W O R L D W I D E

wwPDB

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

Full wwPDB X-ray Structure Validation Report ⓘ

Jun 22, 2024 – 11:49 PM EDT

PDB ID	:	6KXR
Title	:	Crystal structure of wild type Alp1U from the biosynthesis of kinamycins
Authors	:	Zhang, L.; Yingli, Z.; De, B.C.; Zhang, C.
Deposited on	:	2019-09-12
Resolution	:	2.45 Å(reported)

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

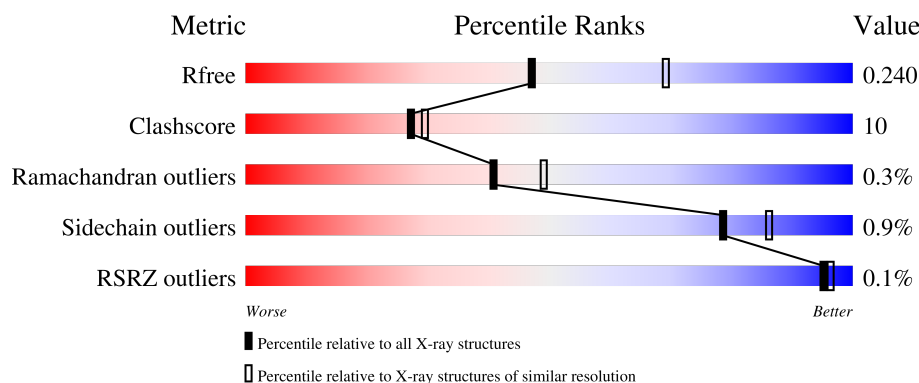|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	2.37.1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (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 2.45 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		10
Ramachandran outliers		0.3%
Sidechain outliers		0.9%
RSRZ outliers		0.1%

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	1544 (2.48-2.44)
Clashscore	141614	1613 (2.48-2.44)
Ramachandran outliers	138981	1598 (2.48-2.44)
Sidechain outliers	138945	1598 (2.48-2.44)
RSRZ outliers	127900	1523 (2.48-2.44)

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	339	73% 13% 14%
1	B	339	68% 18% 14%
1	C	339	63% 23% 14%
1	D	339	68% 17% • 14%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard

residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	MLT	C	401	-	-	X	-

2 Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 9237 atoms, of which 4 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 Putative hydrolase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	293	Total	C	N	O	S	0	0	0
			2280	1443	418	408	11			
1	B	293	Total	C	N	O	S	0	0	0
			2286	1446	421	408	11			
1	C	292	Total	C	N	O	S	0	0	0
			2264	1435	411	407	11			
1	D	292	Total	C	N	O	S	0	0	0
			2267	1436	413	407	11			

There are 80 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-19	MET	-	expression tag	UNP Q1RQU8
A	-18	GLY	-	expression tag	UNP Q1RQU8
A	-17	SER	-	expression tag	UNP Q1RQU8
A	-16	SER	-	expression tag	UNP Q1RQU8
A	-15	HIS	-	expression tag	UNP Q1RQU8
A	-14	HIS	-	expression tag	UNP Q1RQU8
A	-13	HIS	-	expression tag	UNP Q1RQU8
A	-12	HIS	-	expression tag	UNP Q1RQU8
A	-11	HIS	-	expression tag	UNP Q1RQU8
A	-10	HIS	-	expression tag	UNP Q1RQU8
A	-9	SER	-	expression tag	UNP Q1RQU8
A	-8	SER	-	expression tag	UNP Q1RQU8
A	-7	GLY	-	expression tag	UNP Q1RQU8
A	-6	LEU	-	expression tag	UNP Q1RQU8
A	-5	VAL	-	expression tag	UNP Q1RQU8
A	-4	PRO	-	expression tag	UNP Q1RQU8
A	-3	ARG	-	expression tag	UNP Q1RQU8
A	-2	GLY	-	expression tag	UNP Q1RQU8
A	-1	SER	-	expression tag	UNP Q1RQU8
A	0	HIS	-	expression tag	UNP Q1RQU8
B	-19	MET	-	expression tag	UNP Q1RQU8

