# W O R L D W I D E

# wwPDB

## P R O T E I N   D A T A   B A N K

# wwPDB EM Validation Summary Report (i)

Oct 26, 2024 – 11:10 AM EDT

|              |     |                                         |
| ------------ | --- | --------------------------------------- |
| PDB ID       | :   | 5W5Y                                    |
| EMDB ID      | :   | EMD-8771                                |
| Title        | :   | RNA polymerase I Initial Transcribing Complex |
| Authors      | :   | Han, Y.; He, Y.                         |
| Deposited on | :   | 2017-06-16                              |
| Resolution   | :   | 3.80 Å(reported)                        |

# 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 3.80 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.
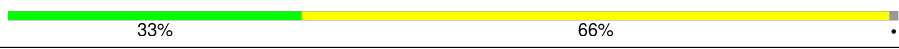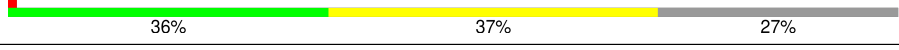
| Metric | Percentile Ranks | Value |
|--------|------------------|-------|
| Clashscore | | 82 |
| Ramachandran outliers | | 4.1% |
| Sidechain outliers | | 5.0% |
| RNA backbone | | 0.25 |

*Worse*  *Better*

▮ Percentile relative to all structures

▯ Percentile relative to all EM structures
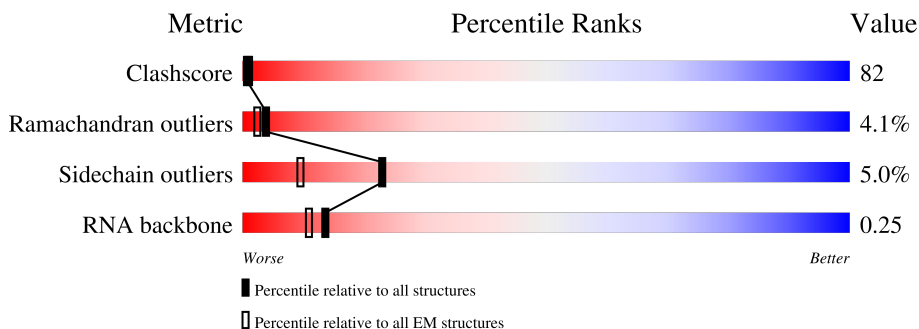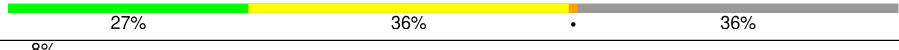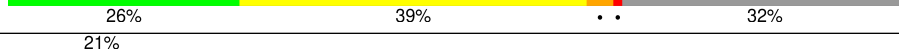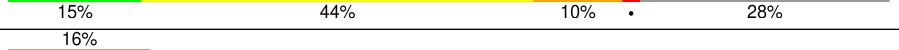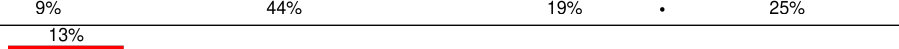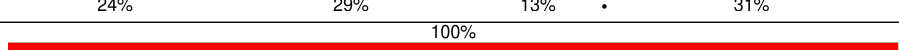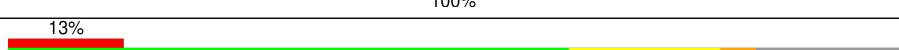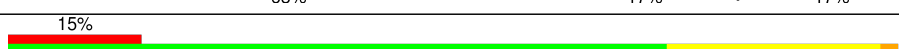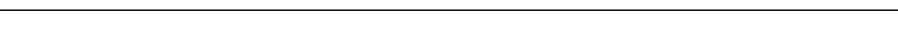
| Metric | Whole archive (#Entries) | EM structures (#Entries) |
|--------|--------------------------|--------------------------|
| Clashscore | 210492 | 15764 |
| Ramachandran outliers | 207382 | 16835 |
| Sidechain outliers | 206894 | 16415 |
| RNA backbone | 6643 | 2191 |

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 | 1664 | 46%    40%    •    12% |
| 2 | B | 1203 | 45%    50%    •    • |
| 3 | C | 335 | 44%    45%    •    9% |
| 4 | D | 137 | 21%    22%    57% |
| 5 | E | 215 | 45%    54%    • |
| 6 | F | 155 | 32%    21%    46% |
| 7 | G | 326 | 6%    16%    44%    •    38% |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 8 | H | 146 | 46%   45%   9% |
| 9 | I | 125 | 24%   25%   48% |
| 10 | J | 70 | 33%   66% |
| 11 | K | 142 | 36%   37%   27% |
| 12 | L | 70 | 27%   36%   36% |
| 13 | M | 415 | 8%   7%   16%   74% |
| 14 | N | 233 | 29%   26%   39%   32% |
| 15 | O | 894 | 21%   15%   44%   10%   28% |
| 16 | P | 514 | 16%   9%   44%   19%   25% |
| 17 | Q | 507 | 13%   24%   29%   13%   31% |
| 18 | R | 6 | 100%   100% |
| 19 | S | 54 | 13%   63%   17%   17% |
| 20 | T | 54 | 15%   74%   24% |

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

| Mol | Type | Chain | Res | Chirality | Geometry | Clashes | Electron density |
|-----|------|-------|-----|-----------|----------|---------|------------------|
| 21 | ZN | A | 1701 | - | - | X | - |

# 2 Entry composition ⓘ

There are 21 unique types of molecules in this entry. The entry contains 46572 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 I subunit RPA190.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 1 | A | 1461 | Total 11542 | C 7292 | N 2004 | O 2184 | S 62 | 0 | 0 |

- Molecule 2 is a protein called DNA-directed RNA polymerase I subunit RPA135.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 2 | B | 1178 | Total 9351 | C 5911 | N 1639 | O 1750 | S 51 | 0 | 0 |

- Molecule 3 is a protein called DNA-directed RNA polymerases I and III subunit RPAC1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 3 | C | 306 | Total 2432 | C 1544 | N 417 | O 463 | S 8 | 0 | 0 |

- Molecule 4 is a protein called DNA-directed RNA polymerase I subunit RPA14.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 4 | D | 59 | Total 467 | C 293 | N 80 | O 94 | 0 | 0 |

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

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 5 | E | 215 | Total 1760 | C 1116 | N 310 | O 322 | S 12 | 0 | 0 |

- Molecule 6 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 6 | F | 83 | Total 670 | C 428 | N 114 | O 125 | S 3 | 0 | 0 |

- Molecule 7 is a protein called DNA-directed RNA polymerase I subunit RPA43.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 7 | G | 201 | Total | C | N | O | S | 0 | 0 |
| | | | 1592 | 1022 | 275 | 290 | 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 |
| | | | 1071 | 676 | 181 | 210 | 4 | | |

- Molecule 9 is a protein called DNA-directed RNA polymerase I subunit RPA12.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 9 | I | 65 | Total | C | N | O | S | 0 | 0 |
| | | | 479 | 300 | 79 | 96 | 4 | | |

- Molecule 10 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC5.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 10 | J | 69 | Total | C | N | O | S | 0 | 0 |
| | | | 569 | 362 | 101 | 100 | 6 | | |

- Molecule 11 is a protein called DNA-directed RNA polymerases I and III subunit RPAC2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 11 | K | 103 | Total | C | N | O | S | 0 | 0 |
| | | | 811 | 506 | 132 | 168 | 5 | | |

- Molecule 12 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC4.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|
| 12 | L | 45 | Total | C | N | O | S | 0 | 0 |
| | | | 359 | 221 | 71 | 63 | 4 | | |

- Molecule 13 is a protein called DNA-directed RNA polymerase I subunit RPA49.

| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|
| 13 | M | 106 | Total | C | N | O | 0 | 0 |
| | | | 841 | 534 | 139 | 168 | | |

- Molecule 14 is a protein called DNA-directed RNA polymerase I subunit RPA34.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | Total | C | N | O | S | | |
| 14 | N | 158 | 1254 | 799 | 205 | 246 | 4 | 0 | 0 |

- Molecule 15 is a protein called RNA polymerase I-specific transcription initiation factor RRN6.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | Total | C | N | O | S | | |
| 15 | O | 640 | 5063 | 3218 | 872 | 964 | 9 | 0 | 0 |

There are 52 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
| --- | --- | --- | --- | --- | --- |
| O | 4 | UNK | GLU | SEE REMARK 999 | UNP P32786 |
| O | 5 | UNK | ASP | SEE REMARK 999 | UNP P32786 |
| O | 6 | UNK | ALA | SEE REMARK 999 | UNP P32786 |
| O | 7 | UNK | LEU | SEE REMARK 999 | UNP P32786 |
| O | 8 | UNK | ASP | SEE REMARK 999 | UNP P32786 |
| O | 9 | UNK | LEU | SEE REMARK 999 | UNP P32786 |
| O | 10 | UNK | HIS | SEE REMARK 999 | UNP P32786 |
| O | 11 | UNK | ILE | SEE REMARK 999 | UNP P32786 |
| O | 12 | UNK | VAL | SEE REMARK 999 | UNP P32786 |
| O | 13 | UNK | VAL | SEE REMARK 999 | UNP P32786 |
| O | 14 | UNK | LYS | SEE REMARK 999 | UNP P32786 |
| O | 15 | UNK | SER | SEE REMARK 999 | UNP P32786 |
| O | 16 | UNK | LEU | SEE REMARK 999 | UNP P32786 |
| O | 17 | UNK | LEU | SEE REMARK 999 | UNP P32786 |
| O | 18 | UNK | CYS | SEE REMARK 999 | UNP P32786 |
| O | 19 | UNK | ASP | SEE REMARK 999 | UNP P32786 |
| O | 20 | UNK | THR | SEE REMARK 999 | UNP P32786 |
| O | 21 | UNK | ALA | SEE REMARK 999 | UNP P32786 |
| O | 22 | UNK | ILE | SEE REMARK 999 | UNP P32786 |
| O | 23 | UNK | ARG | SEE REMARK 999 | UNP P32786 |
| O | 24 | UNK | TYR | SEE REMARK 999 | UNP P32786 |
| O | 25 | UNK | ILE | SEE REMARK 999 | UNP P32786 |
| O | 26 | UNK | SER | SEE REMARK 999 | UNP P32786 |
| O | 27 | UNK | ASP | SEE REMARK 999 | UNP P32786 |
| O | 28 | UNK | ASP | SEE REMARK 999 | UNP P32786 |
| O | 41 | UNK | TYR | SEE REMARK 999 | UNP P32786 |
| O | 42 | UNK | ILE | SEE REMARK 999 | UNP P32786 |
| O | 43 | UNK | PRO | SEE REMARK 999 | UNP P32786 |
| O | 44 | UNK | SER | SEE REMARK 999 | UNP P32786 |
| O | 45 | UNK | ASP | SEE REMARK 999 | UNP P32786 |

