Full wwPDB X-ray Structure Validation Report (i)

Feb 28, 2024 – 10:03 PM EST

PDB ID	:	3VK4
Title	:	Crystal Structure of L-Methionine gamma-Lyase from Pseudomonas putida C116H Mutant complexed with L-homocysteine
Authors	:	Fukumoto, M.; Kudou, D.; Murano, S.; Shiba, T.; Sato, D.; Tamura, T.; Harada, S.; Inagaki, K.
Deposited on	:	2011-11-07
Resolution	:	2.61 Å(reported)

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	:	2.36
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)	:	2.36

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 2.61 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.

■ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution
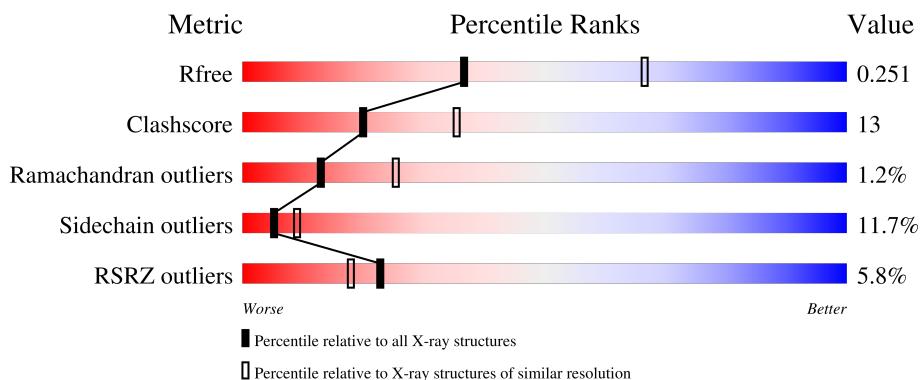
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3797 (2.64-2.60)
Clashscore	141614	4168 (2.64-2.60)
Ramachandran outliers	138981	4093 (2.64-2.60)
Sidechain outliers	138945	4093 (2.64-2.60)
RSRZ outliers	127900	3731 (2.64-2.60)

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	398	6% / 73% 21% 5% •
1	B	398	7% / 76% 19% • ••
1	C	398	5% / 71% 22% 5% •
1	D	398	6% / 69% 24% 5% ••
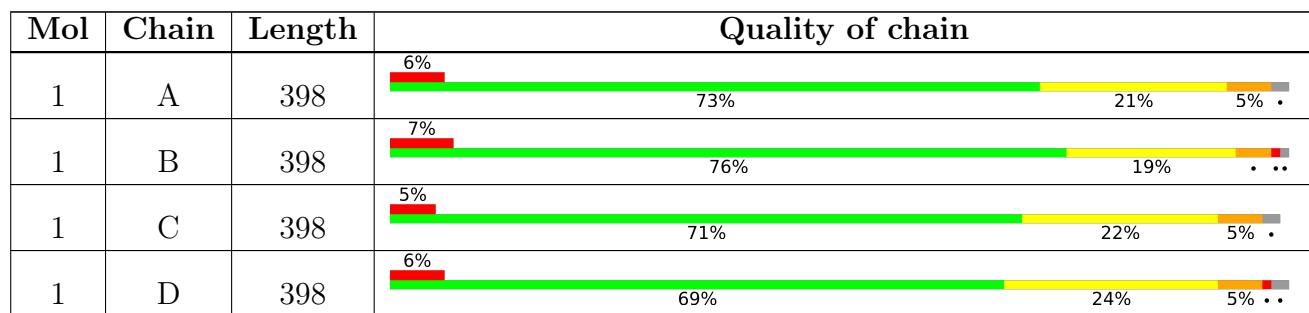
The following table lists non-polymeric compounds, carbohydrate monomers and non-standard

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	HCS	A	501	-	-	X	X
2	HCS	C	501	-	-	X	X
2	HCS	D	501	-	-	X	-