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PROTEIN DATA BANK

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-18	GLY	-	expression tag	UNP Q1RQU8
B	-17	SER	-	expression tag	UNP Q1RQU8
B	-16	SER	-	expression tag	UNP Q1RQU8
B	-15	HIS	-	expression tag	UNP Q1RQU8
B	-14	HIS	-	expression tag	UNP Q1RQU8
B	-13	HIS	-	expression tag	UNP Q1RQU8
B	-12	HIS	-	expression tag	UNP Q1RQU8
B	-11	HIS	-	expression tag	UNP Q1RQU8
B	-10	HIS	-	expression tag	UNP Q1RQU8
B	-9	SER	-	expression tag	UNP Q1RQU8
B	-8	SER	-	expression tag	UNP Q1RQU8
B	-7	GLY	-	expression tag	UNP Q1RQU8
B	-6	LEU	-	expression tag	UNP Q1RQU8
B	-5	VAL	-	expression tag	UNP Q1RQU8
B	-4	PRO	-	expression tag	UNP Q1RQU8
B	-3	ARG	-	expression tag	UNP Q1RQU8
B	-2	GLY	-	expression tag	UNP Q1RQU8
B	-1	SER	-	expression tag	UNP Q1RQU8
B	0	HIS	-	expression tag	UNP Q1RQU8
C	-19	MET	-	expression tag	UNP Q1RQU8
C	-18	GLY	-	expression tag	UNP Q1RQU8
C	-17	SER	-	expression tag	UNP Q1RQU8
C	-16	SER	-	expression tag	UNP Q1RQU8
C	-15	HIS	-	expression tag	UNP Q1RQU8
C	-14	HIS	-	expression tag	UNP Q1RQU8
C	-13	HIS	-	expression tag	UNP Q1RQU8
C	-12	HIS	-	expression tag	UNP Q1RQU8
C	-11	HIS	-	expression tag	UNP Q1RQU8
C	-10	HIS	-	expression tag	UNP Q1RQU8
C	-9	SER	-	expression tag	UNP Q1RQU8
C	-8	SER	-	expression tag	UNP Q1RQU8
C	-7	GLY	-	expression tag	UNP Q1RQU8
C	-6	LEU	-	expression tag	UNP Q1RQU8
C	-5	VAL	-	expression tag	UNP Q1RQU8
C	-4	PRO	-	expression tag	UNP Q1RQU8
C	-3	ARG	-	expression tag	UNP Q1RQU8
C	-2	GLY	-	expression tag	UNP Q1RQU8
C	-1	SER	-	expression tag	UNP Q1RQU8
C	0	HIS	-	expression tag	UNP Q1RQU8
D	-19	MET	-	expression tag	UNP Q1RQU8
D	-18	GLY	-	expression tag	UNP Q1RQU8
D	-17	SER	-	expression tag	UNP Q1RQU8

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-16	SER	-	expression tag	UNP Q1RQU8
D	-15	HIS	-	expression tag	UNP Q1RQU8
D	-14	HIS	-	expression tag	UNP Q1RQU8
D	-13	HIS	-	expression tag	UNP Q1RQU8
D	-12	HIS	-	expression tag	UNP Q1RQU8
D	-11	HIS	-	expression tag	UNP Q1RQU8
D	-10	HIS	-	expression tag	UNP Q1RQU8
D	-9	SER	-	expression tag	UNP Q1RQU8
D	-8	SER	-	expression tag	UNP Q1RQU8
D	-7	GLY	-	expression tag	UNP Q1RQU8
D	-6	LEU	-	expression tag	UNP Q1RQU8
D	-5	VAL	-	expression tag	UNP Q1RQU8
D	-4	PRO	-	expression tag	UNP Q1RQU8
D	-3	ARG	-	expression tag	UNP Q1RQU8
D	-2	GLY	-	expression tag	UNP Q1RQU8
D	-1	SER	-	expression tag	UNP Q1RQU8
D	0	HIS	-	expression tag	UNP Q1RQU8

- Molecule 2 is D-MALATE (three-letter code: MLT) (formula: $C_4H_6O_5$).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
2	C	1	13	4	4	5	0	0

- Molecule 3 is water.

