Full wwPDB X-ray Structure Validation Report (i)

Aug 10, 2023 – 10:27 AM JST

PDB ID	:	7Y5L
Title	:	Crystal structure of human CAF-1 core complex in spacegroup C2
Authors	:	Liu, C.P.; Wang, M.Z.; Xu, R.M.
Deposited on	:	2022-06-17
Resolution	:	3.42 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

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

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

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

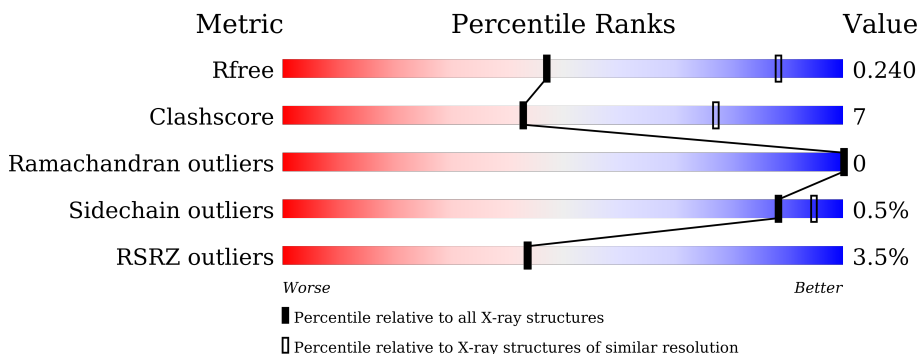|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35

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 3.42 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
Rfree		0.240
Clashscore		7
Ramachandran outliers		0
Sidechain outliers		0.5%
RSRZ outliers		3.5%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1486 (3.50-3.34)
Clashscore	141614	1572 (3.50-3.34)
Ramachandran outliers	138981	1534 (3.50-3.34)
Sidechain outliers	138945	1535 (3.50-3.34)
RSRZ outliers	127900	1395 (3.50-3.34)

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	273	4% — 60% / 12% / 28%
1	D	273	5% — 59% / 14% / 28%
2	B	419	4% — 72% / 18% / 9%
2	E	419	3% — 72% / 18% / 9%
3	C	425	.% — 81% / 14% / 5%
3	F	425	2% — 80% / 16% / 5%

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 15550 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 Chromatin assembly factor 1 subunit A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	197	Total	C	N	O	S	0	0	0
			1595	1008	294	285	8			
1	D	197	Total	C	N	O	S	0	0	0
			1595	1008	294	285	8			

- Molecule 2 is a protein called Chromatin assembly factor 1 subunit B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	380	Total	C	N	O	S	0	0	0
			2965	1894	511	544	16			
2	E	380	Total	C	N	O	S	0	0	0
			2967	1894	511	546	16			

- Molecule 3 is a protein called Histone-binding protein RBBP4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	405	Total	C	N	O	S	0	0	0
			3197	2018	543	626	10			
3	F	405	Total	C	N	O	S	0	0	0
			3197	2018	543	626	10			

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: $C_3H_8O_3$).

GOL

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	F	1	Total 6	C 3	O 3	0	0

- Molecule 5 is water.

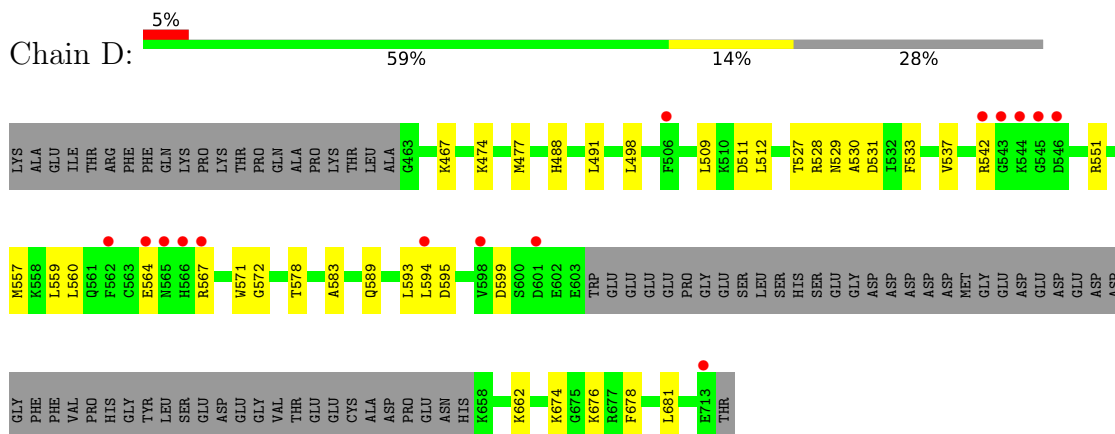| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	5	Total 5	O 5	0	0
5	B	4	Total 4	O 4	0	0
5	C	6	Total 6	O 6	0	0
5	D	4	Total 4	O 4	0	0
5	E	7	Total 7	O 7	0	0
5	F	2	Total 2	O 2	0	0

