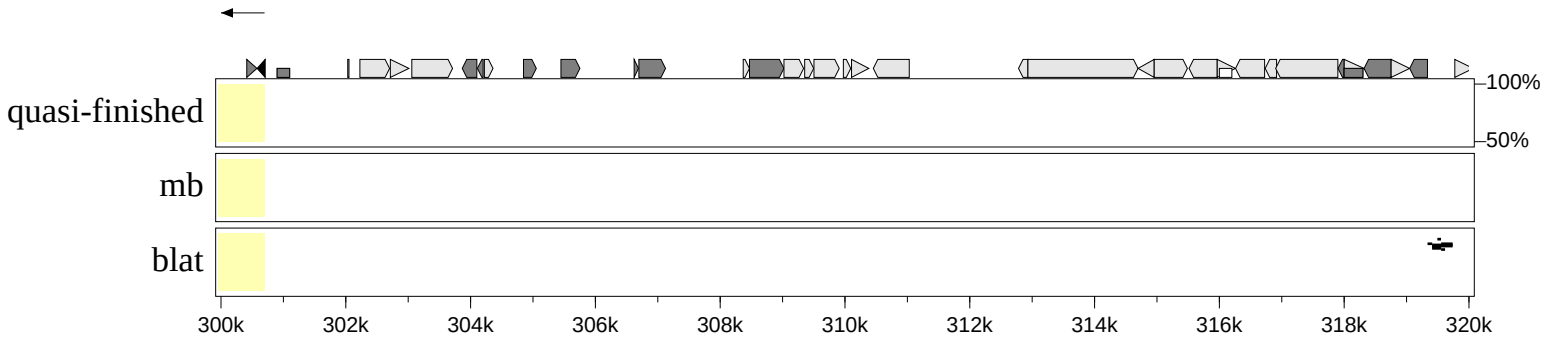
284k
286k
288k
290k
292k
294k
296k
298k
300k


quasi-finished
mb
blat
100%
50%
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302k
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306k
308k
310k
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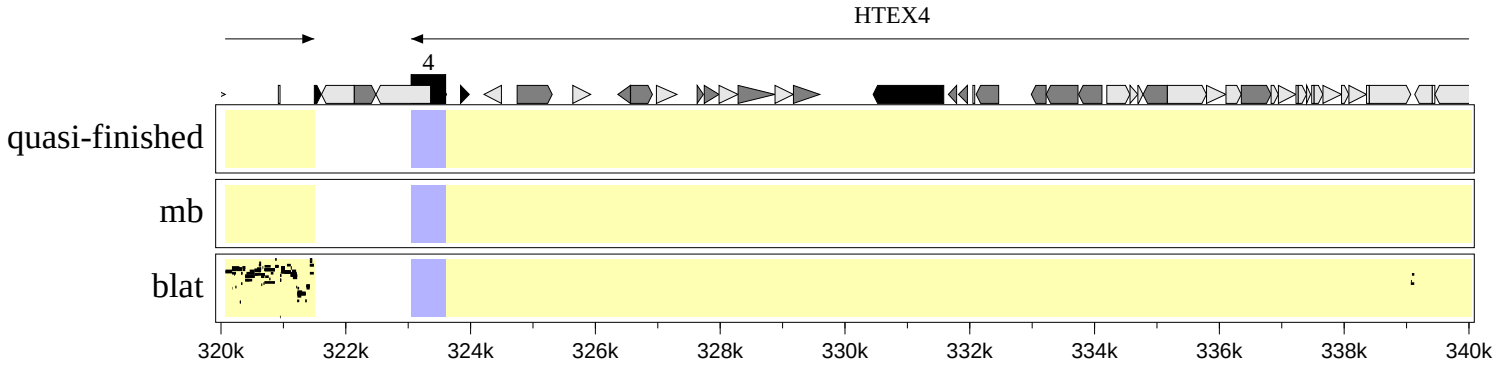
314k
316k
318k
320k


HTEX4
4
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blat
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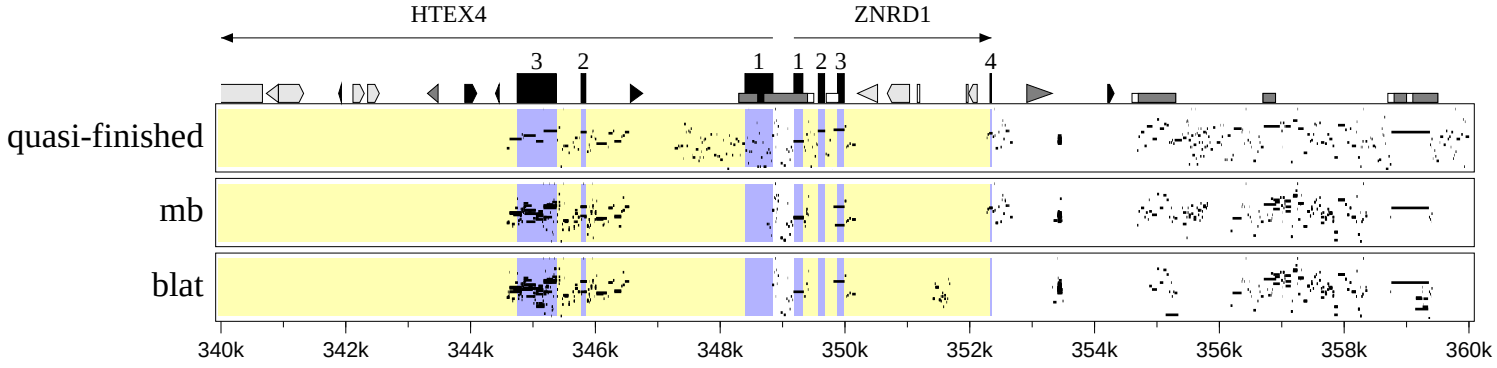
324k
326k
328k
330k
332k
334k
336k
338k
340k


HTEX4
ZNRD1
3
2
1
1
2
3
4
quasi-finished
mb
blat
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344k
346k
348k
350k
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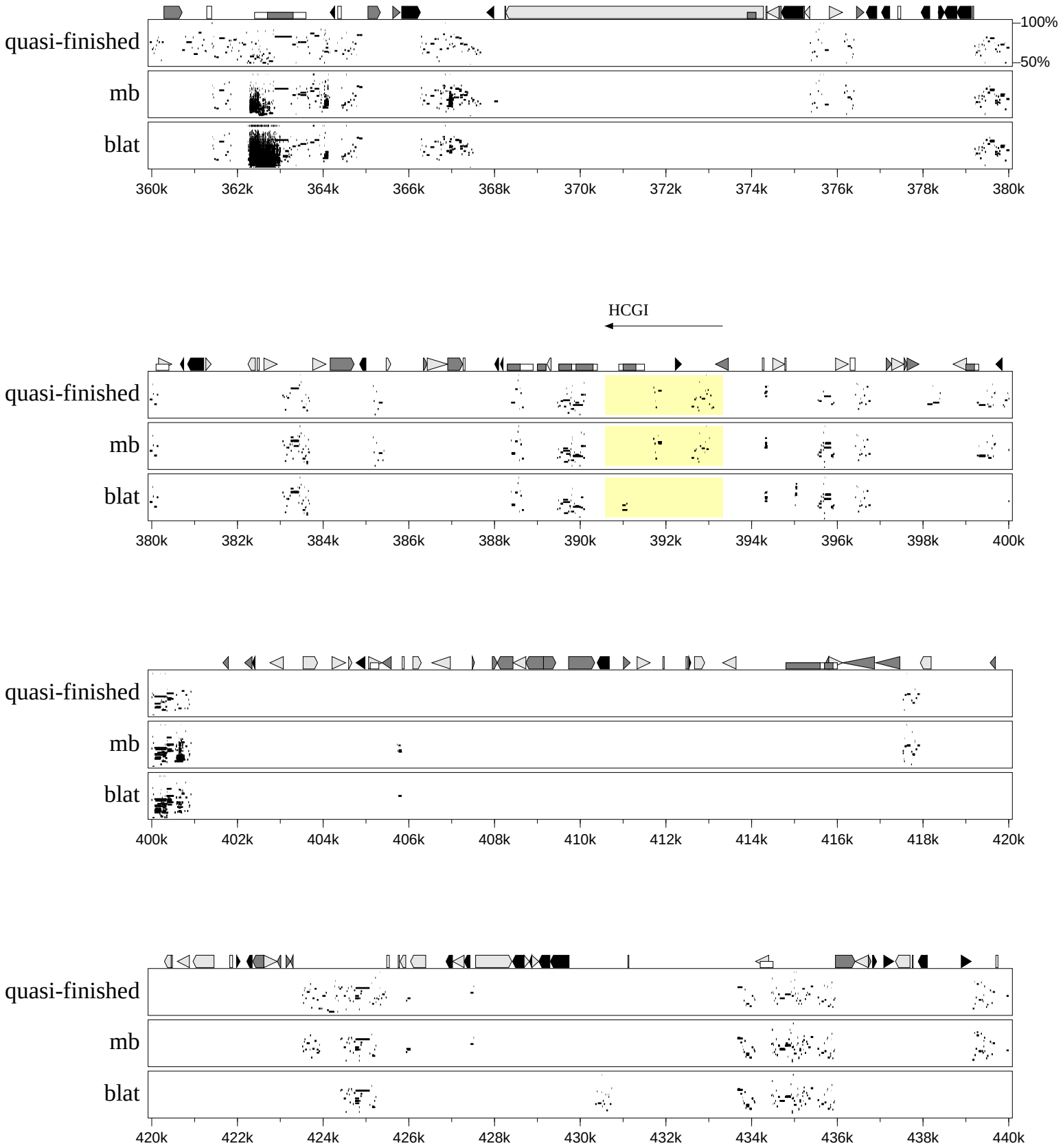
354k
356k
358k
360k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mb
blat
100%
50%
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364k
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368k
370k
372k
374k
376k
378k
380k
HCGI
380k
382k
384k
386k
388k
390k
392k
394k
396k
398k
400k
400k
402k
404k
406k
408k
410k
412k
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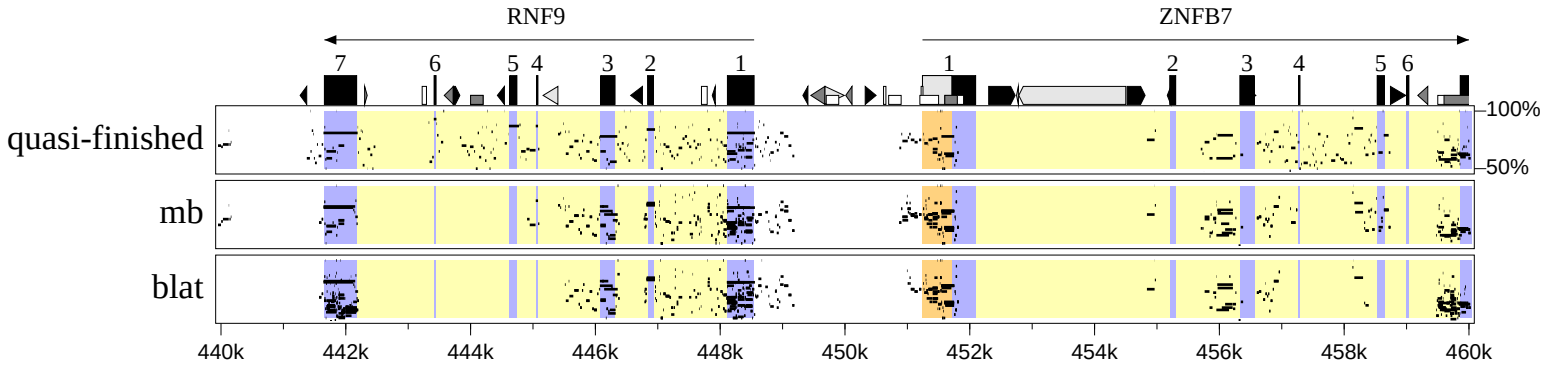
RNF9
ZNFB7
7
6
5
4
3
2
1
1
2
3
4
5
6
100%
50%
quasi-finished
mb
blat
440k
442k
444k
446k
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450k
452k
454k
456k
458k
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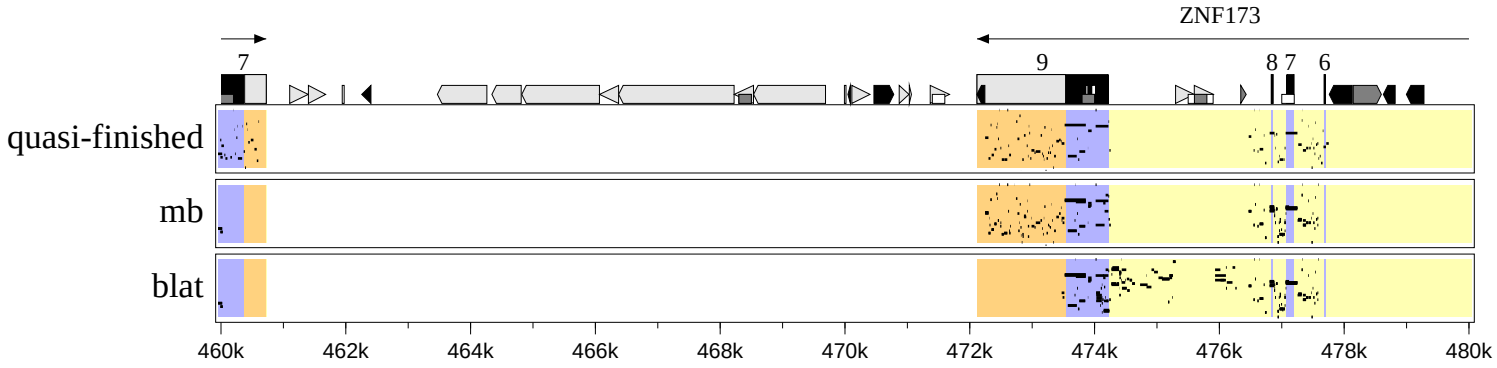
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9
8
7
6
quasi-finished
mb
blat
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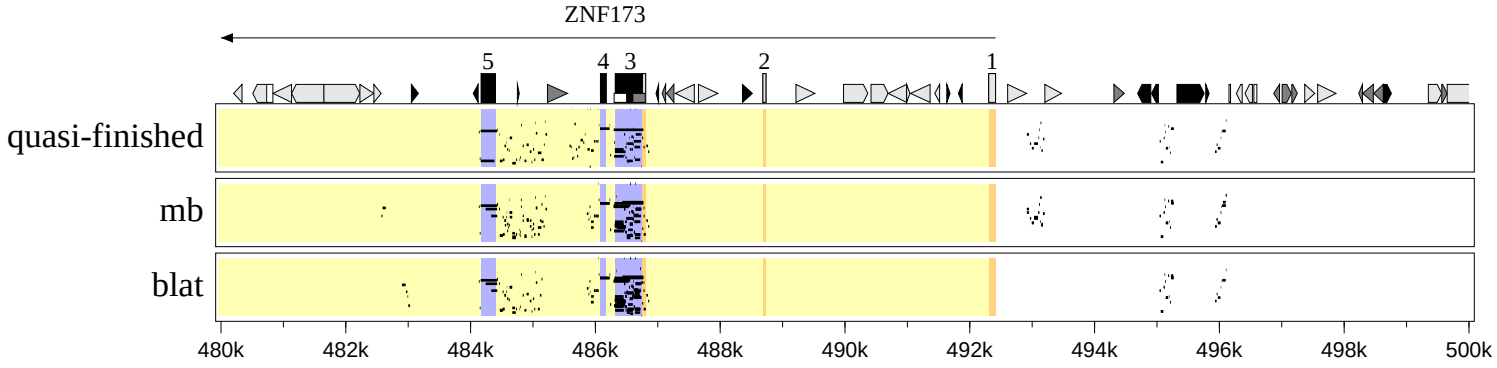
462k
464k
466k
468k
470k
472k
474k
476k
478k
480k


ZNF173
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4
3
2
1
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blat
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484k
486k
488k
490k
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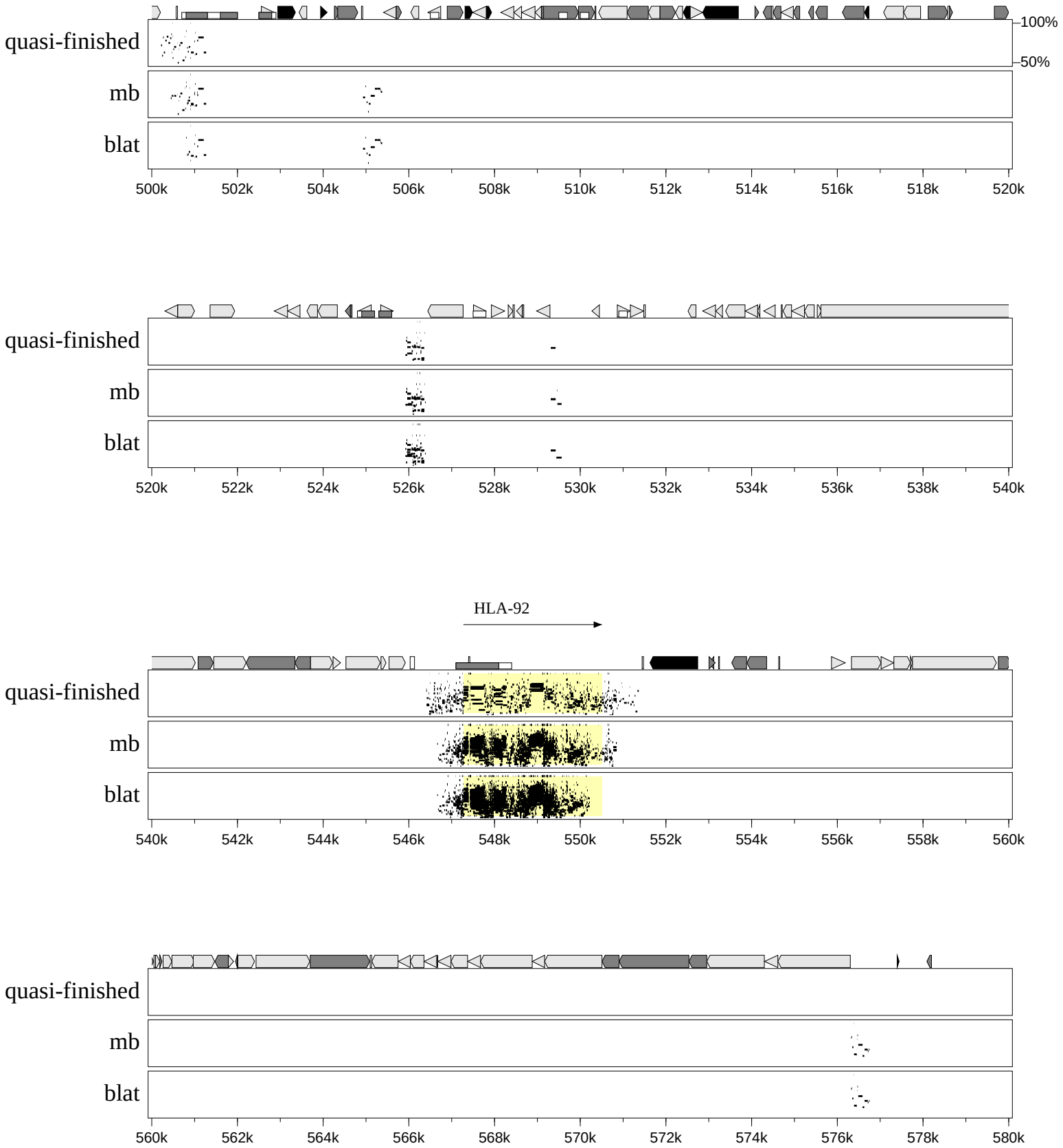
494k
496k
498k
500k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mb
blat
100%
50%
500k
502k
504k
506k
508k
510k
512k
514k
516k
518k
520k
quasi-finished
mb
blat
520k
522k
524k
526k
528k
530k
532k
534k
536k
538k
540k
HLA-92
quasi-finished
mb
blat
540k
542k
544k
546k
548k
550k
552k
554k
556k
558k
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blat
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564k
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576k
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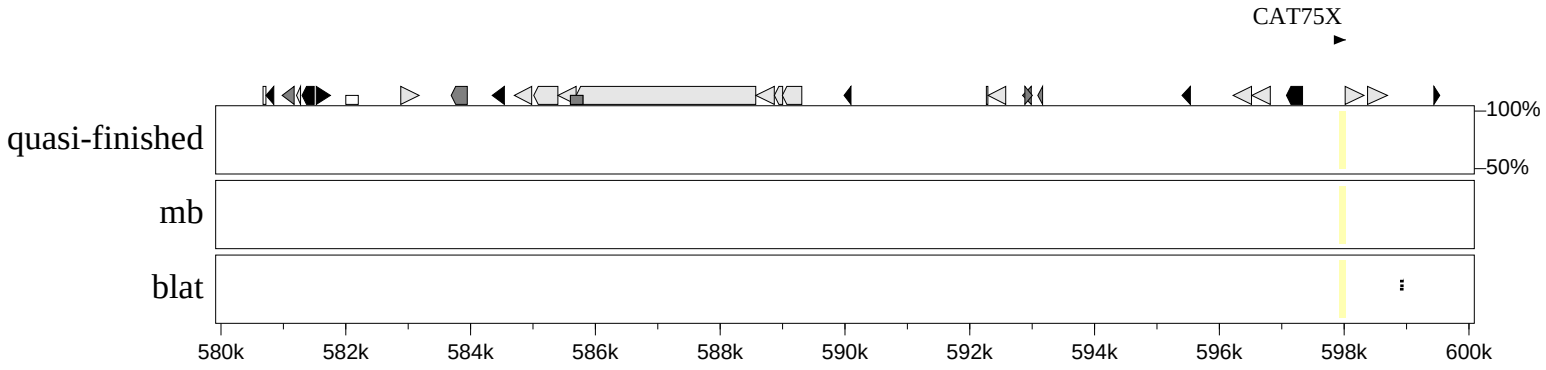
CAT75X
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50%
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584k
586k
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590k
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594k
596k
598k
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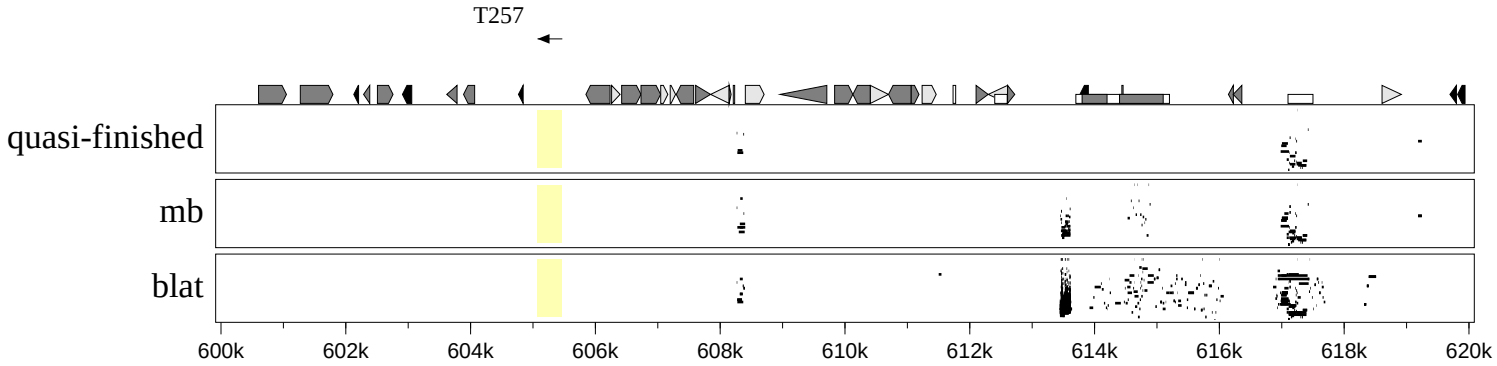
T257
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blat
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604k
606k
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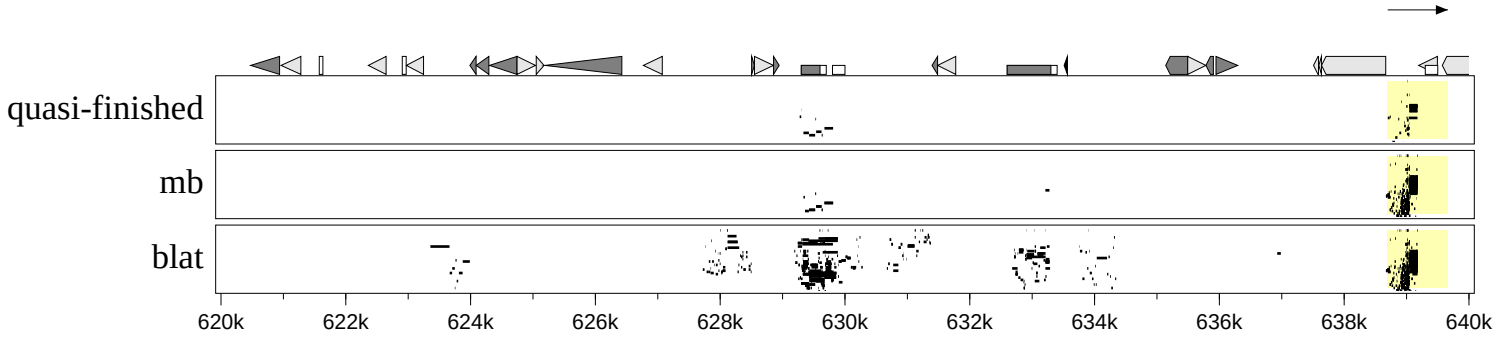
610k
612k
614k
616k
618k
620k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mb
blat
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626k
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636k
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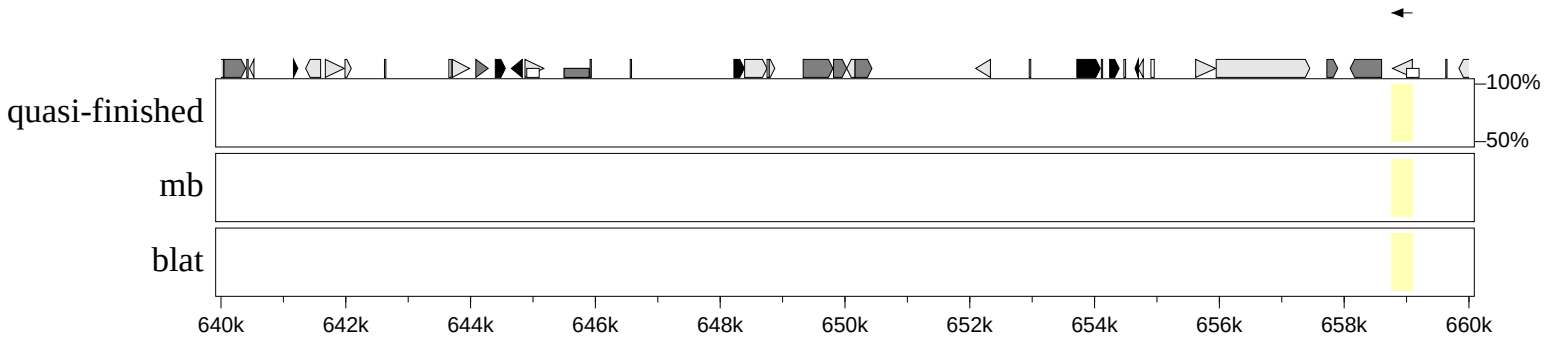
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blat
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50%
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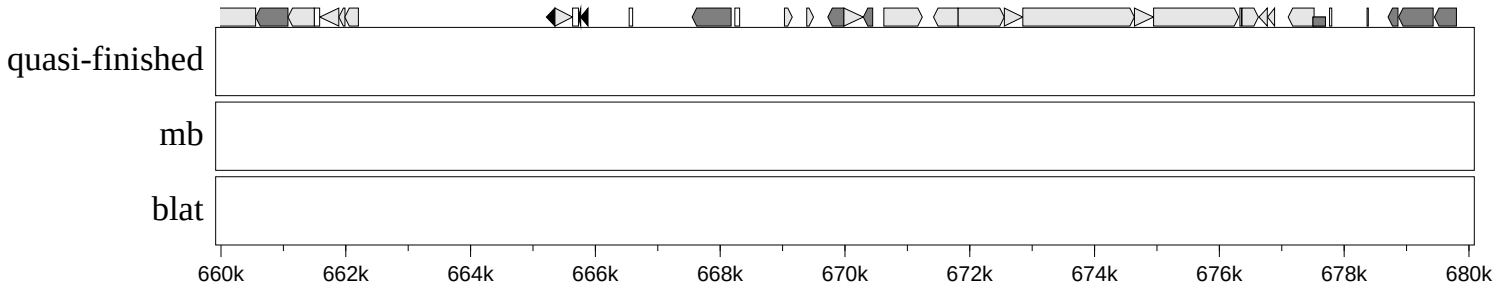
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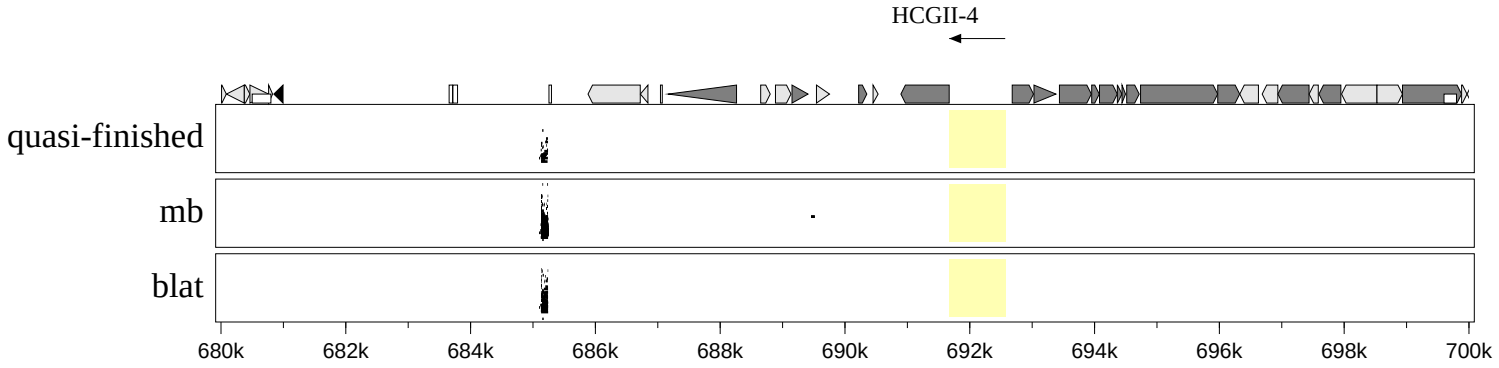
HCGII-4
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blat
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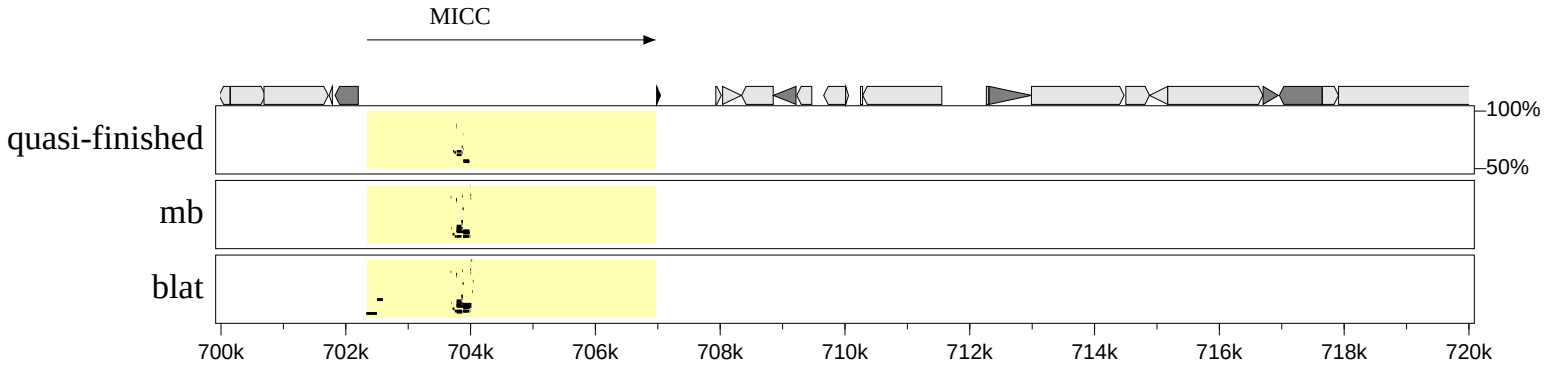
682k
684k
686k
688k
690k
692k
694k
696k
698k
700k


