# Full wwPDB EM Validation Report

Dec 18, 2025 – 04:33 PM JST

| | | |
|---|---|---|
| PDB ID | : | 9WMU / pdb_00009wmu |
| EMDB ID | : | EMD-66105 |
| Title | : | Co-transcriptional histone H3K36 methylation complex containing RNA polymerase II elongation complex, Set2, and the upstream nucleosome. (temp130, type A) |
| Authors | : | Kujirai, T.; Ehara, H.; Ito, T.; Henmi, M.; Sekine, S.; Kurumizaka, H. |
| Deposited on | : | 2025-09-03 |
| Resolution | : | 4.28 Å(reported) |

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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The following versions of software and data (see references (1)) were used in the production of this report:

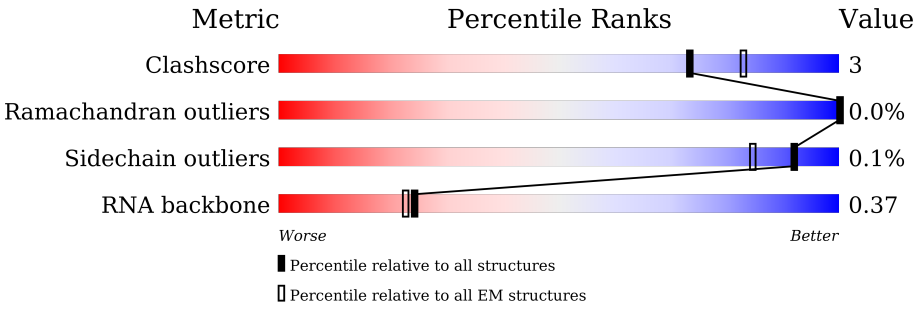
| | | |
|---|---|---|
| EMDB validation analysis | : | 0.0.1.dev129 |
| Mogul | : | 1.8.5 (274361), CSD as541be (2020) |
| MolProbity | : | 4-5-2 with Phenix2.0 |
| buster-report | : | 1.1.7 (2018) |
| Percentile statistics | : | 20231227.v01 (using entries in the PDB archive December 27th 2023) |
| EM percentile statistics | : | 202505.v01 (Using data in the EMDB archive up until May 2025) |
| MapQ | : | 1.9.13 |
| Ideal geometry (proteins) | : | Engh & Huber (2001) |
| Ideal geometry (DNA, RNA) | : | Parkinson et al. (1996) |
| Validation Pipeline (wwPDB-VP) | : | 2.47 |

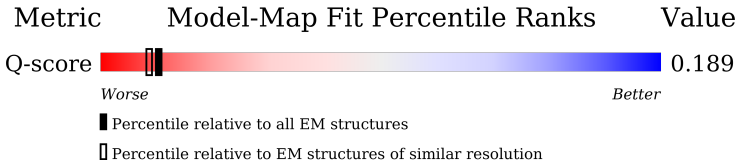
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:
*ELECTRON MICROSCOPY*

The reported resolution of this entry is 4.28 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.




| Metric | Whole archive (#Entries) | EM structures (#Entries) | Similar EM resolution (#Entries, resolution range(Å)) |
|---|---|---|---|
| Clashscore | 210492 | 15764 | - |
| Ramachandran outliers | 207382 | 16835 | - |
| Sidechain outliers | 206894 | 16415 | - |
| RNA backbone | 6643 | 2191 | - |
| Q-score | - | 25397 | 4493 ( 3.79 - 4.78 ) |

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 1 | A | 1743 | 75% 5% 19% |
| 2 | B | 1227 | 87% 8% 5% |
| 3 | C | 304 | 82% 13% |

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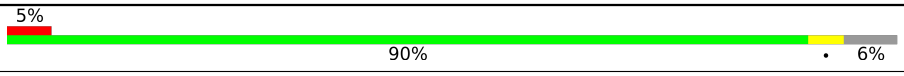
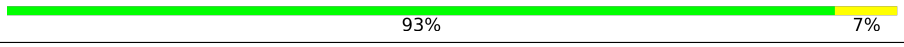
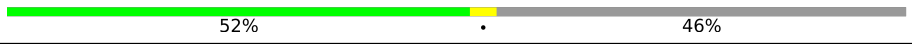
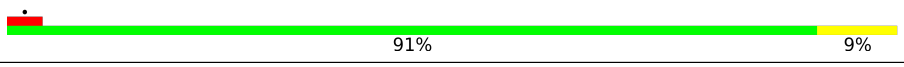
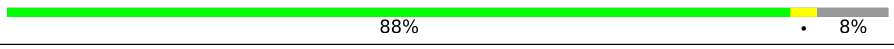
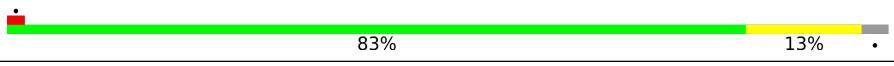
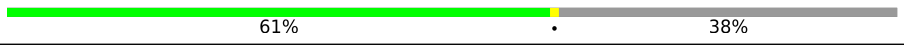
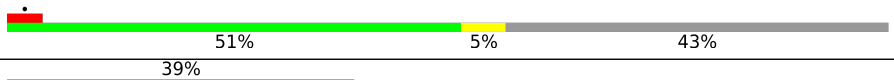
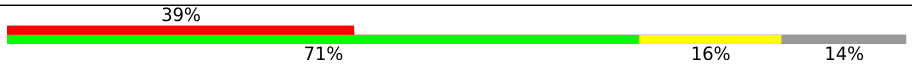
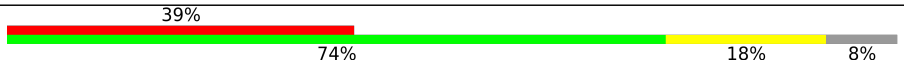
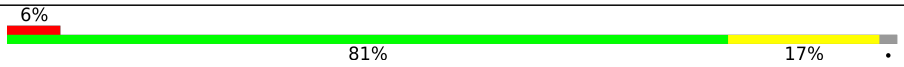
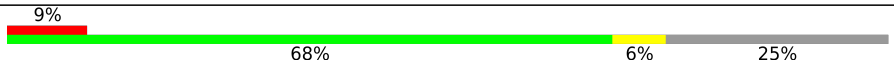
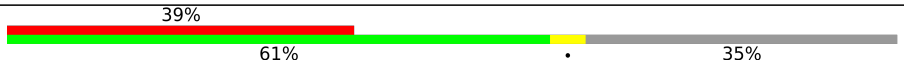
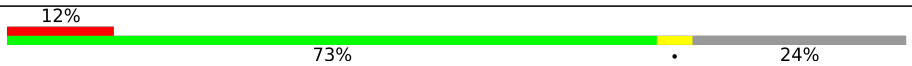
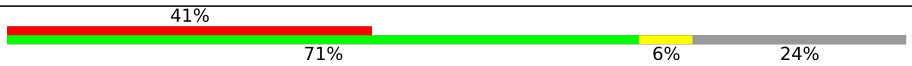
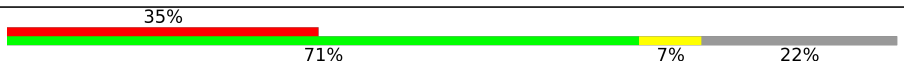
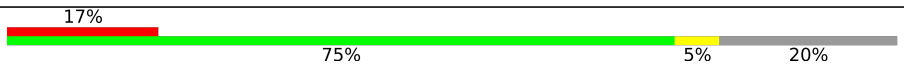
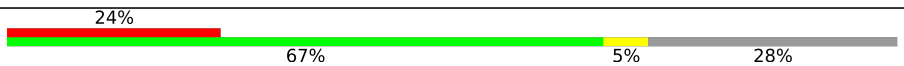
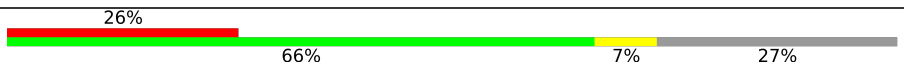
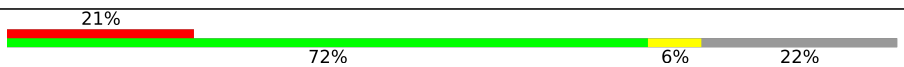
| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 4 | D | 186 |   |
| 5 | E | 214 |   |
| 6 | F | 155 |   |
| 7 | G | 171 |   |
| 8 | H | 145 |   |
| 9 | I | 115 |   |
| 10 | J | 72 |   |
| 11 | K | 118 |   |
| 12 | L | 72 |   |
| 13 | M | 113 |   |
| 14 | N | 198 |   |
| 15 | P | 19 |   |
| 16 | T | 198 |   |
| 17 | V | 108 |   |
| 18 | W | 911 |   |
| 19 | a | 139 |   |
| 19 | e | 139 |   |
| 20 | b | 106 |   |
| 20 | f | 106 |   |
| 21 | c | 133 |   |
| 21 | g | 133 |   |
| 22 | d | 129 |   |
| 22 | h | 129 |   |
| 23 | m | 1503 |   |
| 24 | n | 417 |   |

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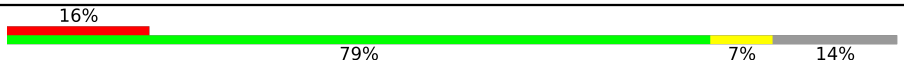
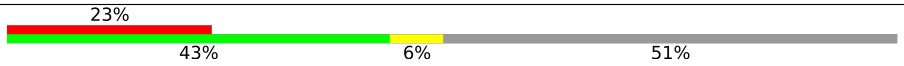
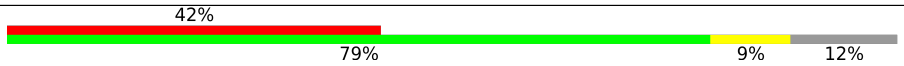
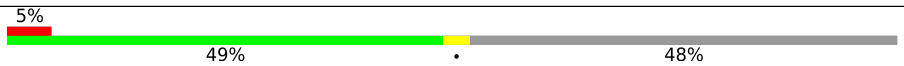
| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 25 | q | 1084 |   |
| 26 | r | 544 |   |
| 27 | s | 725 |   |
| 28 | u | 459 |   |
| 29 | v | 396 |   |
| 30 | x | 395 |   |

# 2 Entry composition

There are 33 unique types of molecules in this entry. The entry contains 80704 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called DNA-directed RNA polymerase subunit.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 1 | A | 1404 | 11064 | 6975 | 1930 | 2089 | 70 | 0 | 0 |

- Molecule 2 is a protein called DNA-directed RNA polymerase subunit beta.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 2 | B | 1164 | 9284 | 5848 | 1639 | 1739 | 58 | 0 | 0 |

- Molecule 3 is a protein called RNA polymerase II third largest subunit B44, part of central core.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 3 | C | 263 | 2098 | 1319 | 354 | 413 | 12 | 0 | 0 |

- Molecule 4 is a protein called RNA polymerase II subunit B32.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 4 | D | 174 | 1349 | 828 | 244 | 274 | 3 | 0 | 0 |

- Molecule 5 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | C | N | O | S | | |
| 5 | E | 213 | 1741 | 1094 | 312 | 325 | 10 | 0 | 0 |

- Molecule 6 is a protein called RNA polymerase subunit ABC23, common to RNA polymerases I, II, and III.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 6 | F | 84 | Total | C | N | O | S | 0 | 0 |
| | | | 677 | 429 | 114 | 131 | 3 | | |

- Molecule 7 is a protein called RNA polymerase II subunit.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 7 | G | 171 | Total | C | N | O | S | 0 | 0 |
| | | | 1325 | 858 | 214 | 248 | 5 | | |

- Molecule 8 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 8 | H | 133 | Total | C | N | O | S | 0 | 0 |
| | | | 1053 | 671 | 169 | 209 | 4 | | |

- Molecule 9 is a protein called DNA-directed RNA polymerase subunit.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 9 | I | 111 | Total | C | N | O | S | 0 | 0 |
| | | | 917 | 565 | 161 | 180 | 11 | | |

- Molecule 10 is a protein called RNA polymerase subunit ABC10-beta, common to RNA polymerases I, II, and III.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 10 | J | 67 | Total | C | N | O | S | 0 | 0 |
| | | | 554 | 355 | 97 | 96 | 6 | | |

- Molecule 11 is a protein called RNA polymerase II subunit B12.5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 11 | K | 113 | Total | C | N | O | S | 0 | 0 |
| | | | 932 | 599 | 160 | 169 | 4 | | |

- Molecule 12 is a protein called RNA polymerase subunit ABC10-alpha.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 12 | L | 45 | Total | C | N | O | S | 0 | 0 |
| | | | 359 | 221 | 72 | 61 | 5 | | |

- Molecule 13 is a protein called Transcription elongation factor 1 homolog.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 13 | M | 64 | Total | C | N | O | S | 0 | 0 |
| | | | 505 | 318 | 82 | 99 | 6 | | |

There are 3 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| M | -2 | GLY | - | expression tag | UNP C4QZ45 |
| M | -1 | PRO | - | expression tag | UNP C4QZ45 |
| M | 0 | GLY | - | expression tag | UNP C4QZ45 |

- Molecule 14 is a DNA chain called DNA (198-MER).

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 14 | N | 171 | Total | C | N | O | P | 0 | 0 |
| | | | 3503 | 1677 | 558 | 1097 | 171 | | |

- Molecule 15 is a RNA chain called RNA (5'-R(P*UP*CP*CP*UP*UP*UP*UP*GP*UP*GP*CP*GP*GP*CP*CP*UP*CP*GP*A)-3').

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 15 | P | 19 | Total | C | N | O | P | 0 | 0 |
| | | | 397 | 177 | 62 | 139 | 19 | | |

- Molecule 16 is a DNA chain called DNA (198-MER).

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 16 | T | 182 | Total | C | N | O | P | 0 | 0 |
| | | | 3731 | 1760 | 769 | 1020 | 182 | | |

- Molecule 17 is a protein called Transcription elongation factor SPT4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 17 | V | 106 | Total | C | N | O | S | 0 | 0 |
| | | | 824 | 512 | 150 | 155 | 7 | | |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| V | 7 | MET | - | initiating methionine | UNP C4R0E6 |

- Molecule 18 is a protein called Transcription elongation factor SPT5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 18 | W | 535 | Total | C | N | O | S | 0 | 0 |
| | | | 4250 | 2680 | 754 | 814 | 2 | | |

There are 3 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| W | -2 | GLY | - | expression tag | UNP C4R370 |
| W | -1 | PRO | - | expression tag | UNP C4R370 |
| W | 0 | GLY | - | expression tag | UNP C4R370 |

- Molecule 19 is a protein called Histone H3.3.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 19 | a | 104 | Total | C | N | O | S | 0 | 0 |
| | | | 841 | 530 | 163 | 145 | 3 | | |
| 19 | e | 91 | Total | C | N | O | S | 0 | 0 |
| | | | 739 | 466 | 141 | 130 | 2 | | |

There are 8 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| a | -3 | GLY | - | expression tag | UNP P84243 |
| a | -2 | SER | - | expression tag | UNP P84243 |
| a | -1 | HIS | - | expression tag | UNP P84243 |
| a | 36 | MET | LYS | variant | UNP P84243 |
| e | -3 | GLY | - | expression tag | UNP P84243 |
| e | -2 | SER | - | expression tag | UNP P84243 |
| e | -1 | HIS | - | expression tag | UNP P84243 |
| e | 36 | MET | LYS | variant | UNP P84243 |

- Molecule 20 is a protein called Histone H4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 20 | b | 81 | Total | C | N | O | S | 0 | 0 |
| | | | 646 | 407 | 126 | 112 | 1 | | |
| 20 | f | 81 | Total | C | N | O | S | 0 | 0 |
| | | | 646 | 407 | 126 | 112 | 1 | | |

There are 6 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| b | -3 | GLY | - | expression tag | UNP P62805 |

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| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| b | -2 | SER | - | expression tag | UNP P62805 |
| b | -1 | HIS | - | expression tag | UNP P62805 |
| f | -3 | GLY | - | expression tag | UNP P62805 |
| f | -2 | SER | - | expression tag | UNP P62805 |
| f | -1 | HIS | - | expression tag | UNP P62805 |

- Molecule 21 is a protein called Histone H2A type 1-B/E.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 21 | c | 104 | Total | C | N | O | 0 | 0 |
| | | | 805 | 508 | 157 | 140 | | |
| 21 | g | 106 | Total | C | N | O | 0 | 0 |
| | | | 819 | 517 | 160 | 142 | | |

There are 6 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| c | -3 | GLY | - | expression tag | UNP P04908 |
| c | -2 | SER | - | expression tag | UNP P04908 |
| c | -1 | HIS | - | expression tag | UNP P04908 |
| g | -3 | GLY | - | expression tag | UNP P04908 |
| g | -2 | SER | - | expression tag | UNP P04908 |
| g | -1 | HIS | - | expression tag | UNP P04908 |

- Molecule 22 is a protein called Histone H2B type 1-J.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 22 | d | 93 | Total | C | N | O | S | 0 | 0 |
| | | | 725 | 456 | 130 | 137 | 2 | | |
| 22 | h | 94 | Total | C | N | O | S | 0 | 0 |
| | | | 735 | 462 | 132 | 139 | 2 | | |

There are 6 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| d | -3 | GLY | - | expression tag | UNP P06899 |
| d | -2 | SER | - | expression tag | UNP P06899 |
| d | -1 | HIS | - | expression tag | UNP P06899 |
| h | -3 | GLY | - | expression tag | UNP P06899 |
| h | -2 | SER | - | expression tag | UNP P06899 |
| h | -1 | HIS | - | expression tag | UNP P06899 |

- Molecule 23 is a protein called Transcription elongation factor Spt6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 23 | m | 1178 | Total | C | N | O | S | 0 | 0 |
| | | | 9653 | 6112 | 1648 | 1866 | 27 | | |

There are 3 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| m | -2 | GLY | - | expression tag | UNP C4R7H2 |
| m | -1 | PRO | - | expression tag | UNP C4R7H2 |
| m | 0 | GLY | - | expression tag | UNP C4R7H2 |

- Molecule 24 is a protein called Protein that interacts with Spt6p and copurifies with Spt5p and RNA polymerase II.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 24 | n | 139 | Total | C | N | O | S | 0 | 0 |
| | | | 1115 | 716 | 193 | 202 | 4 | | |

There are 3 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| n | -2 | GLY | - | expression tag | UNP C4R7L8 |
| n | -1 | PRO | - | expression tag | UNP C4R7L8 |
| n | 0 | GLY | - | expression tag | UNP C4R7L8 |

- Molecule 25 is a protein called Component of the Paf1p complex.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 25 | q | 930 | Total | C | N | O | S | 0 | 0 |
| | | | 7552 | 4805 | 1283 | 1439 | 25 | | |

There are 40 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| q | -39 | MET | - | initiating methionine | UNP C4R6B2 |
| q | -38 | LYS | - | expression tag | UNP C4R6B2 |
| q | -37 | ASP | - | expression tag | UNP C4R6B2 |
| q | -36 | HIS | - | expression tag | UNP C4R6B2 |
| q | -35 | LEU | - | expression tag | UNP C4R6B2 |
| q | -34 | ILE | - | expression tag | UNP C4R6B2 |
| q | -33 | HIS | - | expression tag | UNP C4R6B2 |
| q | -32 | ASN | - | expression tag | UNP C4R6B2 |

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| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| q | -31 | HIS | - | expression tag | UNP C4R6B2 |
| q | -30 | HIS | - | expression tag | UNP C4R6B2 |
| q | -29 | LYS | - | expression tag | UNP C4R6B2 |
| q | -28 | HIS | - | expression tag | UNP C4R6B2 |
| q | -27 | GLU | - | expression tag | UNP C4R6B2 |
| q | -26 | HIS | - | expression tag | UNP C4R6B2 |
| q | -25 | ALA | - | expression tag | UNP C4R6B2 |
| q | -24 | HIS | - | expression tag | UNP C4R6B2 |
| q | -23 | ALA | - | expression tag | UNP C4R6B2 |
| q | -22 | GLU | - | expression tag | UNP C4R6B2 |
| q | -21 | HIS | - | expression tag | UNP C4R6B2 |
| q | -20 | ASP | - | expression tag | UNP C4R6B2 |
| q | -19 | TYR | - | expression tag | UNP C4R6B2 |
| q | -18 | LYS | - | expression tag | UNP C4R6B2 |
| q | -17 | ASP | - | expression tag | UNP C4R6B2 |
| q | -16 | ASP | - | expression tag | UNP C4R6B2 |
| q | -15 | ASP | - | expression tag | UNP C4R6B2 |
| q | -14 | ASP | - | expression tag | UNP C4R6B2 |
| q | -13 | LYS | - | expression tag | UNP C4R6B2 |
| q | -12 | GLU | - | expression tag | UNP C4R6B2 |
| q | -11 | HIS | - | expression tag | UNP C4R6B2 |
| q | -10 | LEU | - | expression tag | UNP C4R6B2 |
| q | -9 | TYR | - | expression tag | UNP C4R6B2 |
| q | -8 | PHE | - | expression tag | UNP C4R6B2 |
| q | -7 | GLN | - | expression tag | UNP C4R6B2 |
| q | -6 | GLY | - | expression tag | UNP C4R6B2 |
| q | -5 | SER | - | expression tag | UNP C4R6B2 |
| q | -4 | SER | - | expression tag | UNP C4R6B2 |
| q | -3 | GLY | - | expression tag | UNP C4R6B2 |
| q | -2 | SER | - | expression tag | UNP C4R6B2 |
| q | -1 | SER | - | expression tag | UNP C4R6B2 |
| q | 0 | GLY | - | expression tag | UNP C4R6B2 |

- Molecule 26 is a protein called RNAPII-associated chromatin remodeling Paf1 complex subunit.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 26 | r | 266 | Total | C | N | O | S | 0 | 0 |
| | | | 2139 | 1342 | 374 | 412 | 11 | | |

There are 30 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| r | -29 | MET | - | initiating methionine | UNP F2QQ42 |
| r | -28 | LYS | - | expression tag | UNP F2QQ42 |
| r | -27 | ASP | - | expression tag | UNP F2QQ42 |
| r | -26 | HIS | - | expression tag | UNP F2QQ42 |
| r | -25 | LEU | - | expression tag | UNP F2QQ42 |
| r | -24 | ILE | - | expression tag | UNP F2QQ42 |
| r | -23 | HIS | - | expression tag | UNP F2QQ42 |
| r | -22 | ASN | - | expression tag | UNP F2QQ42 |
| r | -21 | HIS | - | expression tag | UNP F2QQ42 |
| r | -20 | HIS | - | expression tag | UNP F2QQ42 |
| r | -19 | LYS | - | expression tag | UNP F2QQ42 |
| r | -18 | HIS | - | expression tag | UNP F2QQ42 |
| r | -17 | GLU | - | expression tag | UNP F2QQ42 |
| r | -16 | HIS | - | expression tag | UNP F2QQ42 |
| r | -15 | ALA | - | expression tag | UNP F2QQ42 |
| r | -14 | HIS | - | expression tag | UNP F2QQ42 |
| r | -13 | ALA | - | expression tag | UNP F2QQ42 |
| r | -12 | GLU | - | expression tag | UNP F2QQ42 |
| r | -11 | HIS | - | expression tag | UNP F2QQ42 |
| r | -10 | LEU | - | expression tag | UNP F2QQ42 |
| r | -9 | TYR | - | expression tag | UNP F2QQ42 |
| r | -8 | PHE | - | expression tag | UNP F2QQ42 |
| r | -7 | GLN | - | expression tag | UNP F2QQ42 |
| r | -6 | GLY | - | expression tag | UNP F2QQ42 |
| r | -5 | SER | - | expression tag | UNP F2QQ42 |
| r | -4 | SER | - | expression tag | UNP F2QQ42 |
| r | -3 | GLY | - | expression tag | UNP F2QQ42 |
| r | -2 | SER | - | expression tag | UNP F2QQ42 |
| r | -1 | SER | - | expression tag | UNP F2QQ42 |
| r | 0 | GLY | - | expression tag | UNP F2QQ42 |

- Molecule 27 is a protein called Histone-lysine N-methyltransferase, H3 lysine-36 specific.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 27 | s | 431 | Total | C | N | O | S | 0 | 0 |
| | | | 3419 | 2126 | 593 | 677 | 23 | | |

There are 3 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| s | -2 | GLY | - | expression tag | UNP C4QY01 |
| s | -1 | PRO | - | expression tag | UNP C4QY01 |
| s | 0 | GLY | - | expression tag | UNP C4QY01 |

- Molecule 28 is a protein called Leo1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 28 | u | 208 | Total | C | N | O | S | 0 | 0 |
| | | | 1707 | 1063 | 304 | 337 | 3 | | |

There are 30 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| u | -29 | MET | - | initiating methionine | UNP C4R3K1 |
| u | -28 | LYS | - | expression tag | UNP C4R3K1 |
| u | -27 | ASP | - | expression tag | UNP C4R3K1 |
| u | -26 | HIS | - | expression tag | UNP C4R3K1 |
| u | -25 | LEU | - | expression tag | UNP C4R3K1 |
| u | -24 | ILE | - | expression tag | UNP C4R3K1 |
| u | -23 | HIS | - | expression tag | UNP C4R3K1 |
| u | -22 | ASN | - | expression tag | UNP C4R3K1 |
| u | -21 | HIS | - | expression tag | UNP C4R3K1 |
| u | -20 | HIS | - | expression tag | UNP C4R3K1 |
| u | -19 | LYS | - | expression tag | UNP C4R3K1 |
| u | -18 | HIS | - | expression tag | UNP C4R3K1 |
| u | -17 | GLU | - | expression tag | UNP C4R3K1 |
| u | -16 | HIS | - | expression tag | UNP C4R3K1 |
| u | -15 | ALA | - | expression tag | UNP C4R3K1 |
| u | -14 | HIS | - | expression tag | UNP C4R3K1 |
| u | -13 | ALA | - | expression tag | UNP C4R3K1 |
| u | -12 | GLU | - | expression tag | UNP C4R3K1 |
| u | -11 | HIS | - | expression tag | UNP C4R3K1 |
| u | -10 | LEU | - | expression tag | UNP C4R3K1 |
| u | -9 | TYR | - | expression tag | UNP C4R3K1 |
| u | -8 | PHE | - | expression tag | UNP C4R3K1 |
| u | -7 | GLN | - | expression tag | UNP C4R3K1 |
| u | -6 | GLY | - | expression tag | UNP C4R3K1 |
| u | -5 | SER | - | expression tag | UNP C4R3K1 |
| u | -4 | SER | - | expression tag | UNP C4R3K1 |
| u | -3 | GLY | - | expression tag | UNP C4R3K1 |
| u | -2 | SER | - | expression tag | UNP C4R3K1 |
| u | -1 | SER | - | expression tag | UNP C4R3K1 |
| u | 0 | GLY | - | expression tag | UNP C4R3K1 |

