Full wwPDB/EMDataBank EM Map/Model Validation Report (i)

May 12, 2019 – 01:48 AM EDT

PDB ID	:	6IG9
EMDB ID:	:	EMD-9664
Title	:	Tra1 subunit from Saccharomyces cerevisiae SAGA complex
Authors	:	Zheng, X.D.; Liu, G.C.; Guan, H.P.; Li, H.T.
Deposited on	:	2018-09-25
Resolution	:	4.60 Å(reported)
Based on PDB ID	:	5OJS

This is a Full wwPDB/EMDataBank EM Map/Model Validation Report for a publicly released PDB/EMDB 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.

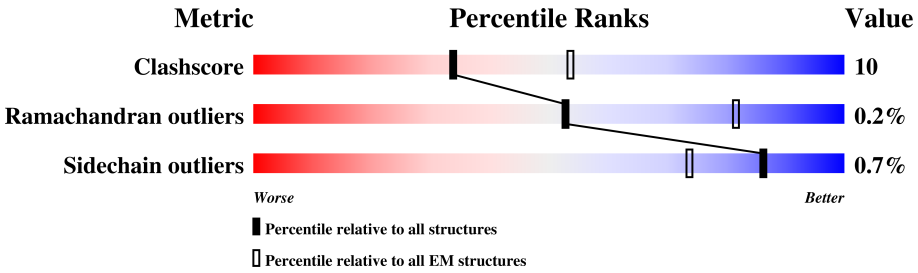
MolProbity	:	4.02b-467
Percentile statistics	:	20171227.v01 (using entries in the PDB archive December 27th 2017)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP)	:	rb-20031633

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 4.60 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)
Clashscore	136327	1886
Ramachandran outliers	132723	1663
Sidechain outliers	132532	1531

The table below summarises the geometric issues observed across the polymeric chains. The red, orange, yellow and green segments on the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria. 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%

Mol	Chain	Length	Quality of chain
1	T	3744	78% 13% 10%

2 Entry composition (i)

There is only 1 type of molecule in this entry. The entry contains 17122 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 Transcription-associated protein 1.

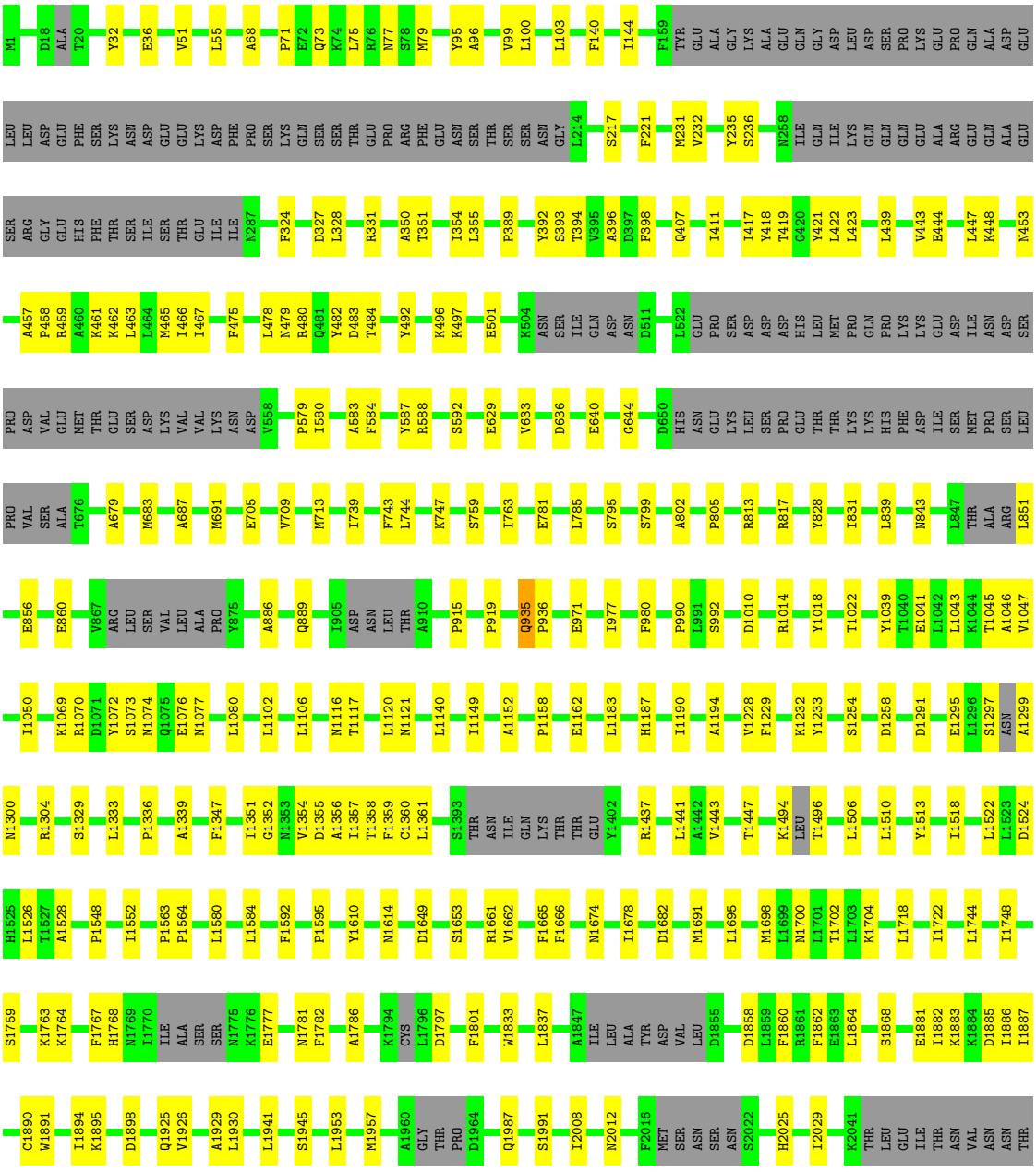
Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
1	T	3386	17122	10350	3386	3386	0	0