2　Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 12018 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 Methionine gamma-lyase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	392	Total	C	N	O	P	S	0	0	0
			2970	1874	525	554	1	16			
1	B	396	Total	C	N	O	P	S	0	0	0
			2997	1889	531	560	1	16			
1	C	392	Total	C	N	O	P	S	0	0	0
			2970	1874	525	554	1	16			
1	D	392	Total	C	N	O	P	S	0	0	0
			2970	1874	525	554	1	16			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	116	HIS	CYS	engineered mutation	UNP P13254
B	116	HIS	CYS	engineered mutation	UNP P13254
C	116	HIS	CYS	engineered mutation	UNP P13254
D	116	HIS	CYS	engineered mutation	UNP P13254

- Molecule 2 is 2-AMINO-4-MERCAPTO-BUTYRIC ACID (three-letter code: HCS) (formula: $C_4H_9NO_2S$).
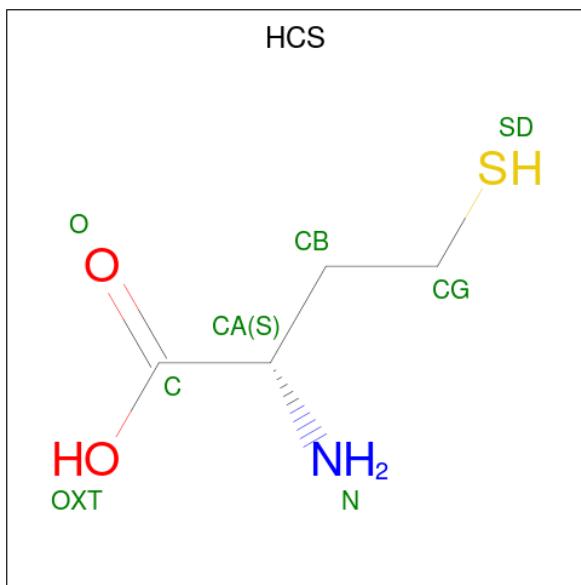
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			8	4	1	2	1		
2	B	1	Total	C	N	O	S	0	0
			8	4	1	2	1		
2	C	1	Total	C	N	O	S	0	0
			8	4	1	2	1		
2	D	1	Total	C	N	O	S	0	0
			8	4	1	2	1		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	16	Total	O	0	0
			16	16		
3	B	25	Total	O	0	0
			25	25		
3	C	18	Total	O	0	0
			18	18		
3	D	20	Total	O	0	0
			20	20		

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: Methionine gamma-lyase

Chain A:

- Molecule 1: Methionine gamma-lyase

Chain B:

- Molecule 1: Methionine gamma-lyase

Chain C:

• Molecule 1: Methionine gamma-lyase

Chain D:
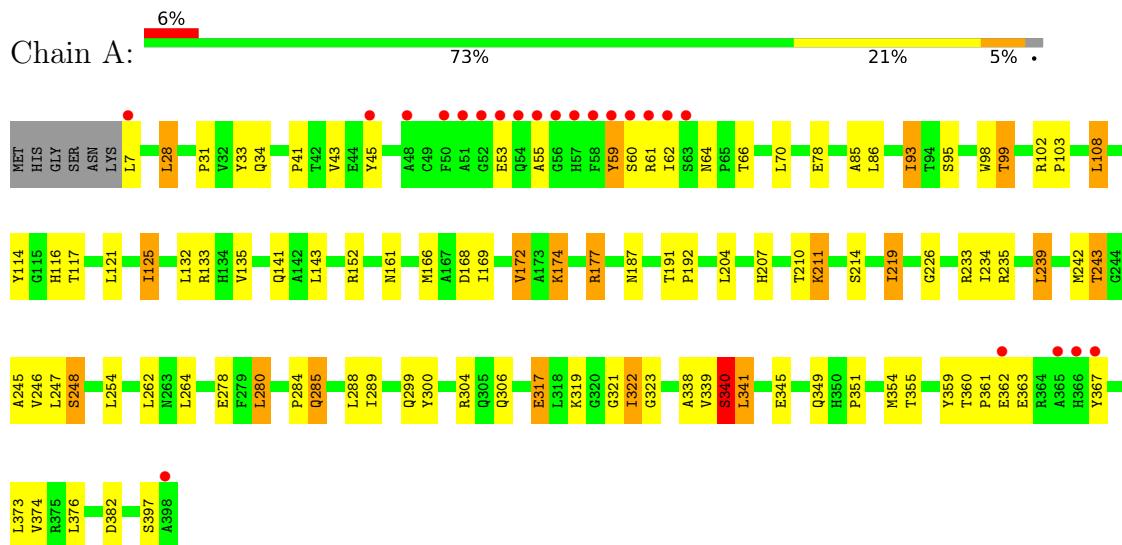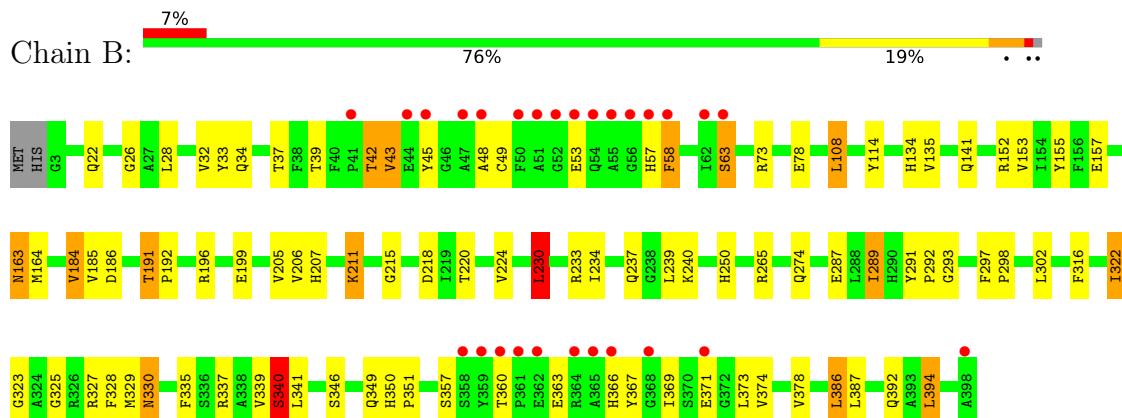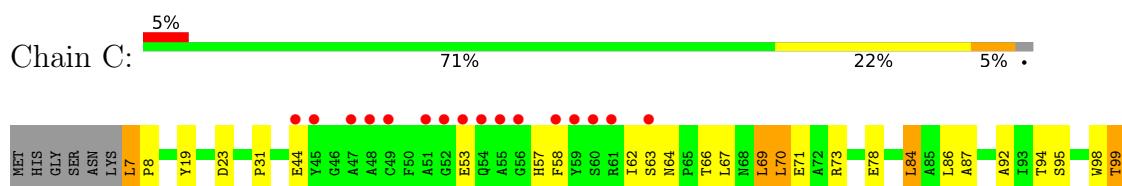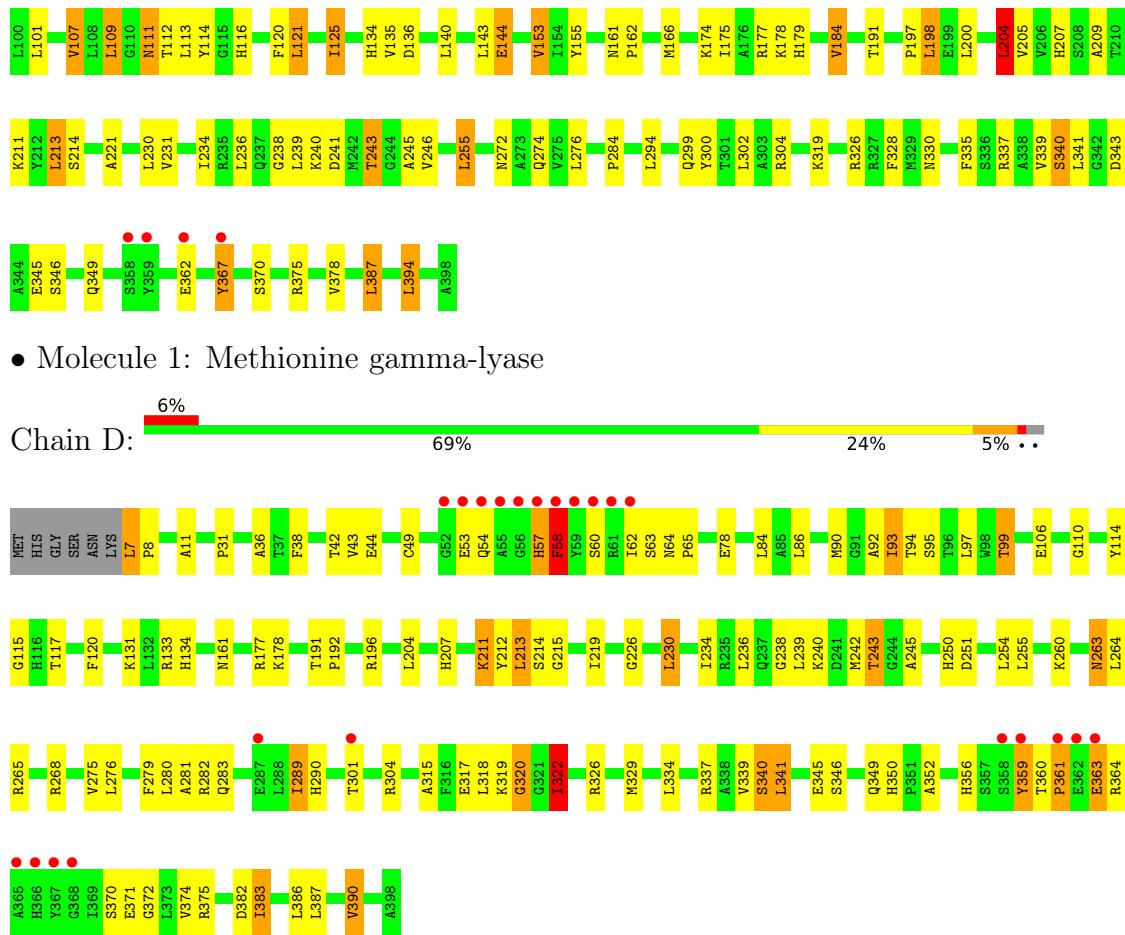
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α, β, γ	153.49Å 153.49Å 80.67Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.28 – 2.61	Depositor
	29.28 – 2.61	EDS
% Data completeness	98.2 (29.28-2.61)	Depositor
(in resolution range)	98.2 (29.28-2.61)	EDS
R_{merge}	0.15	Depositor
R_{sym}	0.07	Depositor
$< I/\sigma(I) >$ [1]	3.39 (at 2.61Å)	Xtriage
Refinement program	REFMAC 5.5.0102	Depositor
R, R_{free}	0.191 , 0.253	Depositor
	0.190 , 0.251	DCC
R_{free} test set	2901 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å^2)	29.1	Xtriage
Anisotropy	0.067	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 35.2	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.013 for k,h,-l	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	12018	wwPDB-VP
Average B, all atoms (Å^2)	29.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.80% 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: LLP, HCS