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| Chain | Residue | Modelled | Actual | Comment | Reference |
|:---:|:---:|:---:|:---:|:---:|:---:|
| O | 46 | UNK | LEU | SEE REMARK 999 | UNP P32786 |
| O | 47 | UNK | LEU | SEE REMARK 999 | UNP P32786 |
| O | 48 | UNK | ARG | SEE REMARK 999 | UNP P32786 |
| O | 49 | UNK | ASN | SEE REMARK 999 | UNP P32786 |
| O | 50 | UNK | LEU | SEE REMARK 999 | UNP P32786 |
| O | 51 | UNK | ASP | SEE REMARK 999 | UNP P32786 |
| O | 52 | UNK | ASP | SEE REMARK 999 | UNP P32786 |
| O | 53 | UNK | THR | SEE REMARK 999 | UNP P32786 |
| O | 54 | UNK | LEU | SEE REMARK 999 | UNP P32786 |
| O | 55 | UNK | GLN | SEE REMARK 999 | UNP P32786 |
| O | 56 | UNK | GLU | SEE REMARK 999 | UNP P32786 |
| O | 57 | UNK | SER | SEE REMARK 999 | UNP P32786 |
| O | 58 | UNK | THR | SEE REMARK 999 | UNP P32786 |
| O | 59 | UNK | ASN | SEE REMARK 999 | UNP P32786 |
| O | 60 | UNK | SER | SEE REMARK 999 | UNP P32786 |
| O | 61 | UNK | SER | SEE REMARK 999 | UNP P32786 |
| O | 62 | UNK | ARG | SEE REMARK 999 | UNP P32786 |
| O | 63 | UNK | PRO | SEE REMARK 999 | UNP P32786 |
| O | 64 | UNK | MET | SEE REMARK 999 | UNP P32786 |
| O | 65 | UNK | GLN | SEE REMARK 999 | UNP P32786 |
| O | 66 | UNK | ASP | SEE REMARK 999 | UNP P32786 |
| O | 67 | UNK | ALA | SEE REMARK 999 | UNP P32786 |

- Molecule 16 is a protein called RNA polymerase I-specific transcription initiation factor RRN7.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|
| 16 | P | 387 | Total | C | N | O | S | 0 | 0 |
| | | | 3238 | 2105 | 540 | 576 | 17 | | |

- Molecule 17 is a protein called RNA polymerase I-specific transcription initiation factor RRN11.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|
| 17 | Q | 349 | Total | C | N | O | S | 0 | 0 |
| | | | 2923 | 1881 | 513 | 518 | 11 | | |

- Molecule 18 is a RNA chain called RNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|:---:|
| 18 | R | 6 | Total | C | N | O | P | 0 | 0 |
| | | | 127 | 58 | 25 | 39 | 5 | | |

- Molecule 19 is a DNA chain called non-template strand DNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|------|---------|-------|
| 19 | S | 45 | Total | C | N | O | P | 0 | 0 |
| | | | 935 | 447 | 174 | 270 | 44 | | |

- Molecule 20 is a DNA chain called template strand DNA.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|------|---------|-------|
| 20 | T | 54 | Total | C | N | O | P | 0 | 0 |
| | | | 1082 | 522 | 177 | 330 | 53 | | |

- Molecule 21 is ZINC ION (three-letter code: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms | | AltConf |
|-----|-------|----------|-------|----|---------|
| 21 | A | 2 | Total | Zn | 0 |
| | | | 2 | 2 | |
| 21 | B | 1 | Total | Zn | 0 |
| | | | 1 | 1 | |
| 21 | I | 1 | Total | Zn | 0 |
| | | | 1 | 1 | |
| 21 | J | 1 | Total | Zn | 0 |
| | | | 1 | 1 | |
| 21 | L | 1 | Total | Zn | 0 |
| | | | 1 | 1 | |

# 3   Residue-property plots ⓘ

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 I subunit RPA190



Chain A:

• Molecule 2: DNA-directed RNA polymerase I subunit RPA135

Chain B:
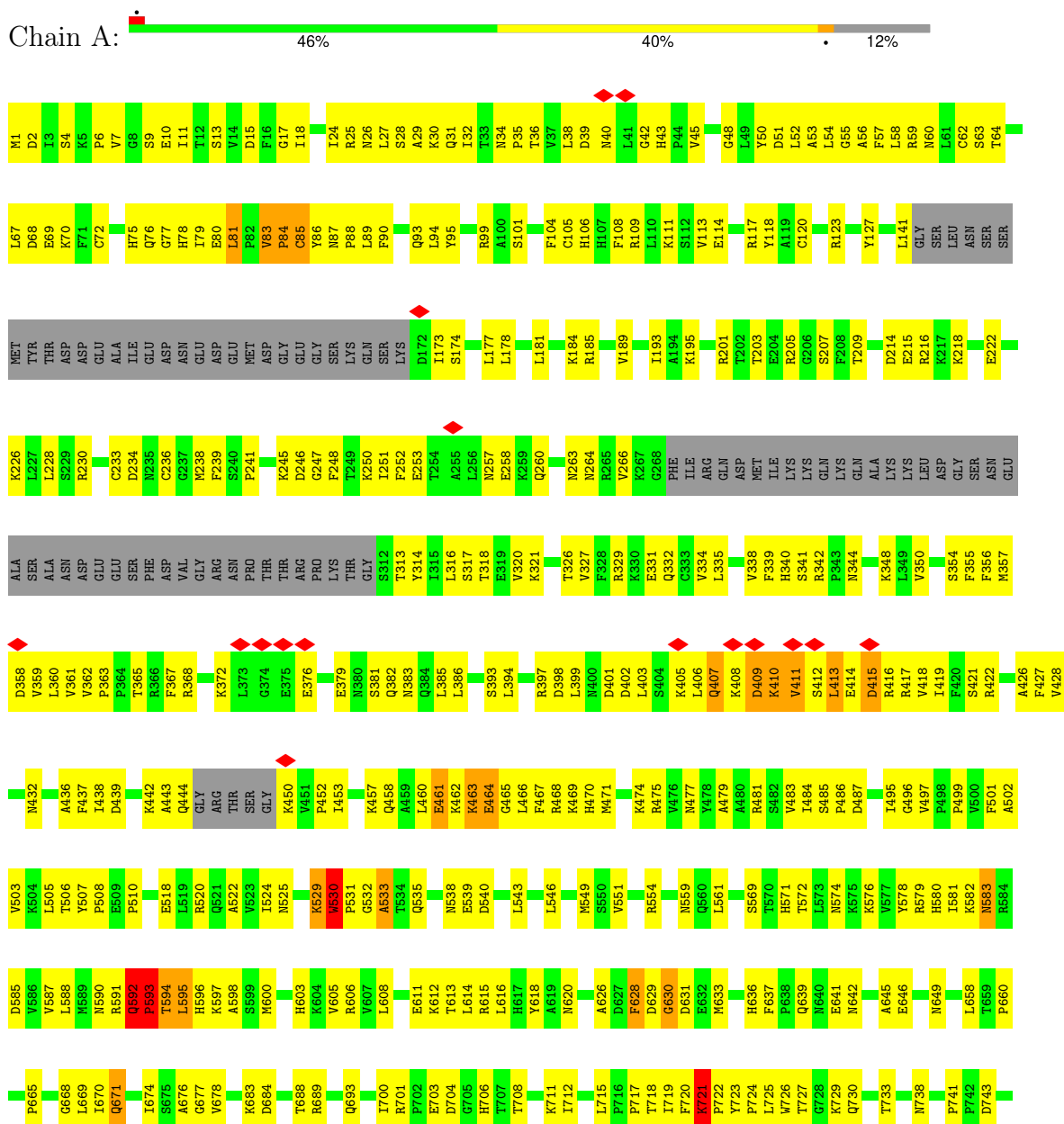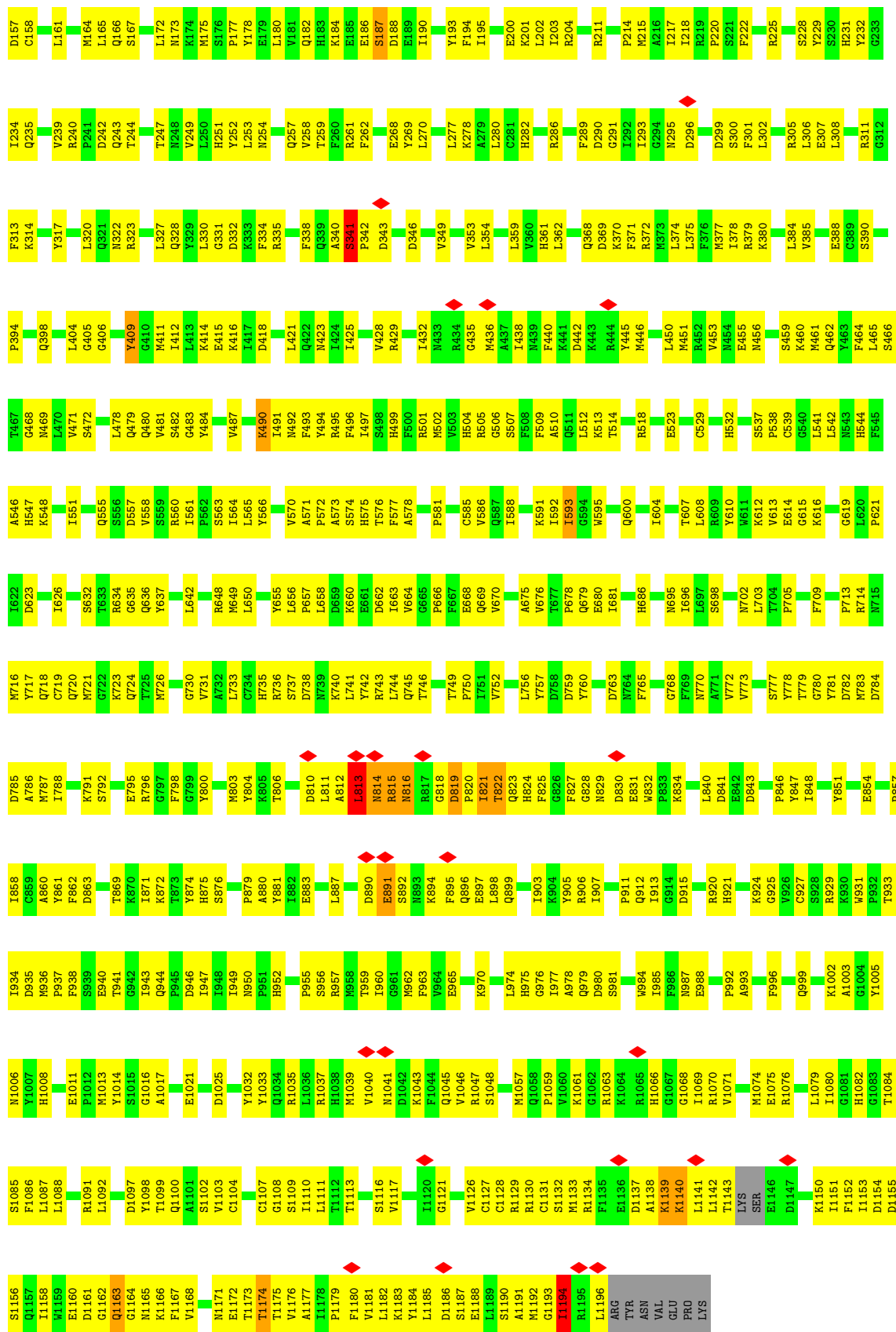
- Molecule 3: DNA-directed RNA polymerases I and III subunit RPAC1