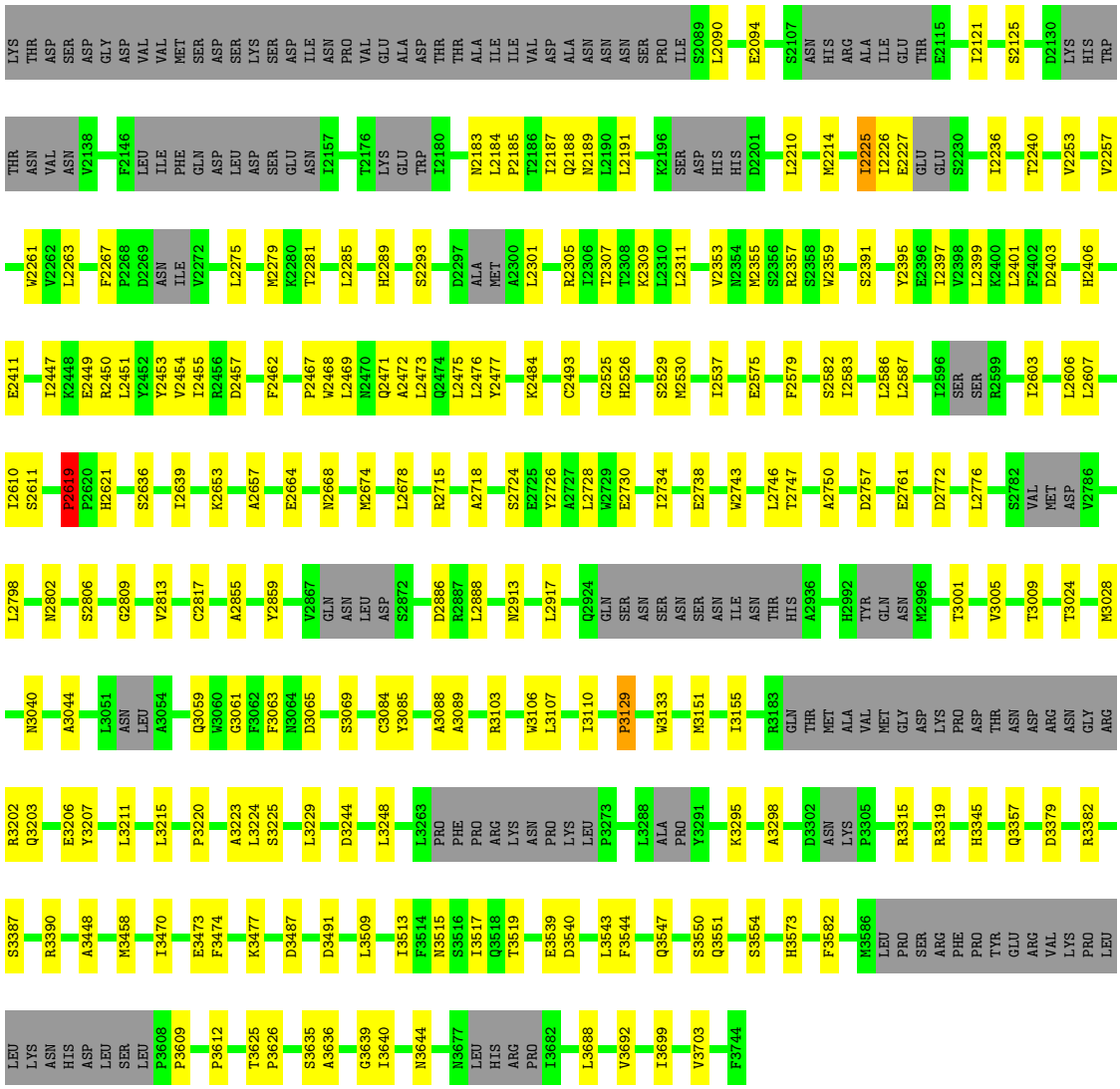
3 Residue-property plots (i)