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	0.75	0/3010	0.81	1/4086 (0.0%)
1	B	0.78	0/3037	0.81	1/4121 (0.0%)
1	C	0.77	0/3010	0.85	6/4086 (0.1%)
1	D	0.73	0/3010	0.79	1/4086 (0.0%)
All	All	0.76	0/12067	0.82	9/16379 (0.1%)

There are no bond length outliers.

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	73	ARG	NE-CZ-NH2	-6.35	117.13	120.30
1	D	268	ARG	NE-CZ-NH2	-5.78	117.41	120.30
1	B	230	LEU	CA-CB-CG	5.72	128.46	115.30
1	A	233	ARG	NE-CZ-NH2	5.61	123.11	120.30
1	C	387	LEU	CA-CB-CG	5.43	127.79	115.30
1	C	204	LEU	CA-CB-CG	5.32	127.53	115.30
1	C	73	ARG	NE-CZ-NH1	5.21	122.90	120.30
1	C	343	ASP	CB-CG-OD1	5.11	122.90	118.30
1	C	337	ARG	NE-CZ-NH2	-5.07	117.77	120.30

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.

WORLDWIDE
wwPDB
PROTEIN DATA BANK

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2970	0	2927	81	0
1	B	2997	0	2954	66	0
1	C	2970	0	2927	88	0
1	D	2970	0	2926	88	0
2	A	8	0	8	5	0
2	B	8	0	8	3	0
2	C	8	0	8	5	0
2	D	8	0	8	8	0
3	A	16	0	0	1	0
3	B	25	0	0	2	0
3	C	18	0	0	1	0
3	D	20	0	0	6	0
All	All	12018	0	11766	298	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 13.

All (298) 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:B:322:ILE:HG22	1:B:371:GLU:HB3	1.20	1.14
1:A:219:ILE:HD11	1:A:254:LEU:HD23	1.12	1.10
1:C:114:TYR:HE1	2:C:501:HCS:HB2	1.20	1.03
1:B:340:SER:HA	2:B:501:HCS:HB2	1.45	0.98
1:C:114:TYR:CE1	2:C:501:HCS:HB2	2.00	0.96
1:C:121:LEU:HA	1:C:125:ILE:CD1	1.99	0.92
1:C:367:TYR:HD1	1:C:367:TYR:O	1.50	0.91
1:A:219:ILE:CD1	1:A:254:LEU:HD23	1.99	0.90
1:D:243:THR:HG22	1:D:245:ALA:H	1.35	0.90
1:C:114:TYR:HE1	2:C:501:HCS:CB	1.85	0.88
1:D:301:THR:HB	3:D:403:HOH:O	1.73	0.88
1:C:95:SER:O	1:C:99:THR:HG22	1.74	0.87
1:C:78:GLU:OE2	1:C:207:HIS:HE1	1.57	0.86
1:A:169:ILE:H	1:A:306:GLN:HE22	1.24	0.85
1:D:99:THR:HG21	1:D:234:ILE:HA	1.59	0.84
1:C:101:LEU:HD21	1:C:153:VAL:HG13	1.59	0.83
1:A:243:THR:HG22	1:A:245:ALA:H	1.40	0.83
1:C:367:TYR:O	1:C:367:TYR:CD1	2.31	0.82
1:D:340:SER:N	2:D:501:HCS:HB2	1.95	0.82
1:C:375:ARG:HH22	2:C:501:HCS:H2	1.27	0.82
1:C:116:HIS:HE1	1:D:240:LYS:HD2	1.45	0.81
1:C:339:VAL:O	1:C:340:SER:CB	2.28	0.81

