WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Jul 16, 2024 – 04:25 PM JST

PDB ID	:	8W8N
Title	:	Thermus thermophilus initiation transcription complex in the pre-translocated state
Authors	:	Li, L.; Zhang, Y.
Deposited on	:	2023-09-04
Resolution	:	2.69 Å(reported)

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

|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.37.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

1   Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.69 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.
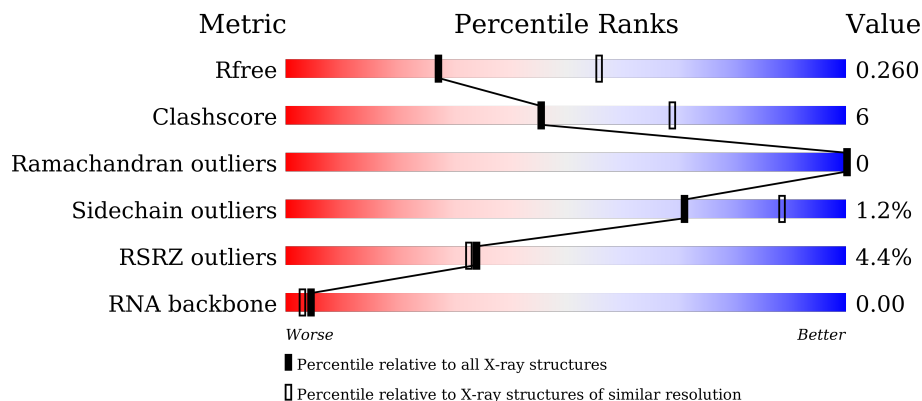
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	2808 (2.70-2.70)
Clashscore	141614	3122 (2.70-2.70)
Ramachandran outliers	138981	3069 (2.70-2.70)
Sidechain outliers	138945	3069 (2.70-2.70)
RSRZ outliers	127900	2737 (2.70-2.70)
RNA backbone	3102	1159 (3.00-2.40)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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 electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	315	57% 14% 28%
1	B	315	% 57% 15% 28%
2	C	1119	4% 81% 18% •
3	D	1524	6% 81% 16% •

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Mol	Chain	Length	Quality of chain
4	E	99	% 81% 14% 5%
5	F	443	2% 67% 11% 22%
6	G	21	38% 38% 24%
7	H	27	7% 44% 41% 15%
8	I	3	100%

2 Entity composition ⓘ

There are 11 unique types of molecules in this entry. The entry contains 28636 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, 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 alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	227	Total	C	N	O	S	0	0	0
			1787	1141	311	333	2			
1	B	227	Total	C	N	O	S	0	0	0
			1789	1143	310	334	2			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	1112	Total	C	N	O	S	0	0	0
			8761	5541	1562	1634	24			

- Molecule 3 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	D	1484	Total	C	N	O	S	0	1	0
			11706	7425	2060	2186	35			

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

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
4	E	94	Total	C	N	O	S	0	0	0
			761	486	132	139	4			

- Molecule 5 is a protein called RNA polymerase sigma factor SigA.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
5	F	346	Total	C	N	O	S	0	0	0
			2807	1770	509	524	4			

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	-19	MET	-	expression tag	UNP Q5SKW1
F	-18	GLY	-	expression tag	UNP Q5SKW1
F	-17	SER	-	expression tag	UNP Q5SKW1
F	-16	SER	-	expression tag	UNP Q5SKW1
F	-15	HIS	-	expression tag	UNP Q5SKW1
F	-14	HIS	-	expression tag	UNP Q5SKW1
F	-13	HIS	-	expression tag	UNP Q5SKW1
F	-12	HIS	-	expression tag	UNP Q5SKW1
F	-11	HIS	-	expression tag	UNP Q5SKW1
F	-10	HIS	-	expression tag	UNP Q5SKW1
F	-9	SER	-	expression tag	UNP Q5SKW1
F	-8	SER	-	expression tag	UNP Q5SKW1
F	-7	GLY	-	expression tag	UNP Q5SKW1
F	-6	LEU	-	expression tag	UNP Q5SKW1
F	-5	VAL	-	expression tag	UNP Q5SKW1
F	-4	PRO	-	expression tag	UNP Q5SKW1
F	-3	ARG	-	expression tag	UNP Q5SKW1
F	-2	GLY	-	expression tag	UNP Q5SKW1
F	-1	SER	-	expression tag	UNP Q5SKW1
F	0	HIS	-	expression tag	UNP Q5SKW1

- Molecule 6 is a DNA chain called DNA (21-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
6	G	16	326	154	62	94	16	0	0	0

- Molecule 7 is a DNA chain called DNA (27-MER).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
7	H	23	476	227	91	136	22	0	0	0

- Molecule 8 is a RNA chain called RNA (5'-D(*PP*PP*P)-R(*GP*GP*U)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
8	I	3	75	29	12	29	5	0	0	0

- Molecule 9 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	B	1	Total 1	Mg 1	0	0
9	D	3	Total 3	Mg 3	0	0
9	F	2	Total 2	Mg 2	0	0

• Molecule 10 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
10	D	2	Total 2	Zn 2	0	0

• Molecule 11 is water.

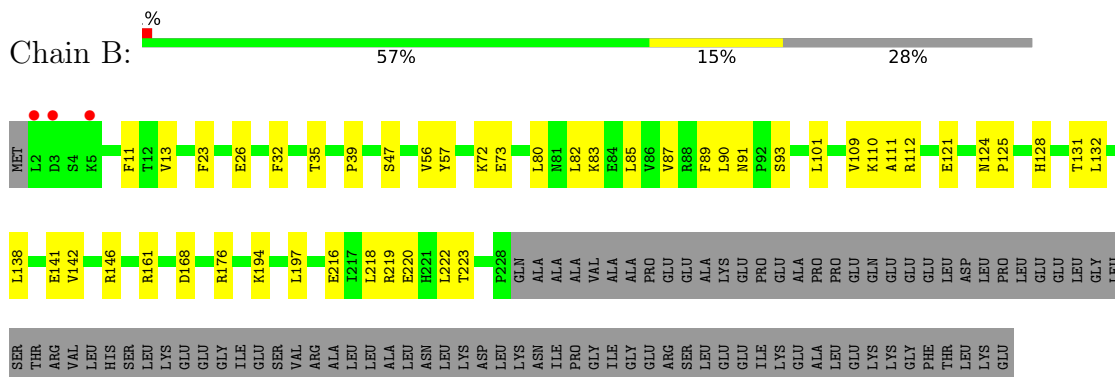| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
11	A	3	Total 3	O 3	0	0
11	B	4	Total 4	O 4	0	0
11	C	47	Total 47	O 47	0	0
11	D	72	Total 72	O 72	0	0
11	E	2	Total 2	O 2	0	0
11	F	6	Total 6	O 6	0	0
11	G	5	Total 5	O 5	0	0
11	I	1	Total 1	O 1	0	0

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 electron 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 dot above a residue indicates a poor fit to the electron density (RSRZ > 2). 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.