Chain C:
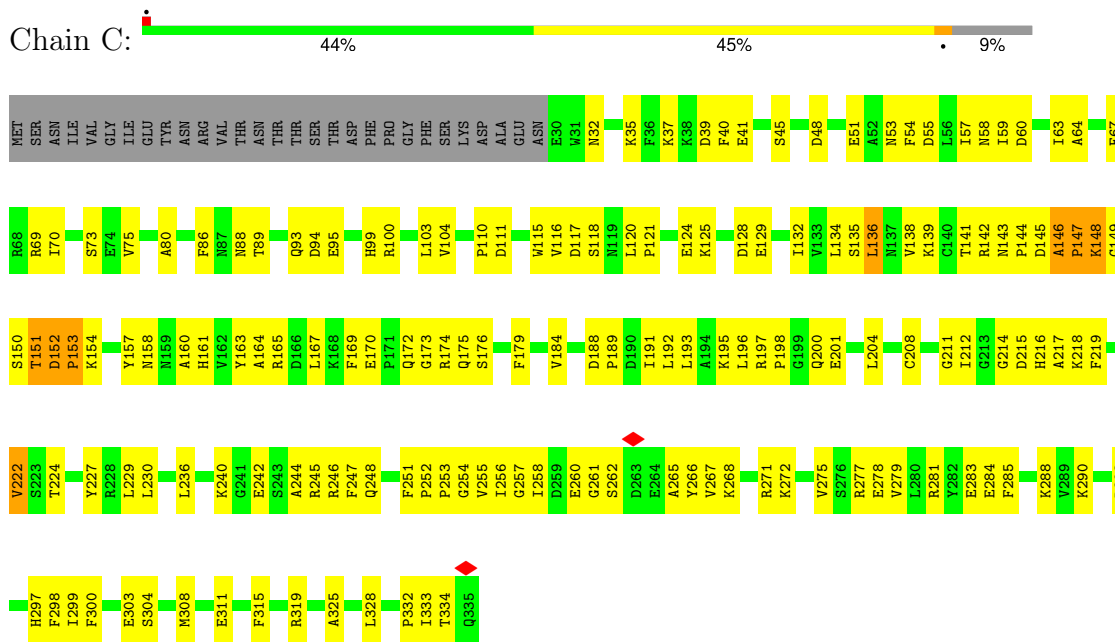


• Molecule 4: DNA-directed RNA polymerase I subunit RPA14

Chain D:



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

Chain E:



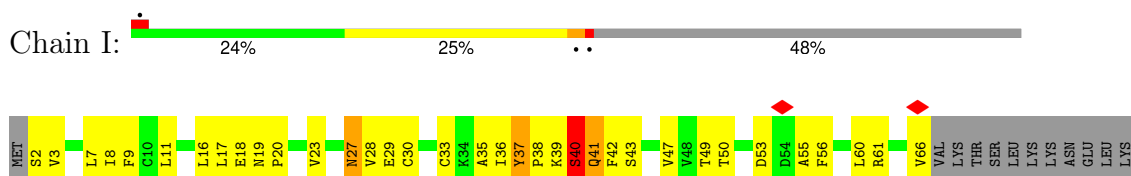• Molecule 6: DNA-directed RNA polymerases I, II, and III subunit RPABC2

Chain F:
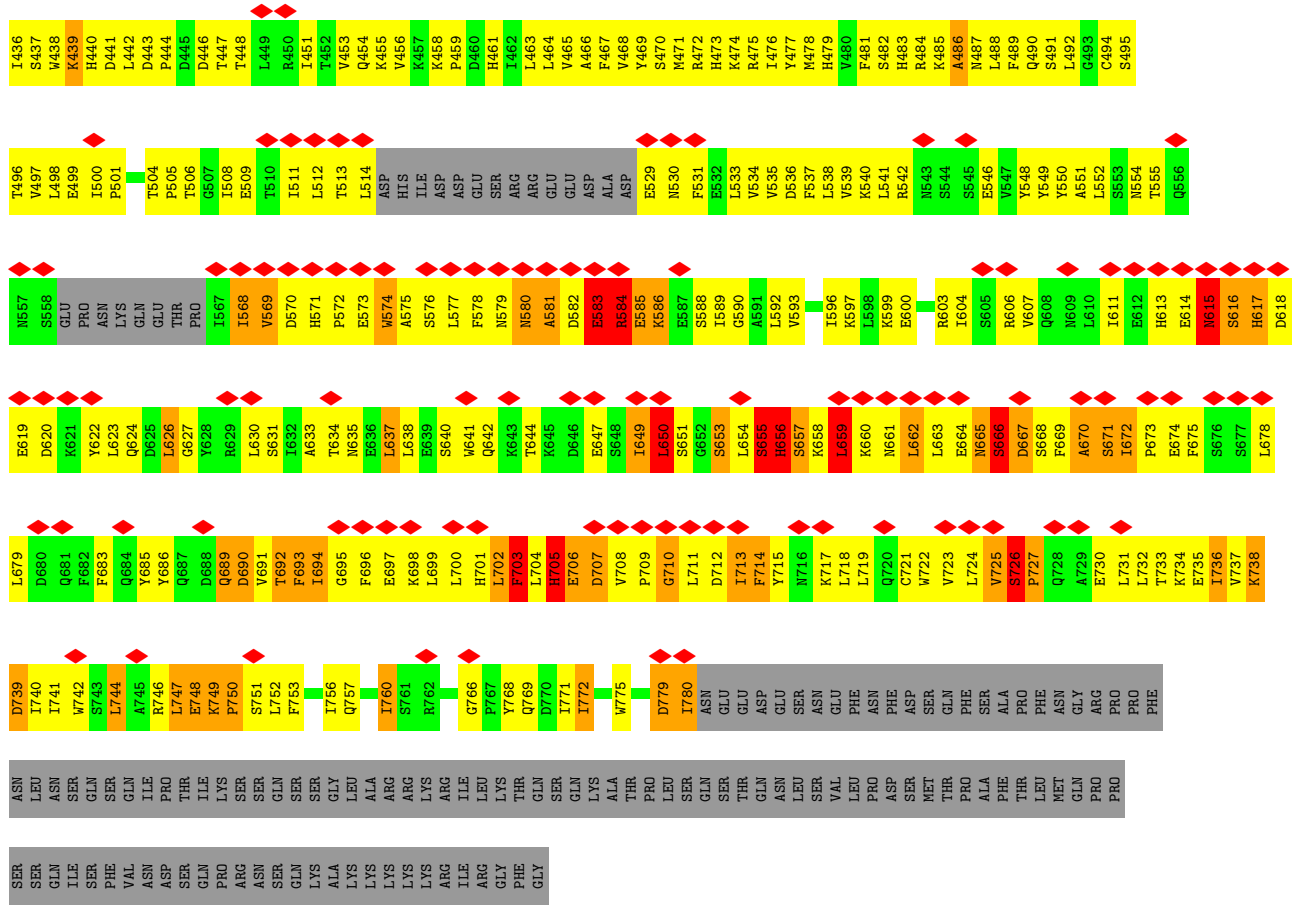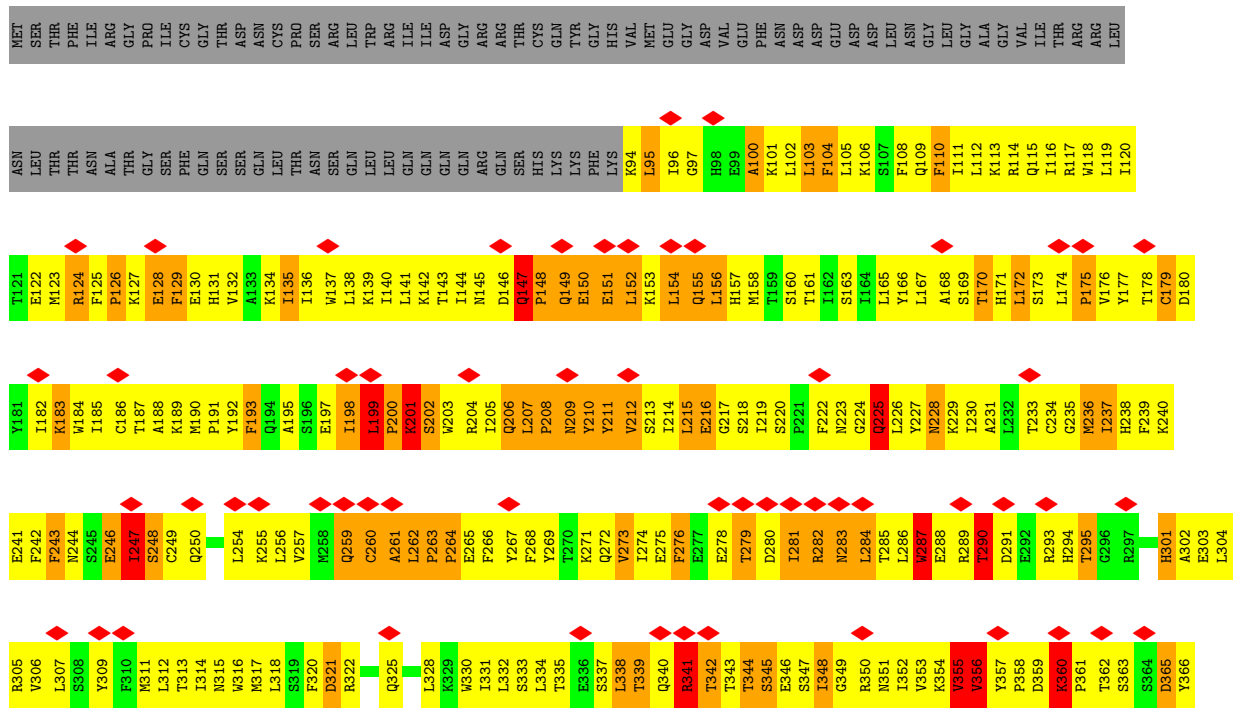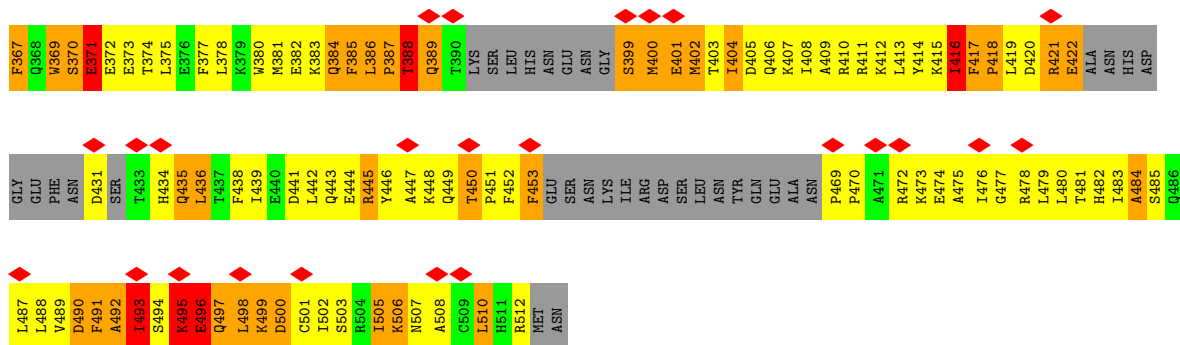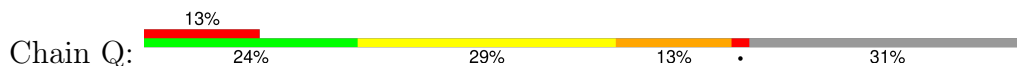
• Molecule 7: DNA-directed RNA polymerase I subunit RPA43