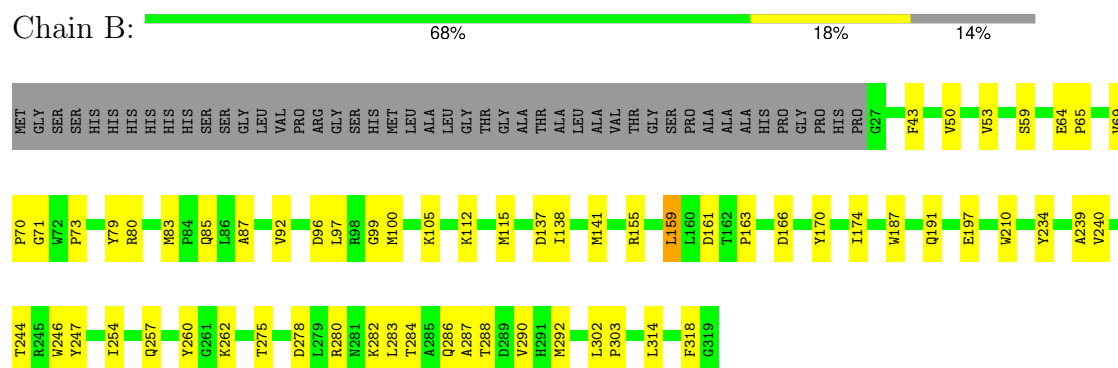| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	52	Total 52	O 52	0	0
3	B	39	Total 39	O 39	0	0
3	C	21	Total 21	O 21	0	0
3	D	15	Total 15	O 15	0	0

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.
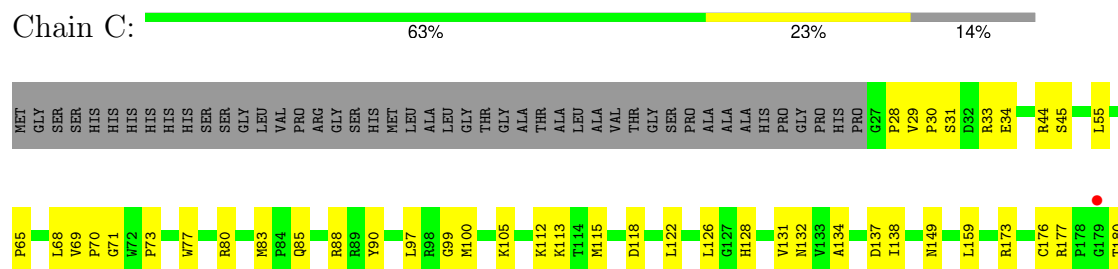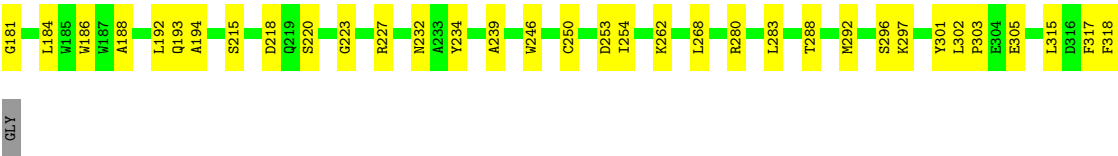
- Molecule 1: Putative hydrolase

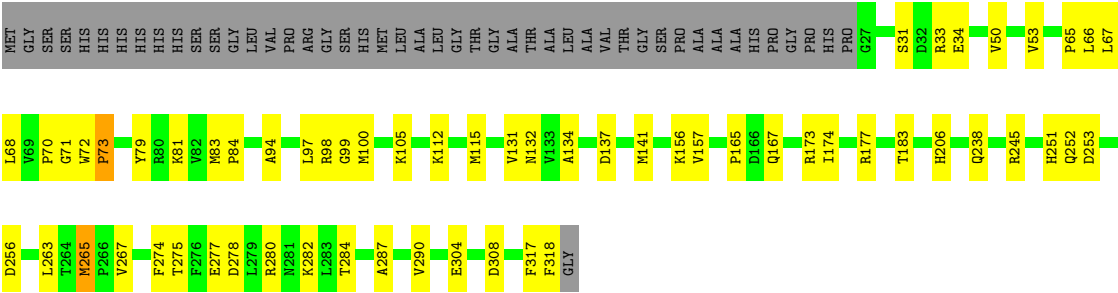Chain A:

- Molecule 1: Putative hydrolase

Chain B:

- Molecule 1: Putative hydrolase

Chain C:

G181 L184 W185 W186 W187 A188 L192 Q193 A194 S215 D218 Q219 S220 G223 R227 N232 A233 Y234 A239 W246 C250 D253 I254 K262 L268 R280 L283 T288 M292 S296 K297 Y301 L302 P303 E304 E305 L315 D316 F317 F318

GLY

• Molecule 1: Putative hydrolase

Chain D:

68%　　　　　　　　17%　　•　　14%

MET GLY SER SER HIS HIS HIS HIS HIS HIS SER SER GLY LEU VAL PRO ARG GLY SER HIS MET LEU ALA LEU GLY THR GLY ALA THR ALA LEU ALA VAL THR GLY SER PRO ALA ALA HIS PRO GLY PRO HIS PRO G27 S31 D32 R33 E34 V50 V53 P65 L66 L67

L68 V69 P70 G71 W72 P73 Y79 R80 K81 V82 M83 P84 A94 L97 R98 G99 M100 K105 K112 M115 V131 N132 V133 A134 D137 M141 K156 V157 P165 D166 Q167 R173 I174 R177 T183 H206 Q238 R245 H251 Q252 D253

D256 L263 T264 M265 P266 V267 F274 T275 F276 E277 D278 L279 R280 N281 K282 L283 T284 A287 V290 E304 D308 F317 F318 GLY

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	97.09Å　　101.58Å　　117.42Å 90.00°　　　90.00°　　　90.00°	Depositor
Resolution (Å)	70.19　–　2.45 70.19　–　2.45	Depositor EDS
% Data completeness (in resolution range)	99.3 (70.19-2.45) 99.3 (70.19-2.45)	Depositor EDS
R_{merge}	0.03	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.86 (at 2.45Å)	Xtriage
Refinement program	PHENIX 1.9_1692+SVN, PHENIX 1.9_1692+SVN	Depositor
R, R_{free}	0.169　,　0.234 0.181　,　0.240	Depositor DCC
R_{free} test set	2052 reflections (4.77%)	wwPDB-VP
Wilson B-factor (Å^2)	46.7	Xtriage
Anisotropy	0.229	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 30.0	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.018 for k,h,-l	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	9237	wwPDB-VP
Average B, all atoms (Å^2)	45.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.92% 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: MLT

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	0.44	0/2345	0.59	0/3191
1	B	0.43	0/2351	0.55	0/3198
1	C	0.40	0/2329	0.54	0/3172
1	D	0.39	0/2332	0.53	0/3176
All	All	0.41	0/9357	0.55	0/12737