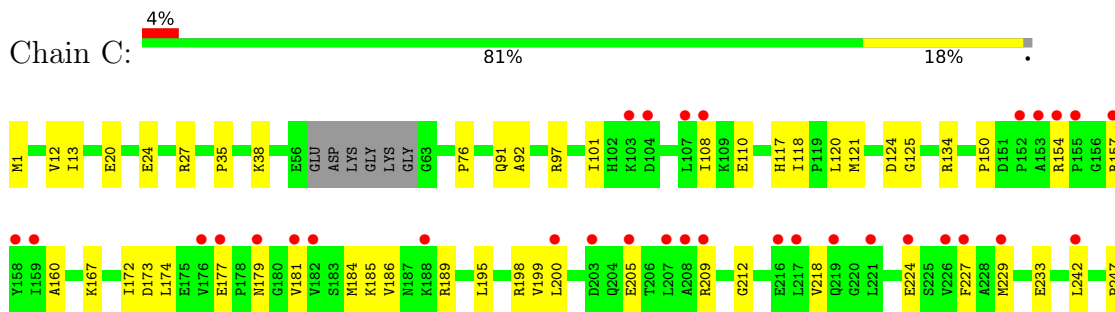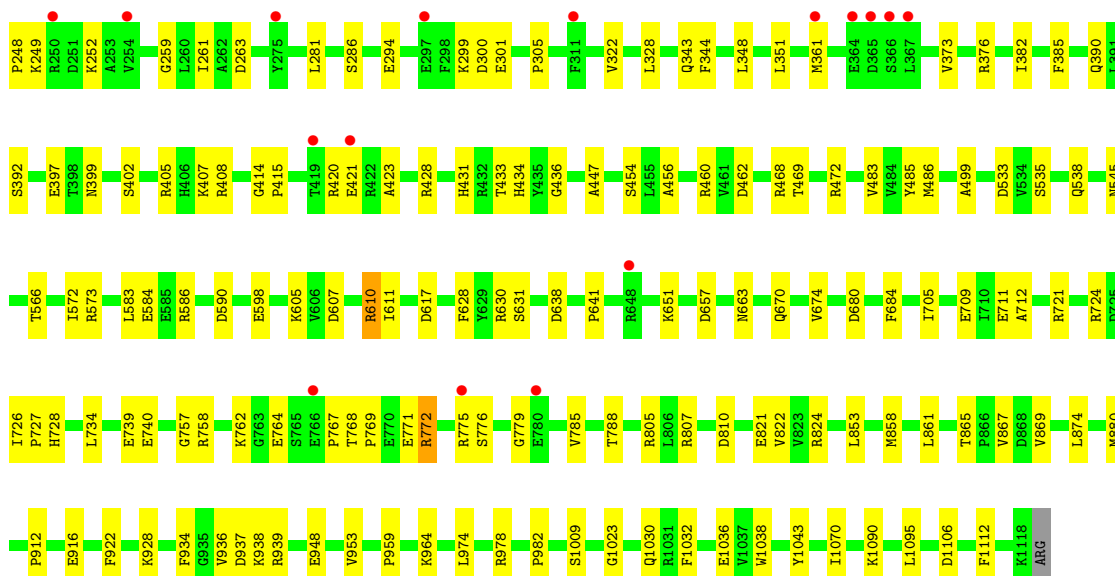• Molecule 1: DNA-directed RNA polymerase subunit alpha
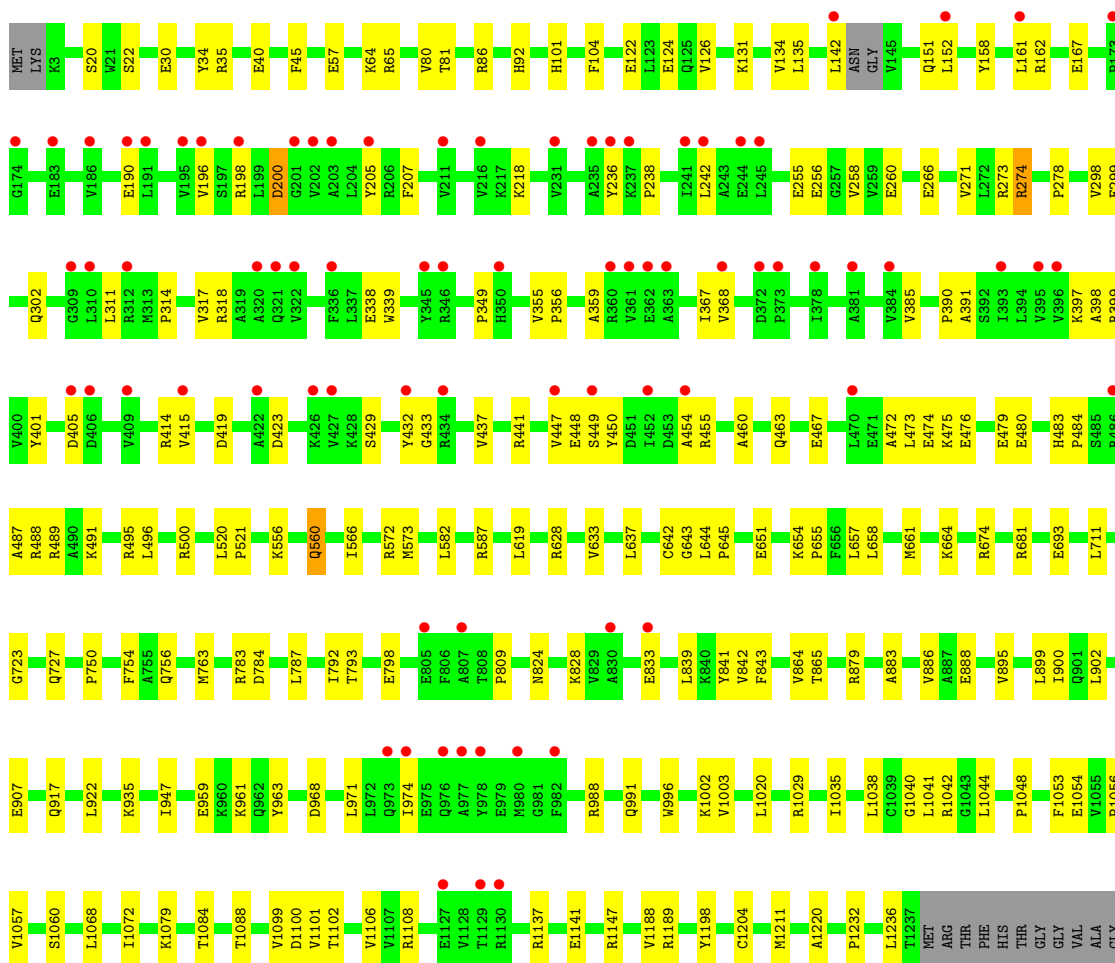
Chain A:

• Molecule 1: DNA-directed RNA polymerase subunit alpha
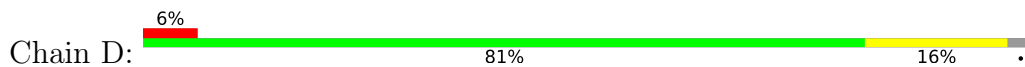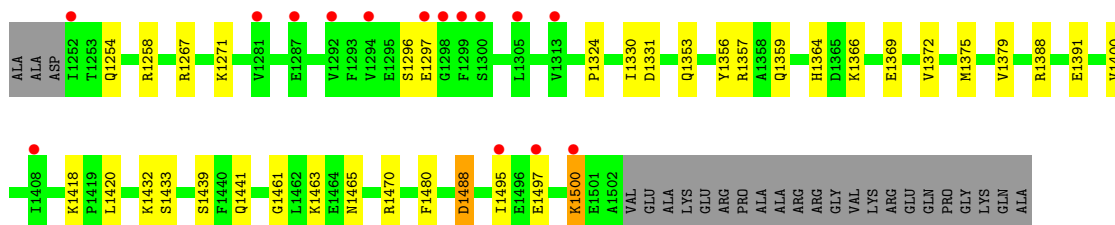
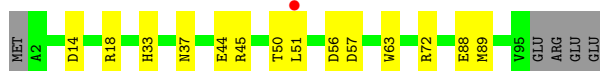Chain B:
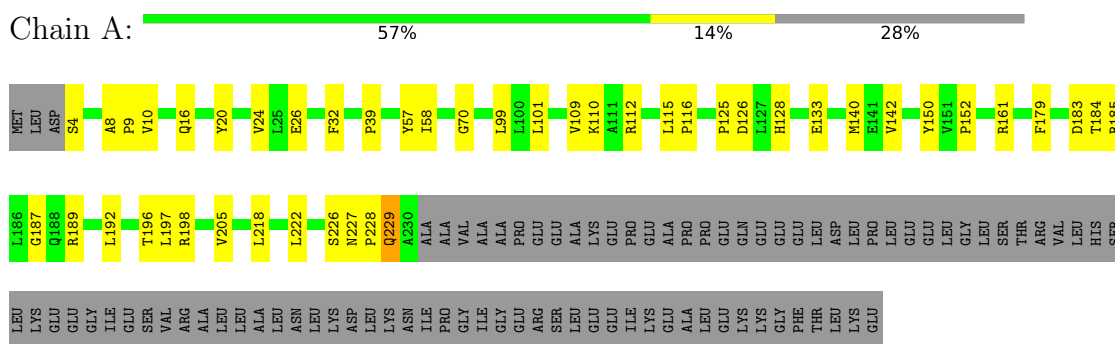
• Molecule 2: DNA-directed RNA polymerase subunit beta