MICC
quasi-finished
mb
blat
100%
50%
700k
702k
704k
706k
708k
710k
712k
714k
716k
718k
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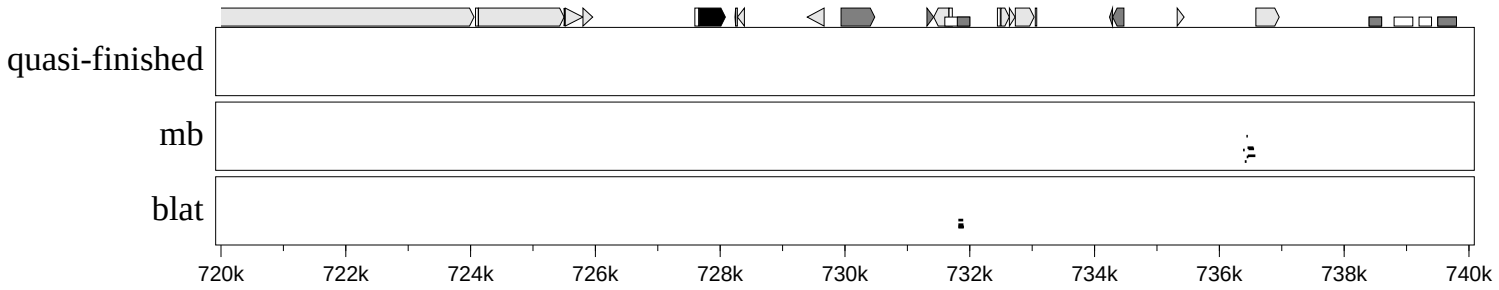
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mb
blat
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728k
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732k
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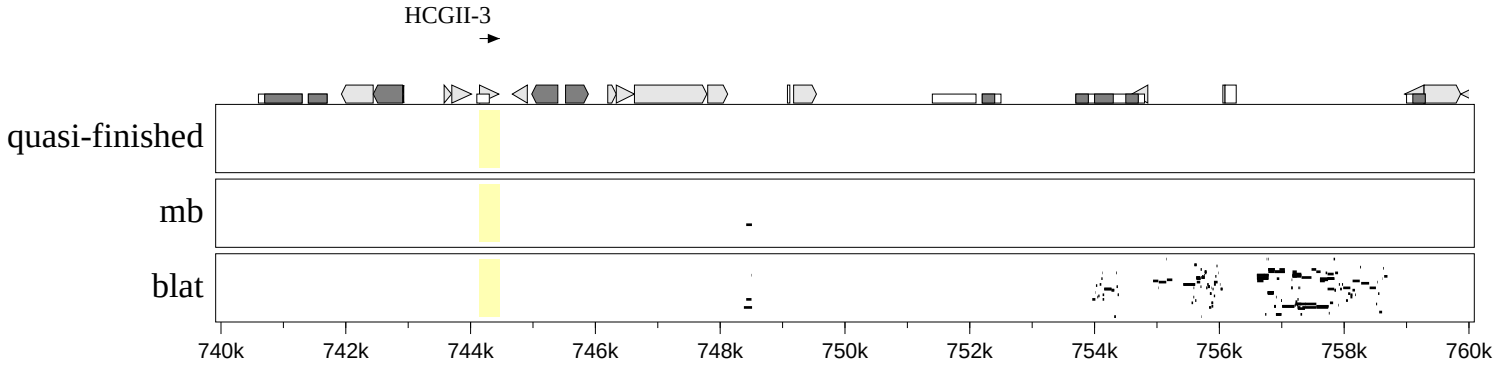
HCGII-3
quasi-finished
mb
blat
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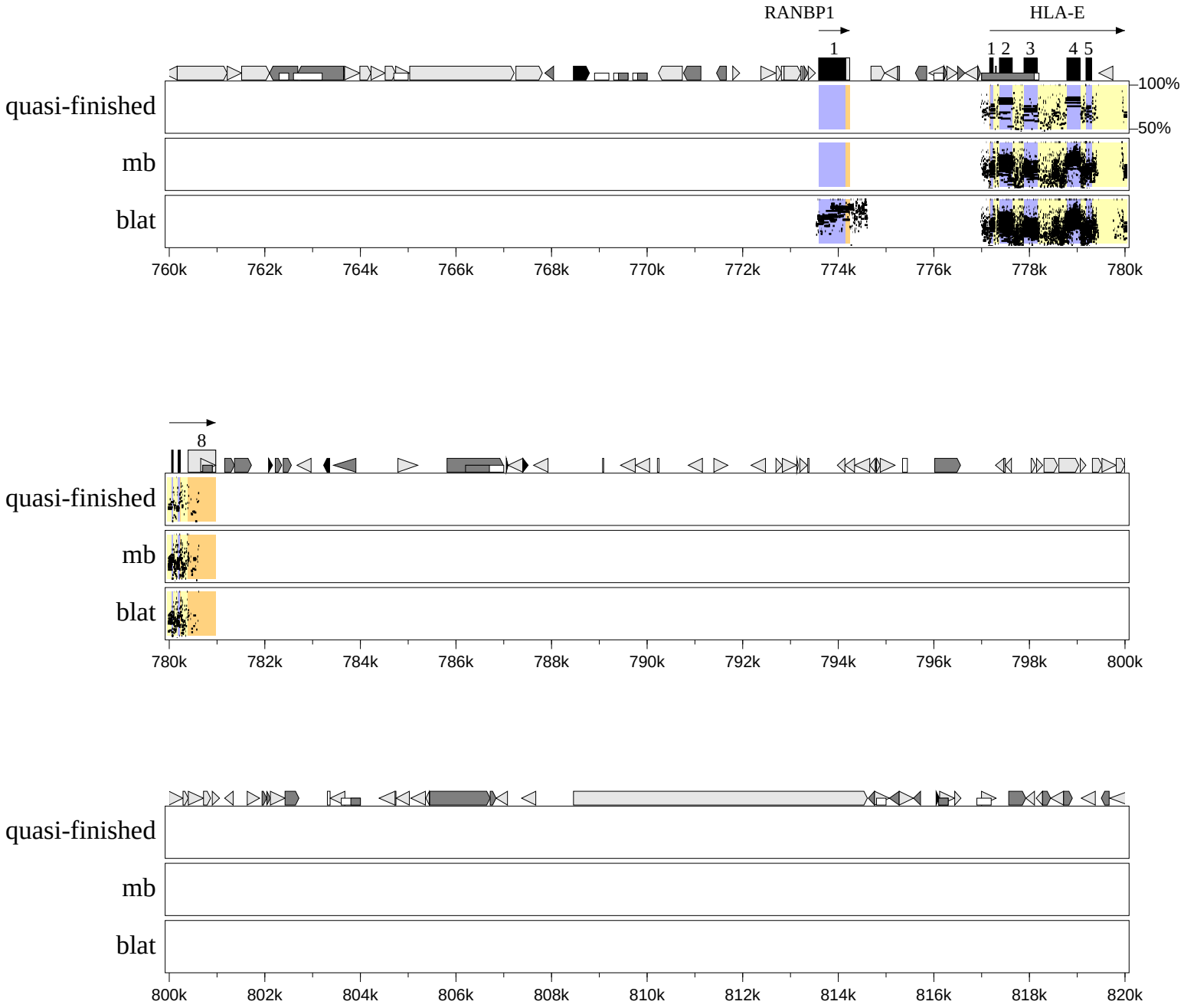
742k
744k
746k
748k
750k
752k
754k
756k
758k
760k


RANBP1
HLA-E
1
1 2 3
4 5
100%
50%
quasi-finished
mb
blat
760k
762k
764k
766k
768k
770k
772k
774k
776k
778k
780k
8
quasi-finished
mb
blat
780k
782k
784k
786k
788k
790k
792k
794k
796k
798k
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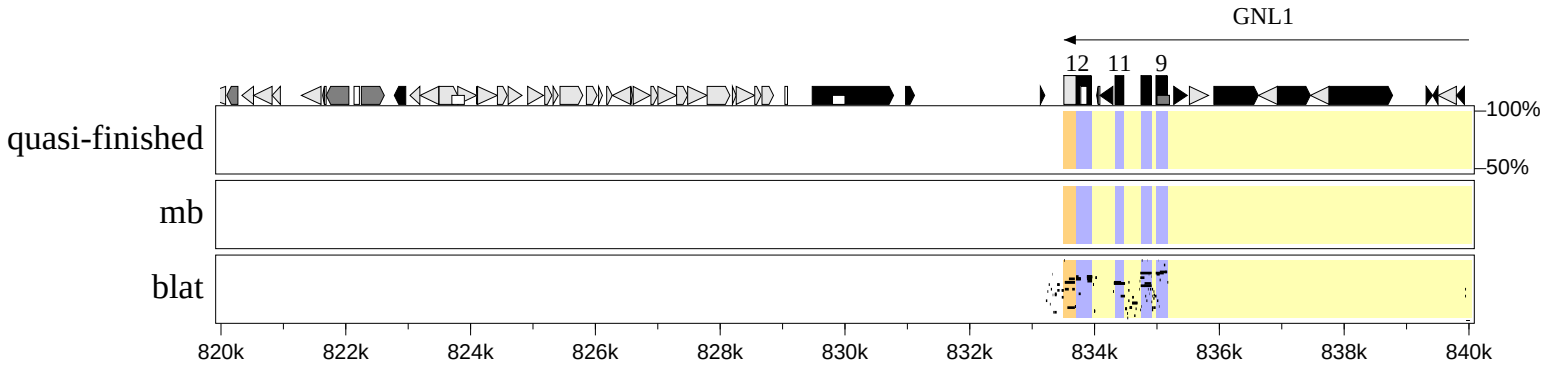
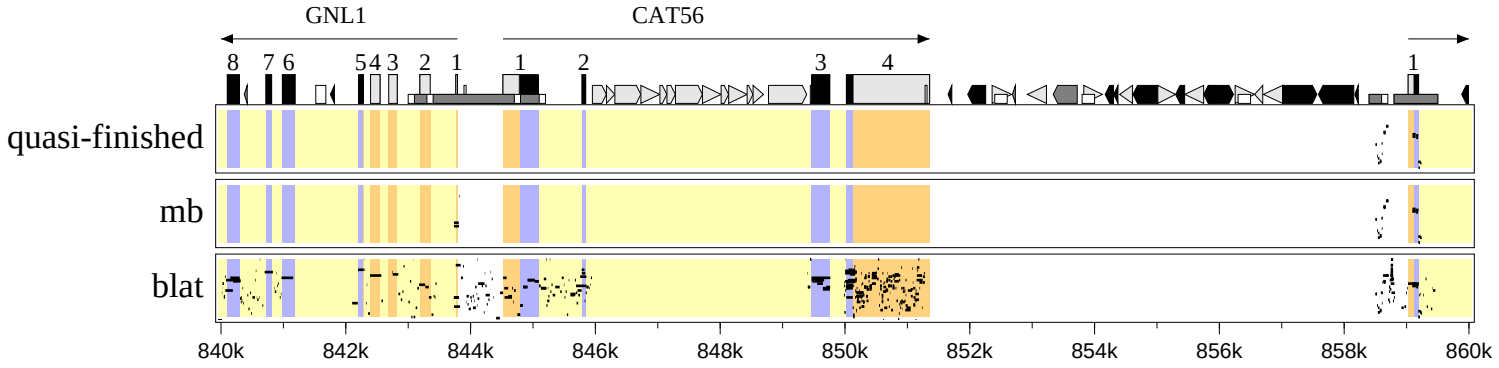
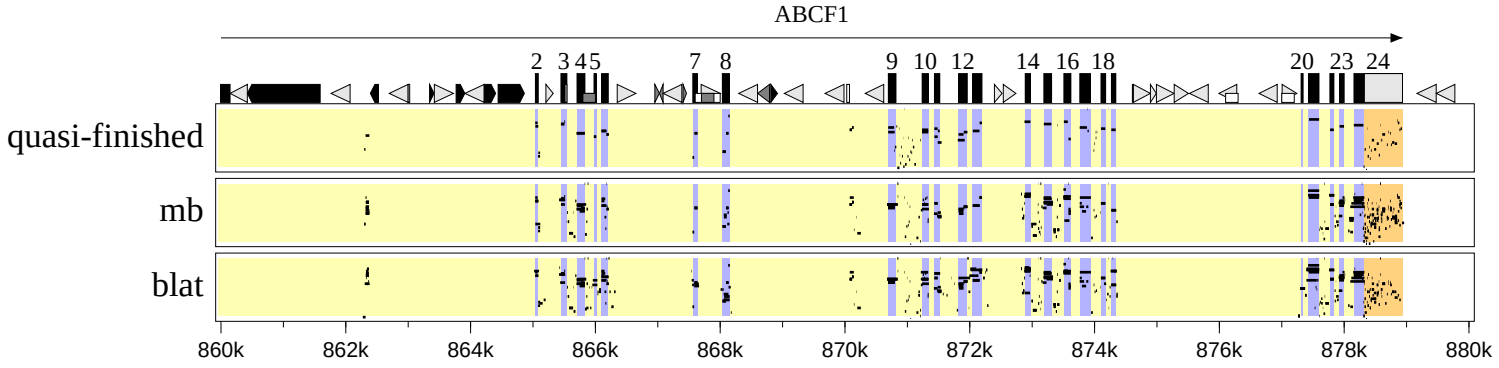
blat
800k
802k
804k
806k
808k
810k
812k
814k
816k
818k
820k


GNL1
12 11 9
100%
50%
quasi-finished
mb
blat
820k 822k 824k 826k 828k 830k 832k 834k 836k 838k 840k


GNL1
CAT56
8 7 6 5 4 3 2 1 1 2 3 4 1
quasi-finished
mb
blat
840k 842k 844k 846k 848k 850k 852k 854k 856k 858k 860k