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	2280	0	2204	34	0
1	B	2286	0	2215	47	0
1	C	2264	0	2179	56	0
1	D	2267	0	2181	55	0
2	C	9	4	4	4	0
3	A	52	0	0	1	0
3	B	39	0	0	1	0
3	C	21	0	0	0	0
3	D	15	0	0	1	0
All	All	9233	4	8783	181	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 (181) 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:C:65:PRO:HB2	1:C:131:VAL:HG23	1.40	1.02
1:D:97:LEU:HB3	1:D:115:MET:HE1	1.40	1.02
1:C:159:LEU:HD12	1:C:283:LEU:HD21	1.47	0.95
1:A:280:ARG:HG3	1:A:292:MET:HG3	1.50	0.93
1:C:29:VAL:HG22	1:C:232:ASN:HD22	1.32	0.90
1:A:79:TYR:HB2	1:A:83:MET:HE2	1.55	0.88
1:D:97:LEU:HB3	1:D:115:MET:CE	2.03	0.88
1:B:138:ILE:HG12	1:B:141:MET:HE2	1.56	0.87
1:A:197:GLU:HG3	3:A:431:HOH:O	1.75	0.86
1:C:280:ARG:HG3	1:C:292:MET:HG3	1.60	0.83
1:D:263:LEU:HB3	1:D:265:MET:HE1	1.59	0.83
1:B:80:ARG:HA	1:B:83:MET:HE3	1.59	0.82
1:D:263:LEU:HB3	1:D:265:MET:CE	2.09	0.82
1:C:159:LEU:CD1	1:C:283:LEU:HD21	2.11	0.81
1:A:79:TYR:HB2	1:A:83:MET:CE	2.10	0.80
1:C:71:GLY:HA3	1:C:137:ASP:HB3	1.64	0.78
1:B:280:ARG:HG3	1:B:292:MET:HG3	1.65	0.78
1:C:176:CYS:HB3	1:C:180:THR:HG23	1.64	0.78
1:A:173:ARG:NH2	1:D:173:ARG:HH12	1.83	0.75
1:B:97:LEU:HB3	1:B:115:MET:HE1	1.72	0.71
1:C:70:PRO:HG2	1:C:100:MET:SD	2.33	0.68
1:A:79:TYR:CB	1:A:83:MET:HE2	2.24	0.67
1:B:280:ARG:O	1:B:284:THR:HG23	1.92	0.67
1:C:296:SER:O	1:C:297:LYS:HB2	1.95	0.67
1:C:65:PRO:HB2	1:C:131:VAL:CG2	2.21	0.66
1:B:138:ILE:HG12	1:B:141:MET:CE	2.26	0.65
1:D:83:MET:N	1:D:84:PRO:HD2	2.12	0.65
1:C:301:TYR:N	1:C:305:GLU:OE1	2.24	0.64
1:A:180:THR:HG22	1:A:181:GLY:N	2.11	0.64
1:B:138:ILE:HA	1:B:141:MET:HE2	1.80	0.64
1:D:157:VAL:CG1	1:D:267:VAL:HG22	2.29	0.63
1:B:97:LEU:HB3	1:B:115:MET:CE	2.29	0.62
1:C:90:TYR:HE2	1:C:315:LEU:HD23	1.64	0.62
1:B:278:ASP:O	1:B:282:LYS:HG2	2.00	0.62
1:B:59:SER:HA	1:B:92:VAL:O	2.01	0.61
1:A:180:THR:HG22	1:A:181:GLY:H	1.66	0.60
1:D:79:TYR:HB2	1:D:83:MET:CE	2.32	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:80:ARG:HA	1:C:83:MET:HE3	1.83	0.60
1:C:176:CYS:HB3	1:C:180:THR:CG2	2.30	0.60
1:D:99:GLY:HA2	1:D:105:LYS:HG2	1.82	0.60
1:B:138:ILE:CG1	1:B:141:MET:HE2	2.29	0.60
1:D:70:PRO:HG2	1:D:100:MET:SD	2.42	0.59
1:B:302:LEU:HB2	1:B:303:PRO:HD3	1.84	0.59
1:A:173:ARG:NH2	1:D:173:ARG:NH1	2.50	0.59
1:C:99:GLY:HA2	1:C:105:LYS:HG2	1.84	0.59
1:B:159:LEU:CD1	1:B:283:LEU:HD21	2.33	0.59
1:C:218:ASP:OD2	1:C:220:SER:HB3	2.02	0.59
1:A:178:PRO:HD3	1:D:251:HIS:ND1	2.17	0.59
1:A:174:ILE:HD13	1:D:174:ILE:HD13	1.85	0.58
1:B:159:LEU:HD13	1:B:283:LEU:HD21	1.85	0.58
1:C:65:PRO:CB	1:C:131:VAL:HG23	2.25	0.58
1:B:161:ASP:OD1	1:B:275:THR:HG21	2.05	0.57
1:C:215:SER:HG	1:C:301:TYR:HD2	1.51	0.57
1:D:79:TYR:HB2	1:D:83:MET:HE3	1.86	0.56
1:B:71:GLY:HA3	1:B:137:ASP:HB3	1.87	0.56
1:C:177:ARG:O	1:C:180:THR:HG22	2.07	0.55
1:D:81:LYS:HB2	3:D:405:HOH:O	2.06	0.55