Chain C:

• Molecule 3: DNA-directed RNA polymerase subunit beta'

ALA ALA ASP I1252 T1253 Q1254 R1258 R1267 K1271 V1281 E1287 V1292 F1293 V1294 E1295 S1296 E1297 G1298 F1299 S1300 L1305 V1313 P1324 I1330 D1331 Q1353 Y1356 R1357 A1358 Q1359 H1364 D1365 K1366 E1369 V1372 M1375 V1379 R1388 E1391 V1400

I1408 K1418 P1419 L1420 K1432 S1433 S1439 F1440 Q1441 G1461 L1462 K1463 E1464 N1465 R1470 F1480 D1488 I1495 E1496 E1497 K1500 E1501 A1502 VAL GLU ALA LYS GLU ARG GLY SER HIS MET LYS SER ARG LYS ARG ARG GLY VAL LYS ARG GLU GLN PRO GLY LYS GLN ALA

• **Molecule 4: DNA-directed RNA polymerase subunit omega**

Chain E:

| | 81% | | 14% | 5% |

MET A2 D14 R18 H33 N37 E44 R45 T50 L51 D56 D57 W63 R72 E88 M89 V95 GLU ARG GLU GLU
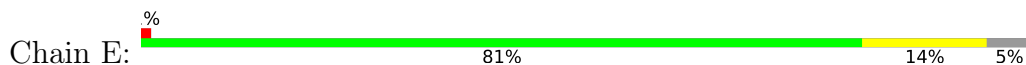
• **Molecule 5: RNA polymerase sigma factor SigA**

Chain F:

| 2% | 67% | 11% | 22% |

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

GLU ASP PRO ASP LEU THR LEU GLU ASP ASP LEU GLU ASP PRO GLU GLU GLY GLU GLY LEU ASP LEU GLU GLU GLU GLU ASP LEU PRO ILE PRO LYS ILE SER THR S78 Q83 Y84 I88 L93 E97 L102 V106 G109 M110 I113 T120 G121 L122

V131 I135 S138 V141 R142 E149 T150 P153 V156 D160 L163 K164 L174 H175 R178 E181 Q185 L192 R193 L210 K270 R276 Q279 E285 P286 M295 I321 S327 L361 S362 E365 L369 K370 K373

I376 D377 G378 R379 E380 I397 I400 K403 A404 L405 R414 T415 R416 R419 L422 D423

• **Molecule 6: DNA (21-MER)**

Chain G:

| 38% | 38% | 24% |

DC DC DT DG C4 A5 T6 G11 A12 C13 A14 C15 C16 A17 G18 G19 DG

• **Molecule 7: DNA (27-MER)**

Chain H:

| 7% | 44% | 41% | 15% |

T1 T6 G7 G8 G9 A10 G11 C12 T13 G14 T15 C16 A17 C18 G19 T22 G23 DC DA DG DG

• **Molecule 8: RNA (5'-D(*PP*PP*P)-R(*GP*GP*U)-3')**

Chain I:

| 100% |

There are no outlier residues recorded for this chain.

4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	184.42Å 103.70Å 295.44Å 90.00° 98.67° 90.00°	Depositor
Resolution (Å)	48.86 – 2.69 48.86 – 2.69	Depositor EDS
% Data completeness (in resolution range)	74.9 (48.86-2.69) 74.9 (48.86-2.69)	Depositor EDS
R_{merge}	0.13	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.10 (at 2.69Å)	Xtriage
Refinement program	PHENIX (1.12_2829: ???)	Depositor
R, R_{free}	0.212 , 0.260 0.212 , 0.260	Depositor DCC
R_{free} test set	2002 reflections (1.75%)	wwPDB-VP
Wilson B-factor (Å^2)	43.7	Xtriage
Anisotropy	0.079	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.28 , 35.2	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.91	EDS
Total number of atoms	28636	wwPDB-VP
Average B, all atoms (Å^2)	47.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.08% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: GTP, 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	0.26	0/1819	0.46	0/2473
1	B	0.25	0/1821	0.45	0/2476
2	C	0.26	0/8927	0.44	0/12074
3	D	0.26	0/11914	0.45	0/16111
4	E	0.25	0/775	0.41	0/1045
5	F	0.25	0/2852	0.40	0/3837
6	G	0.52	0/365	0.86	0/560
7	H	0.59	0/535	0.91	0/826
8	I	0.27	0/47	0.81	0/71
All	All	0.27	0/29055	0.47	0/39473

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 ⓘ

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	1787	0	1839	30	0
1	B	1789	0	1841	31	0
2	C	8761	0	8859	127	0
3	D	11706	0	11929	153	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	E	761	0	778	9	0
5	F	2807	0	2882	33	0
6	G	326	0	179	8	0
7	H	476	0	261	8	0
8	I	75	0	33	0	0
9	B	1	0	0	0	0
9	D	3	0	0	0	0
9	F	2	0	0	0	0
10	D	2	0	0	0	0
11	A	3	0	0	0	0
11	B	4	0	0	0	0
11	C	47	0	0	1	0
11	D	72	0	0	0	0
11	E	2	0	0	0	0
11	F	6	0	0	0	0
11	G	5	0	0	0	0
11	I	1	0	0	0	0
All	All	28636	0	28601	363	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 6.