- Molecule 29 is a protein called RNAP II-associated protein.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 29 | v | 349 | Total | C | N | O | S | 0 | 0 |
| | | | 2878 | 1835 | 510 | 528 | 5 | | |

There are 3 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| v | -2 | GLY | - | expression tag | UNP C4R997 |
| v | -1 | SER | - | expression tag | UNP C4R997 |
| v | 0 | ALA | - | expression tag | UNP C4R997 |

- Molecule 30 is a protein called Constituent of Paf1 complex with RNA polymerase II, Paf1p, Hpr1p, Ctr9, Leo1, Rtf1 and Ccr4p.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 30 | x | 205 | Total | C | N | O | S | 0 | 0 |
| | | | 1682 | 1086 | 287 | 307 | 2 | | |

There are 30 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| x | -29 | MET | - | initiating methionine | UNP C4R1E6 |
| x | -28 | LYS | - | expression tag | UNP C4R1E6 |
| x | -27 | ASP | - | expression tag | UNP C4R1E6 |
| x | -26 | HIS | - | expression tag | UNP C4R1E6 |
| x | -25 | LEU | - | expression tag | UNP C4R1E6 |
| x | -24 | ILE | - | expression tag | UNP C4R1E6 |
| x | -23 | HIS | - | expression tag | UNP C4R1E6 |
| x | -22 | ASN | - | expression tag | UNP C4R1E6 |
| x | -21 | HIS | - | expression tag | UNP C4R1E6 |
| x | -20 | HIS | - | expression tag | UNP C4R1E6 |
| x | -19 | LYS | - | expression tag | UNP C4R1E6 |
| x | -18 | HIS | - | expression tag | UNP C4R1E6 |
| x | -17 | GLU | - | expression tag | UNP C4R1E6 |
| x | -16 | HIS | - | expression tag | UNP C4R1E6 |
| x | -15 | ALA | - | expression tag | UNP C4R1E6 |
| x | -14 | HIS | - | expression tag | UNP C4R1E6 |
| x | -13 | ALA | - | expression tag | UNP C4R1E6 |
| x | -12 | GLU | - | expression tag | UNP C4R1E6 |
| x | -11 | HIS | - | expression tag | UNP C4R1E6 |
| x | -10 | LEU | - | expression tag | UNP C4R1E6 |
| x | -9 | TYR | - | expression tag | UNP C4R1E6 |
| x | -8 | PHE | - | expression tag | UNP C4R1E6 |
| x | -7 | GLN | - | expression tag | UNP C4R1E6 |

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| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| x | -6 | GLY | - | expression tag | UNP C4R1E6 |
| x | -5 | SER | - | expression tag | UNP C4R1E6 |
| x | -4 | SER | - | expression tag | UNP C4R1E6 |
| x | -3 | GLY | - | expression tag | UNP C4R1E6 |
| x | -2 | SER | - | expression tag | UNP C4R1E6 |
| x | -1 | SER | - | expression tag | UNP C4R1E6 |
| x | 0 | GLY | - | expression tag | UNP C4R1E6 |

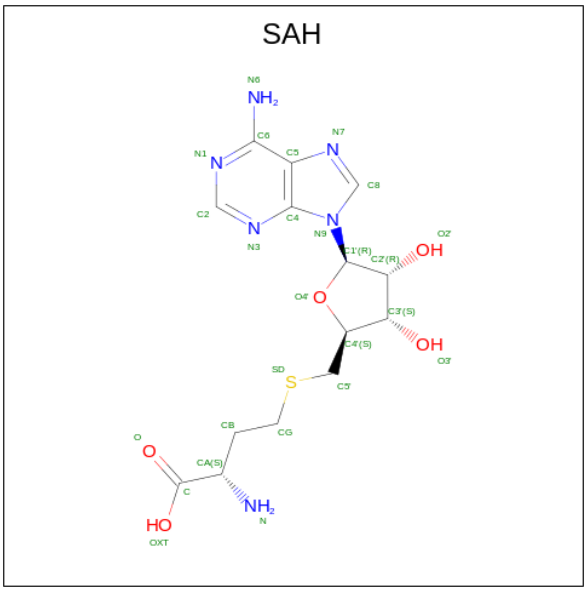
- Molecule 31 is ZINC ION (CCD ID: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms | AltConf |
|---|---|---|---|---|
| 31 | A | 2 | Total Zn<br>2 2 | 0 |
| 31 | B | 1 | Total Zn<br>1 1 | 0 |
| 31 | C | 1 | Total Zn<br>1 1 | 0 |
| 31 | I | 2 | Total Zn<br>2 2 | 0 |
| 31 | J | 1 | Total Zn<br>1 1 | 0 |
| 31 | L | 1 | Total Zn<br>1 1 | 0 |
| 31 | M | 1 | Total Zn<br>1 1 | 0 |
| 31 | V | 1 | Total Zn<br>1 1 | 0 |
| 31 | s | 3 | Total Zn<br>3 3 | 0 |

- Molecule 32 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

| Mol | Chain | Residues | Atoms | AltConf |
|---|---|---|---|---|
| 32 | A | 1 | Total Mg<br>1 1 | 0 |

- Molecule 33 is S-ADENOSYL-L-HOMOCYSTEINE (CCD ID: SAH) (formula: $C_{14}H_{20}N_6O_5S$).



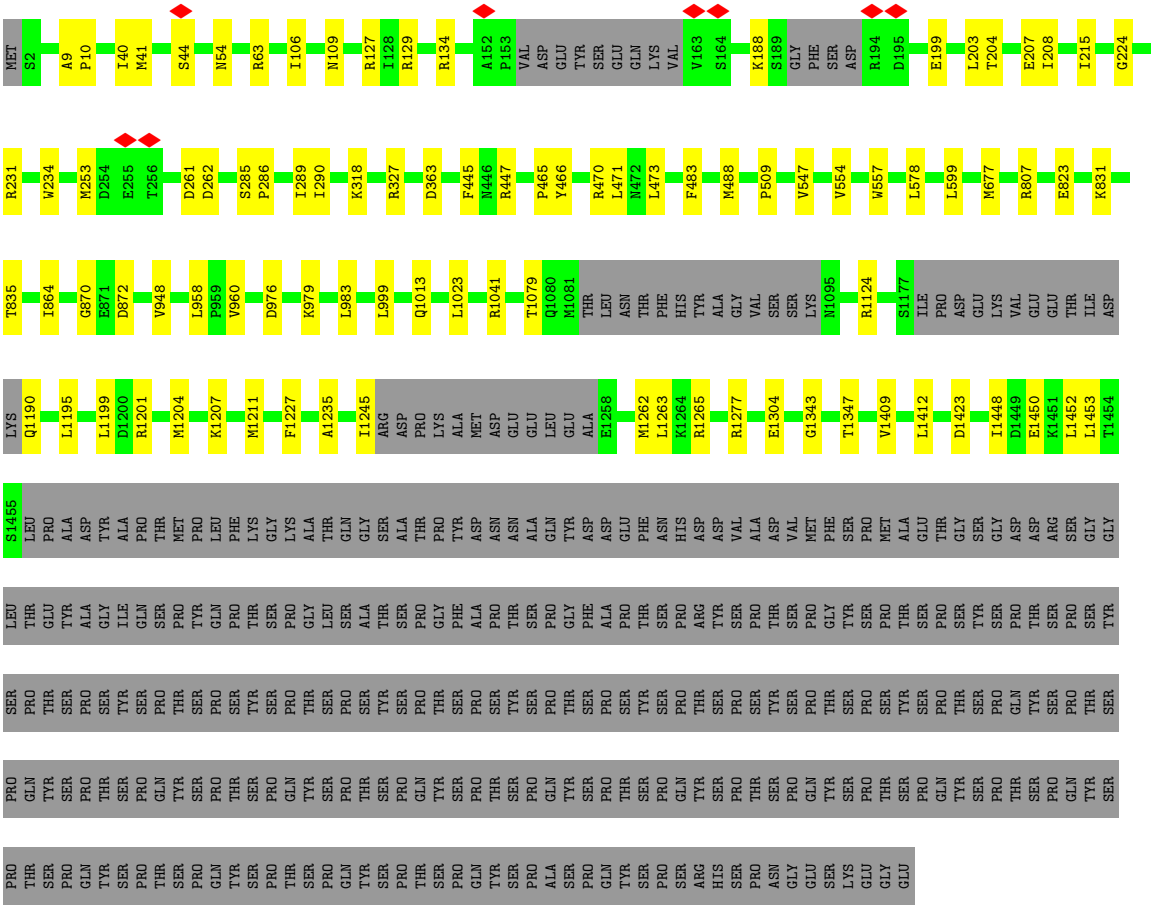

| Mol | Chain | Residues | Atoms | | | | | AltConf |
|---|---|---|---|---|---|---|---|---|
| 33 | s | 1 | Total | C | N | O | S | 0 |
| | | | 26 | 14 | 6 | 5 | 1 | |

# 3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

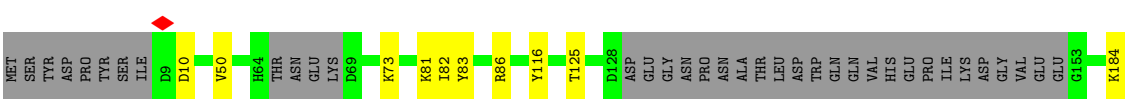
• Molecule 1: DNA-directed RNA polymerase subunit

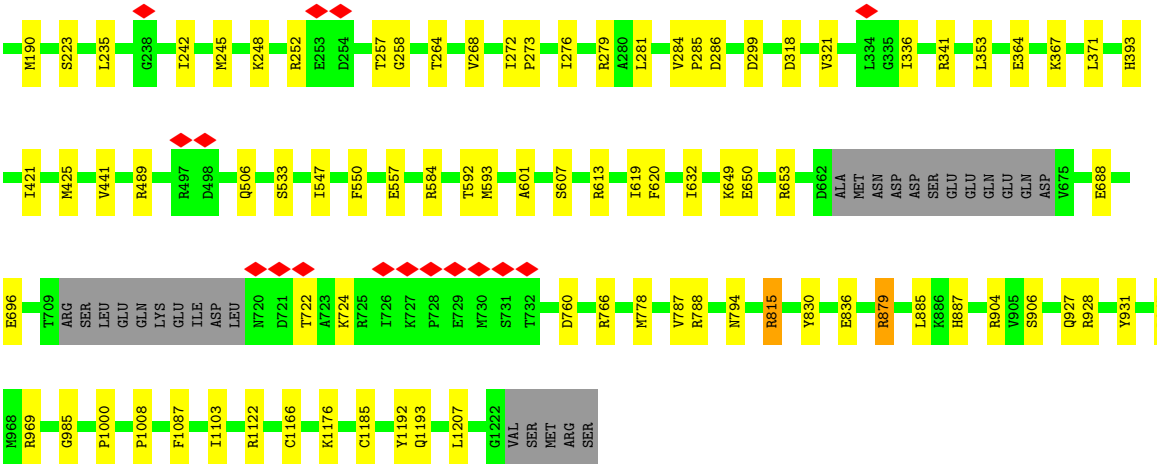
Chain A:

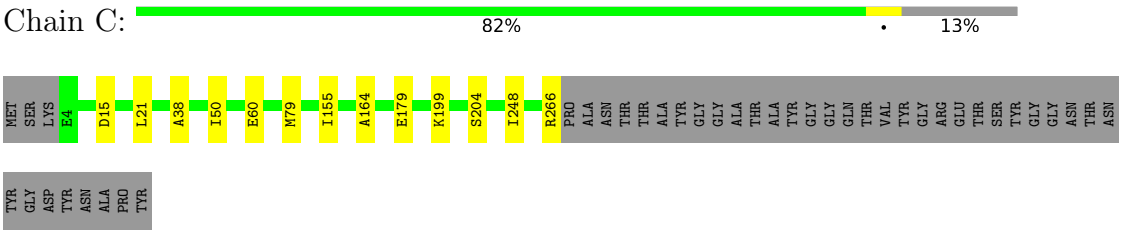

• Molecule 2: DNA-directed RNA polymerase subunit beta

Chain B:

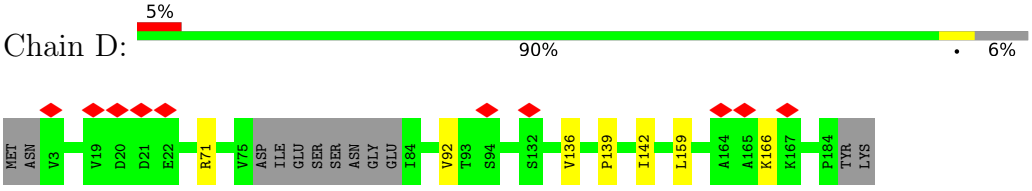





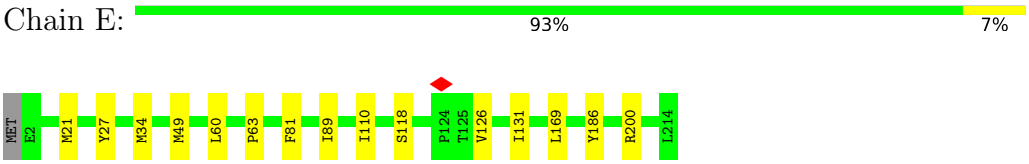

• Molecule 3: RNA polymerase II third largest subunit B44, part of central core



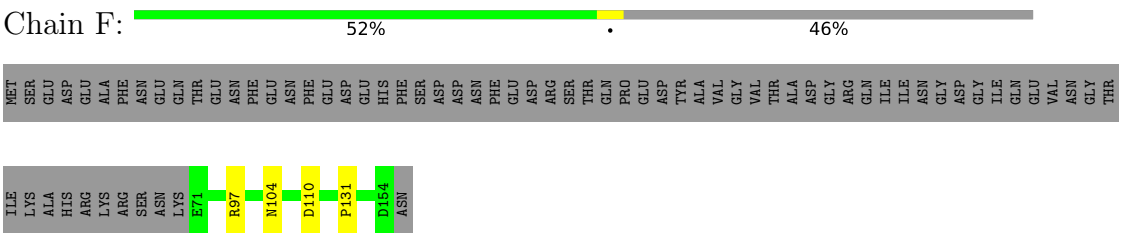

• Molecule 4: RNA polymerase II subunit B32




• Molecule 5: DNA-directed RNA polymerases I, II, and III subunit RPABC1

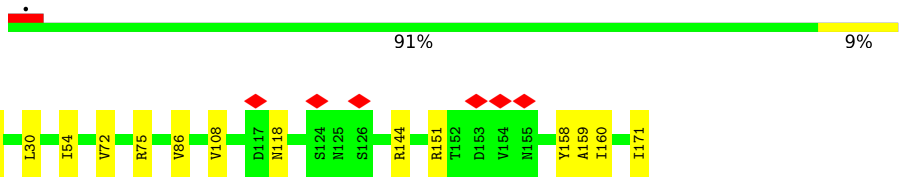



• Molecule 6: RNA polymerase subunit ABC23, common to RNA polymerases I, II, and III



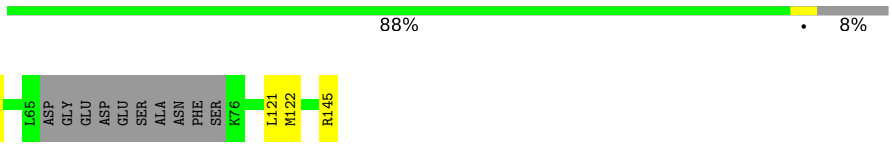

• Molecule 7: RNA polymerase II subunit

Chain G:



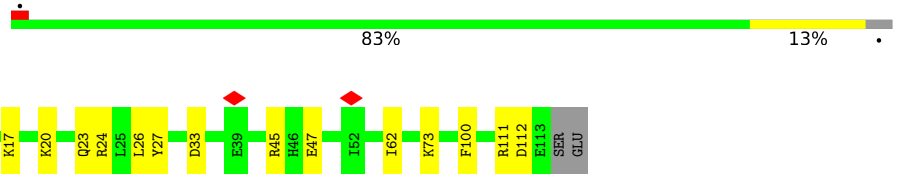

• Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC3

Chain H:



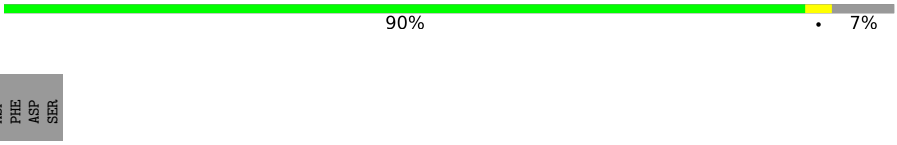

• Molecule 9: DNA-directed RNA polymerase subunit

Chain I:



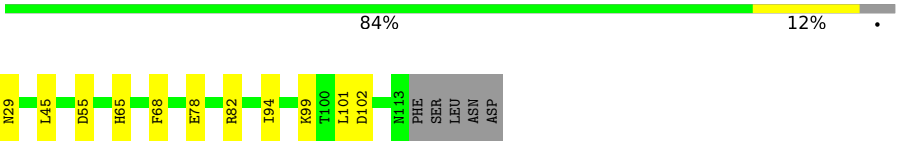

• Molecule 10: RNA polymerase subunit ABC10-beta, common to RNA polymerases I, II, and III

Chain J:



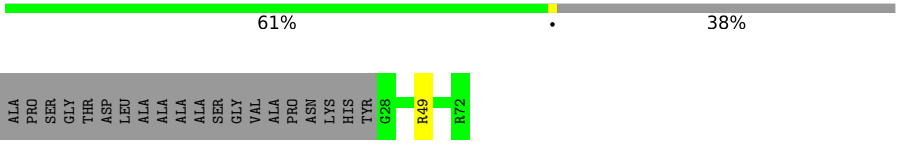

• Molecule 11: RNA polymerase II subunit B12.5

Chain K:



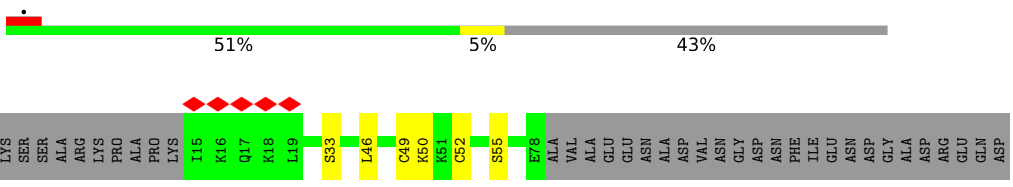

• Molecule 12: RNA polymerase subunit ABC10-alpha

Chain L:



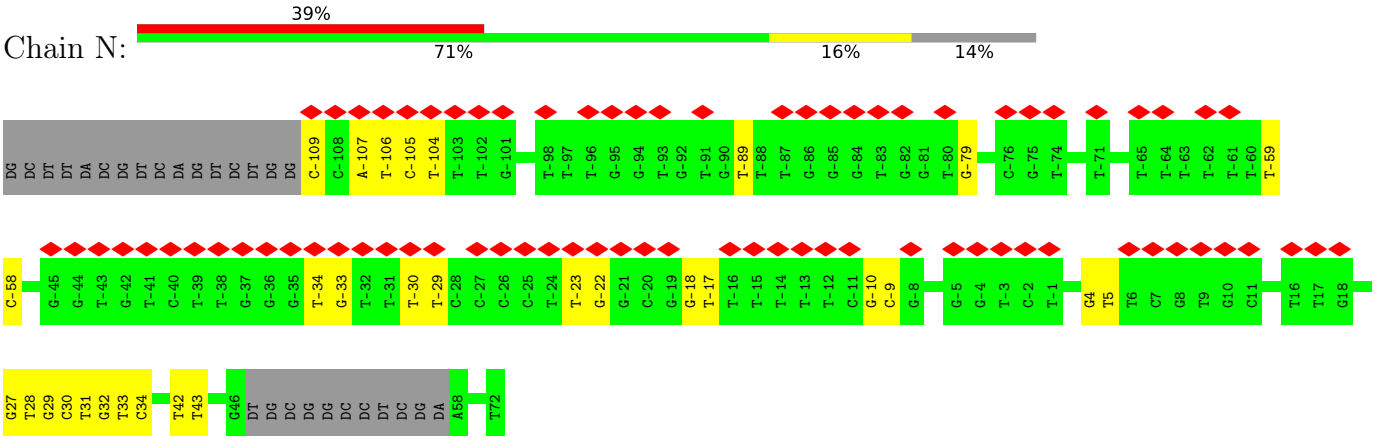

• Molecule 13: Transcription elongation factor 1 homolog

Chain M:



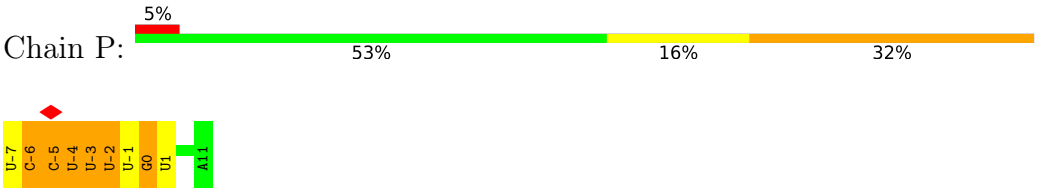

• Molecule 14: DNA (198-MER)

Chain N:



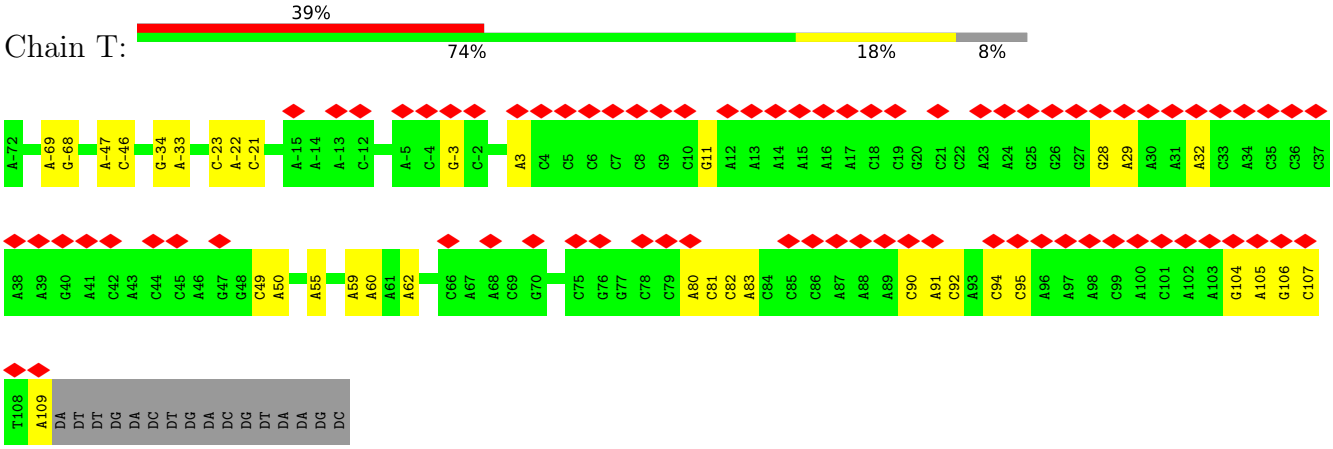

• Molecule 15: RNA (5'-R(P*UP*CP*CP*UP*UP*UP*UP*GP*UP*GP*CP*GP*GP*CP*CP*UP*CP*GP*A)-3')

Chain P:



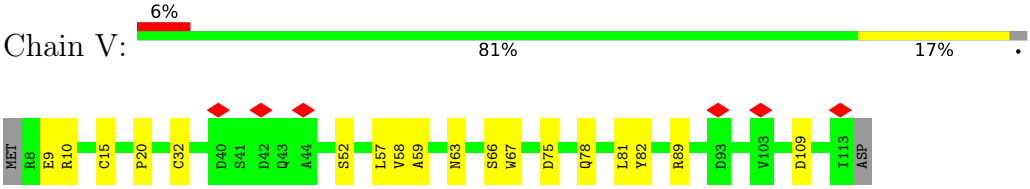

• Molecule 16: DNA (198-MER)

Chain T:



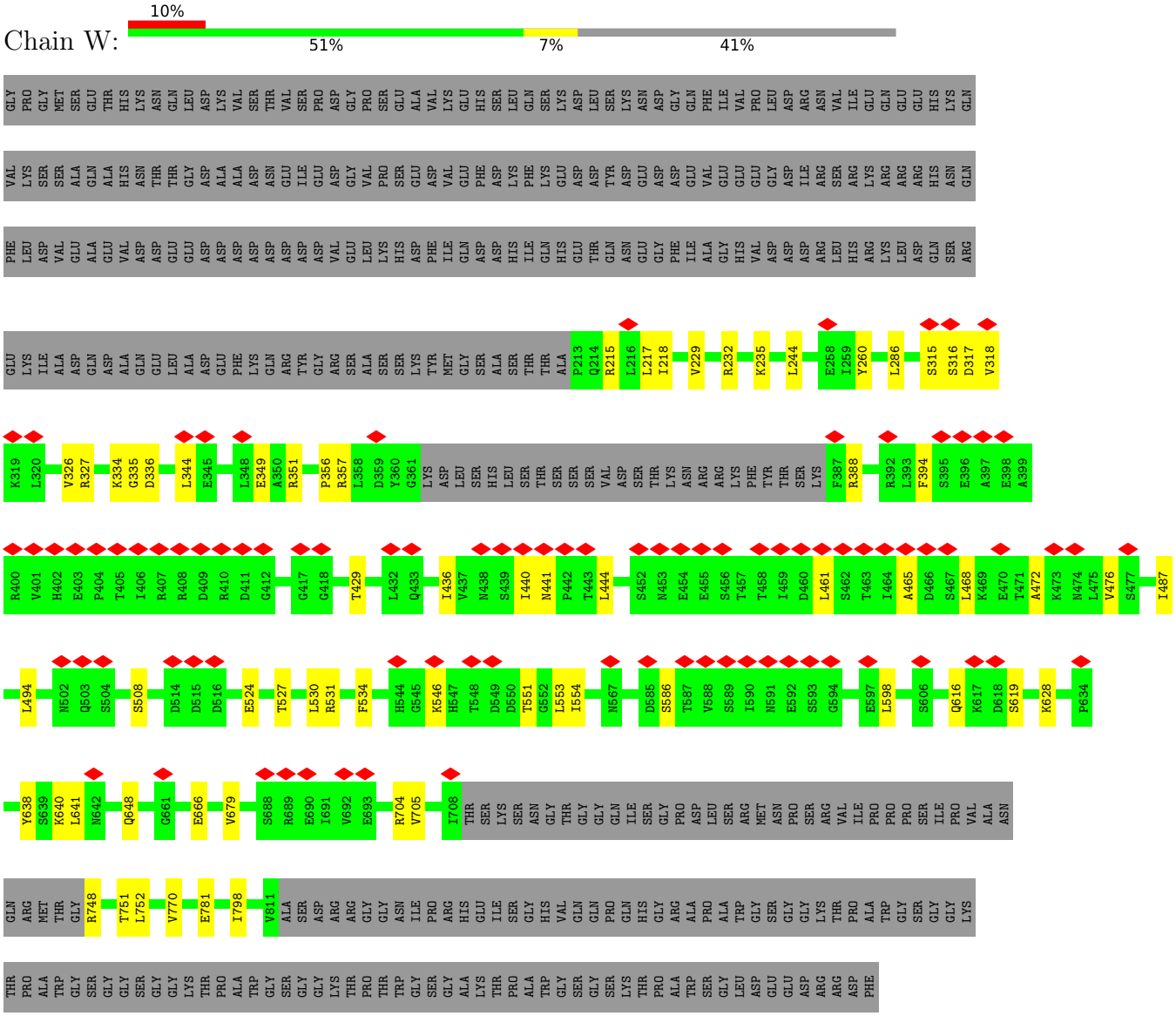

• Molecule 17: Transcription elongation factor SPT4

Chain V:



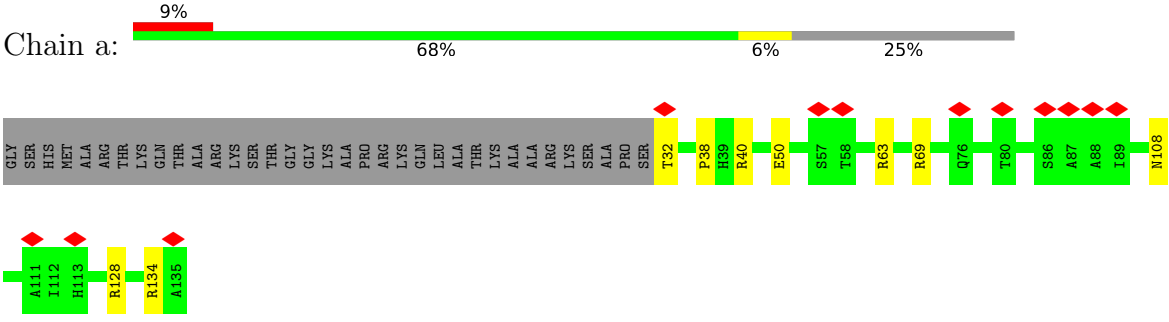

• Molecule 18: Transcription elongation factor SPT5

Chain W:



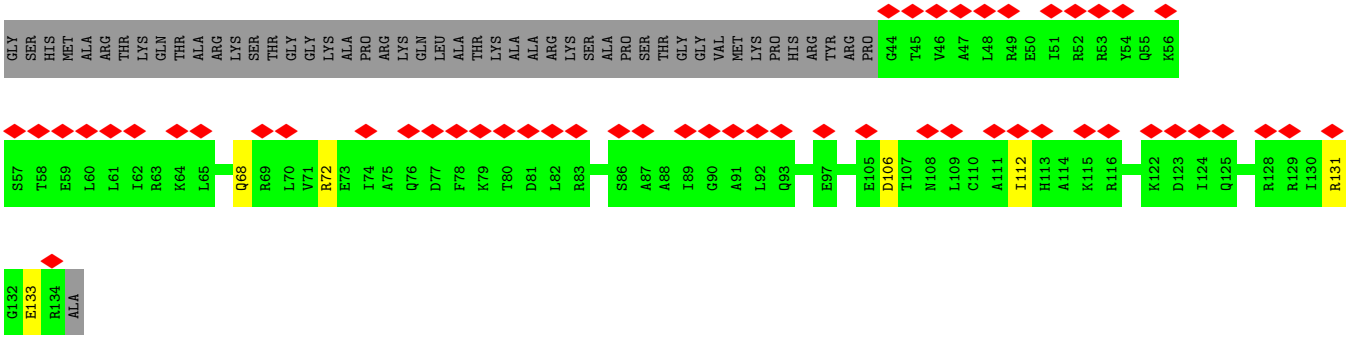

• Molecule 19: Histone H3.3

Chain a:



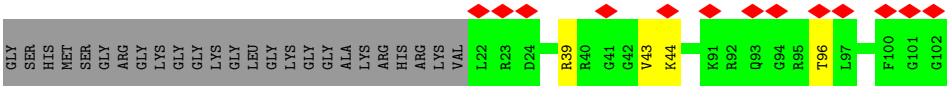

• Molecule 19: Histone H3.3

Chain e:



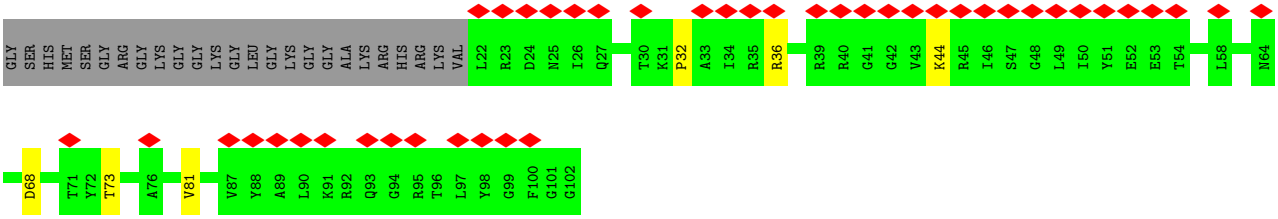

• Molecule 20: Histone H4

Chain b:

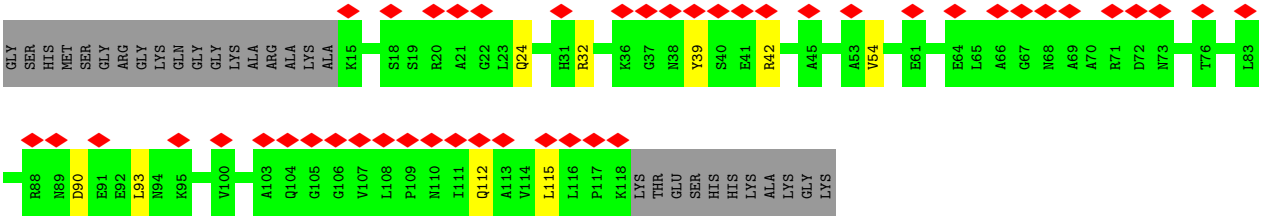

• Molecule 20: Histone H4

Chain f:

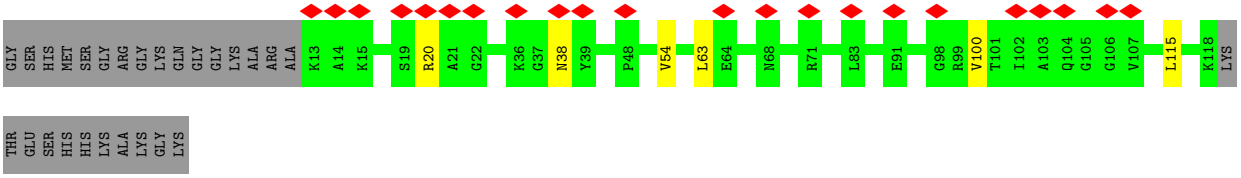

• Molecule 21: Histone H2A type 1-B/E

Chain c:

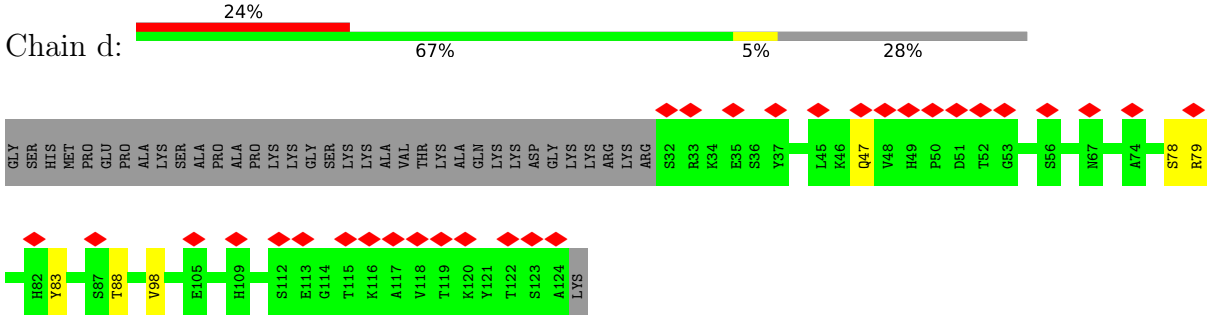

• Molecule 21: Histone H2A type 1-B/E

Chain g:

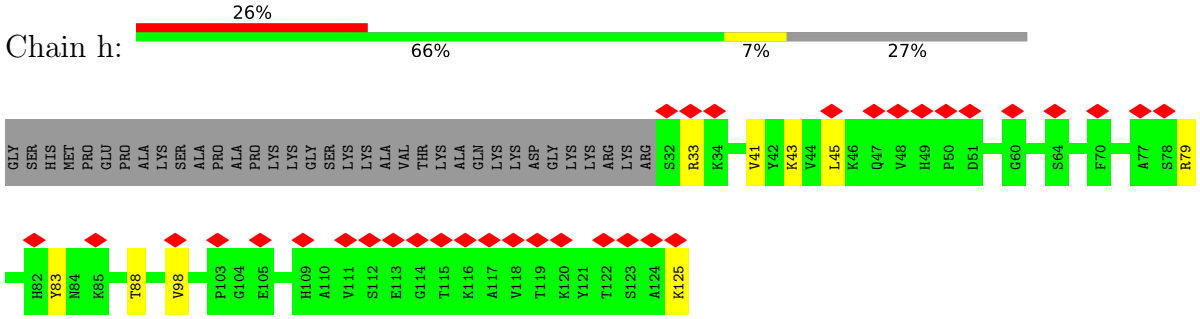
• Molecule 22: Histone H2B type 1-J

Chain d:



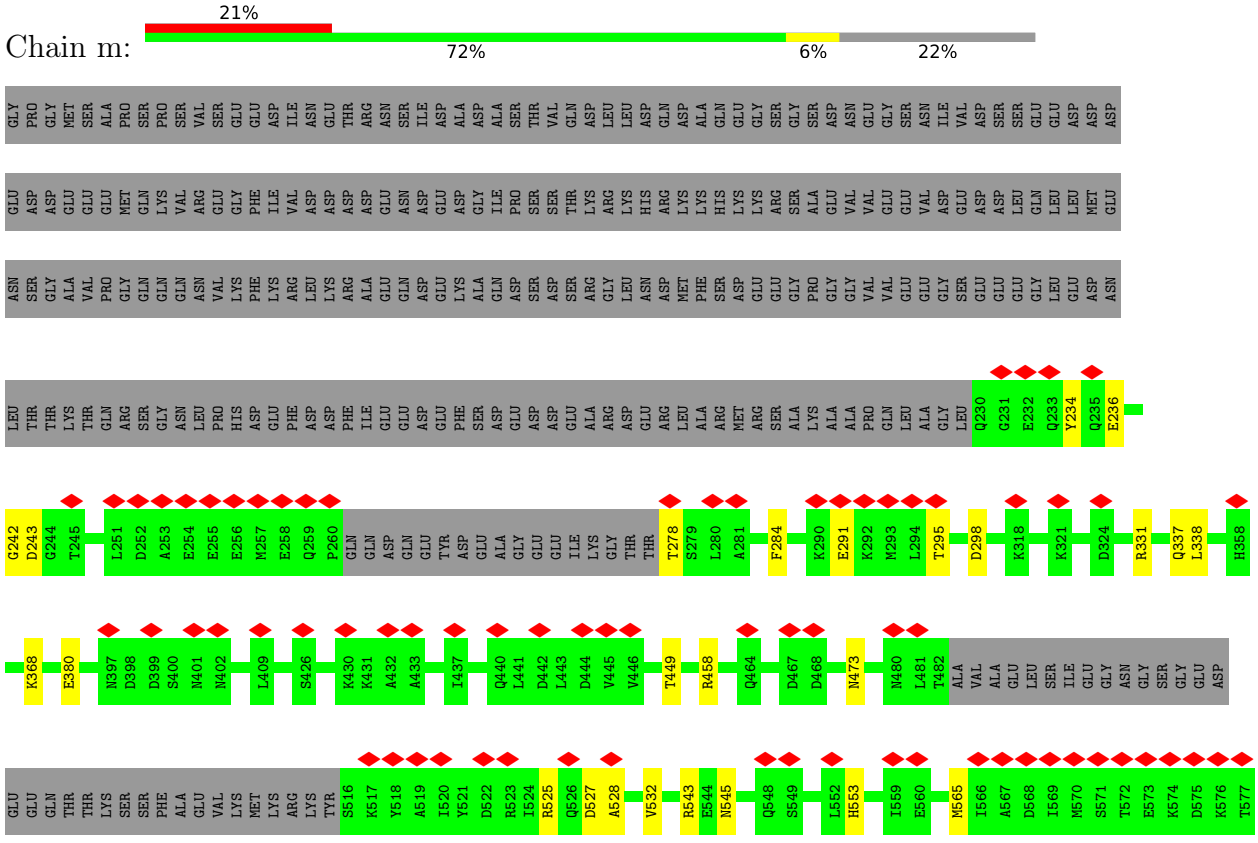

• Molecule 22: Histone H2B type 1-J

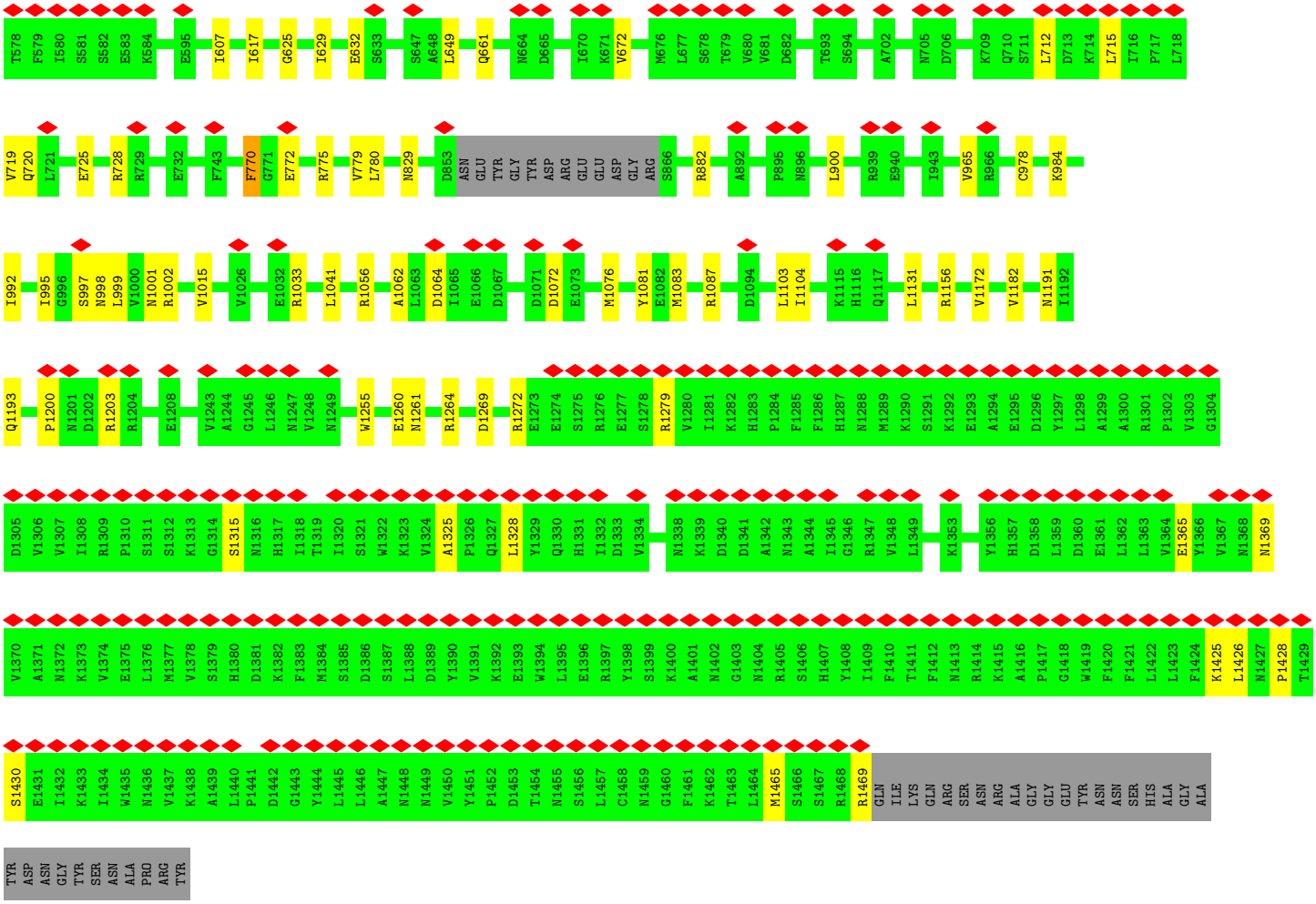
Chain h:




• Molecule 23: Transcription elongation factor Spt6

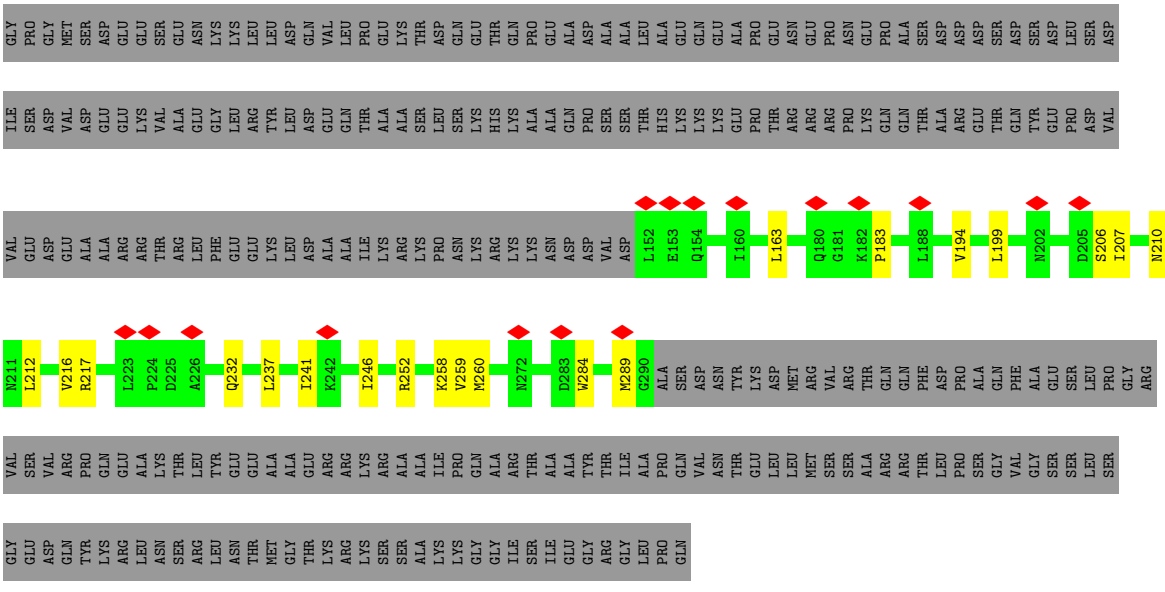
Chain m:





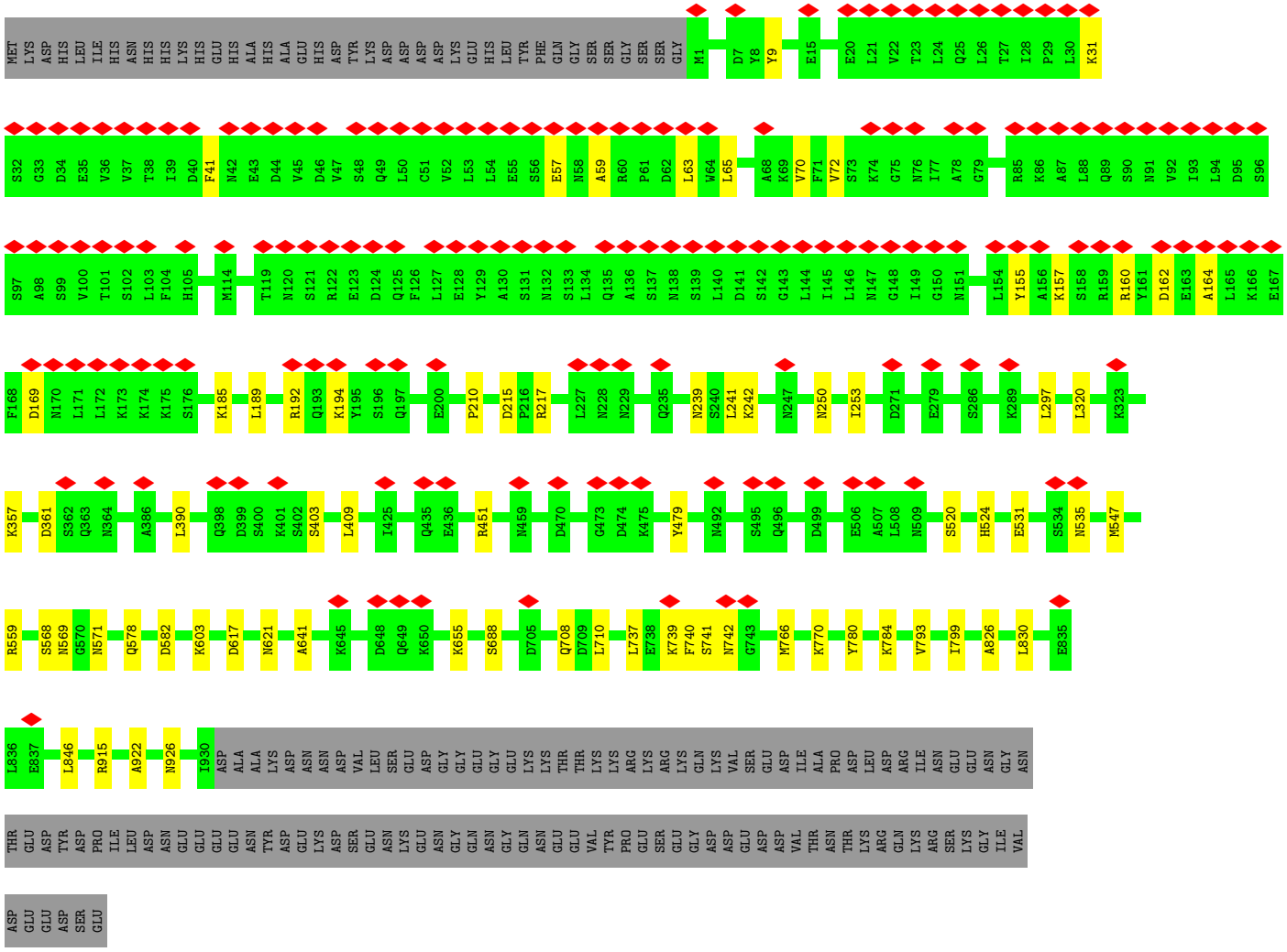
• Molecule 24: Protein that interacts with Spt6p and copurifies with Spt5p and RNA polymerase II

Chain n:

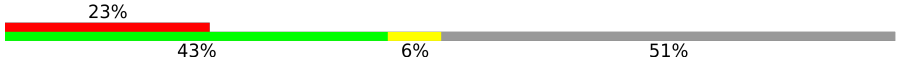
• Molecule 25: Component of the Paf1p complex

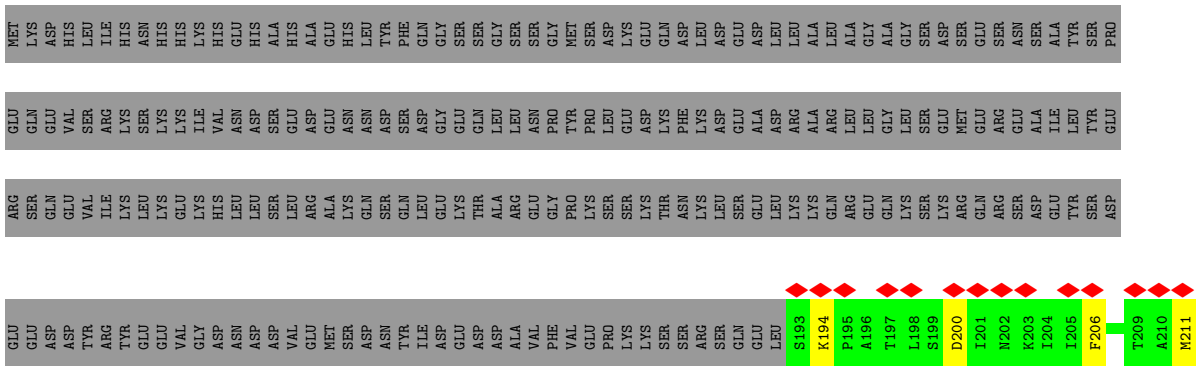
Chain q:

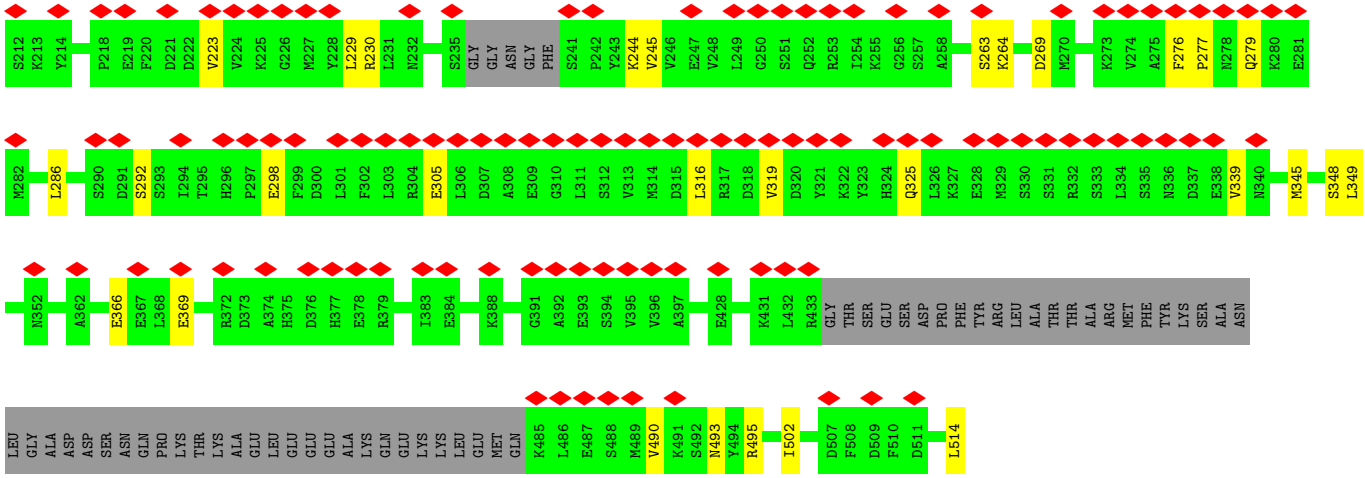




• Molecule 26: RNAPII-associated chromatin remodeling Paf1 complex subunit

Chain r:

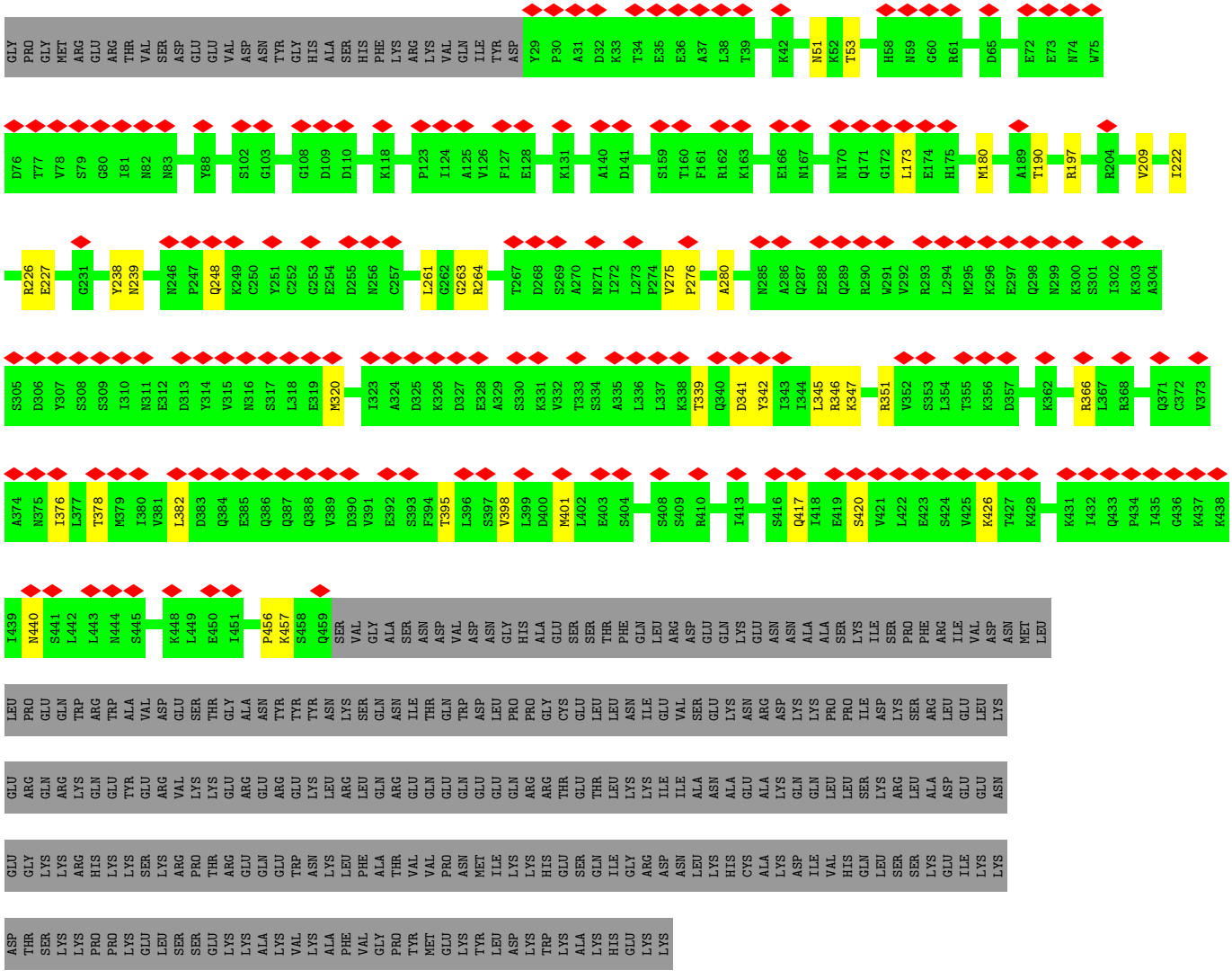




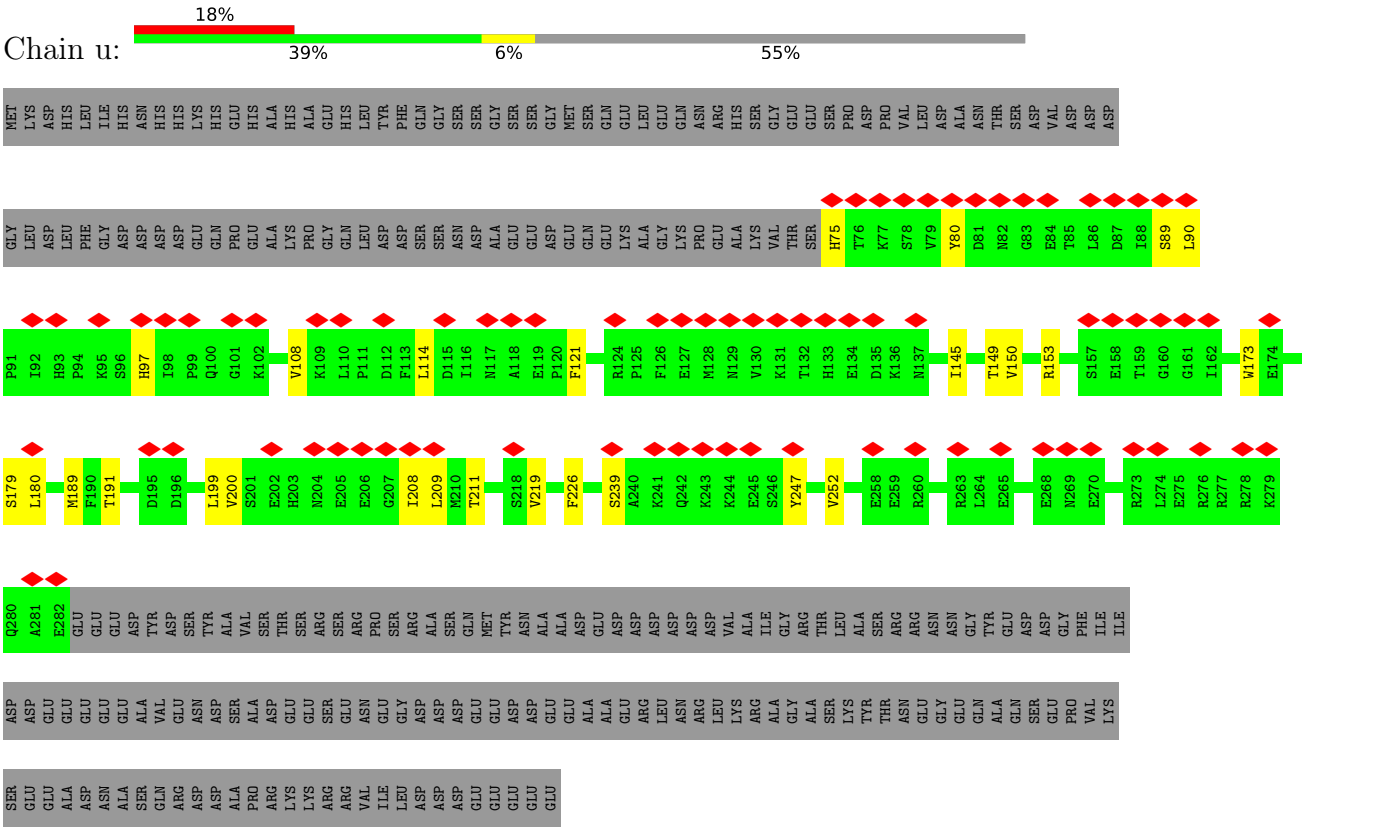

• Molecule 27: Histone-lysine N-methyltransferase, H3 lysine-36 specific

Chain s:

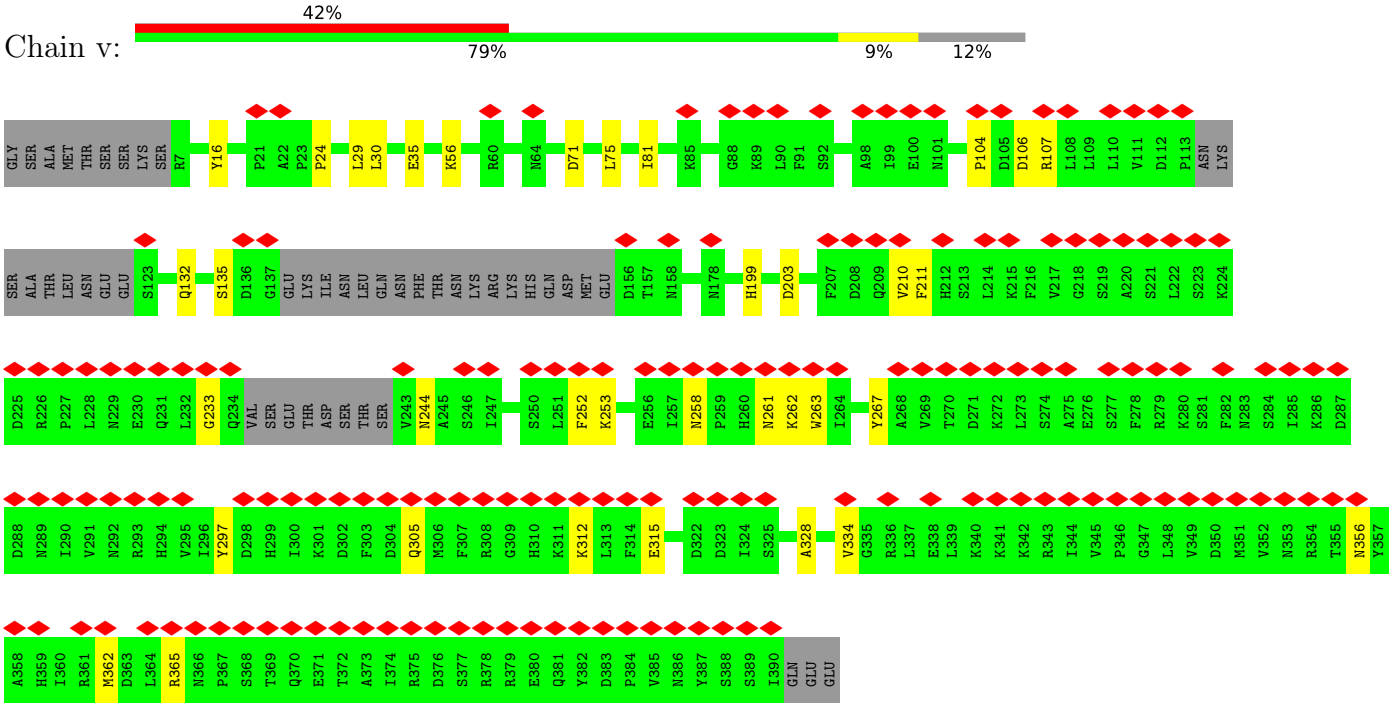
• Molecule 28: Leo1

Chain u:



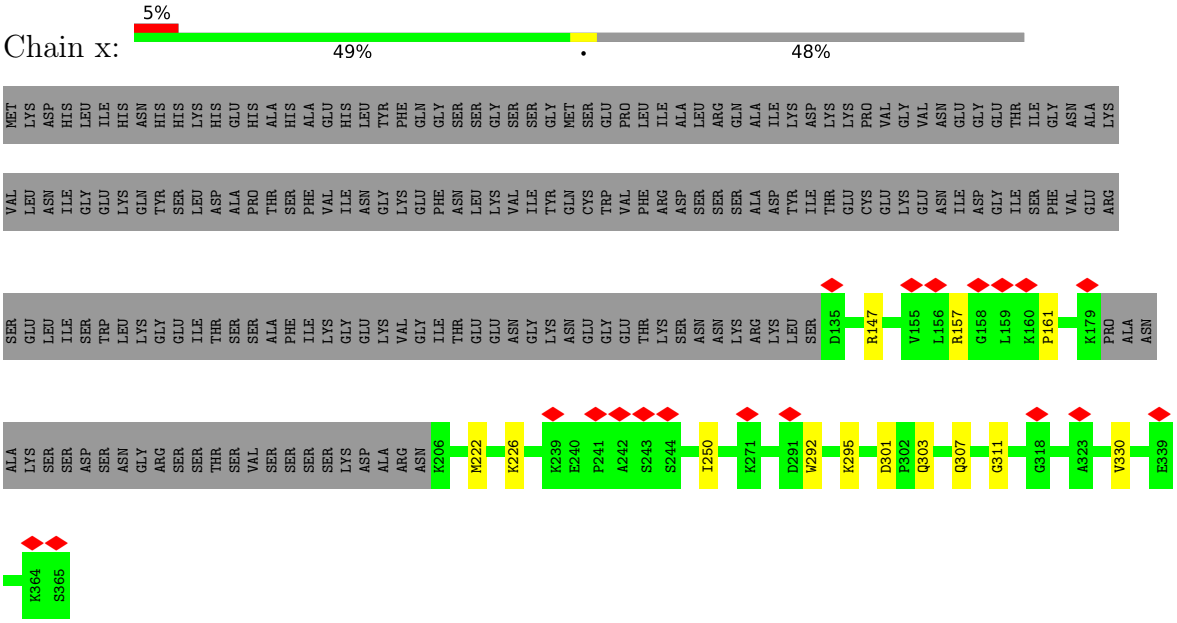

• Molecule 29: RNAP II-associated protein

Chain v:




• Molecule 30: Constituent of Paf1 complex with RNA polymerase II, Paf1p, Hpr1p, Ctr9, Leo1, Rtf1 and Ccr4p

Chain x:


5%
49%
48%
MET LYS ASP HIS LEU ILE HIS ASN HIS HIS LYS HIS GLU HIS ALA HIS ALA GLU HIS LEU TYR PHE GLN GLY SER SER GLY SER SER GLY MET SER GLU PRO LEU ILE ALA LEU ARG GLN ALA ILE LYS ASP LYS LYS PRO VAL GLY VAL ASN GLU GLY GLU THR ILE GLY ASN ALA LYS
VAL LEU ASN ILE GLY GLU LYS GLN TYR SER LEU ASP ALA PRO THR SER PHE VAL ILE ASN GLY LYS GLU PHE ASN LEU LYS VAL ILE TYR GLN CYS TRP VAL PHE ARG ASP SER SER SER ALA ASP TYR ILE THR GLU CYS GLU LYS GLU ASN ILE ASP GLY ILE SER PHE VAL GLU ARG
SER GLU LEU ILE SER TRP LEU LYS GLY GLU ILE THR SER SER ALA PHE ILE LYS GLY GLU LYS VAL GLY ILE THR GLU GLU ASN GLY LYS ASN GLU GLY GLU THR LYS SER ASN ASN LYS ARG LYS LEU SER D135 R147 V155 L156 R157 G158 L159 K160 P161 K179 PRO ALA ASN
ALA LYS SER SER ASP SER ASN GLY ARG SER SER THR SER VAL SER SER SER SER LYS ASP ALA ARG ASN K206 M222 K226 K239 E240 P241 A242 S243 S244 I250 K271 D291 W292 K295 D301 P302 Q303 Q307 G311 G318 A323 V330 E339
K364 S365

# 4 Experimental information (i)

| Property | Value | Source |
|---|---|---|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, C1 | Depositor |
| Number of particles used | 15255 | Depositor |
| Resolution determination method | FSC 0.143 CUT-OFF | Depositor |
| CTF correction method | NONE | Depositor |
| Microscope | TFS KRIOS | Depositor |
| Voltage (kV) | 300 | Depositor |
| Electron dose ($e^-/Å^2$) | 59.1 | Depositor |
| Minimum defocus (nm) | 1200 | Depositor |
| Maximum defocus (nm) | 2000 | Depositor |
| Magnification | Not provided | |
| Image detector | GATAN K3 BIOQUANTUM (6k x 4k) | Depositor |
| Maximum map value | 0.086 | Depositor |
| Minimum map value | -0.028 | Depositor |
| Average map value | 0.000 | Depositor |
| Map value standard deviation | 0.003 | Depositor |
| Recommended contour level | 0.014 | Depositor |
| Map size (Å) | 531.0, 531.0, 531.0 | wwPDB |
| Map dimensions | 360, 360, 360 | wwPDB |
| Map angles (°) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (Å) | 1.475, 1.475, 1.475 | Depositor |

# 5 Model quality

## 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: SAH, MG, ZN

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

| Mol | Chain | Bond lengths | | Bond angles | |
|---|---|---|---|---|---|
| | | RMSZ | #$\|Z\|>5$ | RMSZ | #$\|Z\|>5$ |
| 1 | A | 0.22 | 0/11267 | 0.50 | 0/15222 |
| 2 | B | 0.22 | 0/9464 | 0.51 | 0/12763 |
| 3 | C | 0.22 | 0/2139 | 0.46 | 0/2895 |
| 4 | D | 0.17 | 0/1361 | 0.45 | 0/1837 |
| 5 | E | 0.21 | 0/1773 | 0.54 | 0/2385 |
| 6 | F | 0.21 | 0/687 | 0.47 | 0/931 |
| 7 | G | 0.16 | 0/1354 | 0.38 | 0/1837 |
| 8 | H | 0.21 | 0/1070 | 0.43 | 0/1444 |
| 9 | I | 0.14 | 0/934 | 0.41 | 0/1257 |
| 10 | J | 0.21 | 0/563 | 0.52 | 0/753 |
| 11 | K | 0.22 | 0/953 | 0.49 | 0/1291 |
| 12 | L | 0.22 | 0/365 | 0.57 | 0/484 |
| 13 | M | 0.16 | 0/513 | 0.37 | 0/693 |
| 14 | N | 0.31 | 0/3904 | 0.64 | 0/6033 |
| 15 | P | 0.32 | 0/440 | 0.65 | 0/682 |
| 16 | T | 0.29 | 0/4209 | 0.57 | 0/6481 |
| 17 | V | 0.17 | 0/840 | 0.46 | 0/1140 |
| 18 | W | 0.20 | 0/4319 | 0.51 | 0/5838 |
| 19 | a | 0.24 | 0/853 | 0.63 | 0/1144 |
| 19 | e | 0.25 | 0/747 | 0.65 | 0/1001 |
| 20 | b | 0.26 | 0/653 | 0.67 | 0/873 |
| 20 | f | 0.25 | 0/653 | 0.67 | 0/873 |
| 21 | c | 0.23 | 0/815 | 0.60 | 0/1100 |
| 21 | g | 0.26 | 0/829 | 0.62 | 0/1118 |
| 22 | d | 0.23 | 0/736 | 0.61 | 0/990 |
| 22 | h | 0.26 | 0/746 | 0.60 | 0/1001 |
| 23 | m | 0.19 | 0/9847 | 0.46 | 0/13321 |
| 24 | n | 0.19 | 0/1132 | 0.45 | 0/1526 |
| 25 | q | 0.17 | 0/7689 | 0.40 | 0/10368 |
| 26 | r | 0.18 | 0/2169 | 0.43 | 0/2901 |
| 27 | s | 0.24 | 0/3473 | 0.55 | 0/4676 |
| 28 | u | 0.16 | 0/1740 | 0.38 | 0/2347 |

| Mol | Chain | Bond lengths | | Bond angles | |
|---|---|---|---|---|---|
| | | RMSZ | $\#\|Z\| > 5$ | RMSZ | $\#\|Z\| > 5$ |
| 29 | v | 0.17 | 0/2944 | 0.44 | 0/3973 |
| 30 | x | 0.15 | 0/1716 | 0.39 | 0/2310 |
| All | All | 0.22 | 0/82897 | 0.50 | 0/113488 |

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|---|---|---|---|---|---|---|
| 1 | A | 11064 | 0 | 11090 | 61 | 0 |
| 2 | B | 9284 | 0 | 9282 | 62 | 0 |
| 3 | C | 2098 | 0 | 2057 | 10 | 0 |
| 4 | D | 1349 | 0 | 1345 | 4 | 0 |
| 5 | E | 1741 | 0 | 1754 | 10 | 0 |
| 6 | F | 677 | 0 | 693 | 4 | 0 |
| 7 | G | 1325 | 0 | 1342 | 10 | 0 |
| 8 | H | 1053 | 0 | 1050 | 3 | 0 |
| 9 | I | 917 | 0 | 864 | 9 | 0 |
| 10 | J | 554 | 0 | 573 | 1 | 0 |
| 11 | K | 932 | 0 | 944 | 11 | 0 |
| 12 | L | 359 | 0 | 358 | 1 | 0 |
| 13 | M | 505 | 0 | 495 | 3 | 0 |
| 14 | N | 3503 | 0 | 1960 | 27 | 0 |
| 15 | P | 397 | 0 | 203 | 17 | 0 |
| 16 | T | 3731 | 0 | 2010 | 27 | 0 |
| 17 | V | 824 | 0 | 795 | 11 | 0 |
| 18 | W | 4250 | 0 | 4296 | 52 | 0 |
| 19 | a | 841 | 0 | 883 | 9 | 0 |
| 19 | e | 739 | 0 | 778 | 4 | 0 |
| 20 | b | 646 | 0 | 687 | 4 | 0 |
| 20 | f | 646 | 0 | 687 | 5 | 0 |
| 21 | c | 805 | 0 | 861 | 14 | 0 |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|---|---|---|---|---|---|---|
| 21 | g | 819 | 0 | 879 | 9 | 0 |
| 22 | d | 725 | 0 | 745 | 7 | 0 |
| 22 | h | 735 | 0 | 758 | 11 | 0 |
| 23 | m | 9653 | 0 | 9500 | 66 | 0 |
| 24 | n | 1115 | 0 | 1186 | 15 | 0 |
| 25 | q | 7552 | 0 | 7545 | 46 | 0 |
| 26 | r | 2139 | 0 | 2155 | 19 | 0 |
| 27 | s | 3419 | 0 | 3351 | 24 | 0 |
| 28 | u | 1707 | 0 | 1676 | 20 | 0 |
| 29 | v | 2878 | 0 | 2873 | 28 | 0 |
| 30 | x | 1682 | 0 | 1731 | 8 | 0 |
| 31 | A | 2 | 0 | 0 | 0 | 0 |
| 31 | B | 1 | 0 | 0 | 0 | 0 |
| 31 | C | 1 | 0 | 0 | 0 | 0 |
| 31 | I | 2 | 0 | 0 | 0 | 0 |
| 31 | J | 1 | 0 | 0 | 0 | 0 |
| 31 | L | 1 | 0 | 0 | 0 | 0 |
| 31 | M | 1 | 0 | 0 | 0 | 0 |
| 31 | V | 1 | 0 | 0 | 0 | 0 |
| 31 | s | 3 | 0 | 0 | 0 | 0 |
| 32 | A | 1 | 0 | 0 | 0 | 0 |
| 33 | s | 26 | 0 | 19 | 1 | 0 |
| All | All | 80704 | 0 | 77425 | 482 | 0 |