ABCF1
2 3 4 5 7 8 9 10 12 14 16 18 20 23 24
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mb
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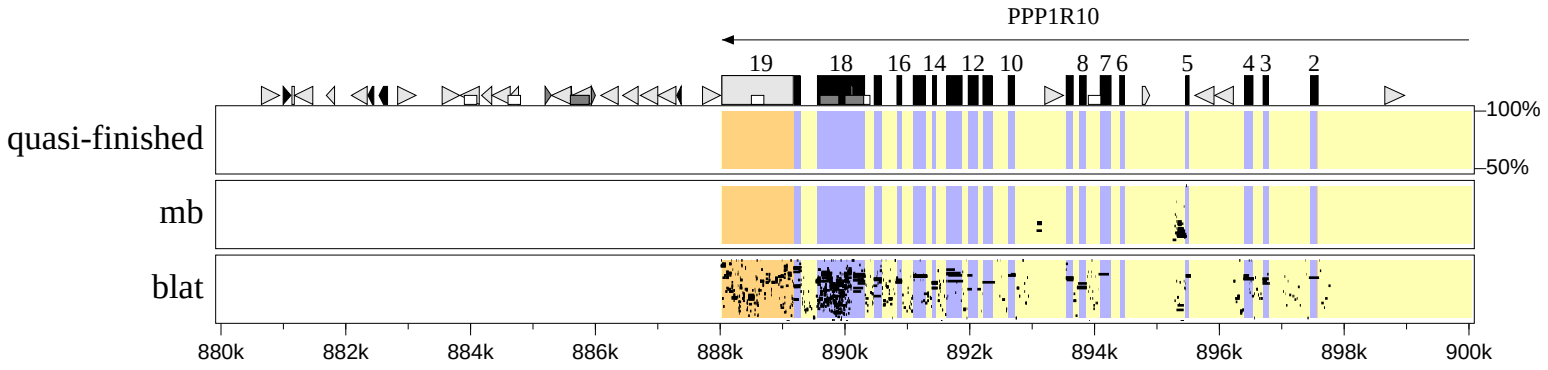
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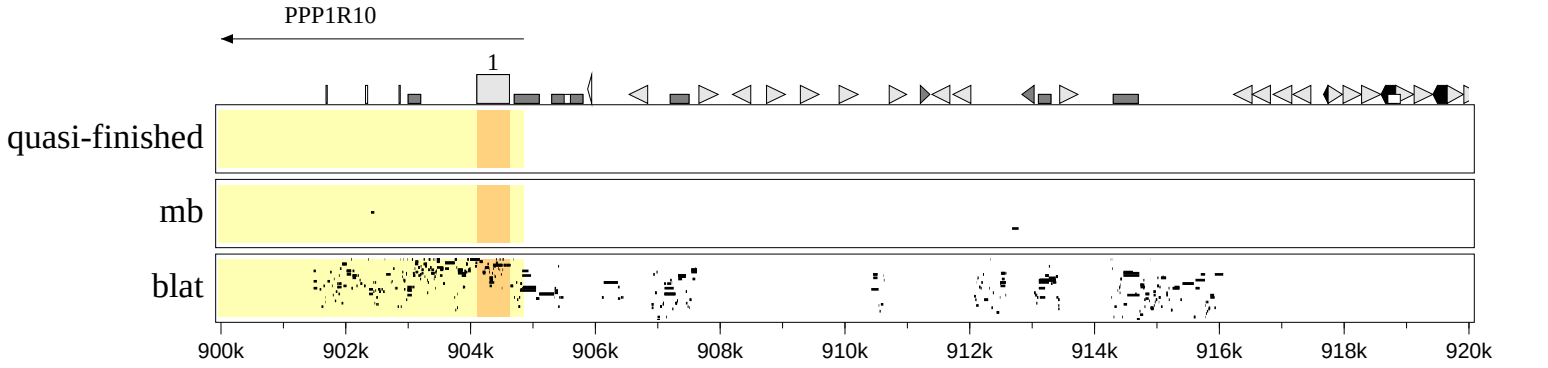
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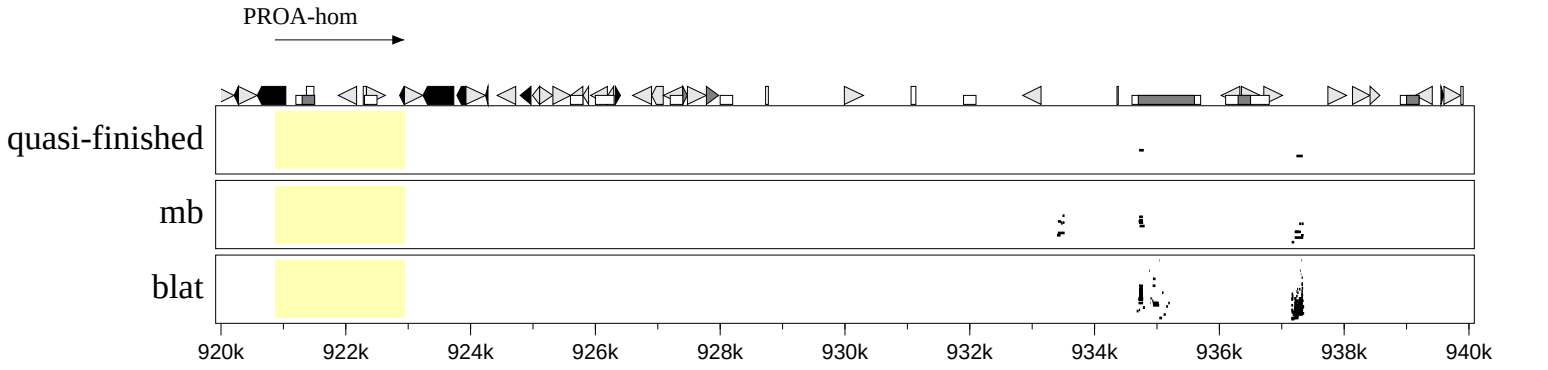
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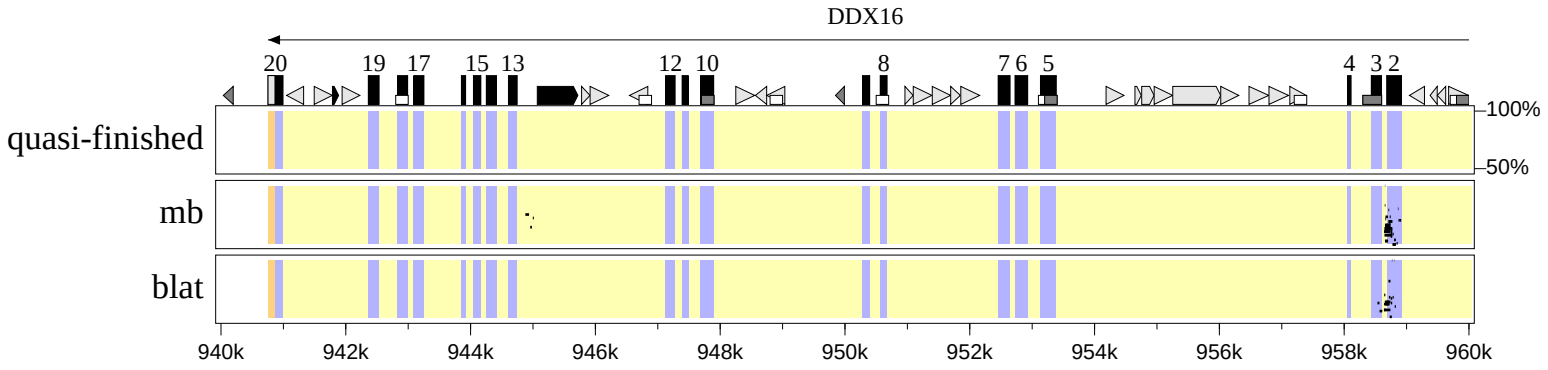
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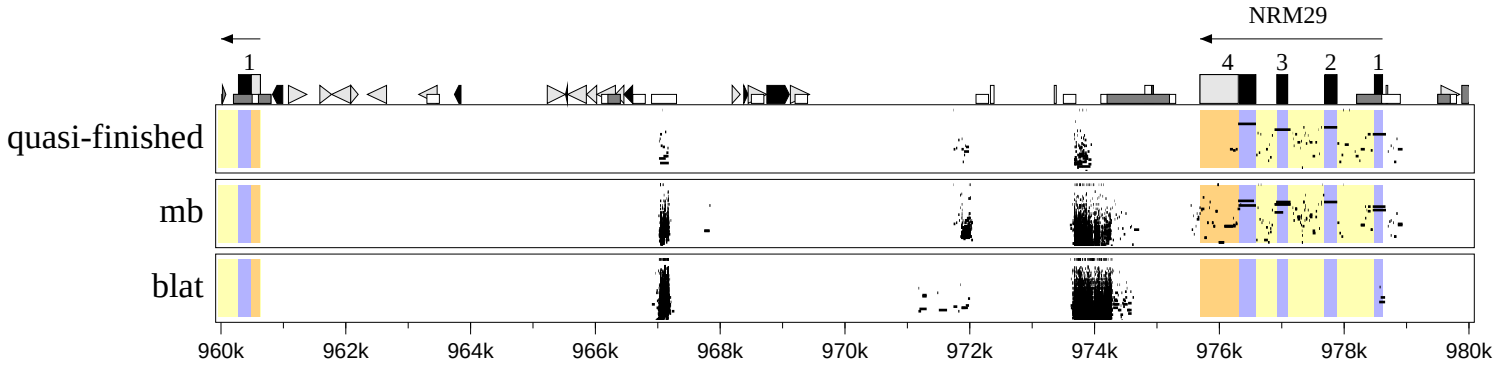
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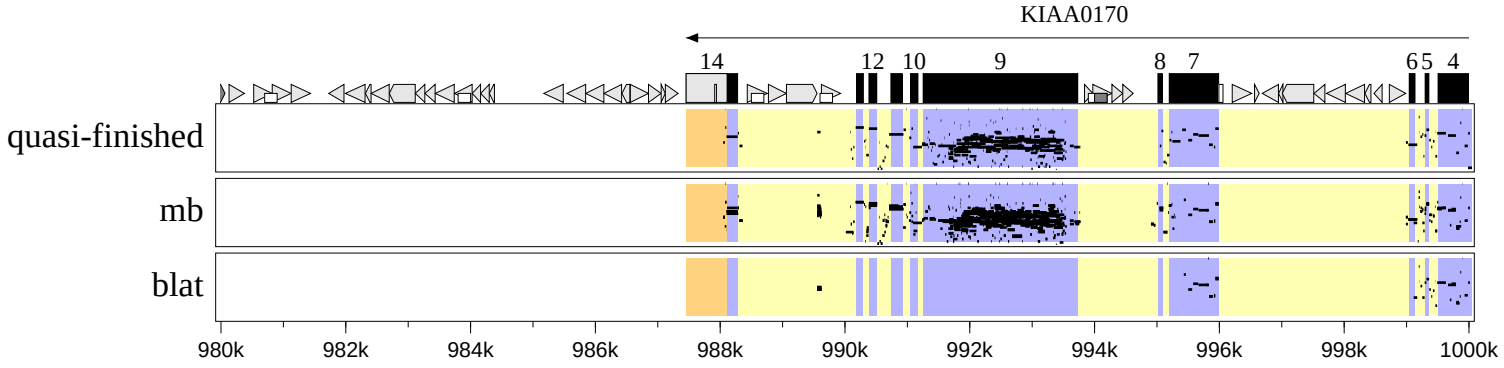
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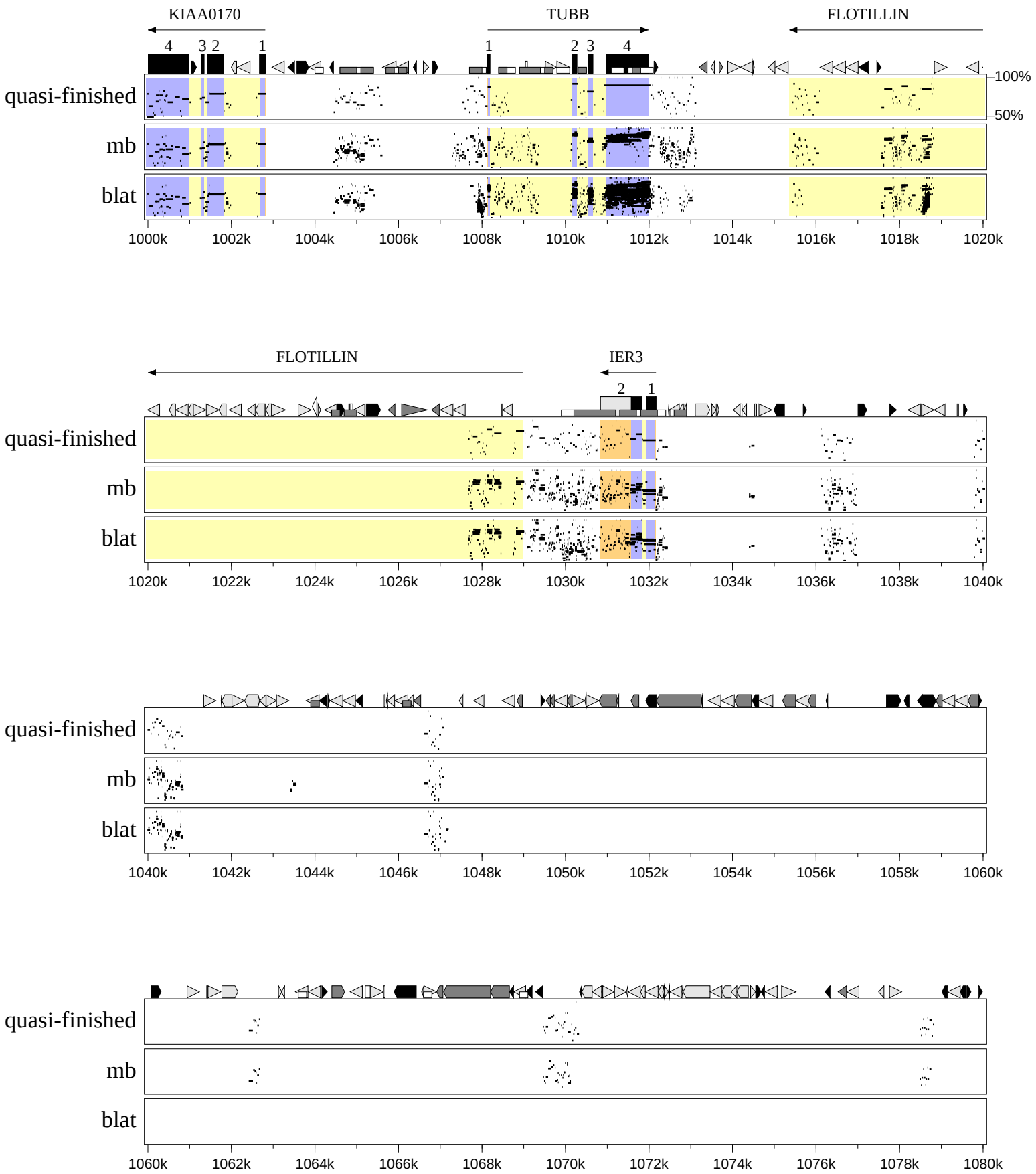
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FLOTILLIN
IER3
2
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mb
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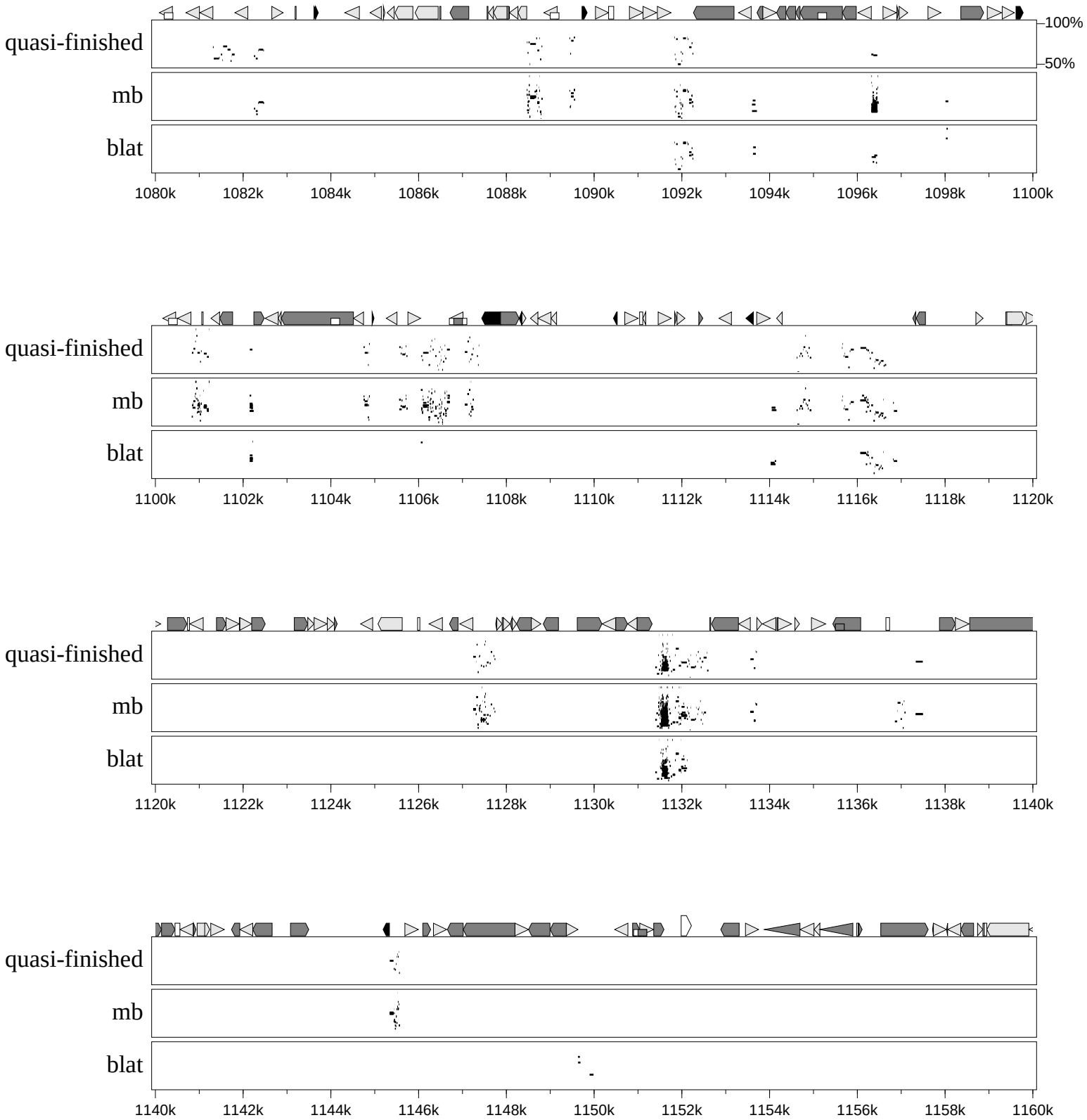
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1134k
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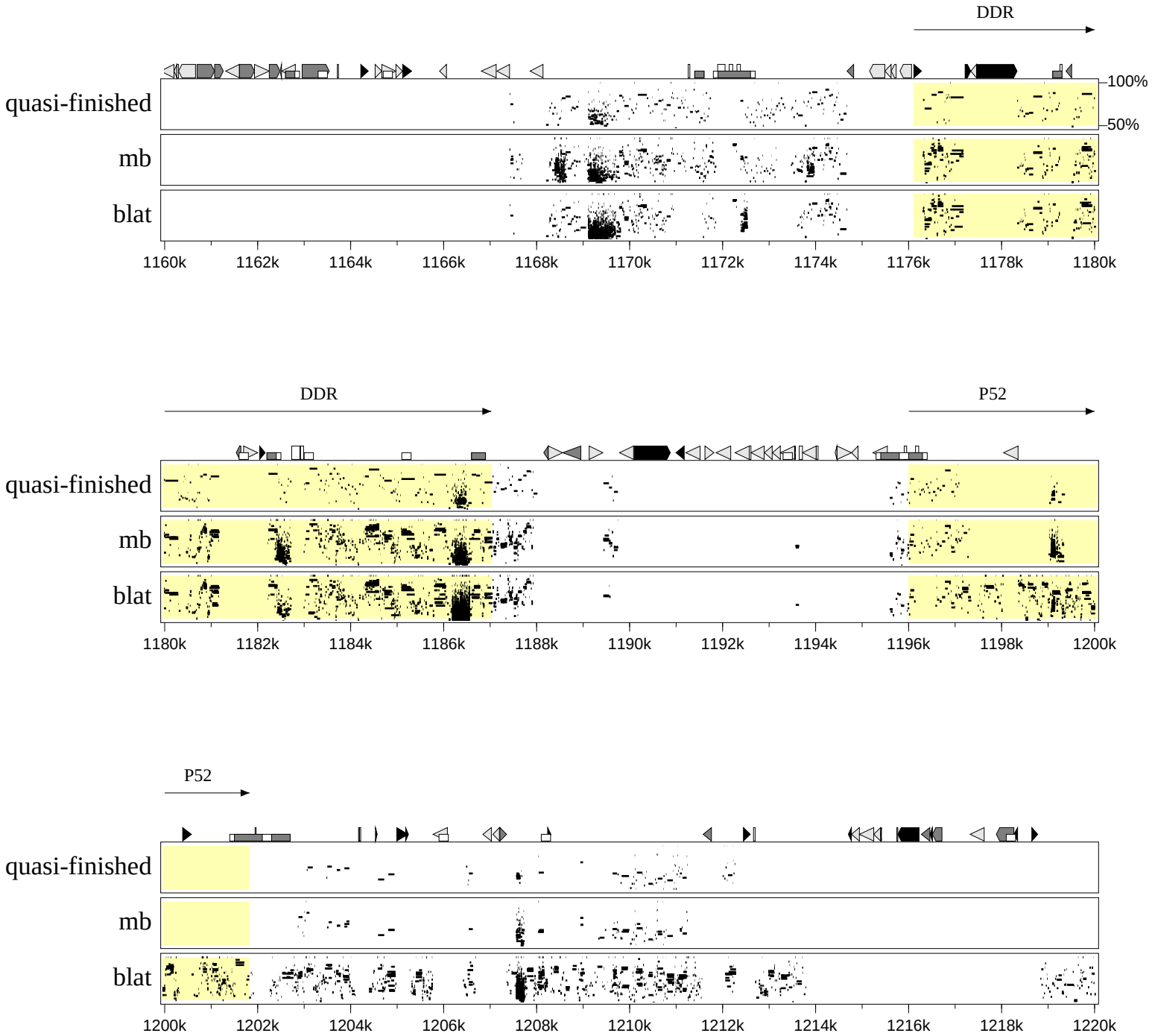
1160k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DDR
P52
quasi-finished
mb
blat
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1200k
P52
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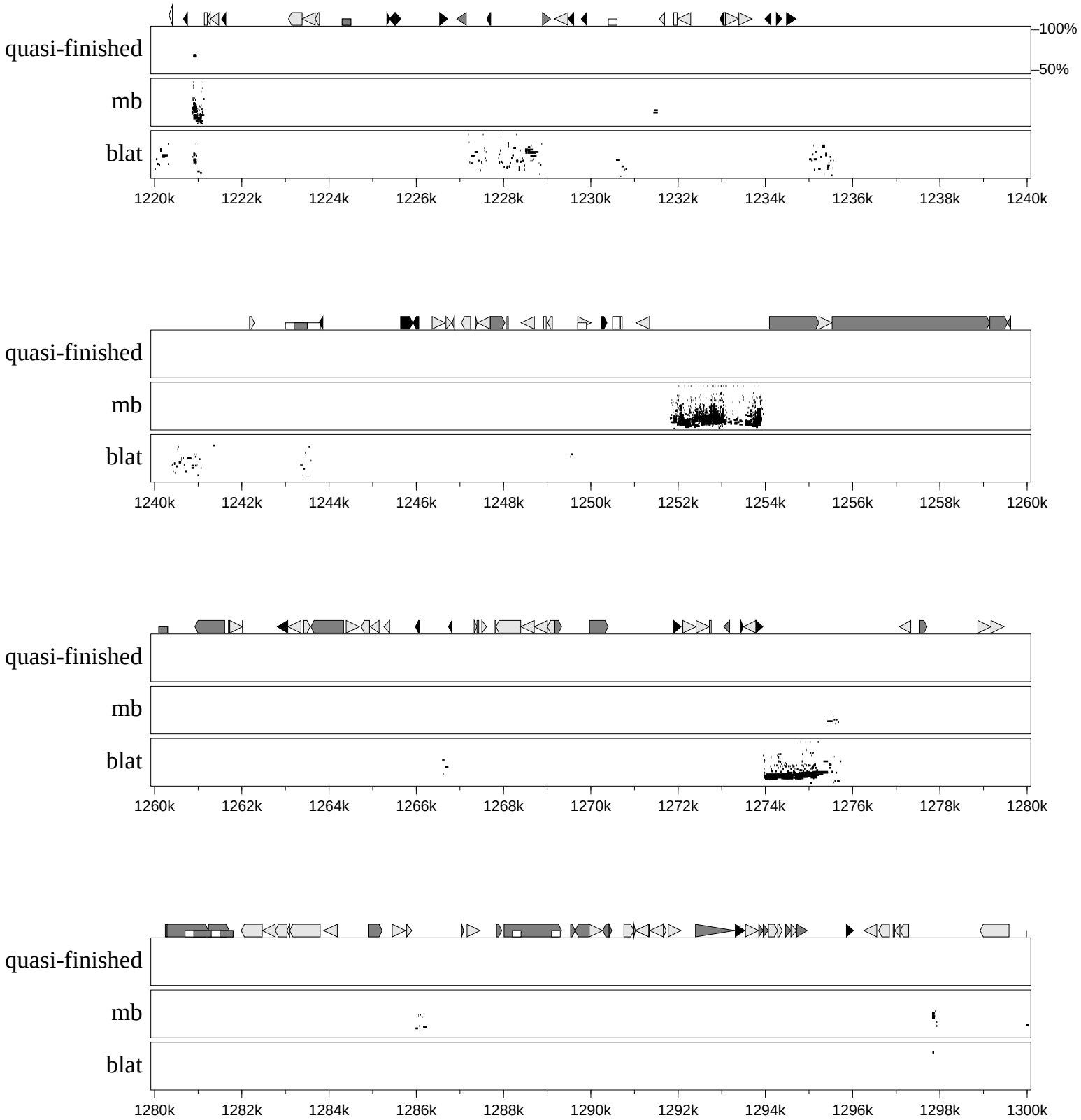
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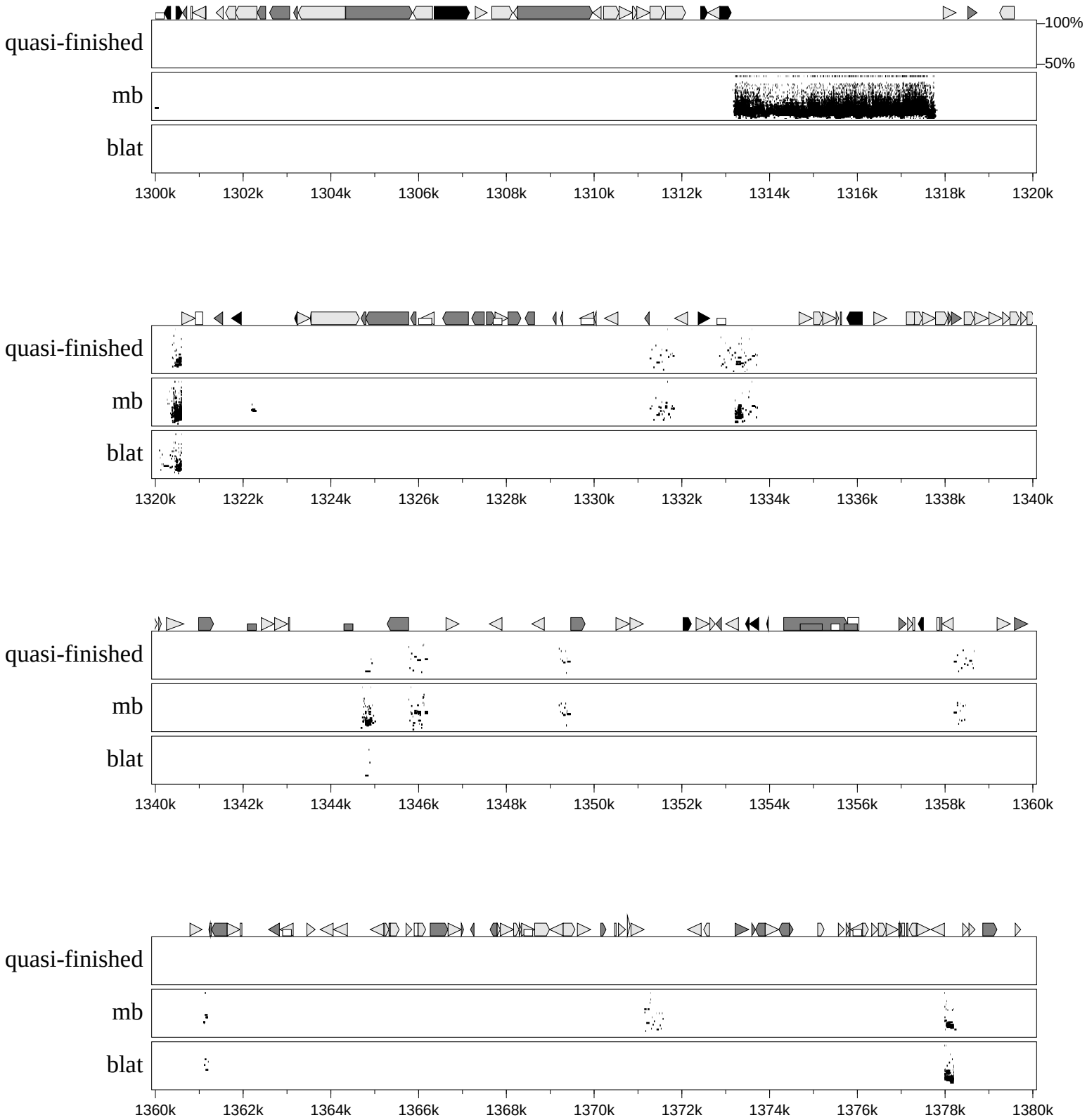
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blat
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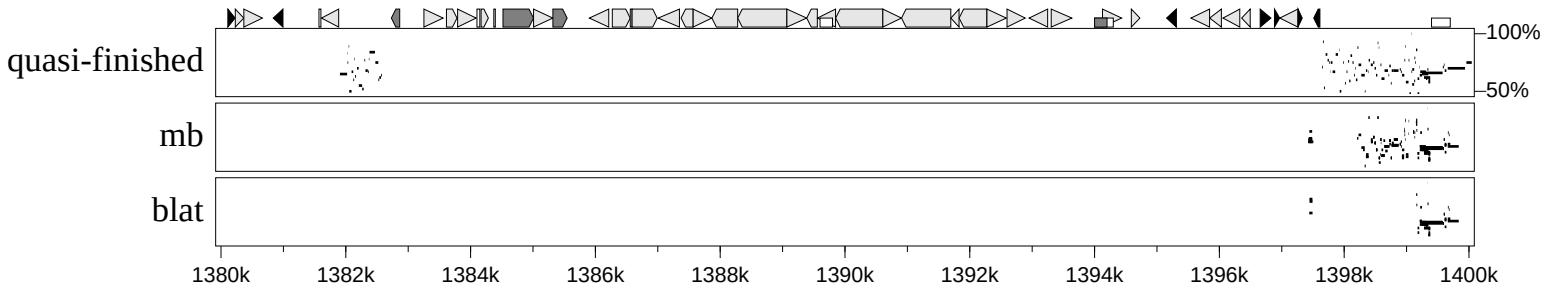
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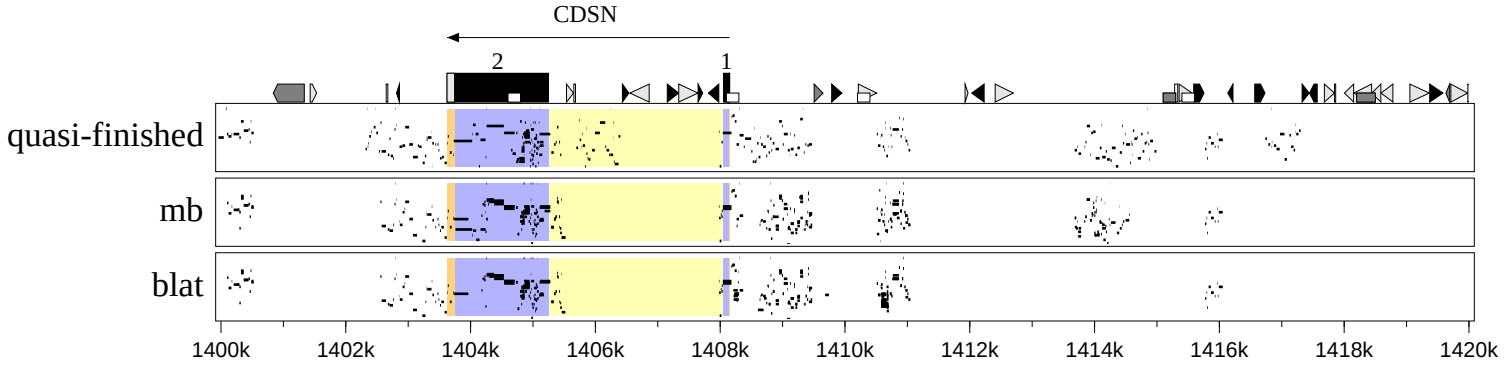
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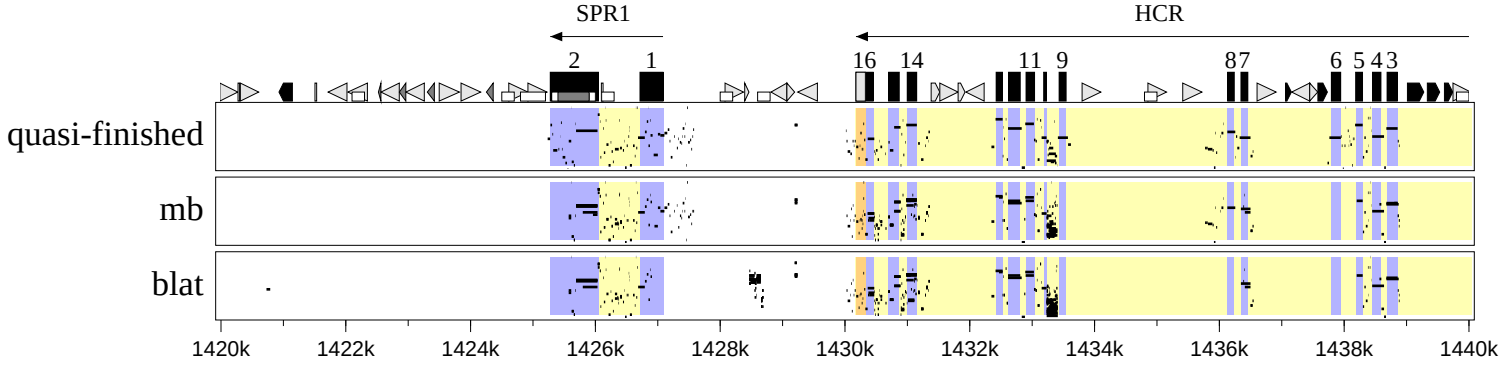
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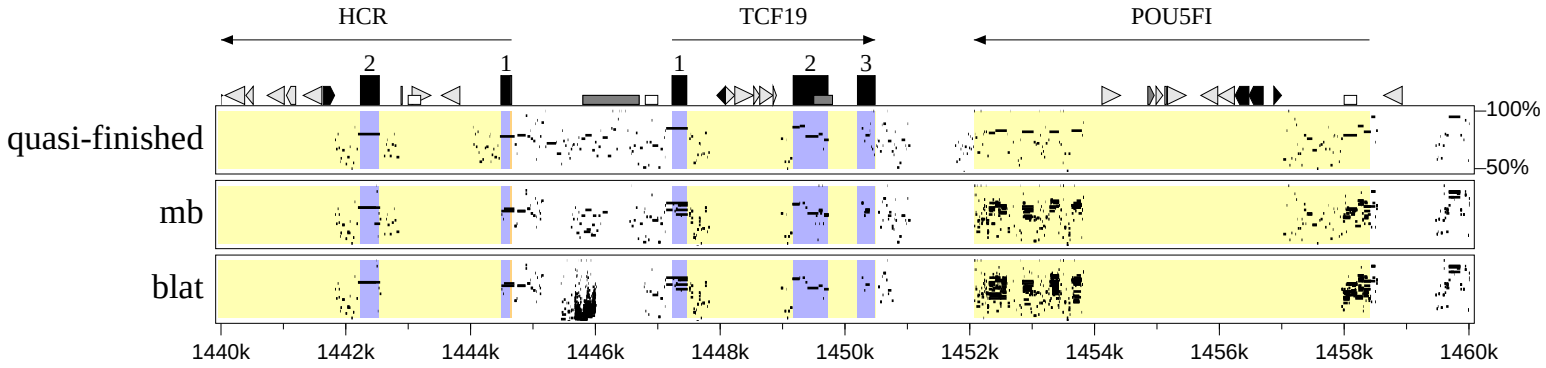
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POU5FI
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quasi-finished
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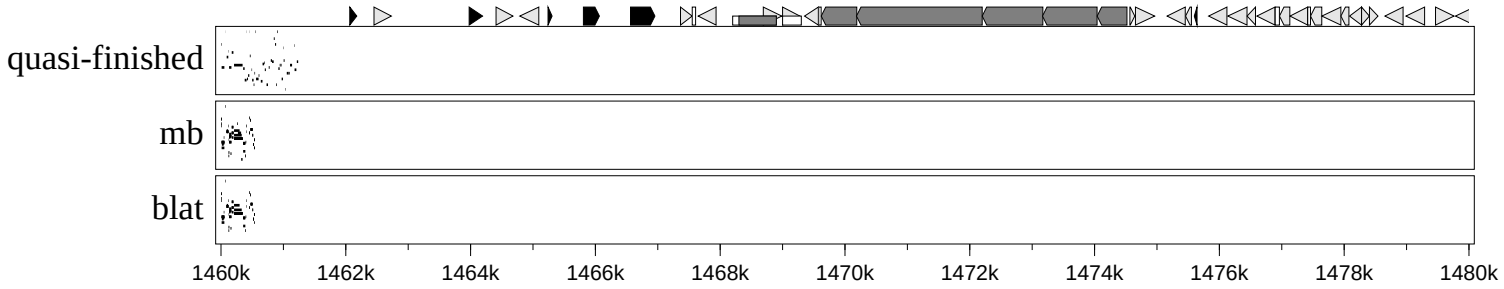
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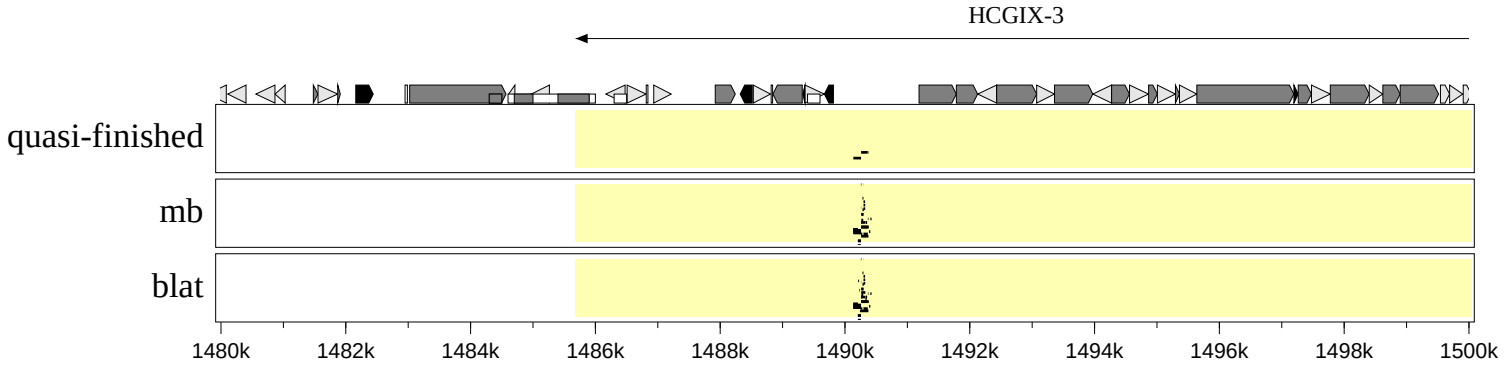
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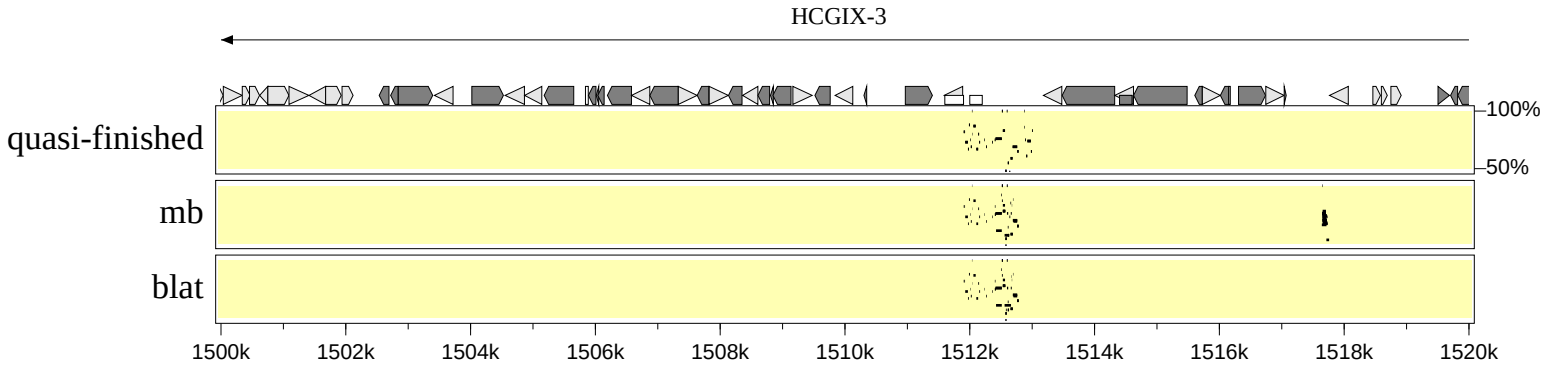
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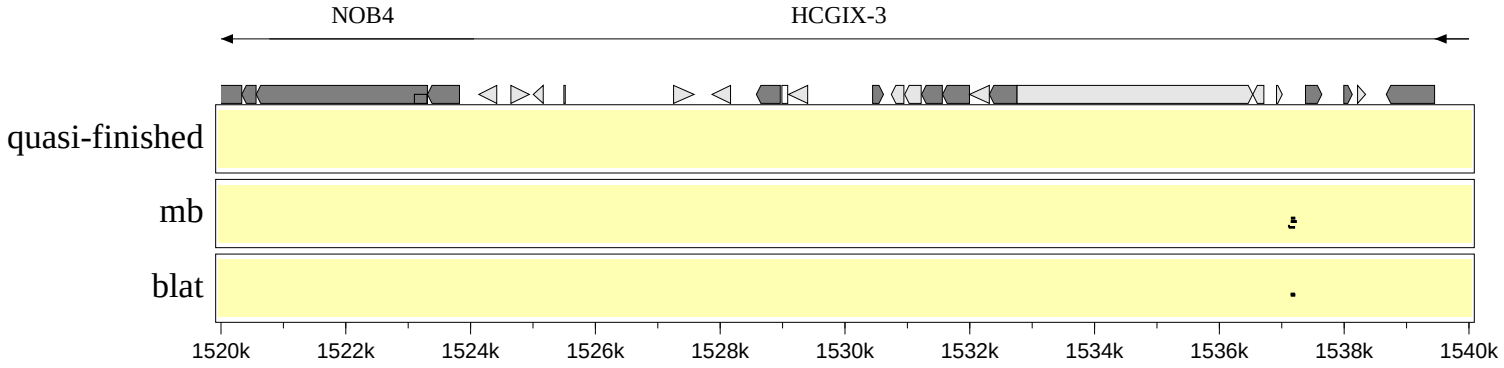
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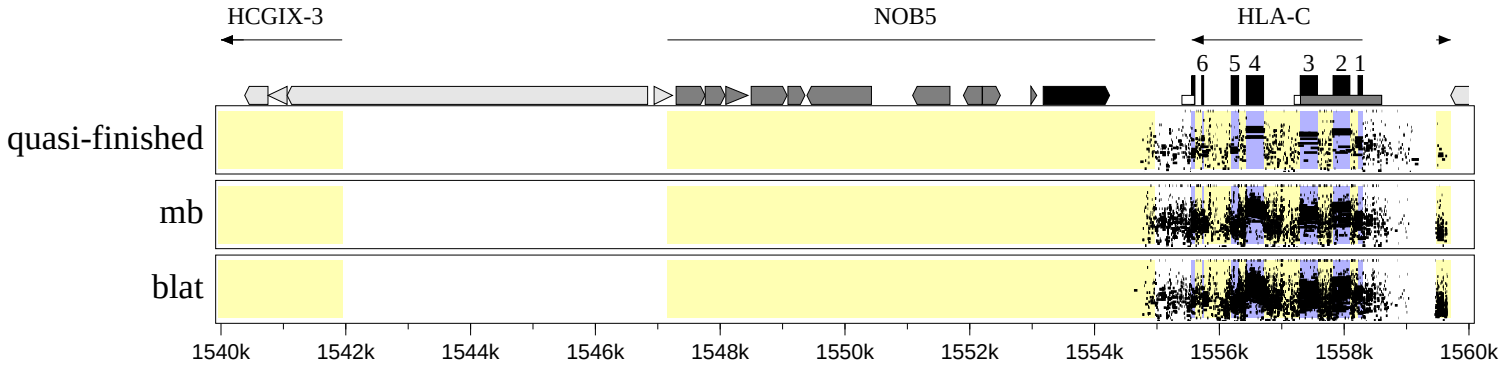
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quasi-finished
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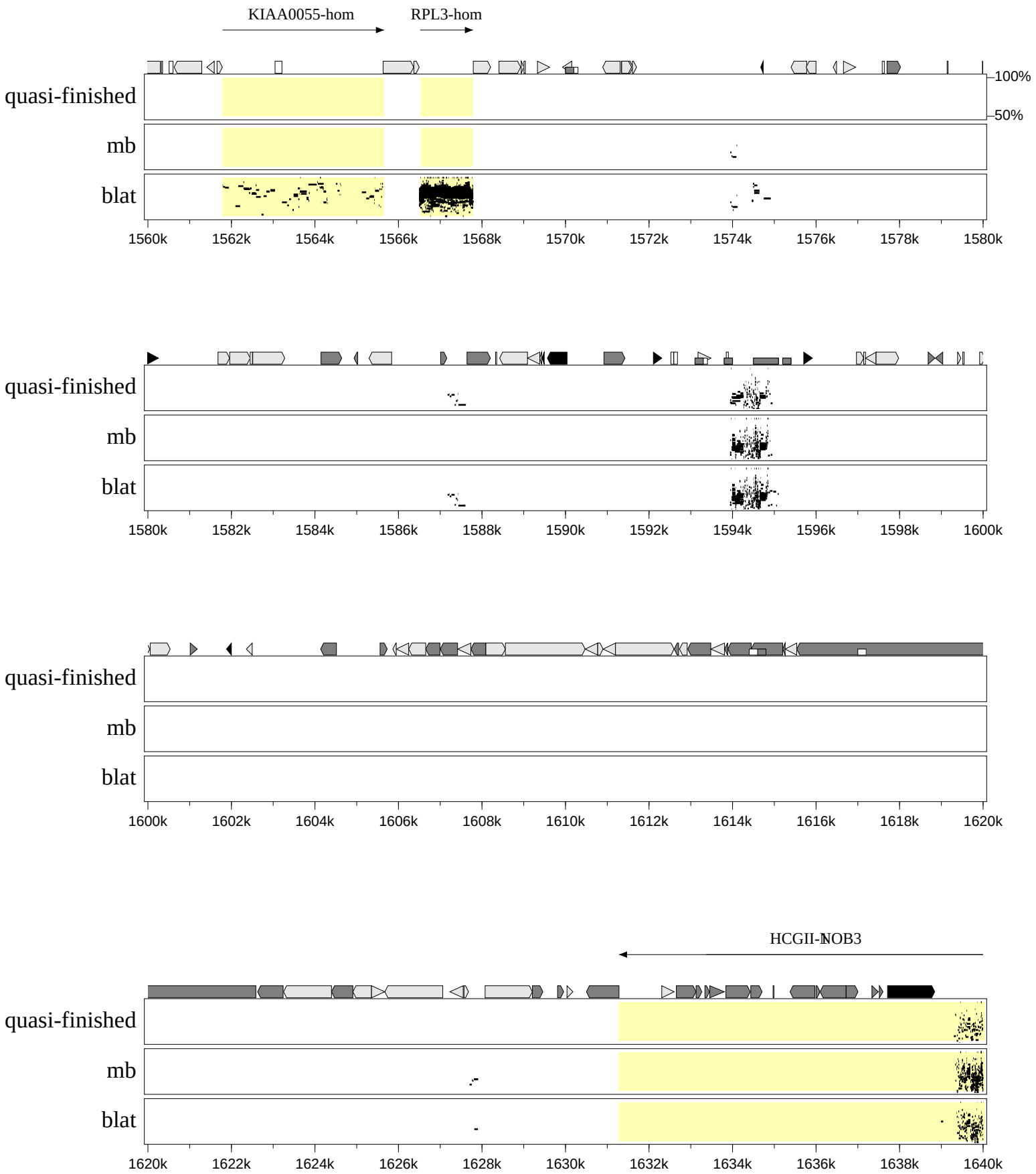
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1580k
quasi-finished
mb
blat
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1600k
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blat
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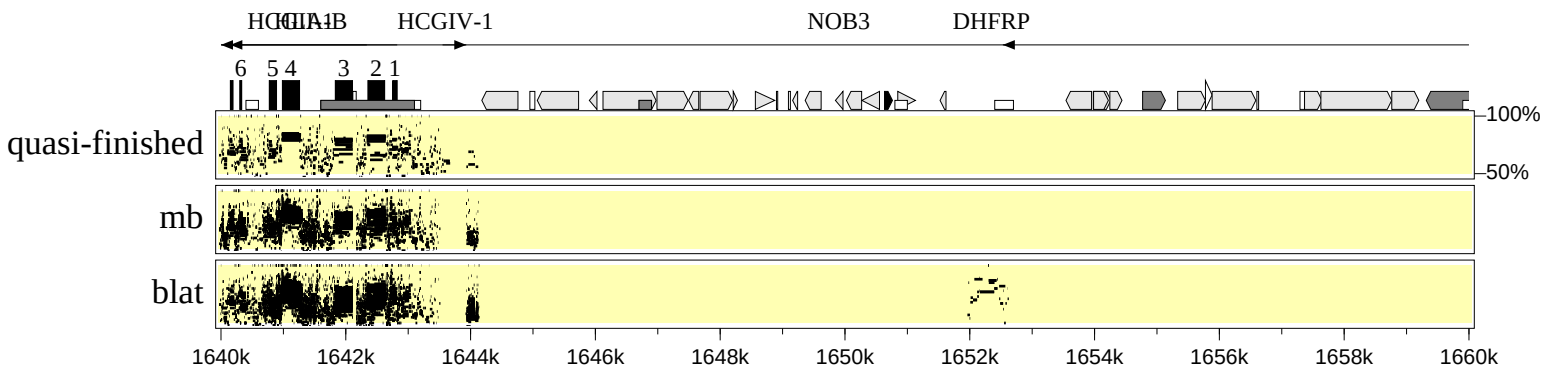
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DHFRP
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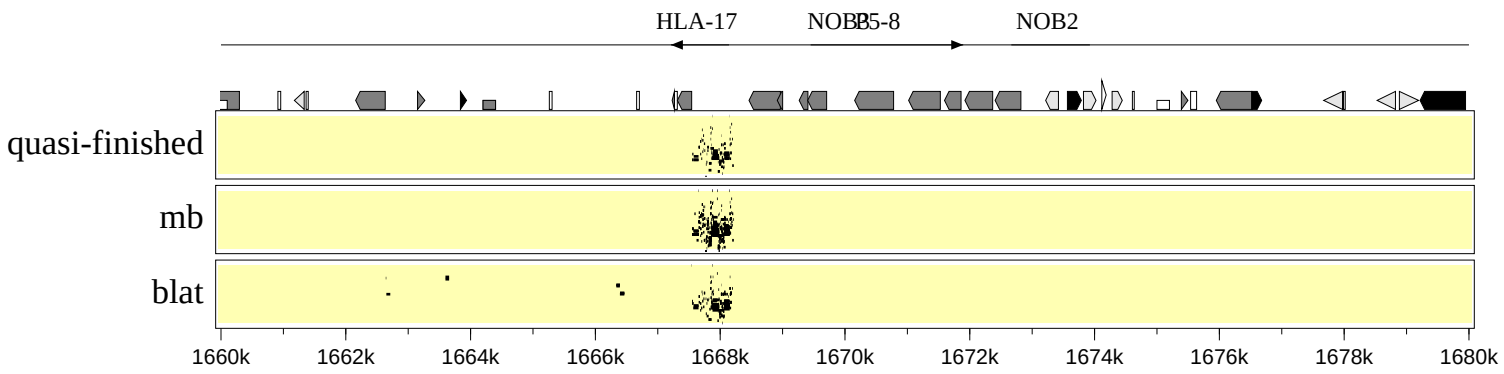
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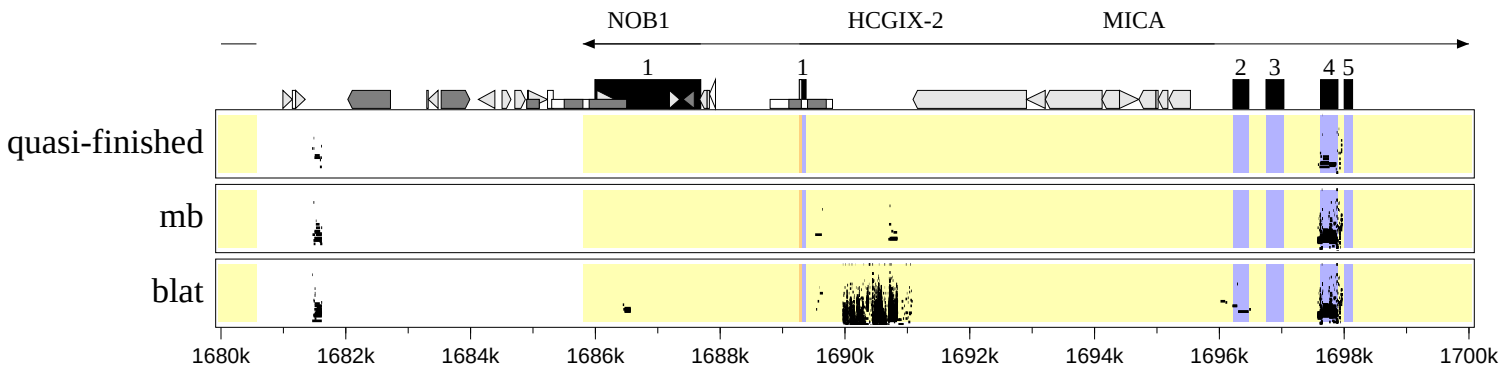
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4 5
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blat
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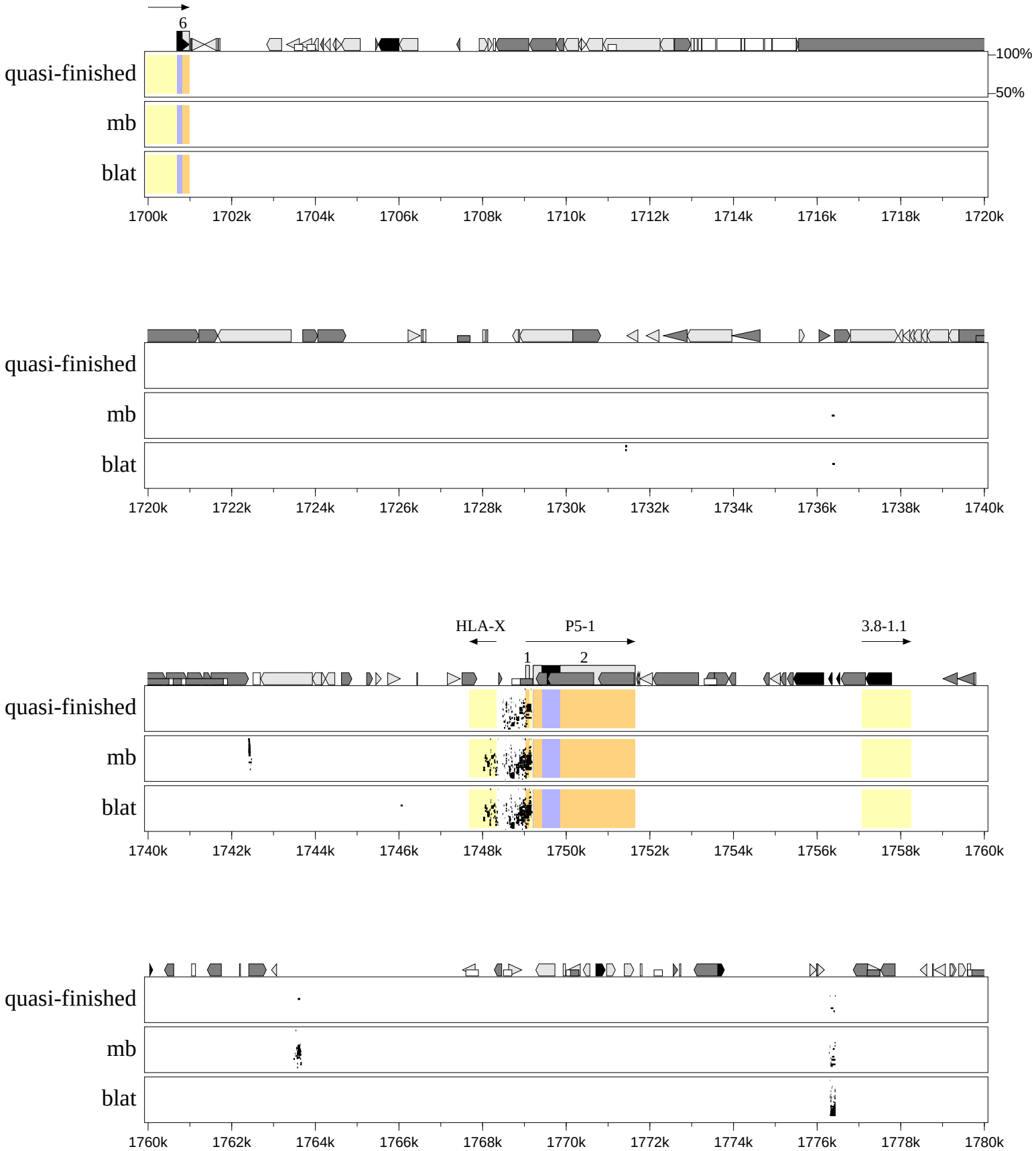
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50%
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quasi-finished
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HLA-X
P5-1
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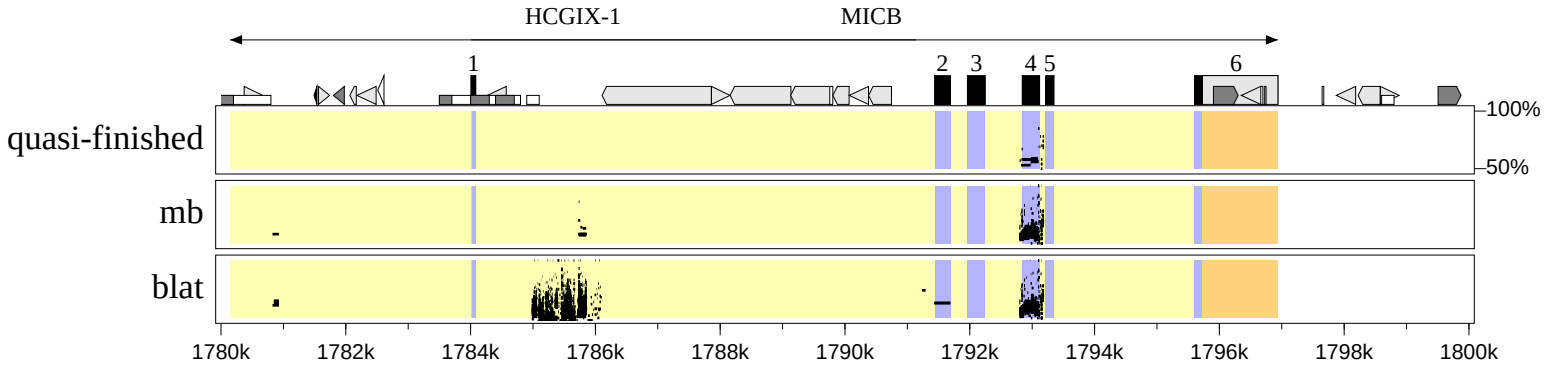
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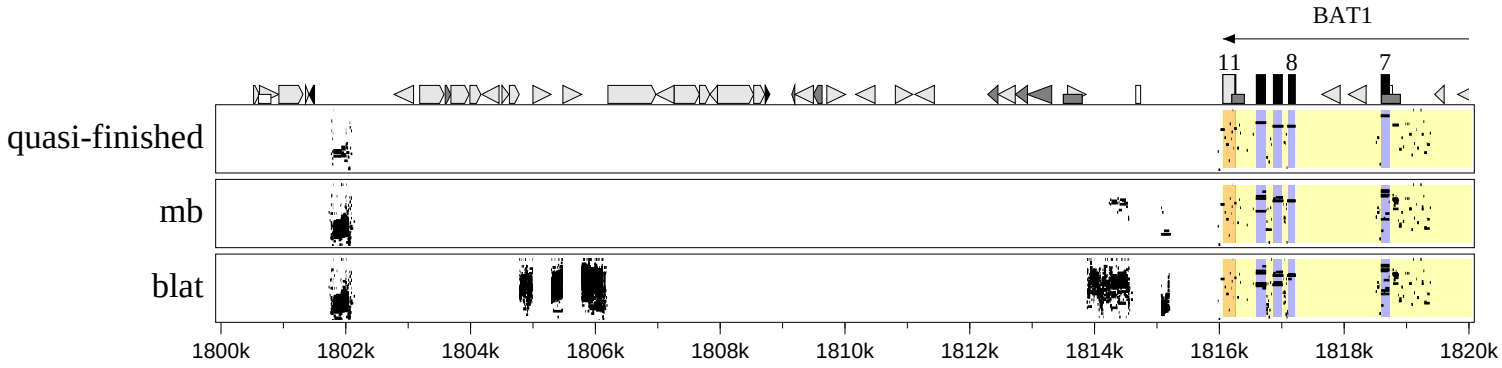
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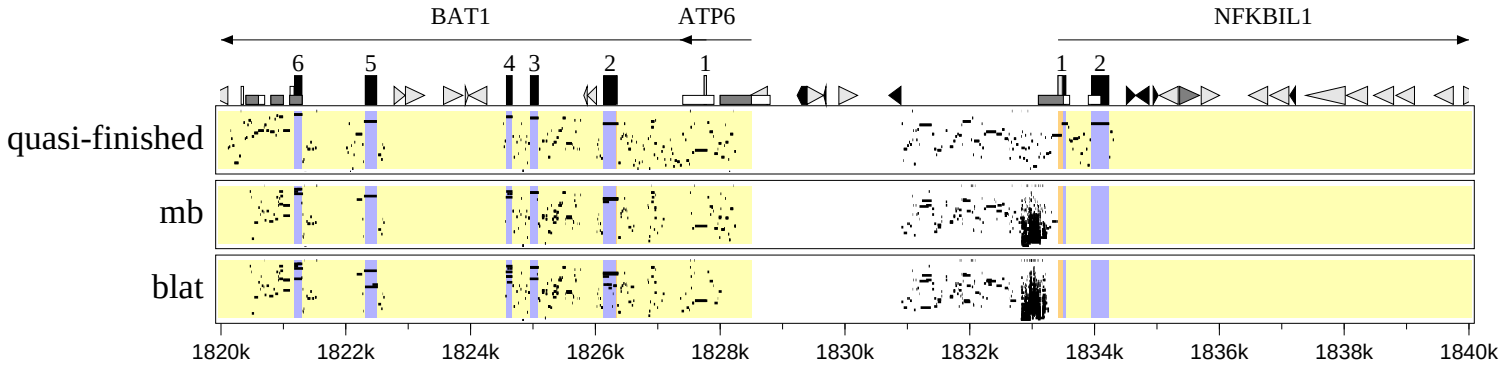
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1
2
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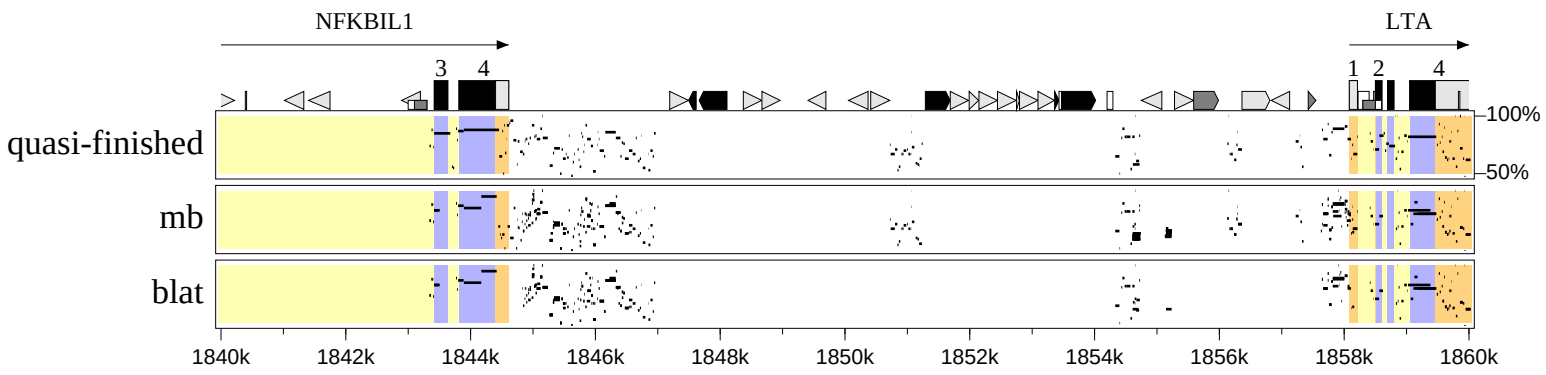
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50%
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mb
blat
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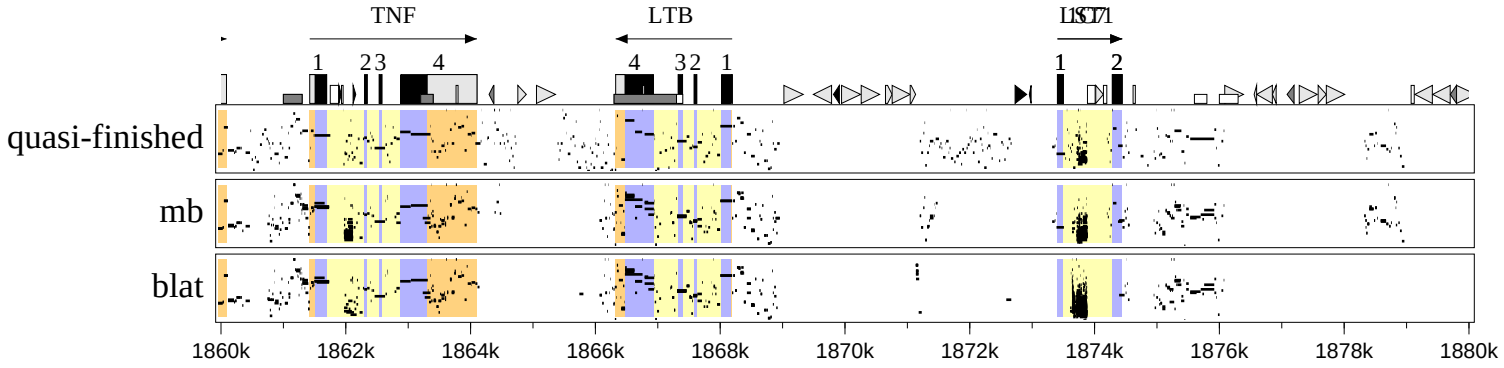
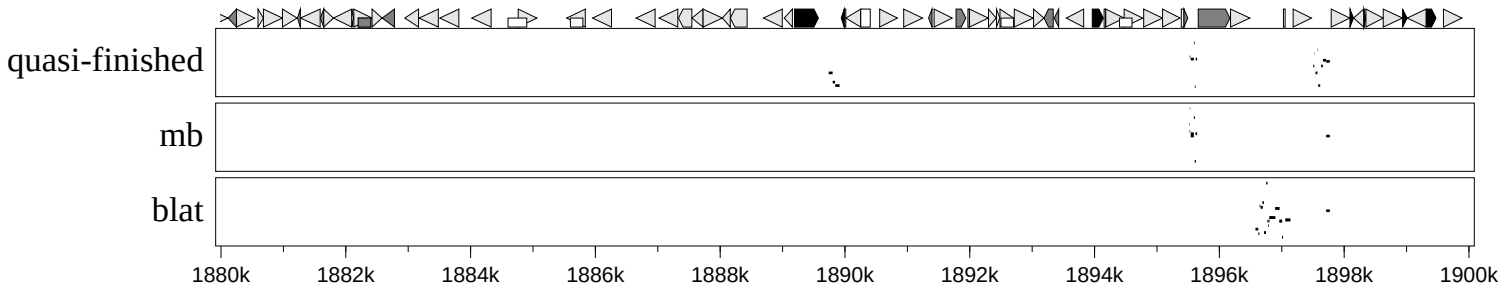
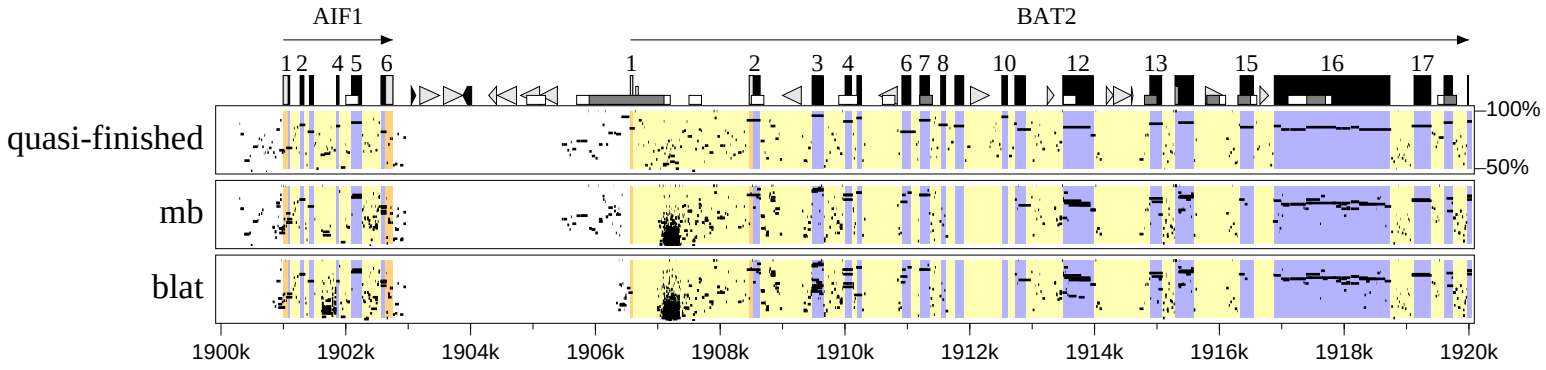
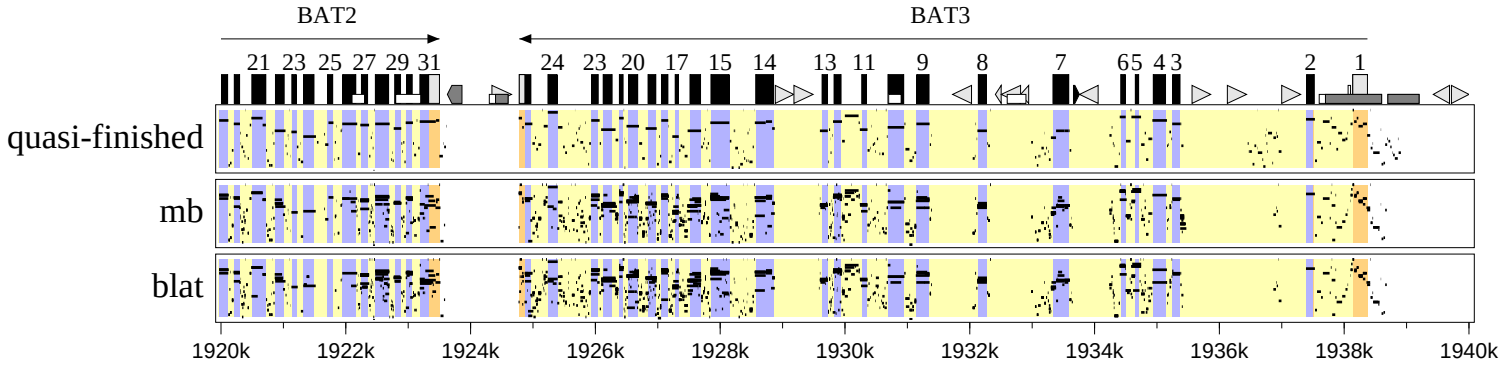
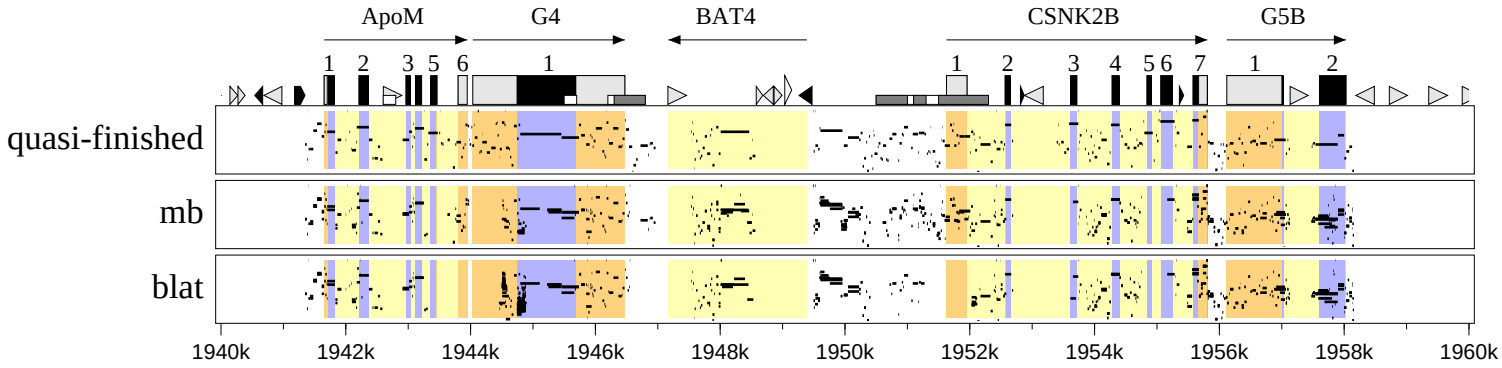
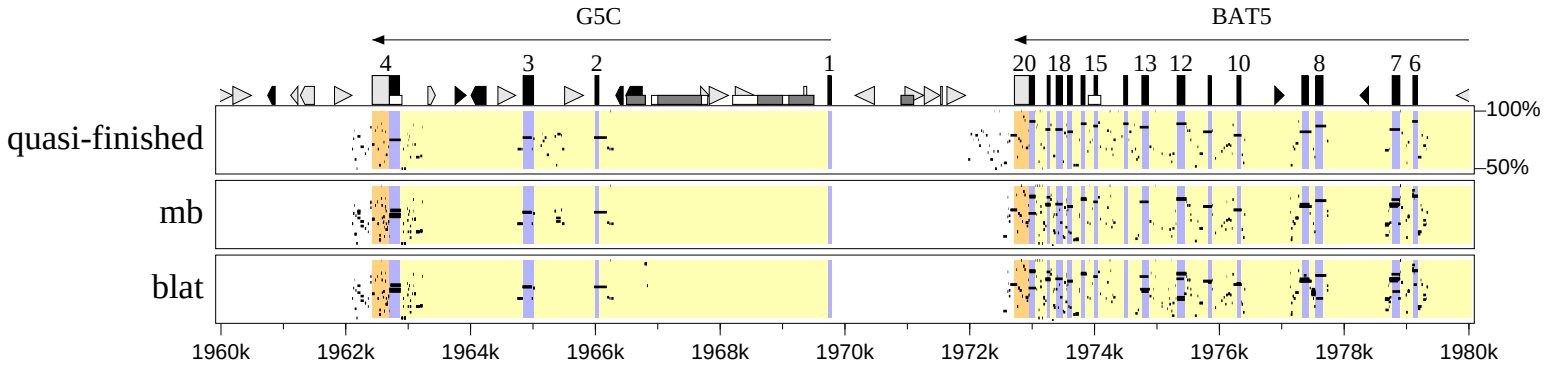