All (363) 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)
6:G:11:DG:H2'	6:G:12:DA:C8	2.20	0.76
3:D:1495:ILE:HG12	4:E:88:GLU:HG3	1.68	0.74
5:F:361:LEU:HB3	5:F:365:GLU:HG3	1.69	0.72
3:D:65:ARG:NH1	5:F:378:GLY:O	2.21	0.72
3:D:1254:GLN:HB3	3:D:1258:ARG:HB2	1.70	0.72
2:C:12:VAL:HG21	2:C:472:ARG:HD3	1.73	0.70
2:C:134:ARG:NH1	2:C:392:SER:O	2.25	0.70
3:D:256:GLU:O	3:D:274:ARG:NH1	2.26	0.69
2:C:198:ARG:HE	2:C:227:PHE:HA	1.57	0.67
3:D:162:ARG:O	3:D:414:ARG:NH1	2.28	0.67
6:G:12:DA:H2'	6:G:13:DC:C6	2.29	0.67
1:B:101:LEU:HD21	1:B:109:VAL:HG11	1.77	0.67
5:F:365:GLU:HB2	5:F:404:ALA:HB2	1.77	0.67
6:G:15:DC:H2'	6:G:16:DC:H6	1.59	0.67
3:D:190:GLU:HG2	3:D:196:VAL:HG22	1.77	0.66
5:F:400:ILE:HA	5:F:403:LYS:HG2	1.77	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:1106:VAL:HG13	3:D:1220:ALA:H	1.61	0.66
3:D:266:GLU:HG3	3:D:314:PRO:HB3	1.78	0.66
2:C:776:SER:OG	5:F:373:LYS:NZ	2.29	0.65
3:D:1044:LEU:HD23	3:D:1056:PRO:HB3	1.77	0.65
2:C:462:ASP:HB3	2:C:468:ARG:HD2	1.78	0.65
5:F:370:LYS:HB3	5:F:376:ILE:HG12	1.78	0.65
3:D:1236:LEU:HA	3:D:1359:GLN:HG3	1.78	0.64
1:B:91:ASN:ND2	1:B:93:SER:OG	2.30	0.64
3:D:355:VAL:HG11	3:D:385:VAL:HG21	1.80	0.64
6:G:15:DC:H2'	6:G:16:DC:C6	2.32	0.63
2:C:709:GLU:OE2	2:C:824:ARG:NH1	2.31	0.63
2:C:24:GLU:OE2	2:C:27:ARG:NH2	2.32	0.63
2:C:680:ASP:OD2	2:C:978:ARG:NH2	2.32	0.63
2:C:229:MET:HB2	2:C:233:GLU:HB2	1.81	0.63
3:D:474:GLU:HG3	3:D:496:LEU:HD11	1.81	0.63
3:D:566:ILE:HD11	5:F:192:LEU:HD21	1.81	0.62
1:B:112:ARG:HG3	1:B:125:PRO:HB2	1.81	0.62
3:D:1488:ASP:OD1	3:D:1488:ASP:N	2.32	0.62
3:D:619:LEU:HD11	3:D:1439:SER:HB2	1.81	0.61
3:D:1324:PRO:HG3	3:D:1330:ILE:HD11	1.83	0.61
1:A:24:VAL:HG22	1:A:196:THR:HG23	1.81	0.61
3:D:489:ARG:NH1	3:D:1391:GLU:OE2	2.34	0.61
2:C:711:GLU:HG2	2:C:822:VAL:HG22	1.81	0.60
4:E:45:ARG:NH1	4:E:56:ASP:OD2	2.34	0.60
2:C:212:GLY:HA2	2:C:218:VAL:HG11	1.83	0.60
2:C:768:THR:OG1	2:C:771:GLU:OE1	2.20	0.60
3:D:356:PRO:HB3	3:D:441:ARG:HA	1.84	0.60
3:D:1100:ASP:OD2	3:D:1463:LYS:NZ	2.27	0.60
1:A:58:ILE:HG12	1:A:140:MET:HG2	1.84	0.60
3:D:1108:ARG:NH2	3:D:1198:TYR:O	2.34	0.60
1:B:216:GLU:OE1	1:B:219:ARG:NH2	2.30	0.59
3:D:134:VAL:HG22	3:D:151:GLN:H	1.66	0.59
5:F:131:VAL:HG13	5:F:178:ARG:HD3	1.84	0.59
1:A:218:LEU:HD23	1:B:222:LEU:HD21	1.84	0.59
3:D:218:LYS:HG2	3:D:338:GLU:HG2	1.82	0.59
3:D:356:PRO:HG2	3:D:359:ALA:HB2	1.85	0.59
2:C:397:GLU:HG3	2:C:631:SER:HB2	1.82	0.59
5:F:397:ILE:HD12	5:F:400:ILE:HD11	1.82	0.59
1:A:185:ARG:NH2	1:A:187:GLY:O	2.35	0.59
2:C:399:ASN:O	2:C:402:SER:OG	2.20	0.59
3:D:367:ILE:HG22	3:D:368:VAL:HG23	1.84	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:57:GLU:HG3	3:D:64:LYS:HG2	1.85	0.58
3:D:664:LYS:NZ	3:D:693:GLU:OE1	2.28	0.58
2:C:605:LYS:HB3	2:C:610:ARG:NH2	2.19	0.58
3:D:405:ASP:HB3	3:D:423:ASP:HA	1.84	0.58
4:E:14:ASP:OD1	4:E:18:ARG:NH1	2.36	0.57
2:C:468:ARG:NH2	11:C:1201:HOH:O	2.36	0.57
2:C:13:ILE:HD13	2:C:483:VAL:HG11	1.87	0.57
2:C:460:ARG:HD2	2:C:485:TYR:CZ	2.39	0.57
2:C:154:ARG:HE	2:C:157:ARG:HG3	1.69	0.56
2:C:172:ILE:HG12	2:C:186:VAL:HG22	1.87	0.56
1:B:132:LEU:HD21	1:B:138:LEU:HB2	1.87	0.56
3:D:968:ASP:O	3:D:971:LEU:HB2	2.06	0.56
7:H:18:DC:H2"	7:H:19:DG:C8	2.41	0.56
2:C:343:GLN:HG3	2:C:385:PHE:HB2	1.87	0.56
2:C:408:ARG:NH1	2:C:456:ALA:O	2.38	0.56
2:C:724:ARG:NH2	2:C:734:LEU:O	2.39	0.56
5:F:163:LEU:HB3	5:F:174:LEU:HD22	1.88	0.55
2:C:771:GLU:O	2:C:775:ARG:HG2	2.07	0.55
2:C:428:ARG:NH2	2:C:447:ALA:O	2.36	0.55
3:D:787:LEU:HD21	3:D:947:ILE:HG21	1.87	0.55
2:C:97:ARG:NH1	2:C:110:GLU:OE1	2.36	0.54
3:D:142:LEU:HD13	3:D:161:LEU:HD11	1.89	0.54
3:D:1461:GLY:O	3:D:1465:ASN:ND2	2.37	0.54
1:A:112:ARG:HG3	1:A:125:PRO:HB2	1.89	0.54
1:B:176:ARG:NH2	3:D:888:GLU:OE1	2.27	0.54
2:C:423:ALA:O	2:C:428:ARG:NH1	2.41	0.54
3:D:959:GLU:N	3:D:959:GLU:OE1	2.40	0.54
4:E:50:THR:HG22	4:E:51:LEU:H	1.73	0.54
2:C:173:ASP:HB2	2:C:185:LYS:HB3	1.90	0.54
1:B:220:GLU:O	1:B:223:THR:OG1	2.23	0.54
3:D:1137:ARG:O	3:D:1141:GLU:HG3	2.08	0.54
5:F:153:PRO:HA	5:F:156:VAL:HG22	1.89	0.53
3:D:1353:GLN:O	3:D:1357:ARG:HG3	2.09	0.53