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

All (482) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:A:445:PHE:CE2 | 1:A:471:LEU:HD21 | 2.24 | 0.72 |
| 14:N:-89:DT:H73 | 21:c:32:ARG:NH1 | 2.05 | 0.72 |
| 18:W:218:ILE:CD1 | 24:n:289:MET:HE1 | 2.22 | 0.69 |
| 18:W:444:LEU:HG | 23:m:284:PHE:CE1 | 2.28 | 0.69 |
| 18:W:461:LEU:HD13 | 23:m:278:THR:HA | 1.74 | 0.68 |
| 14:N:5:DT:H5' | 22:h:33:ARG:HG2 | 1.75 | 0.67 |
| 2:B:1166:CYS:HB3 | 2:B:1185:CYS:SG | 2.35 | 0.67 |
| 18:W:444:LEU:HD12 | 23:m:284:PHE:CD2 | 2.30 | 0.67 |
| 15:P:-3:U:H4' | 15:P:-2:U:OP2 | 1.95 | 0.67 |
| 1:A:483:PHE:CD2 | 2:B:836:GLU:HB2 | 2.29 | 0.67 |
| 14:N:-109:DC:H42 | 16:T:109:DA:H61 | 1.44 | 0.66 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 15:P:-4:U:OP2 | 15:P:-4:U:H3' | 1.95 | 0.66 |
| 1:A:445:PHE:HE2 | 1:A:471:LEU:HD21 | 1.60 | 0.66 |
| 14:N:-107:DA:H61 | 16:T:107:DC:H42 | 1.45 | 0.65 |
| 23:m:337:GLN:HG2 | 23:m:458:ARG:HH12 | 1.62 | 0.65 |
| 18:W:487:ILE:HD11 | 18:W:531:ARG:HB2 | 1.79 | 0.64 |
| 16:T:62:DA:OP2 | 19:a:69:ARG:NH1 | 2.31 | 0.64 |
| 19:e:68:GLN:HE21 | 19:e:72:ARG:HH11 | 1.46 | 0.63 |
| 15:P:-5:C:H5' | 23:m:775:ARG:HH11 | 1.63 | 0.63 |
| 21:c:115:LEU:HD21 | 19:e:112:ILE:HD11 | 1.79 | 0.63 |
| 1:A:285:SER:HB2 | 1:A:290:ILE:HD11 | 1.80 | 0.63 |
| 14:N:-105:DC:H42 | 16:T:105:DA:H61 | 1.46 | 0.63 |
| 21:g:63:LEU:HD13 | 22:h:45:LEU:HB2 | 1.81 | 0.62 |
| 14:N:-89:DT:H73 | 21:c:32:ARG:HH11 | 1.62 | 0.62 |
| 18:W:444:LEU:HB2 | 23:m:284:PHE:CE2 | 2.35 | 0.62 |
| 23:m:473:ASN:HA | 23:m:525:ARG:HH12 | 1.64 | 0.62 |
| 3:C:266:ARG:HH12 | 11:K:82:ARG:HH12 | 1.48 | 0.62 |
| 19:a:38:PRO:HD3 | 27:s:180:MET:HB3 | 1.82 | 0.61 |
| 23:m:331:ARG:HH11 | 23:m:368:LYS:HB3 | 1.65 | 0.61 |
| 25:q:793:VAL:HG11 | 25:q:830:LEU:HG | 1.83 | 0.61 |
| 1:A:1211:MET:SD | 1:A:1211:MET:N | 2.73 | 0.61 |
| 9:I:33:ASP:OD1 | 28:u:75:HIS:N | 2.35 | 0.60 |
| 2:B:1103:ILE:O | 2:B:1122:ARG:NH2 | 2.34 | 0.60 |
| 23:m:1072:ASP:OD2 | 27:s:366:ARG:NH2 | 2.35 | 0.60 |
| 2:B:969:ARG:NH2 | 3:C:60:GLU:OE1 | 2.35 | 0.60 |
| 17:V:57:LEU:HD11 | 17:V:81:LEU:HD22 | 1.85 | 0.59 |
| 21:c:39:TYR:HB3 | 22:d:78:SER:HB2 | 1.83 | 0.59 |
| 1:A:831:LYS:NZ | 1:A:1079:THR:O | 2.34 | 0.59 |
| 16:T:3:DA:OP1 | 21:g:20:ARG:NH1 | 2.35 | 0.59 |
| 17:V:15:CYS:HB3 | 17:V:32:CYS:SG | 2.42 | 0.59 |
| 7:G:27:ARG:NH2 | 7:G:54:ILE:O | 2.36 | 0.59 |
| 24:n:206:SER:O | 24:n:210:ASN:ND2 | 2.35 | 0.59 |
| 25:q:169:ASP:OD1 | 25:q:185:LYS:NZ | 2.35 | 0.59 |
| 2:B:1176:LYS:HD2 | 18:W:598:LEU:HD23 | 1.86 | 0.58 |
| 1:A:1262:MET:SD | 1:A:1265:ARG:NH1 | 2.76 | 0.58 |
| 2:B:887:HIS:HA | 15:P:-2:U:C4 | 2.39 | 0.58 |
| 2:B:778:MET:HE3 | 2:B:794:ASN:HB3 | 1.84 | 0.58 |
| 25:q:253:ILE:HG12 | 25:q:297:LEU:HD21 | 1.84 | 0.58 |
| 25:q:922:ALA:O | 25:q:926:ASN:ND2 | 2.35 | 0.58 |
| 27:s:248:GLN:HB3 | 27:s:261:LEU:HD12 | 1.86 | 0.58 |
| 27:s:320:MET:HE3 | 27:s:347:LYS:HB3 | 1.84 | 0.58 |
| 27:s:426:LYS:NZ | 27:s:440:ASN:OD1 | 2.32 | 0.58 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 23:m:672:VAL:O | 23:m:720:GLN:NE2 | 2.37 | 0.58 |
| 26:r:269:ASP:HB3 | 26:r:349:LEU:HD21 | 1.85 | 0.58 |
| 2:B:73:LYS:HG2 | 2:B:125:THR:HG22 | 1.85 | 0.57 |
| 2:B:190:MET:SD | 2:B:190:MET:N | 2.77 | 0.57 |
| 2:B:815:ARG:HD2 | 29:v:135:SER:HB3 | 1.86 | 0.57 |
| 8:H:48:PRO:O | 8:H:145:ARG:NH2 | 2.37 | 0.57 |
| 23:m:725:GLU:OE2 | 23:m:728:ARG:NH1 | 2.36 | 0.57 |
| 29:v:267:TYR:HB3 | 29:v:297:TYR:HB3 | 1.87 | 0.57 |
| 2:B:489:ARG:NH1 | 2:B:533:SER:O | 2.37 | 0.57 |
| 4:D:71:ARG:HE | 4:D:92:VAL:HG13 | 1.70 | 0.57 |
| 22:d:79:ARG:NH2 | 22:d:83:TYR:OH | 2.38 | 0.57 |
| 25:q:569:ASN:O | 25:q:603:LYS:NZ | 2.36 | 0.57 |
| 27:s:238:TYR:O | 27:s:239:ASN:C | 2.47 | 0.57 |
| 2:B:50:VAL:HG21 | 2:B:82:ILE:HD11 | 1.86 | 0.57 |
| 18:W:218:ILE:HG13 | 24:n:289:MET:HE1 | 1.86 | 0.57 |
| 28:u:121:PHE:HB3 | 28:u:153:ARG:HB3 | 1.86 | 0.57 |
| 1:A:127:ARG:O | 1:A:129:ARG:NH2 | 2.38 | 0.57 |
| 18:W:444:LEU:HG | 23:m:284:PHE:CZ | 2.39 | 0.57 |
| 29:v:233:GLY:O | 29:v:244:ASN:ND2 | 2.38 | 0.57 |
| 10:J:1:MET:HA | 10:J:55:LEU:HB2 | 1.86 | 0.57 |
| 25:q:793:VAL:HG13 | 25:q:826:ALA:HB1 | 1.87 | 0.57 |
| 13:M:49:CYS:SG | 13:M:52:CYS:HB2 | 2.45 | 0.56 |
| 25:q:531:GLU:O | 25:q:535:ASN:N | 2.38 | 0.56 |
| 1:A:1207:LYS:O | 1:A:1277:ARG:NH1 | 2.39 | 0.56 |
| 26:r:200:ASP:HB3 | 26:r:319:VAL:HG11 | 1.88 | 0.56 |
| 1:A:473:LEU:HD23 | 2:B:836:GLU:HG3 | 1.88 | 0.56 |
| 18:W:616:GLN:OE1 | 18:W:619:SER:OG | 2.23 | 0.56 |
| 21:c:115:LEU:HB3 | 20:f:44:LYS:HD2 | 1.88 | 0.56 |
| 23:m:1056:ARG:HB3 | 23:m:1076:MET:HB3 | 1.88 | 0.56 |
| 28:u:209:LEU:HB2 | 29:v:252:PHE:HB2 | 1.88 | 0.56 |
| 1:A:1201:ARG:NH1 | 1:A:1235:ALA:O | 2.39 | 0.56 |
| 2:B:281:LEU:HD12 | 2:B:364:GLU:HB2 | 1.88 | 0.56 |
| 23:m:1261:ASN:OD1 | 23:m:1264:ARG:NH1 | 2.39 | 0.56 |
| 5:E:126:VAL:HG11 | 5:E:131:ILE:HG12 | 1.88 | 0.55 |
| 28:u:145:ILE:O | 28:u:149:THR:OG1 | 2.21 | 0.55 |
| 2:B:421:ILE:HD11 | 2:B:441:VAL:HG22 | 1.89 | 0.55 |
| 9:I:73:LYS:NZ | 9:I:112:ASP:OD2 | 2.39 | 0.55 |
| 9:I:20:LYS:O | 9:I:23:GLN:NE2 | 2.39 | 0.54 |
| 26:r:490:VAL:HG22 | 26:r:495:ARG:HE | 1.72 | 0.54 |
| 18:W:524:GLU:O | 24:n:232:GLN:NE2 | 2.40 | 0.54 |
| 18:W:327:ARG:NH2 | 18:W:335:GLY:O | 2.38 | 0.54 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 8:H:59:LEU:HD21 | 8:H:122:MET:HE1 | 1.88 | 0.54 |
| 30:x:292:TRP:HA | 30:x:295:LYS:HE2 | 1.89 | 0.54 |
| 9:I:100:PHE:HE1 | 9:I:111:ARG:HE | 1.56 | 0.54 |
| 1:A:40:ILE:HG23 | 1:A:54:ASN:HD22 | 1.72 | 0.54 |
| 2:B:557:GLU:OE2 | 2:B:584:ARG:NH2 | 2.40 | 0.54 |
| 3:C:248:ILE:HG21 | 11:K:102:ASP:HB2 | 1.88 | 0.54 |
| 27:s:280:ALA:O | 27:s:351:ARG:NH2 | 2.39 | 0.54 |
| 4:D:159:LEU:HD22 | 7:G:86:VAL:HG11 | 1.90 | 0.54 |
| 2:B:879:ARG:HD2 | 2:B:885:LEU:HD12 | 1.91 | 0.53 |
| 23:m:607:ILE:HG22 | 23:m:719:VAL:HG11 | 1.89 | 0.53 |
| 28:u:199:LEU:HD11 | 29:v:211:PHE:HB3 | 1.91 | 0.53 |
| 13:M:33:SER:HA | 13:M:50:LYS:HE2 | 1.91 | 0.53 |
| 1:A:1124:ARG:NH1 | 1:A:1304:GLU:OE2 | 2.39 | 0.53 |
| 17:V:89:ARG:NH2 | 17:V:109:ASP:OD2 | 2.41 | 0.53 |
| 25:q:157:LYS:NZ | 29:v:71:ASP:OD1 | 2.40 | 0.53 |
| 2:B:927:GLN:HB2 | 2:B:931:TYR:HB3 | 1.89 | 0.53 |
| 21:g:20:ARG:NH2 | 22:h:125:LYS:OXT | 2.42 | 0.53 |
| 23:m:1426:LEU:HD13 | 23:m:1469:ARG:HH21 | 1.75 | 0.52 |
| 30:x:157:ARG:HB3 | 30:x:161:PRO:HB3 | 1.91 | 0.52 |
| 1:A:976:ASP:O | 1:A:979:LYS:NZ | 2.42 | 0.52 |
| 2:B:235:LEU:HD23 | 2:B:242:ILE:HG13 | 1.91 | 0.52 |
| 23:m:1083:MET:HE1 | 23:m:1131:LEU:HD23 | 1.91 | 0.52 |
| 9:I:14:LEU:HB3 | 9:I:27:TYR:HB3 | 1.92 | 0.52 |
| 25:q:830:LEU:HD22 | 25:q:846:LEU:HB3 | 1.91 | 0.52 |
| 27:s:378:THR:HG23 | 27:s:382:LEU:HD12 | 1.91 | 0.52 |
| 14:N:29:DG:H1' | 14:N:30:DC:O4' | 2.10 | 0.52 |
| 23:m:236:GLU:OE2 | 24:n:252:ARG:NH1 | 2.43 | 0.52 |
| 25:q:688:SER:HG | 29:v:16:TYR:HH | 1.56 | 0.52 |
| 2:B:906:SER:OG | 18:W:781:GLU:OE1 | 2.27 | 0.52 |
| 14:N:-104:DT:H3 | 16:T:104:DG:H1 | 1.57 | 0.52 |
| 25:q:59:ALA:HB1 | 25:q:63:LEU:HD12 | 1.91 | 0.52 |
| 18:W:232:ARG:HH22 | 18:W:235:LYS:HE3 | 1.73 | 0.52 |
| 25:q:155:TYR:HB2 | 25:q:164:ALA:HB2 | 1.90 | 0.52 |
| 25:q:766:MET:HG3 | 25:q:770:LYS:HE3 | 1.92 | 0.52 |
| 28:u:114:LEU:HD11 | 28:u:150:VAL:HG23 | 1.92 | 0.52 |
| 1:A:63:ARG:NH1 | 15:P:0:G:OP1 | 2.42 | 0.52 |
| 2:B:393:HIS:NE2 | 2:B:696:GLU:OE2 | 2.42 | 0.52 |
| 9:I:45:ARG:NH1 | 9:I:47:GLU:OE2 | 2.42 | 0.52 |
| 7:G:6:ASP:OD1 | 7:G:75:ARG:NH2 | 2.43 | 0.51 |
| 23:m:532:VAL:HG22 | 23:m:565:MET:HE2 | 1.91 | 0.51 |
| 25:q:451:ARG:NH2 | 29:v:35:GLU:OE1 | 2.43 | 0.51 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 18:W:356:PRO:HG2 | 18:W:394:PHE:HB2 | 1.92 | 0.51 |
| 25:q:239:ASN:HA | 25:q:242:LYS:HD2 | 1.92 | 0.51 |
| 2:B:10:ASP:HB3 | 2:B:649:LYS:HG3 | 1.93 | 0.51 |
| 2:B:353:LEU:O | 2:B:367:LYS:NZ | 2.38 | 0.51 |
| 25:q:578:GLN:NE2 | 25:q:582:ASP:OD1 | 2.43 | 0.51 |
| 2:B:257:THR:OG1 | 2:B:258:GLY:N | 2.42 | 0.51 |
| 27:s:226:ARG:NH2 | 27:s:227:GLU:O | 2.43 | 0.51 |
| 1:A:1195:LEU:HB2 | 1:A:1263:LEU:HD21 | 1.93 | 0.51 |
| 1:A:447:ARG:HB2 | 1:A:488:MET:HE3 | 1.93 | 0.51 |
| 11:K:25:SER:O | 30:x:307:GLN:NE2 | 2.41 | 0.51 |
| 18:W:218:ILE:CG1 | 24:n:289:MET:HE1 | 2.41 | 0.51 |
| 2:B:245:MET:HE1 | 2:B:371:LEU:HD21 | 1.93 | 0.50 |
| 23:m:1033:ARG:HH22 | 23:m:1087:ARG:HH22 | 1.58 | 0.50 |
| 23:m:1191:ASN:OD1 | 23:m:1193:GLN:NE2 | 2.43 | 0.50 |
| 24:n:207:ILE:HG23 | 24:n:212:LEU:HB3 | 1.92 | 0.50 |
| 25:q:215:ASP:OD1 | 25:q:217:ARG:NH2 | 2.43 | 0.50 |
| 25:q:357:LYS:NZ | 25:q:361:ASP:OD1 | 2.43 | 0.50 |
| 2:B:879:ARG:HH21 | 15:P:-3:U:H1' | 1.76 | 0.50 |
| 14:N:-89:DT:C7 | 21:c:32:ARG:NH1 | 2.75 | 0.50 |
| 18:W:229:VAL:HG21 | 18:W:286:LEU:HD11 | 1.92 | 0.50 |
| 23:m:1200:PRO:O | 23:m:1203:ARG:NH2 | 2.43 | 0.50 |
| 18:W:666:GLU:HG2 | 18:W:705:VAL:HG12 | 1.93 | 0.50 |
| 5:E:49:MET:SD | 5:E:49:MET:N | 2.76 | 0.50 |
| 16:T:32:DA:H5" | 20:f:32:PRO:HG2 | 1.92 | 0.50 |
| 24:n:260:MET:HG3 | 24:n:284:TRP:HZ3 | 1.77 | 0.50 |
| 25:q:31:LYS:HB2 | 25:q:57:GLU:HA | 1.94 | 0.50 |
| 1:A:286:PRO:HG2 | 1:A:289:ILE:HD12 | 1.93 | 0.50 |
| 20:b:96:THR:HB | 21:g:100:VAL:HG12 | 1.93 | 0.50 |
| 23:m:1041:LEU:HD11 | 23:m:1081:TYR:HD2 | 1.77 | 0.50 |
| 23:m:1425:LYS:HE3 | 23:m:1428:PRO:HA | 1.94 | 0.50 |
| 14:N:4:DG:O3' | 22:h:33:ARG:HD2 | 2.12 | 0.50 |
| 1:A:363:ASP:OD1 | 1:A:363:ASP:N | 2.45 | 0.49 |
| 15:P:-5:C:H5' | 23:m:775:ARG:NH1 | 2.26 | 0.49 |
| 18:W:351:ARG:HA | 18:W:429:THR:HA | 1.94 | 0.49 |
| 19:e:106:ASP:OD2 | 19:e:131:ARG:NH2 | 2.41 | 0.49 |
| 28:u:191:THR:HG22 | 28:u:219:VAL:HG22 | 1.94 | 0.49 |
| 30:x:226:LYS:HG3 | 30:x:250:ILE:HG22 | 1.93 | 0.49 |
| 1:A:1190:GLN:HA | 1:A:1245:ILE:HA | 1.95 | 0.49 |
| 24:n:163:LEU:HD11 | 24:n:194:VAL:HG22 | 1.94 | 0.49 |
| 21:c:42:ARG:HB2 | 22:d:88:THR:HG22 | 1.94 | 0.49 |
| 2:B:268:VAL:HG11 | 2:B:272:ILE:HD11 | 1.95 | 0.49 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 16:T:-34:DG:H2” | 16:T:-33:DA:C8 | 2.48 | 0.49 |
| 16:T:11:DG:OP1 | 22:h:88:THR:OG1 | 2.22 | 0.49 |
| 29:v:210:VAL:HG13 | 29:v:334:VAL:HG21 | 1.95 | 0.49 |
| 1:A:807:ARG:NH2 | 2:B:724:LYS:O | 2.43 | 0.49 |
| 27:s:275:VAL:O | 27:s:276:PRO:C | 2.54 | 0.49 |
| 25:q:250:ASN:HA | 25:q:253:ILE:HD12 | 1.93 | 0.49 |
| 27:s:51:ASN:OD1 | 27:s:53:THR:OG1 | 2.27 | 0.49 |
| 2:B:613:ARG:HH11 | 9:I:62:ILE:HD11 | 1.76 | 0.49 |
| 17:V:9:GLU:HA | 17:V:20:PRO:HA | 1.95 | 0.49 |
| 24:n:216:VAL:HG13 | 24:n:237:LEU:HD13 | 1.94 | 0.49 |
| 1:A:599:LEU:O | 8:H:121:LEU:HD12 | 2.13 | 0.49 |
| 5:E:60:LEU:O | 25:q:915:ARG:NH2 | 2.39 | 0.49 |
| 14:N:-58:DC:H5’ | 19:a:63:ARG:HH11 | 1.77 | 0.49 |
| 18:W:317:ASP:O | 18:W:318:VAL:C | 2.55 | 0.49 |
| 23:m:1172:VAL:HA | 23:m:1182:VAL:HG12 | 1.93 | 0.49 |
| 2:B:336:ILE:O | 2:B:341:ARG:NH2 | 2.46 | 0.49 |
| 18:W:666:GLU:HA | 18:W:705:VAL:HA | 1.94 | 0.49 |
| 1:A:9:ALA:O | 2:B:1193:GLN:NE2 | 2.44 | 0.48 |
| 2:B:279:ARG:NH1 | 2:B:286:ASP:OD1 | 2.46 | 0.48 |
| 18:W:640:LYS:NZ | 18:W:641:LEU:O | 2.46 | 0.48 |
| 25:q:479:TYR:HD1 | 29:v:30:LEU:HB3 | 1.78 | 0.48 |
| 17:V:10:ARG:HA | 17:V:52:SER:HA | 1.95 | 0.48 |
| 18:W:704:ARG:NH2 | 23:m:632:GLU:OE2 | 2.46 | 0.48 |
| 14:N:-18:DG:H2” | 14:N:-17:DT:H71 | 1.96 | 0.48 |
| 18:W:327:ARG:NH1 | 18:W:441:ASN:O | 2.46 | 0.48 |
| 18:W:465:ALA:HA | 18:W:468:LEU:HD12 | 1.95 | 0.48 |
| 1:A:253:MET:SD | 16:T:-47:DA:H2” | 2.54 | 0.48 |
| 11:K:14:ASP:N | 11:K:14:ASP:OD1 | 2.47 | 0.48 |
| 15:P:-7:U:C2 | 15:P:-6:C:C2 | 3.01 | 0.48 |
| 23:m:1255:TRP:NE1 | 23:m:1260:GLU:OE1 | 2.42 | 0.48 |
| 28:u:173:TRP:NE1 | 28:u:179:SER:OG | 2.37 | 0.48 |
| 1:A:1199:LEU:HD13 | 1:A:1204:MET:HG3 | 1.96 | 0.48 |
| 3:C:15:ASP:OD1 | 3:C:15:ASP:N | 2.44 | 0.48 |
| 16:T:32:DA:OP1 | 20:f:36:ARG:NH1 | 2.47 | 0.48 |
| 30:x:311:GLY:HA3 | 30:x:330:VAL:HG12 | 1.95 | 0.48 |
| 1:A:204:THR:OG1 | 1:A:207:GLU:OE1 | 2.31 | 0.47 |
| 2:B:601:ALA:HA | 28:u:239:SER:HB3 | 1.96 | 0.47 |
| 16:T:-3:DG:H21 | 22:h:33:ARG:HH22 | 1.60 | 0.47 |
| 16:T:55:DA:H5’ | 19:a:40:ARG:HG2 | 1.96 | 0.47 |
| 19:a:32:THR:OG1 | 27:s:173:LEU:O | 2.31 | 0.47 |
| 25:q:390:LEU:HB3 | 25:q:409:LEU:HD21 | 1.96 | 0.47 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:A:1450:GLU:OE2 | 7:G:23:ASN:ND2 | 2.47 | 0.47 |
| 2:B:879:ARG:NH2 | 15:P:-3:U:H1' | 2.29 | 0.47 |
| 3:C:38:ALA:HA | 3:C:164:ALA:HB3 | 1.95 | 0.47 |
| 1:A:106:ILE:HD13 | 1:A:215:ILE:HD11 | 1.96 | 0.47 |
| 22:h:79:ARG:NH2 | 22:h:83:TYR:OH | 2.44 | 0.47 |
| 23:m:998:ASN:HD22 | 23:m:999:LEU:N | 2.12 | 0.47 |
| 28:u:108:VAL:HG22 | 28:u:219:VAL:HB | 1.96 | 0.47 |
| 2:B:248:LYS:NZ | 2:B:264:THR:OG1 | 2.46 | 0.47 |
| 15:P:-5:C:O3' | 15:P:-4:U:H2' | 2.15 | 0.47 |
| 16:T:-23:DC:H2" | 16:T:-22:DA:C8 | 2.49 | 0.47 |
| 25:q:559:ARG:NH1 | 29:v:24:PRO:O | 2.47 | 0.47 |
| 26:r:223:VAL:HG22 | 26:r:325:GLN:HG2 | 1.95 | 0.47 |
| 1:A:1227:PHE:HB2 | 1:A:1245:ILE:HD11 | 1.97 | 0.47 |
| 14:N:-23:DT:H2" | 14:N:-22:DG:H5" | 1.96 | 0.47 |
| 23:m:625:GLY:O | 23:m:629:ILE:HG12 | 2.14 | 0.47 |
| 25:q:72:VAL:HG21 | 29:v:75:LEU:HD13 | 1.97 | 0.47 |
| 26:r:493:ASN:HB2 | 26:r:502:ILE:HD11 | 1.96 | 0.47 |
| 29:v:263:TRP:HE1 | 29:v:356:ASN:HD21 | 1.61 | 0.47 |
| 5:E:34:MET:HE2 | 5:E:34:MET:HB2 | 1.80 | 0.47 |
| 14:N:-106:DT:H3 | 16:T:106:DG:H1 | 1.63 | 0.47 |
| 18:W:326:VAL:HA | 18:W:440:ILE:HD13 | 1.96 | 0.47 |
| 25:q:210:PRO:O | 25:q:217:ARG:NH1 | 2.39 | 0.47 |
| 25:q:708:GLN:OE1 | 25:q:739:LYS:NZ | 2.48 | 0.47 |
| 1:A:261:ASP:OD1 | 1:A:262:ASP:N | 2.48 | 0.47 |