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.
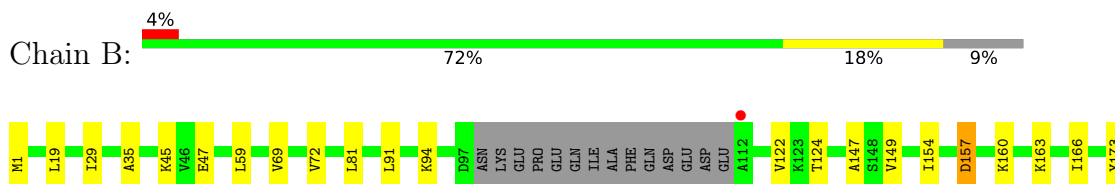
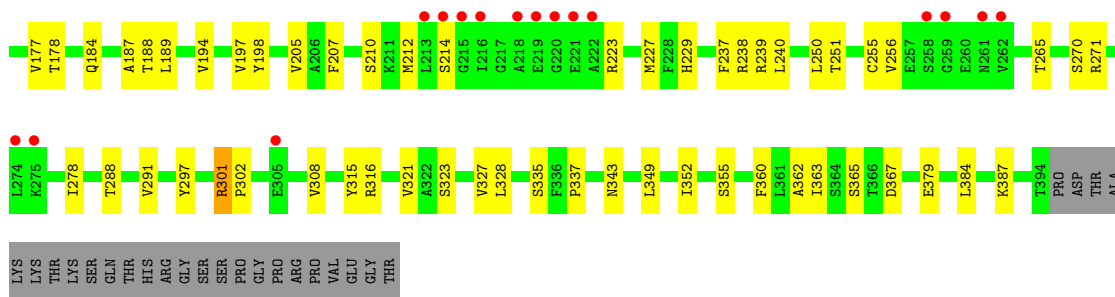• Molecule 1: Chromatin assembly factor 1 subunit A

• Molecule 1: Chromatin assembly factor 1 subunit A

• Molecule 2: Chromatin assembly factor 1 subunit B

V177 T178 Q184 A187 T188 L189 V194 V197 Y198 V205 A206 F207 S210 K211 M212 L213 S214 G215 I216 G217 A218 E219 G220 E221 A222 R223 M227 F228 H229 F237 R238 R239 L240 L250 T251 C255 V256 E257 S258 G259 E260 N261 V262 T265 S270 R271

L274 K275 I278 T288 V291 Y297 R301 P302 E305 V308 Y315 R316 V321 A322 S323 V327 L328 S335 F336 P337 N343 L349 I352 S355 F360 L361 A362 I363 S364 S365 T366 D367 E379 L384 K387 T394 PRO ASP THR ALA
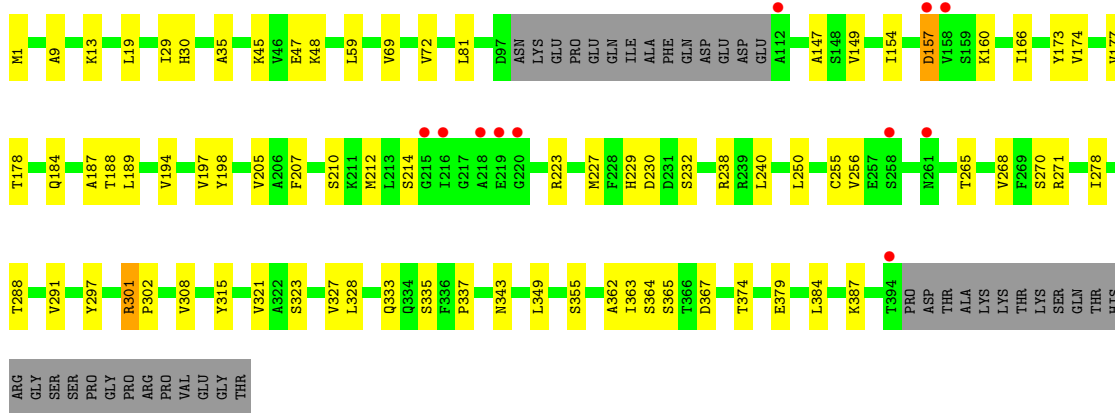
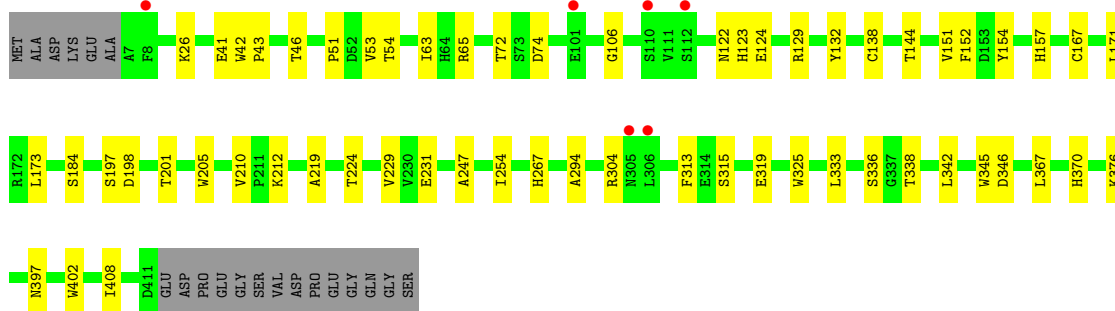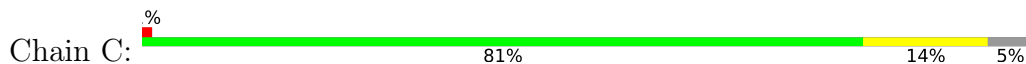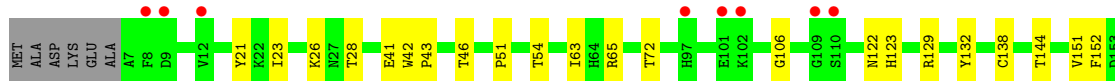LYS LYS THR LYS SER GLN THR HIS ARG GLY SER SER PRO GLY PRO ARG PRO VAL GLU GLY THR