2:C:607:ASP:HB2	2:C:610:ARG:CZ	2.39	0.53
1:A:133:GLU:OE1	2:C:610:ARG:NH2	2.40	0.53
3:D:1048:PRO:O	3:D:1079:LYS:NZ	2.27	0.53
3:D:1465:ASN:OD1	3:D:1470:ARG:NH1	2.42	0.53
2:C:1009:SER:HB3	3:D:651:GLU:O	2.09	0.52
3:D:657:LEU:HG	3:D:661:MET:HE2	1.92	0.52
3:D:1101:VAL:HG13	3:D:1102:THR:HG23	1.91	0.52
5:F:135:ILE:HD11	5:F:178:ARG:HB3	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:F:163:LEU:HD13	5:F:174:LEU:HD13	1.90	0.52
3:D:886:VAL:HB	3:D:900:ILE:HD11	1.91	0.52
2:C:1095:LEU:HD23	3:D:582:LEU:HD22	1.92	0.52
3:D:843:PHE:HE2	3:D:864:VAL:HG11	1.75	0.52
2:C:118:ILE:HD11	2:C:344:PHE:CE1	2.45	0.52
3:D:260:GLU:HB3	3:D:271:VAL:HB	1.91	0.52
3:D:864:VAL:HG12	3:D:865:THR:H	1.75	0.52
3:D:828:LYS:HG2	3:D:833:GLU:HG2	1.92	0.52
3:D:433:GLY:HA2	3:D:449:SER:H	1.75	0.51
3:D:131:LYS:HD2	3:D:152:LEU:HD23	1.93	0.51
2:C:630:ARG:HG3	2:C:705:ILE:HB	1.93	0.51
3:D:963:TYR:CE1	3:D:1002:LYS:HD3	2.45	0.51
3:D:273:ARG:HG2	3:D:278:PRO:HA	1.92	0.51
3:D:472:ALA:O	3:D:476:GLU:HG2	2.10	0.51
3:D:843:PHE:CE2	3:D:864:VAL:HG11	2.45	0.51
2:C:805:ARG:HH21	2:C:807:ARG:HD3	1.75	0.51
3:D:437:VAL:HG11	5:F:175:HIS:CD2	2.45	0.51
3:D:968:ASP:HA	3:D:971:LEU:HD12	1.92	0.51
2:C:1043:TYR:CG	3:D:763:MET:HG2	2.46	0.51
2:C:101:ILE:HG12	2:C:108:ILE:HG12	1.93	0.51
3:D:1042:ARG:HB3	3:D:1057:VAL:HB	1.93	0.50
1:A:4:SER:O	1:A:189:ARG:NH2	2.44	0.50
1:A:20:TYR:OH	1:A:198:ARG:HD2	2.12	0.50
3:D:996:TRP:CD2	3:D:1056:PRO:HG3	2.47	0.50
1:A:99:LEU:HB2	1:A:142:VAL:HG22	1.93	0.50
3:D:455:ARG:HB2	3:D:460:ALA:HB2	1.94	0.50
2:C:628:PHE:H	2:C:638:ASP:CB	2.24	0.50
3:D:573:MET:SD	5:F:210:LEU:HB3	2.50	0.50
3:D:242:LEU:HB3	3:D:311:LEU:HD12	1.92	0.50
3:D:658:LEU:HA	3:D:661:MET:HE3	1.94	0.50
3:D:658:LEU:HD11	3:D:674[A]:ARG:HH11	1.76	0.50
3:D:959:GLU:HB3	3:D:963:TYR:CE2	2.46	0.50
1:A:110:LYS:HD3	1:A:128:HIS:HA	1.94	0.50
2:C:200:LEU:HD13	2:C:300:ASP:HB2	1.93	0.50
3:D:124:GLU:OE2	3:D:587:ARG:NH2	2.45	0.50
3:D:1020:LEU:HB3	3:D:1035:ILE:HD12	1.93	0.50
1:B:23:PHE:HB2	1:B:197:LEU:HB2	1.93	0.50
5:F:270:LYS:HG2	5:F:295:MET:HE1	1.94	0.50
1:B:80:LEU:HD21	3:D:842:VAL:HG12	1.93	0.50
3:D:349:PRO:HB3	5:F:97:GLU:HG3	1.94	0.50
2:C:294:GLU:HB3	2:C:299:LYS:HE2	1.94	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:351:LEU:HD11	2:C:373:VAL:HG13	1.93	0.49
3:D:864:VAL:HG12	3:D:865:THR:N	2.28	0.49
3:D:238:PRO:HD3	3:D:318:ARG:HG3	1.94	0.49
1:A:198:ARG:HD3	2:C:934:PHE:CZ	2.48	0.49
2:C:628:PHE:H	2:C:638:ASP:HB3	1.78	0.49
3:D:500:ARG:NH1	3:D:1388:ARG:O	2.44	0.49
2:C:167:LYS:HG2	7:H:12:DC:H2'	1.93	0.49
3:D:167:GLU:OE2	3:D:198:ARG:NH1	2.46	0.49
2:C:937:ASP:OD1	2:C:938:LYS:N	2.46	0.49
1:A:183:ASP:HA	2:C:938:LYS:HE3	1.95	0.48
2:C:436:GLY:HA2	2:C:538:GLN:O	2.13	0.48
3:D:895:VAL:HG11	3:D:922:LEU:HD21	1.95	0.48
3:D:1372:VAL:HA	3:D:1375:MET:HE3	1.95	0.48
2:C:1038:TRP:CE2	3:D:1099:VAL:HG11	2.48	0.48
2:C:772:ARG:H	2:C:772:ARG:HG2	1.49	0.48
3:D:473:LEU:HD21	3:D:495:ARG:HH21	1.79	0.48
2:C:584:GLU:OE2	2:C:584:GLU:N	2.44	0.48
2:C:853:LEU:HB2	2:C:858:MET:HE1	1.93	0.48
2:C:545:ASN:HB3	2:C:583:LEU:HD23	1.96	0.48
3:D:974:ILE:HD13	3:D:991:GLN:HB3	1.96	0.48
2:C:740:GLU:HB3	2:C:805:ARG:NH1	2.28	0.47
2:C:861:LEU:HD12	2:C:865:THR:HB	1.97	0.47
5:F:120:THR:HG22	5:F:122:LEU:HD13	1.95	0.47
6:G:5:DA:H2'	6:G:6:DT:H72	1.95	0.47
1:A:222:LEU:HD21	1:B:218:LEU:HD23	1.97	0.47
1:B:26:GLU:HB3	1:B:194:LYS:HG3	1.96	0.47
2:C:572:ILE:HG13	2:C:573:ARG:HG3	1.96	0.47
2:C:586:ARG:NH2	2:C:590:ASP:OD2	2.38	0.47
2:C:674:VAL:HG12	2:C:869:VAL:HB	1.97	0.47
3:D:809:PRO:HB3	3:D:839:LEU:HD13	1.96	0.47
2:C:390:GLN:HB3	2:C:415:PRO:HD3	1.96	0.47
3:D:101:HIS:HB3	3:D:104:PHE:HD2	1.79	0.47
3:D:1068:LEU:O	3:D:1072:ILE:HG12	2.14	0.47
3:D:158:TYR:CE1	3:D:454:ALA:HB3	2.50	0.47
3:D:432:TYR:O	3:D:448:GLU:HA	2.15	0.47
4:E:37:ASN:OD1	4:E:37:ASN:N	2.41	0.47
2:C:853:LEU:HB2	2:C:858:MET:CE	2.45	0.47
1:B:89:PHE:HD2	1:B:146:ARG:HD2	1.80	0.47
2:C:376:ARG:HD3	5:F:276:ARG:HD2	1.97	0.47
3:D:255:GLU:OE1	3:D:274:ARG:NH2	2.40	0.47