These plots are drawn for all protein, RNA and DNA 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. 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. 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: Transcription-associated protein 1

Chain T:




LYS THR ASP SER ASP GLY ASP VAL VAL MET SER ASP SER LYS SER ASP ILE ASN PRO VAL GLU ALA ASP THR THR ALA ILE ILE VAL ASP ALA ASN ASN ASN SER PRO ILE S2089 L2090 E2094 S2107 ASN HIS ARG ALA ILE GLU THR E2115 I2121 S2125 D2130 LYS HIS TRP
THR ASN VAL ASN V2138 F2146 LEU ILE PHE GLN ASP LEU ASP SER GLU ASN I2157 T2176 LYS GLU TRP I2180 N2183 L2184 P2185 T2186 I2187 Q2188 N2189 L2190 L2191 K2196 SER ASP HIS HIS D2201 L2210 M2214 I2225 I2226 E2227 GLU GLU S2230 I2236 T2240 V2253 V2257
W2261 V2262 L2263 F2267 P2268 D2269 ASN ILE V2272 L2275 M2279 K2280 T2281 L2285 H2289 S2293 D2297 ALA MET A2300 L2301 R2305 I2306 T2307 T2308 K2309 L2310 L2311 V2353 N2354 M2355 S2356 R2357 S2358 W2359 S2391 Y2395 E2396 I2397 V2398 L2399 K2400 L2401 F2402 D2403 H2406
E2411 I2447 K2448 E2449 R2450 L2451 Y2452 Y2453 V2454 I2455 R2456 D2457 F2462 P2467 W2468 L2469 N2470 Q2471 A2472 L2473 Q2474 L2475 L2476 Y2477 K2484 C2493 G2525 H2526 S2529 M2530 I2537 E2575 F2579 S2582 I2583 L2586 L2587 I2596 SER SER R2599 I2603 L2606 L2607
I2610 S2611 P2619 P2620 H2621 S2636 I2639 K2653 A2657 E2664 N2668 M2674 L2678 R2715 A2718 S2724 E2725 Y2726 A2727 L2728 W2729 E2730 I2734 E2738 W2743 L2746 T2747 A2750 D2757 E2761 D2772 L2776 S2782 VAL MET ASP V2786
L2798 N2802 S2806 G2809 V2813 C2817 A2855 Y2859 V2867 GLN ASN LEU ASP S2872 D2886 R2887 L2888 N2913 L2917 Q2924 GLN SER ASN SER ASN SER ASN ILE ASN THR HIS A2936 H2992 TYR GLN ASN M2996 T3001 V3005 T3009 T3024 M3028
N3040 A3044 L3051 ASN LEU A3054 Q3059 W3060 G3061 F3062 F3063 N3064 D3065 S3069 C3084 Y3085 A3088 A3089 R3103 W3106 L3107 I3110 P3129 W3133 M3151 I3155 R3183 GLN THR MET ALA VAL MET GLY ASP LYS PRO ASP THR ASN ASP ARG ASN GLY ARG
R3202 Q3203 E3206 Y3207 L3211 L3215 P3220 A3223 L3224 S3225 L3229 D3244 L3248 L3263 PRO PHE PRO ARG LYS ASN PRO LYS LEU P3273 L3288 ALA PRO Y3291 K3295 A3298 D3302 ASN LYS P3305 R3315 R3319 H3345 Q3357 D3379 R3382
S3387 R3390 A3448 M3458 I3470 E3473 F3474 K3477 D3487 D3491 L3509 I3513 F3514 N3515 S3516 I3517 Q3518 T3519 E3539 D3540 L3543 F3544 Q3547 S3550 Q3551 S3554 H3573 F3582 M3586 LEU PRO SER ARG PHE PRO TYR GLU ARG VAL LYS PRO LEU
LEU LYS ASN HIS ASP LEU SER LEU P3608 P3609 P3612 T3625 P3626 S3635 A3636 G3639 I3640 N3644 N3677 LEU HIS ARG PRO I3682 L3688 V3692 I3699 V3703 F3744

