Full wwPDB X-ray Structure Validation Report (i)

Apr 25, 2026 – 09:38 PM EDT

PDB ID	:	9PRP / pdb_00009prp
Title	:	N-terminal domain of E. coli MutL bound to NP660
Authors	:	Rodriguez Gonzalez, J.; Guarne, A.; Blagg, J.
Deposited on	:	2025-07-24
Resolution	:	2.10 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:

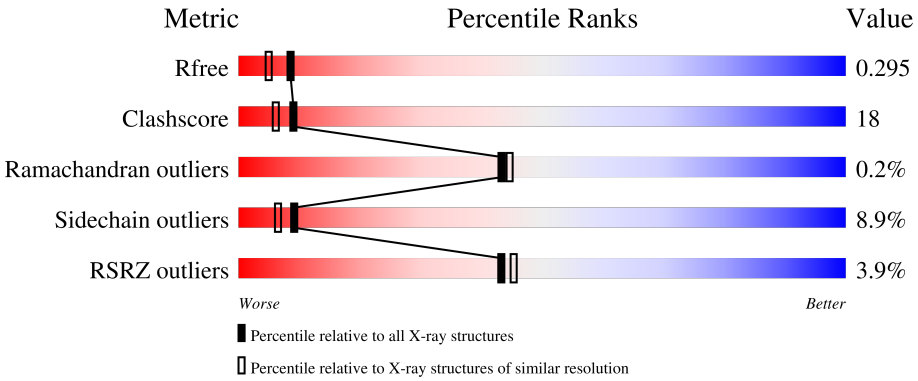
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.10 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}	180053	6658 (2.10-2.10)
Clashscore	190562	7164 (2.10-2.10)
Ramachandran outliers	187476	7099 (2.10-2.10)
Sidechain outliers	187428	7100 (2.10-2.10)
RSRZ outliers	180081	6662 (2.10-2.10)

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	352	4% 52% 31% 5% 12%
1	B	352	3% 63% 24% • 11%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 4988 atoms, of which 28 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.

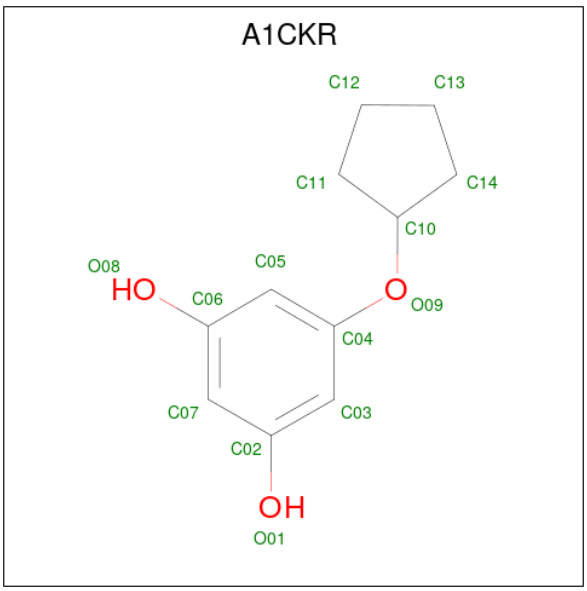
- Molecule 1 is a protein called DNA mismatch repair protein MutL.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	309	Total	C	N	O	S	0	0	0
			2383	1493	432	451	7			
1	B	313	Total	C	N	O	S	0	0	0
			2426	1521	440	458	7			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	GLY	-	expression tag	UNP P23367
A	-1	SER	-	expression tag	UNP P23367
A	0	HIS	-	expression tag	UNP P23367
B	-2	GLY	-	expression tag	UNP P23367
B	-1	SER	-	expression tag	UNP P23367
B	0	HIS	-	expression tag	UNP P23367

- Molecule 2 is 5-(cyclopentyloxy)benzene-1,3-diol (CCD ID: A1CKR) (formula: $C_{11}H_{14}O_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	H	O	0	0
			28	11	14	3		
2	B	1	Total	C	H	O	0	0
			28	11	14	3		

- Molecule 3 is water.