3:D:1500:LYS:HB3	3:D:1500:LYS:HE2	1.57	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:32:PHE:HE1	1:B:47:SER:HG	1.60	0.47
1:A:229:GLN:HB2	1:B:11:PHE:O	2.14	0.46
2:C:224:GLU:CD	2:C:224:GLU:H	2.18	0.46
2:C:173:ASP:O	2:C:184:MET:HA	2.14	0.46
3:D:22:SER:HB2	3:D:92:HIS:HB3	1.96	0.46
7:H:16:DC:H2'	7:H:17:DA:C8	2.50	0.46
3:D:798:GLU:HG3	3:D:824:ASN:HB2	1.97	0.46
2:C:499:ALA:HB2	2:C:533:ASP:HB2	1.97	0.46
2:C:936:VAL:HG11	2:C:959:PRO:HB2	1.98	0.46
2:C:948:GLU:HG3	2:C:953:VAL:HG23	1.97	0.46
2:C:1090:LYS:HE2	2:C:1112:PHE:CZ	2.50	0.46
3:D:399:ARG:HB3	3:D:401:TYR:CE2	2.51	0.46
3:D:415:VAL:HG13	3:D:419:ASP:HB2	1.97	0.46
3:D:988:ARG:NH2	3:D:1054:GLU:OE2	2.49	0.46
3:D:1271:LYS:HD3	3:D:1331:ASP:HB2	1.98	0.46
1:B:72:LYS:HG2	1:B:131:THR:OG1	2.15	0.46
2:C:195:LEU:O	2:C:199:VAL:HG23	2.16	0.46
2:C:92:ALA:HB2	2:C:120:LEU:HD11	1.97	0.46
3:D:1084:THR:O	3:D:1088:THR:HG23	2.16	0.46
3:D:1108:ARG:HD2	3:D:1198:TYR:O	2.16	0.46
7:H:8:DG:C8	7:H:8:DG:H5'	2.50	0.46
1:A:10:VAL:HG12	1:A:26:GLU:O	2.16	0.46
1:B:72:LYS:HG3	1:B:73:GLU:N	2.31	0.46
1:B:90:LEU:HD21	1:B:121:GLU:HB2	1.97	0.46
3:D:750:PRO:O	3:D:756:GLN:NE2	2.49	0.46
3:D:883:ALA:HA	3:D:900:ILE:HD13	1.97	0.46
2:C:431:HIS:HB3	2:C:434:HIS:CD2	2.51	0.46
2:C:607:ASP:HB2	2:C:610:ARG:NH2	2.31	0.46
2:C:769:PRO:HA	2:C:772:ARG:HG3	1.97	0.45
3:D:475:LYS:O	3:D:479:GLU:HG2	2.16	0.45
3:D:637:LEU:HD13	3:D:642:CYS:HA	1.98	0.45
2:C:535:SER:O	2:C:538:GLN:HG2	2.16	0.45
3:D:1497:GLU:HA	3:D:1500:LYS:HB2	1.97	0.45
2:C:150:PRO:HG3	2:C:322:VAL:HG11	1.99	0.45
2:C:189:ARG:HD2	2:C:242:LEU:HD23	1.98	0.45
1:A:226:SER:O	1:A:228:PRO:HD3	2.16	0.45
2:C:1070:ILE:CG2	3:D:655:PRO:HB2	2.47	0.45
3:D:487:ALA:O	3:D:491:LYS:HG2	2.17	0.45
2:C:35:PRO:HG2	2:C:38:LYS:HD2	1.97	0.45
2:C:402:SER:HA	2:C:566:THR:HG23	1.99	0.45
2:C:468:ARG:HA	2:C:486:MET:O	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:598:GLU:O	2:C:651:LYS:NZ	2.42	0.45
2:C:657:ASP:OD2	2:C:663:ASN:N	2.45	0.45
3:D:1480:PHE:O	4:E:18:ARG:NH2	2.50	0.45
1:A:70:GLY:N	2:C:607:ASP:OD1	2.46	0.45
2:C:469:THR:OG1	2:C:538:GLN:NE2	2.50	0.45
2:C:740:GLU:HB3	2:C:805:ARG:HH12	1.82	0.45
1:A:39:PRO:HG3	1:B:39:PRO:HG3	1.99	0.45
1:A:179:PHE:HB3	1:A:197:LEU:HD23	1.99	0.45
2:C:922:PHE:CD2	2:C:964:LYS:HG3	2.52	0.45
3:D:1296:SER:OG	3:D:1297:GLU:N	2.49	0.45
2:C:1030:GLN:OE1	3:D:628:ARG:NH1	2.42	0.45
3:D:45:PHE:O	3:D:86:ARG:NH2	2.50	0.45
3:D:643:GLY:HA3	3:D:727:GLN:HB2	1.98	0.45
3:D:122:GLU:O	3:D:126:VAL:HG23	2.16	0.45
3:D:317:VAL:HG23	3:D:339:TRP:HB3	1.98	0.45
1:A:101:LEU:HD21	1:A:109:VAL:HG11	1.99	0.44
3:D:1003:VAL:HG21	3:D:1041:LEU:HG	1.98	0.44
5:F:369:LEU:HD21	5:F:405:LEU:HD12	1.99	0.44
5:F:400:ILE:HG22	5:F:403:LYS:HE2	1.99	0.44
1:B:141:GLU:OE1	1:B:161:ARG:NH2	2.50	0.44
2:C:281:LEU:HD13	2:C:305:PRO:HB2	2.00	0.44
3:D:1364:HIS:ND1	3:D:1366:LYS:HB2	2.33	0.44
1:B:32:PHE:HA	1:B:35:THR:HB	1.99	0.44
2:C:205:GLU:O	2:C:209:ARG:HG2	2.18	0.44
2:C:390:GLN:HB3	2:C:414:GLY:HA2	2.00	0.44
5:F:160:ASP:O	5:F:164:LYS:HD3	2.18	0.44
1:B:57:TYR:CD1	1:B:161:ARG:HD2	2.53	0.44
1:B:110:LYS:HD3	1:B:128:HIS:HA	2.00	0.44
2:C:880:MET:HG2	3:D:1038:LEU:HD21	1.99	0.44
3:D:135:LEU:HD23	3:D:463:GLN:HG2	2.00	0.44
3:D:1267:ARG:NE	3:D:1331:ASP:OD2	2.51	0.44
3:D:463:GLN:O	3:D:467:GLU:HG2	2.17	0.44
7:H:16:DC:H2"	7:H:17:DA:H5'	1.99	0.44
3:D:256:GLU:HG2	3:D:299:GLU:HA	1.99	0.44
5:F:362:SER:OG	5:F:365:GLU:HG2	2.18	0.44
2:C:726:ILE:HD11	2:C:757:GLY:HA3	2.00	0.44
5:F:84:TYR:O	5:F:88:ILE:HG12	2.17	0.44
2:C:1090:LYS:HA	2:C:1090:LYS:HD3	1.77	0.43
3:D:483:HIS:CG	3:D:484:PRO:HD2	2.53	0.43
3:D:30:GLU:OE1	3:D:40:GLU:HG2	2.18	0.43
3:D:480:GLU:OE2	3:D:488:ARG:NH2	2.51	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:899:LEU:HD22	3:D:917:GLN:HB3	1.98	0.43
1:B:56:VAL:HG21	1:B:82:LEU:HD13	2.00	0.43
2:C:179:ASN:HD21	2:C:181:VAL:HG12	1.83	0.43
2:C:431:HIS:HB3	2:C:434:HIS:HD2	1.82	0.43
3:D:792:ILE:HG13	3:D:793:THR:HG23	2.00	0.43
1:A:150:TYR:CE2	1:A:152:PRO:HG3	2.53	0.43
2:C:76:PRO:HG3	2:C:120:LEU:HD12	2.00	0.43
3:D:398:ALA:HB2	3:D:447:VAL:HG22	2.00	0.43
2:C:874:LEU:O	3:D:1029:ARG:HG3	2.18	0.43