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:237:GLN:HB3	3:B:408:HOH:O	1.81	0.80
1:C:101:LEU:HD21	1:C:153:VAL:CG1	2.13	0.78
1:B:322:ILE:CG2	1:B:371:GLU:HB3	2.07	0.78
1:D:375:ARG:HH22	2:D:501:HCS:HCA	1.50	0.77
1:D:281:ALA:HA	1:D:289:ILE:HD11	1.68	0.75
1:D:340:SER:H	2:D:501:HCS:HB2	1.50	0.75
1:A:43:VAL:HG22	1:B:330:ASN:HD21	1.50	0.75
1:C:112:THR:HG21	1:C:162:PRO:HD3	1.69	0.75
1:C:78:GLU:OE2	1:C:207:HIS:CE1	2.40	0.74
1:C:116:HIS:CE1	1:D:240:LYS:HD2	2.22	0.74
1:C:198:LEU:HD13	1:C:205:VAL:HG13	1.70	0.73
1:A:284:PRO:HD2	1:A:285:GLN:NE2	2.03	0.72
1:B:34:GLN:HE22	1:B:250:HIS:HB2	1.54	0.72
1:B:325:GLY:HA3	1:B:350:HIS:CE1	2.25	0.71
1:A:166:MET:H	1:A:299:GLN:NE2	1.87	0.71
1:A:288:LEU:HB3	1:A:317:GLU:HG3	1.71	0.70
1:A:219:ILE:HD11	1:A:254:LEU:CD2	2.07	0.70
1:A:121:LEU:HA	1:A:125:ILE:CD1	2.22	0.69
1:A:339:VAL:O	1:A:340:SER:CB	2.40	0.69
1:C:95:SER:O	1:C:99:THR:CG2	2.41	0.69
1:C:166:MET:H	1:C:299:GLN:HE22	1.41	0.69
1:A:166:MET:H	1:A:299:GLN:HE22	1.40	0.69
1:C:339:VAL:O	1:C:340:SER:HB2	1.92	0.68
1:A:340:SER:HA	2:A:501:HCS:HB2	1.75	0.67
1:D:191:THR:HB	1:D:192:PRO:HD2	1.76	0.67
1:A:98:TRP:CZ3	1:A:125:ILE:HG23	2.30	0.67
1:A:339:VAL:O	1:A:340:SER:HB2	1.93	0.66
1:A:95:SER:O	1:A:99:THR:HG23	1.95	0.66
1:D:93:ILE:CD1	1:D:117:THR:HG23	2.26	0.66
1:C:98:TRP:CZ3	1:C:125:ILE:HG23	2.31	0.66
1:B:34:GLN:NE2	1:B:250:HIS:HB2	2.10	0.66
1:C:161:ASN:HD21	1:C:375:ARG:HH11	1.43	0.65
1:C:107:VAL:HG22	1:C:109:LEU:HD13	1.78	0.65
1:C:243:THR:CG2	1:C:245:ALA:H	2.10	0.64
1:A:43:VAL:HG22	1:B:330:ASN:ND2	2.12	0.64
1:A:285:GLN:H	1:A:285:GLN:HE21	1.44	0.64
1:A:41:PRO:HD2	1:A:45:TYR:CD1	2.33	0.64
1:C:330:ASN:HD21	1:D:43:VAL:H	1.44	0.64
1:D:78:GLU:OE2	1:D:207:HIS:HE1	1.81	0.64
1:B:322:ILE:HG22	1:B:371:GLU:CB	2.14	0.63
1:D:301:THR:HG23	3:D:404:HOH:O	1.98	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:323:GLY:O	1:B:327:ARG:NH1	2.32	0.63
1:C:99:THR:HG21	1:C:234:ILE:HA	1.79	0.63
1:D:95:SER:O	1:D:99:THR:CG2	2.47	0.63
1:D:243:THR:CG2	1:D:245:ALA:H	2.10	0.63
1:A:95:SER:O	1:A:99:THR:CG2	2.46	0.62
1:C:84:LEU:HD13	1:C:86:LEU:HD11	1.82	0.62
1:D:207:HIS:HD2	3:D:399:HOH:O	1.83	0.62
1:A:166:MET:N	1:A:299:GLN:HE22	1.97	0.61
1:D:36:ALA:O	1:D:60:SER:HB3	2.01	0.60
1:C:143:LEU:HD22	1:C:175:ILE:HG21	1.83	0.60