4 Experimental information (i)

Property	Value	Source
Reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	176464	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE; GPU accelerated	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	5.6	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	81000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor

5 Model quality

5.1 Standard geometry

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	$\#\|Z\| > 2$	RMSZ	$\#\|Z\| > 2$
1	T	0.37	0/17220	0.53	0/24103

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	T	0	18

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (18) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	T	1513	TYR	Peptide
1	T	1682	ASP	Peptide
1	T	1898	ASP	Peptide
1	T	2225	ILE	Peptide
1	T	2411	GLU	Peptide
1	T	2457	ASP	Peptide
1	T	2462	PHE	Peptide
1	T	2619	PRO	Peptide
1	T	2715	ARG	Peptide
1	T	3009	THR	Peptide
1	T	3129	PRO	Peptide
1	T	3345	HIS	Peptide
1	T	3357	GLN	Peptide
1	T	851	LEU	Peptide
1	T	919	PRO	Peptide

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Mol	Chain	Res	Type	Group
1	T	935	GLN	Peptide
1	T	936	PRO	Peptide
1	T	971	GLU	Peptide

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	T	17122	0	8056	246	0
All	All	17122	0	8056	246	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 10.

All (246) 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:T:1046:ALA:O	1:T:1050:ILE:N	2.30	0.62
1:T:3540:ASP:O	1:T:3544:PHE:N	2.31	0.61
1:T:1580:LEU:O	1:T:1584:LEU:N	2.33	0.61
1:T:2391:SER:O	1:T:2395:TYR:N	2.31	0.61
1:T:3635:SER:O	1:T:3639:GLY:N	2.31	0.61
1:T:1518:ILE:O	1:T:1522:LEU:N	2.33	0.60
1:T:461:LYS:O	1:T:465:MET:N	2.30	0.60
1:T:977:ILE:HA	1:T:992:SER:HA	1.82	0.59
1:T:1355:ASP:O	1:T:1359:PHE:N	2.34	0.59
1:T:458:PRO:O	1:T:462:LYS:N	2.34	0.59
1:T:1698:MET:O	1:T:1702:THR:N	2.34	0.58
1:T:1354:VAL:O	1:T:1358:THR:N	2.35	0.58
1:T:2772:ASP:O	1:T:2776:LEU:N	2.34	0.58
1:T:1070:ARG:O	1:T:1074:ASN:N	2.32	0.58
1:T:2305:ARG:O	1:T:2309:LYS:N	2.33	0.58
1:T:1352:GLY:O	1:T:1356:ALA:N	2.37	0.58
1:T:1437:ARG:O	1:T:1441:LEU:N	2.36	0.57
1:T:3382:ARG:HA	1:T:3387:SER:HA	1.85	0.57
1:T:2606:LEU:O	1:T:2610:ILE:N	2.37	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:T:3539:GLU:O	1:T:3543:LEU:N	2.35	0.57
1:T:73:GLN:O	1:T:77:ASN:N	2.36	0.57
1:T:583:ALA:O	1:T:587:TYR:N	2.33	0.57
1:T:457:ALA:O	1:T:461:LYS:N	2.32	0.57
1:T:709:VAL:O	1:T:713:MET:N	2.34	0.57
1:T:2183:ASN:O	1:T:2187:ILE:N	2.35	0.57