5:F:109:GLY:O	5:F:113:ILE:HG13	2.18	0.43
5:F:181:GLU:O	5:F:185:GLN:HG2	2.19	0.43
1:B:111:ALA:HB3	1:B:125:PRO:HA	2.00	0.43
2:C:124:ASP:OD2	2:C:407:LYS:NZ	2.30	0.43
2:C:286:SER:OG	2:C:301:GLU:OE2	2.24	0.43
4:E:57:ASP:O	4:E:63:TRP:NE1	2.46	0.43
1:A:228:PRO:HB3	1:B:13:VAL:HG21	2.01	0.43
1:B:83:LYS:HE2	1:B:168:ASP:HB2	2.00	0.43
2:C:328:LEU:HD12	2:C:433:THR:O	2.18	0.43
3:D:207:PHE:HD2	3:D:391:ALA:HB3	1.84	0.43
3:D:1053:PHE:CZ	3:D:1072:ILE:HD12	2.54	0.43
2:C:259:GLY:HA2	2:C:263:ASP:HB2	2.01	0.43
2:C:1023:GLY:HA2	6:G:18:DG:OP2	2.19	0.43
3:D:314:PRO:HB2	3:D:317:VAL:HG12	2.00	0.43
2:C:20:GLU:O	2:C:24:GLU:HB2	2.18	0.43
3:D:654:LYS:O	3:D:658:LEU:HG	2.18	0.43
3:D:1147:ARG:HD3	3:D:1188:VAL:HG21	2.01	0.43
3:D:1441:GLN:HG2	6:G:12:DA:H5"	2.01	0.43
1:A:57:TYR:CG	1:A:161:ARG:HD2	2.54	0.42
2:C:772:ARG:NE	5:F:380:GLU:OE2	2.46	0.42
3:D:961:LYS:HE3	3:D:961:LYS:HB2	1.82	0.42
1:B:56:VAL:HG22	1:B:142:VAL:HG12	2.01	0.42
3:D:236:TYR:CE1	3:D:242:LEU:HD12	2.53	0.42
3:D:255:GLU:HB3	3:D:274:ARG:HH12	1.84	0.42
3:D:258:VAL:HG12	3:D:273:ARG:O	2.19	0.42
3:D:419:ASP:H	3:D:429:SER:HB3	1.84	0.42
3:D:644:LEU:HD12	3:D:645:PRO:HD2	2.00	0.42
2:C:247:PRO:HA	2:C:248:PRO:HD3	1.89	0.42
2:C:348:LEU:HD12	2:C:348:LEU:HA	1.87	0.42
3:D:572:ARG:NH1	5:F:83:GLN:HB3	2.34	0.42
2:C:805:ARG:HE	2:C:807:ARG:HD3	1.85	0.42
1:B:85:LEU:HG	1:B:87:VAL:HG23	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:121:MET:SD	2:C:125:GLY:HA2	2.60	0.42
2:C:160:ALA:HB3	2:C:174:LEU:HB2	2.00	0.42
4:E:44:GLU:OE2	4:E:72:ARG:NH1	2.41	0.42
2:C:974:LEU:HD12	2:C:974:LEU:HA	1.93	0.42
3:D:556:LYS:O	3:D:560:GLN:HG3	2.19	0.42
3:D:1379:VAL:HG21	3:D:1400:VAL:HG11	2.01	0.42
2:C:858:MET:HG2	2:C:867:VAL:O	2.19	0.42
3:D:298:VAL:HG12	3:D:302:GLN:NE2	2.35	0.42
2:C:611:ILE:HD11	2:C:641:PRO:HB3	2.02	0.41
2:C:767:PRO:HB2	2:C:772:ARG:HD2	2.03	0.41
2:C:91:GLN:HB2	2:C:117:HIS:HB3	2.01	0.41
5:F:88:ILE:HG22	5:F:193:ARG:HG2	2.02	0.41
5:F:321:ILE:O	5:F:327:SER:HB3	2.19	0.41
1:A:115:LEU:HA	1:A:116:PRO:HD3	1.95	0.41
2:C:928:LYS:HE3	2:C:928:LYS:HB2	1.68	0.41
1:A:8:ALA:HA	1:A:9:PRO:HD3	1.95	0.41
2:C:684:PHE:HB3	3:D:633:VAL:HG21	2.01	0.41
2:C:420:ARG:O	2:C:421:GLU:HB3	2.21	0.41
2:C:939:ARG:HG2	2:C:982:PRO:HD3	2.03	0.41
5:F:93:LEU:HD11	7:H:6:DT:H2"	2.01	0.41
5:F:285:GLU:HA	5:F:286:PRO:HD3	1.96	0.41
1:A:16:GLN:HB2	1:A:20:TYR:HB3	2.02	0.41
1:A:184:THR:O	1:A:192:LEU:HB2	2.20	0.41
2:C:177:GLU:OE1	2:C:179:ASN:ND2	2.54	0.41
2:C:721:ARG:HH22	2:C:785:VAL:HG11	1.85	0.41
2:C:758:ARG:HH21	2:C:788:THR:HB	1.85	0.41
2:C:807:ARG:HB2	2:C:810:ASP:OD2	2.21	0.41
1:B:128:HIS:HE1	1:B:131:THR:HG22	1.86	0.41
7:H:10:DA:H2"	7:H:11:DG:C8	2.55	0.41
1:A:227:ASN:HD21	1:A:229:GLN:HE22	1.67	0.41
3:D:34:TYR:CZ	3:D:35:ARG:HG3	2.56	0.41
7:H:14:DG:C8	7:H:15:DT:H72	2.54	0.41
3:D:520:LEU:HD12	3:D:521:PRO:HD2	2.02	0.41
3:D:1040:GLY:O	3:D:1060:SER:HB3	2.20	0.41
3:D:1420:LEU:HD12	3:D:1420:LEU:HA	1.91	0.41
4:E:33:HIS:NE2	4:E:89:MET:HB3	2.35	0.41
2:C:249:LYS:HB3	2:C:252:LYS:HB2	2.02	0.41
3:D:841:TYR:HB2	3:D:864:VAL:HG13	2.02	0.41
3:D:1053:PHE:CE2	3:D:1072:ILE:HG23	2.55	0.41
3:D:1147:ARG:HH22	3:D:1369:GLU:CD	2.24	0.41
3:D:1211:MET:HE3	3:D:1211:MET:HB2	1.93	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:1232:PRO:HG2	3:D:1356:TYR:HE1	1.86	0.41
5:F:102:LEU:O	5:F:106:VAL:HG23	2.21	0.41
6:G:11:DG:H2'	6:G:12:DA:H8	1.78	0.41
2:C:118:ILE:HG12	2:C:382:ILE:HD13	2.03	0.40
3:D:637:LEU:O	3:D:935:LYS:NZ	2.53	0.40
3:D:645:PRO:HB3	3:D:723:GLY:O	2.21	0.40
1:A:112:ARG:NH1	1:A:126:ASP:OD1	2.48	0.40
3:D:1189:ARG:HB3	3:D:1204:CYS:HA	2.03	0.40
1:B:124:ASN:OD1	1:B:124:ASN:N	2.54	0.40
2:C:712:ALA:HB3	2:C:821:GLU:HG3	2.03	0.40
3:D:134:VAL:CG2	3:D:151:GLN:H	2.32	0.40
3:D:205:TYR:CE1	3:D:390:PRO:HG3	2.56	0.40
3:D:879:ARG:HD3	3:D:902:LEU:O	2.21	0.40
3:D:1432:LYS:HE3	3:D:1432:LYS:HB2	1.85	0.40
2:C:727:PRO:HB2	2:C:728:HIS:ND1	2.37	0.40
3:D:200:ASP:O	3:D:397:LYS:HG2	2.22	0.40
2:C:775:ARG:O	2:C:779:GLY:N	2.53	0.40
2:C:912:PRO:O	2:C:916:GLU:HG3	2.22	0.40
2:C:1032:PHE:CZ	2:C:1036:GLU:HB3	2.56	0.40