TNF
LTB
1 2 3 4
4 3 2 1
1 2
quasi-finished
mb
blat
1860k 1862k 1864k 1866k 1868k 1870k 1872k 1874k 1876k 1878k 1880k

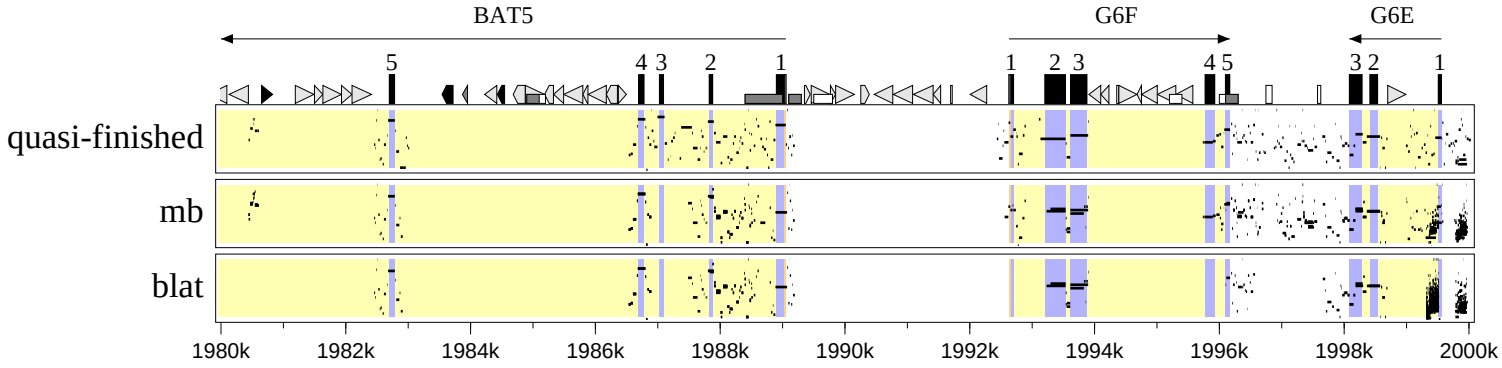

quasi-finished
mb
blat
1880k 1882k 1884k 1886k 1888k 1890k 1892k 1894k 1896k 1898k 1900k

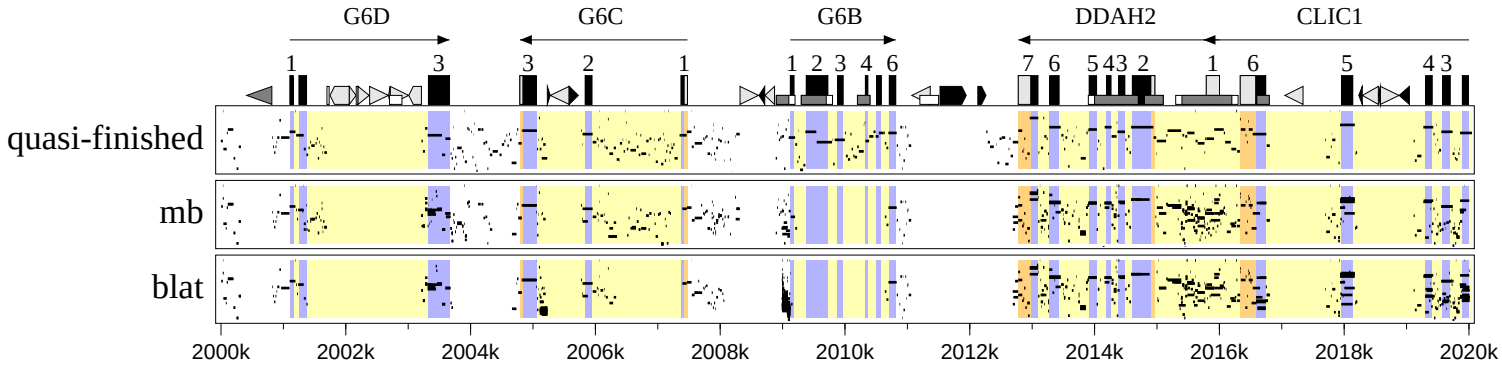

AIF1
BAT2
1 2 4 5 6
1 2 3 4 6 7 8 10 12 13 15 16 17
100%
50%
quasi-finished
mb
blat
1900k 1902k 1904k 1906k 1908k 1910k 1912k 1914k 1916k 1918k 1920k

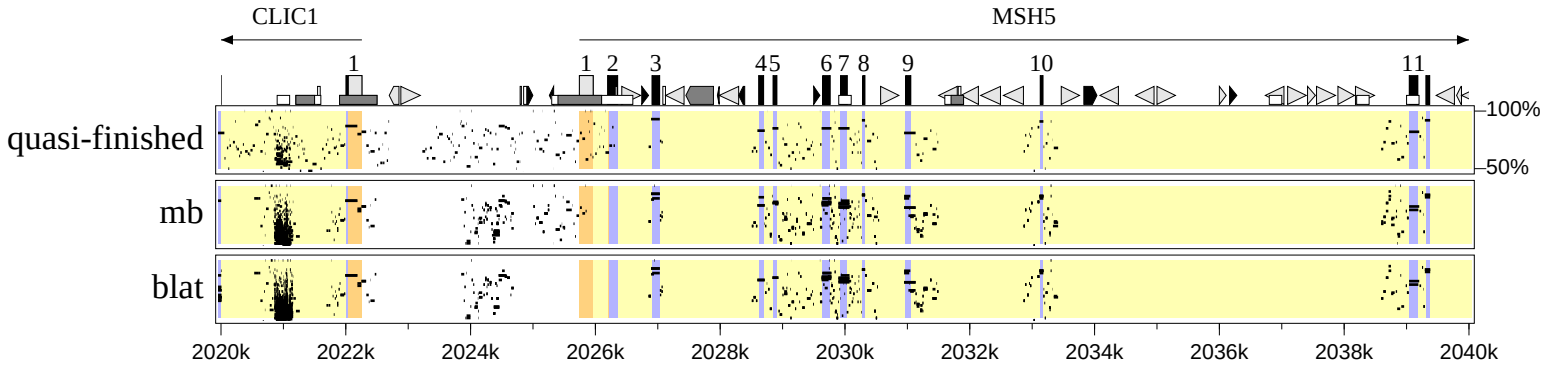

BAT2
BAT3
21 23 25 27 29 31
24 23 20 17 15 14 13 11 9 8 7 6 5 4 3 2 1
quasi-finished
mb
blat
1920k 1922k 1924k 1926k 1928k 1930k 1932k 1934k 1936k 1938k 1940k

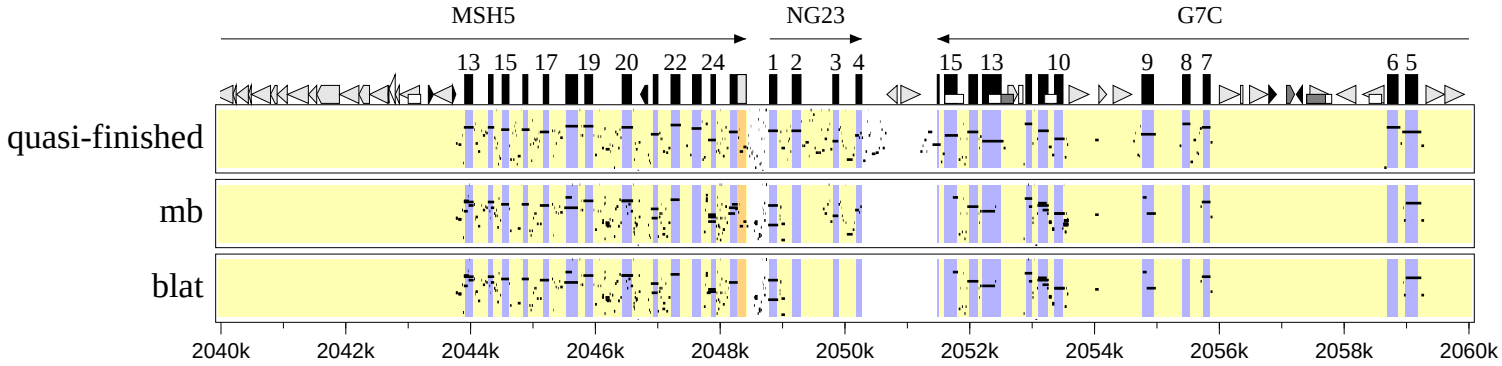

ApoM
G4
BAT4
CSNK2B
G5B
1 2 3 5 6
1
1 2 3 4 5 6 7
1 2
quasi-finished
mb
blat
1940k 1942k 1944k 1946k 1948k 1950k 1952k 1954k 1956k 1958k 1960k

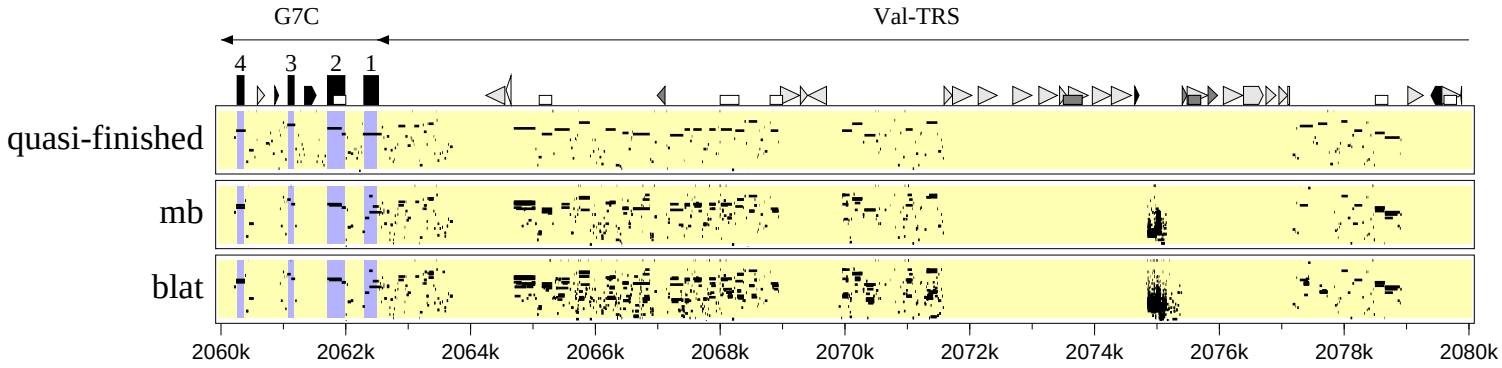

G5C
BAT5
quasi-finished
mb
blat
100%
50%
1960k
1962k
1964k
1966k
1968k
1970k
1972k
1974k
1976k
1978k
1980k

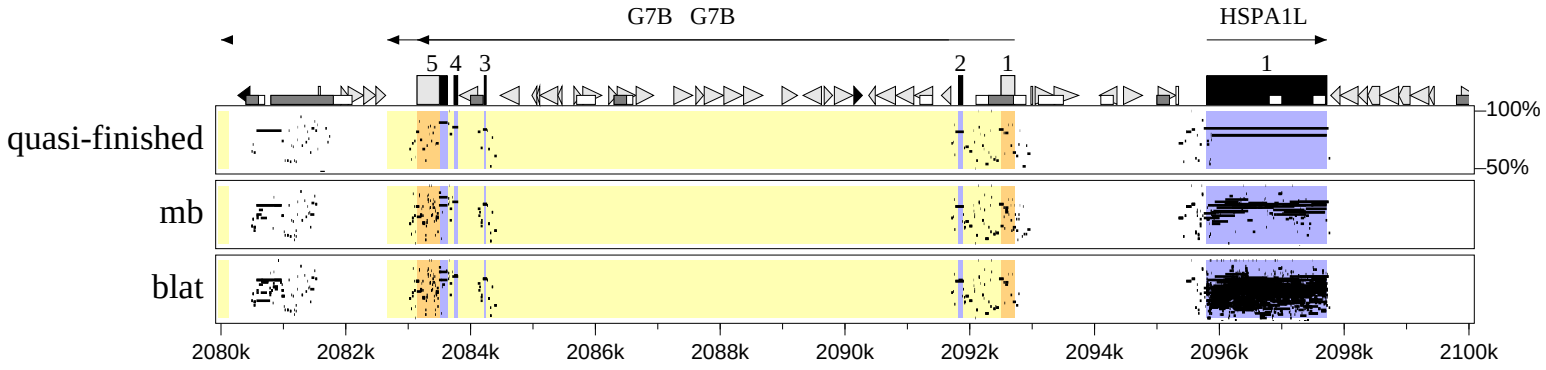

BAT5
G6F
G6E
quasi-finished
mb
blat
1980k
1982k
1984k
1986k
1988k
1990k
1992k
1994k
1996k
1998k
2000k

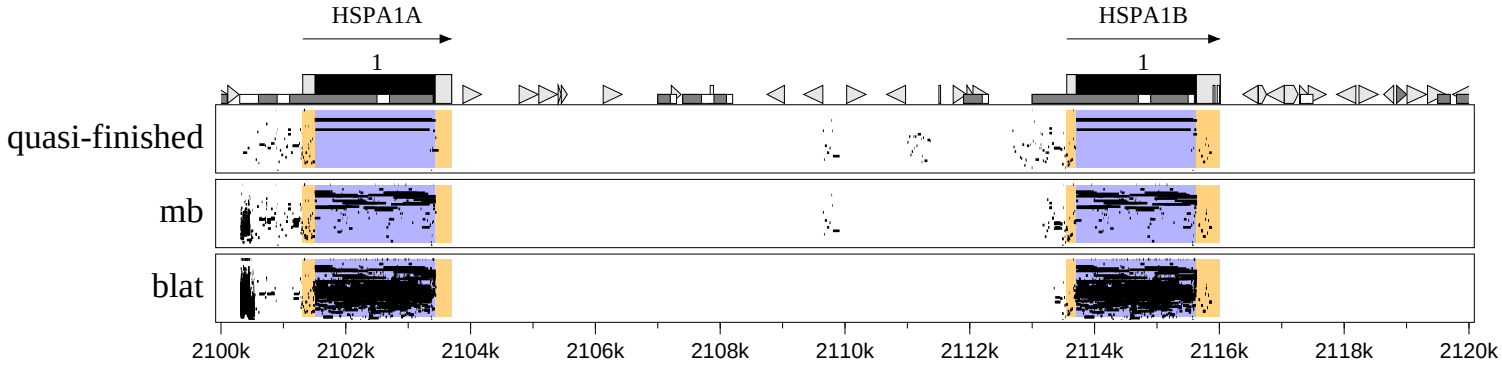

G6D
G6C
G6B
DDAH2
CLIC1
quasi-finished
mb
blat
2000k
2002k
2004k
2006k
2008k
2010k
2012k
2014k
2016k
2018k
2020k