Chain G:

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

Chain H:

• Molecule 9: DNA-directed RNA polymerase I subunit RPA12

Chain I:

ASP GLY ALA THR ILE LYS GLU LYS CYS PRO GLN CYS ASN GLU GLU MET ASN TYR HIS THR LEU GLN LEU ARG SER ALA ASP GLU GLY ALA THR VAL PHE TYR THR CYS THR SER CYS GLY TYR LYS PHE ARG THR ASN ASN

• Molecule 10: DNA-directed RNA polymerases I, II, and III subunit RPABC5

Chain J:

33%    66%

M1 I2 V3 R6 C7 F8 S9 C10 G11 K12 V13 V14 K17 W18 E19 S20 Y21 L22 N23 L24 L25 Q26 E27 L30 D31 E32 G33 T34 A35 L36 L39 G40 L41 K42 R43 Y44 C45 C46 R47 R48 M49 I50 L51 T52 E58 K59 F60 L61 L66 E67 K68 R69 ASP

• Molecule 11: DNA-directed RNA polymerases I and III subunit RPAC2

Chain K:

36%    37%    27%

MET THR GLU ILE GLU GLN LYS THR ALA THR VAL THR PRO GLN GLU PRO LYS HIS ILE GLN GLU GLU GLU GLN GLN ASP VAL ASP MET THR GLY ASP GLU GLU GLU E40 E41 P42 D43 R44 E45 K46 I47 K48 L49 A53 T54 S60 F63 Q64 I65 E68

D69 H70 T71 L72 G73 N74 A75 L76 R77 I80 N83 V86 E87 F88 C89 G90 Y91 S92 I93 P94 H95 P96 S97 E98 N99 L100 L101 N102 I103 R104 I105 Q106 T107 Y108 T111 T112 A113 V114 L121 M125 V130 V131 E132 S133 K134 F135 T136 K140 S141 M142

• Molecule 12: DNA-directed RNA polymerases I, II, and III subunit RPABC4

Chain L:

27%    36%    36%

MET SER ARG GLU GLY PHE GLN ILE PRO THR ASN LEU ASP ALA ALA ALA GLY THR SER GLN ALA ARG THR ALA T26 L27 K28 Y29 I30 C31 A32 E33 C34 S35 S36 K37 L38 S39 L40 S41 R42 A45 V46 R47 C48 K49 D50 C51 G52 H53 L56 R60 T61 K62 R63 L64

F67 E68 A69 R70

• Molecule 13: DNA-directed RNA polymerase I subunit RPA49

Chain M:

8%
7%    16%    74%

MET SER VAL LYS ARG SER VAL S8 E9 I10 E11 I12 E13 S14 V15 Q16 D17 S20 V21 A22 V23 F26 F27 K28 G29 F30 R31 A32 P33 S34 D35 T36 T37 F38 D39 L40 Y41 K42 K43 K44 K45 S46 E47 K48 D49 E50 F51 V52 L53 H54 G55 E56 N57 E58 R59 L60 E61 Y62

E63 G64 Y65 T66 D67 S68 S69 S70 Q71 A72 S73 V76 V77 V78 G79 L80 F81 N82 P83 E84 K85 K86 S87 I88 Q89 L90 Y91 K92 V95 L96 V97 S98 V99 V100 V101 S102 K103 S104 S105 L108 R109 G110 P111 K112 I113 LYS SER LYS SER ASP THR ARG PRO SER ALA LEU ARG

ASN ALA LEU GLY GLU ALA PHE GLY THR LYS LYS ALA LYS ALA ILE ALA ASP LEU GLU ARG ASN ARG ILE ASP SER ILE ILE PRO LYS LEU GLU LEU GLY VAL TYR GLU LEU ASN ARG ARG VAL ASN LYS THR LYS LEU GLU GLU ALA LYS ASN VAL ARG THR ALA SER ILE ILE ASP LYS SER VAL ASP LYS LEU GLU LEU PHE PRO TYR GLN ASN ASN SER LYS TYR VAL ALA LYS

ARG PRO THR PRO LEU ALA ASN ILE ASP ALA THR ASP VAL GLU GLN ILE ILE PRO ILE GLU SER ILE PRO LYS LEU GLU GLN PHE ILE ARG VAL SER ILE LEU GLU ALA THR SER ILE ILE VAL ASP SER VAL ARG LEU ASN SER PRO PRO GLU ILE LEU GLU PHE PRO TYR GLN ASN ASN SER SER LYS TYR VAL THR VAL ALA LYS

LYS LEU ASP SER LEU THR GLN GLN PRO SER GLN MET THR LYS LEU GLN ILE LEU TYR TYR LEU SER LEU GLY VAL TYR GLU LEU ASN ARG ARG VAL ASN LYS THR LYS LEU GLU GLU ALA LYS ASP ASP PRO GLU ILE LEU GLU PHE PRO TYR GLN ASN ASP GLY ILE LEU LEU SER ARG PHE THR VAL ILE

LYS PRO GLY GLN PHE GLY ARG SER LYS ASP ARG SER TYR ILE ASP GLN ASN ASP LYS ILE LEU CYS TYR ILE LEU ALA ILE ILE MET HIS LEU ASP ASN PHE ILE VAL GLU ILE THR PRO LEU ALA HIS GLU LEU ASN LEU LYS PRO SER LYS VAL VAL SER LEU PHE ARG

VAL LEU GLY ALA ILE VAL LYS GLY ALA THR VAL ALA GLN ALA GLU PHE GLY ILE PRO LYS SER THR ALA ALA SER TYR LYS ILE ALA THR MET LYS VAL SER LEU LEU PRO MET THR ARG ARG ARG GLY ARG ARG

• Molecule 14: DNA-directed RNA polymerase I subunit RPA34

Chain N:

29%

26% 39% • • 32%

MET SER LYS LEU SER LYS ASP TYR VAL VAL SER ASP SER ASP SER ASP GLU VAL ILE SER ASN GLU F23 S24 I25 P26 D27 G28 F29 K30 K31 C32 K33 H34 L35 K36 N37 F38 P39 L40 N41 G42 D43 N44 K45 K46 K47 A48 K49 Q50 Q51 Q52 V53 W54 L55 I56 K57 F58 P59 S60

N61 V62 D63 I64 S65 K66 L67 K68 S69 L70 P71 V72 D73 F74 S77 T78 T79 M80 T81 I82 D83 K84 H85 D86 Y87 K88 I89 M90 D91 D92 T93 D94 I95 E96 S97 S98 L99 T100 Q101 D102 N103 L104 S105 N106 L109 L110 V111 P112 S113 E114 S115 K116 E117 S118 L119 K120 I121 A122

S123 T124 A125 K126 D127 N128 A129 P130 L131 Q132 F133 D134 K135 V136 F137 T142 A143 K144 I145 Y150 R154 R157 V160 V163 L166 K167 L168 A172 T173 G174 Y175 E178 D179 F180 HIS VAL ALA GLU GLU VAL LYS GLU ASN LYS LYS GLU PRO LYS LYS ARG SER

HIS HIS ASP ASP GLU GLU GLU SER SER GLU LYS LYS LYS LYS LYS GLU LYS ARG GLU LYS GLU LYS LYS ASP LYS LYS ASP LYS LYS LYS HIS ARG ASP

• Molecule 15: RNA polymerase I-specific transcription initiation factor RRN6

Chain O:

21%

15% 44% 10% • 28%

MET SER GLU GLY GLN ILE PRO SER SER ASP VAL LEU GLY SER GLN LEU VAL VAL GLY VAL GLN GLN GLY ALA SER LEU TYR CYS PRO GLN GLN GLU ASN TYR THR THR LYS LYS GLN GLU GLN LYS PRO GLN TRP LEU ARG PRO VAL ASP ASP THR LEU A3 X4 X5 X6 X7 X8 X9 X10 X11 X12

X13 X14 X15 X16 X17 X18 X19 X20 X21 X22 X23 X24 X28 LYS VAL LEU GLN GLU ASP SER ALA ASP ASP ASP LEU ILE THR SER ASP ILE ASP GLU ASP THR ASP ASN GLN GLY THR SER ILE VAL VAL ASN PRO VAL ASP PRO VAL PRO LYS ASP VAL HIS PHE PHE LYS

LYS VAL ASP VAL GLY ASN ASP SER MET PHE GLY VAL ASN CYS ASP THR PRO VAL SER PHE GLN ASN ASP X41 X44 X45 X46 X53 X54 X55 X56 X65 X66 X67 F172 F173 W174 D175 P176 T177 V178 A179 N180 R181 L182 D183 S184 Q185 Y186 I187 Q188 T189 A190 S191 D192 L193 R194 N195

Y196 R197 D198 G199 T200 E201 I202 I203 A204 Y205 A206 S207 G208 K209 T210 G211 S212 V213 L214 N215 I216 A217 V218 L219 T220 R221 Q222 N223 T224 L225 H226 L227 N228 R229 H230 N231 N232 V233 T234 S235 I236 E237 L238 H239 S240 P241 I242 K243 S244 I245 K246 I247 P248 G249 A250 S251 E252 S253 I254 G255

R256 R257 S258 N259 L260 V261 G262 I263 I264 T265 E266 N267 S268 F269 Q270 I271 F272 R273 I274 E275 S276 V277 H278 S279 R280 S281 C282 D283 V284 M285 V286 S287 S288 S289 E290 P291 L292 Y293 F294 V295 E296 I297 D298 D299 L300 Q301 V302 V303 D304 F305 A306 F307 N308 P309 W310 D311 L312 Q313 Q314 F315

A316 I317 I318 D319 I320 K321 G322 N323 W324 S325 I326 G327 R328 I329 P330 K331 N332 F333 N334 N335 N336 N337 K338 R339 K340 L341 Q342 L343 I344 D345 N346 L347 H348 G349 T350 I351 F352 D353 P354 E355 E356 L357 S358 S359 G360 K361 R362 E363 E364 W365 F366 S367 H368 F369 Q370 K371 I372 L373 V374 F375

D376 R377 S378 K379 M380 I381 E382 I383 D384 F385 M386 N387 N388 W389 Q390 T391 E392 V393 V394 Q395 A396 K397 A398 W399 S400 N401 I402 D403 D404 Y405 K406 R407 I408 D409 D410 K411 N412 G413 I414 L415 L416 T417 S418 R419 E420 I421 I422 I423 V424 G425 A426 S427 E428 R429 N430 D431 P432 V433 R434 R435