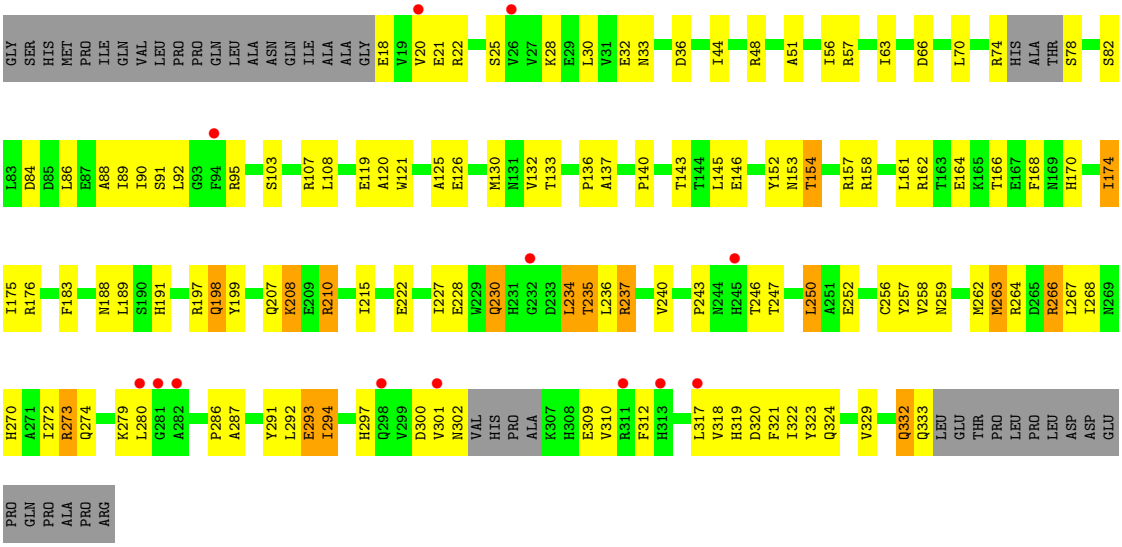
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	36	Total	O	0	0
			36	36		
3	B	87	Total	O	0	0
			87	87		

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and 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.

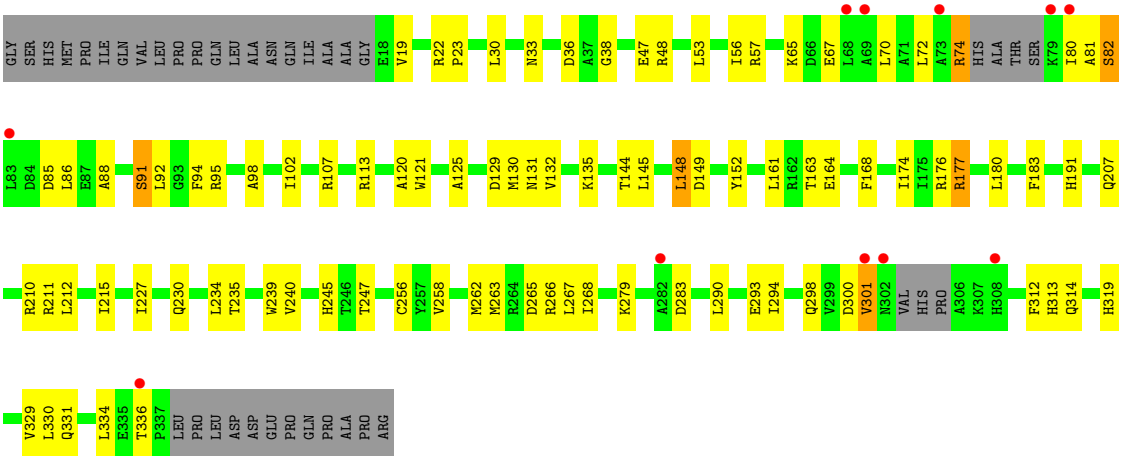
• Molecule 1: DNA mismatch repair protein MutL

Chain A:



• Molecule 1: DNA mismatch repair protein MutL

Chain B:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	69.13Å 69.69Å 74.72Å 90.00° 113.74° 90.00°	Depositor
Resolution (Å)	48.82 – 2.10 48.82 – 2.10	Depositor EDS
% Data completeness (in resolution range)	97.7 (48.82-2.10) 98.4 (48.82-2.10)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.47 (at 2.10Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.237 , 0.295 0.238 , 0.295	Depositor DCC
R_{free} test set	1875 reflections (3.91%)	wwPDB-VP
Wilson B-factor (Å^2)	38.8	Xtriage
Anisotropy	0.410	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 44.7	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	0.96	EDS
Total number of atoms	4988	wwPDB-VP
Average B, all atoms (Å^2)	56.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 48.76 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 8.2216e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[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: A1CKR