1:D:263:LEU:HB3	1:D:265:MET:HE3	1.86	0.55
1:C:159:LEU:HD12	1:C:283:LEU:CD2	2.30	0.55
1:A:173:ARG:HH21	1:D:173:ARG:HH12	1.49	0.55
1:C:302:LEU:HB2	1:C:303:PRO:HD3	1.89	0.55
1:D:280:ARG:O	1:D:284:THR:HG23	2.08	0.54
1:B:50:VAL:O	1:B:53:VAL:HG12	2.09	0.53
1:C:97:LEU:HD13	1:C:115:MET:CE	2.38	0.53
2:C:401:MLT:H32	1:D:206:HIS:CE1	2.43	0.53
1:D:252:GLN:NE2	1:D:256:ASP:OD1	2.42	0.53
1:A:71:GLY:HA3	1:A:137:ASP:HB3	1.90	0.53
1:B:138:ILE:HD11	1:B:247:TYR:CE1	2.44	0.53
1:A:70:PRO:HG2	1:A:100:MET:SD	2.49	0.53
1:D:265:MET:H	1:D:265:MET:HE2	1.74	0.52
1:C:29:VAL:HG22	1:C:232:ASN:ND2	2.14	0.52
1:D:50:VAL:O	1:D:53:VAL:HG12	2.09	0.51
1:D:66:LEU:HD12	1:D:67:LEU:N	2.26	0.51
1:D:81:LYS:HD2	1:D:304:GLU:HA	1.92	0.51
1:C:31:SER:OG	1:C:34:GLU:HG3	2.11	0.50
1:D:99:GLY:HA2	1:D:105:LYS:CG	2.41	0.50
1:D:157:VAL:HG12	1:D:267:VAL:HG22	1.92	0.50
1:C:180:THR:OG1	1:C:181:GLY:N	2.41	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:28:PRO:HB3	1:C:218:ASP:OD2	2.11	0.50
1:B:257:GLN:HA	1:B:260:TYR:CD2	2.47	0.50
1:D:83:MET:HE1	1:D:94:ALA:CB	2.42	0.49
1:A:262:LYS:HE2	1:A:285:ALA:O	2.12	0.49
1:C:65:PRO:HG3	1:C:128:HIS:ND1	2.27	0.49
1:B:80:ARG:HA	1:B:83:MET:CE	2.37	0.49
1:B:99:GLY:HA2	1:B:105:LYS:HG2	1.95	0.49
1:C:28:PRO:HG2	1:C:232:ASN:ND2	2.27	0.49
1:C:268:LEU:HB2	1:C:317:PHE:CD1	2.48	0.48
1:B:174:ILE:HG13	1:C:188:ALA:HB2	1.95	0.48
1:A:173:ARG:CZ	1:D:173:ARG:NH1	2.77	0.48
1:C:97:LEU:HD13	1:C:115:MET:HE1	1.95	0.48
2:C:401:MLT:C3	1:D:206:HIS:NE2	2.76	0.48
1:B:210:TRP:CZ2	1:C:192:LEU:HD22	2.49	0.48
1:B:262:LYS:HD2	1:B:288:THR:CG2	2.44	0.48
1:B:197:GLU:HA	1:B:240:VAL:HG11	1.96	0.47
1:B:79:TYR:O	1:B:83:MET:HG3	2.14	0.47
1:D:71:GLY:HA3	1:D:137:ASP:HB3	1.96	0.47
1:C:184:LEU:HD22	1:C:186:TRP:CH2	2.50	0.47
1:D:278:ASP:OD2	1:D:282:LYS:HE2	2.14	0.47
2:C:401:MLT:H32	1:D:206:HIS:NE2	2.30	0.47
1:D:238:GLN:H	1:D:238:GLN:CD	2.18	0.47
1:A:59:SER:HA	1:A:92:VAL:O	2.14	0.47
1:A:180:THR:CG2	1:A:181:GLY:N	2.78	0.47
1:C:68:LEU:HD23	1:C:134:ALA:HB3	1.97	0.47
1:D:98:ARG:O	1:D:98:ARG:HG3	2.15	0.47
1:D:287:ALA:HB3	1:D:290:VAL:HG23	1.95	0.47
1:B:314:LEU:HD22	1:B:318:PHE:CE2	2.50	0.47
1:D:65:PRO:CG	1:D:131:VAL:HG12	2.45	0.47
1:D:177:ARG:HH21	1:D:177:ARG:HG3	1.79	0.47
1:B:85:GLN:HG3	3:B:428:HOH:O	2.14	0.46
1:C:69:VAL:HG11	1:C:97:LEU:HD21	1.97	0.46
1:C:234:TYR:HA	1:C:239:ALA:HB1	1.97	0.46
1:D:141:MET:HG2	1:D:165:PRO:HD3	1.97	0.46
1:D:112:LYS:HG2	1:D:253:ASP:CG	2.35	0.46
1:A:280:ARG:HG3	1:A:292:MET:CG	2.33	0.46
1:B:282:LYS:O	1:B:286:GLN:HG3	2.16	0.46
1:D:132:ASN:HB3	1:D:318:PHE:CE1	2.51	0.46
1:C:55:LEU:HD11	1:C:118:ASP:HB3	1.97	0.46
1:A:79:TYR:CB	1:A:83:MET:CE	2.87	0.46
1:D:277:GLU:HG3	1:D:280:ARG:HH21	1.81	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:164:HIS:CG	1:A:165:PRO:HD2	2.51	0.45
1:B:287:ALA:HB3	1:B:290:VAL:CG2	2.46	0.45
1:A:85:GLN:HG2	1:A:88:ARG:HH12	1.82	0.45