• Molecule 16: RNA polymerase I-specific transcription initiation factor RRN7

• Molecule 17: RNA polymerase I-specific transcription initiation factor RRN11

Chain Q:





• Molecule 18: RNA

Chain R:

• Molecule 19: non-template strand DNA

Chain S:

• Molecule 20: template strand DNA

Chain T:

# 4 Experimental information ⓘ

| Property | Value | Source |
|---|---|---|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, C1 | Depositor |
| Number of particles used | 124112 | Depositor |
| Resolution determination method | FSC 0.143 CUT-OFF | Depositor |
| CTF correction method | PHASE FLIPPING ONLY; CTF amplitude correction was performed following 3D auto refinement in relion. | Depositor |
| Microscope | FEI TITAN KRIOS | Depositor |
| Voltage (kV) | 300 | Depositor |
| Electron dose $(e^-/\text{Å}^2)$ | 56.8 | Depositor |
| Minimum defocus (nm) | 1500 | Depositor |
| Maximum defocus (nm) | 4500 | Depositor |
| Magnification | 22500 | Depositor |
| Image detector | GATAN K2 SUMMIT (4k x 4k) | Depositor |
| Maximum map value | 0.268 | Depositor |
| Minimum map value | -0.144 | Depositor |
| Average map value | 0.000 | Depositor |
| Map value standard deviation | 0.013 | Depositor |
| Recommended contour level | 0.04 | Depositor |
| Map size (Å) | 249.59999, 249.59999, 249.59999 | wwPDB |
| Map dimensions | 192, 192, 192 | wwPDB |
| Map angles (°) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (Å) | 1.3, 1.3, 1.3 | Depositor |

# 5   Model quality ⓘ

## 5.1   Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 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 | 0.29 | 1/11752 (0.0%) | 0.53 | 1/15870 (0.0%) |
| 2 | B | 0.31 | 0/9556 | 0.54 | 5/12916 (0.0%) |
| 3 | C | 0.30 | 0/2484 | 0.54 | 1/3366 (0.0%) |
| 4 | D | 0.25 | 0/473 | 0.46 | 0/641 |
| 5 | E | 0.28 | 0/1796 | 0.52 | 0/2416 |
| 6 | F | 0.27 | 0/682 | 0.49 | 0/922 |
| 7 | G | 0.26 | 0/1630 | 0.50 | 0/2216 |
| 8 | H | 0.30 | 0/1089 | 0.54 | 0/1474 |
| 9 | I | 0.27 | 0/485 | 0.67 | 0/657 |
| 10 | J | 0.32 | 0/578 | 0.58 | 0/775 |
| 11 | K | 0.28 | 0/822 | 0.51 | 0/1108 |
| 12 | L | 0.26 | 0/361 | 0.53 | 0/478 |
| 13 | M | 0.29 | 0/857 | 0.65 | 2/1151 (0.2%) |
| 14 | N | 0.27 | 0/1279 | 0.58 | 0/1724 |
| 15 | O | 0.56 | 2/4906 (0.0%) | 1.00 | 31/6645 (0.5%) |
| 16 | P | 0.39 | 0/3316 | 1.08 | 30/4477 (0.7%) |
| 17 | Q | 0.60 | 0/2990 | 1.03 | 13/4030 (0.3%) |
| 18 | R | 0.34 | 0/142 | 0.99 | 0/220 |
| 19 | S | 0.75 | 0/1050 | 1.20 | 7/1621 (0.4%) |
| 20 | T | 0.73 | 0/1206 | 1.26 | 9/1855 (0.5%) |
| All | All | 0.39 | 3/47454 (0.0%) | 0.74 | 99/64562 (0.2%) |

All (3) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|------|-------------|----------|
| 15 | O | 750 | PRO | N-CD | 7.11 | 1.57 | 1.47 |
| 1 | A | 593 | PRO | N-CD | 5.30 | 1.55 | 1.47 |
| 15 | O | 353 | ASP | CA-C | 5.23 | 1.66 | 1.52 |

The worst 5 of 99 bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|-----|-------|-----|------|-------|---|----------------|-------------|
| 16 | P | 199 | LEU | N-CA-C | -9.72 | 84.76 | 111.00 |
| 20 | T | 22 | DG | P-O3'-C3' | 9.27 | 130.83 | 119.70 |
| 16 | P | 290 | THR | N-CA-CB | 8.88 | 127.17 | 110.30 |
| 19 | S | 19 | DG | O4'-C1'-N9 | -8.64 | 101.95 | 108.00 |
| 15 | O | 301 | GLN | N-CA-C | -7.88 | 89.72 | 111.00 |

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts ⓘ

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 | 11542 | 0 | 11625 | 1110 | 0 |
| 2 | B | 9351 | 0 | 9242 | 861 | 0 |
| 3 | C | 2432 | 0 | 2418 | 228 | 0 |
| 4 | D | 467 | 0 | 468 | 48 | 0 |
| 5 | E | 1760 | 0 | 1788 | 167 | 0 |
| 6 | F | 670 | 0 | 690 | 35 | 0 |
| 7 | G | 1592 | 0 | 1600 | 233 | 0 |
| 8 | H | 1071 | 0 | 1045 | 105 | 0 |
| 9 | I | 479 | 0 | 478 | 84 | 0 |
| 10 | J | 569 | 0 | 585 | 57 | 0 |
| 11 | K | 811 | 0 | 801 | 63 | 0 |
| 12 | L | 359 | 0 | 381 | 41 | 0 |
| 13 | M | 841 | 0 | 833 | 187 | 0 |
| 14 | N | 1254 | 0 | 1265 | 231 | 0 |
| 15 | O | 5063 | 0 | 4796 | 2307 | 0 |
| 16 | P | 3238 | 0 | 3263 | 1670 | 0 |
| 17 | Q | 2923 | 0 | 2969 | 1018 | 0 |
| 18 | R | 127 | 0 | 67 | 0 | 0 |
| 19 | S | 935 | 0 | 513 | 7 | 0 |
| 20 | T | 1082 | 0 | 615 | 21 | 0 |
| 21 | A | 2 | 0 | 0 | 2 | 0 |
| 21 | B | 1 | 0 | 0 | 0 | 0 |
| 21 | I | 1 | 0 | 0 | 0 | 0 |
| 21 | J | 1 | 0 | 0 | 0 | 0 |
| 21 | L | 1 | 0 | 0 | 0 | 0 |

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W O R L D W I D E
wwPDB
PROTEIN DATA BANK

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| All | All | 46572 | 0 | 45442 | 7198 | 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 82.

The worst 5 of 7198 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) |
|--------|--------|--------------------------|-------------------|
| 16:P:419:LEU:HB3 | 17:Q:233:TYR:CZ | 1.24 | 1.70 |
| 15:O:389:TRP:HZ3 | 17:Q:148:ASN:CA | 1.05 | 1.68 |
| 16:P:104:PHE:CD1 | 16:P:211:TYR:HB2 | 1.22 | 1.67 |
| 2:B:155:VAL:HG21 | 17:Q:359:MET:SD | 1.29 | 1.67 |
| 15:O:702:LEU:HD23 | 16:P:125:PHE:CZ | 1.13 | 1.65 |

There are no symmetry-related clashes.

## 5.3　Torsion angles ⓘ

### 5.3.1　Protein backbone ⓘ

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 | 1445/1664 (87%) | 1328 (92%) | 92 (6%) | 25 (2%) | 7 | 34 |
| 2 | B | 1172/1203 (97%) | 1081 (92%) | 70 (6%) | 21 (2%) | 7 | 34 |
| 3 | C | 304/335 (91%) | 283 (93%) | 14 (5%) | 7 (2%) | 5 | 30 |
| 4 | D | 55/137 (40%) | 52 (94%) | 3 (6%) | 0 | 100 | 100 |
| 5 | E | 213/215 (99%) | 205 (96%) | 7 (3%) | 1 (0%) | 25 | 58 |
| 6 | F | 81/155 (52%) | 73 (90%) | 7 (9%) | 1 (1%) | 11 | 40 |
| 7 | G | 197/326 (60%) | 179 (91%) | 15 (8%) | 3 (2%) | 8 | 37 |
| 8 | H | 129/146 (88%) | 121 (94%) | 8 (6%) | 0 | 100 | 100 |
| 9 | I | 63/125 (50%) | 52 (82%) | 9 (14%) | 2 (3%) | 3 | 25 |

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| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|-----|-------|----------|----------|---------|----------|-----|-----|
| 10 | J | 67/70 (96%) | 60 (90%) | 6 (9%) | 1 (2%) | 8 | 37 |
| 11 | K | 101/142 (71%) | 94 (93%) | 7 (7%) | 0 | 100 | 100 |
| 12 | L | 43/70 (61%) | 38 (88%) | 4 (9%) | 1 (2%) | 5 | 30 |
| 13 | M | 104/415 (25%) | 94 (90%) | 8 (8%) | 2 (2%) | 6 | 33 |
| 14 | N | 156/233 (67%) | 129 (83%) | 21 (14%) | 6 (4%) | 2 | 21 |
| 15 | O | 581/894 (65%) | 417 (72%) | 108 (19%) | 56 (10%) | 0 | 8 |
| 16 | P | 378/514 (74%) | 280 (74%) | 46 (12%) | 52 (14%) | 0 | 3 |
| 17 | Q | 343/507 (68%) | 236 (69%) | 65 (19%) | 42 (12%) | 0 | 4 |
| All | All | 5432/7151 (76%) | 4722 (87%) | 490 (9%) | 220 (4%) | 4 | 20 |

5 of 220 Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | A | 466 | LEU |
| 1 | A | 530 | TRP |
| 1 | A | 533 | ALA |
| 1 | A | 592 | GLN |
| 1 | A | 594 | THR |

### 5.3.2　Protein sidechains ⓘ

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 | 1292/1465 (88%) | 1266 (98%) | 26 (2%) | 50 | 68 |
| 2 | B | 1030/1053 (98%) | 1012 (98%) | 18 (2%) | 56 | 72 |
| 3 | C | 270/296 (91%) | 268 (99%) | 2 (1%) | 81 | 86 |
| 4 | D | 56/116 (48%) | 56 (100%) | 0 | 100 | 100 |
| 5 | E | 197/197 (100%) | 194 (98%) | 3 (2%) | 60 | 74 |
| 6 | F | 73/137 (53%) | 73 (100%) | 0 | 100 | 100 |
| 7 | G | 179/291 (62%) | 171 (96%) | 8 (4%) | 23 | 47 |
| 8 | H | 117/128 (91%) | 116 (99%) | 1 (1%) | 75 | 82 |

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| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|-----|-------|----------|-----------|----------|:-----------:|:---:|
| 9 | I | 57/110 (52%) | 54 (95%) | 3 (5%) | 19 | 44 |
| 10 | J | 64/65 (98%) | 64 (100%) | 0 | 100 | 100 |
| 11 | K | 93/130 (72%) | 93 (100%) | 0 | 100 | 100 |
| 12 | L | 40/57 (70%) | 39 (98%) | 1 (2%) | 42 | 62 |
| 13 | M | 96/371 (26%) | 86 (90%) | 10 (10%) | 5 | 23 |
| 14 | N | 146/220 (66%) | 142 (97%) | 4 (3%) | 40 | 60 |
| 15 | O | 545/779 (70%) | 483 (89%) | 62 (11%) | 4 | 21 |
| 16 | P | 362/476 (76%) | 303 (84%) | 59 (16%) | 2 | 13 |
| 17 | Q | 331/474 (70%) | 280 (85%) | 51 (15%) | 2 | 14 |
| All | All | 4948/6365 (78%) | 4700 (95%) | 248 (5%) | 23 | 45 |

5 of 248 residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 15 | O | 655 | SER |
| 17 | Q | 248 | LYS |
| 16 | P | 152 | LEU |
| 17 | Q | 246 | GLN |
| 17 | Q | 365 | TRP |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 92 such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 14 | N | 103 | ASN |
| 15 | O | 556 | GLN |
| 15 | O | 215 | ASN |
| 15 | O | 308 | ASN |
| 15 | O | 642 | GLN |

### 5.3.3 RNA ⓘ

| Mol | Chain | Analysed | Backbone Outliers | Pucker Outliers |
|-----|-------|----------|-------------------|-----------------|
| 18 | R | 5/6 (83%) | 0 | 0 |

There are no RNA backbone outliers to report.