| 23:m:1279:ARG:NH2 | 23:m:1315:SER:O | 2.48 | 0.47 |
| 21:c:112:GLN:HB2 | 21:c:115:LEU:HG | 1.97 | 0.47 |
| 17:V:58:VAL:N | 17:V:82:TYR:O | 2.45 | 0.47 |
| 20:b:44:LYS:HB2 | 21:g:115:LEU:HD11 | 1.96 | 0.47 |
| 28:u:80:TYR:CZ | 29:v:356:ASN:HB2 | 2.49 | 0.47 |
| 23:m:882:ARG:HH12 | 23:m:1156:ARG:HH11 | 1.62 | 0.46 |
| 26:r:211:MET:HB3 | 26:r:286:LEU:HD23 | 1.97 | 0.46 |
| 2:B:81:LYS:NZ | 28:u:247:TYR:O | 2.44 | 0.46 |
| 18:W:494:LEU:HD21 | 24:n:183:PRO:HG3 | 1.96 | 0.46 |
| 23:m:1269:ASP:OD1 | 23:m:1272:ARG:NH2 | 2.46 | 0.46 |
| 11:K:55:ASP:OD1 | 11:K:55:ASP:N | 2.41 | 0.46 |
| 15:P:-5:C:H4' | 15:P:-4:U:C6 | 2.51 | 0.46 |
| 21:c:39:TYR:O | 21:g:38:ASN:ND2 | 2.48 | 0.46 |
| 7:G:160:ILE:HD12 | 18:W:553:LEU:HD12 | 1.97 | 0.46 |
| 16:T:-22:DA:H2" | 16:T:-21:DC:C6 | 2.50 | 0.46 |
| 25:q:65:LEU:HD13 | 29:v:81:ILE:HG12 | 1.96 | 0.46 |
| 1:A:999:LEU:O | 1:A:1013:GLN:NE2 | 2.38 | 0.46 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 2:B:550:PHE:HB3 | 2:B:593:MET:HE1 | 1.96 | 0.46 |
| 27:s:339:THR:HG22 | 27:s:341:ASP:H | 1.80 | 0.46 |
| 15:P:-2:U:C6 | 15:P:-2:U:H5" | 2.51 | 0.46 |
| 18:W:215:ARG:NH2 | 23:m:234:TYR:CE1 | 2.84 | 0.46 |
| 1:A:10:PRO:HG2 | 2:B:1192:TYR:HD1 | 1.80 | 0.46 |
| 5:E:89:ILE:HD13 | 5:E:118:SER:HB2 | 1.98 | 0.46 |
| 7:G:151:ARG:HB3 | 7:G:158:TYR:HB2 | 1.98 | 0.46 |
| 11:K:29:ASN:ND2 | 11:K:78:GLU:O | 2.49 | 0.46 |
| 21:c:24:GLN:HE21 | 22:d:47:GLN:HE21 | 1.63 | 0.46 |
| 23:m:712:LEU:HA | 23:m:715:LEU:HB2 | 1.98 | 0.46 |
| 1:A:599:LEU:HD12 | 1:A:599:LEU:HA | 1.73 | 0.46 |
| 15:P:-4:U:H1' | 15:P:-3:U:C2 | 2.51 | 0.46 |
| 16:T:-69:DA:H2" | 16:T:-68:DG:C8 | 2.51 | 0.46 |
| 16:T:59:DA:H1' | 16:T:60:DA:H5' | 1.97 | 0.46 |
| 23:m:527:ASP:OD1 | 23:m:528:ALA:N | 2.47 | 0.45 |
| 16:T:80:DA:H2" | 16:T:81:DC:C5 | 2.51 | 0.45 |
| 19:e:133:GLU:OE1 | 19:e:133:GLU:N | 2.49 | 0.45 |
| 14:N:-30:DT:H2" | 14:N:-29:DT:C6 | 2.51 | 0.45 |
| 17:V:66:SER:HB2 | 18:W:260:TYR:HB3 | 1.98 | 0.45 |
| 18:W:638:TYR:CZ | 23:m:882:ARG:HG3 | 2.52 | 0.45 |
| 19:a:50:GLU:HG3 | 20:b:39:ARG:HG2 | 1.99 | 0.45 |
| 23:m:780:LEU:HD12 | 23:m:900:LEU:HB3 | 1.97 | 0.45 |
| 23:m:984:LYS:HE2 | 23:m:1015:VAL:HG21 | 1.99 | 0.45 |
| 25:q:520:SER:O | 25:q:524:HIS:ND1 | 2.48 | 0.45 |
| 12:L:49:ARG:HD3 | 26:r:339:VAL:HG11 | 1.98 | 0.45 |
| 13:M:46:LEU:HD11 | 13:M:55:SER:HB3 | 1.99 | 0.45 |
| 21:c:90:ASP:HB3 | 21:c:93:LEU:HB2 | 1.98 | 0.45 |
| 25:q:737:LEU:O | 25:q:742:ASN:N | 2.47 | 0.45 |
| 26:r:366:GLU:HG2 | 28:u:252:VAL:HG22 | 1.99 | 0.45 |
| 1:A:864:ILE:HD12 | 5:E:169:LEU:HD11 | 1.99 | 0.45 |
| 1:A:1423:ASP:OD1 | 1:A:1423:ASP:N | 2.41 | 0.45 |
| 4:D:139:PRO:HA | 4:D:142:ILE:HD12 | 1.99 | 0.45 |
| 16:T:49:DC:H2" | 16:T:50:DA:C8 | 2.52 | 0.45 |
| 21:c:54:VAL:HG21 | 22:d:98:VAL:HG21 | 1.99 | 0.45 |
| 1:A:134:ARG:HH11 | 1:A:224:GLY:HA2 | 1.81 | 0.45 |
| 1:A:466:TYR:HB2 | 1:A:470:ARG:NH1 | 2.32 | 0.45 |
| 6:F:110:ASP:OD1 | 6:F:110:ASP:N | 2.38 | 0.45 |
| 14:N:-89:DT:C7 | 21:c:32:ARG:HH11 | 2.28 | 0.45 |
| 23:m:992:ILE:HG22 | 23:m:997:SER:HA | 1.99 | 0.45 |
| 23:m:1064:ASP:OD1 | 27:s:457:LYS:NZ | 2.46 | 0.45 |
| 25:q:189:LEU:HD22 | 25:q:194:LYS:HD2 | 1.98 | 0.45 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 26:r:276:PHE:HB2 | 26:r:279:GLN:HB2 | 1.99 | 0.45 |
| 27:s:342:TYR:CZ | 27:s:346:ARG:HD2 | 2.51 | 0.45 |
| 27:s:345:LEU:HD13 | 27:s:376:ILE:HG23 | 1.99 | 0.45 |
| 14:N:32:DG:H1' | 14:N:33:DT:H5' | 1.98 | 0.45 |
| 18:W:527:THR:HA | 18:W:530:LEU:HD12 | 1.99 | 0.45 |
| 11:K:45:LEU:HG | 11:K:94:ILE:HD13 | 1.98 | 0.45 |
| 14:N:-59:DT:O3' | 19:a:63:ARG:NH1 | 2.49 | 0.45 |
| 18:W:215:ARG:NH1 | 23:m:234:TYR:CE1 | 2.85 | 0.45 |
| 1:A:1452:LEU:HD22 | 6:F:131:PRO:HB3 | 1.98 | 0.45 |
| 18:W:751:THR:HG23 | 18:W:798:ILE:HG12 | 1.99 | 0.45 |
| 20:f:73:THR:HG21 | 20:f:81:VAL:HG22 | 1.99 | 0.45 |
| 25:q:320:LEU:HD13 | 26:r:514:LEU:HD11 | 1.99 | 0.45 |
| 16:T:90:DC:H2" | 16:T:91:DA:C8 | 2.52 | 0.44 |
| 18:W:508:SER:HA | 18:W:524:GLU:HA | 1.99 | 0.44 |
| 25:q:568:SER:O | 25:q:571:ASN:ND2 | 2.50 | 0.44 |
| 27:s:190:THR:O | 27:s:197:ARG:NH1 | 2.50 | 0.44 |
| 1:A:41:MET:HG2 | 1:A:44:SER:HA | 1.98 | 0.44 |
| 1:A:870:GLY:C | 1:A:872:ASP:H | 2.24 | 0.44 |
| 23:m:1104:ILE:HD12 | 27:s:456:PRO:HB2 | 1.98 | 0.44 |
| 7:G:144:ARG:HB2 | 7:G:171:ILE:HD13 | 1.99 | 0.44 |
| 18:W:546:LYS:NZ | 23:m:291:GLU:OE1 | 2.48 | 0.44 |
| 29:v:262:LYS:HD3 | 29:v:305:GLN:HE21 | 1.81 | 0.44 |
| 1:A:948:VAL:O | 5:E:200:ARG:NH2 | 2.50 | 0.44 |
| 27:s:395:THR:HA | 27:s:398:VAL:HG12 | 1.98 | 0.44 |
| 1:A:231:ARG:HB3 | 1:A:234:TRP:CD2 | 2.53 | 0.44 |
| 2:B:284:VAL:N | 2:B:285:PRO:HD2 | 2.32 | 0.44 |
| 18:W:444:LEU:HD12 | 23:m:284:PHE:CG | 2.52 | 0.44 |
| 16:T:91:DA:H2" | 16:T:92:DC:C5 | 2.52 | 0.44 |
| 28:u:97:HIS:NE2 | 29:v:203:ASP:OD2 | 2.47 | 0.44 |
| 29:v:312:LYS:HB3 | 29:v:315:GLU:HG2 | 1.99 | 0.44 |
| 5:E:21:MET:HE2 | 5:E:186:TYR:HA | 2.00 | 0.44 |
| 16:T:28:DG:H2" | 16:T:29:DA:C8 | 2.52 | 0.44 |
| 28:u:90:LEU:HB2 | 29:v:362:MET:HE1 | 1.99 | 0.44 |
| 4:D:136:VAL:O | 4:D:166:LYS:NZ | 2.50 | 0.44 |
| 17:V:67:TRP:NE1 | 18:W:217:LEU:O | 2.51 | 0.44 |
| 26:r:244:LYS:NZ | 26:r:305:GLU:OE2 | 2.46 | 0.44 |
| 14:N:-10:DG:H2" | 14:N:-9:DC:C5 | 2.53 | 0.44 |
| 16:T:94:DC:H2' | 16:T:95:DC:C6 | 2.53 | 0.44 |
| 18:W:315:SER:O | 18:W:316:SER:C | 2.61 | 0.44 |
| 21:g:63:LEU:HD11 | 22:h:41:VAL:HG13 | 2.00 | 0.44 |
| 25:q:641:ALA:HB1 | 25:q:655:LYS:HG3 | 2.00 | 0.44 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 29:v:258:ASN:OD1 | 29:v:261:ASN:N | 2.44 | 0.44 |
| 2:B:86:ARG:NH1 | 26:r:369:GLU:OE1 | 2.50 | 0.43 |
| 1:A:835:THR:HG21 | 1:A:1079:THR:HA | 1.99 | 0.43 |
| 1:A:1343:GLY:O | 1:A:1347:THR:OG1 | 2.29 | 0.43 |
| 3:C:179:GLU:OE2 | 3:C:204:SER:OG | 2.36 | 0.43 |
| 17:V:59:ALA:HB1 | 18:W:244:LEU:HD13 | 2.01 | 0.43 |
| 15:P:-5:C:H4' | 15:P:-4:U:C5 | 2.53 | 0.43 |
| 25:q:617:ASP:OD1 | 25:q:621:ASN:ND2 | 2.51 | 0.43 |
| 1:A:188:LYS:HE3 | 1:A:199:GLU:HB2 | 2.01 | 0.43 |
| 7:G:30:LEU:HD22 | 7:G:72:VAL:HG11 | 2.00 | 0.43 |
| 9:I:23:GLN:O | 9:I:24:ARG:NE | 2.51 | 0.43 |
| 14:N:-79:DG:OP1 | 22:d:88:THR:OG1 | 2.25 | 0.43 |
| 16:T:105:DA:H2' | 16:T:106:DG:C8 | 2.54 | 0.43 |
| 18:W:628:LYS:HE3 | 23:m:661:GLN:HE22 | 1.82 | 0.43 |
| 23:m:1062:ALA:HB2 | 23:m:1103:LEU:HD11 | 1.99 | 0.43 |
| 11:K:99:LYS:HB2 | 11:K:99:LYS:HE2 | 1.73 | 0.43 |
| 20:f:68:ASP:OD1 | 20:f:68:ASP:N | 2.52 | 0.43 |
| 23:m:770:PHE:HB3 | 23:m:779:VAL:HG22 | 2.00 | 0.43 |
| 2:B:273:PRO:HG2 | 2:B:276:ILE:HD12 | 2.00 | 0.43 |
| 14:N:27:DG:H2' | 14:N:28:DT:H72 | 2.00 | 0.43 |
| 17:V:78:GLN:O | 17:V:82:TYR:OH | 2.23 | 0.43 |
| 18:W:534:PHE:HB3 | 18:W:554:ILE:HD13 | 2.00 | 0.43 |
| 18:W:752:LEU:HD23 | 18:W:770:VAL:HG12 | 1.99 | 0.43 |
| 19:a:108:ASN:HB2 | 20:b:43:VAL:HG22 | 2.00 | 0.43 |
| 1:A:465:PRO:O | 1:A:470:ARG:NH1 | 2.52 | 0.43 |
| 2:B:788:ARG:O | 2:B:967:ARG:NH2 | 2.52 | 0.43 |
| 14:N:33:DT:H2" | 14:N:34:DC:C6 | 2.54 | 0.43 |
| 23:m:242:GLY:HA3 | 24:n:258:LYS:HG2 | 2.00 | 0.43 |
| 27:s:401:MET:HE3 | 27:s:401:MET:HB3 | 1.90 | 0.43 |
| 28:u:200:VAL:HA | 28:u:211:THR:HA | 2.00 | 0.43 |
| 9:I:17:LYS:N | 9:I:26:LEU:O | 2.50 | 0.43 |
| 21:g:54:VAL:HG21 | 22:h:98:VAL:HG21 | 1.99 | 0.43 |
| 23:m:1426:LEU:HD21 | 23:m:1465:MET:HE2 | 1.99 | 0.43 |
| 26:r:277:PRO:HB2 | 26:r:305:GLU:HB3 | 2.01 | 0.43 |
| 29:v:104:PRO:HA | 29:v:107:ARG:HD3 | 2.00 | 0.43 |
| 15:P:-6:C:C2 | 15:P:-5:C:N4 | 2.87 | 0.43 |
| 23:m:1365:GLU:O | 23:m:1369:ASN:ND2 | 2.49 | 0.43 |
| 30:x:222:MET:HE3 | 30:x:222:MET:HB3 | 1.85 | 0.43 |
| 14:N:-34:DT:H2" | 14:N:-33:DG:C8 | 2.55 | 0.42 |
| 18:W:334:LYS:HB3 | 18:W:388:ARG:HH22 | 1.84 | 0.42 |
| 18:W:472:ALA:O | 18:W:476:VAL:HG23 | 2.18 | 0.42 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 22:h:43:LYS:HE3 | 22:h:43:LYS:HB2 | 1.89 | 0.42 |
| 27:s:263:GLY:O | 27:s:264:ARG:C | 2.62 | 0.42 |
| 1:A:958:LEU:HD13 | 1:A:1023:LEU:HD22 | 2.01 | 0.42 |
| 18:W:327:ARG:HB3 | 18:W:436:ILE:HB | 2.01 | 0.42 |
| 26:r:245:VAL:HG23 | 26:r:298:GLU:HG2 | 2.01 | 0.42 |
| 1:A:547:VAL:HG22 | 1:A:578:LEU:HD21 | 2.01 | 0.42 |
| 25:q:41:PHE:CG | 25:q:70:VAL:HG11 | 2.55 | 0.42 |
| 25:q:155:TYR:HB3 | 25:q:160:ARG:HB2 | 2.01 | 0.42 |
| 28:u:208:ILE:HG22 | 29:v:253:LYS:HG3 | 2.01 | 0.42 |
| 1:A:318:LYS:HE3 | 16:T:-46:DC:C5 | 2.54 | 0.42 |
| 17:V:63:ASN:HB3 | 17:V:75:ASP:HA | 2.01 | 0.42 |
| 3:C:199:LYS:HB3 | 3:C:199:LYS:HE2 | 1.80 | 0.42 |
| 23:m:1425:LYS:NZ | 23:m:1430:SER:O | 2.41 | 0.42 |
| 3:C:79:MET:HE2 | 3:C:79:MET:HB3 | 1.87 | 0.42 |
| 18:W:344:LEU:HD12 | 18:W:349:GLU:HB2 | 2.01 | 0.42 |
| 18:W:461:LEU:HD12 | 23:m:278:THR:HG23 | 2.01 | 0.42 |
| 23:m:1325:ALA:HB3 | 23:m:1328:LEU:HB3 | 2.02 | 0.42 |
| 1:A:823:GLU:OE2 | 2:B:506:GLN:NE2 | 2.53 | 0.42 |
| 1:A:1448:ILE:HD11 | 1:A:1453:LEU:HD11 | 2.01 | 0.42 |
| 2:B:928:ARG:NH1 | 23:m:775:ARG:O | 2.52 | 0.42 |
| 6:F:97:ARG:HD2 | 6:F:97:ARG:HA | 1.88 | 0.42 |
| 2:B:299:ASP:OD1 | 2:B:299:ASP:N | 2.52 | 0.42 |
| 5:E:81:PHE:HE1 | 5:E:110:ILE:HD13 | 1.84 | 0.42 |
| 23:m:545:ASN:ND2 | 23:m:553:HIS:O | 2.53 | 0.42 |
| 24:n:217:ARG:HG3 | 24:n:259:VAL:HG21 | 2.02 | 0.42 |
| 26:r:206:PHE:H | 26:r:229:LEU:HD21 | 1.85 | 0.42 |
| 2:B:83:TYR:HB2 | 2:B:116:TYR:HB2 | 2.01 | 0.42 |
| 2:B:223:SER:O | 2:B:252:ARG:NH1 | 2.41 | 0.42 |
| 2:B:547:ILE:HG21 | 2:B:619:ILE:HG21 | 2.00 | 0.42 |
| 23:m:295:THR:OG1 | 23:m:298:ASP:OD2 | 2.37 | 0.42 |
| 23:m:338:LEU:HD23 | 23:m:338:LEU:HA | 1.86 | 0.42 |
| 23:m:380:GLU:HB3 | 23:m:978:CYS:SG | 2.60 | 0.42 |
| 2:B:318:ASP:HB3 | 2:B:321:VAL:HG22 | 2.02 | 0.42 |
| 7:G:108:VAL:HG22 | 7:G:159:ALA:HB3 | 2.02 | 0.42 |
| 25:q:737:LEU:HD12 | 25:q:741:SER:HB2 | 2.01 | 0.42 |
| 2:B:592:THR:HA | 28:u:226:PHE:HZ | 1.85 | 0.41 |
| 2:B:607:SER:HB2 | 2:B:620:PHE:HB2 | 2.02 | 0.41 |
| 25:q:710:LEU:HD13 | 25:q:740:PHE:HB2 | 2.01 | 0.41 |
| 30:x:301:ASP:OD1 | 30:x:303:GLN:NE2 | 2.53 | 0.41 |
| 18:W:551:THR:HG21 | 18:W:586:SER:HA | 2.03 | 0.41 |
| 1:A:983:LEU:HD13 | 1:A:1041:ARG:HA | 2.01 | 0.41 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 18:W:648:GLN:NE2 | 18:W:679:VAL:H | 2.18 | 0.41 |
| 2:B:766:ARG:NH1 | 2:B:985:GLY:O | 2.53 | 0.41 |
| 19:a:128:ARG:HH11 | 19:a:134:ARG:HH11 | 1.68 | 0.41 |
| 1:A:203:LEU:HB3 | 1:A:208:ILE:HD11 | 2.01 | 0.41 |
| 2:B:760:ASP:OD1 | 2:B:760:ASP:N | 2.48 | 0.41 |
| 2:B:887:HIS:HA | 15:P:-2:U:C5 | 2.56 | 0.41 |
| 25:q:241:LEU:HD23 | 25:q:241:LEU:HA | 1.95 | 0.41 |
| 26:r:194:LYS:HB2 | 26:r:316:LEU:HD12 | 2.03 | 0.41 |
| 2:B:815:ARG:NH2 | 29:v:132:GLN:O | 2.54 | 0.41 |
| 1:A:327:ARG:HG3 | 1:A:1409:VAL:HG21 | 2.01 | 0.41 |
| 2:B:184:LYS:HB3 | 2:B:787:VAL:HG21 | 2.03 | 0.41 |
| 2:B:632:ILE:HD11 | 2:B:688:GLU:HB3 | 2.01 | 0.41 |
| 24:n:241:ILE:HG23 | 24:n:246:ILE:HD12 | 2.03 | 0.41 |
| 27:s:417:GLN:O | 27:s:420:SER:OG | 2.31 | 0.41 |
| 3:C:21:LEU:HD22 | 11:K:101:LEU:HD11 | 2.03 | 0.41 |
| 11:K:65:HIS:HB3 | 11:K:68:PHE:HD2 | 1.86 | 0.41 |
| 23:m:772:GLU:O | 23:m:829:ASN:ND2 | 2.48 | 0.41 |
| 23:m:992:ILE:HA | 23:m:995:ILE:HG12 | 2.02 | 0.41 |
| 25:q:766:MET:HE1 | 25:q:799:ILE:HG23 | 2.02 | 0.41 |
| 1:A:557:TRP:O | 11:K:26:ARG:NH2 | 2.54 | 0.41 |
| 1:A:677:MET:HG3 | 2:B:722:THR:HB | 2.03 | 0.41 |
| 2:B:650:GLU:OE1 | 2:B:653:ARG:NH1 | 2.49 | 0.41 |
| 3:C:50:ILE:HG12 | 3:C:155:ILE:HG22 | 2.03 | 0.41 |
| 5:E:27:TYR:HA | 5:E:63:PRO:HA | 2.03 | 0.41 |
| 6:F:104:ASN:HD22 | 6:F:104:ASN:HA | 1.70 | 0.41 |
| 7:G:118:ASN:OD1 | 7:G:118:ASN:N | 2.53 | 0.41 |
| 14:N:4:DG:O3’ | 22:h:33:ARG:HB3 | 2.21 | 0.41 |
| 18:W:336:ASP:OD2 | 18:W:357:ARG:NE | 2.47 | 0.41 |
| 21:c:24:GLN:HE21 | 22:d:47:GLN:NE2 | 2.19 | 0.41 |
| 21:g:63:LEU:HD23 | 21:g:63:LEU:HA | 1.91 | 0.41 |
| 23:m:449:THR:HG21 | 23:m:543:ARG:HD2 | 2.03 | 0.41 |
| 23:m:1001:ASN:OD1 | 23:m:1002:ARG:N | 2.54 | 0.41 |
| 25:q:9:TYR:OH | 29:v:106:ASP:OD2 | 2.28 | 0.41 |
| 25:q:162:ASP:OD1 | 25:q:192:ARG:NH1 | 2.51 | 0.41 |
| 26:r:345:MET:O | 26:r:348:SER:OG | 2.33 | 0.41 |
| 27:s:209:VAL:HG22 | 27:s:222:ILE:HG12 | 2.03 | 0.41 |
| 2:B:830:TYR:CZ | 2:B:1000:PRO:HD3 | 2.55 | 0.41 |
| 16:T:82:DC:H2” | 16:T:83:DA:C8 | 2.56 | 0.41 |
| 26:r:263:SER:OG | 26:r:264:LYS:N | 2.53 | 0.41 |
| 14:N:32:DG:H2” | 14:N:33:DT:OP2 | 2.20 | 0.40 |
| 2:B:1008:PRO:HB3 | 2:B:1087:PHE:HE1 | 1.86 | 0.40 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 14:N:42:DT:C6 | 14:N:43:DT:H72 | 2.56 | 0.40 |
| 27:s:238:TYR:OH | 33:s:1904:SAH:H5'2 | 2.20 | 0.40 |
| 28:u:180:LEU:HB2 | 28:u:189:MET:HE3 | 2.03 | 0.40 |
| 29:v:199:HIS:O | 29:v:328:ALA:N | 2.54 | 0.40 |
| 14:N:30:DC:H2" | 14:N:31:DT:O5' | 2.22 | 0.40 |
| 25:q:403:SER:OG | 29:v:56:LYS:NZ | 2.54 | 0.40 |
| 29:v:29:LEU:N | 30:x:147:ARG:O | 2.52 | 0.40 |
| 1:A:109:ASN:HD21 | 24:n:199:LEU:HB3 | 1.85 | 0.40 |
| 1:A:1412:LEU:HD13 | 2:B:1207:LEU:HD21 | 2.02 | 0.40 |
| 23:m:617:ILE:HG13 | 23:m:649:LEU:HD11 | 2.04 | 0.40 |
| 23:m:965:VAL:HG21 | 23:m:992:ILE:HG21 | 2.02 | 0.40 |
| 1:A:215:ILE:O | 1:A:231:ARG:NH1 | 2.47 | 0.40 |
| 1:A:363:ASP:HB3 | 1:A:509:PRO:HD3 | 2.03 | 0.40 |
| 1:A:554:VAL:HB | 1:A:557:TRP:HB2 | 2.04 | 0.40 |
| 15:P:-5:C:O2 | 18:W:748:ARG:HD3 | 2.21 | 0.40 |
| 23:m:243:ASP:OD1 | 23:m:243:ASP:N | 2.55 | 0.40 |
| 25:q:547:MET:HE3 | 25:q:547:MET:HB2 | 1.97 | 0.40 |
| 25:q:780:TYR:O | 25:q:784:LYS:N | 2.50 | 0.40 |
| 26:r:230:ARG:NH2 | 26:r:292:SER:OG | 2.45 | 0.40 |
| 28:u:89:SER:HB3 | 29:v:365:ARG:HE | 1.86 | 0.40 |