• Molecule 2: Chromatin assembly factor 1 subunit B

Chain E:
3%
72%   18%   9%

M1 A9 K13 L19 I29 H30 A35 K45 V46 E47 K48 L59 V69 V72 L81 D97 ASN LYS GLU PRO GLU GLN ILE ALA PHE GLN ASP GLU ASP GLU A112 A147 S148 V149 I154 D157 V158 S159 K160 I166 Y173 V174 V177

T178 Q184 A187 T188 L189 V194 V197 Y198 V205 F207 S210 K211 M212 L213 S214 G215 I216 G217 A218 E219 G220 R223 M227 F228 H229 D230 D231 S232 R238 R239 L240 L250 C255 V256 E257 S258 N261 T265 V268 F269 S270 R271 I278

T288 V291 Y297 R301 P302 V308 Y315 V321 A322 S323 V327 L328 Q333 Q334 S335 F336 P337 N343 L349 S355 A362 I363 S364 S365 T366 D367 T374 E379 L384 K387 T394 PRO ASP THR ALA LYS LYS THR LYS SER GLN THR HIS

ARG GLY SER SER PRO GLY PRO ARG PRO VAL GLU GLY THR

• Molecule 3: Histone-binding protein RBBP4

Chain C:
%
81%   14%   5%

MET ALA ASP LYS GLU ALA A7 F8 K26 E41 W42 P43 T46 P51 D52 V53 T54 I63 H64 R65 T72 S73 D74 E101 G106 S110 V111 S112 N122 H123 E124 R129 Y132 C138 T144 V151 F152 D153 Y154 H157 C167 L171

R172 L173 S184 S197 D198 T201 W205 V210 P211 K212 A219 T224 V229 V230 E231 A247 I254 H267 A294 R304 N305 L306 F313 E314 S315 E319 W325 L333 S336 G337 T338 L342 W345 D346 L367 H370 K376

N397 W402 I408 D411 GLU ASP PRO GLU GLY SER VAL ASP PRO GLU GLY GLN GLY SER

• Molecule 3: Histone-binding protein RBBP4

Chain F:
2%
80%   16%   5%

MET ALA ASP LYS GLU ALA A7 F8 D9 V12 Y21 K22 I23 K26 N27 T28 E41 W42 P43 T46 P51 T54 I63 H64 R65 T72 H97 E101 K102 G106 G109 S110 N122 H123 R129 Y132 C138 T144 V151 F152 D153

Y154 H157 D162 C167 L171 R172 L173 H176 W185 L193 L194 S195 A196 S197 D198 T201 W205 V210 P211 K212 A219 T224 V229 H272 S293 A294 R304 F313 E314 S315 H316 E319 W325 L333 S336 G337 T338 L342

N343 V344 W345 D346 S355 D358 L367 H370 K376 I377 S378 S394 N397 W402 I408 D411 GLU ASP PRO GLU GLY SER VAL ASP PRO GLU GLY GLN GLY SER

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	108.72Å　170.96Å　181.08Å 90.00°　104.77°　90.00°	Depositor
Resolution (Å)	47.14　–　3.42 48.20　–　3.42	Depositor EDS
% Data completeness (in resolution range)	74.9 (47.14-3.42) 82.5 (48.20-3.42)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	3.69 (at 3.40Å)	Xtriage
Refinement program	PHENIX (1.20_4459: ???)	Depositor
R, R_{free}	0.218　,　0.237 0.220　,　0.240	Depositor DCC
R_{free} test set	2011 reflections (5.30%)	wwPDB-VP
Wilson B-factor (Å^2)	59.8	Xtriage
Anisotropy	0.207	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 20.1	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.056 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.86	EDS
Total number of atoms	15550	wwPDB-VP
Average B, all atoms (Å^2)	63.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.22% 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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: GOL