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	0.32	0/2419	0.50	0/3280
1	B	0.40	0/2464	0.55	0/3342
All	All	0.36	0/4883	0.52	0/6622

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	2383	0	2336	112	1
1	B	2426	0	2388	71	1
2	A	14	14	0	4	0
2	B	14	14	0	0	0
3	A	36	0	0	4	0
3	B	87	0	0	1	1
All	All	4960	28	4724	176	2

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 18.

All (176) close contacts within the same asymmetric unit are listed below, sorted by their clash

magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:267:LEU:HD11	1:A:319:HIS:HB2	1.40	1.04
1:B:227:ILE:HD11	1:B:240:VAL:HG23	1.45	0.99
1:B:230:GLN:HG3	1:B:235:THR:HG22	1.55	0.88
1:A:243:PRO:HB2	1:A:280:LEU:HD12	1.57	0.87
1:A:234:LEU:HB3	1:A:294:ILE:HG22	1.57	0.86
1:B:300:ASP:OD2	1:B:313:HIS:NE2	2.08	0.85
1:B:207:GLN:HE22	1:B:210:ARG:HG2	1.41	0.83
1:A:263:MET:HE2	1:A:310:VAL:HB	1.59	0.82
1:B:125:ALA:HB2	1:B:132:VAL:HG22	1.64	0.80
1:A:48:ARG:HA	1:A:164:GLU:HG3	1.62	0.80
1:B:227:ILE:CD1	1:B:240:VAL:HG23	2.11	0.79
1:B:113:ARG:HB2	1:B:120:ALA:HB2	1.63	0.78
1:B:33:ASN:HA	1:B:95:ARG:NH2	1.99	0.78
1:B:245:HIS:O	3:B:701:HOH:O	2.03	0.76
1:A:234:LEU:HB3	1:A:294:ILE:CG2	2.18	0.74
1:A:48:ARG:HA	1:A:164:GLU:CG	2.18	0.73
1:B:74:ARG:HG3	1:B:130:MET:HA	1.71	0.73
1:A:227:ILE:HG12	1:A:329:VAL:HG21	1.72	0.72
1:A:30:LEU:HB2	1:A:56:ILE:HD12	1.73	0.71
1:A:317:LEU:HD12	1:A:317:LEU:O	1.91	0.71
1:A:176:ARG:HG3	1:A:215:ILE:HG23	1.73	0.69
1:A:168:PHE:CE1	1:A:191:HIS:HB2	2.27	0.69
1:B:177:ARG:HG2	1:B:262:MET:SD	2.32	0.69
1:B:227:ILE:HD11	1:B:240:VAL:CG2	2.19	0.69
1:A:70:LEU:CD1	1:A:92:LEU:HD11	2.23	0.68
1:A:88:ALA:O	1:A:91:SER:N	2.26	0.68
1:B:88:ALA:O	1:B:91:SER:HB3	1.94	0.67
1:A:162:ARG:HD3	1:A:166:THR:HG21	1.77	0.66
1:B:113:ARG:HB2	1:B:120:ALA:CB	2.26	0.64
1:A:28:LYS:O	1:A:32:GLU:HG3	1.96	0.63
1:A:243:PRO:CB	1:A:280:LEU:HD12	2.29	0.63
1:A:18:GLU:HG3	1:A:20:VAL:H	1.62	0.63
1:A:188:ASN:OD1	1:A:198:GLN:HG3	1.98	0.63
1:A:273:ARG:HD2	1:B:80:ILE:CG2	2.29	0.63
1:A:70:LEU:HD12	1:A:92:LEU:HD11	1.81	0.61