There are no RNA pucker outliers to report.

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

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

## 5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry ⓘ

Of 6 ligands modelled in this entry, 6 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers ⓘ

There are no such residues in this entry.

## 5.8 Polymer linkage issues ⓘ

The following chains have linkage breaks:

| Mol | Chain | Number of breaks |
|-----|-------|------------------|
| 15  | O     | 1                |

All chain breaks are listed below:

| Model | Chain | Residue-1 | Atom-1 | Residue-2 | Atom-2 | Distance (Å) |
|-------|-------|-----------|--------|-----------|--------|--------------|
| 1     | O     | 67:UNK    | C      | 172:PHE   | N      | 30.74        |

# 6   Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-8771. These allow visual inspection of the internal detail of the map and identification of artifacts.

No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

## 6.1   Orthogonal projections ⓘ

### 6.1.1   Primary map



| X | Y | Z |
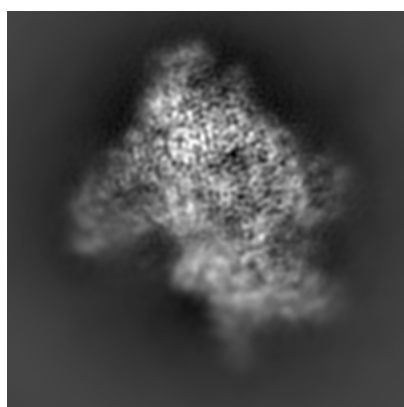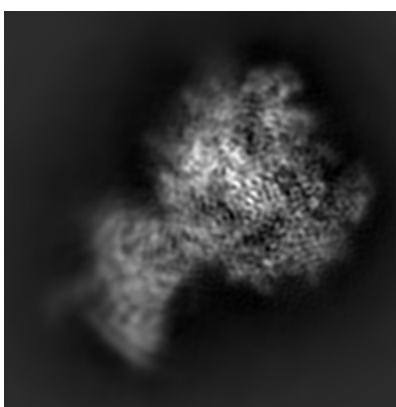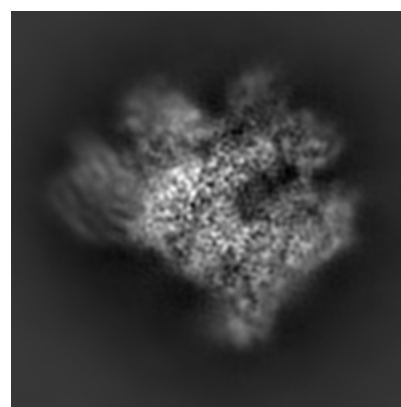
The images above show the map projected in three orthogonal directions.

## 6.2   Central slices ⓘ
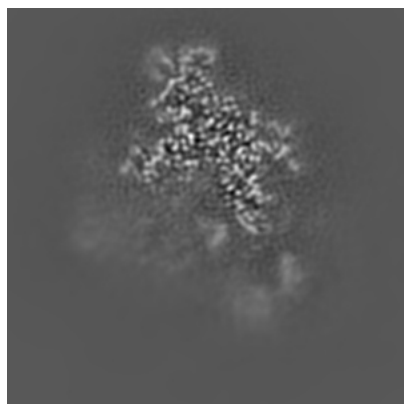
### 6.2.1   Primary map
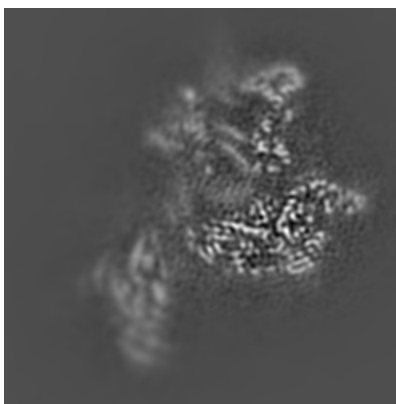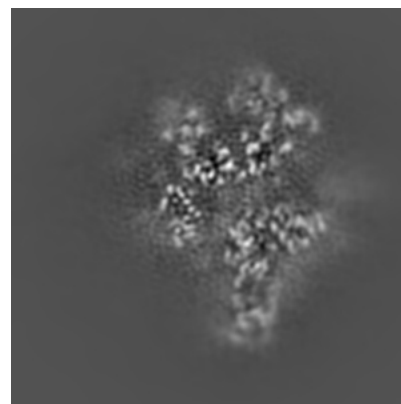


| X Index: 96 | Y Index: 96 | Z Index: 96 |

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

## 6.3   Largest variance slices ⓘ
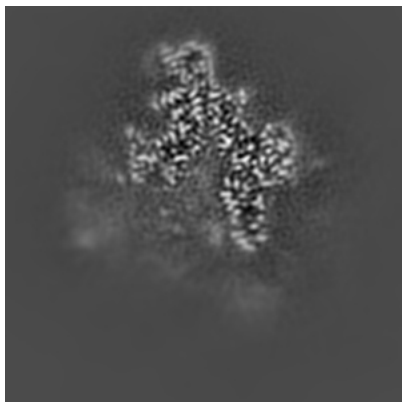
### 6.3.1   Primary map
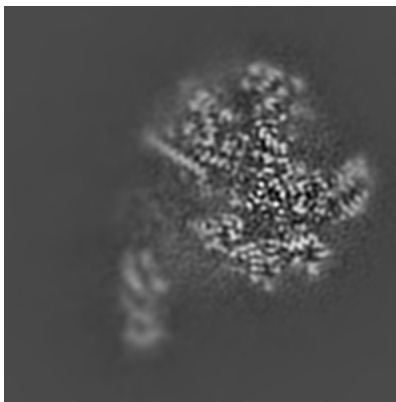






| X Index: 100 | Y Index: 87 | Z Index: 127 |
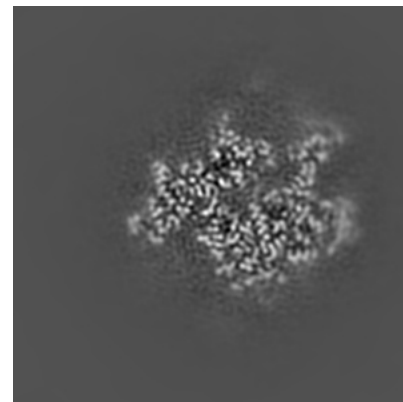
The images above show the largest variance slices of the map in three orthogonal directions.

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

### 6.4.1   Primary map







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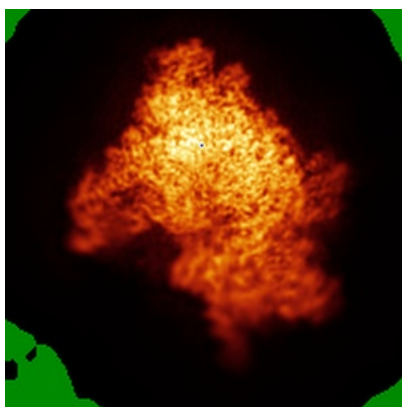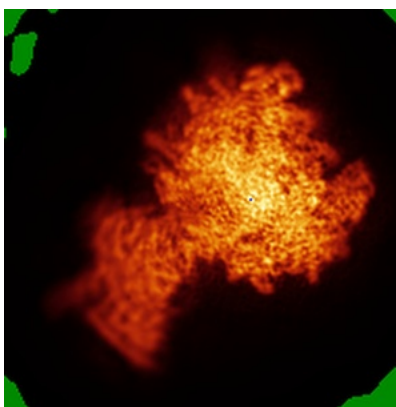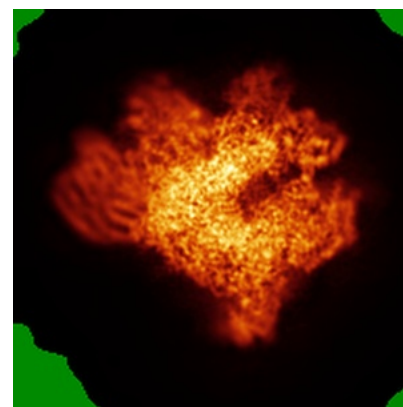
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

## 6.5 Orthogonal surface views ⓘ
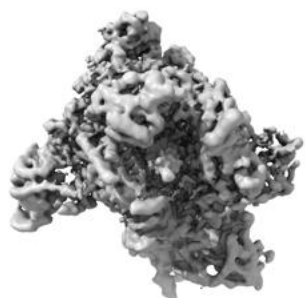
### 6.5.1 Primary map



|   |   |   |
|:-:|:-:|:-:|
| X | Y | Z |
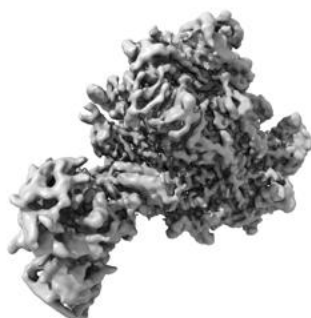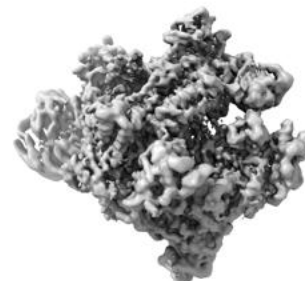
The images above show the 3D surface view of the map at the recommended contour level 0.04. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