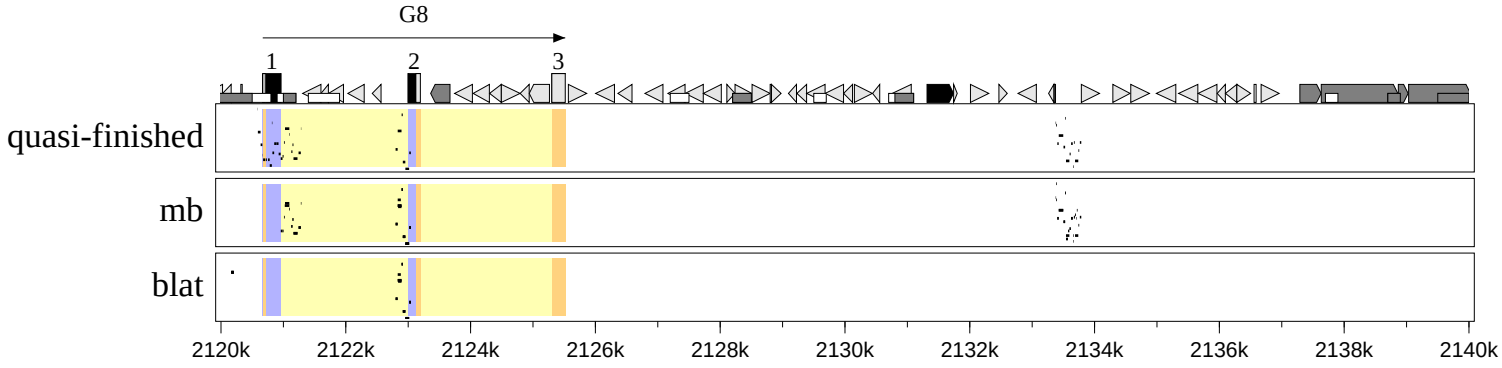

CLIC1
MSH5
1
1 2 3
4 5
6 7 8
9
10
11
100%
50%
quasi-finished
mb
blat
2020k
2022k
2024k
2026k
2028k
2030k
2032k
2034k
2036k
2038k
2040k

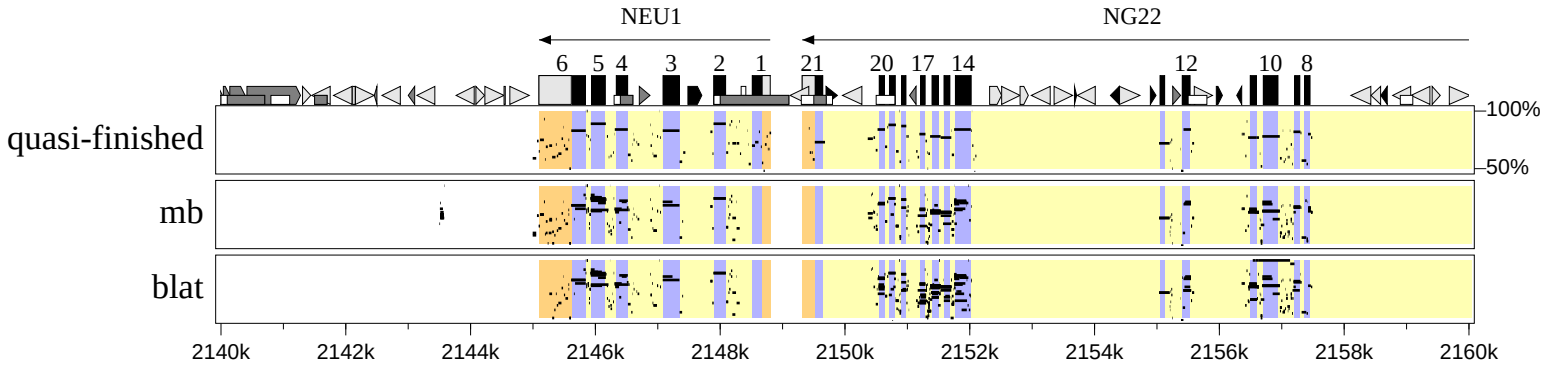

MSH5
NG23
G7C
13 15 17 19 20 22 24
1 2 3 4
15 13 10
9
8 7
6 5
quasi-finished
mb
blat
2040k
2042k
2044k
2046k
2048k
2050k
2052k
2054k
2056k
2058k
2060k

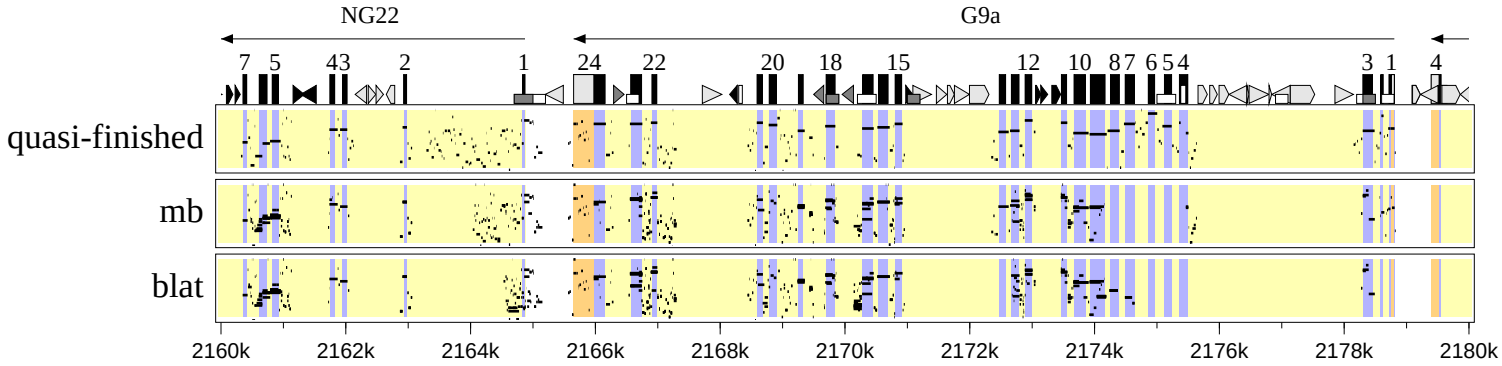

G7C
Val-TRS
4 3 2 1
quasi-finished
mb
blat
2060k
2062k
2064k
2066k
2068k
2070k
2072k
2074k
2076k
2078k
2080k

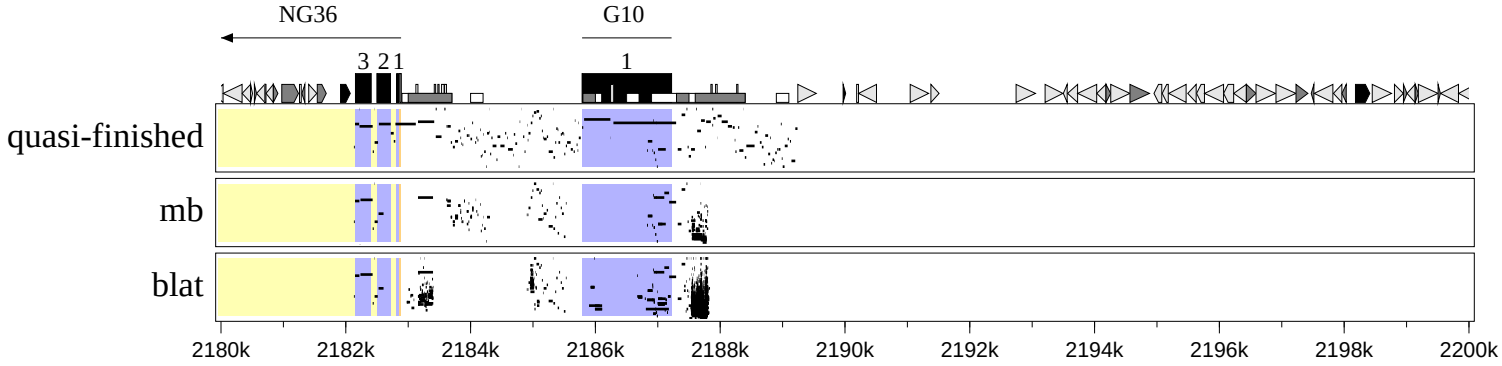

G7B G7B
HSPA1L
5 4 3
2 1
1
100%
50%
quasi-finished
mb
blat
2080k
2082k
2084k
2086k
2088k
2090k
2092k
2094k
2096k
2098k
2100k

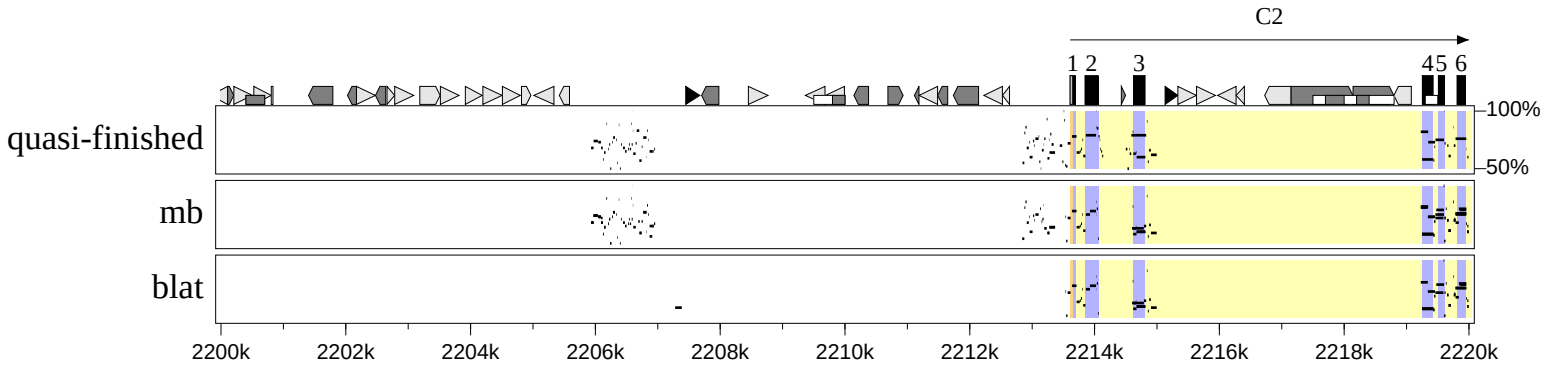

HSPA1A
HSPA1B
1
1
quasi-finished
mb
blat
2100k
2102k
2104k
2106k
2108k
2110k
2112k
2114k
2116k
2118k
2120k

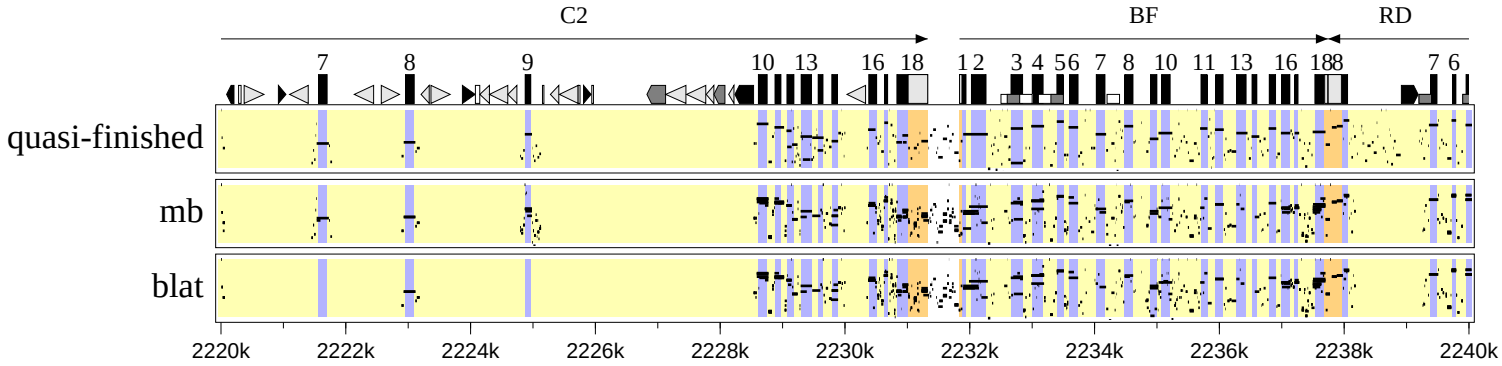

G8
1
2
3
quasi-finished
mb
blat
2120k
2122k
2124k
2126k
2128k
2130k
2132k
2134k
2136k
2138k
2140k

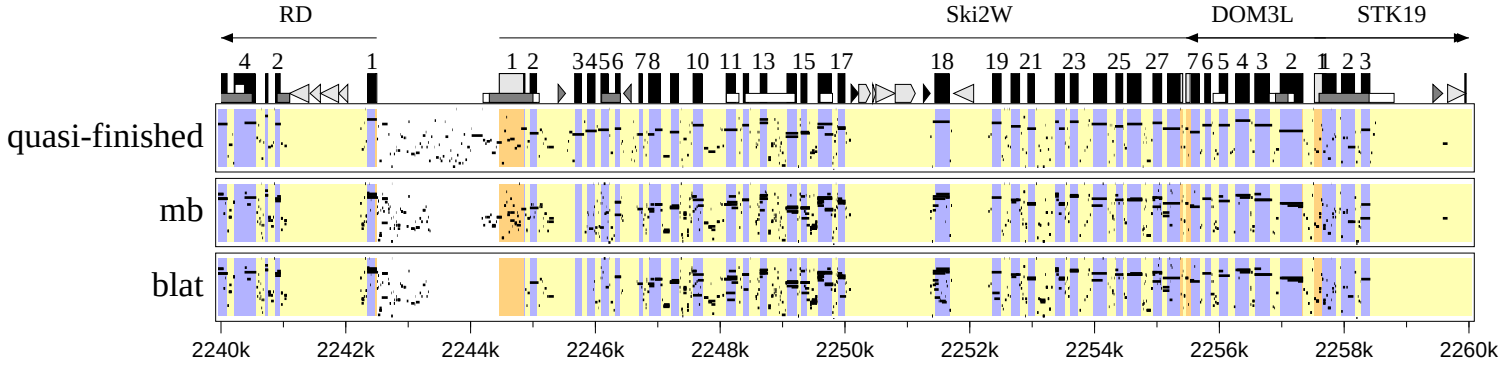

NEU1
NG22
6 5 4 3 2 1
21 20 17 14
12 10 8
100%
50%
quasi-finished
mb
blat
2140k 2142k 2144k 2146k 2148k 2150k 2152k 2154k 2156k 2158k 2160k

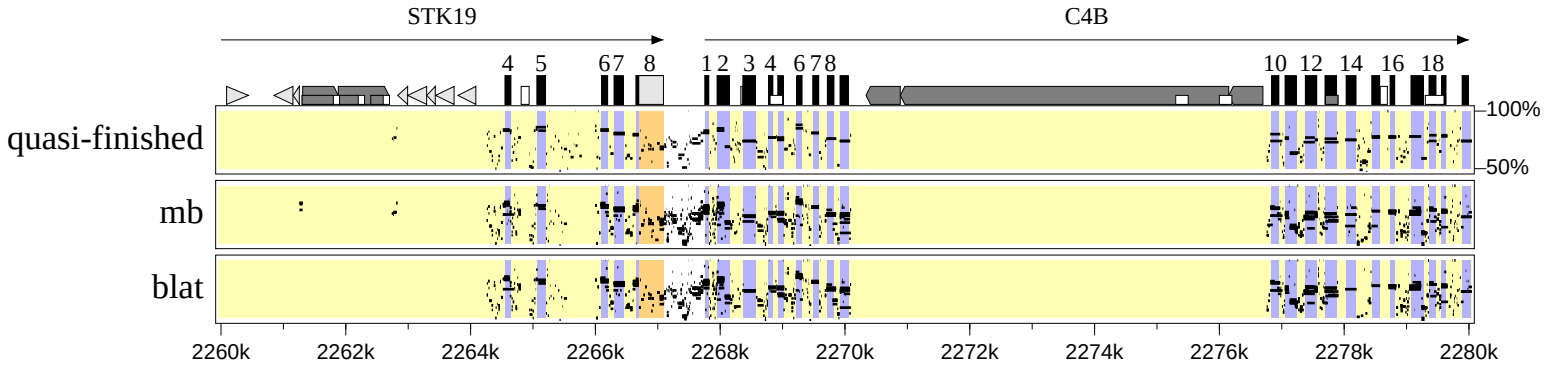

NG22
G9a
7 5 43 2 1
24 22 20 18 15 12 10 87 654 3 1 4
quasi-finished
mb
blat
2160k 2162k 2164k 2166k 2168k 2170k 2172k 2174k 2176k 2178k 2180k

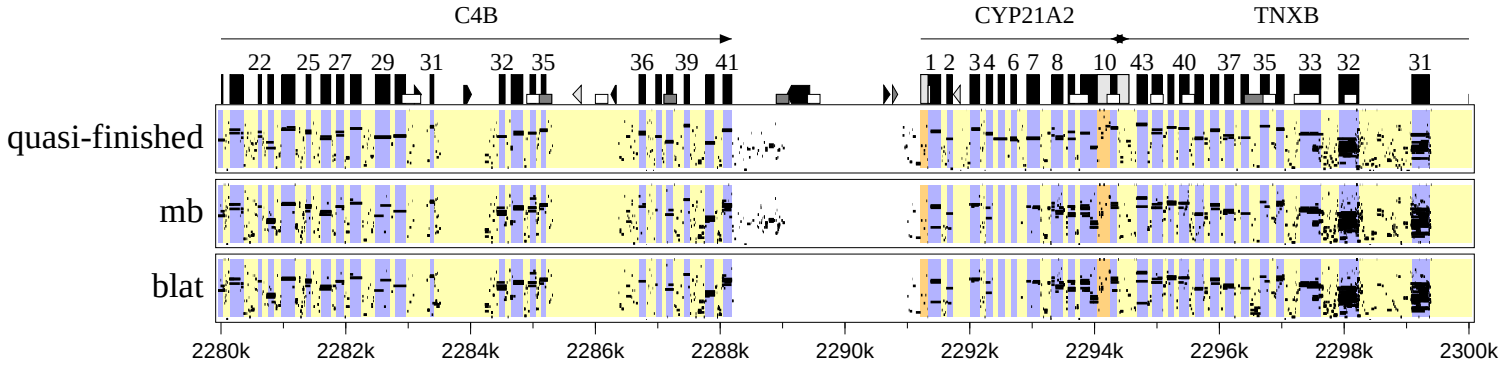

NG36
G10
3 2 1
1
quasi-finished
mb
blat
2180k 2182k 2184k 2186k 2188k 2190k 2192k 2194k 2196k 2198k 2200k

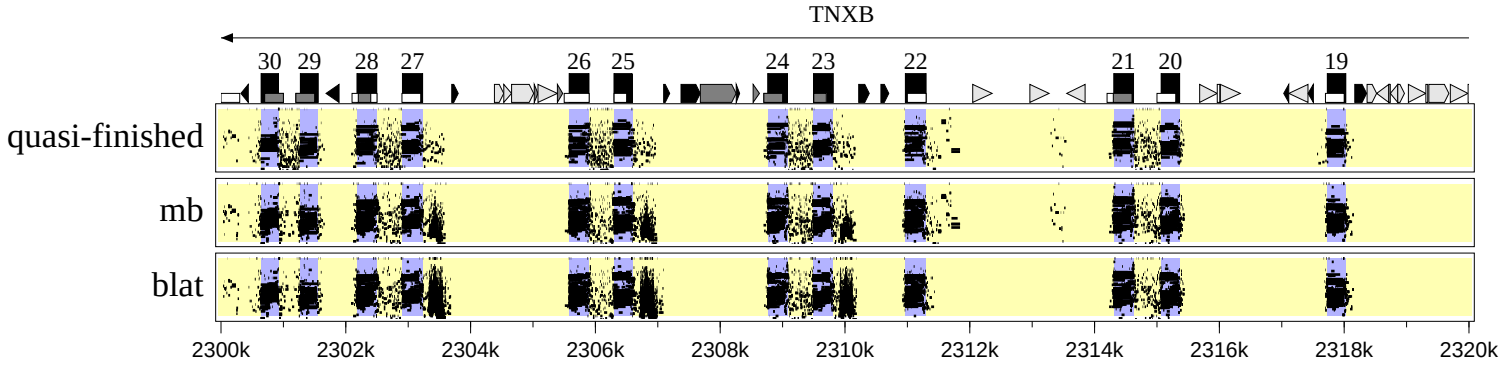

C2
1 2
3
4 5 6
100%
50%
quasi-finished
mb
blat
2200k
2202k
2204k
2206k
2208k
2210k
2212k
2214k
2216k
2218k
2220k

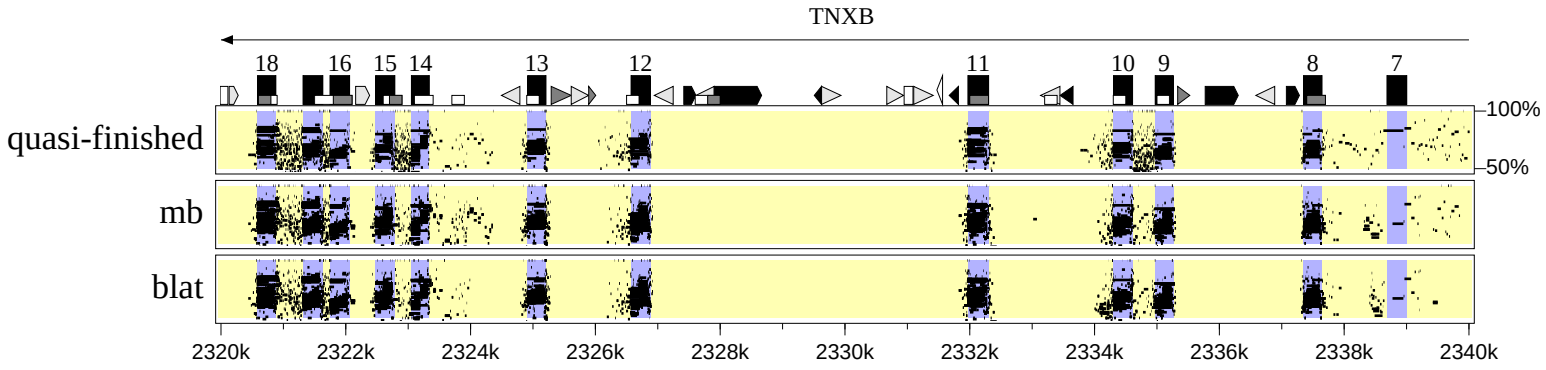

C2
BF
RD
7
8
9
10 13
16 18
1 2
3 4 5 6
7 8
10 11 13 16 18 8
7 6
quasi-finished
mb
blat
2220k
2222k
2224k
2226k
2228k
2230k
2232k
2234k
2236k
2238k
2240k

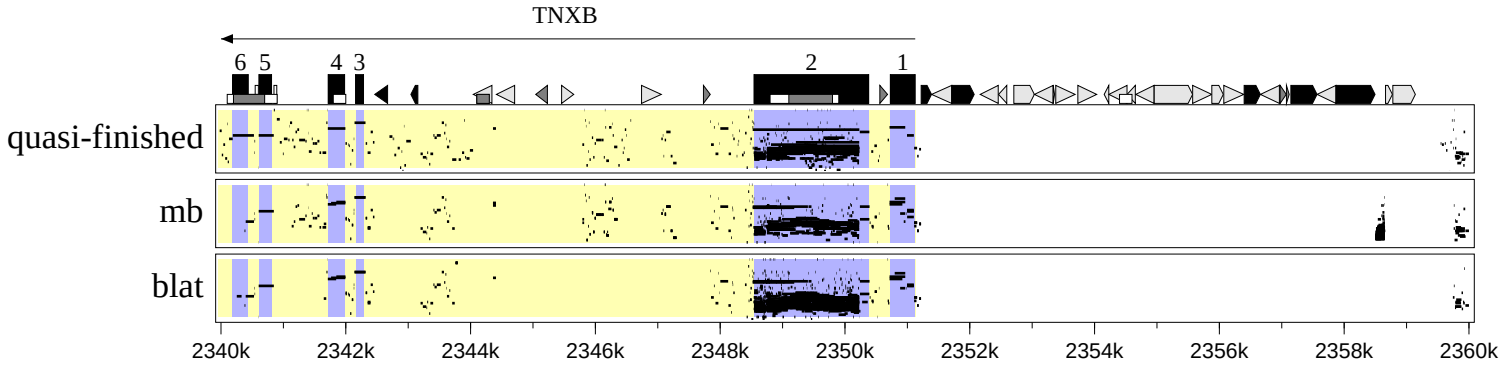

RD
Ski2W
DOM3L
STK19
4 2
1
1 2
3 4 5 6
7 8
10 11 13 15 17
18
19 21
23
25 27
7 6 5 4 3 2 1
1 2 3
quasi-finished
mb
blat
2240k
2242k
2244k
2246k
2248k
2250k
2252k
2254k
2256k
2258k
2260k

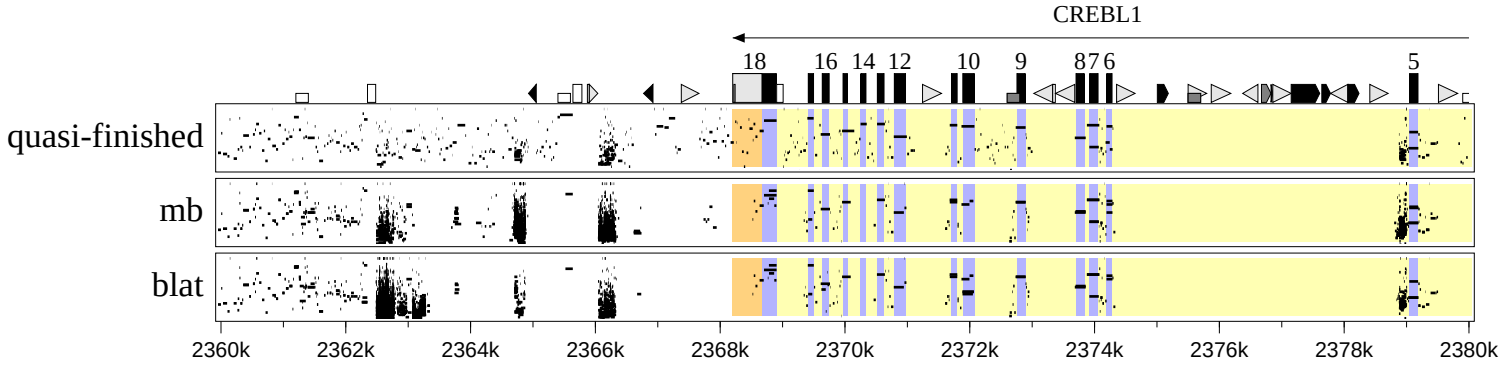

STK19
C4B
4 5 6 7 8
1 2 3 4 6 7 8
10 12 14 16 18
100%
50%
quasi-finished
mb
blat
2260k
2262k
2264k
2266k
2268k
2270k
2272k
2274k
2276k
2278k
2280k

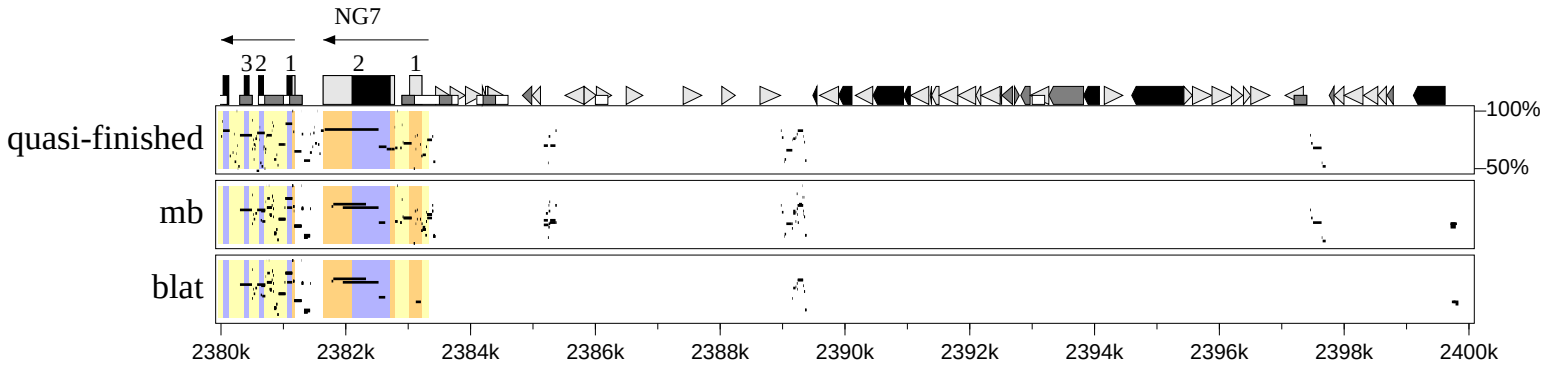

C4B
CYP21A2
TNXB
22 25 27 29 31 32 35 36 39 41
1 2 3 4 6 7 8 10 43 40 37 35 33 32 31
quasi-finished
mb
blat
2280k
2282k
2284k
2286k
2288k
2290k
2292k
2294k
2296k
2298k
2300k


TNXB
30 29 28 27 26 25 24 23 22 21 20 19
quasi-finished
mb
blat
2300k
2302k
2304k
2306k
2308k
2310k
2312k
2314k
2316k
2318k
2320k


TNXB
18
16
15
14
13
12
11
10
9
8
7
100%
50%
quasi-finished
mb
blat
2320k
2322k
2324k
2326k
2328k
2330k
2332k
2334k
2336k
2338k
2340k


TNXB
6
5
4
3
2
1
quasi-finished
mb
blat
2340k
2342k
2344k
2346k
2348k
2350k
2352k
2354k
2356k
2358k
2360k


CREBL1
18
16
14
12
10
9
8
7
6
5
quasi-finished
mb
blat
2360k
2362k
2364k
2366k
2368k
2370k
2372k
2374k
2376k
2378k
2380k


NG7
quasi-finished
mb
blat
100%
50%
2380k
2382k
2384k
2386k
2388k
2390k
2392k
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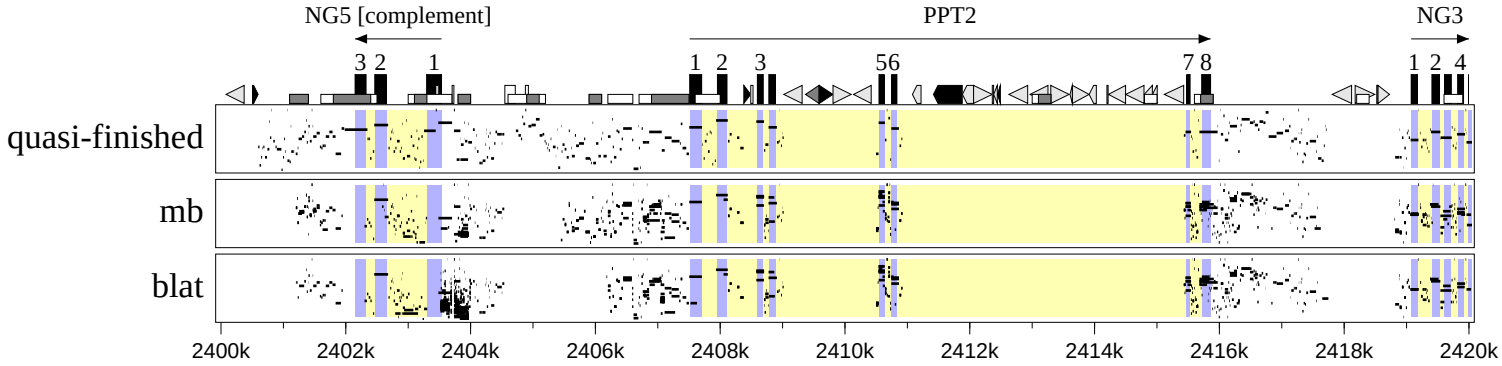
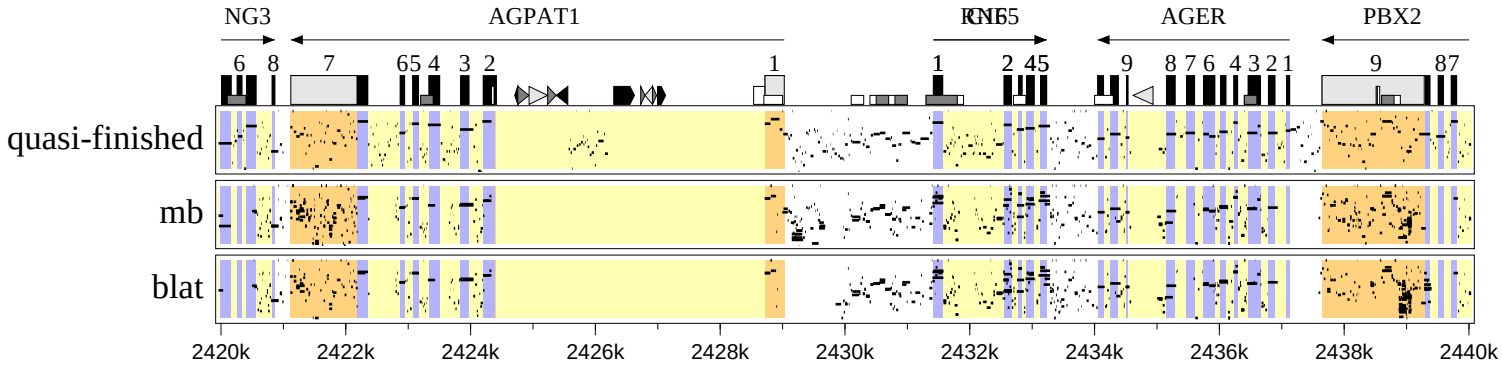
2396k
2398k
2400k


NG5 [complement]
PPT2
NG3
quasi-finished
mb
blat
2400k
2402k
2404k
2406k
2408k
2410k
2412k
2414k
2416k
2418k
2420k


