**Supplemental Table 1**

Detailed outline of the 5 scaffolding steps taken to produce final assemblies. Steps are visually shown on Figure 1 of the trio-binning workflow. After final quality control, the outputs of Step 5 were renamed as outlined in Supplemental Table 2 for release of v1.0 assemblies.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Step** | **Description** |

|  |  |  |
| --- | --- | --- |
| **Query** | **Reference** | **Output** |

 |
| **Step 1** | Homology based scaffolding between Hifiasm and TrioCanu assemblies |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hifiasm-HDA149 | + | TrioCanu-HDA149 | = | Hifiasm-HDA149.1 |
| TrioCanu-HDA149 | + | Hifiasm-HDA149 | = | TrioCanu-HDA149.1 |
| Hifiasm-HDA330 | + | TrioCanu-HDA330 | = | Hifiasm-HDA149.1 |
| TrioCanu-HDA330 | + | Hifiasm-HDA330 | = | TrioCanu-HDA330.1 |

 |
| **Step 2** | Homology based gap filling between Hifiasm and TrioCanu assemblies |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hifiasm-HDA149.1 | + | TrioCanu-HDA149.1 | = | Hifiasm-HDA149.2 |
| TrioCanu-HDA149.1 | + | Hifiasm-HDA149.1 | = | TrioCanu-HDA149.2 |
| Hifiasm-HDA330.1 | + | TrioCanu-HDA330.1 | = | Hifiasm-HDA149.2 |
| TrioCanu-HDA330.1 | + | Hifiasm-HDA330.1 | = | TrioCanu-HDA330.2 |

 |
| **Step 3** | Homology based scaffolding to between HDA149 and HDA330 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hifiasm-HDA149.2 | + | Hifiasm-HDA330.2 | = | Hifiasm-HDA149.3 |
| TrioCanu-HDA149.2 | + | TrioCanu-HDA330.2 | = | TrioCanu-HDA149.3 |
| Hifiasm-HDA330.2 | + | Hifiasm-HDA149.2  | = | Hifiasm-HDA149.3 |
| TrioCanu-HDA330.2 | + | TrioCanu-HDA149.2 | = | TrioCanu-HDA330.3 |

 |
| **Step 4** | Homology based scaffolding to Bionano-contig hybrid scaffolds |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hifiasm-HDA149.3 | + | Hifiasm-HDA330.BN | = | Hifiasm-HDA149.4 |
| TrioCanu-HDA149.3 | + | TrioCanu-HDA330.BN | = | TrioCanu-HDA149.4 |
| Hifiasm-HDA330.3 | + | Hifiasm-HDA149.BN | = | Hifiasm-HDA149.4 |
| TrioCanu-HDA330.3 | + | TrioCanu-HDA149.BN | = | TrioCanu-HDA330.4 |

 |
| **Step 5** | Homology based scaffolding to Dempsey v1.0 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hifiasm-HDA149.4 | + | Dempsey v1.0 | = | Hifiasm-HDA149.5 |
| TrioCanu-HDA149.4 | + | Dempsey v1.0 | = | TrioCanu-HDA149.5 |
| Hifiasm-HDA330.4 | + | Dempsey v1.0 | = | Hifiasm-HDA149.5 |
| TrioCanu-HDA330.4 | + | Dempsey v1.0 | = | TrioCanu-HDA330.5 |

 |