1:T:2582:SER:O	1:T:2586:LEU:N	2.37	0.57
1:T:802:ALA:HB3	1:T:805:PRO:HB3	1.86	0.57
1:T:640:GLU:O	1:T:644:GLY:N	2.33	0.57
1:T:2526:HIS:O	1:T:2530:MET:N	2.37	0.56
1:T:3509:LEU:O	1:T:3513:ILE:N	2.37	0.56
1:T:580:ILE:O	1:T:584:PHE:N	2.34	0.56
1:T:2579:PHE:O	1:T:2583:ILE:N	2.37	0.56
1:T:1833:TRP:O	1:T:1837:LEU:N	2.35	0.56
1:T:231:MET:O	1:T:235:TYR:N	2.35	0.56
1:T:2395:TYR:O	1:T:2399:LEU:N	2.30	0.56
1:T:3103:ARG:O	1:T:3107:LEU:N	2.36	0.56
1:T:3513:ILE:O	1:T:3517:ILE:N	2.34	0.56
1:T:687:ALA:O	1:T:691:MET:N	2.38	0.56
1:T:2008:ILE:O	1:T:2012:ASN:N	2.38	0.55
1:T:71:PRO:O	1:T:75:LEU:N	2.40	0.55
1:T:2757:ASP:O	1:T:2761:GLU:N	2.38	0.55
1:T:1076:GLU:O	1:T:1080:LEU:N	2.32	0.55
1:T:1073:SER:O	1:T:1077:ASN:N	2.37	0.55
1:T:2185:PRO:O	1:T:2189:ASN:N	2.37	0.55
1:T:3059:GLN:O	1:T:3063:PHE:N	2.35	0.55
1:T:1069:LYS:O	1:T:1073:SER:N	2.36	0.54
1:T:2184:LEU:O	1:T:2188:GLN:N	2.37	0.54
1:T:3244:ASP:O	1:T:3248:LEU:N	2.39	0.54
1:T:3636:ALA:O	1:T:3640:ILE:N	2.36	0.54
1:T:1102:LEU:O	1:T:1106:LEU:N	2.37	0.54
1:T:2468:TRP:O	1:T:2472:ALA:N	2.38	0.54
1:T:2664:GLU:O	1:T:2668:ASN:N	2.41	0.54
1:T:392:TYR:O	1:T:396:ALA:N	2.35	0.54
1:T:2399:LEU:O	1:T:2403:ASP:N	2.34	0.54
1:T:1329:SER:O	1:T:1333:LEU:N	2.39	0.53
1:T:3024:THR:O	1:T:3028:MET:N	2.41	0.53
1:T:497:LYS:O	1:T:501:GLU:N	2.41	0.53
1:T:2469:LEU:HA	1:T:2472:ALA:HB3	1.90	0.53
1:T:2798:LEU:O	1:T:2802:ASN:N	2.40	0.53
1:T:3001:THR:O	1:T:3005:VAL:N	2.41	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:T:2355:MET:O	1:T:2359:TRP:N	2.41	0.53
1:T:1506:LEU:O	1:T:1510:LEU:N	2.39	0.53
1:T:3225:SER:O	1:T:3229:LEU:N	2.37	0.53
1:T:1661:ARG:O	1:T:1665:PHE:N	2.40	0.52
1:T:3515:ASN:O	1:T:3519:THR:N	2.40	0.52
1:T:96:ALA:O	1:T:100:LEU:N	2.41	0.52
1:T:1953:LEU:O	1:T:1957:MET:N	2.39	0.52
1:T:1149:ILE:HA	1:T:1152:ALA:HB3	1.90	0.52
1:T:3106:TRP:O	1:T:3110:ILE:N	2.43	0.52
1:T:1347:PHE:O	1:T:1351:ILE:N	2.33	0.52
1:T:1941:LEU:O	1:T:1945:SER:N	2.38	0.52
1:T:2285:LEU:O	1:T:2289:HIS:N	2.40	0.52
1:T:2447:ILE:O	1:T:2451:LEU:N	2.34	0.51
1:T:462:LYS:O	1:T:466:ILE:N	2.37	0.51
1:T:1592:PHE:HA	1:T:1595:PRO:HD2	1.93	0.51
1:T:2397:ILE:O	1:T:2401:LEU:N	2.39	0.51
1:T:2450:ARG:O	1:T:2454:VAL:N	2.40	0.51
1:T:2451:LEU:O	1:T:2455:ILE:N	2.39	0.51
1:T:480:ARG:O	1:T:484:THR:N	2.34	0.51
1:T:1700:ASN:O	1:T:1704:LYS:N	2.44	0.51
1:T:1764:LYS:O	1:T:1768:HIS:N	2.42	0.51
1:T:3129:PRO:O	1:T:3133:TRP:N	2.39	0.51
1:T:579:PRO:O	1:T:583:ALA:N	2.42	0.51
1:T:2603:ILE:O	1:T:2607:LEU:N	2.43	0.51