NG3
AGPAT1
AGER
PBX2
quasi-finished
mb
blat
2420k
2422k
2424k
2426k
2428k
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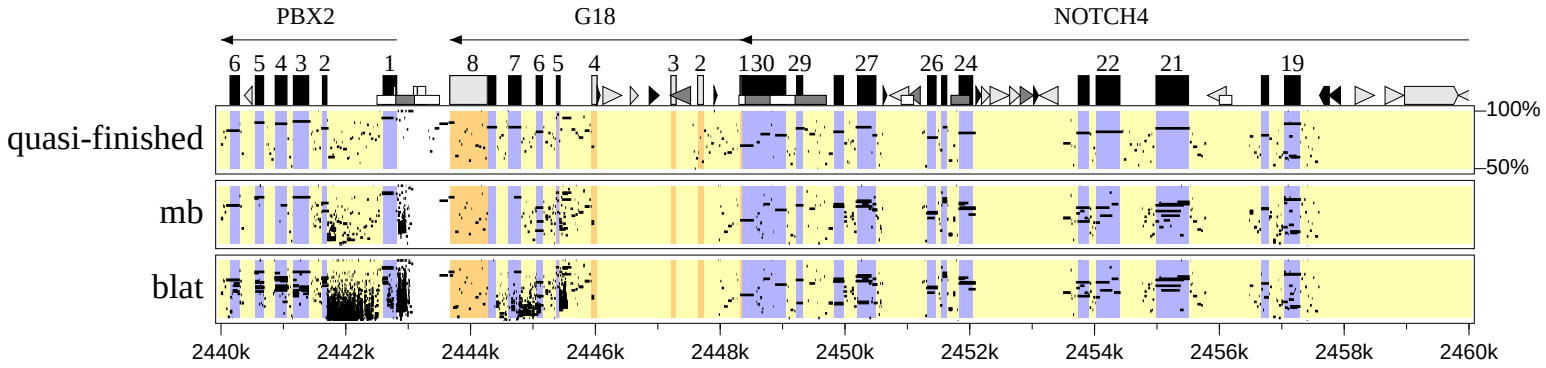
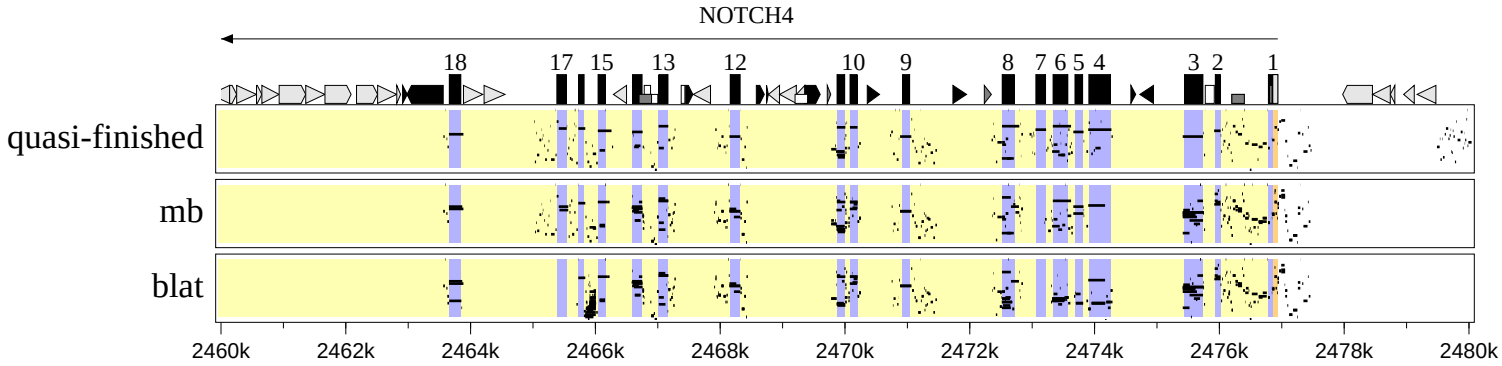
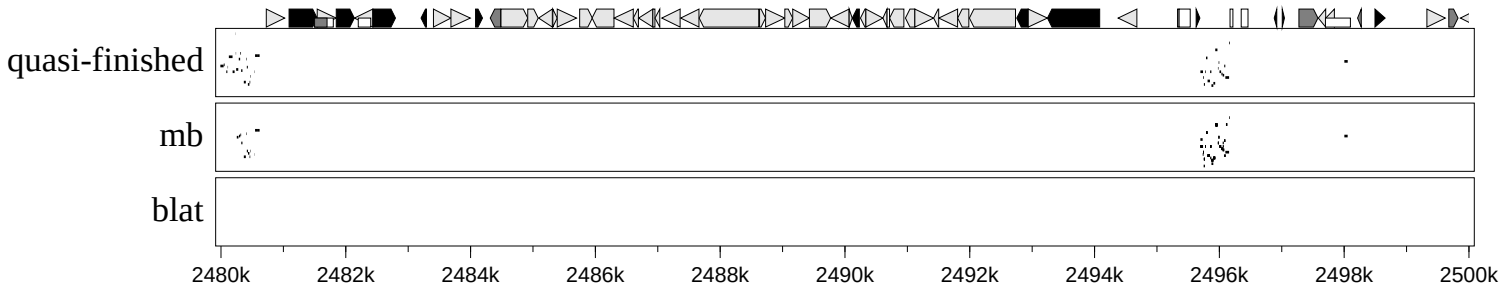
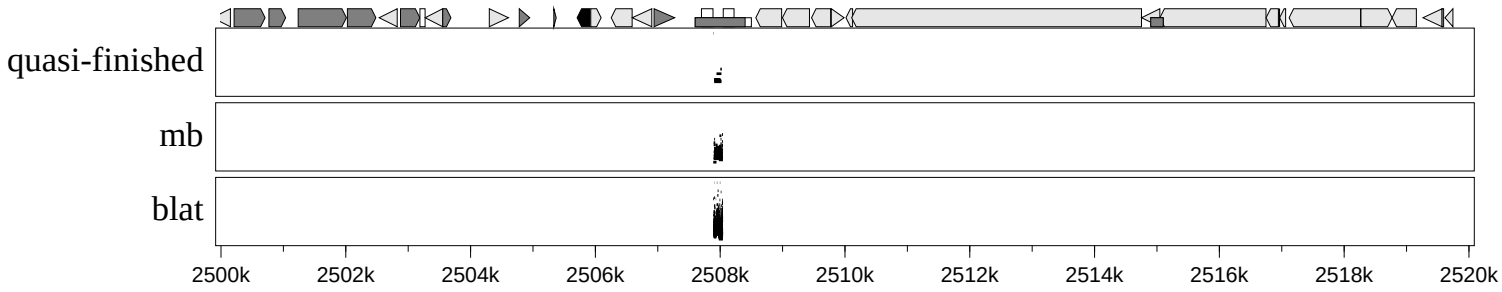
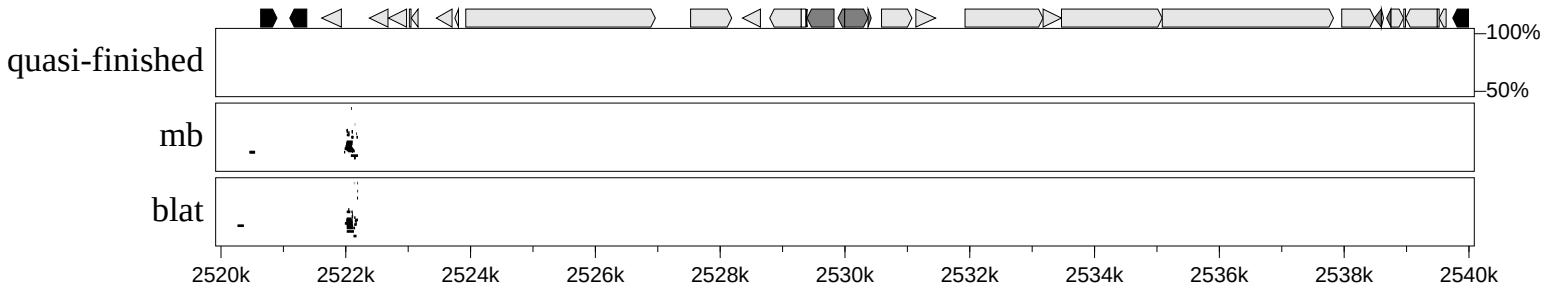
2438k
2440k

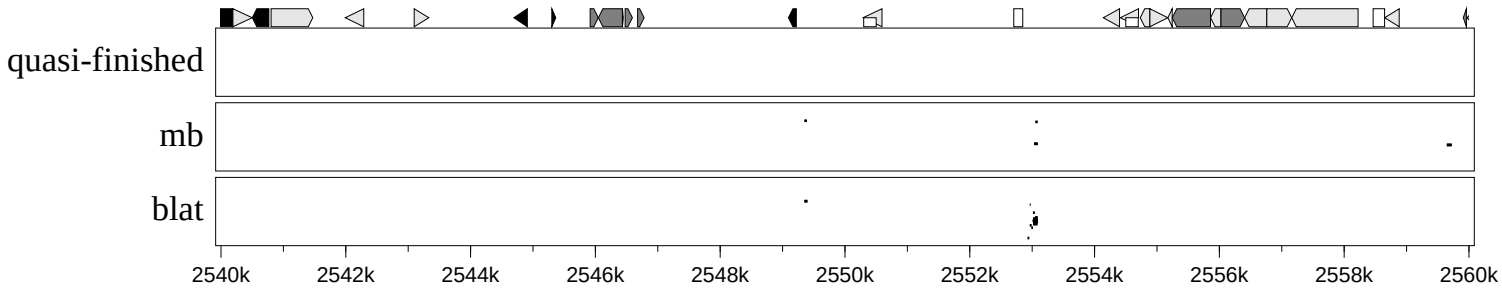

PBX2
G18
NOTCH4
6 5 4 3 2 1 8 7 6 5 4 3 2 130 29 27 26 24 22 21 19
100%
50%
quasi-finished
mb
blat
2440k 2442k 2444k 2446k 2448k 2450k 2452k 2454k 2456k 2458k 2460k

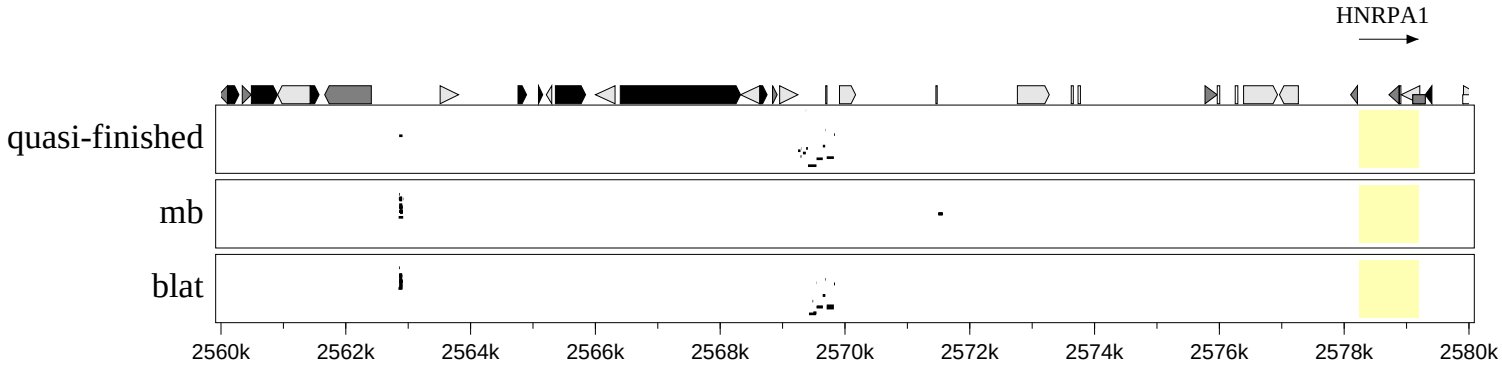

NOTCH4
18 17 15 13 12 10 9 8 7 6 5 4 3 2 1
quasi-finished
mb
blat
2460k 2462k 2464k 2466k 2468k 2470k 2472k 2474k 2476k 2478k 2480k

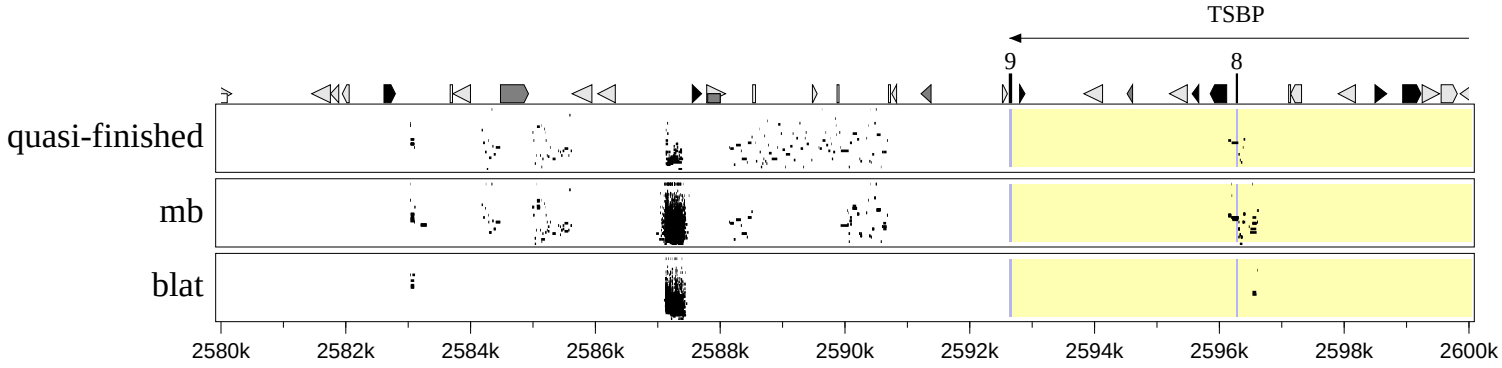

quasi-finished
mb
blat
2480k 2482k 2484k 2486k 2488k 2490k 2492k 2494k 2496k 2498k 2500k


quasi-finished
mb
blat
2500k 2502k 2504k 2506k 2508k 2510k 2512k 2514k 2516k 2518k 2520k


quasi-finished
mb
blat
100%
50%
2520k
2522k
2524k
2526k
2528k
2530k
2532k
2534k
2536k
2538k
2540k


quasi-finished
mb
blat
2540k
2542k
2544k
2546k
2548k
2550k
2552k
2554k
2556k
2558k
2560k


HNRPA1
quasi-finished
mb
blat
2560k
2562k
2564k
2566k
2568k
2570k
2572k
2574k
2576k
2578k
2580k


TSBP
9
8
quasi-finished
mb
blat
2580k
2582k
2584k
2586k
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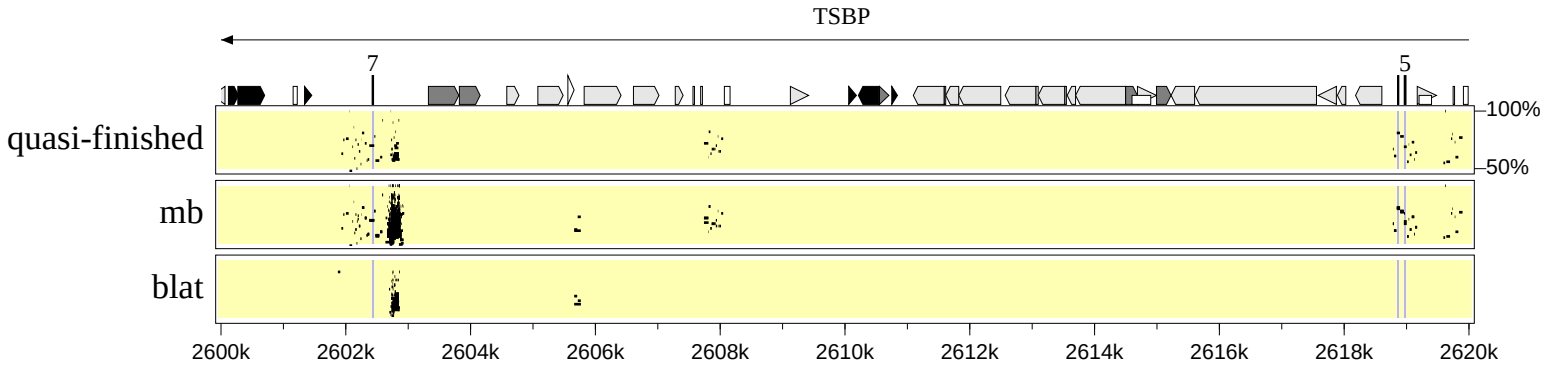
2598k
2600k


TSBP
7
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100%
50%
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mb
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2604k
2606k
2608k
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2612k
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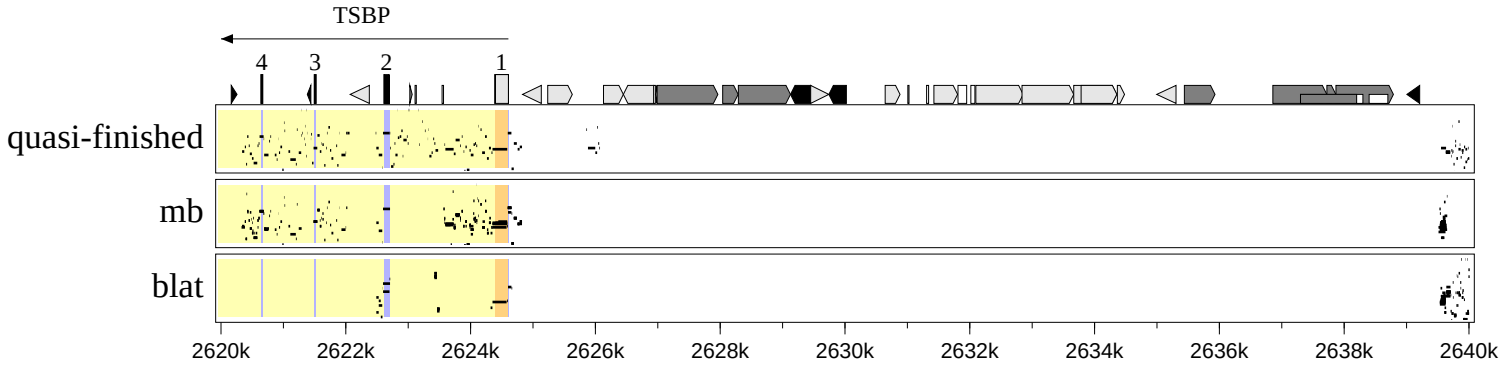
2620k


TSBP
4
3
2
1
quasi-finished
mb
blat
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2632k
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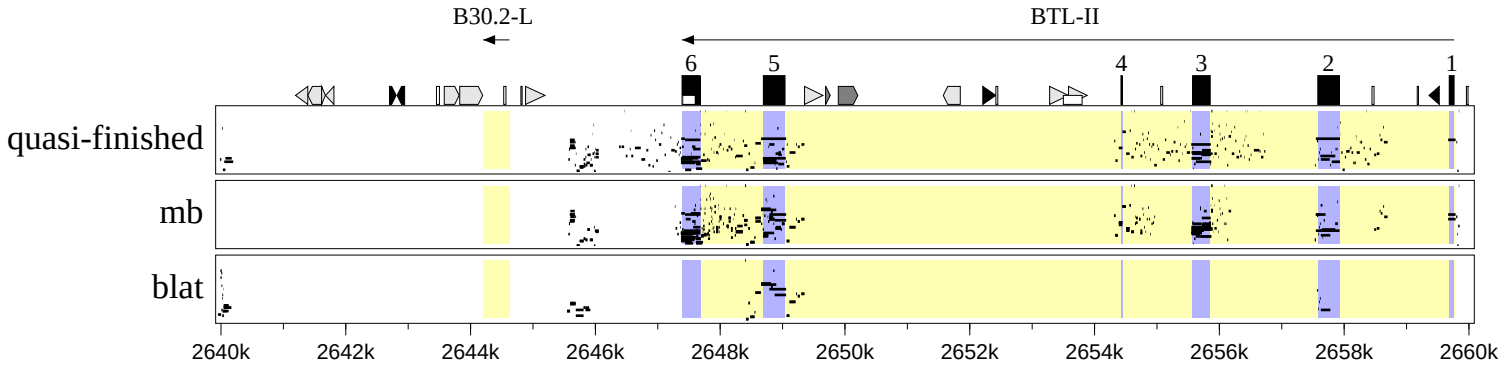
B30.2-L
BTL-II
6
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4
3
2
1
quasi-finished
mb
blat
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2652k
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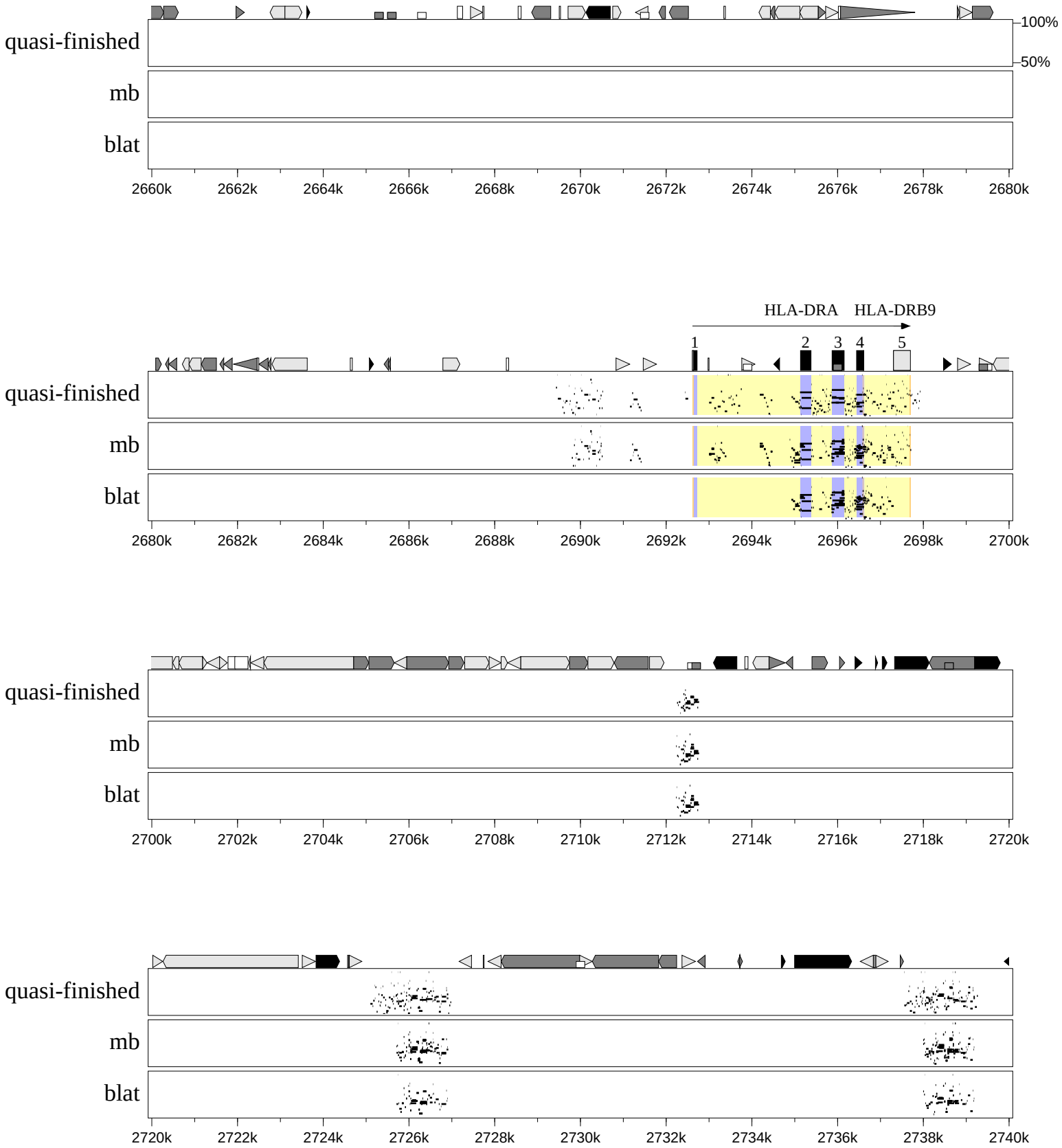
2660k


quasi-finished
mb
blat
100%
50%
2660k
2662k
2664k
2666k
2668k
2670k
2672k
2674k
2676k
2678k
2680k
HLA-DRA
HLA-DRB9
1
2
3
4
5
2680k
2682k
2684k
2686k
2688k
2690k
2692k
2694k
2696k
2698k
2700k
2700k
2702k
2704k
2706k
2708k
2710k
2712k
2714k
2716k
2718k
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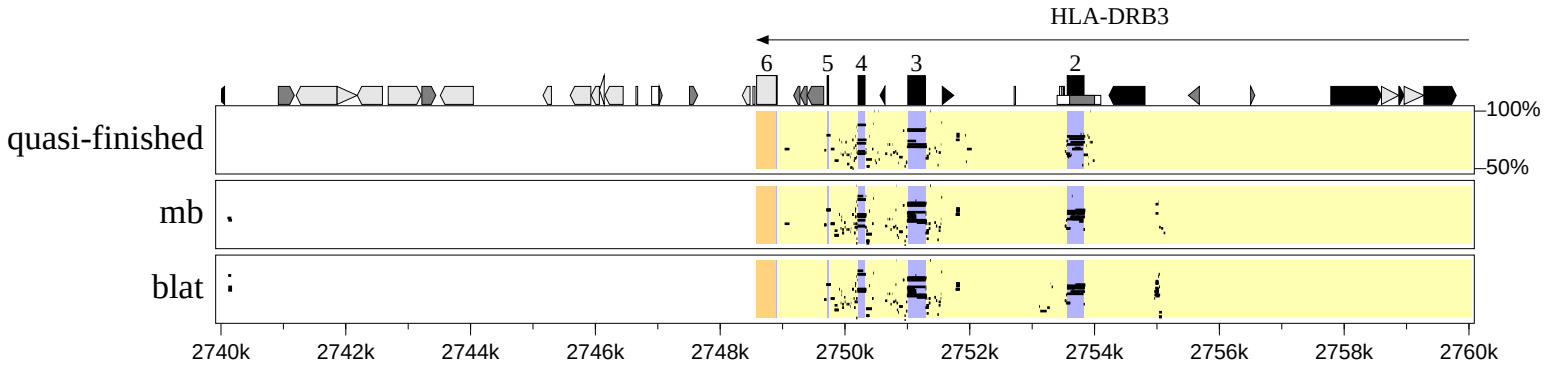
HLA-DRB3
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5
4
3
2
100%
50%
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blat
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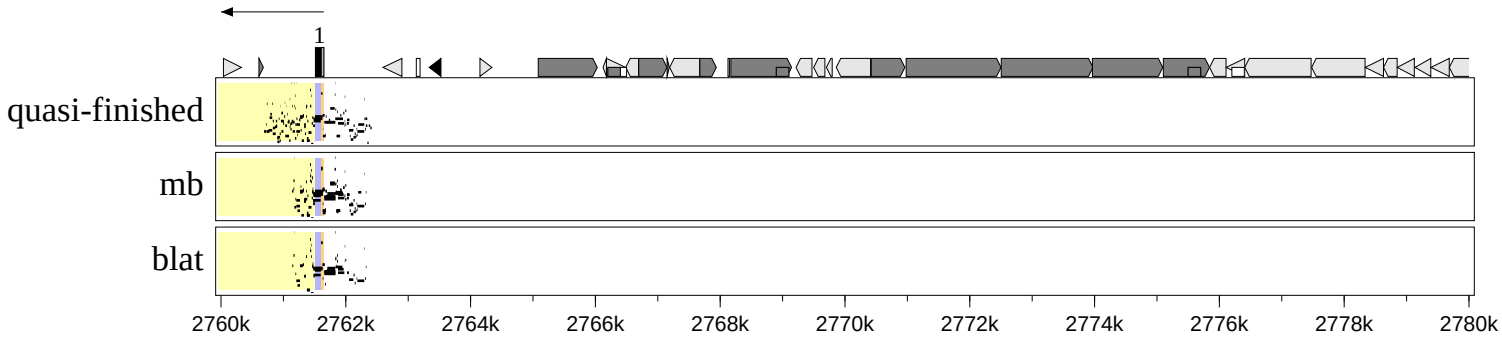
1
quasi-finished
mb
blat
2760k
2762k
2764k
2766k
2768k
2770k
2772k
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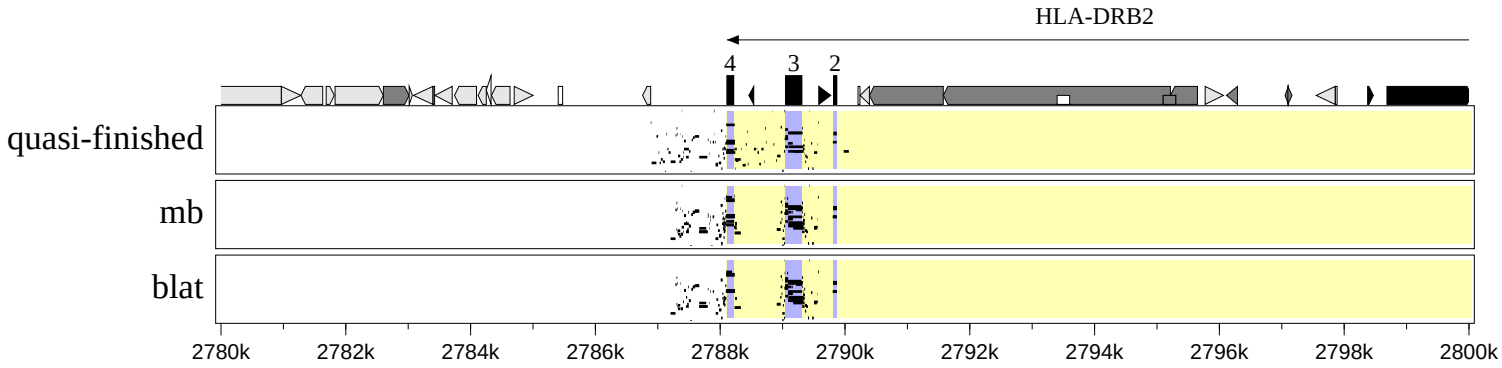
2778k
2780k


HLA-DRB2
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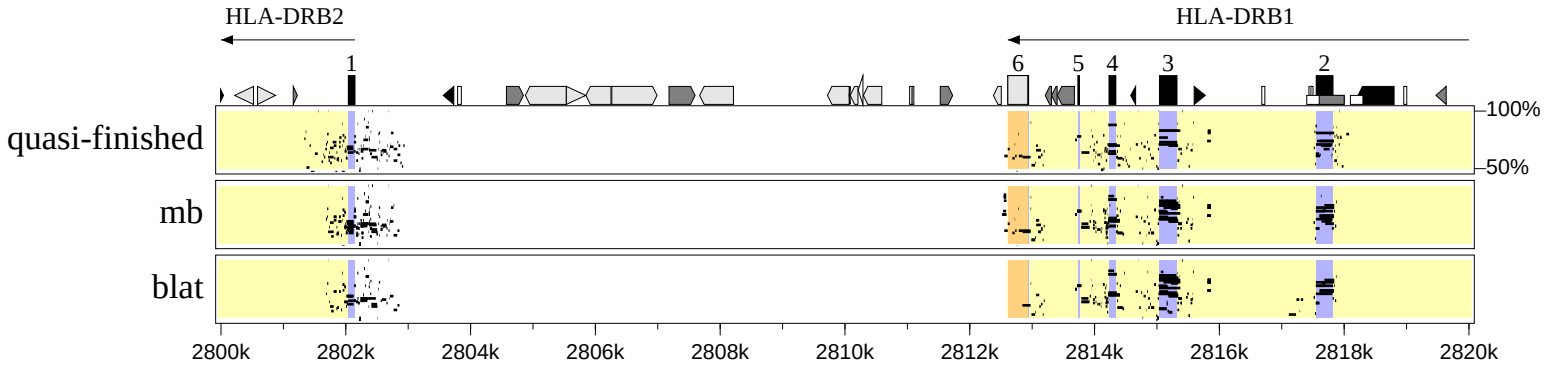
2798k
2800k


HLA-DRB2
HLA-DRB1
1
6
5
4
3
2
100%
50%
quasi-finished
mb
blat
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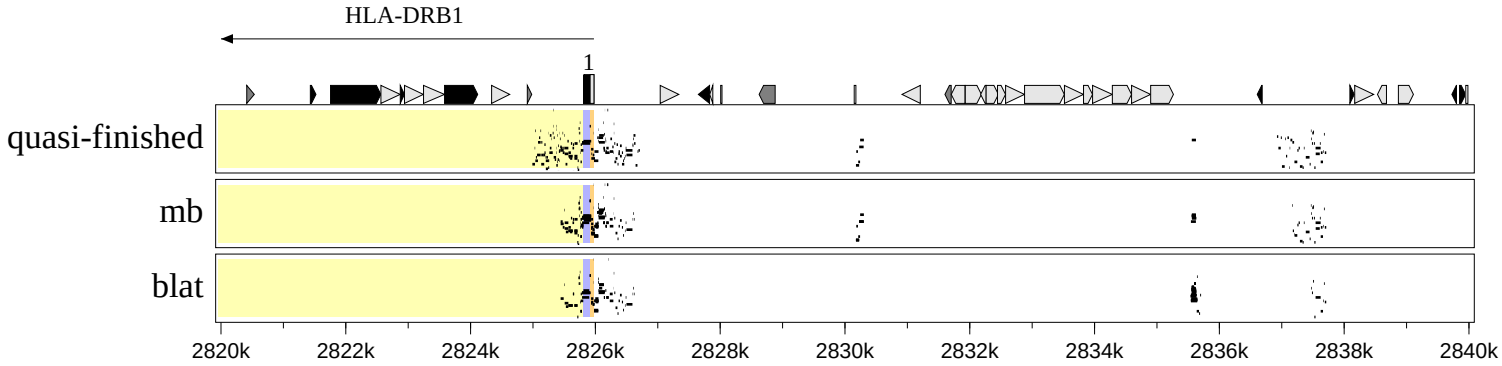
2818k
2820k