There are no symmetry-related clashes.

## 5.3 Torsion angles (i)

### 5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles |
|---|---|---|---|---|---|---|
| 1 | A | 1392/1743 (80%) | 1355 (97%) | 36 (3%) | 1 (0%) | 48 83 |
| 2 | B | 1154/1227 (94%) | 1127 (98%) | 27 (2%) | 0 | 100 100 |
| 3 | C | 261/304 (86%) | 259 (99%) | 2 (1%) | 0 | 100 100 |
| 4 | D | 170/186 (91%) | 168 (99%) | 2 (1%) | 0 | 100 100 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|---|---|---|---|---|---|---|---|
| 5 | E | 211/214 (99%) | 207 (98%) | 4 (2%) | 0 | 100 | 100 |
| 6 | F | 82/155 (53%) | 79 (96%) | 3 (4%) | 0 | 100 | 100 |
| 7 | G | 169/171 (99%) | 166 (98%) | 3 (2%) | 0 | 100 | 100 |
| 8 | H | 129/145 (89%) | 125 (97%) | 4 (3%) | 0 | 100 | 100 |
| 9 | I | 109/115 (95%) | 105 (96%) | 4 (4%) | 0 | 100 | 100 |
| 10 | J | 65/72 (90%) | 65 (100%) | 0 | 0 | 100 | 100 |
| 11 | K | 111/118 (94%) | 109 (98%) | 2 (2%) | 0 | 100 | 100 |
| 12 | L | 43/72 (60%) | 41 (95%) | 2 (5%) | 0 | 100 | 100 |
| 13 | M | 62/113 (55%) | 62 (100%) | 0 | 0 | 100 | 100 |
| 17 | V | 104/108 (96%) | 102 (98%) | 2 (2%) | 0 | 100 | 100 |
| 18 | W | 529/911 (58%) | 506 (96%) | 23 (4%) | 0 | 100 | 100 |
| 19 | a | 102/139 (73%) | 100 (98%) | 2 (2%) | 0 | 100 | 100 |
| 19 | e | 89/139 (64%) | 89 (100%) | 0 | 0 | 100 | 100 |
| 20 | b | 79/106 (74%) | 76 (96%) | 3 (4%) | 0 | 100 | 100 |
| 20 | f | 79/106 (74%) | 76 (96%) | 3 (4%) | 0 | 100 | 100 |
| 21 | c | 102/133 (77%) | 100 (98%) | 2 (2%) | 0 | 100 | 100 |
| 21 | g | 104/133 (78%) | 101 (97%) | 3 (3%) | 0 | 100 | 100 |
| 22 | d | 91/129 (70%) | 88 (97%) | 3 (3%) | 0 | 100 | 100 |
| 22 | h | 92/129 (71%) | 90 (98%) | 2 (2%) | 0 | 100 | 100 |
| 23 | m | 1170/1503 (78%) | 1152 (98%) | 18 (2%) | 0 | 100 | 100 |
| 24 | n | 137/417 (33%) | 136 (99%) | 1 (1%) | 0 | 100 | 100 |
| 25 | q | 928/1084 (86%) | 923 (100%) | 5 (0%) | 0 | 100 | 100 |
| 26 | r | 260/544 (48%) | 254 (98%) | 6 (2%) | 0 | 100 | 100 |
| 27 | s | 429/725 (59%) | 417 (97%) | 12 (3%) | 0 | 100 | 100 |
| 28 | u | 206/459 (45%) | 206 (100%) | 0 | 0 | 100 | 100 |
| 29 | v | 341/396 (86%) | 330 (97%) | 11 (3%) | 0 | 100 | 100 |
| 30 | x | 201/395 (51%) | 200 (100%) | 1 (0%) | 0 | 100 | 100 |
| All | All | 9001/12191 (74%) | 8814 (98%) | 186 (2%) | 1 (0%) | 100 | 100 |

All (1) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | A | 960 | VAL |

### 5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles |
|---|---|---|---|---|---|
| 1 | A | 1219/1528 (80%) | 1219 (100%) | 0 | 100 100 |
| 2 | B | 1018/1077 (94%) | 1014 (100%) | 4 (0%) | 89 91 |
| 3 | C | 236/264 (89%) | 236 (100%) | 0 | 100 100 |
| 4 | D | 149/160 (93%) | 149 (100%) | 0 | 100 100 |
| 5 | E | 196/197 (100%) | 196 (100%) | 0 | 100 100 |
| 6 | F | 75/137 (55%) | 75 (100%) | 0 | 100 100 |
| 7 | G | 148/148 (100%) | 148 (100%) | 0 | 100 100 |
| 8 | H | 120/130 (92%) | 120 (100%) | 0 | 100 100 |
| 9 | I | 106/109 (97%) | 106 (100%) | 0 | 100 100 |
| 10 | J | 61/66 (92%) | 61 (100%) | 0 | 100 100 |
| 11 | K | 104/109 (95%) | 104 (100%) | 0 | 100 100 |
| 12 | L | 38/56 (68%) | 38 (100%) | 0 | 100 100 |
| 13 | M | 61/99 (62%) | 61 (100%) | 0 | 100 100 |
| 17 | V | 90/92 (98%) | 90 (100%) | 0 | 100 100 |
| 18 | W | 482/796 (61%) | 482 (100%) | 0 | 100 100 |
| 19 | a | 87/112 (78%) | 87 (100%) | 0 | 100 100 |
| 19 | e | 77/112 (69%) | 77 (100%) | 0 | 100 100 |
| 20 | b | 66/81 (82%) | 66 (100%) | 0 | 100 100 |
| 20 | f | 66/81 (82%) | 66 (100%) | 0 | 100 100 |
| 21 | c | 83/102 (81%) | 83 (100%) | 0 | 100 100 |
| 21 | g | 84/102 (82%) | 84 (100%) | 0 | 100 100 |
| 22 | d | 79/107 (74%) | 79 (100%) | 0 | 100 100 |
| 22 | h | 80/107 (75%) | 80 (100%) | 0 | 100 100 |
| 23 | m | 1079/1354 (80%) | 1078 (100%) | 1 (0%) | 92 95 |
| 24 | n | 125/361 (35%) | 125 (100%) | 0 | 100 100 |
| 25 | q | 824/962 (86%) | 824 (100%) | 0 | 100 100 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles |
|---|---|---|---|---|---|
| 26 | r | 239/485 (49%) | 239 (100%) | 0 | 100 100 |
| 27 | s | 380/649 (59%) | 380 (100%) | 0 | 100 100 |
| 28 | u | 192/406 (47%) | 192 (100%) | 0 | 100 100 |
| 29 | v | 325/369 (88%) | 325 (100%) | 0 | 100 100 |
| 30 | x | 190/354 (54%) | 190 (100%) | 0 | 100 100 |
| All | All | 8079/10712 (75%) | 8074 (100%) | 5 (0%) | 92 95 |

All (5) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 2 | B | 425 | MET |
| 2 | B | 815 | ARG |
| 2 | B | 879 | ARG |
| 2 | B | 904 | ARG |
| 23 | m | 770 | PHE |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (102) such sidechains are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | A | 54 | ASN |
| 1 | A | 278 | GLN |
| 1 | A | 288 | HIS |
| 1 | A | 291 | ASN |
| 1 | A | 387 | HIS |
| 1 | A | 661 | ASN |
| 1 | A | 690 | GLN |
| 1 | A | 769 | GLN |
| 1 | A | 839 | GLN |
| 1 | A | 1080 | GLN |
| 2 | B | 157 | HIS |
| 2 | B | 477 | ASN |
| 2 | B | 492 | ASN |
| 2 | B | 524 | GLN |
| 2 | B | 549 | ASN |
| 2 | B | 996 | HIS |
| 2 | B | 1074 | ASN |
| 2 | B | 1084 | GLN |
| 2 | B | 1179 | GLN |
| 3 | C | 8 | ASN |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 3 | C | 25 | ASN |
| 4 | D | 46 | HIS |
| 4 | D | 130 | ASN |
| 4 | D | 170 | ASN |
| 5 | E | 53 | GLN |
| 5 | E | 162 | GLN |
| 6 | F | 104 | ASN |
| 6 | F | 119 | GLN |
| 6 | F | 127 | GLN |
| 8 | H | 43 | ASN |
| 9 | I | 23 | GLN |
| 11 | K | 113 | ASN |
| 12 | L | 55 | HIS |
| 13 | M | 32 | ASN |
| 13 | M | 65 | GLN |
| 18 | W | 283 | ASN |
| 18 | W | 402 | HIS |
| 18 | W | 558 | ASN |
| 18 | W | 568 | GLN |
| 18 | W | 786 | ASN |
| 19 | a | 39 | HIS |
| 19 | a | 55 | GLN |
| 20 | b | 64 | ASN |
| 21 | c | 24 | GLN |
| 21 | c | 84 | GLN |
| 22 | d | 82 | HIS |
| 19 | e | 68 | GLN |
| 19 | e | 125 | GLN |
| 20 | f | 25 | ASN |
| 21 | g | 38 | ASN |
| 21 | g | 73 | ASN |
| 21 | g | 94 | ASN |
| 22 | h | 95 | GLN |
| 23 | m | 428 | HIS |
| 23 | m | 473 | ASN |
| 23 | m | 553 | HIS |
| 23 | m | 661 | GLN |
| 23 | m | 819 | ASN |
| 23 | m | 869 | HIS |
| 23 | m | 886 | HIS |
| 23 | m | 899 | GLN |
| 23 | m | 998 | ASN |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 23 | m | 1191 | ASN |
| 23 | m | 1193 | GLN |
| 23 | m | 1242 | GLN |
| 23 | m | 1338 | ASN |
| 23 | m | 1436 | ASN |
| 24 | n | 156 | GLN |
| 24 | n | 232 | GLN |
| 25 | q | 58 | ASN |
| 25 | q | 132 | ASN |
| 25 | q | 147 | ASN |
| 25 | q | 170 | ASN |
| 25 | q | 187 | GLN |
| 25 | q | 319 | ASN |
| 25 | q | 325 | ASN |
| 25 | q | 397 | ASN |
| 25 | q | 398 | GLN |
| 25 | q | 503 | GLN |
| 25 | q | 526 | ASN |
| 25 | q | 615 | HIS |
| 25 | q | 625 | HIS |
| 26 | r | 279 | GLN |
| 26 | r | 493 | ASN |
| 27 | s | 50 | GLN |
| 27 | s | 82 | ASN |
| 27 | s | 83 | ASN |
| 27 | s | 114 | GLN |
| 27 | s | 139 | GLN |
| 27 | s | 171 | GLN |
| 27 | s | 311 | ASN |
| 27 | s | 375 | ASN |
| 28 | u | 103 | GLN |
| 28 | u | 138 | GLN |
| 28 | u | 172 | GLN |
| 28 | u | 261 | GLN |
| 29 | v | 64 | ASN |
| 29 | v | 199 | HIS |
| 29 | v | 283 | ASN |
| 29 | v | 381 | GLN |
| 30 | x | 246 | ASN |
| 30 | x | 251 | GLN |

### 5.3.3 RNA (i)

| Mol | Chain | Analysed | Backbone Outliers | Pucker Outliers |
|---|---|---|---|---|
| 15 | P | 18/19 (94%) | 8 (44%) | 1 (5%) |

All (8) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 15 | P | -6 | C |
| 15 | P | -5 | C |
| 15 | P | -4 | U |
| 15 | P | -3 | U |
| 15 | P | -2 | U |
| 15 | P | -1 | U |
| 15 | P | 0 | G |
| 15 | P | 1 | U |

All (1) RNA pucker outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 15 | P | -4 | U |

## 5.4 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

## 5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry (i)

Of 15 ligands modelled in this entry, 14 are monoatomic - leaving 1 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Counts | RMSZ | $\#\|Z\| > 2$ | Counts | RMSZ | $\#\|Z\| > 2$ |
| 33 | SAH | s | 1904 | - | 24,28,28 | 0.84 | 1 (4%) | 25,40,40 | 0.74 | 0 |

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|---|---|---|---|---|---|---|---|
| 33 | SAH | s | 1904 | - | - | 2/11/31/31 | 0/3/3/3 |

All (1) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|---|---|---|---|---|---|---|---|
| 33 | s | 1904 | SAH | C8-N7 | -2.48 | 1.30 | 1.34 |

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

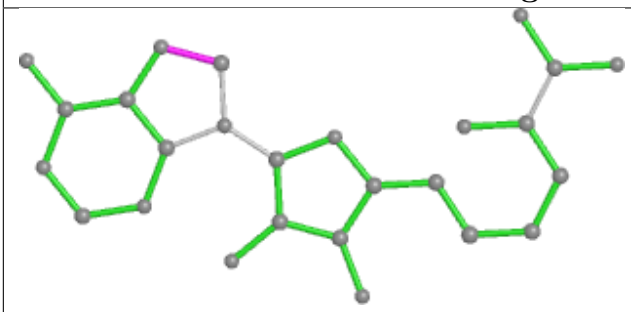
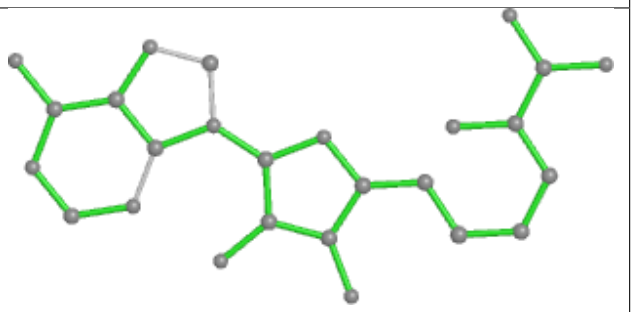
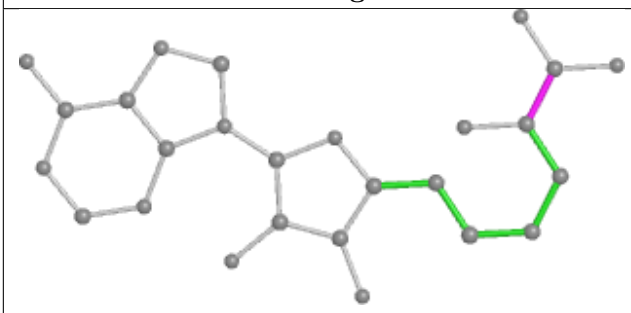
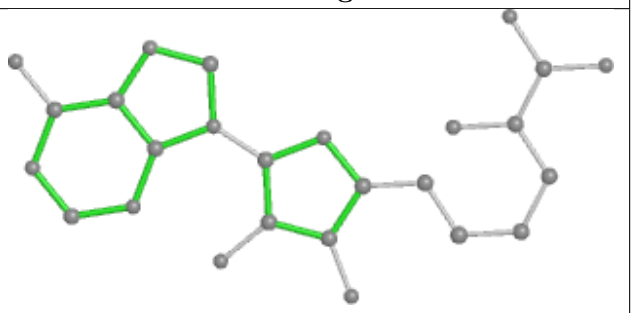
| Mol | Chain | Res | Type | Atoms |
|---|---|---|---|---|
| 33 | s | 1904 | SAH | O-C-CA-N |
| 33 | s | 1904 | SAH | OXT-C-CA-N |

There are no ring outliers.

1 monomer is involved in 1 short contact:

| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|---|---|---|---|---|---|
| 33 | s | 1904 | SAH | 1 | 0 |

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

| Ligand SAH s 1904 | |
|---|---|
|  Bond lengths |  Bond angles |
|  Torsions |  Rings |

## 5.7 Other polymers

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

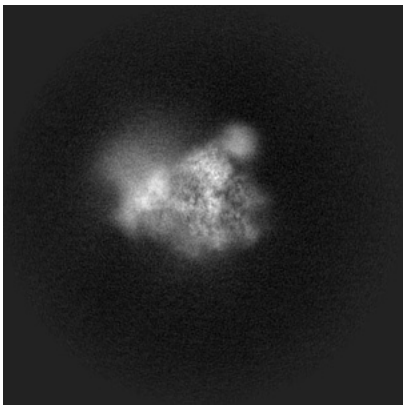
# 6 Map visualisation

This section contains visualisations of the EMDB entry EMD-66105. These allow visual inspection of the internal detail of the map and identification of artifacts.

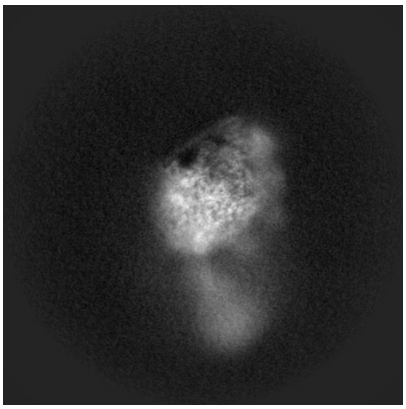
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

## 6.1 Orthogonal projections

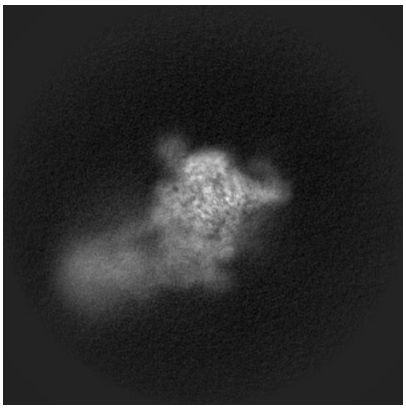
### 6.1.1 Primary map



X

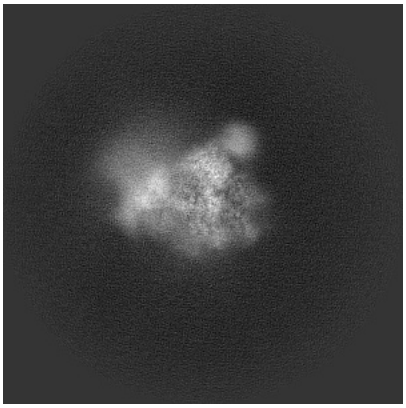


Y

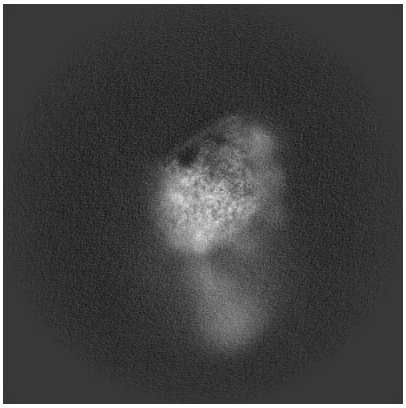


Z

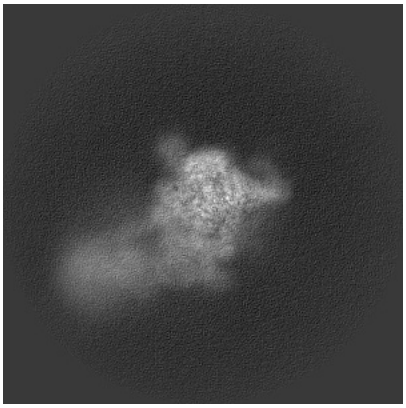
### 6.1.2 Raw map



X



Y

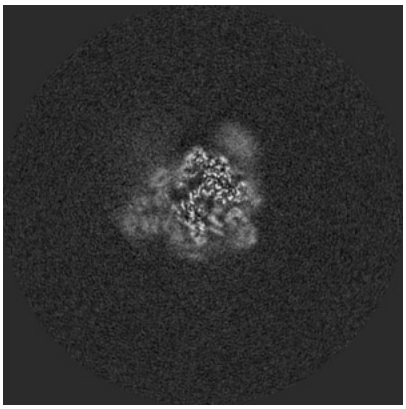


Z

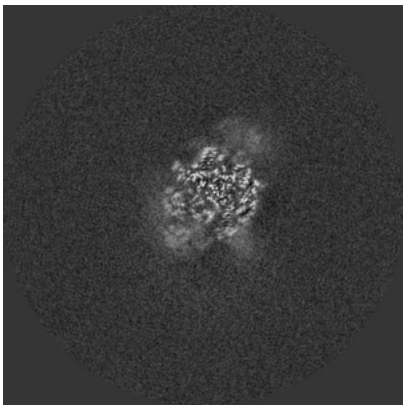
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices (i)

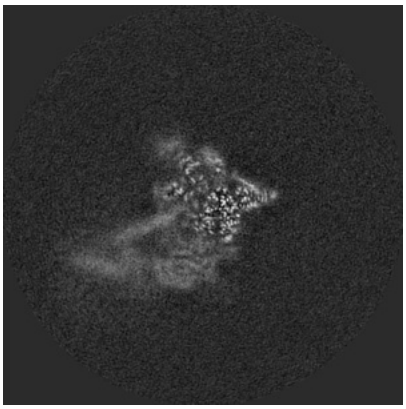
### 6.2.1 Primary map



X Index: 180

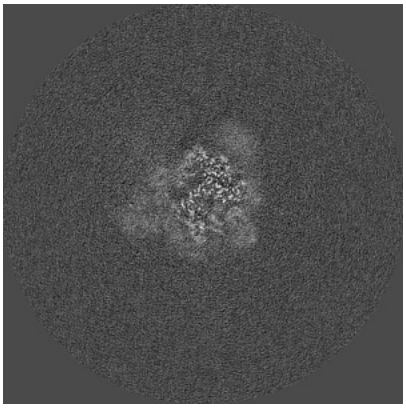


Y Index: 180

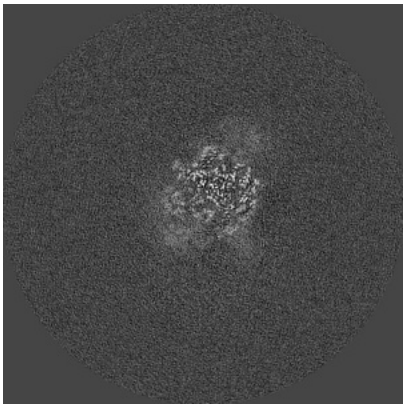


Z Index: 180

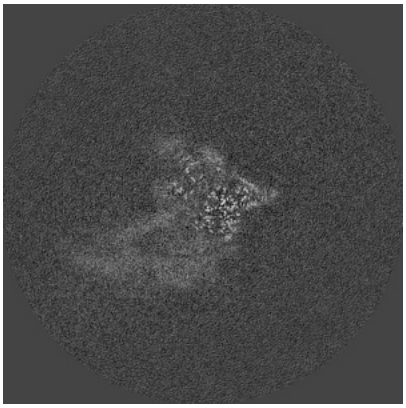
### 6.2.2 Raw map



X Index: 180



Y Index: 180

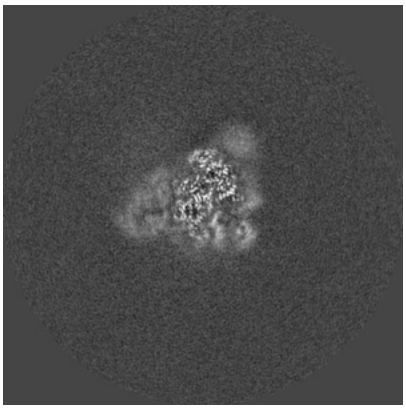


Z Index: 180

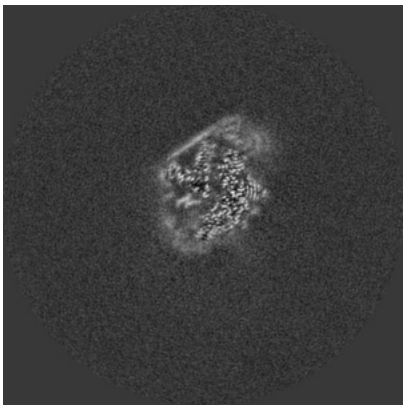
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices (i)

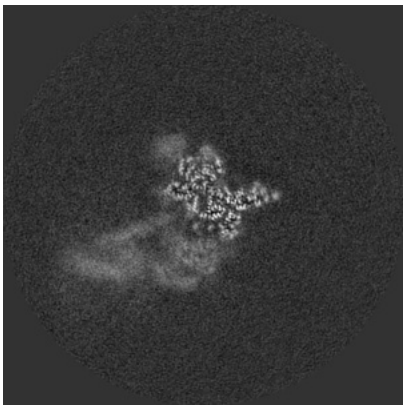
### 6.3.1 Primary map



X Index: 185

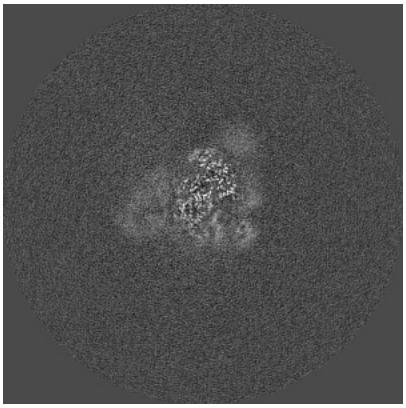


Y Index: 189

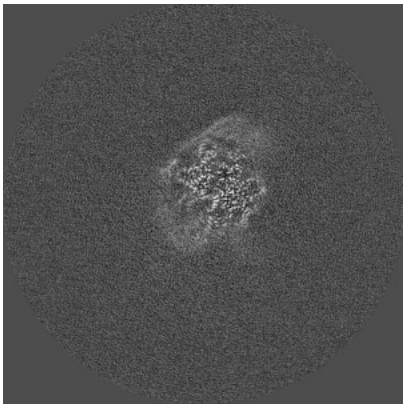


Z Index: 184

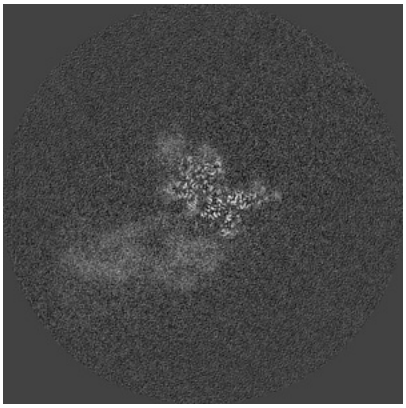
### 6.3.2 Raw map



X Index: 185



Y Index: 186

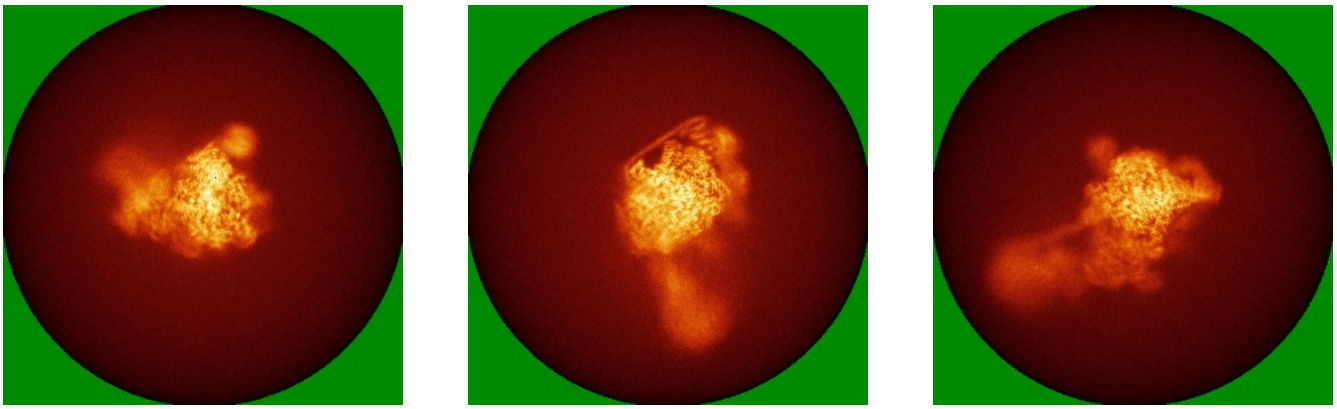


Z Index: 185

The images above show the largest variance slices of the map in three orthogonal directions.