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	0.24	0/1630	0.49	0/2191
1	D	0.24	0/1630	0.49	0/2191
2	B	0.24	0/3034	0.51	0/4119
2	E	0.25	0/3036	0.51	0/4121
3	C	0.24	0/3287	0.45	0/4483
3	F	0.24	0/3287	0.45	0/4483
All	All	0.24	0/15904	0.48	0/21588

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1595	0	1581	21	0
1	D	1595	0	1581	25	0
2	B	2965	0	2940	47	0
2	E	2967	0	2946	51	0
3	C	3197	0	3009	40	0
3	F	3197	0	3009	43	0
4	F	6	0	8	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	A	5	0	0	0	0
5	B	4	0	0	0	0
5	C	6	0	0	0	0
5	D	4	0	0	0	0
5	E	7	0	0	0	0
5	F	2	0	0	0	0
All	All	15550	0	15074	208	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 7.

All (208) 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)
2:E:270:SER:HB2	2:E:278:ILE:HD11	1.53	0.88
2:B:270:SER:HB2	2:B:278:ILE:HD11	1.57	0.85
3:F:346:ASP:HB2	3:F:367:LEU:HD12	1.69	0.73
2:B:301:ARG:HG3	2:B:302:PRO:HD2	1.69	0.72
1:A:594:LEU:HD21	3:C:26:LYS:HE2	1.70	0.72
2:E:301:ARG:HG3	2:E:302:PRO:HD2	1.72	0.70
1:A:597:GLU:O	3:C:26:LYS:NZ	2.24	0.70
3:C:346:ASP:HB2	3:C:367:LEU:HD12	1.73	0.70
3:C:151:VAL:HB	3:C:171:LEU:HB2	1.74	0.68
1:D:498:LEU:HB3	3:F:304:ARG:HG2	1.77	0.67
1:D:595:ASP:O	3:F:26:LYS:NZ	2.27	0.66
2:E:214:SER:HB3	2:E:223:ARG:HB3	1.77	0.65
2:E:291:VAL:HG22	2:E:321:VAL:HG22	1.79	0.65
2:E:178:THR:HG22	2:E:187:ALA:HB3	1.79	0.64
3:F:151:VAL:HB	3:F:171:LEU:HB2	1.78	0.64
3:C:342:LEU:HB3	3:C:370:HIS:HB3	1.79	0.63
2:B:291:VAL:HG22	2:B:321:VAL:HG22	1.81	0.63
2:E:214:SER:O	2:E:214:SER:OG	2.17	0.63
3:F:176:HIS:NE2	3:F:195:SER:OG	2.32	0.63
2:B:178:THR:HG22	2:B:187:ALA:HB3	1.81	0.63
1:A:498:LEU:HB3	3:C:304:ARG:HG2	1.82	0.62
3:F:198:ASP:HA	3:F:229:VAL:HG13	1.82	0.61
2:E:189:LEU:HD23	2:E:238:ARG:HB3	1.81	0.61
2:E:315:TYR:HB3	2:E:384:LEU:HD11	1.81	0.61
3:C:198:ASP:HA	3:C:229:VAL:HG13	1.83	0.60
3:F:46:THR:HB	3:F:129:ARG:HA	1.83	0.60
2:B:315:TYR:HB3	2:B:384:LEU:HD11	1.82	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:342:LEU:HB3	3:F:370:HIS:HB3	1.82	0.60
3:F:152:PHE:HD2	3:F:157:HIS:HE1	1.50	0.59
1:D:467:LYS:HB2	3:F:212:LYS:HD2	1.85	0.58
1:D:488:HIS:HB2	1:D:491:LEU:HB2	1.85	0.58
2:B:157:ASP:HB3	2:B:160:LYS:HB2	1.84	0.58
2:E:308:VAL:HG13	2:E:335:SER:HB3	1.85	0.58
3:F:336:SER:HB3	3:F:342:LEU:HD13	1.85	0.58
2:B:147:ALA:HB2	2:B:177:VAL:HG23	1.84	0.58
2:B:365:SER:OG	2:B:367:ASP:OD2	2.22	0.57
2:E:147:ALA:HB2	2:E:177:VAL:HG23	1.86	0.57
1:A:681:LEU:HD22	2:B:343:ASN:HB3	1.86	0.56
2:E:147:ALA:HB1	2:E:174:VAL:HG12	1.85	0.56
1:D:681:LEU:HD22	2:E:343:ASN:HB3	1.88	0.56
2:B:189:LEU:HD23	2:B:238:ARG:HB3	1.87	0.56
2:B:308:VAL:HG13	2:B:335:SER:HB3	1.87	0.56
3:C:294:ALA:HA	3:C:319:GLU:HG3	1.87	0.56