1:A:154:THR:HB	1:A:157:ARG:HG3	1.82	0.61
1:A:183:PHE:HE2	1:A:208:LYS:HB3	1.64	0.61
1:A:243:PRO:O	1:A:246:THR:HG22	2.01	0.60
1:A:320:ASP:O	1:A:324:GLN:HG2	2.01	0.60
1:B:82:SER:OG	1:B:85:ASP:HB2	2.01	0.60
1:A:183:PHE:CE2	1:A:208:LYS:HB3	2.38	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:298:GLN:OE1	1:B:314:GLN:HG3	2.03	0.59
1:A:120:ALA:HB3	1:A:137:ALA:O	2.03	0.59
1:A:22:ARG:NH2	1:A:162:ARG:HD2	2.17	0.59
1:A:86:LEU:HD23	1:A:86:LEU:O	2.02	0.58
1:B:70:LEU:HD22	1:B:88:ALA:HB1	1.86	0.58
1:B:30:LEU:HD22	1:B:145:LEU:HD22	1.85	0.57
1:B:70:LEU:HD12	1:B:92:LEU:HD11	1.86	0.57
1:A:266:ARG:HG3	1:B:86:LEU:HD11	1.87	0.57
1:B:53:LEU:HD13	1:B:148:LEU:HD12	1.87	0.57
1:A:267:LEU:CD1	1:A:319:HIS:HB2	2.27	0.57
1:A:230:GLN:HB2	1:A:234:LEU:O	2.05	0.57
1:B:149:ASP:O	1:B:152:TYR:HB3	2.05	0.56
1:B:85:ASP:O	1:B:88:ALA:HB3	2.04	0.56
1:B:235:THR:OG1	1:B:293:GLU:HB2	2.06	0.56
1:B:107:ARG:HB2	1:B:148:LEU:HB3	1.88	0.55
1:A:273:ARG:HD2	1:B:80:ILE:HG23	1.89	0.55
1:A:30:LEU:HD22	1:A:145:LEU:HD22	1.87	0.55
1:A:126:GLU:HG2	1:A:152:TYR:OH	2.07	0.55
1:A:170:HIS:HD2	3:A:733:HOH:O	1.89	0.54
1:A:227:ILE:HD12	1:A:240:VAL:HG23	1.89	0.54
1:A:273:ARG:CG	1:B:80:ILE:HG22	2.37	0.54
1:A:107:ARG:HG2	1:A:126:GLU:HG3	1.88	0.54
1:B:301:VAL:HG22	1:B:301:VAL:O	2.08	0.53
1:B:256:CYS:SG	1:B:268:ILE:HD13	2.48	0.53
1:B:183:PHE:CD2	1:B:211:ARG:HD3	2.44	0.53
1:A:170:HIS:CD2	3:A:733:HOH:O	2.62	0.53
1:A:21:GLU:HG2	1:A:22:ARG:HB2	1.91	0.53
1:A:301:VAL:HG12	1:A:302:ASN:N	2.24	0.52
1:A:176:ARG:HG3	1:A:215:ILE:CG2	2.39	0.52
1:A:18:GLU:HG3	1:A:20:VAL:HG22	1.91	0.52
1:B:129:ASP:OD1	1:B:131:ASN:N	2.40	0.52
1:A:234:LEU:O	1:A:234:LEU:HD12	2.09	0.52
1:B:53:LEU:CD1	1:B:148:LEU:HD12	2.38	0.52
1:B:33:ASN:HA	1:B:95:ARG:HH21	1.75	0.52
1:B:234:LEU:HG	1:B:294:ILE:HD13	1.91	0.52
1:B:180:LEU:HG	1:B:215:ILE:HG21	1.91	0.51
1:A:268:ILE:HG23	1:A:322:ILE:HD13	1.92	0.51
1:A:30:LEU:CB	1:A:56:ILE:HD12	2.40	0.51
1:A:33:ASN:HB3	2:A:600:A1CKR:C02	2.40	0.51
1:B:94:PHE:CZ	1:B:95:ARG:HD3	2.46	0.51