1:T:232:VAL:O	1:T:236:SER:N	2.42	0.51
1:T:2813:VAL:O	1:T:2817:CYS:N	2.44	0.51
1:T:492:TYR:O	1:T:496:LYS:N	2.39	0.51
1:T:1759:SER:O	1:T:1763:LYS:N	2.41	0.50
1:T:2236:ILE:O	1:T:2240:THR:N	2.43	0.50
1:T:2263:LEU:O	1:T:2267:PHE:N	2.40	0.50
1:T:475:PHE:O	1:T:479:ASN:N	2.33	0.50
1:T:856:GLU:O	1:T:860:GLU:N	2.39	0.50
1:T:2583:ILE:O	1:T:2587:LEU:N	2.42	0.50
1:T:1043:LEU:O	1:T:1047:VAL:N	2.42	0.50
1:T:1782:PHE:O	1:T:1786:ALA:N	2.39	0.50
1:T:2674:MET:O	1:T:2678:LEU:N	2.43	0.50
1:T:1860:PHE:O	1:T:1864:LEU:N	2.41	0.50
1:T:443:VAL:O	1:T:447:LEU:N	2.42	0.50
1:T:1864:LEU:O	1:T:1868:SER:N	2.41	0.50
1:T:2289:HIS:O	1:T:2293:SER:N	2.39	0.50
1:T:1522:LEU:O	1:T:1526:LEU:N	2.40	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:T:2307:THR:O	1:T:2311:LEU:N	2.37	0.50
1:T:2653:LYS:O	1:T:2657:ALA:N	2.42	0.50
1:T:2743:TRP:O	1:T:2747:THR:N	2.37	0.50
1:T:2855:ALA:O	1:T:2859:TYR:N	2.44	0.50
1:T:2090:LEU:O	1:T:2094:GLU:N	2.42	0.49
1:T:3202:ARG:O	1:T:3206:GLU:N	2.39	0.49
1:T:324:PHE:O	1:T:328:LEU:N	2.39	0.49
1:T:463:LEU:O	1:T:467:ILE:N	2.45	0.49
1:T:1158:PRO:O	1:T:1162:GLU:N	2.44	0.49
1:T:1190:ILE:O	1:T:1194:ALA:N	2.43	0.49
1:T:459:ARG:O	1:T:463:LEU:N	2.37	0.49
1:T:1718:LEU:O	1:T:1722:ILE:N	2.41	0.49
1:T:636:ASP:O	1:T:640:GLU:N	2.40	0.49
1:T:1018:TYR:O	1:T:1022:THR:N	2.45	0.49
1:T:2025:HIS:O	1:T:2029:ILE:N	2.43	0.49
1:T:759:SER:O	1:T:763:ILE:N	2.40	0.49
1:T:2210:LEU:O	1:T:2214:MET:N	2.44	0.49
1:T:1072:TYR:O	1:T:1076:GLU:N	2.45	0.49
1:T:3470:ILE:O	1:T:3474:PHE:N	2.40	0.49
1:T:389:PRO:O	1:T:393:SER:N	2.31	0.49
1:T:419:THR:O	1:T:423:LEU:N	2.39	0.49
1:T:584:PHE:O	1:T:588:ARG:N	2.43	0.48
1:T:68:ALA:O	1:T:73:GLN:N	2.47	0.48
1:T:1674:ASN:O	1:T:1678:ILE:N	2.44	0.48
1:T:2121:ILE:O	1:T:2125:SER:N	2.46	0.48
1:T:1777:GLU:O	1:T:1781:ASN:N	2.37	0.48
1:T:3609:PRO:HB2	1:T:3612:PRO:HD3	1.94	0.48
1:T:2257:VAL:O	1:T:2261:TRP:N	2.41	0.48
1:T:3699:ILE:O	1:T:3703:VAL:N	2.41	0.48
1:T:1254:SER:O	1:T:1258:ASP:N	2.44	0.48
1:T:2726:TYR:O	1:T:2730:GLU:N	2.47	0.47
1:T:479:ASN:O	1:T:483:ASP:N	2.43	0.47
1:T:1039:TYR:O	1:T:1043:LEU:N	2.40	0.47
1:T:2467:PRO:HB2	1:T:2469:LEU:H	1.79	0.47
1:T:813:ARG:O	1:T:817:ARG:N	2.47	0.47
1:T:1649:ASP:O	1:T:1653:SER:N	2.38	0.47
1:T:1662:VAL:O	1:T:1666:PHE:N	2.46	0.47
1:T:75:LEU:O	1:T:79:MET:N	2.45	0.47
1:T:439:LEU:O	1:T:443:VAL:N	2.47	0.47
1:T:3547:GLN:O	1:T:3550:SER:N	2.48	0.47
1:T:3473:GLU:O	1:T:3477:LYS:N	2.48	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:T:1610:TYR:O	1:T:1614:ASN:N	2.48	0.47