2:B:250:LEU:HB2	2:B:291:VAL:HG11	1.87	0.56
2:B:288:THR:HA	2:B:323:SER:HA	1.88	0.56
1:D:572:GLY:HA3	3:F:106:GLY:HA2	1.88	0.56
2:B:45:LYS:HB2	2:B:59:LEU:HD11	1.88	0.56
1:D:674:LYS:HB3	1:D:678:PHE:HB2	1.88	0.55
3:F:294:ALA:HA	3:F:319:GLU:HG3	1.89	0.55
2:E:184:GLN:OE1	2:E:271:ARG:NH2	2.40	0.55
3:C:46:THR:HB	3:C:129:ARG:HA	1.87	0.55
1:A:537:VAL:HG11	1:A:662:LYS:HB3	1.89	0.55
2:E:72:VAL:HG13	2:E:81:LEU:HD11	1.89	0.55
2:E:157:ASP:HB3	2:E:160:LYS:HB2	1.89	0.54
2:E:154:ILE:HG12	2:E:166:ILE:HG12	1.89	0.54
3:F:171:LEU:HD21	3:F:210:VAL:HG11	1.89	0.54
3:C:138:CYS:HA	3:C:154:TYR:CE2	2.43	0.54
1:D:527:THR:HB	1:D:530:ALA:HB2	1.90	0.54
2:E:365:SER:OG	2:E:367:ASP:OD2	2.23	0.54
2:B:194:VAL:HG22	2:B:210:SER:HB3	1.88	0.54
2:E:29:ILE:HG21	2:E:45:LYS:HE3	1.88	0.54
1:D:537:VAL:HG11	1:D:662:LYS:HB3	1.90	0.54
2:E:250:LEU:HB2	2:E:291:VAL:HG11	1.90	0.54
2:E:149:VAL:HG13	2:E:173:TYR:CD1	2.42	0.53
3:C:152:PHE:HD1	3:C:157:HIS:HE1	1.56	0.53
3:F:138:CYS:HA	3:F:154:TYR:CE2	2.44	0.53
2:B:29:ILE:HG21	2:B:45:LYS:HE3	1.90	0.53
1:D:477:MET:HG2	3:F:54:THR:HG22	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:45:LYS:HB2	2:E:59:LEU:HD11	1.91	0.53
3:F:41:GLU:HG2	3:F:42:TRP:CD1	2.44	0.53
1:A:674:LYS:HB3	1:A:678:PHE:HB2	1.91	0.53
2:E:194:VAL:HG22	2:E:210:SER:HB3	1.90	0.53
2:E:214:SER:HB3	2:E:223:ARG:CB	2.39	0.52
2:B:94:LYS:HD3	2:B:122:VAL:HG21	1.91	0.52
2:E:297:TYR:HD1	2:E:387:LYS:HD2	1.73	0.52
3:C:336:SER:HB3	3:C:342:LEU:HD13	1.92	0.52
3:F:42:TRP:CD2	3:F:72:THR:HG22	2.45	0.52
1:D:589:GLN:HG2	3:F:23:ILE:HD11	1.92	0.52
3:F:65:ARG:NH2	3:F:154:TYR:OH	2.35	0.52
1:A:572:GLY:HA3	3:C:106:GLY:HA2	1.91	0.52
2:E:288:THR:HA	2:E:323:SER:HA	1.92	0.52
1:A:527:THR:HB	1:A:530:ALA:HB2	1.91	0.52
1:D:474:LYS:HB2	1:D:477:MET:HG3	1.92	0.52
3:C:51:PRO:HD3	3:C:132:TYR:CZ	2.45	0.52
1:A:601:ASP:OD1	1:A:602:GLU:N	2.43	0.51
3:C:65:ARG:NH2	3:C:154:TYR:OH	2.37	0.51
2:B:29:ILE:HG23	2:B:47:GLU:HB3	1.91	0.51
2:B:154:ILE:HG12	2:B:166:ILE:HG12	1.93	0.51
3:F:51:PRO:HD3	3:F:132:TYR:CZ	2.46	0.51
2:B:177:VAL:HG22	2:B:188:THR:HG22	1.91	0.51
2:E:29:ILE:HG23	2:E:47:GLU:HB3	1.91	0.51
3:C:171:LEU:HD21	3:C:210:VAL:HG11	1.93	0.51
2:B:149:VAL:HG13	2:B:173:TYR:CD1	2.45	0.51
2:E:214:SER:CB	2:E:223:ARG:HB3	2.40	0.50
1:A:551:ARG:NH2	1:A:557:MET:HG3	2.26	0.50
3:C:41:GLU:HG2	3:C:42:TRP:CD1	2.47	0.50
2:B:189:LEU:HD22	2:B:240:LEU:HD23	1.94	0.50
2:B:328:LEU:HD22	2:B:337:PRO:HG3	1.94	0.49
2:B:327:VAL:HG21	2:B:363:ILE:HD13	1.95	0.49
2:E:349:LEU:HA	2:E:365:SER:HA	1.95	0.49
2:B:1:MET:N	2:B:379:GLU:OE2	2.42	0.49
1:D:578:THR:HG22	1:D:593:LEU:HD13	1.93	0.49
2:E:256:VAL:HG23	2:E:265:THR:HG21	1.93	0.49
2:B:72:VAL:HG13	2:B:81:LEU:HD11	1.95	0.48
