|  |  |
| --- | --- |
| Track name | Assembly |
| Orphadata: Aggregated Data From Orphanet (1) | hg19, hg38 |
| Microarray Probesets  | hg19, hg38 |
| dbSNP 155 (2) | hg19, hg38 |
| JARVIS: score to prioritize non-coding regions for disease relevance (3) | hg19, hg38 |
| HMC - Homologous Missense Constraint Score on PFAM domains  | hg19, hg38 |
| gnomAD Genome Mutational Constraint (4) | hg38 |
| gnomAD Predicted Constraint Metrics (pLI and Z-scores) (5) | hg38 |
| The Gene Curation Coalition (GenCC) Annotations (6) | hg38 |
| MTR - Missense Tolerance Ratio Scores (7) | hg19 |
| MetaDome - Tolerance Landscape score  (8) | hg19 |

**Supplementary Table S1:** New and updated clinical tracks for hg19 and hg38.

|  |  |
| --- | --- |
| Track name | Assembly |
| GTEx High-Confidence cis-eQTLs from CAVIAR (9) | hg38 |
| GTEx V8 RNA-Seq Read Coverage by Tissue (10) | hg38 |
| GTEx cis-eQTL  | hg38 |
| Cactus 241-way comparative genomics (11,12) | hg38 |
| Peripheral blood mononuclear cells (PBMC) from Hao et al 2020 (13) | hg38 |
| Colon single cell sequencing from Wang et al 2020 (14) | hg38 |
| Cerebral cortex single cell data from Velmeshev et al 2019 (15) | hg38 |
| Fetal Gene Atlas from Cao et al 2020 (16) | hg38 |
| Heart single cell RNA data from https://www.heartcellatlas.org (17) | hg38 |
| Ileum single cell sequencing from Wang et al 2020 | hg38 |
| Pancreas single cell sequencing from Baron et al 2016 (18) | hg38 |
| Muscle single cell data from De Micheli et al 2020 (19) | hg38 |
| Lung cells from from Travaglini et al 2020 (20) | hg38 |
| Liver single cell sequencing from MacParland et al 2018 (21) | hg38 |
| Kidney single cell data from Stewart et al 2019 (22) | hg38 |
| Placenta and decidua cells from from Vento-Tormo et al 2018 (23) | hg38 |
| Rectum single cell sequencing from Wang et al 2020  | hg38 |
| Skin single cell data from Sole-Boldo et al 2020 (24) | hg38 |
| Merged Cells: Single cell RNA expression levels cell types from many organs | hg38 |
| Tabula Sapiens single cell RNA data (25) | hg38 |
| ReMap Atlas of Regulatory Regions (26) | hg38, hg19, mm39, mm10, dm6 |
| JASPAR Transcription Factor Binding Sites (27) | hg38 hg19 mm39 mm10 |
| European Variation Archive (28) | mm39, mm10, danRer11, danRer10, +12 more |
| CRISPR Targets (29) | bosTau9 |

**Supplementary Table S2:** New and updated clinical tracks for hg19 and hg38.

|  |  |
| --- | --- |
| Track name | Assembly |
| GENCODE Genes v41 (knownGene) (30) | hg38 |
| GENCODE Genes v41  | hg19, hg38 |
| GENCODE Genes v40  | hg19, hg38 |
| GENCODE Genes v39 (knownGene) | hg38 |
| GENCODE Genes v39  | hg19, hg38 |
| GENCODE Genes v38 (knownGene)  | hg38 |
| GENCODE Genes VM30 (knownGene) | mm39 |
| GENCODE Genes VM30  | mm39 |
| GENCODE Genes VM29  | mm39 |
| GENCODE Genes VM28 | mm39 |
| GENCODE Genes VM27 | mm39 |
| MANE Select v1.0 (31) | hg38 |
| NCBI RefSeq 109.20211119 (32) | hg38 |
| NCBI RefSeq 105.20220307  | hg19 |

**Supplementary Table S3:** New and updated gene model tracks on human and mouse. Tracks designated knownGene contain additional data associations and serve as the default genes track for the assembly.

|  |
| --- |
| Track name |
| Variants of Concern (VOC): Includes the latest WHO-designated VOC from <https://www.who.int/activities/tracking-SARS-CoV-2-variants> |
| Varskip Primers  |
| Natural selection data from [https://observablehq.com/@spond/revised-sars-cov-2-analytics-page](https://observablehq.com/%40spond/revised-sars-cov-2-analytics-page) |
| Omicron BA.4 and BA.5  |
| Galaxy ENA  |
| Predicted Covid-drug resistance mutation positions (33) |
| ARTIC v4.1 (34) |
| ARTIC v4  |
| Omicron mutations  |
| Problematic Sites (35) |
| SARS-CoV-2 Phylogeny (36) |
| UniProt Protein Annotations (37) |

**Supplementary Table S4:** List of new and updated tracks for the SARS-CoV-2 assembly.

|  |  |
| --- | --- |
| Track name | Assembly |
| DECIPHER CNVs (38) | hg38 |
| NHGRI Catalog of Published GWAS (39) | hg38, hg19, hg18 |
| GeneReviews (40) | hg38, hg19, hg18 |
| Locus Reference Genomic (LRG) / RefSeqGene Fixed Transcript Annotations (41) | hg38, hg19 |
| Orphadata: Aggregated Data From Orphanet | hg38, hg19 |
| ClinVar Variants (42) | hg38, hg19 |
| OMIM Genes & Phenotypes  | hg38, hg19, hg18 |
| OMIM Allelic Variant Phenotypes  | hg38, hg19, hg18 |
| Mastermind Variants (43) | hg38, hg19 |
| UniProt Protein Annotations  | hg38, hg19 + 110 more |
| ClinGen Research (44) | hg38, hg19 |
| GRC Incident Database  | hg38, hg19, mm10, mm9, danRer10, danRer7 |
| RefSeq genes from NCBI  | hg38, hg19 |

**Supplementary Table S5:** List of tracks and corresponding assemblies belonging to our automatic pipelines that were updated since August 2021. These annotations update regularly without manual intervention.

|  |  |
| --- | --- |
| Hub name | Assembly |
| ReMap 2022 Regulatory Atlas  | mm10, mm39, hg38, hg19, dm6, araTha1 |
| Golden Hamster genome (45) | MesAur2.0 |
| Bird Alignment (363 species): Zoonomia Project (46) | 363 bird assemblies |
| Mammal and Bird Alignment (605 species) (47) | 605 mammal and bird assemblies |
| EyeBrowse  | hg19, bosTau6, canFam2, cavPor3, danRer6, danRer7, rn4, rheMac2, galGal3, hg17, hg18, mm9 |
| Singing mouse genome hub  | steguina |
| Dfam database of TE families and annotations  | hg38 |

**Supplementary Table S6:** New Genome Browser Public Hubs added in the last year.

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