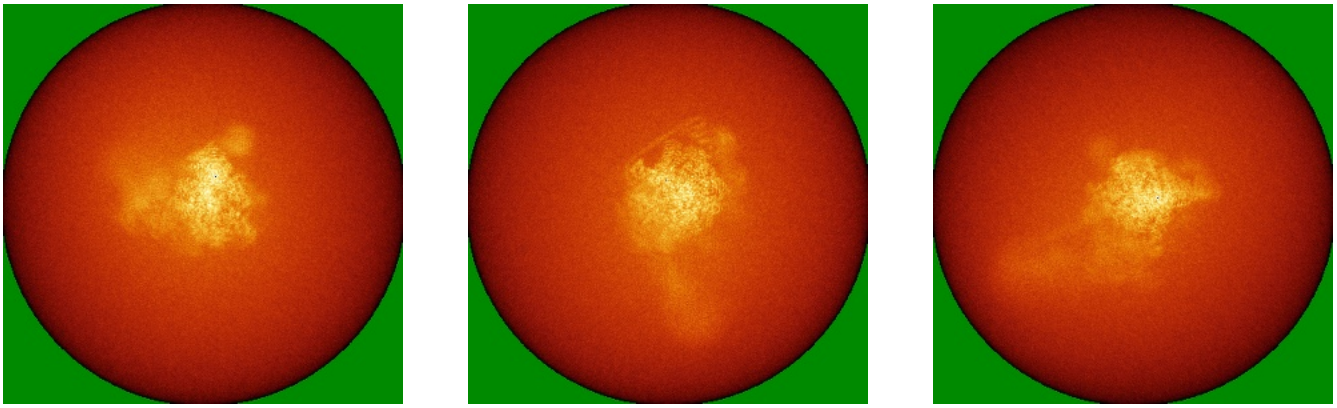
## 6.4 Orthogonal standard-deviation projections (False-color) (i)

### 6.4.1 Primary map



X Y Z

### 6.4.2 Raw map



X Y Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

## 6.5 Orthogonal surface views (i)

### 6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.014. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map

X Y Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

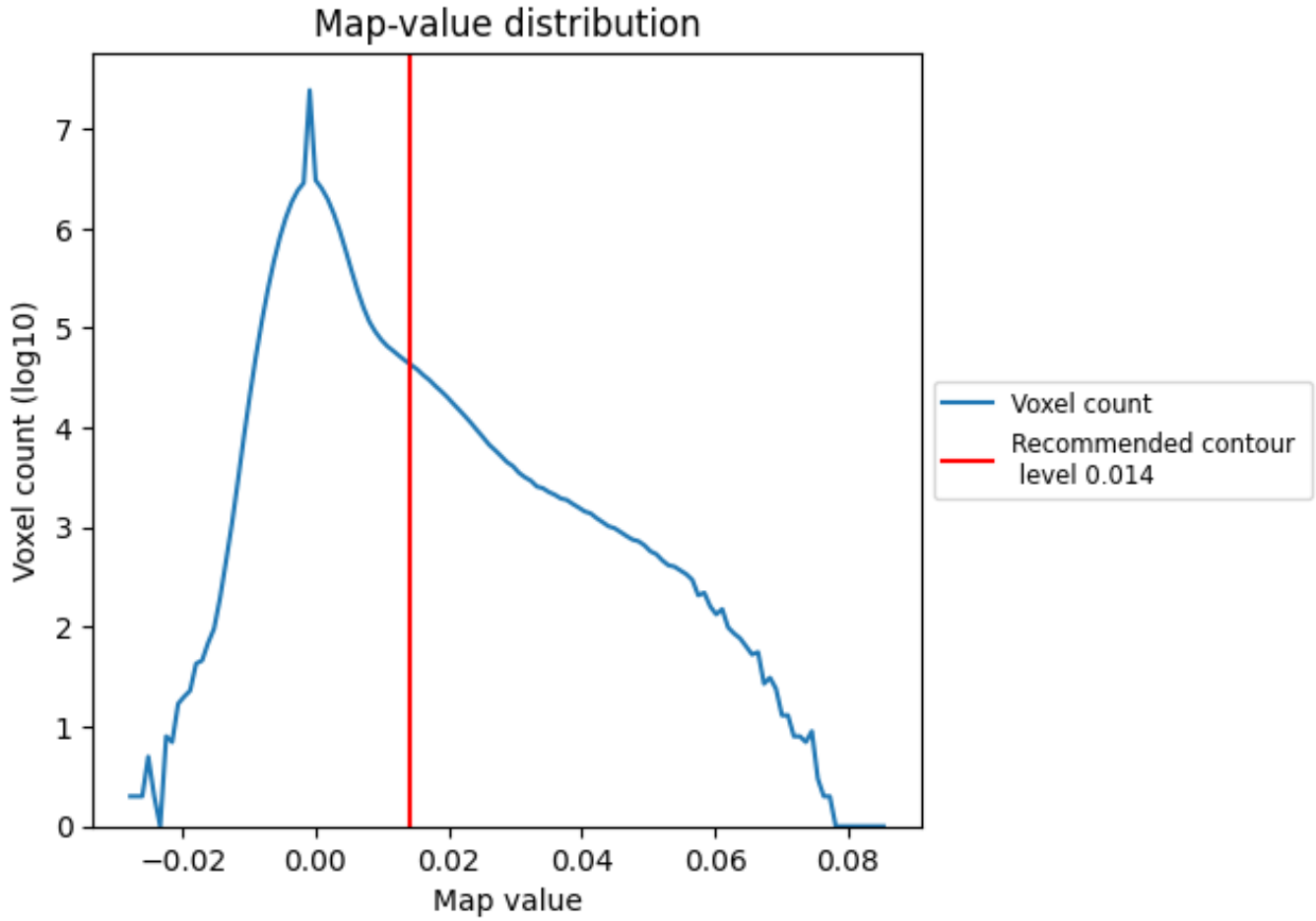
## 6.6 Mask visualisation (i)

This section was not generated. No masks/segmentation were deposited.

# 7 Map analysis

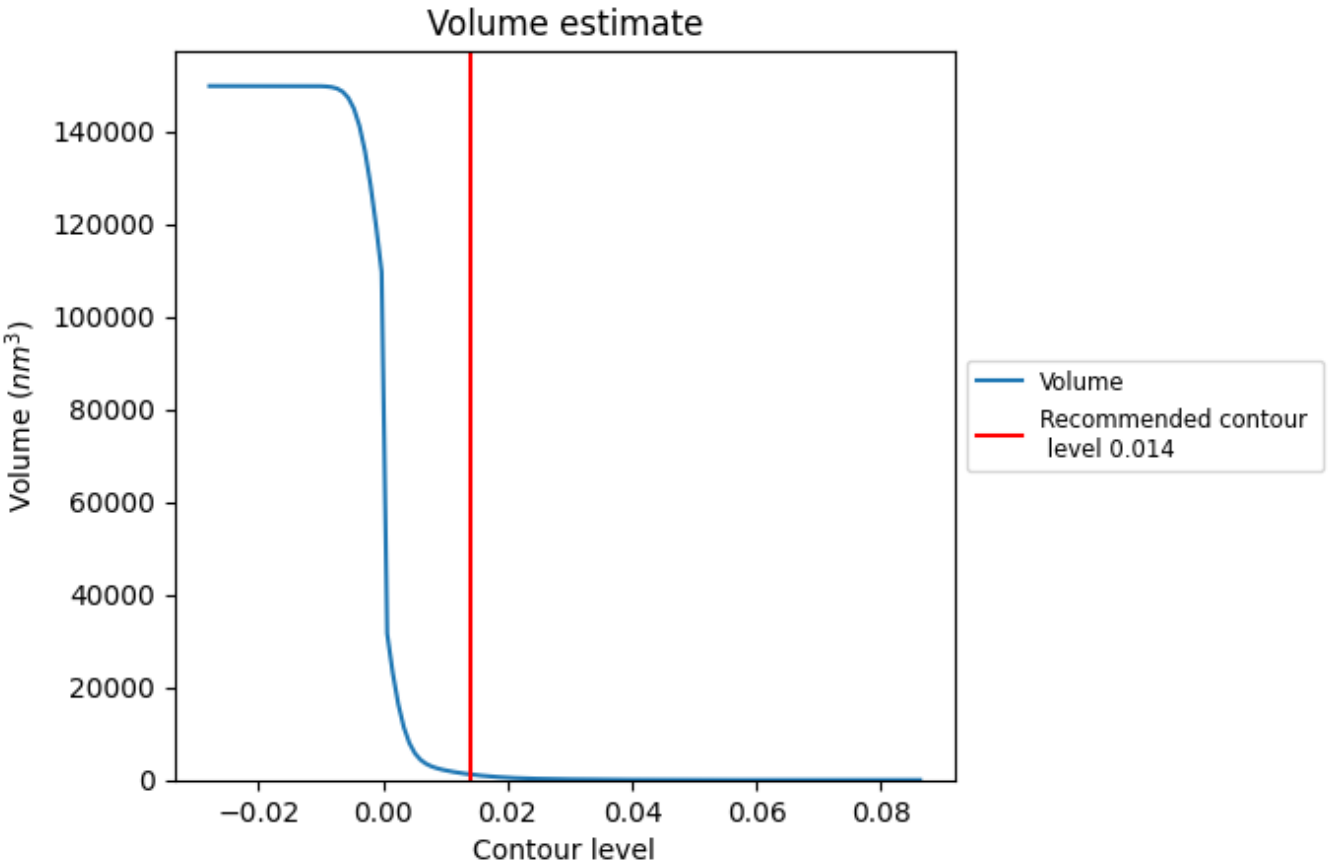
This section contains the results of statistical analysis of the map.

## 7.1 Map-value distribution




The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

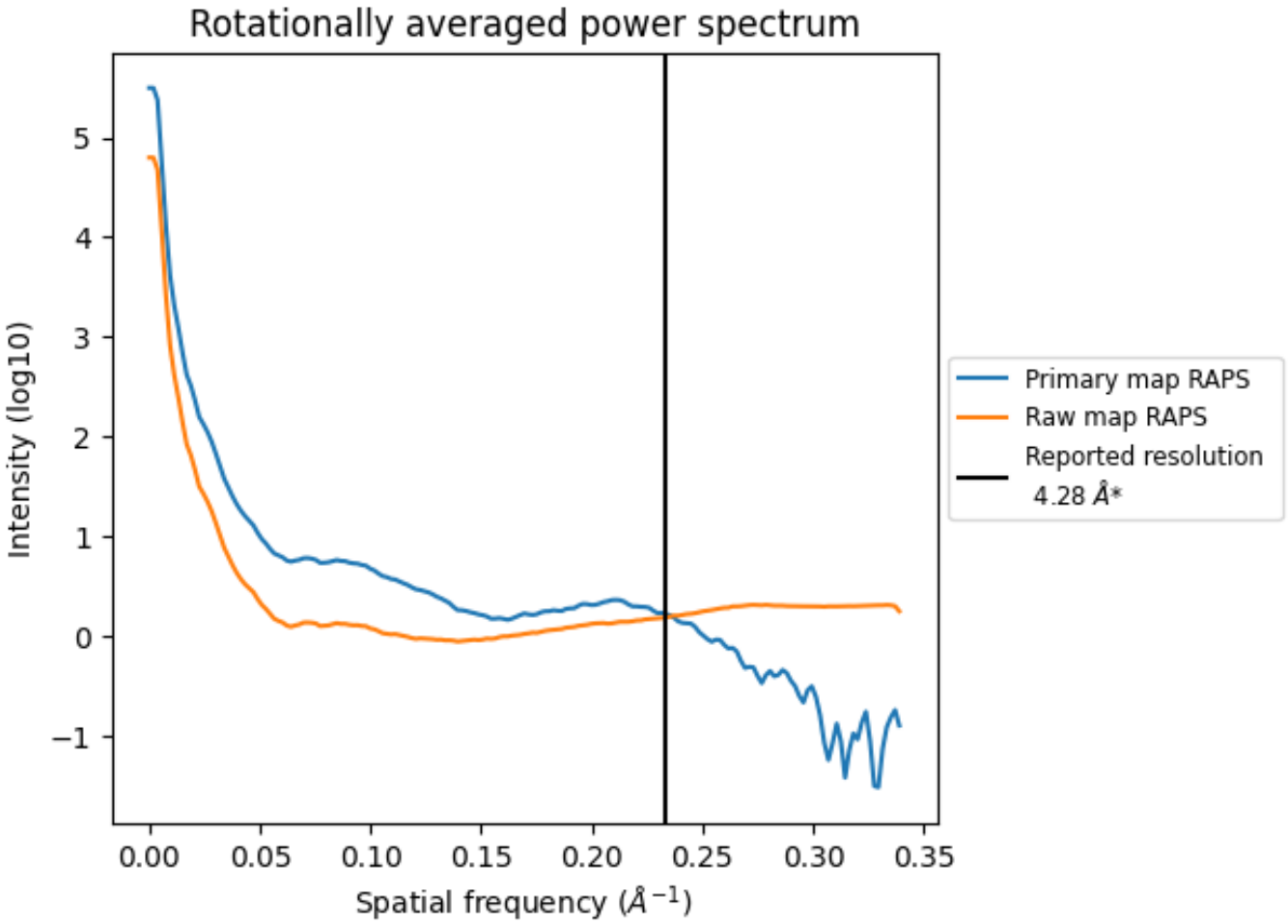
## 7.2 Volume estimate




The volume at the recommended contour level is 1212 $nm^3$; this corresponds to an approximate mass of 1095 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

## 7.3 Rotationally averaged power spectrum (i)

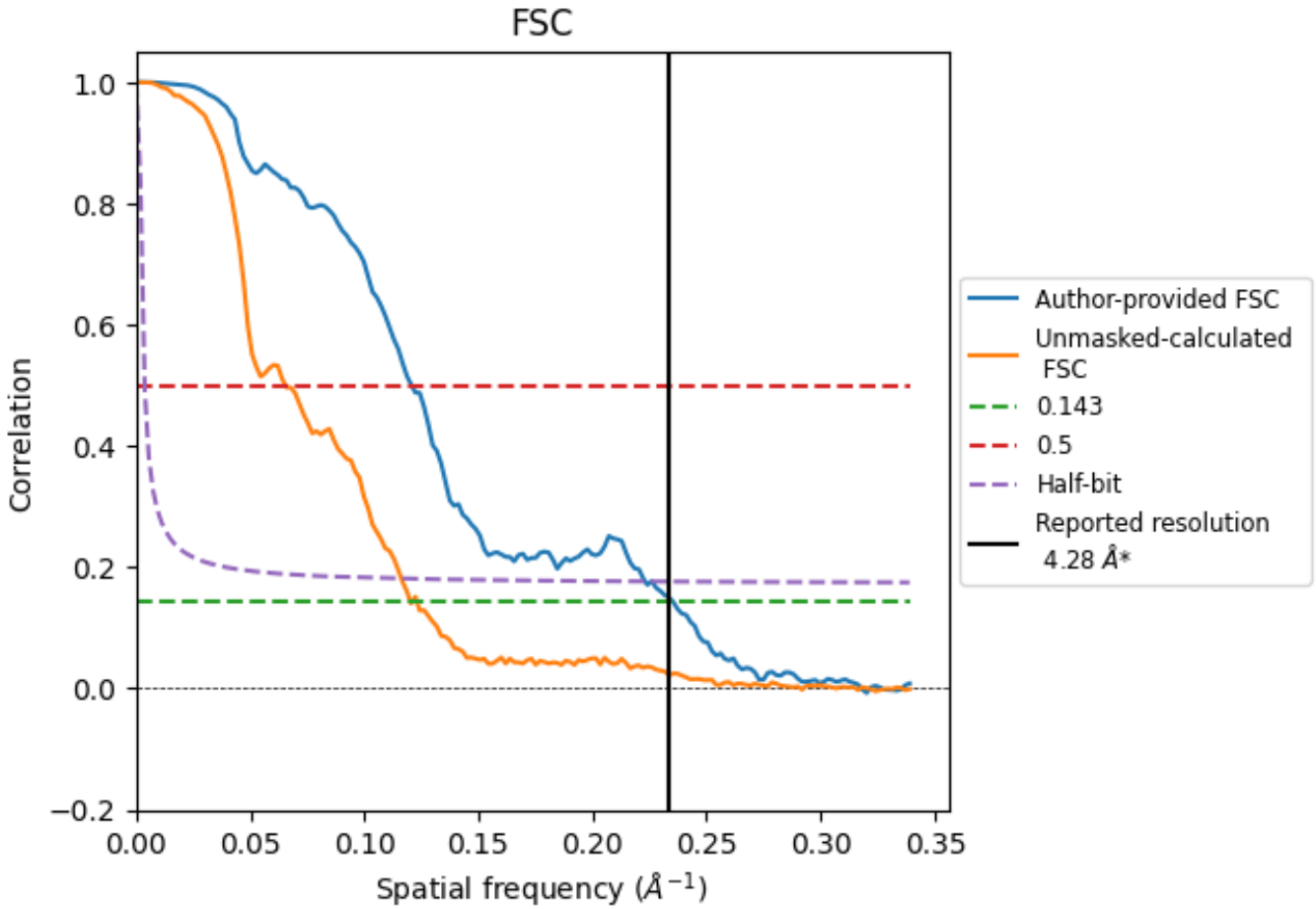



*Reported resolution corresponds to spatial frequency of 0.234 Å$^{-1}$

# 8 Fourier-Shell correlation

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

## 8.1 FSC




*Reported resolution corresponds to spatial frequency of 0.234 Å$^{-1}$

## 8.2 Resolution estimates (i)

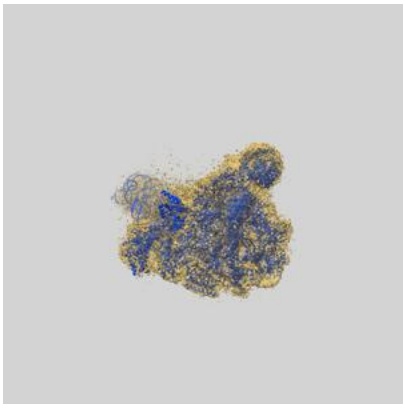
| Resolution estimate (Å) | Estimation criterion (FSC cut-off) | | |
|---|---|---|---|
| | 0.143 | 0.5 | Half-bit |
| Reported by author | 4.28 | - | - |
| Author-provided FSC curve | 4.25 | 8.29 | 4.48 |
| Unmasked-calculated* | 8.31 | 15.27 | 8.61 |

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 8.31 differs from the reported value 4.28 by more than 10 %

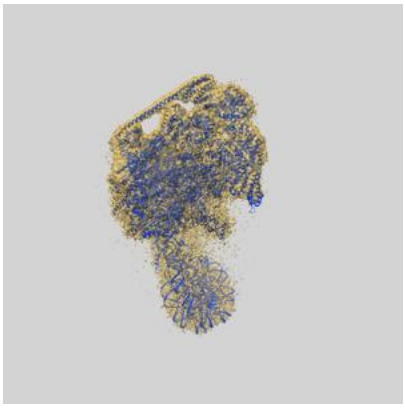
# 9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-66105 and PDB model 9WMU. Per-residue inclusion information can be found in section 3 on page 17.

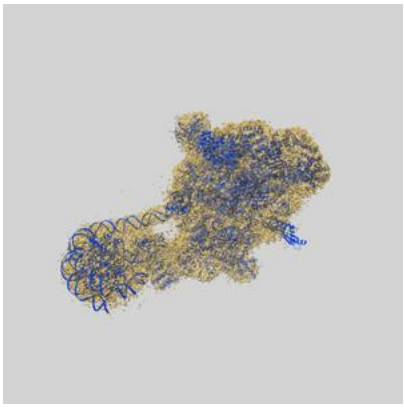
## 9.1 Map-model overlay



X



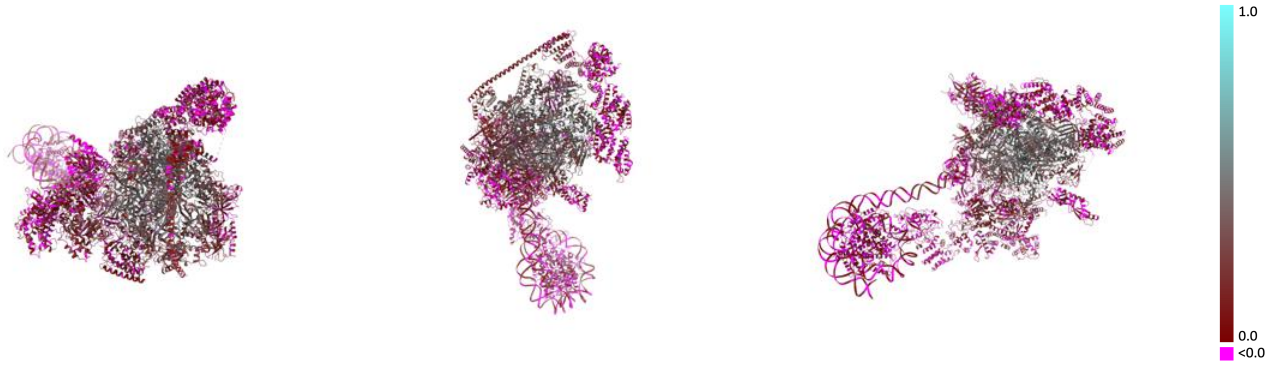
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.014 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

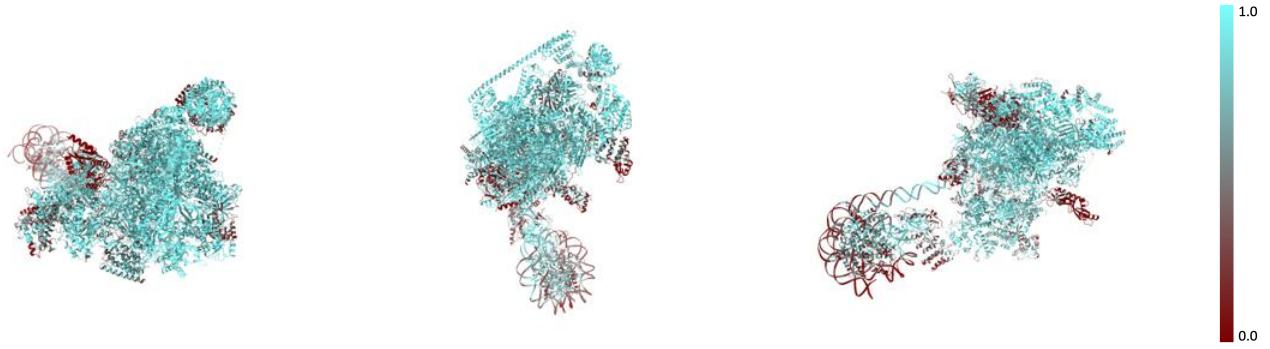
## 9.2 Q-score mapped to coordinate model




X Y Z

The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

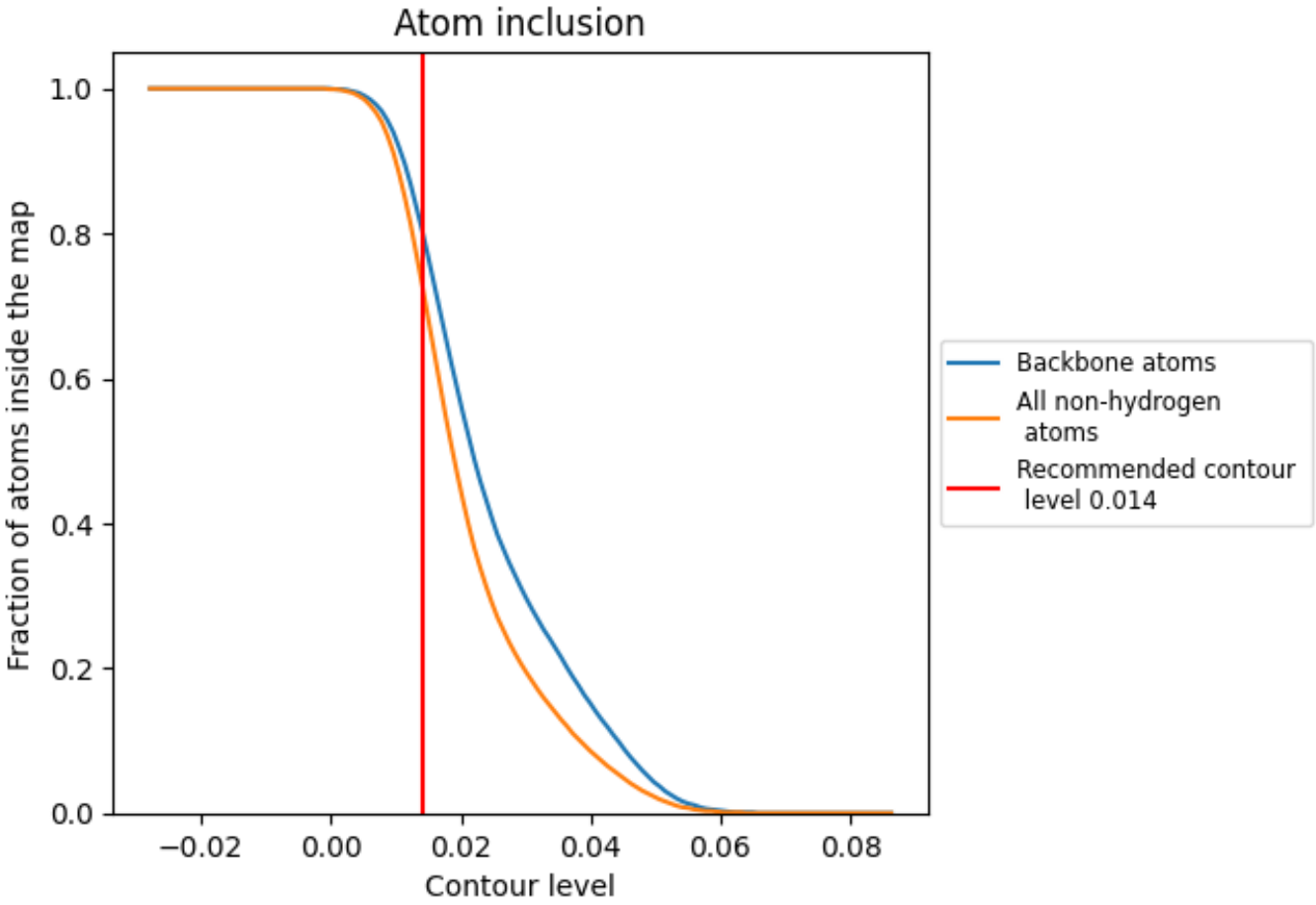
## 9.3 Atom inclusion mapped to coordinate model




X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.014).

## 9.4 Atom inclusion (i)




At the recommended contour level, 81% of all backbone atoms, 73% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.014) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion | Q-score |
|---|---|---|
| All | 0.7320 | 0.1890 |
| A | 0.9240 | 0.3800 |
| B | 0.9050 | 0.3800 |
| C | 0.9160 | 0.4000 |
| D | 0.8150 | 0.1620 |
| E | 0.9490 | 0.3470 |
| F | 0.9420 | 0.4200 |
| G | 0.8500 | 0.2590 |
| H | 0.9310 | 0.3910 |
| I | 0.8830 | 0.2090 |
| J | 0.9130 | 0.3920 |
| K | 0.9320 | 0.4130 |
| L | 0.9050 | 0.3330 |
| M | 0.8310 | 0.1350 |
| N | 0.5000 | 0.0580 |
| P | 0.8940 | 0.2780 |
| T | 0.5330 | 0.0910 |
| V | 0.8510 | 0.0580 |
| W | 0.7370 | 0.1260 |
| a | 0.7680 | 0.0230 |
| b | 0.7770 | 0.0380 |
| c | 0.4920 | 0.0280 |
| d | 0.5680 | 0.0150 |
| e | 0.3760 | 0.0300 |
| f | 0.4000 | -0.0160 |
| g | 0.6670 | 0.0170 |
| h | 0.5320 | 0.0240 |
| m | 0.6350 | 0.0860 |
| n | 0.6740 | 0.1170 |
| q | 0.7460 | 0.0730 |
| r | 0.4490 | 0.0880 |
| s | 0.5110 | 0.0240 |
| u | 0.4790 | 0.0960 |
| v | 0.5030 | 0.0580 |
| x | 0.7500 | 0.1980 |