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 X-ray entries followed by that with respect to entries of similar resolution.

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	225/315 (71%)	222 (99%)	3 (1%)	0	100	100
1	B	225/315 (71%)	221 (98%)	4 (2%)	0	100	100
2	C	1108/1119 (99%)	1078 (97%)	30 (3%)	0	100	100
3	D	1479/1524 (97%)	1448 (98%)	31 (2%)	0	100	100
4	E	92/99 (93%)	90 (98%)	2 (2%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
5	F	344/443 (78%)	341 (99%)	3 (1%)	0	100	100
All	All	3473/3815 (91%)	3400 (98%)	73 (2%)	0	100	100

There are no Ramachandran outliers to report.

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 X-ray entries followed by that with respect to entries of similar resolution.

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	199/273 (73%)	197 (99%)	2 (1%)	76	91
1	B	200/273 (73%)	200 (100%)	0	100	100
2	C	934/941 (99%)	921 (99%)	13 (1%)	67	86
3	D	1247/1279 (98%)	1230 (99%)	17 (1%)	67	86
4	E	83/88 (94%)	83 (100%)	0	100	100
5	F	301/388 (78%)	298 (99%)	3 (1%)	76	91
All	All	2964/3242 (91%)	2929 (99%)	35 (1%)	71	88

All (35) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	205	VAL
1	A	229	GLN
2	C	1	MET
2	C	261	ILE
2	C	361	MET
2	C	405	ARG
2	C	454	SER
2	C	610	ARG
2	C	617	ASP
2	C	670	GLN
2	C	739	GLU
2	C	762	LYS
2	C	764	GLU

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Mol	Chain	Res	Type
2	C	772	ARG
2	C	1106	ASP
3	D	20	SER
3	D	80	VAL
3	D	81	THR
3	D	200	ASP
3	D	274	ARG
3	D	450	TYR
3	D	560	GLN
3	D	681	ARG
3	D	711	LEU
3	D	754	PHE
3	D	783	ARG
3	D	784	ASP
3	D	907	GLU
3	D	1418	LYS
3	D	1433	SER
3	D	1488	ASP
3	D	1500	LYS
5	F	110	MET
5	F	141	VAL
5	F	279	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	227	ASN
1	B	91	ASN
2	C	538	GLN
3	D	696	HIS

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
8	I	1/3 (33%)	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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 8 ligands modelled in this entry, 8 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 ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å²)	Q<0.9
1	A	227/315 (72%)	-0.29	0	100	100	26, 41, 65, 77	0
1	B	227/315 (72%)	0.01	3 (1%)	77	78	25, 52, 80, 109	0
2	C	1112/1119 (99%)	-0.06	48 (4%)	35	33	7, 36, 97, 122	0
3	D	1484/1524 (97%)	0.08	93 (6%)	20	19	8, 38, 96, 123	0
4	E	94/99 (94%)	-0.32	1 (1%)	80	82	17, 38, 73, 83	0
5	F	346/443 (78%)	0.08	10 (2%)	51	52	17, 55, 91, 111	0
6	G	16/21 (76%)	-0.22	0	100	100	29, 49, 123, 131	0
7	H	23/27 (85%)	0.02	2 (8%)	10	8	52, 72, 120, 136	0
8	I	2/3 (66%)	0.78	0	100	100	37, 37, 37, 43	2 (100%)
All	All	3531/3866 (91%)	-0.00	157 (4%)	34	33	7, 41, 95, 136	2 (0%)

All (157) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	D	1313	VAL	4.6
3	D	974	ILE	4.5
3	D	173	PRO	4.4
3	D	236	TYR	4.3
5	F	414	ARG	4.3
3	D	422	ALA	4.3
2	C	188	LYS	4.3
3	D	309	GLY	4.3
2	C	104	ASP	4.2
2	C	207	LEU	4.2
2	C	365	ASP	4.2
1	B	3	ASP	4.1
3	D	241	ILE	4.1
2	C	221	LEU	4.1
3	D	203	ALA	4.1

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Mol	Chain	Res	Type	RSRZ
3	D	1130	ARG	4.0
2	C	226	VAL	4.0
3	D	1287	GLU	3.9
3	D	242	LEU	3.9
2	C	419	THR	3.9
2	C	176	VAL	3.9
2	C	297	GLU	3.9
2	C	107	LEU	3.8
2	C	242	LEU	3.8
2	C	311	PHE	3.7
2	C	275	TYR	3.7
5	F	138	SER	3.5
3	D	186	VAL	3.5
3	D	322	VAL	3.5
2	C	364	GLU	3.4
3	D	174	GLY	3.4
3	D	183	GLU	3.4
2	C	766	GLU	3.3
3	D	312	ARG	3.3
2	C	254	VAL	3.3
2	C	227	PHE	3.3
3	D	982	PHE	3.3
2	C	219	GLN	3.3
3	D	310	LEU	3.3
5	F	149	GLU	3.2
3	D	237	LYS	3.2
3	D	1127	GLU	3.2
2	C	366	SER	3.2
3	D	345	TYR	3.2
1	B	5	LYS	3.2
2	C	367	LEU	3.1
3	D	198	ARG	3.1
2	C	208	ALA	3.1
3	D	976	GLN	3.1
3	D	805	GLU	3.1
2	C	224	GLU	3.1
3	D	447	VAL	3.1
5	F	423	ASP	3.1
2	C	216	GLU	3.0
3	D	393	ILE	3.0
2	C	648	ARG	3.0
2	C	203	ASP	3.0

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Mol	Chain	Res	Type	RSRZ
3	D	980	MET	3.0
3	D	830	ALA	3.0
5	F	422	LEU	2.9
3	D	245	LEU	2.9
3	D	361	VAL	2.9
3	D	363	ALA	2.9
3	D	360	ARG	2.9
4	E	51	LEU	2.8
5	F	415	THR	2.8
2	C	182	VAL	2.8
2	C	229	MET	2.8
3	D	235	ALA	2.8
3	D	152	LEU	2.8
3	D	452	ILE	2.8
3	D	231	VAL	2.8
3	D	1408	ILE	2.8
3	D	1305	LEU	2.7
3	D	211	VAL	2.7
3	D	977	ALA	2.7
1	B	2	LEU	2.7
3	D	161	LEU	2.7
3	D	201	GLY	2.7
5	F	416	ARG	2.7
3	D	1299	PHE	2.7
3	D	973	GLN	2.7
2	C	217	LEU	2.7
3	D	1495	ILE	2.7
3	D	196	VAL	2.7
2	C	103	LYS	2.7
3	D	395	VAL	2.6
3	D	142	LEU	2.6
3	D	195	VAL	2.6
2	C	421	GLU	2.6
3	D	396	VAL	2.6
3	D	1281	VAL	2.6
2	C	153	ALA	2.6
3	D	350	HIS	2.6
2	C	361	MET	2.6
2	C	209	ARG	2.6
2	C	250	ARG	2.6
3	D	381	ALA	2.5
3	D	978	TYR	2.5

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Mol	Chain	Res	Type	RSRZ
3	D	244	GLU	2.5
2	C	155	PRO	2.5
3	D	202	VAL	2.5
7	H	22	DT	2.5
3	D	372	ASP	2.5
3	D	406	ASP	2.4
3	D	216	VAL	2.4
3	D	368	VAL	2.4
2	C	157	ARG	2.4
3	D	378	ILE	2.4
3	D	434	ARG	2.4
5	F	142	ARG	2.4
3	D	190	GLU	2.4
3	D	205	TYR	2.3
3	D	449	SER	2.3
2	C	152	PRO	2.3
2	C	181	VAL	2.3
3	D	405	ASP	2.3
3	D	1497	GLU	2.3
3	D	320	ALA	2.3
2	C	159	ILE	2.3
3	D	409	VAL	2.3
3	D	191	LEU	2.3
3	D	807	ALA	2.2
2	C	179	ASN	2.2
2	C	775	ARG	2.2
3	D	427	VAL	2.2
3	D	1294	VAL	2.2
2	C	158	TYR	2.2
3	D	1298	GLY	2.2
3	D	384	VAL	2.2
3	D	454	ALA	2.2
3	D	486	ARG	2.2
2	C	200	LEU	2.1
3	D	362	GLU	2.1
3	D	1252	ILE	2.1
3	D	1300	SER	2.1
3	D	415	VAL	2.1
5	F	419	ARG	2.1
5	F	150	THR	2.1
3	D	336	PHE	2.1
3	D	1500	LYS	2.1

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Mol	Chain	Res	Type	RSRZ
3	D	426	LYS	2.1
2	C	108	ILE	2.1
3	D	1292	VAL	2.1
2	C	177	GLU	2.1
3	D	373	PRO	2.1
3	D	432	TYR	2.1
3	D	1129	THR	2.1
7	H	23	DG	2.1
3	D	346	ARG	2.1
3	D	833	GLU	2.1
3	D	321	GLN	2.0
2	C	154	ARG	2.0
3	D	470	LEU	2.0
3	D	1297	GLU	2.0
2	C	205	GLU	2.0
2	C	780	GLU	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($Å^2$)	Q<0.9
9	MG	D	1605	1/1	0.82	0.09	41,41,41,41	0
9	MG	B	401	1/1	0.84	0.11	60,60,60,60	0
9	MG	F	501	1/1	0.88	0.07	41,41,41,41	0
9	MG	D	1603	1/1	0.97	0.17	18,18,18,18	0
9	MG	D	1604	1/1	0.97	0.28	33,33,33,33	0
9	MG	F	502	1/1	0.98	0.23	43,43,43,43	0
10	ZN	D	1601	1/1	0.99	0.13	23,23,23,23	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å²)	Q<0.9
10	ZN	D	1602	1/1	0.99	0.08	58,58,58,58	0

6.5 Other polymers ⓘ

There are no such residues in this entry.