1:T:3085:TYR:O	1:T:3089:ALA:N	2.44	0.47
1:T:1744:LEU:O	1:T:1748:ILE:N	2.45	0.47
1:T:327:ASP:O	1:T:331:ARG:N	2.42	0.47
1:T:3551:GLN:O	1:T:3554:SER:N	2.48	0.47
1:T:839:LEU:O	1:T:843:ASN:N	2.48	0.47
1:T:1443:VAL:O	1:T:1447:THR:N	2.46	0.47
1:T:2253:VAL:O	1:T:2257:VAL:N	2.44	0.46
1:T:3061:GLY:O	1:T:3065:ASP:N	2.42	0.46
1:T:3379:ASP:O	1:T:3390:ARG:N	2.40	0.46
1:T:1691:MET:O	1:T:1695:LEU:N	2.47	0.46
1:T:2187:ILE:O	1:T:2191:LEU:N	2.45	0.46
1:T:2472:ALA:O	1:T:2476:LEU:N	2.36	0.46
1:T:453:ASN:O	1:T:457:ALA:N	2.48	0.46
1:T:3220:PRO:O	1:T:3224:LEU:N	2.38	0.46
1:T:629:GLU:O	1:T:633:VAL:N	2.43	0.46
1:T:1881:GLU:O	1:T:1885:ASP:N	2.43	0.46
1:T:744:LEU:O	1:T:747:LYS:N	2.48	0.46
1:T:1117:THR:O	1:T:1121:ASN:N	2.38	0.46
1:T:2353:VAL:O	1:T:2357:ARG:N	2.32	0.46
1:T:2746:LEU:O	1:T:2750:ALA:N	2.49	0.46
1:T:417:ILE:O	1:T:421:TYR:N	2.44	0.46
1:T:1228:VAL:O	1:T:1232:LYS:N	2.48	0.46
1:T:140:PHE:O	1:T:144:ILE:N	2.47	0.46
1:T:2607:LEU:O	1:T:2611:SER:N	2.49	0.46
1:T:1890:CYS:O	1:T:1894:ILE:N	2.42	0.46
1:T:444:GLU:O	1:T:448:LYS:N	2.49	0.46
1:T:351:THR:O	1:T:355:LEU:N	2.37	0.45
1:T:1116:ASN:O	1:T:1120:LEU:N	2.43	0.45
1:T:99:VAL:O	1:T:103:LEU:N	2.48	0.45
1:T:3625:THR:HA	1:T:3626:PRO:HD3	1.79	0.45
1:T:781:GLU:O	1:T:785:LEU:N	2.48	0.45
1:T:2575:GLU:O	1:T:2579:PHE:N	2.39	0.45
1:T:3203:GLN:O	1:T:3207:TYR:N	2.45	0.45
1:T:3220:PRO:HA	1:T:3223:ALA:HB3	1.99	0.45
1:T:3573:HIS:O	1:T:3582:PHE:N	2.41	0.45
1:T:1858:ASP:O	1:T:1862:PHE:N	2.40	0.45
1:T:2525:GLY:O	1:T:2529:SER:N	2.39	0.45
1:T:1351:ILE:O	1:T:1355:ASP:N	2.46	0.45
1:T:2275:LEU:O	1:T:2279:MET:N	2.39	0.45
1:T:1925:GLN:O	1:T:1929:ALA:N	2.45	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:T:2473:LEU:O	1:T:2477:TYR:N	2.46	0.45
1:T:3688:LEU:O	1:T:3692:VAL:N	2.44	0.45
1:T:2734:ILE:O	1:T:2738:GLU:N	2.45	0.45
1:T:407:GLN:O	1:T:411:ILE:N	2.38	0.45
1:T:51:VAL:O	1:T:55:LEU:N	2.39	0.45
1:T:679:ALA:O	1:T:683:MET:N	2.42	0.44
1:T:1010:ASP:O	1:T:1014:ARG:N	2.38	0.44
1:T:705:GLU:O	1:T:709:VAL:N	2.38	0.44
1:T:1926:VAL:O	1:T:1930:LEU:N	2.45	0.44
1:T:3151:MET:O	1:T:3155:ILE:N	2.46	0.44
1:T:1883:LYS:O	1:T:1887:ILE:N	2.43	0.44
1:T:3065:ASP:O	1:T:3069:SER:N	2.46	0.44
1:T:980:PHE:H	1:T:990:PRO:HA	1.83	0.44
1:T:1041:GLU:O	1:T:1045:THR:N	2.42	0.44
1:T:1797:ASP:O	1:T:1801:PHE:N	2.49	0.44
1:T:2471:GLN:O	1:T:2475:LEU:N	2.46	0.44
1:T:2484:LYS:HA	1:T:2537:ILE:HA	2.00	0.44
1:T:2806:SER:O	1:T:2809:GLY:N	2.51	0.43