## 6.6 Mask visualisation ⓘ

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 ⓘ
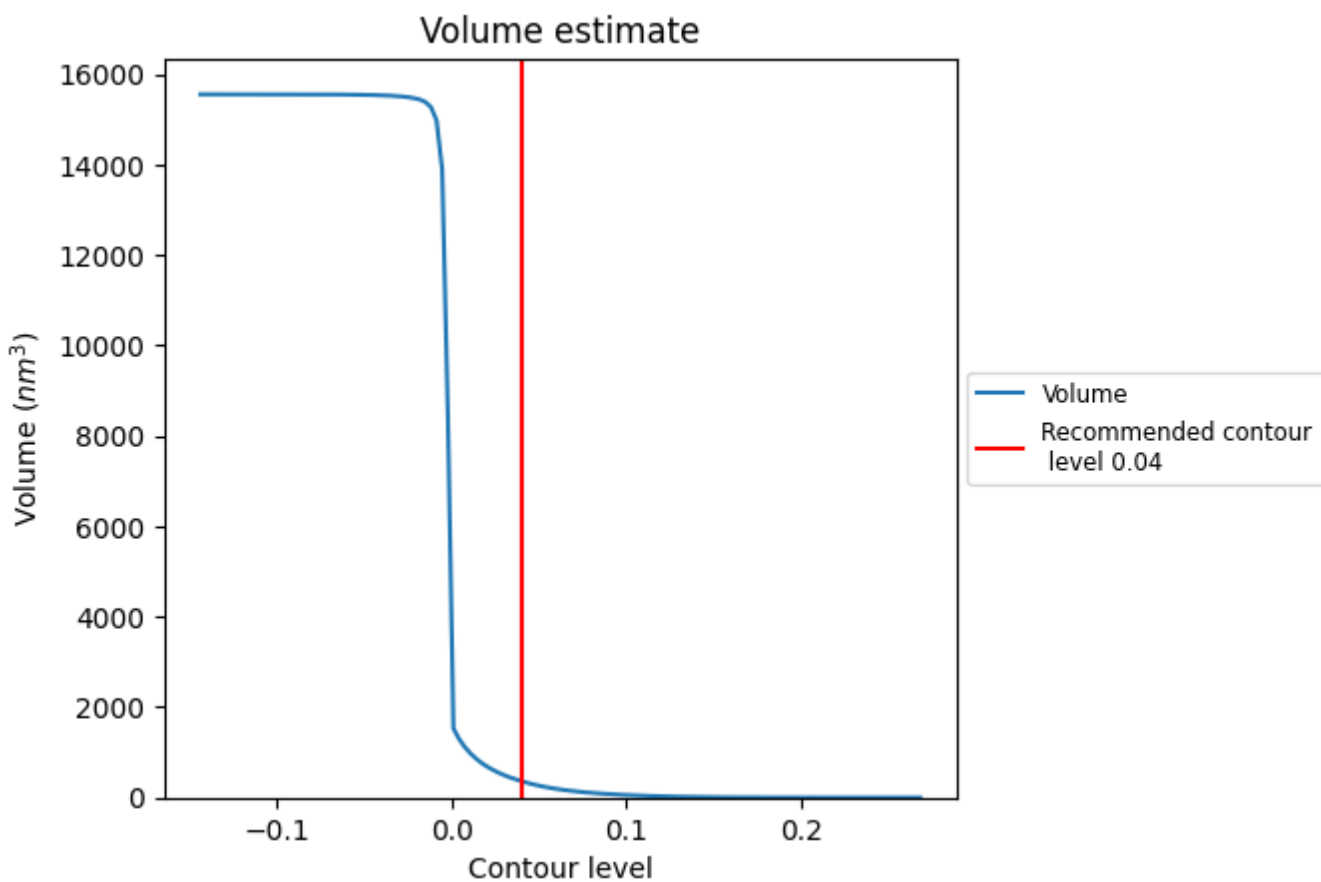


The volume at the recommended contour level is 363 nm$^3$; this corresponds to an approximate mass of 328 kDa.

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 ⓘ
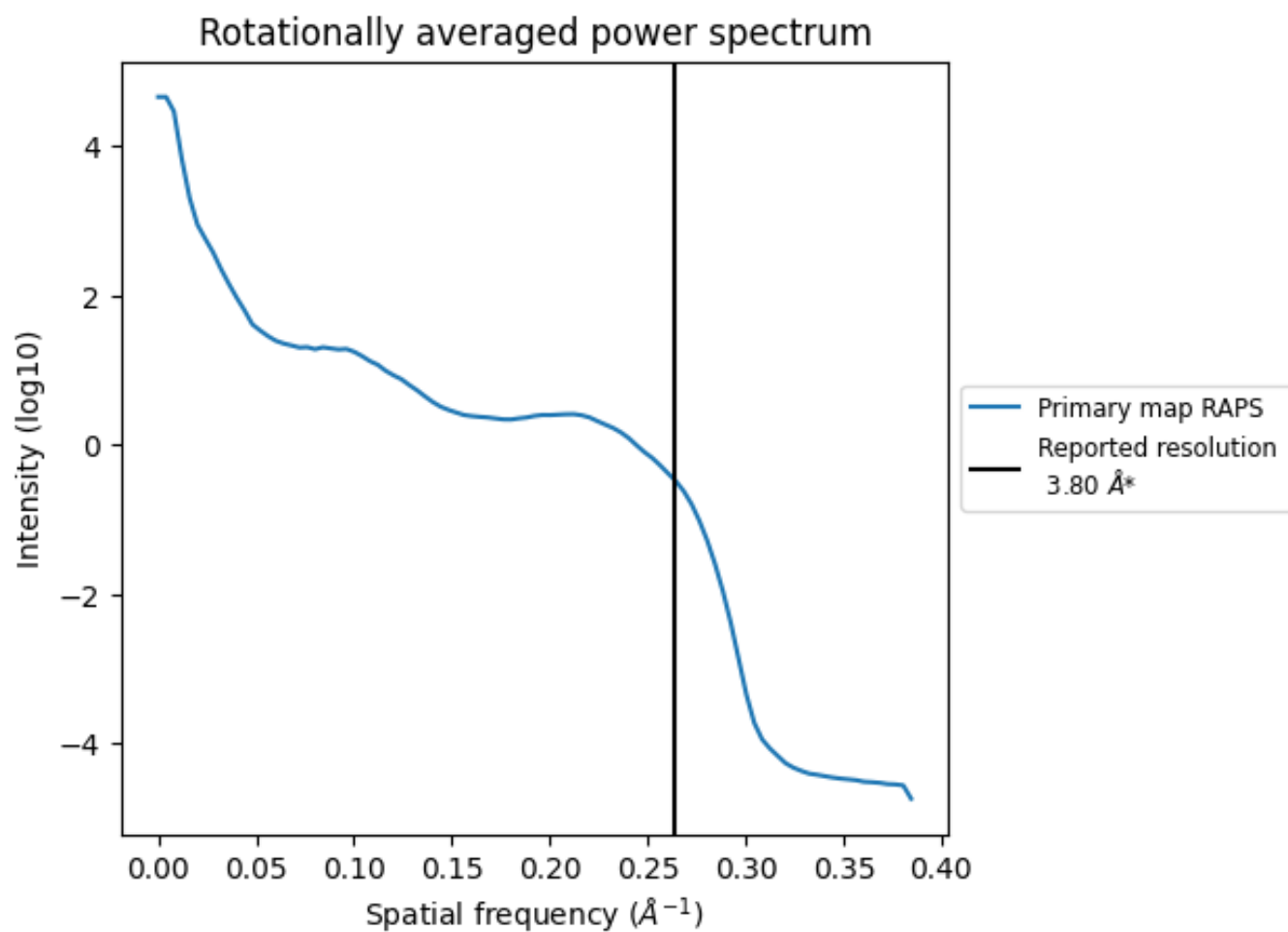


*Reported resolution corresponds to spatial frequency of 0.263 $\text{Å}^{-1}$

# 8    Fourier-Shell correlation (i)

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 (i)
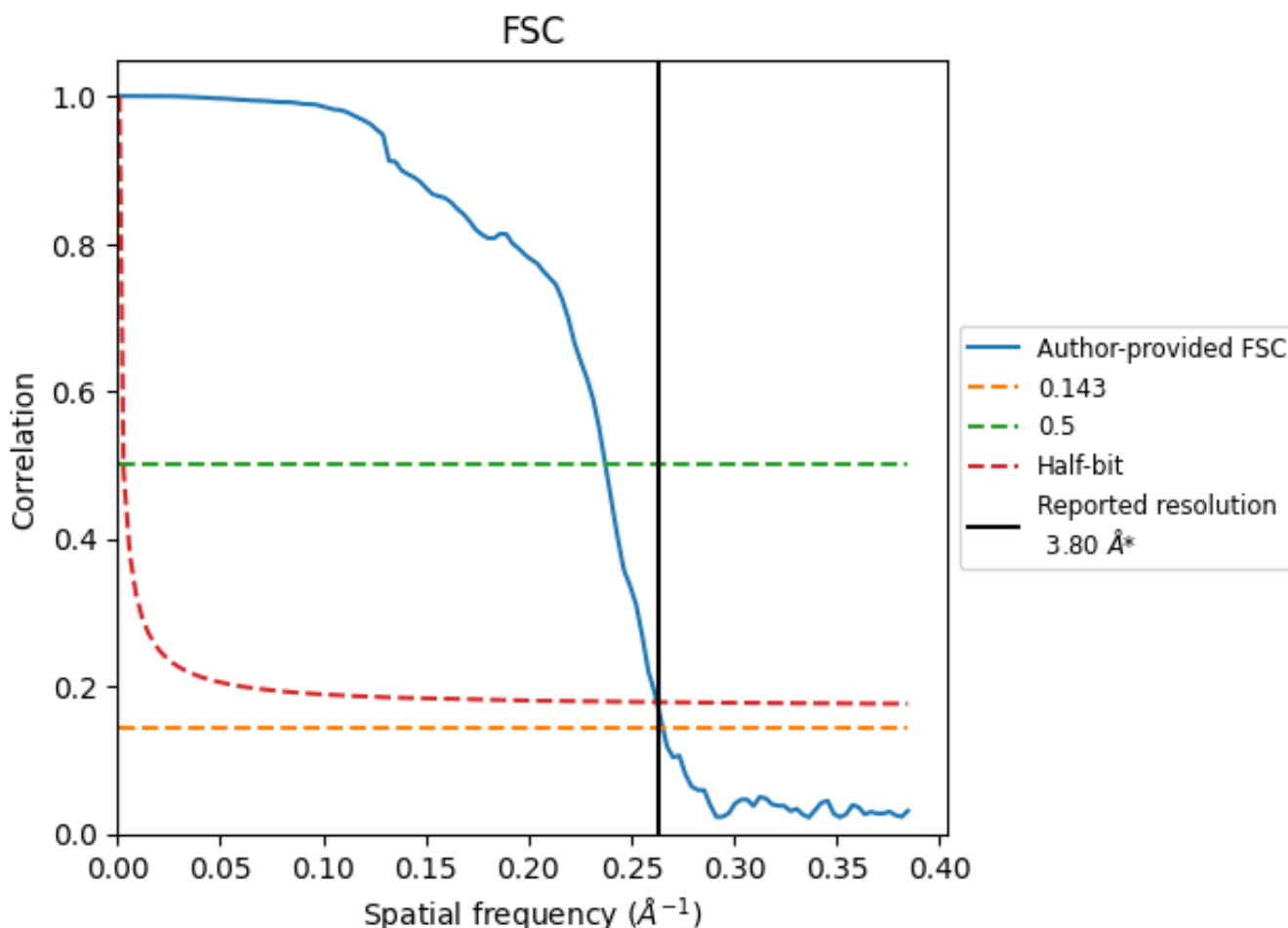


*Reported resolution corresponds to spatial frequency of 0.263 Å$^{-1}$

## 8.2   Resolution estimates (i)

| Resolution estimate (Å) | Estimation criterion (FSC cut-off) | | |
|---|---|---|---|
| | 0.143 | 0.5 | Half-bit |
| Reported by author | 3.80 | - | - |
| Author-provided FSC curve | 3.77 | 4.21 | 3.81 |
| Unmasked-calculated* | - | - | - |

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

# 9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-8771 and PDB model 5W5Y. Per-residue inclusion information can be found in section 3 on page 9.