HLA-DRB1
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mb
blat
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2828k
2830k
2832k
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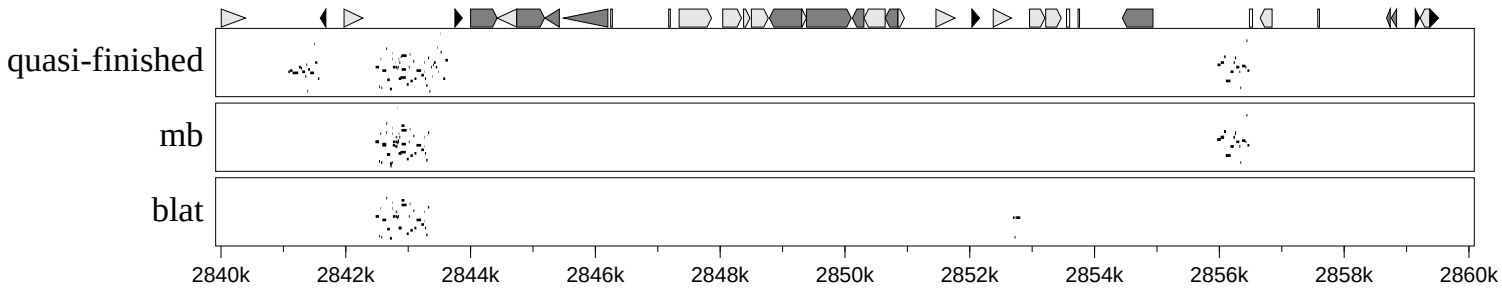
2836k
2838k
2840k


quasi-finished
mb
blat
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2848k
2850k
2852k
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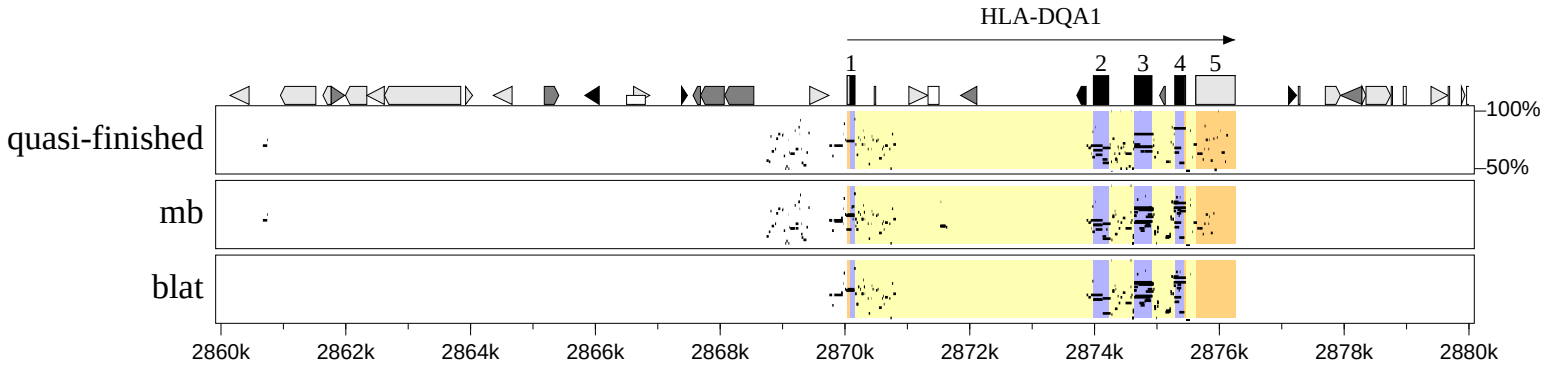
2858k
2860k


HLA-DQA1
1
2
3
4
5
100%
50%
quasi-finished
mb
blat
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2872k
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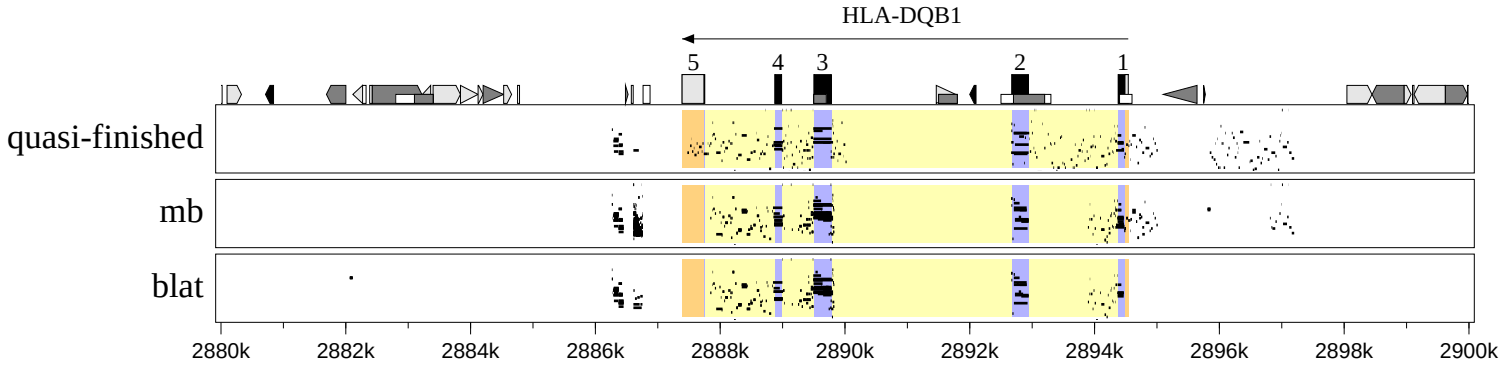
2878k
2880k


HLA-DQB1
5
4
3
2
1
quasi-finished
mb
blat
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2882k
2884k
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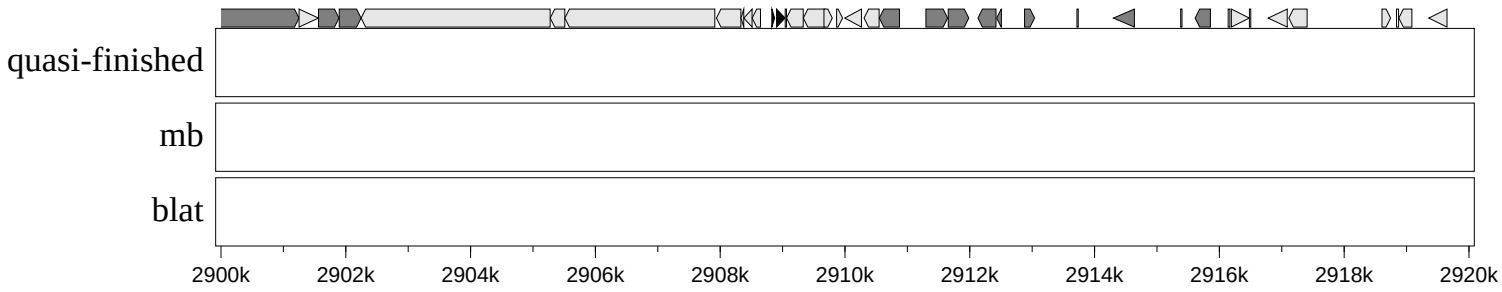
2896k
2898k
2900k


quasi-finished
mb
blat
2900k
2902k
2904k
2906k
2908k
2910k
2912k
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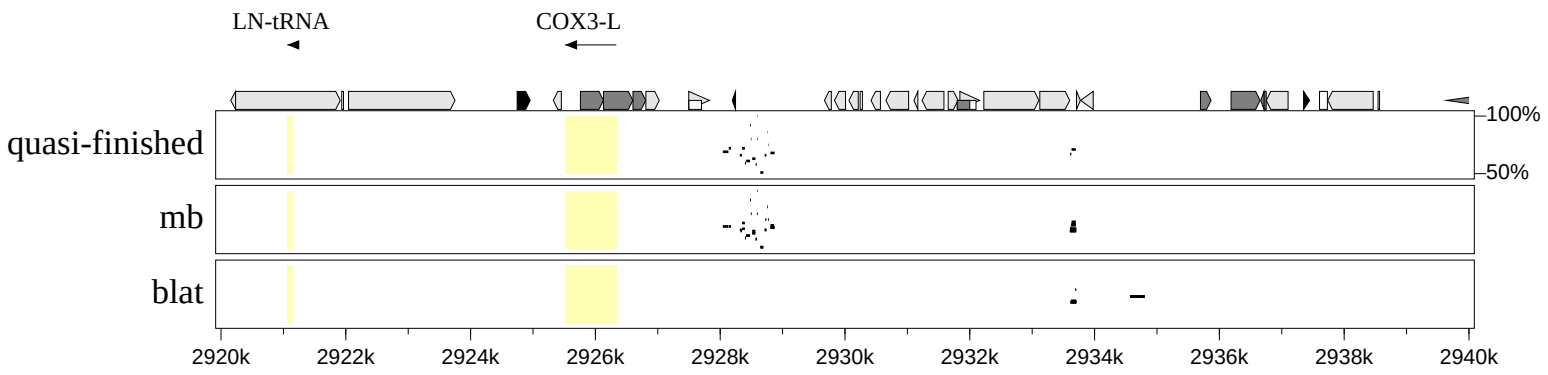
2918k
2920k


LN-tRNA
COX3-L
quasi-finished
mb
blat
100%
50%
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2924k
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2932k
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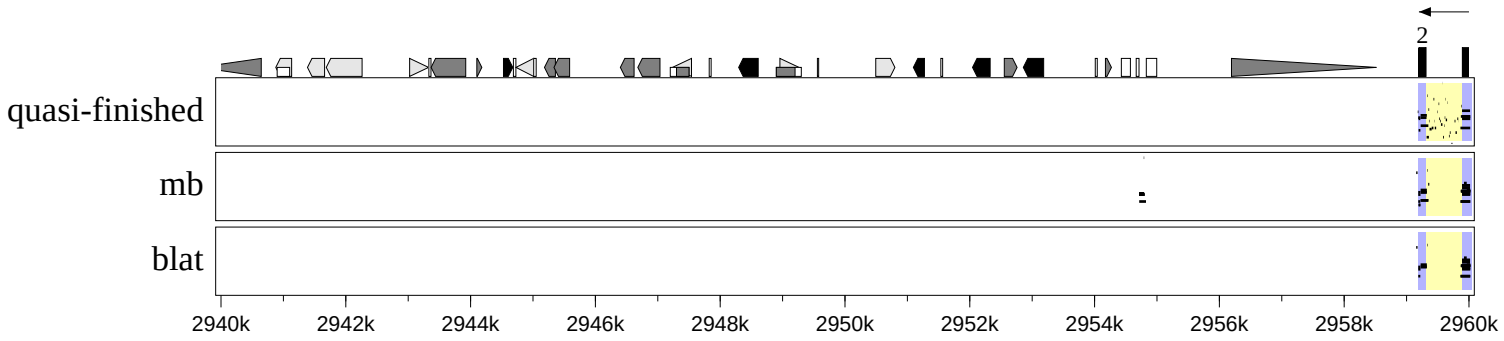
2938k
2940k


2
quasi-finished
mb
blat
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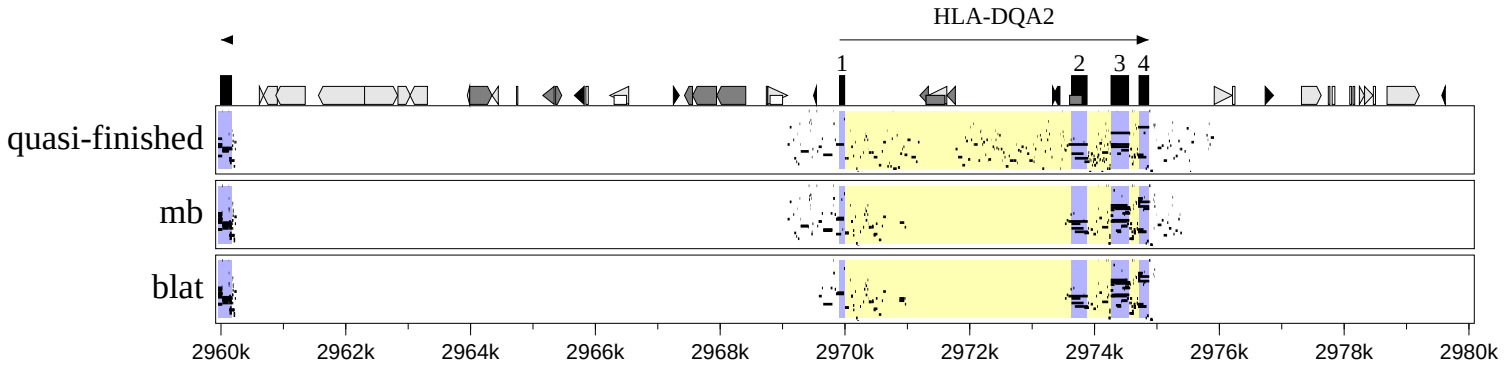
2960k


HLA-DQA2
1
2
3
4
quasi-finished
mb
blat
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2962k
2964k
2966k
2968k
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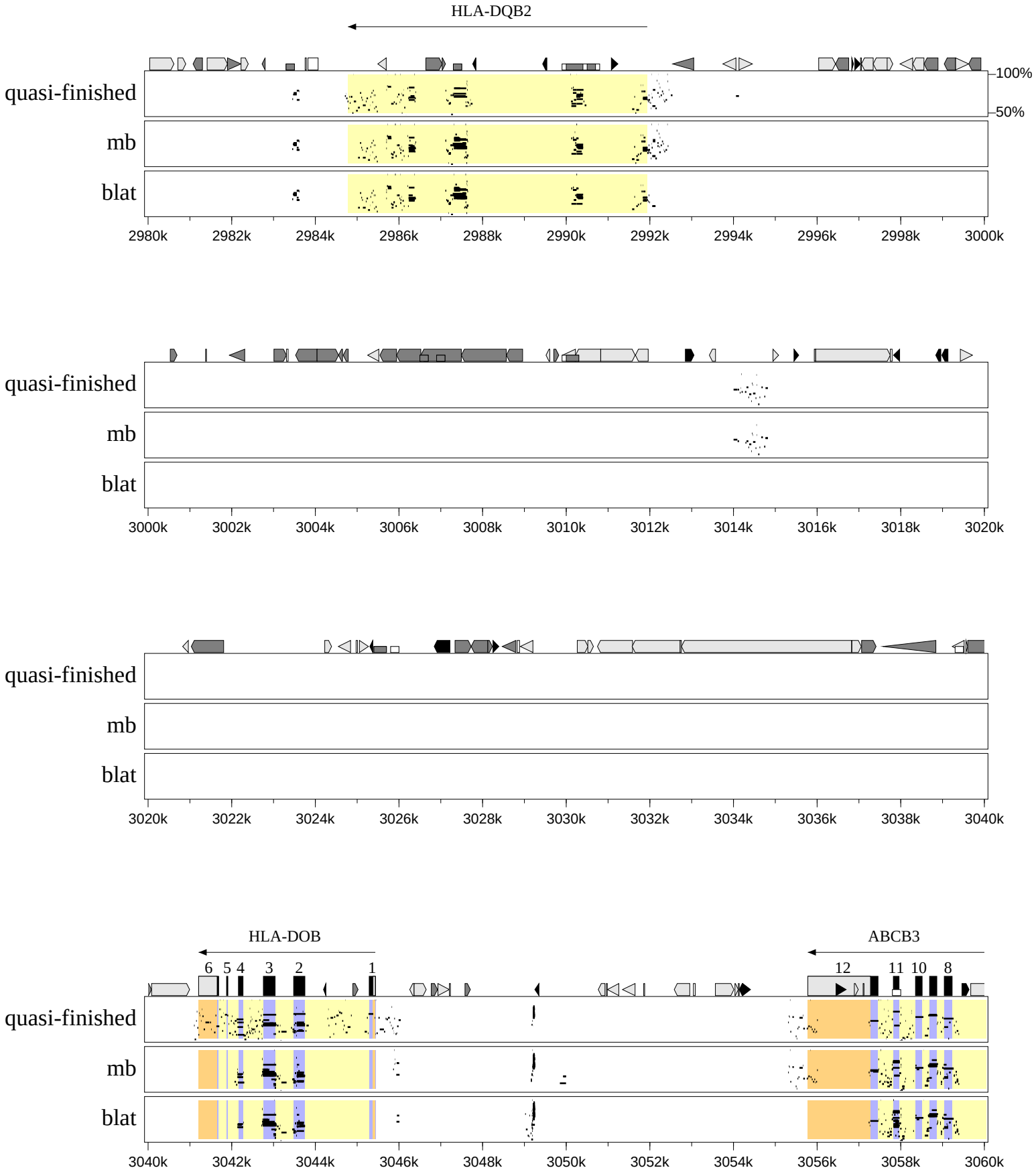
2980k


HLA-DQB2
quasi-finished
mb
blat
100%
50%
2980k
2982k
2984k
2986k
2988k
2990k
2992k
2994k
2996k
2998k
3000k
3000k
3002k
3004k
3006k
3008k
3010k
3012k
3014k
3016k
3018k
3020k
3020k
3022k
3024k
3026k
3028k
3030k
3032k
3034k
3036k
3038k
3040k
HLA-DOB
ABCB3
6 5 4 3 2 1
12 11 10 8
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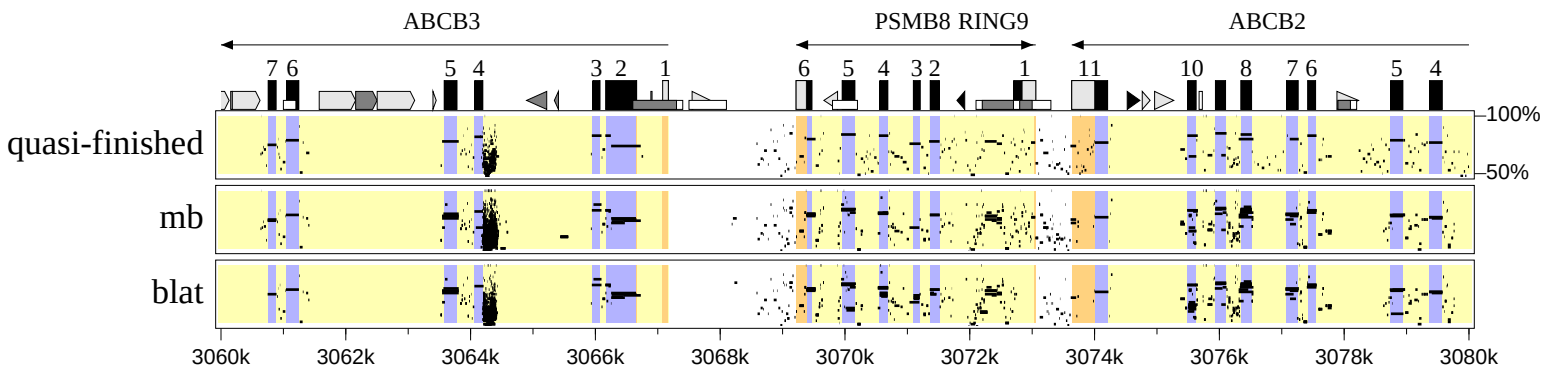
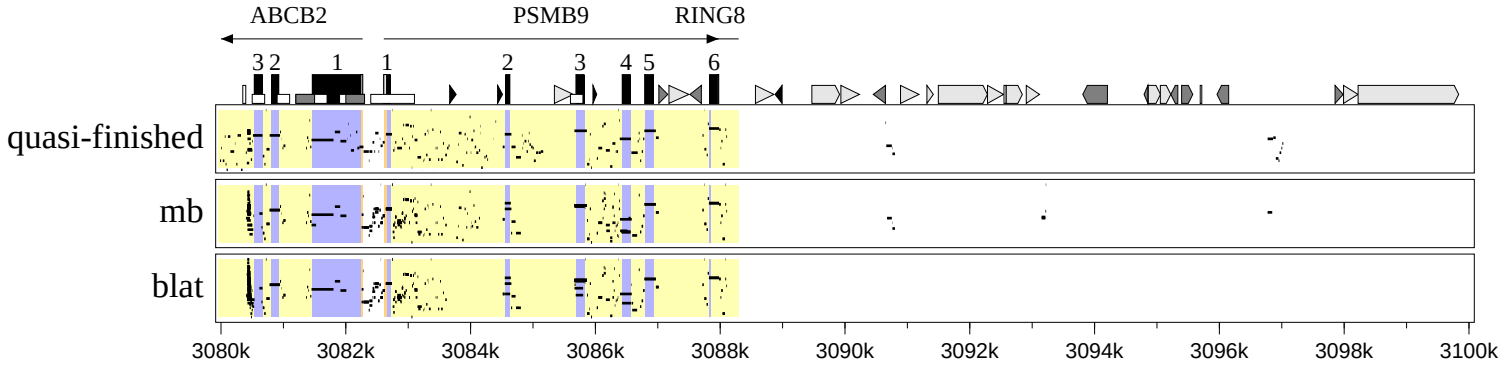
3060k


ABCB3
PSMB8 RING9
ABCB2
7 6
5 4
3 2
1
6
5
4
3 2
1
11
10
8
7 6
5
4
100%
50%
quasi-finished
mb
blat
3060k
3062k
3064k
3066k
3068k
3070k
3072k
3074k
3076k
3078k
3080k


ABCB2
PSMB9
RING8
3 2
1
1
2
3
4 5
6
quasi-finished
mb
blat
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3082k
3084k
3086k
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3092k
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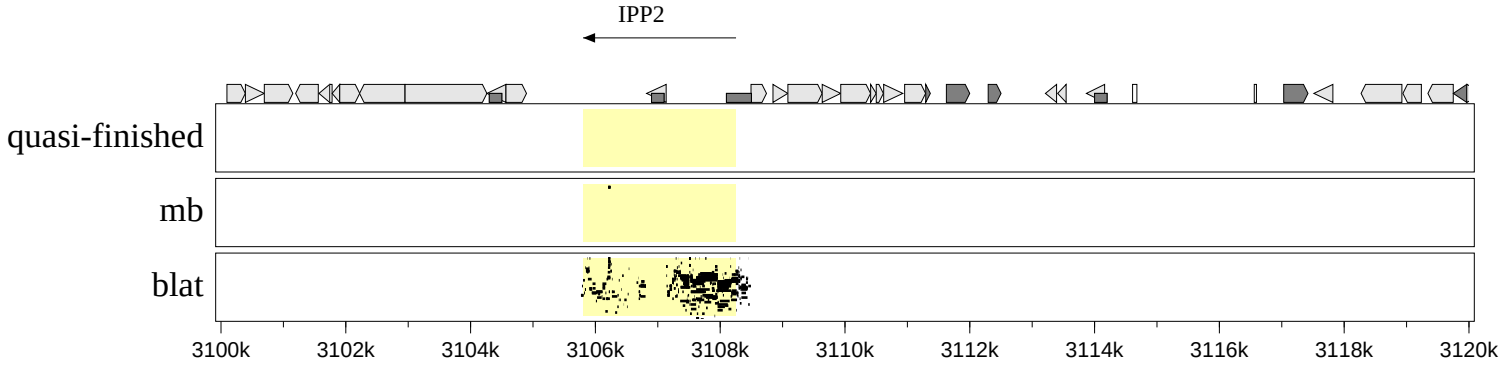
3098k
3100k


IPP2
quasi-finished
mb
blat
3100k
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3104k
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3108k
3110k
3112k
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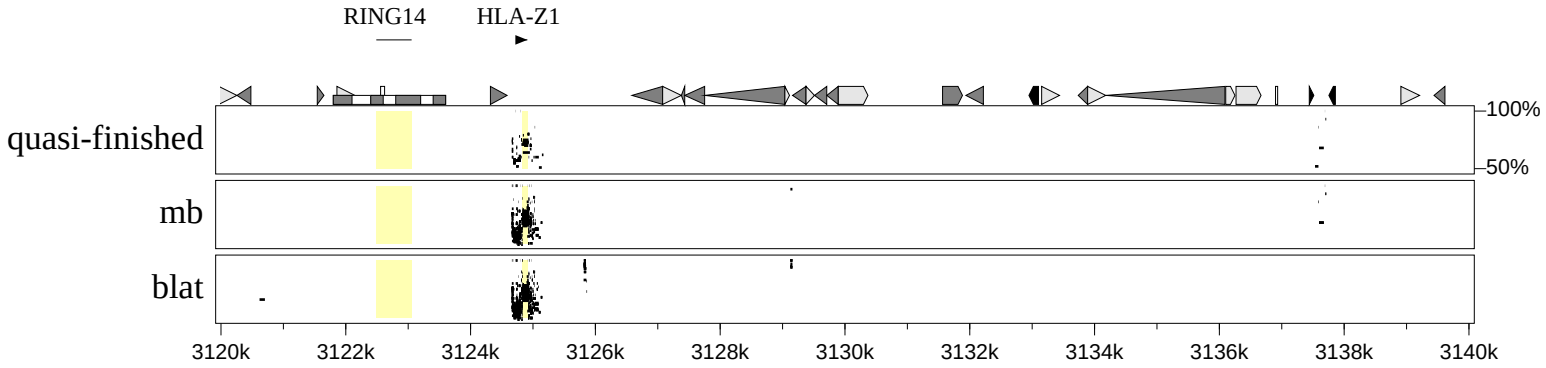
3118k
3120k


RING14
HLA-Z1
quasi-finished
mb
blat
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50%
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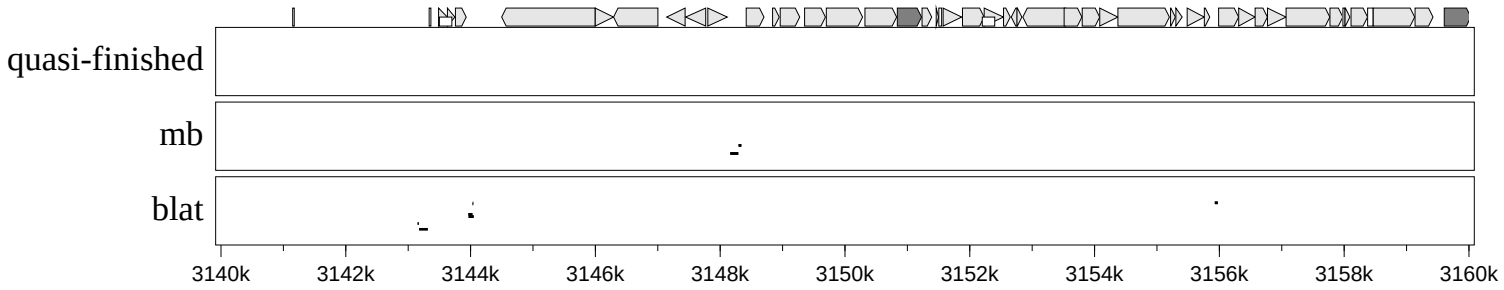
3140k


quasi-finished
mb
blat
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3144k
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3148k
3150k
3152k
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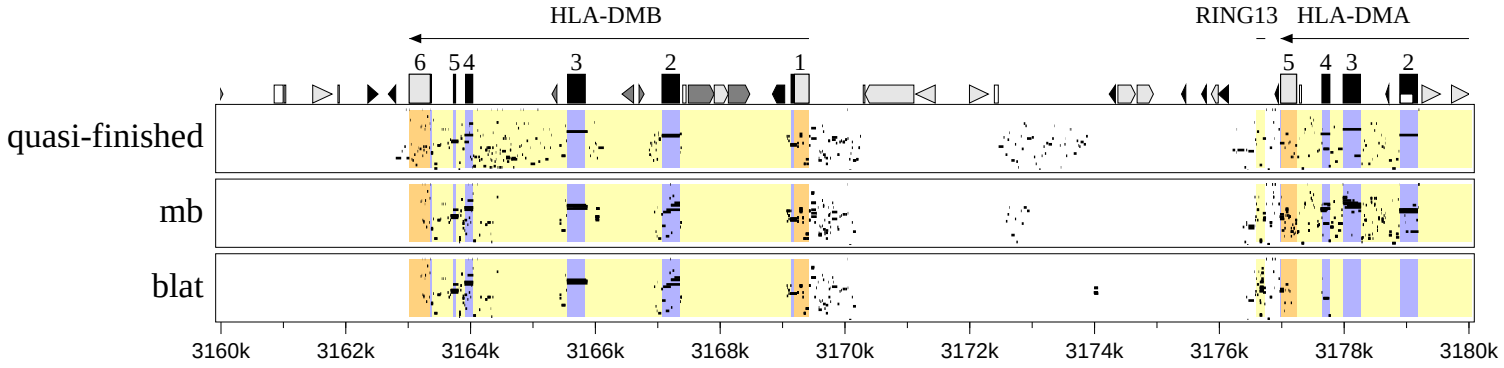
3156k
3158k
3160k


HLA-DMB
RING13
HLA-DMA
6
5
4
3
2
1
5
4
3
2
quasi-finished
mb
blat
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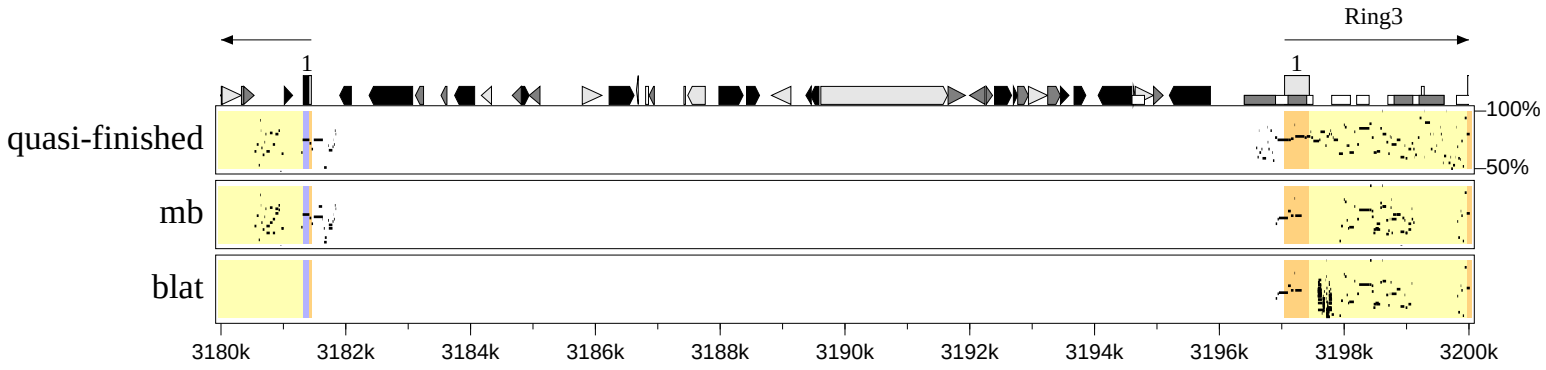
3164k
3166k
3168k
3170k
3172k
3174k
3176k
3178k
3180k


Ring3
1
1
100%
50%
quasi-finished
mb
blat
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3182k
3184k
3186k
3188k
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3192k
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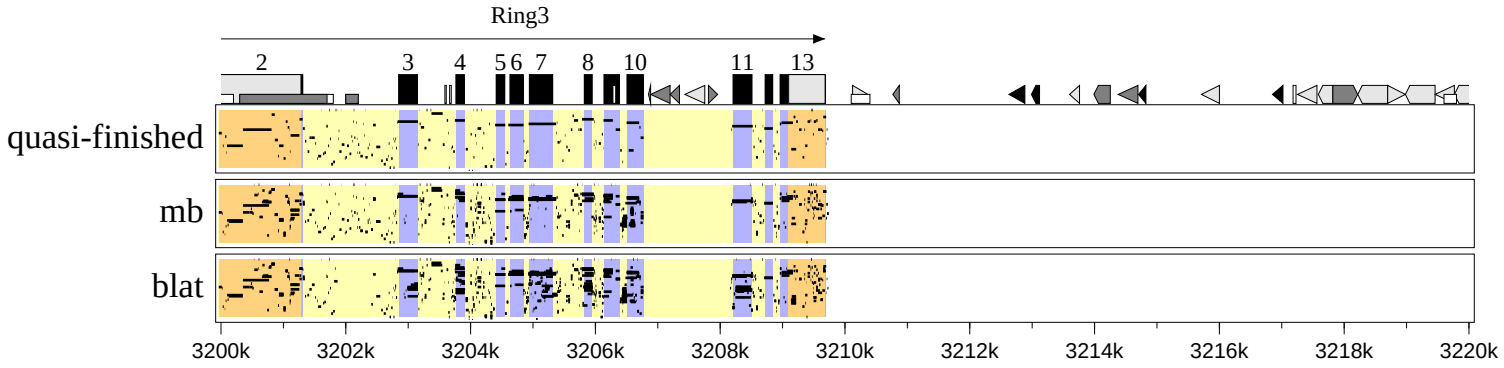
3196k
3198k
3200k


Ring3
2
3
4
5 6
7
8
10
11
13
quasi-finished
mb
blat
3200k
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3204k
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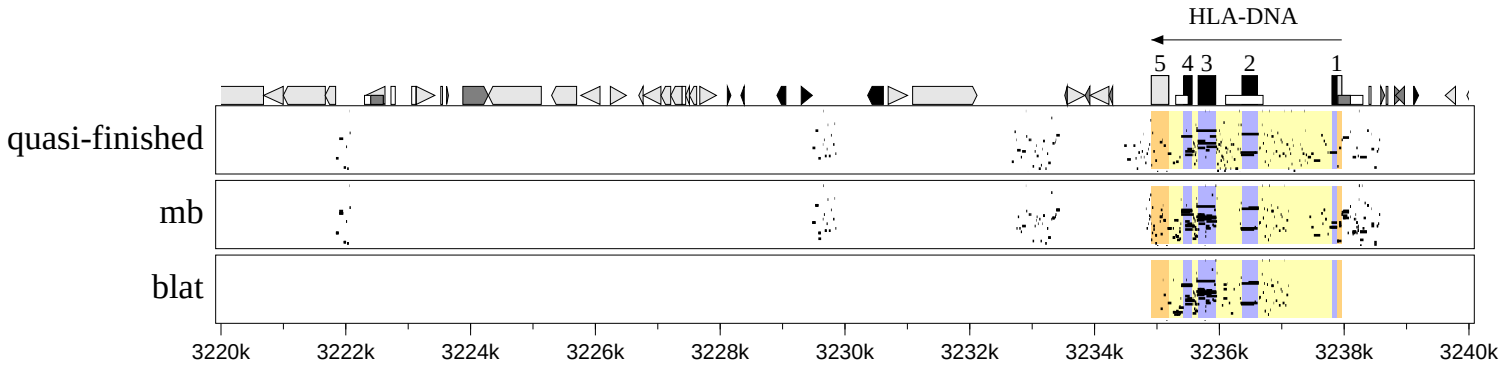
3218k
3220k