1:A:227:ILE:CD1	1:A:240:VAL:HG23	2.41	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:246:THR:O	1:A:246:THR:HG23	2.11	0.51
1:A:30:LEU:HB2	1:A:56:ILE:CD1	2.41	0.50
1:A:272:ILE:HG22	1:A:286:PRO:HG2	1.93	0.50
1:A:274:GLN:HG2	1:A:323:TYR:CE2	2.47	0.50
1:A:174:ILE:HD12	1:A:174:ILE:C	2.35	0.50
1:B:22:ARG:HB2	1:B:23:PRO:CD	2.41	0.50
1:B:148:LEU:HD23	1:B:149:ASP:OD2	2.11	0.50
1:B:129:ASP:OD1	1:B:129:ASP:C	2.54	0.50
1:A:22:ARG:HH22	1:A:162:ARG:HD2	1.77	0.49
1:B:65:LYS:HG3	1:B:121:TRP:CG	2.48	0.49
1:B:265:ASP:OD2	1:B:312:PHE:HE2	1.96	0.49
1:A:63:ILE:HD11	2:A:600:A1CKR:C04	2.43	0.48
1:A:270:HIS:NE2	1:B:81:ALA:O	2.44	0.48
1:B:74:ARG:CG	1:B:130:MET:HA	2.40	0.48
1:B:67:GLU:HG2	1:B:92:LEU:HD21	1.96	0.48
1:B:267:LEU:HD11	1:B:319:HIS:HB2	1.95	0.48
1:A:121:TRP:CZ3	1:A:136:PRO:HD3	2.49	0.48
1:A:243:PRO:HD2	1:A:280:LEU:HD11	1.94	0.48
1:A:294:ILE:O	1:A:294:ILE:HD12	2.14	0.48
1:A:230:GLN:HA	1:A:321:PHE:HZ	1.79	0.47
1:B:258:VAL:HB	1:B:263:MET:HE2	1.96	0.47
1:A:86:LEU:HD23	1:A:86:LEU:C	2.40	0.47
1:A:279:LYS:O	1:A:280:LEU:HD23	2.15	0.47
1:A:74:ARG:CZ	1:A:125:ALA:HB1	2.45	0.47
1:A:257:TYR:CE2	1:A:262:MET:HB2	2.50	0.47
1:A:227:ILE:O	1:A:237:ARG:HA	2.15	0.47
1:A:332:GLN:HG3	3:A:724:HOH:O	2.15	0.47
1:B:168:PHE:CE1	1:B:191:HIS:HB2	2.50	0.46
1:A:63:ILE:HD11	2:A:600:A1CKR:O09	2.15	0.46
1:B:74:ARG:HD2	1:B:74:ARG:N	2.30	0.46
1:A:256:CYS:O	1:A:262:MET:HA	2.15	0.46
1:A:74:ARG:HG2	1:A:130:MET:HB3	1.98	0.46
1:B:80:ILE:HD12	1:B:80:ILE:C	2.40	0.46
1:B:227:ILE:HD12	1:B:290:LEU:HD21	1.97	0.46
1:B:227:ILE:HG12	1:B:329:VAL:HG21	1.96	0.45
1:B:48:ARG:HA	1:B:164:GLU:OE2	2.17	0.45
1:B:234:LEU:HD12	1:B:234:LEU:N	2.30	0.45
1:A:234:LEU:HD13	1:A:321:PHE:CZ	2.51	0.45
1:A:279:LYS:O	1:A:279:LYS:HG3	2.15	0.45
1:A:170:HIS:O	1:A:174:ILE:HG23	2.17	0.45
1:A:88:ALA:O	1:A:89:ILE:C	2.60	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:19:VAL:HG21	1:B:98:ALA:HB1	1.97	0.45
1:A:18:GLU:CG	1:A:20:VAL:HG22	2.47	0.44
1:A:273:ARG:CD	1:B:80:ILE:HG22	2.48	0.44
1:A:57:ARG:HH21	1:A:140:PRO:HG3	1.82	0.44
1:A:162:ARG:CD	1:A:166:THR:HG21	2.47	0.44
1:A:207:GLN:OE1	1:A:210:ARG:HD3	2.18	0.44