1:A:177:ARG:NH1	1:D:167:GLN:OE1	2.48	0.45
1:C:138:ILE:HD13	1:C:246:TRP:HB3	1.99	0.45
1:B:43:PHE:CZ	1:B:87:ALA:HB2	2.52	0.45
1:D:287:ALA:HB3	1:D:290:VAL:CG2	2.47	0.45
1:B:112:LYS:HG3	1:B:141:MET:HB3	1.99	0.45
1:B:170:TYR:O	1:C:173:ARG:HD3	2.17	0.45
1:C:77:TRP:CE2	1:C:80:ARG:HD3	2.52	0.45
1:C:193:GLN:O	1:C:194:ALA:HB3	2.18	0.44
1:C:44:ARG:HH11	1:C:44:ARG:HG3	1.83	0.44
1:C:223:GLY:O	1:C:227:ARG:HG3	2.17	0.44
1:D:278:ASP:O	1:D:282:LYS:HG3	2.18	0.44
1:A:278:ASP:OD1	1:A:282:LYS:HE3	2.17	0.44
1:D:79:TYR:O	1:D:83:MET:HG3	2.18	0.44
1:A:166:ASP:O	1:A:169:GLU:HG2	2.18	0.43
1:B:96:ASP:HB3	1:B:100:MET:O	2.17	0.43
1:C:90:TYR:OH	1:C:318:PHE:HB2	2.18	0.43
1:B:138:ILE:HD13	1:B:246:TRP:CB	2.48	0.43
1:D:97:LEU:CB	1:D:115:MET:HE1	2.29	0.43
1:B:64:GLU:CG	1:B:155:ARG:NH1	2.81	0.43
1:B:163:PRO:HG3	1:B:282:LYS:HD2	2.00	0.43
1:C:262:LYS:HE2	1:C:288:THR:CG2	2.49	0.43
1:A:67:LEU:HD21	1:A:119:LEU:HD13	2.01	0.42
1:A:300:HIS:O	1:A:302:LEU:HD13	2.19	0.42
1:B:43:PHE:HZ	1:B:87:ALA:HB2	1.84	0.42
1:A:212:TYR:CD1	1:A:216:LEU:HD11	2.54	0.42
1:B:69:VAL:HA	1:B:70:PRO:HD3	1.73	0.42
1:A:158:ALA:C	1:A:159:LEU:HG	2.38	0.42
1:B:166:ASP:O	1:B:254:ILE:HG12	2.19	0.42
1:D:274:PHE:HD2	1:D:275:THR:HG23	1.84	0.42
1:A:180:THR:CG2	1:A:181:GLY:H	2.30	0.42
1:D:68:LEU:HD23	1:D:134:ALA:HB3	2.01	0.42
1:C:112:LYS:HG2	1:C:253:ASP:OD2	2.19	0.42
1:D:72:TRP:HA	1:D:73:PRO:HA	1.84	0.42
1:D:245:ARG:HA	1:D:245:ARG:HD3	1.70	0.42
1:D:265:MET:CE	1:D:265:MET:H	2.33	0.42
1:D:79:TYR:HB2	1:D:83:MET:HE2	2.00	0.42
1:C:122:LEU:O	1:C:126:LEU:HG	2.20	0.42
1:A:162:THR:HA	1:A:163:PRO:HD3	1.94	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:190:ASN:O	1:A:244:THR:HB	2.19	0.42
1:B:302:LEU:CB	1:B:303:PRO:HD3	2.48	0.42
1:C:29:VAL:HB	1:C:30:PRO:HD2	2.01	0.41
1:C:85:GLN:OE1	1:C:85:GLN:N	2.41	0.41
2:C:401:MLT:H31	1:D:206:HIS:NE2	2.35	0.41
1:B:64:GLU:HG3	1:B:65:PRO:HD2	2.02	0.41
1:B:234:TYR:HA	1:B:239:ALA:HB1	2.03	0.41
1:C:113:LYS:HE3	1:C:149:ASN:OD1	2.20	0.41
1:B:187:TRP:O	1:B:191:GLN:HG2	2.20	0.41
1:C:33:ARG:HG3	1:C:33:ARG:NH1	2.36	0.41
1:C:131:VAL:HG22	1:C:132:ASN:N	2.36	0.41
1:C:250:CYS:O	1:C:254:ILE:HG13	2.21	0.40
1:D:156:LYS:HB3	1:D:317:PHE:CE2	2.56	0.40
1:B:69:VAL:CG1	1:B:97:LEU:HD21	2.51	0.40
1:C:85:GLN:O	1:C:88:ARG:HG2	2.21	0.40
1:B:240:VAL:O	1:B:244:THR:HG23	2.21	0.40
1:C:69:VAL:CG1	1:C:97:LEU:HD21	2.50	0.40
1:C:80:ARG:CA	1:C:83:MET:HE3	2.49	0.40
1:D:31:SER:OG	1:D:34:GLU:HG3	2.20	0.40
1:A:33:ARG:HG3	1:A:45:SER:HB3	2.02	0.40
1:B:138:ILE:HD13	1:B:246:TRP:HB3	2.03	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 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	291/339 (86%)	281 (97%)	9 (3%)	1 (0%)	41	49
1	B	291/339 (86%)	279 (96%)	11 (4%)	1 (0%)	41	49
1	C	290/339 (86%)	277 (96%)	12 (4%)	1 (0%)	41	49
1	D	290/339 (86%)	276 (95%)	13 (4%)	1 (0%)	41	49