1:T:1763:LYS:O	1:T:1767:PHE:N	2.43	0.43
1:T:3211:LEU:O	1:T:3215:LEU:N	2.41	0.43
1:T:3448:ALA:HA	1:T:3458:MET:HA	2.00	0.43
1:T:886:ALA:O	1:T:889:GLN:N	2.45	0.43
1:T:1548:PRO:O	1:T:1552:ILE:N	2.45	0.43
1:T:3040:ASN:O	1:T:3044:ALA:N	2.39	0.43
1:T:3487:ASP:O	1:T:3491:ASP:N	2.52	0.43
1:T:1524:ASP:O	1:T:1528:ALA:N	2.51	0.42
1:T:739:ILE:O	1:T:743:PHE:N	2.37	0.42
1:T:1291:ASP:O	1:T:1295:GLU:N	2.51	0.42
1:T:1140:LEU:N	1:T:2493:CYS:O	2.53	0.42
1:T:1882:ILE:O	1:T:1886:ILE:N	2.52	0.42
1:T:2636:SER:O	1:T:2639:ILE:N	2.52	0.42
1:T:418:TYR:O	1:T:422:LEU:N	2.43	0.42
1:T:1336:PRO:HA	1:T:1339:ALA:HB3	2.02	0.42
1:T:1891:TRP:O	1:T:1895:LYS:N	2.48	0.42
1:T:217:SER:O	1:T:221:PHE:N	2.48	0.42
1:T:394:THR:O	1:T:398:PHE:N	2.53	0.42
1:T:95:TYR:O	1:T:99:VAL:N	2.51	0.42
1:T:2281:THR:O	1:T:2285:LEU:N	2.46	0.41
1:T:3315:ARG:O	1:T:3319:ARG:N	2.48	0.41
1:T:3295:LYS:HA	1:T:3298:ALA:HB3	2.01	0.41
1:T:1356:ALA:O	1:T:1360:CYS:N	2.53	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:T:2619:PRO:O	1:T:2621:HIS:N	2.48	0.41
1:T:478:LEU:O	1:T:482:TYR:N	2.39	0.41
1:T:1229:PHE:O	1:T:1233:TYR:N	2.44	0.41
1:T:1297:SER:O	1:T:1299:ALA:N	2.54	0.41
1:T:350:ALA:O	1:T:354:ILE:N	2.44	0.41
1:T:795:SER:O	1:T:799:SER:N	2.50	0.41
1:T:1563:PRO:HA	1:T:1564:PRO:HD3	1.83	0.41
1:T:1987:GLN:O	1:T:1991:SER:N	2.54	0.41
1:T:588:ARG:O	1:T:592:SER:N	2.52	0.41
1:T:3084:CYS:O	1:T:3088:ALA:N	2.41	0.41
1:T:32:TYR:O	1:T:36:GLU:N	2.42	0.41
1:T:3640:ILE:O	1:T:3644:ASN:N	2.46	0.41
1:T:1357:ILE:O	1:T:1361:LEU:N	2.54	0.40
1:T:1494:LYS:HA	1:T:1496:THR:HA	2.03	0.40
1:T:828:TYR:O	1:T:831:ILE:N	2.54	0.40
1:T:1183:LEU:O	1:T:1187:HIS:N	2.49	0.40
1:T:2225:ILE:O	1:T:2227:GLU:N	2.55	0.40
1:T:2724:SER:O	1:T:2728:LEU:N	2.40	0.40
1:T:1300:ASN:O	1:T:1304:ARG:N	2.50	0.40
1:T:2449:GLU:O	1:T:2453:TYR:N	2.42	0.40
1:T:2886:ASP:O	1:T:2888:LEU:N	2.55	0.40
1:T:2913:ASN:O	1:T:2917:LEU:N	2.49	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	T	3308/3744 (88%)	2966 (90%)	336 (10%)	6 (0%)	49 84

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	T	2406	HIS
1	T	2718	ALA
1	T	935	GLN
1	T	2301	LEU
1	T	2619	PRO
1	T	2226	ILE

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	T	137/3452 (4%)	136 (99%)	1 (1%)	85 92

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	T	915	PRO

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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 carbohydrates in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.