## 9.1 Map-model overlay ⓘ



| X | Y | Z |
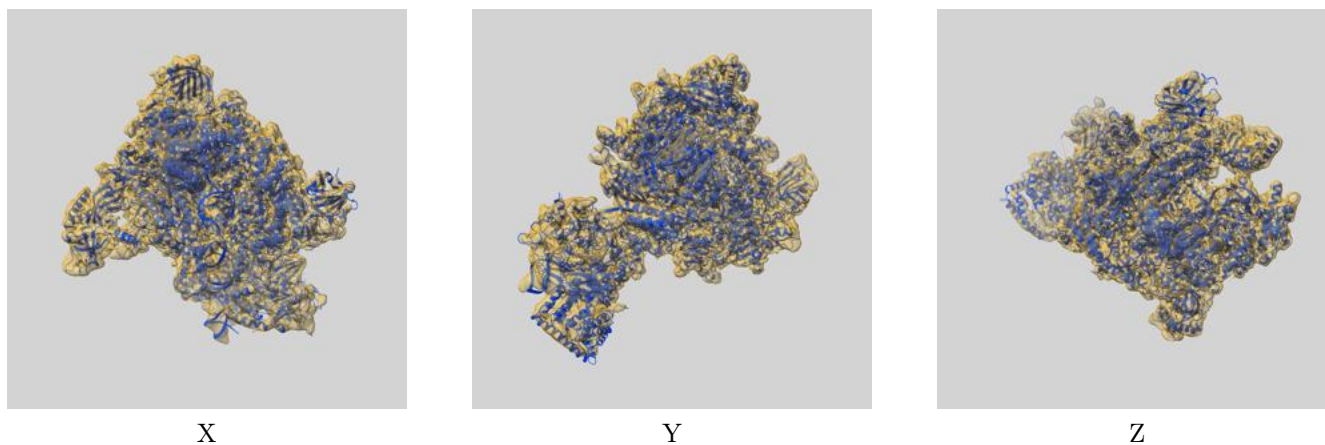
The images above show the 3D surface view of the map at the recommended contour level 0.04 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2　Q-score mapped to coordinate model ⓘ



X　　　　　　　　　　Y　　　　　　　　　　Z
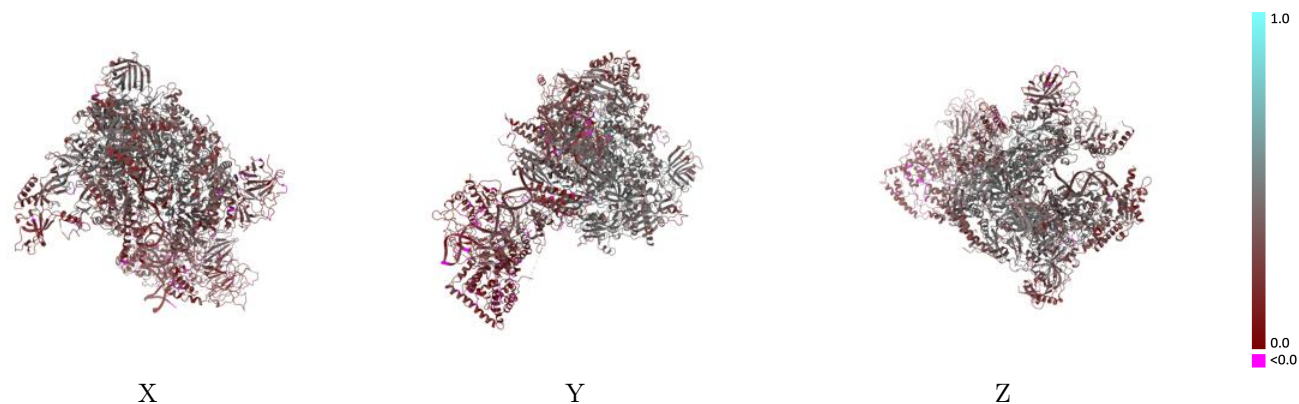
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
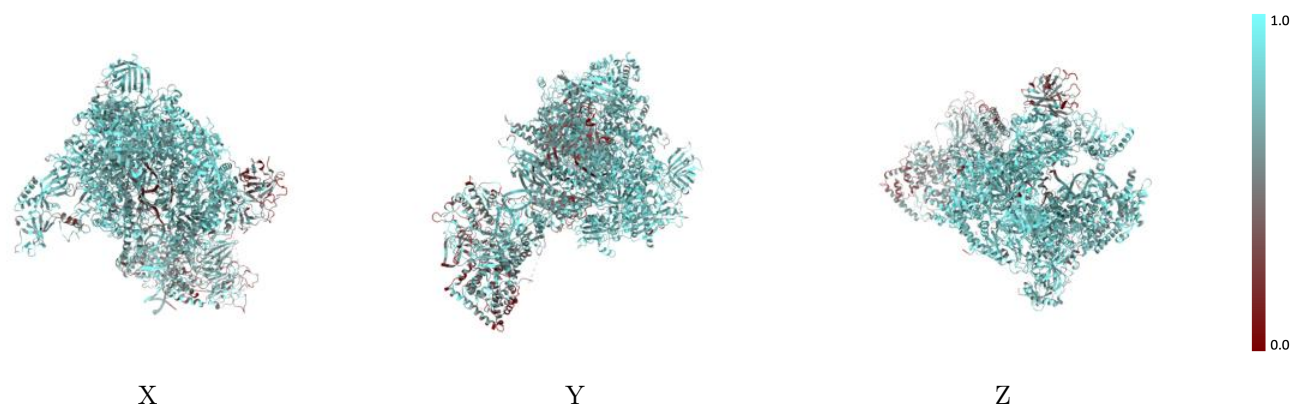
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.04).

## 9.4　Atom inclusion　ⓘ
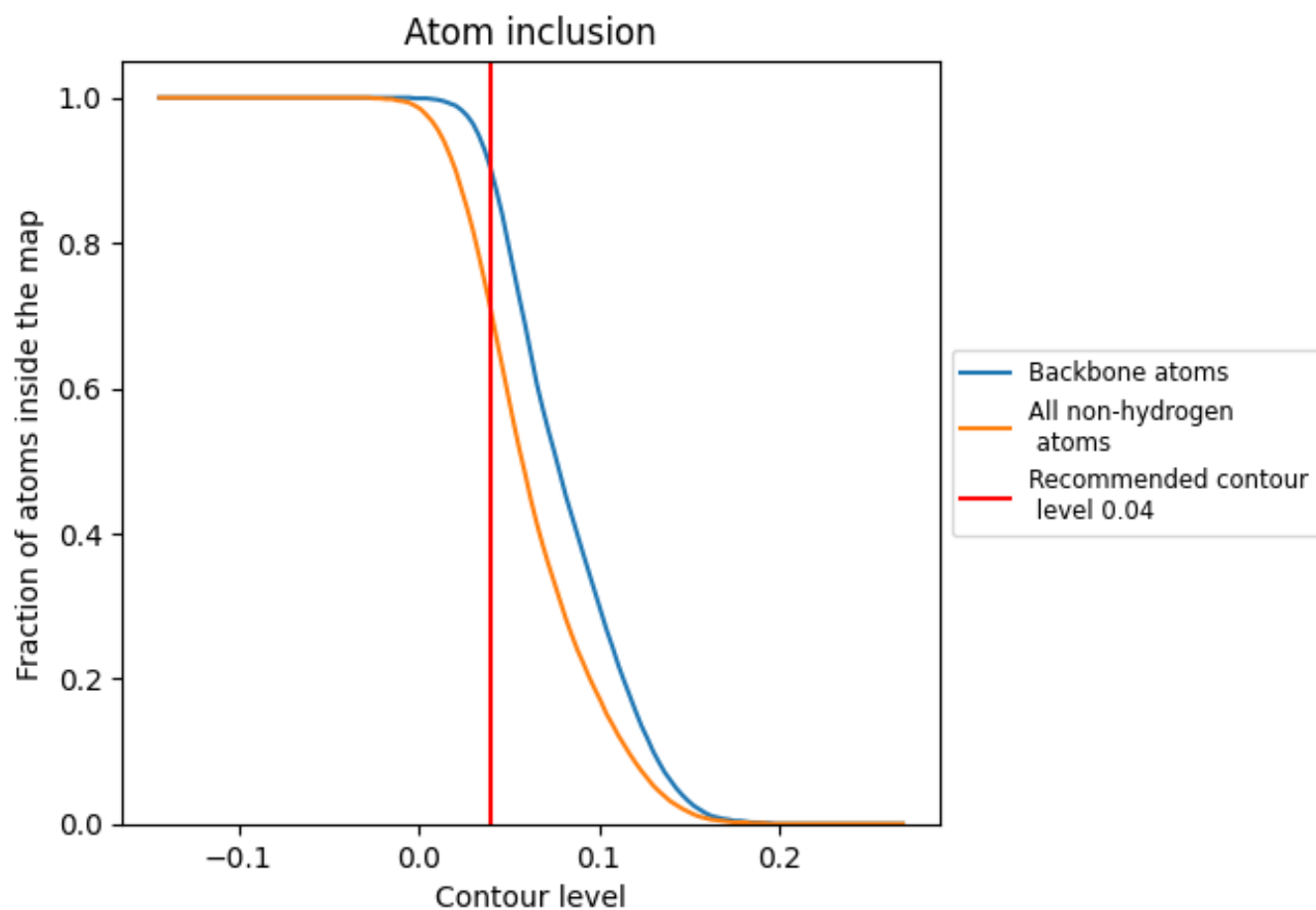


At the recommended contour level, 90% of all backbone atoms, 71% of all non-hydrogen atoms, are inside the map.

## 9.5   Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.04) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion | Q-score |
|:-----:|:--------------:|:-------:|
| All   | 0.7080         | 0.3370  |
| A     | 0.7750         | 0.3930  |
| B     | 0.7870         | 0.4230  |
| C     | 0.8240         | 0.4090  |
| D     | 0.7210         | 0.2800  |
| E     | 0.7680         | 0.3390  |
| F     | 0.8140         | 0.4130  |
| G     | 0.7010         | 0.2810  |
| H     | 0.7930         | 0.3880  |
| I     | 0.7400         | 0.3380  |
| J     | 0.8510         | 0.4560  |
| K     | 0.7770         | 0.3950  |
| L     | 0.7950         | 0.4100  |
| M     | 0.4840         | 0.2730  |
| N     | 0.4200         | 0.2770  |
| O     | 0.5540         | 0.2150  |
| P     | 0.5950         | 0.1900  |
| Q     | 0.5870         | 0.2230  |
| R     | 0.1260         | 0.2270  |
| S     | 0.6780         | 0.2560  |
| T     | 0.6360         | 0.2350  |

1.0

0.0
<0.0