1:A:189:LEU:HB3	1:A:197:ARG:HB2	2.00	0.44
1:A:51:ALA:CB	1:A:161:LEU:HD13	2.47	0.44
1:A:158:ARG:HG3	1:A:161:LEU:HD12	1.99	0.44
1:A:236:LEU:HA	1:A:291:TYR:O	2.17	0.44
1:A:28:LYS:HE3	1:A:32:GLU:OE2	2.18	0.44
1:A:199:TYR:CE1	1:A:215:ILE:HG13	2.52	0.44
1:A:250:LEU:O	1:A:287:ALA:HB2	2.17	0.44
1:B:267:LEU:HD23	1:B:312:PHE:CD2	2.53	0.44
1:A:74:ARG:HG2	1:A:130:MET:HA	2.00	0.43
1:A:84:ASP:N	1:A:84:ASP:OD1	2.50	0.43
1:A:125:ALA:HB2	1:A:132:VAL:HG22	2.00	0.43
1:B:212:LEU:HD22	1:B:239:TRP:CE2	2.54	0.43
1:B:330:LEU:O	1:B:334:LEU:HG	2.18	0.43
1:A:33:ASN:OD1	1:A:95:ARG:HD3	2.19	0.43
1:A:268:ILE:HG22	1:A:272:ILE:HD12	2.00	0.43
1:A:274:GLN:HG2	1:A:323:TYR:HE2	1.82	0.43
1:B:19:VAL:CG1	1:B:102:ILE:HD11	2.49	0.43
1:B:279:LYS:CE	1:B:331:GLN:HG2	2.49	0.43
1:A:108:LEU:C	1:A:108:LEU:HD23	2.44	0.43
1:A:235:THR:O	1:A:292:LEU:HD12	2.18	0.43
1:A:234:LEU:HD12	1:A:234:LEU:C	2.44	0.43
1:B:47:GLU:HB2	1:B:53:LEU:HB3	2.00	0.42
1:A:230:GLN:HA	1:A:321:PHE:CZ	2.54	0.42
1:B:30:LEU:HB2	1:B:56:ILE:HD12	2.02	0.42
1:A:103:SER:HB2	3:A:705:HOH:O	2.19	0.42
1:B:57:ARG:HD2	1:B:144:THR:OG1	2.19	0.42
1:B:36:ASP:C	1:B:38:GLY:H	2.28	0.42
1:B:290:LEU:HD23	1:B:290:LEU:HA	1.84	0.42
1:A:207:GLN:OE1	1:A:210:ARG:CD	2.67	0.41
1:A:258:VAL:HA	1:A:292:LEU:O	2.20	0.41
1:A:36:ASP:OD2	1:A:95:ARG:NH2	2.41	0.41
1:B:22:ARG:HB2	1:B:23:PRO:HD2	2.02	0.41
1:A:199:TYR:CD1	1:A:215:ILE:HG13	2.55	0.41
1:A:89:ILE:HG21	1:B:266:ARG:NH2	2.35	0.41
1:A:230:GLN:HB3	1:A:235:THR:HG23	2.01	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:259:ASN:HA	1:A:293:GLU:HG3	2.02	0.41
1:A:143:THR:HG22	1:A:145:LEU:HD12	2.03	0.41
1:A:234:LEU:C	1:A:234:LEU:CD1	2.94	0.41
1:B:72:LEU:O	1:B:74:ARG:NH1	2.42	0.41
1:B:113:ARG:HD3	1:B:120:ALA:HB2	2.03	0.41
1:A:234:LEU:HA	1:A:293:GLU:O	2.21	0.41
1:A:44:ILE:HD13	1:A:175:ILE:CD1	2.50	0.41
1:B:72:LEU:O	1:B:132:VAL:HG21	2.20	0.41
1:A:108:LEU:HA	1:A:146:GLU:O	2.21	0.40
1:A:312:PHE:CD2	1:A:318:VAL:HG21	2.57	0.40
1:A:33:ASN:CB	2:A:600:A1CKR:C02	3.00	0.40
1:A:152:TYR:CD1	1:A:153:ASN:N	2.90	0.40