1:D:542:ARG:HG3	1:D:676:LYS:HD2	1.95	0.48
3:C:325:TRP:CD2	3:C:333:LEU:HD13	2.48	0.48
2:E:149:VAL:HG13	2:E:173:TYR:HD1	1.78	0.48
2:E:229:HIS:HE1	2:E:232:SER:HB2	1.78	0.48
2:E:48:LYS:HE2	2:E:374:THR:HB	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:338:THR:HA	3:F:376:LYS:HG3	1.95	0.47
2:B:349:LEU:HA	2:B:365:SER:HA	1.97	0.47
3:F:201:THR:HG22	3:F:224:THR:HG22	1.96	0.47
2:E:177:VAL:HG22	2:E:188:THR:HG22	1.95	0.47
2:B:149:VAL:HG13	2:B:173:TYR:HD1	1.80	0.47
3:C:42:TRP:CD2	3:C:72:THR:HG22	2.50	0.47
2:B:184:GLN:OE1	2:B:271:ARG:NH2	2.48	0.47
3:F:123:HIS:CE1	3:F:144:THR:HG22	2.50	0.47
2:B:301:ARG:HH11	2:B:316:ARG:NH2	2.13	0.47
1:A:477:MET:HG2	3:C:54:THR:HG22	1.97	0.46
1:A:488:HIS:HB2	1:A:491:LEU:HB2	1.97	0.46
2:B:212:MET:HB2	2:B:227:MET:HE3	1.98	0.46
2:E:1:MET:N	2:E:379:GLU:OE2	2.44	0.46
1:A:583:ALA:HB2	3:C:408:ILE:HD13	1.97	0.46
3:C:201:THR:HG22	3:C:224:THR:HG22	1.98	0.46
2:E:214:SER:HB3	2:E:223:ARG:O	2.16	0.46
3:C:254:ILE:HB	3:C:267:HIS:HB2	1.97	0.46
2:E:35:ALA:HB1	2:E:69:VAL:HB	1.98	0.46
3:C:338:THR:HG22	3:C:376:LYS:HD2	1.99	0.46
1:A:567:ARG:HH22	1:A:599:ASP:HB3	1.81	0.45
2:B:35:ALA:HB1	2:B:69:VAL:HB	1.98	0.45
2:B:256:VAL:HG23	2:B:265:THR:HG21	1.96	0.45
1:D:567:ARG:HH22	1:D:599:ASP:HB3	1.82	0.45
3:F:205:TRP:CD1	3:F:219:ALA:HA	2.51	0.45
1:D:594:LEU:HD23	1:D:594:LEU:HA	1.83	0.45
2:E:328:LEU:HD22	2:E:337:PRO:HG3	1.99	0.45
2:E:198:TYR:CE2	2:E:205:VAL:HG22	2.51	0.45
3:F:325:TRP:CD2	3:F:333:LEU:HD13	2.51	0.45
3:C:43:PRO:HA	3:C:397:ASN:HA	1.98	0.45
3:F:185:TRP:CZ3	3:F:193:LEU:HB2	2.51	0.45
2:E:147:ALA:HB1	2:E:174:VAL:CG1	2.47	0.45
2:B:237:PHE:HB3	2:B:239:ARG:HG3	1.98	0.44
2:B:297:TYR:HD1	2:B:387:LYS:HD2	1.81	0.44
2:E:212:MET:HB2	2:E:227:MET:HE3	1.99	0.44
2:E:19:LEU:HD13	2:E:362:ALA:HB1	1.98	0.44
1:D:551:ARG:NH2	1:D:557:MET:HG3	2.33	0.44
2:E:327:VAL:HG21	2:E:363:ILE:HD13	1.99	0.44
3:F:338:THR:HG22	3:F:376:LYS:HD2	2.00	0.44
3:C:205:TRP:CD1	3:C:219:ALA:HA	2.51	0.44
1:D:583:ALA:HB2	3:F:408:ILE:HD13	1.99	0.44
3:C:123:HIS:CE1	3:C:144:THR:HG22	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:478:VAL:HB	3:C:53:VAL:HG13	2.00	0.44
3:C:338:THR:HA	3:C:376:LYS:HG3	1.99	0.44
2:B:197:VAL:HB	2:B:207:PHE:HB2	2.00	0.44
3:C:124:GLU:HG2	3:C:167:CYS:SG	2.58	0.44
3:C:315:SER:H	3:C:345:TRP:HH2	1.66	0.43
2:E:230:ASP:OD1	2:E:230:ASP:N	2.46	0.43
3:F:54:THR:OG1	3:F:63:ILE:HB	2.18	0.43
3:C:313:PHE:HB3	3:C:345:TRP:CZ3	2.53	0.43
1:D:564:GLU:OE2	3:F:21:TYR:OH	2.24	0.43
2:B:214:SER:CB	2:B:223:ARG:HE	2.32	0.43
3:F:122:ASN:ND2	3:F:162:ASP:HB2	2.34	0.43
1:A:551:ARG:HH21	1:A:557:MET:HG3	1.83	0.43
3:C:54:THR:OG1	3:C:63:ILE:HB	2.19	0.43
3:C:197:SER:OG	3:C:198:ASP:N	2.52	0.43
