Two best nicking enzymes selected

Select nicking enzymes

BspQ1
De novo assembly 1

De novo assembly 2

Hybrid scaffold

Final merged Optical Map (OM) (Chromosome)

BbvCI
De novo assembly 1

De novo assembly 2

Hybrid scaffold

S1 Fig. Optical Map assembly (1 of 14 slides)
Table M4 restriction enzyme nicking density and labels per 100kb

<table>
<thead>
<tr>
<th>Enzyme</th>
<th>NickDensity (Nicks/100kb)</th>
<th>LabelDensity (Labels/100kb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nt.BspQ1</td>
<td>26.17856</td>
<td>17.95897</td>
</tr>
<tr>
<td>Nb.BsmI</td>
<td>50.15073</td>
<td>27.85473</td>
</tr>
<tr>
<td>Nb.BbvCI</td>
<td>20.38771</td>
<td>14.86319</td>
</tr>
<tr>
<td>Nb.BsrD1</td>
<td>66.08656</td>
<td>32.1038</td>
</tr>
<tr>
<td>Nb.BssSI</td>
<td>43.95672</td>
<td>25.75829</td>
</tr>
</tbody>
</table>

Table M4 Restriction enzyme molecule fragment statistics

<table>
<thead>
<tr>
<th>Enzyme</th>
<th>BbvC1</th>
<th>BspQ1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min molecule length for assembly (kb)</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Mapped Molecule Quantity (Mb)</td>
<td>9,949.13</td>
<td>76,661.32</td>
</tr>
<tr>
<td>Mapped Avg Size (Kb)</td>
<td>199</td>
<td>220</td>
</tr>
<tr>
<td>Avg Label Density (per 100 Kb)</td>
<td>13.9</td>
<td>14.9</td>
</tr>
<tr>
<td>Number of Consensus Genome Maps</td>
<td>44</td>
<td>76</td>
</tr>
<tr>
<td>Consensus Genome Maps Size (Mb)</td>
<td>41.332</td>
<td>68.999</td>
</tr>
<tr>
<td>Consensus Genome Maps N50 (Mb)</td>
<td>1.352</td>
<td>1.052</td>
</tr>
<tr>
<td>Avg Depth of Molecule Coverage</td>
<td>100.8</td>
<td>99.6</td>
</tr>
</tbody>
</table>

S1 Fig. Optical Mapping Statistics (2 of 14 slides)
S1 Fig. Image of M4 Optical mapping (3 of 14 slides)
Figure shows the Final Optical Map of M4 Chr1 (H4) (10Mb) (top) and the alignment of 1) *in silico* digested M4 contigs (2, 6 & 11) (middle orange bars 2) M4 enzyme Nt.BbvC1 optical maps (purple) and 3) M4 enzyme Nt.BspQ1 optical maps (bottom yellow). Telomeres are also shown (T).

**S1 Fig. M4 Optical Map for Chromosome 1 (4 of 14 slides)**
Figure shows the Final Optical Map of M4 Chr2 (H2) (5.1Mb) (top) and the alignment of 1) in silico digested M4 contigs 1A* and 13 (middle orange bars 2) M4 enzyme Nt.BbvC1 optical maps (purple) and 3) M4 enzyme Nt.BspQ1 optical maps (bottom yellow). Telomeres are also shown (T).

*Refer to slide 14

S1 Fig. M4 Optical Map for Chromosome 2 (5 of 14 slides)
Figure shows the Final Optical Map of M4 Chr3 (H7) (3.6Mb) (top) and the alignment of 1) *in silico* digested M4 contig 3 (middle orange bars) 2) M4 enzyme Nt.BbvC1 optical maps (purple) and 3) M4 enzyme Nt.BspQ1 optical maps (bottom yellow). Telomeres are also shown (T).

**S1 Fig. M4 Optical Map for Chromosome 3 (6 of 14 slides)**
Figure shows the Final Optical Map of M4 Chr4 (H9) (3.1Mb) (top) and the alignment of 1) in silico digested M4 contig 5 (middle orange bars 2) M4 enzyme Nt.BbvC1 optical maps (purple) and 3) M4 enzyme Nt.BspQ1 optical maps (bottom yellow). Telomeres are also shown (T).

S1 Fig. M4 Optical Map for Chromosome 4 (7 of 14 slides)
Figure shows the Final Optical Map of M4 Chr5 (H8) (3.4Mb) (top) and the alignment of 1) *in silico* digested M4 contigs 4 and 20 (middle orange bars) 2) M4 enzyme Nt.BbvC1 optical maps (purple) and 3) M4 enzyme Nt.BspQ1 optical maps (bottom yellow). Telomeres are also shown (T).

**S1 Fig. M4 Optical Map for Chromosome 5 (8 of 14 slides)**
Figure shows the Final Optical Map of M4 Chr6 (H6) (3.0Mb) (top) and the alignment of 1) in silico digested M4 contigs 19 and 1B* (middle orange bars 2) M4 enzyme Nt.BbvC1 optical maps (purple) and 3) M4 enzyme Nt.BspQ1 optical maps (bottom yellow). Telomeres are also shown (T).

*Refer to slide 14

S1 Fig. M4 Optical Map for Chromosome 6 (9 of 14 slides)
Figure shows the Final Optical Map of M4 Chr7 (H1) (2.8Mb) (top) and the alignment of 1) *in silico* digested M4 contigs 15, 14 & 12 (middle orange bars), 2) M4 enzyme Nt.BbvC1 optical maps (purple) and 3) M4 enzyme Nt.BspQ1 optical maps (bottom yellow). Telomeres are also shown (T).

**S1 Fig. M4 Optical Map for Chromosome 7 (10 of 14 slides)**
Figure shows the Final Optical Map of M4 Chr8 (H5) (2.4Mb) (top) and the alignment of 1) *in silico* digested M4 contigs 7 & 18 (middle orange bars), 2) M4 enzyme Nt.BbvC1 optical maps (purple) and 3) M4 enzyme Nt.BspQ1 optical maps (bottom yellow). Telomeres are also shown (T).

**S1 Fig. M4 Optical Map for Chromosome 8 (11 of 14 slides)**
Figure shows the Final Optical Map of M4 Chr9 (H10) (1.5Mb) (top) and the alignment of 1) *in silico* digested M4 contig 8 (middle orange bars), 2) M4 enzyme Nt.BbvC1 optical map (purple) and 3) M4 enzyme Nt.BspQ1 optical map (bottom yellow). Telomeres are also shown (T).

**S1 Fig. M4 Optical Map for Chromosome 9 (12 of 14 slides)**
Figure shows the Final Optical Map of M4 Chr10 (H10) (4.3Mb) (top) and the alignment of 1) in silico digested M4 contig 10, 16 & 9 (middle orange bars), 2) M4 enzyme Nt.BbvC1 optical map (purple) and 3) M4 enzyme Nt.BspQ1 optical map (bottom yellow). Telomeres are also shown (T).

S1 Fig. M4 Optical Map for Chromosome 10 (13 of 14 slides)
Figure shows the alignment of the M4 enzyme Nt.BbvC1 optical map (purple) and M4 enzyme Nt.BspQ1 optical map (bottom yellow) to the in silico digested M4 contig 1 (7Mb) (middle orange bar), and lack of support the contig at the ~4Mb region.

**S1 Fig. M4 contig1 two enzyme optical map alignments**