All (2) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:771:HOH:O	3:B:775:HOH:O[2_657]	1.89	0.31
1:A:222:GLU:O	1:B:210:ARG:NH1[1_554]	2.12	0.08

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 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	303/352 (86%)	284 (94%)	19 (6%)	0	100	100
1	B	307/352 (87%)	289 (94%)	17 (6%)	1 (0%)	36	36
All	All	610/704 (87%)	573 (94%)	36 (6%)	1 (0%)	43	44

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	301	VAL

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all 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	244/293 (83%)	213 (87%)	31 (13%)	4 2
1	B	250/293 (85%)	237 (95%)	13 (5%)	21 20
All	All	494/586 (84%)	450 (91%)	44 (9%)	9 6

All (44) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	25	SER
1	A	66	ASP
1	A	78	SER
1	A	82	SER
1	A	90	ILE
1	A	119	GLU
1	A	133	THR
1	A	154	THR
1	A	174	ILE
1	A	198	GLN
1	A	208	LYS
1	A	210	ARG
1	A	228	GLU
1	A	230	GLN
1	A	234	LEU
1	A	235	THR
1	A	237	ARG
1	A	247	THR
1	A	250	LEU
1	A	252	GLU
1	A	263	MET
1	A	264	ARG
1	A	266	ARG

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Mol	Chain	Res	Type
1	A	273	ARG
1	A	293	GLU
1	A	294	ILE
1	A	297	HIS
1	A	300	ASP
1	A	309	GLU
1	A	332	GLN
1	A	333	GLN
1	B	74	ARG
1	B	82	SER
1	B	91	SER
1	B	135	LYS
1	B	148	LEU
1	B	161	LEU
1	B	163	THR
1	B	174	ILE
1	B	176	ARG
1	B	177	ARG
1	B	247	THR
1	B	283	ASP
1	B	336	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (3) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	223	GLN
1	A	230	GLN
1	B	122	GLN

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

2 ligands are 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	$\#\|Z\| > 2$
2	A1CKR	A	600	-	15,15,15	1.86	4 (26%)	20,20,20	1.85	2 (10%)
2	A1CKR	B	600	-	15,15,15	1.81	4 (26%)	20,20,20	1.37	1 (5%)

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
2	A1CKR	A	600	-	-	4/4/11/11	0/2/2/2
2	A1CKR	B	600	-	-	4/4/11/11	0/2/2/2

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	600	A1CKR	C12-C11	3.89	1.67	1.51
2	B	600	A1CKR	C12-C11	3.84	1.67	1.51
2	A	600	A1CKR	O08-C06	3.30	1.44	1.37
2	A	600	A1CKR	C11-C10	-3.15	1.36	1.52
2	B	600	A1CKR	C11-C10	-3.09	1.36	1.52
2	B	600	A1CKR	O08-C06	2.87	1.43	1.37
2	B	600	A1CKR	C13-C14	2.43	1.61	1.51
2	A	600	A1CKR	C13-C14	2.24	1.60	1.51

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	600	A1CKR	C04-O09-C10	-7.54	105.55	119.18
2	B	600	A1CKR	C04-O09-C10	-4.53	110.98	119.18
2	A	600	A1CKR	C04-C03-C02	2.06	120.63	118.61

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	600	A1CKR	C11-C10-O09-C04
2	B	600	A1CKR	C11-C10-O09-C04
2	B	600	A1CKR	C14-C10-O09-C04
2	B	600	A1CKR	C03-C04-O09-C10
2	B	600	A1CKR	C05-C04-O09-C10
2	A	600	A1CKR	C14-C10-O09-C04
2	A	600	A1CKR	C05-C04-O09-C10
2	A	600	A1CKR	C03-C04-O09-C10

There are no ring outliers.

1 monomer is involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	600	A1CKR	4	0

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.

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, 95^{th} 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(Å^2)	Q<0.9
1	A	309/352 (87%)	0.55	13 (4%)	40	42	36, 60, 100, 163	0
1	B	313/352 (88%)	0.10	11 (3%)	47	49	28, 44, 91, 117	0
All	All	622/704 (88%)	0.32	24 (3%)	43	45	28, 52, 94, 163	0

All (24) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	20	VAL	3.7
1	A	280	LEU	3.6
1	A	281	GLY	2.8
1	B	80	ILE	2.8
1	B	282	ALA	2.8
1	B	336	THR	2.7
1	A	232	GLY	2.6
1	A	94	PHE	2.6
1	A	26	VAL	2.6
1	B	73	ALA	2.6
1	A	282	ALA	2.5
1	B	79	LYS	2.4
1	B	301	VAL	2.3
1	B	69	ALA	2.3
1	B	68	LEU	2.3
1	A	298	GLN	2.2
1	A	317	LEU	2.2
1	A	245	HIS	2.2
1	A	313	HIS	2.2
1	B	302	ASN	2.1
1	A	301	VAL	2.1
1	B	83	LEU	2.0
1	A	311	ARG	2.0
1	B	308	HIS	2.0

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

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

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands (i)

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, 95^{th} 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
2	A1CKR	A	600	14/14	0.91	0.10	44,56,76,80	0
2	A1CKR	B	600	14/14	0.93	0.07	33,46,64,70	0

6.5 Other polymers (i)

There are no such residues in this entry.