3:C:342:LEU:HD23	3:C:402:TRP:HZ2	1.84	0.43
3:F:342:LEU:HD23	3:F:402:TRP:HZ2	1.82	0.42
1:A:578:THR:HG22	1:A:593:LEU:HD13	2.00	0.42
2:B:189:LEU:HD12	2:B:189:LEU:HA	1.91	0.42
2:E:189:LEU:HD22	2:E:240:LEU:HD23	2.01	0.42
3:F:313:PHE:HB3	3:F:345:TRP:CZ3	2.54	0.42
3:C:122:ASN:O	3:C:167:CYS:HB3	2.19	0.42
1:A:694:ARG:HA	1:A:694:ARG:HD2	1.80	0.42
3:F:173:LEU:HB3	3:F:205:TRP:CE2	2.54	0.42
2:E:197:VAL:HB	2:E:207:PHE:HB2	2.02	0.42
2:E:227:MET:O	2:E:255:CYS:N	2.43	0.42
3:F:355:SER:OG	3:F:358:ASP:HB2	2.19	0.42
1:A:467:LYS:HB2	3:C:212:LYS:HD2	2.02	0.42
3:F:197:SER:OG	3:F:198:ASP:N	2.52	0.42
2:B:91:LEU:HD22	2:B:124:THR:HG22	2.01	0.41
2:B:198:TYR:CE2	2:B:205:VAL:HG22	2.55	0.41
2:B:355:SER:HB3	2:B:360:PHE:HB2	2.02	0.41
1:D:528:ARG:HG2	1:D:529:ASN:OD1	2.20	0.41
1:A:528:ARG:HG2	1:A:529:ASN:OD1	2.20	0.41
3:C:74:ASP:OD1	3:C:74:ASP:N	2.53	0.41
2:E:9:ALA:HB1	2:E:13:LYS:H	1.84	0.41
1:A:531:ASP:HB3	1:A:533:PHE:CE2	2.56	0.41
1:D:531:ASP:HB3	1:D:533:PHE:CE2	2.54	0.41
2:E:301:ARG:HB2	2:E:333:GLN:OE1	2.20	0.41
1:D:509:LEU:HD23	1:D:512:LEU:HD12	2.03	0.41
1:D:512:LEU:HD23	1:D:512:LEU:HA	1.87	0.41
3:F:316:HIS:CD2	3:F:343:ASN:HD22	2.39	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:272:HIS:CD2	3:F:293:SER:HB2	2.56	0.41
2:B:19:LEU:HD13	2:B:362:ALA:HB1	2.03	0.41
2:B:227:MET:O	2:B:255:CYS:N	2.43	0.41
2:E:268:VAL:O	2:E:278:ILE:N	2.54	0.41
3:F:43:PRO:HA	3:F:397:ASN:HA	2.03	0.41
2:B:352:ILE:HG22	2:B:363:ILE:HG12	2.03	0.41
2:B:240:LEU:HB3	2:B:251:THR:HA	2.03	0.40
2:B:35:ALA:HB2	2:B:72:VAL:HG23	2.01	0.40
2:B:163:LYS:HD3	2:B:166:ILE:HG13	2.02	0.40
3:C:231:GLU:H	3:C:247:ALA:HA	1.86	0.40
2:E:30:HIS:CE1	2:E:355:SER:HB2	2.56	0.40
3:F:122:ASN:O	3:F:167:CYS:HB3	2.22	0.40
3:F:378:SER:H	3:F:394:SER:HA	1.85	0.40
3:C:173:LEU:HB3	3:C:205:TRP:CE2	2.57	0.40
1:D:560:LEU:HD13	3:F:28:THR:HG23	2.03	0.40
1:D:559:LEU:HB2	1:D:571:TRP:CE3	2.56	0.40
2:E:19:LEU:HG	2:E:364:SER:HB3	2.03	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	193/273 (71%)	190 (98%)	3 (2%)	0	100	100
1	D	193/273 (71%)	190 (98%)	3 (2%)	0	100	100
2	B	376/419 (90%)	363 (96%)	13 (4%)	0	100	100
2	E	376/419 (90%)	361 (96%)	15 (4%)	0	100	100
3	C	403/425 (95%)	394 (98%)	9 (2%)	0	100	100
3	F	403/425 (95%)	393 (98%)	10 (2%)	0	100	100
All	All	1944/2234 (87%)	1891 (97%)	53 (3%)	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	168/235 (72%)	166 (99%)	2 (1%)	71	87
1	D	168/235 (72%)	167 (99%)	1 (1%)	86	94
2	B	323/363 (89%)	320 (99%)	3 (1%)	78	90
2	E	325/363 (90%)	323 (99%)	2 (1%)	86	94
3	C	354/375 (94%)	353 (100%)	1 (0%)	92	97
3	F	354/375 (94%)	354 (100%)	0	100	100
All	All	1692/1946 (87%)	1683 (100%)	9 (0%)	88	95