HLA-DNA
5
4 3
2
1
quasi-finished
mb
blat
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3224k
3226k
3228k
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3232k
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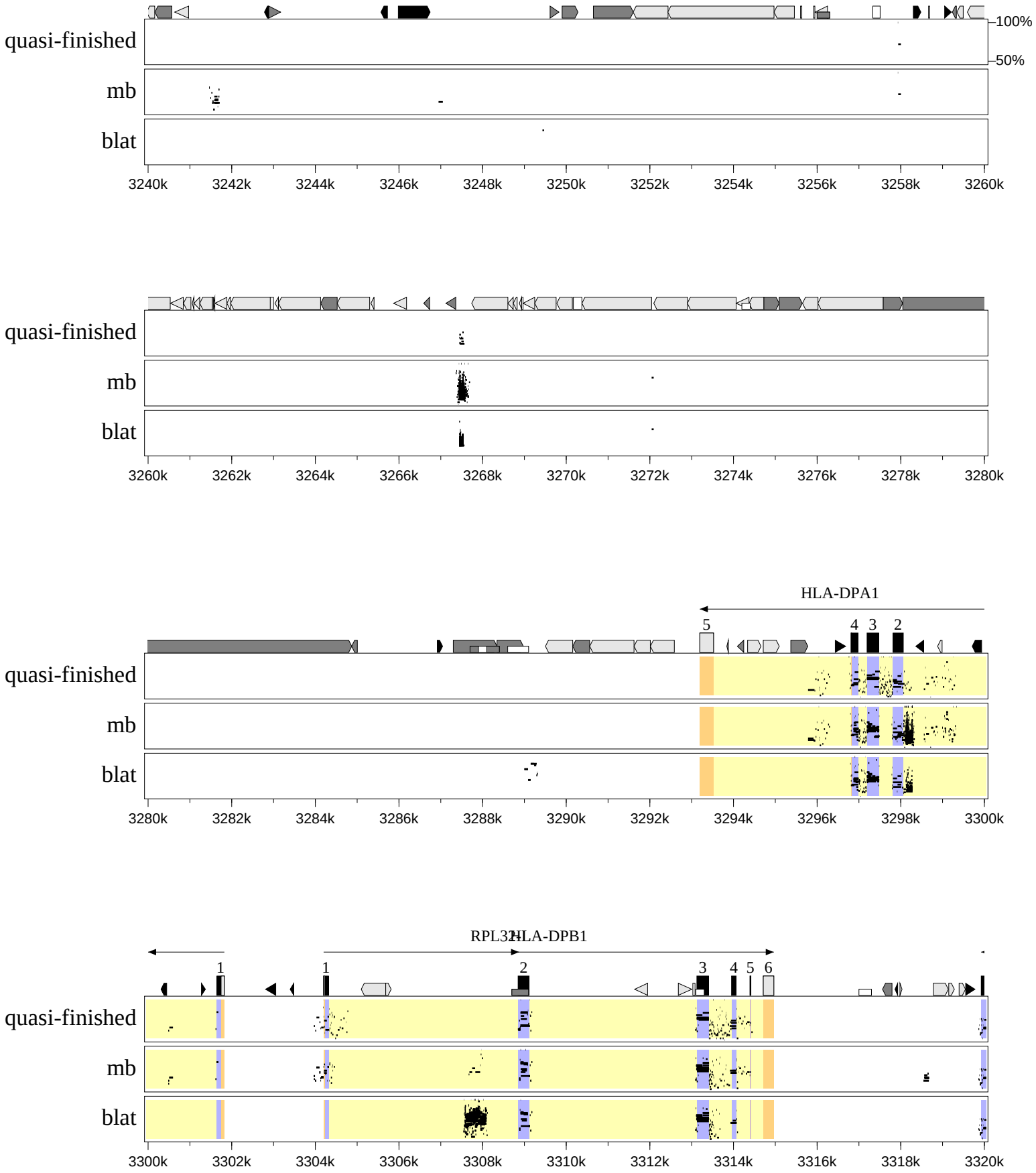
3236k
3238k
3240k


quasi-finished
mb
blat
100%
50%
3240k
3242k
3244k
3246k
3248k
3250k
3252k
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3256k
3258k
3260k
3262k
3264k
3266k
3268k
3270k
3272k
3274k
3276k
3278k
3280k
HLA-DPA1
5
4
3
2
3282k
3284k
3286k
3288k
3290k
3292k
3294k
3296k
3298k
3300k
RPL32
HLA-DPB1
1
1
2
3
4
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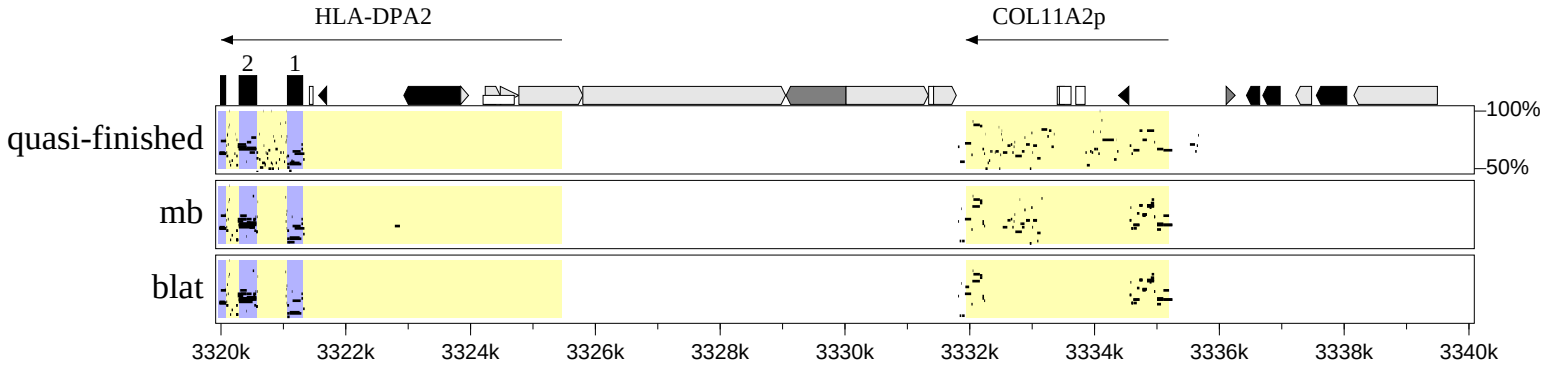
3318k
3320k


HLA-DPA2
COL11A2p
2
1
100%
50%
quasi-finished
mb
blat
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3324k
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3328k
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3332k
3334k
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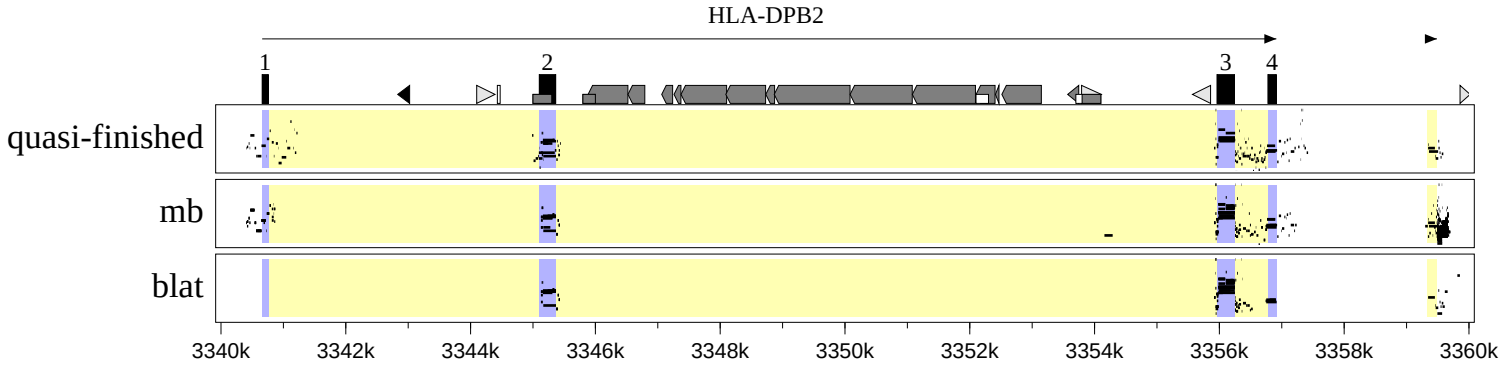
3338k
3340k


HLA-DPB2
1
2
3
4
quasi-finished
mb
blat
3340k
3342k
3344k
3346k
3348k
3350k
3352k
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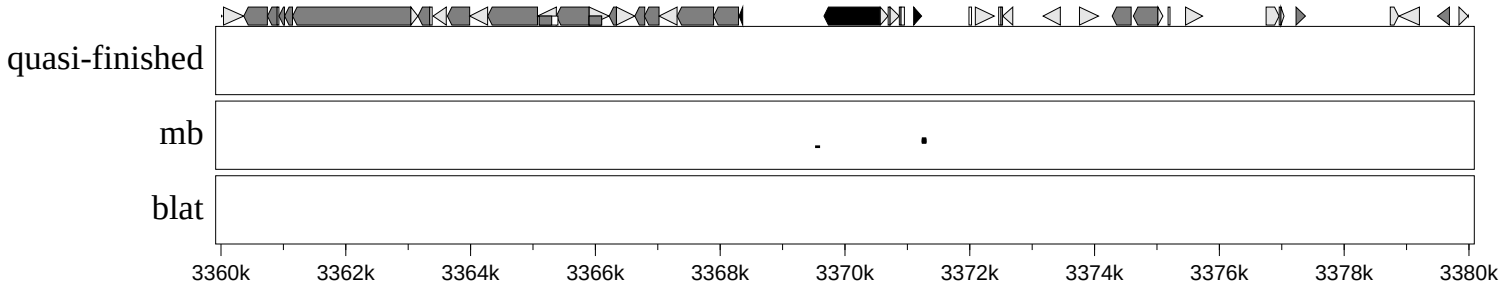
3356k
3358k
3360k


quasi-finished
mb
blat
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3362k
3364k
3366k
3368k
3370k
3372k
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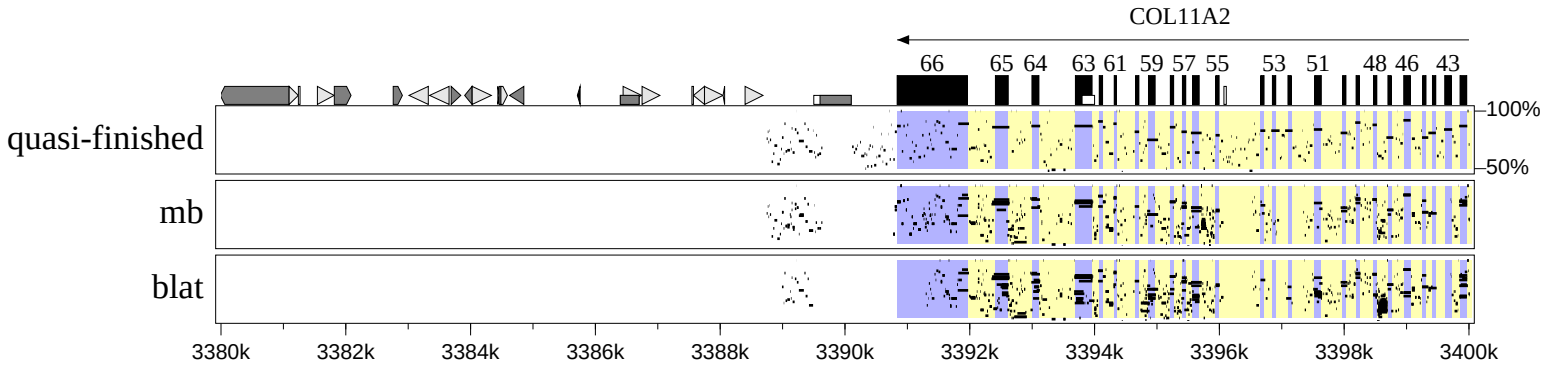
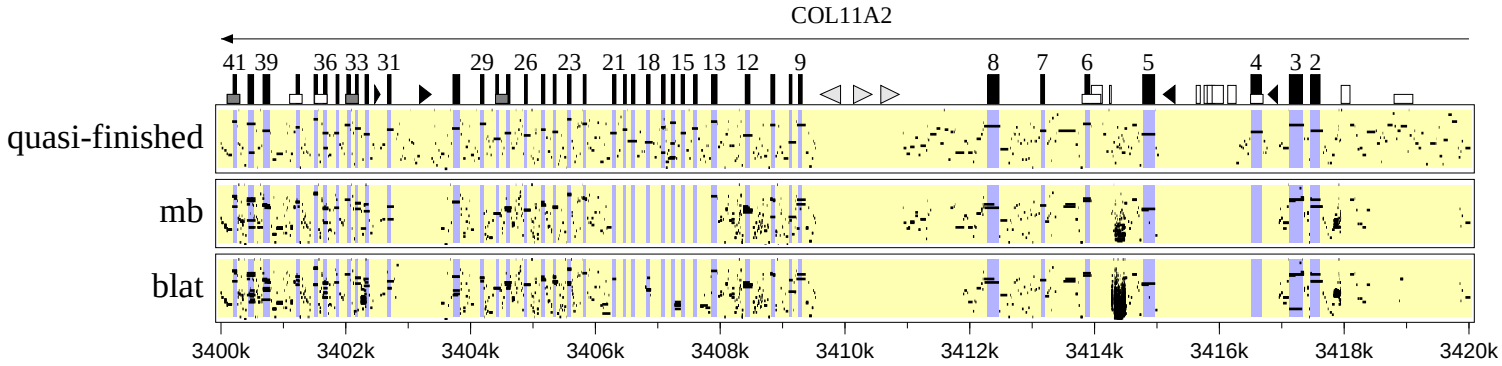
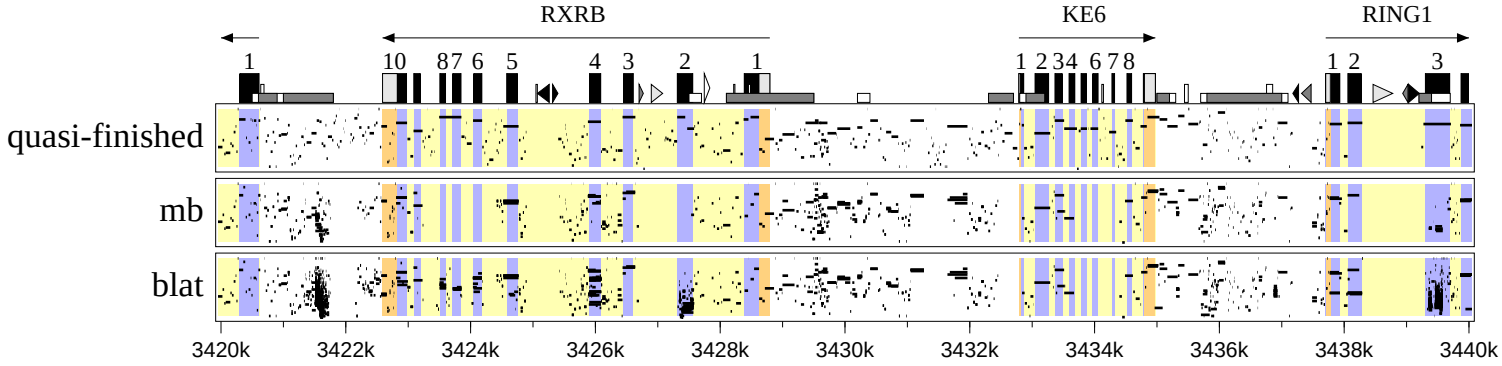
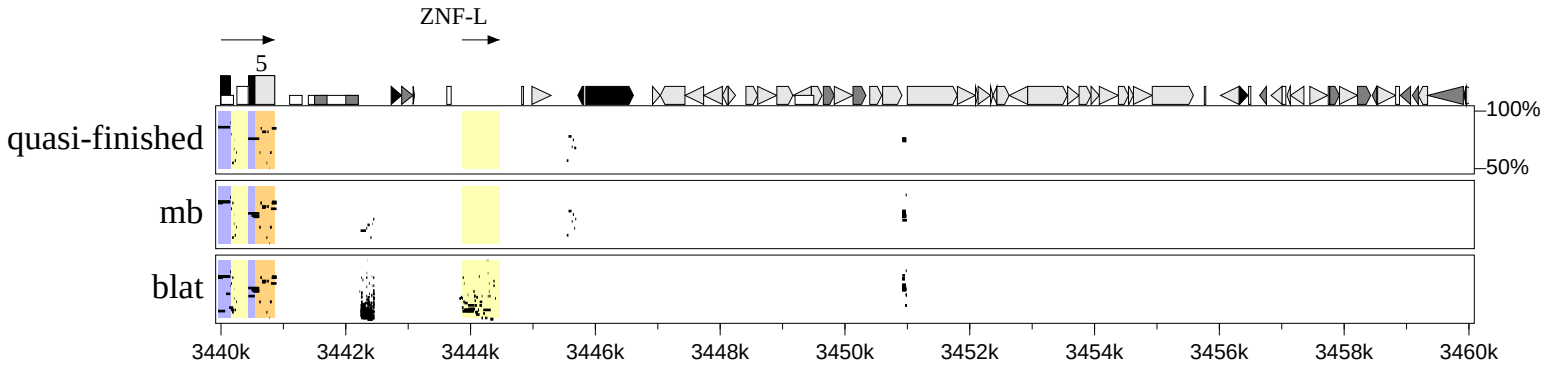
3378k
3380k


COL11A2
66 65 64 63 61 59 57 55 53 51 48 46 43
100%
50%
quasi-finished
mb
blat
3380k 3382k 3384k 3386k 3388k 3390k 3392k 3394k 3396k 3398k 3400k


COL11A2
41 39 36 33 31 29 26 23 21 18 15 13 12 9 8 7 6 5 4 3 2
quasi-finished
mb
blat
3400k 3402k 3404k 3406k 3408k 3410k 3412k 3414k 3416k 3418k 3420k


RXRB
KE6
RING1
1 10 8 7 6 5 4 3 2 1
1 2 3 4 6 7 8
1 2 3
quasi-finished
mb
blat
3420k 3422k 3424k 3426k 3428k 3430k 3432k 3434k 3436k 3438k 3440k


ZNF-L
5
quasi-finished
mb
blat
100%
50%
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3442k
3444k
3446k
3448k
3450k
3452k
3454k
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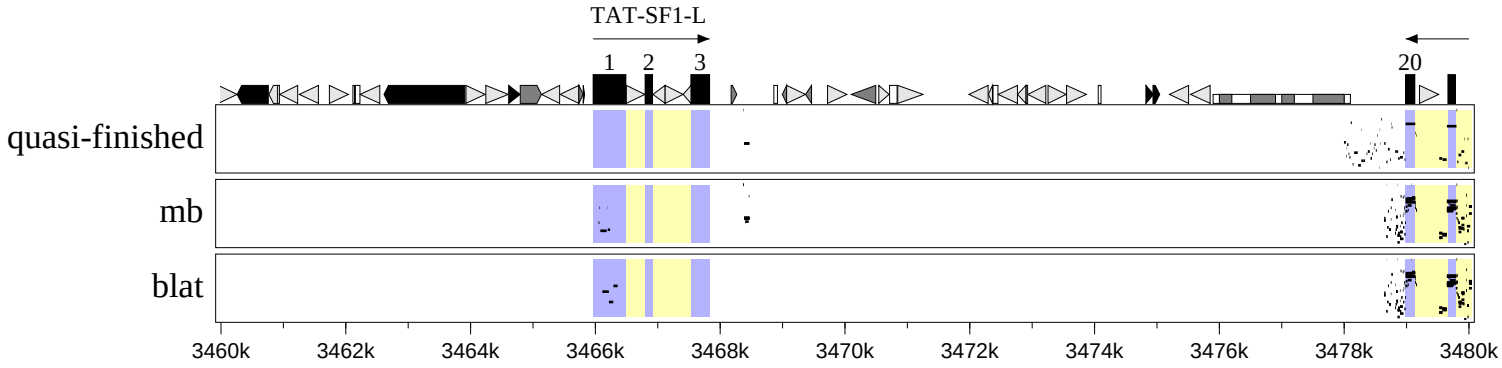
3458k
3460k


TAT-SF1-L
1
2
3
20
quasi-finished
mb
blat
3460k
3462k
3464k
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3470k
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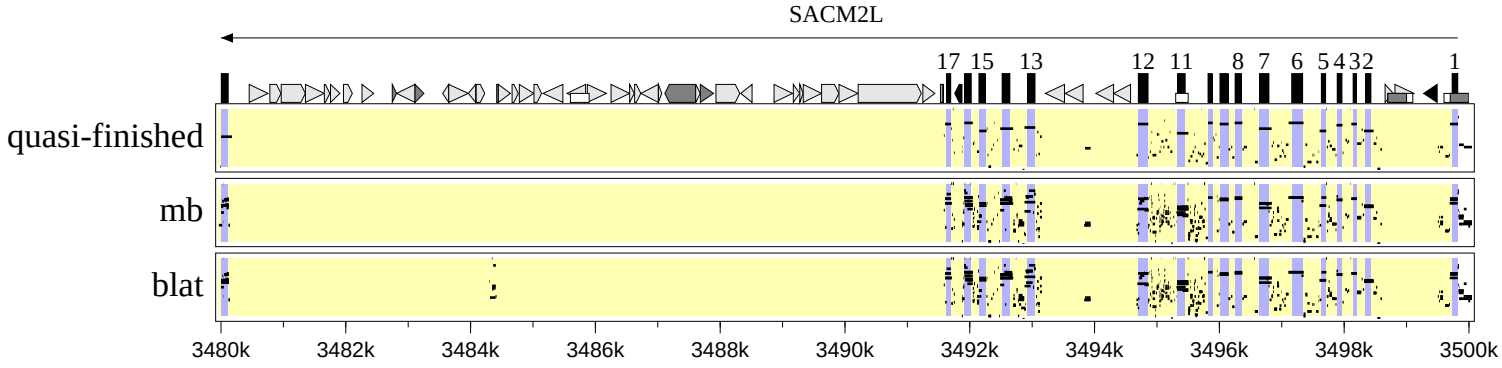
SACM2L
17
15
13
12
11
8
7
6
5
4
3
2
1
quasi-finished
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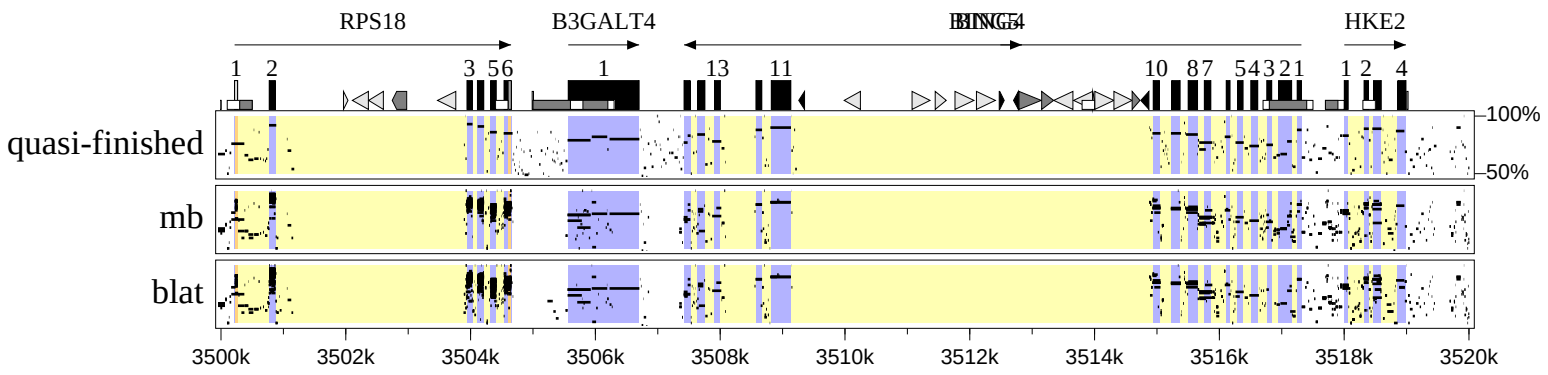
3500k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B3GALT4
HKE2
quasi-finished
mb
blat
100%
50%
3500k
3502k
3504k
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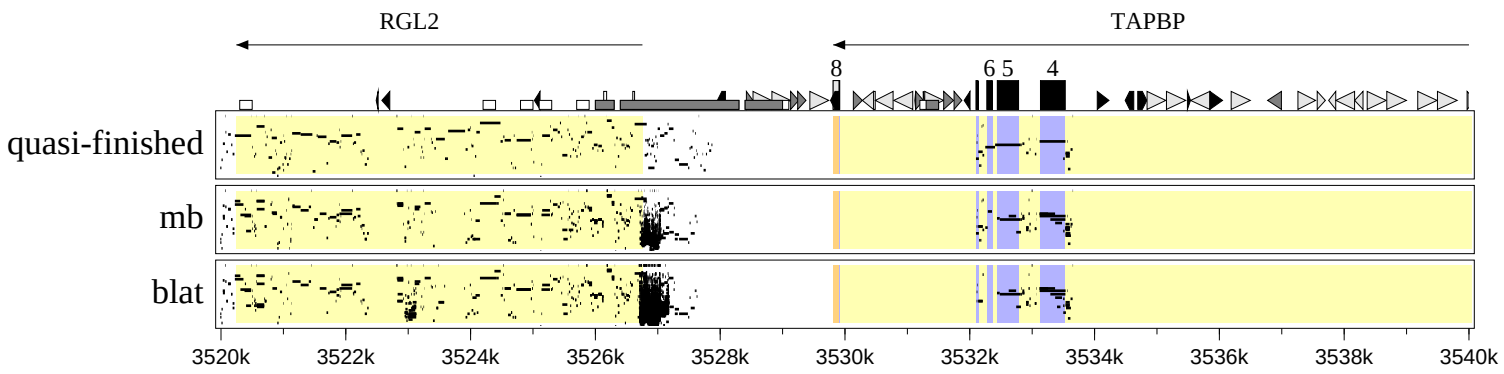
RGL2
TAPBP
quasi-finished
mb
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3532k
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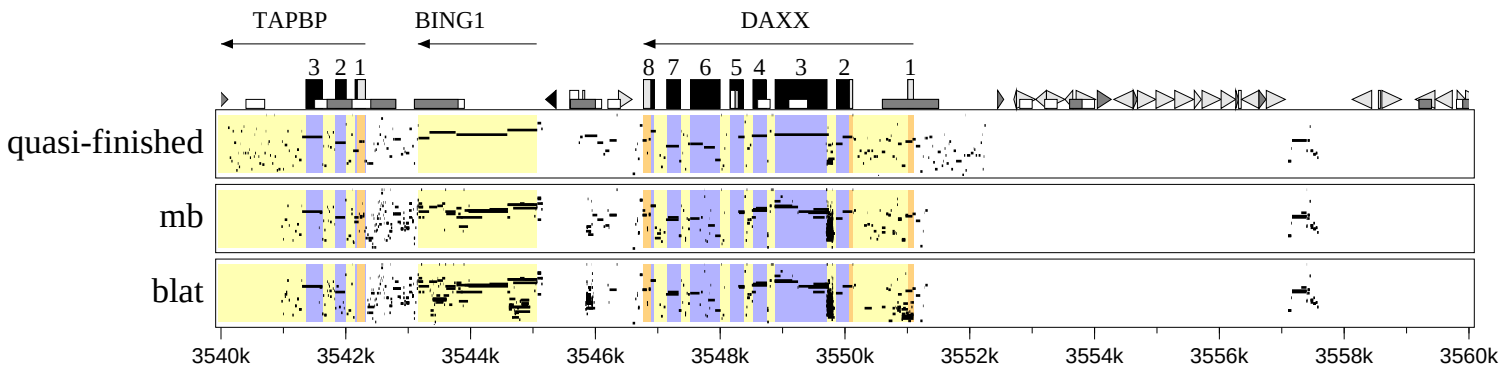
3540k


TAPBP
BING1
DAXX
quasi-finished
mb
blat
3540k
3542k
3544k
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3548k
3550k
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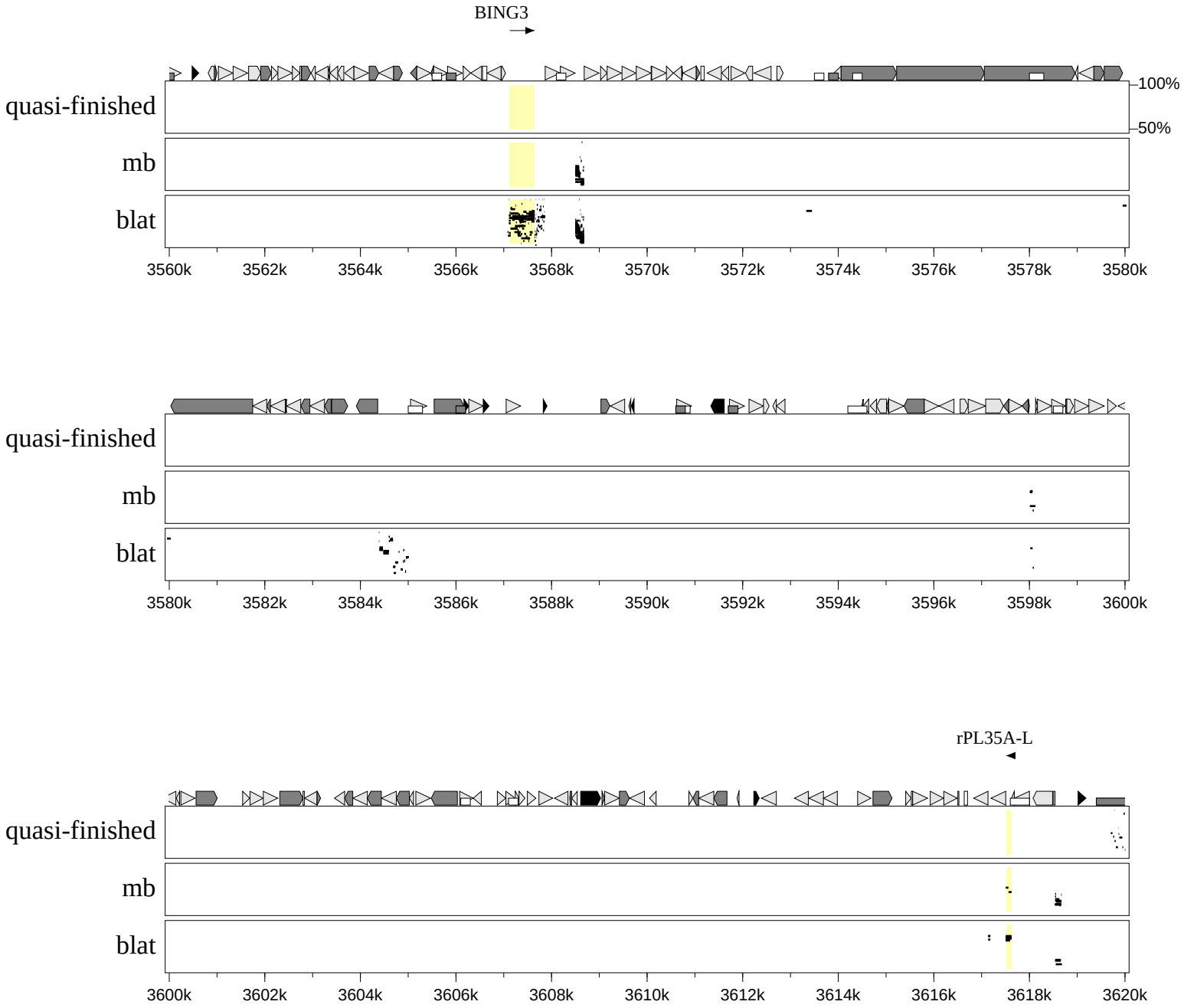
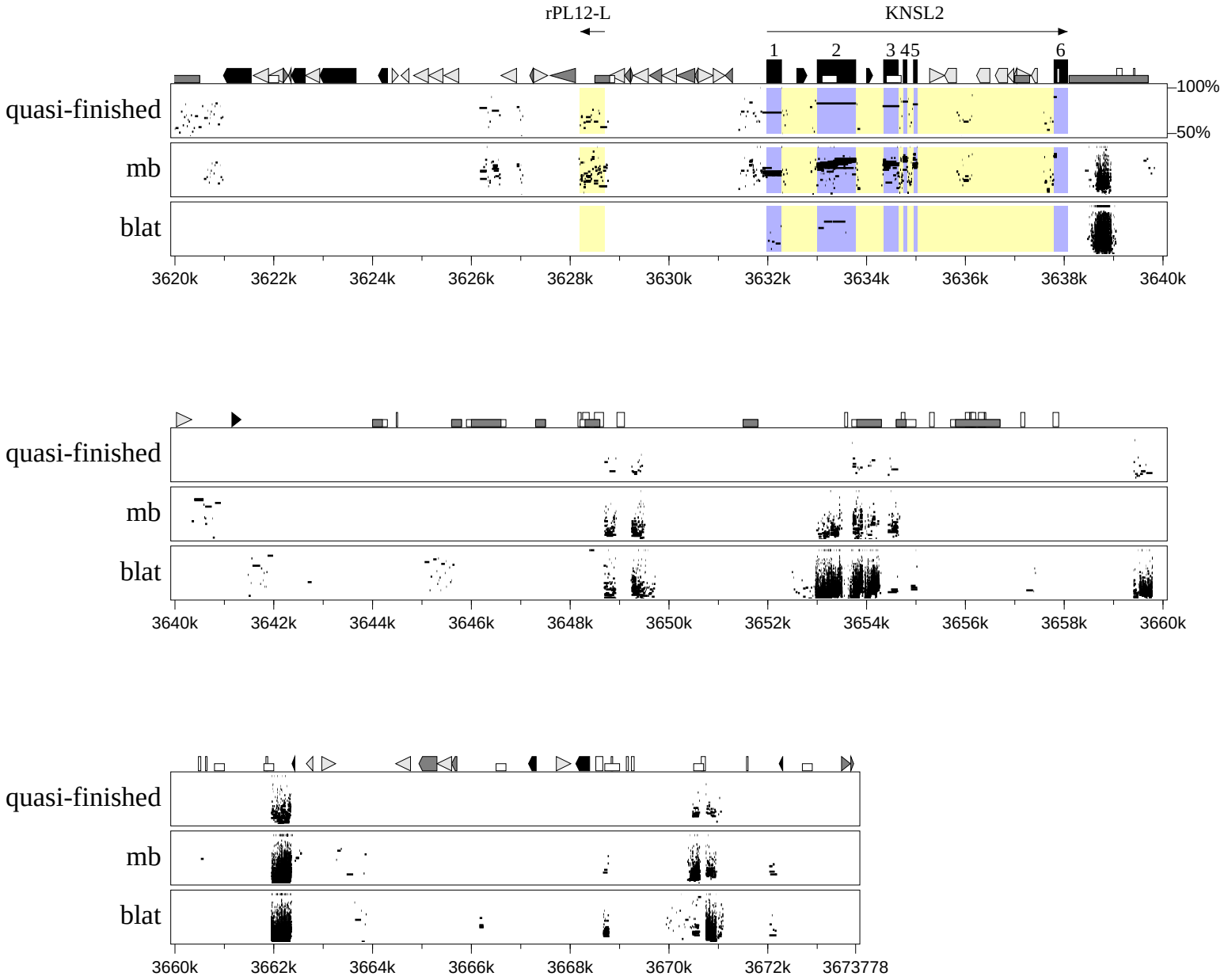
3554k
3556k
3558k
3560k


BING3
quasi-finished
mb
blat
100%
50%
3560k
3562k
3564k
3566k
3568k
3570k
3572k
3574k
3576k
3578k
3580k
quasi-finished
mb
blat
3580k
3582k
3584k
3586k
3588k
3590k
3592k
3594k
3596k
3598k
3600k
rPL35A-L
quasi-finished
mb
blat
3600k
3602k
3604k
3606k
3608k
3610k
3612k
3614k
3616k
3618k
3620k


rPL12-L
KNSL2
1
2
3 4 5
6
100%
50%
quasi-finished
mb
blat
3620k
3622k
3624k
3626k
3628k
3630k
3632k
3634k
3636k
3638k
3640k
quasi-finished
mb
blat
3640k
3642k
3644k
3646k
3648k
3650k
3652k
3654k
3656k
3658k
3660k
quasi-finished
mb
blat
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3666k
3668k
3670k
3672k
3673778