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	1162/1356 (86%)	1113 (96%)	45 (4%)	4 (0%)	41 49

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	73	PRO
1	B	73	PRO
1	D	73	PRO
1	C	73	PRO

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	230/264 (87%)	228 (99%)	2 (1%)	78 86
1	B	231/264 (88%)	230 (100%)	1 (0%)	91 94
1	C	228/264 (86%)	227 (100%)	1 (0%)	91 94
1	D	228/264 (86%)	224 (98%)	4 (2%)	59 71
All	All	917/1056 (87%)	909 (99%)	8 (1%)	78 86

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	123	VAL
1	A	302	LEU
1	B	159	LEU
1	C	45	SER
1	D	33	ARG
1	D	183	THR
1	D	265	MET
1	D	308	ASP

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	286	GLN
1	C	232	ASN

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	$\#|Z| > 2$
2	MLT	C	401	-	8,8,8	1.28	0	10,10,10	1.99	3 (30%)

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	MLT	C	401	-	-	0/8/8/8	-

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	401	MLT	O2-C1-C2	4.08	121.37	112.74
2	C	401	MLT	O2-C1-O1	-2.64	118.09	124.08
2	C	401	MLT	O5-C4-C3	2.14	120.66	114.00

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	401	MLT	4	0

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.

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wwPDB
PROTEIN DATA BANK

6 Fit of model and data (i)

6.1 Protein, DNA and RNA chains (i)

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(Å^2)	Q<0.9
1	A	293/339 (86%)	-0.55	0	100	100	27, 38, 52, 69	0
1	B	293/339 (86%)	-0.51	0	100	100	28, 41, 57, 66	0
1	C	292/339 (86%)	-0.38	1 (0%)	94	94	30, 48, 68, 85	0
1	D	292/339 (86%)	-0.31	0	100	100	29, 52, 68, 79	0
All	All	1170/1356 (86%)	-0.44	1 (0%)	95	96	27, 44, 65, 85	0

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	179	GLY	2.1

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 monosaccharides 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, 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
2	MLT	C	401	9/9	0.84	0.25	45,51,58,62	0

6.5 Other polymers (i)

There are no such residues in this entry.