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	511	ASP
1	A	542	ARG
2	B	157	ASP
2	B	229	HIS
2	B	301	ARG
3	C	184	SER
1	D	511	ASP
2	E	157	ASP
2	E	301	ARG

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

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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 ⓘ

1 ligand is modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
4	GOL	F	501	-	5,5,5	0.92	0	5,5,5	1.01	0

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GOL	F	501	-	-	0/4/4/4	-

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	197/273 (72%)	0.49	11 (5%)	24	25	38, 67, 92, 124	0
1	D	197/273 (72%)	0.53	15 (7%)	13	17	47, 70, 100, 122	0
2	B	380/419 (90%)	0.25	17 (4%)	33	33	45, 57, 97, 136	0
2	E	380/419 (90%)	0.25	11 (2%)	51	50	45, 59, 95, 128	0
3	C	405/425 (95%)	0.13	6 (1%)	73	72	35, 53, 83, 106	0
3	F	405/425 (95%)	0.28	9 (2%)	62	61	43, 65, 91, 121	0
All	All	1964/2234 (87%)	0.28	69 (3%)	44	44	35, 61, 93, 136	0

All (69) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	546	ASP	4.7
2	B	219	GLU	4.5
2	B	220	GLY	4.1
2	E	216	ILE	4.1
2	E	215	GLY	4.1
2	E	220	GLY	4.0
2	E	219	GLU	3.9
2	B	216	ILE	3.9
2	B	258	SER	3.7
1	A	544	LYS	3.6
2	E	258	SER	3.5
2	B	215	GLY	3.4
3	F	8	PHE	3.4
1	A	546	ASP	3.2
2	E	261	ASN	3.2
3	F	109	GLY	3.1
3	C	305	ASN	3.1
2	B	222	ALA	3.1
1	D	545	GLY	3.1

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Mol	Chain	Res	Type	RSRZ
1	A	543	GLY	3.0
3	F	101	GLU	2.9
2	E	218	ALA	2.9
2	E	394	THR	2.8
2	B	218	ALA	2.7
2	B	214	SER	2.7
1	D	565	ASN	2.7
3	F	110	SER	2.7
1	D	542	ARG	2.6
1	D	594	LEU	2.6
1	A	659	VAL	2.6
1	A	506	PHE	2.6
2	B	305	GLU	2.6
1	A	545	GLY	2.6
3	C	112	SER	2.6
2	E	112	ALA	2.5
3	F	314	GLU	2.5
1	D	566	HIS	2.5
2	B	221	GLU	2.4
1	D	601	ASP	2.4
1	D	567	ARG	2.4
1	A	542	ARG	2.3
1	A	700	ASP	2.3
1	A	505	GLU	2.3
3	F	9	ASP	2.3
1	D	564	GLU	2.3
1	D	562	PHE	2.3
3	F	12	VAL	2.3
3	C	8	PHE	2.2
2	B	112	ALA	2.2
3	F	102	LYS	2.2
1	D	506	PHE	2.2
2	E	158	VAL	2.2
3	C	101	GLU	2.2
1	D	598	VAL	2.1
1	D	713	GLU	2.1
1	A	504	GLY	2.1
3	F	97	HIS	2.1
2	B	213	LEU	2.1
2	B	259	GLY	2.1
2	B	261	ASN	2.1
3	C	110	SER	2.1

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Mol	Chain	Res	Type	RSRZ
3	C	306	LEU	2.1
1	A	595	ASP	2.1
1	D	543	GLY	2.1
2	B	274	LEU	2.1
2	B	262	VAL	2.1
2	E	157	ASP	2.1
1	D	544	LYS	2.0
2	B	275	LYS	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
4	GOL	F	501	6/6	0.90	0.17	61,61,61,61	0

6.5 Other polymers ⓘ

There are no such residues in this entry.