1:D:49:CYS:HB3	1:D:58:PHE:HB3	1.84	0.60
1:C:121:LEU:HA	1:C:125:ILE:HD11	1.82	0.60
1:A:121:LEU:HA	1:A:125:ILE:HD12	1.82	0.60
1:B:155:TYR:CD1	1:B:184:VAL:HG22	2.37	0.59
1:D:78:GLU:OE2	1:D:207:HIS:CE1	2.55	0.59
1:A:363:GLU:O	1:A:367:TYR:HD1	1.85	0.59
1:A:33:TYR:CE2	1:C:31:PRO:HG3	2.37	0.59
1:B:369:ILE:HG23	1:B:373:LEU:HD23	1.84	0.59
1:A:41:PRO:HD2	1:A:45:TYR:HD1	1.67	0.58
1:D:207:HIS:CD2	3:D:399:HOH:O	2.56	0.58
1:A:99:THR:HG21	1:A:234:ILE:HA	1.86	0.58
1:C:243:THR:HG22	1:C:245:ALA:H	1.68	0.58
1:D:236:LEU:O	1:D:240:LYS:HG2	2.04	0.58
1:A:204:LEU:HD23	1:A:226:GLY:HA3	1.85	0.58
1:A:93:ILE:HD11	1:A:117:THR:HG23	1.86	0.58
1:B:78:GLU:OE1	1:B:207:HIS:HE1	1.86	0.58
1:D:106:GLU:HG3	1:D:131:LYS:HG2	1.86	0.57
1:A:116:HIS:CE1	1:B:240:LYS:HD2	2.39	0.57
1:B:163:ASN:HD22	1:B:163:ASN:H	1.53	0.57
1:C:95:SER:OG	1:C:243:THR:HG21	2.04	0.57
1:B:339:VAL:HG22	3:B:423:HOH:O	2.05	0.57
1:C:64:ASN:HD22	1:C:67:LEU:H	1.53	0.57
1:B:316:PHE:CE1	1:B:374:VAL:HG22	2.40	0.56
1:C:121:LEU:HD12	1:C:125:ILE:CD1	2.35	0.56
1:B:78:GLU:OE1	1:B:207:HIS:CE1	2.58	0.56
1:D:340:SER:HA	2:D:501:HCS:HB2	1.87	0.56
1:C:121:LEU:HA	1:C:125:ILE:HD12	1.87	0.56
1:D:340:SER:CA	2:D:501:HCS:HB2	2.36	0.55
1:D:99:THR:HG22	1:D:238:GLY:HA3	1.88	0.55
1:C:111:ASN:HD22	1:C:134:HIS:HB3	1.72	0.55
1:A:43:VAL:H	1:B:330:ASN:HD21	1.55	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:340:SER:CA	2:A:501:HCS:HB2	2.37	0.55
1:B:339:VAL:O	1:B:340:SER:CB	2.55	0.54
1:D:95:SER:O	1:D:99:THR:HG23	2.07	0.54
1:B:33:TYR:CE2	1:D:31:PRO:HG3	2.42	0.54
1:A:360:THR:HB	1:A:361:PRO:HD2	1.89	0.54
1:A:28:LEU:HD21	1:D:345:GLU:HG3	1.90	0.54
1:D:322:ILE:HG22	1:D:326:ARG:NH1	2.23	0.54
1:A:61:ARG:HG2	1:A:246:VAL:HG21	1.90	0.54
1:C:64:ASN:ND2	1:C:66:THR:HB	2.23	0.54
1:C:70:LEU:HD21	1:C:255:LEU:HD13	1.90	0.53
1:A:28:LEU:CD2	1:D:345:GLU:HG3	2.38	0.53
1:D:114:TYR:HE1	2:D:501:HCS:HG2	1.73	0.53
1:D:279:PHE:O	1:D:283:GLN:HG2	2.09	0.53
1:B:329:MET:HE3	1:B:337:ARG:HG2	1.91	0.53
1:B:340:SER:HA	2:B:501:HCS:CB	2.29	0.53
1:D:86:LEU:HD23	1:D:239:LEU:HD13	1.91	0.53
1:A:121:LEU:HD23	1:A:125:ILE:CD1	2.39	0.53
1:C:191:THR:HG22	3:C:408:HOH:O	2.08	0.53
1:C:155:TYR:HD1	1:C:184:VAL:HG22	1.74	0.52
1:A:59:TYR:O	1:A:60:SER:HB3	2.09	0.52
1:A:168:ASP:O	1:A:172:VAL:HG13	2.09	0.52
1:C:155:TYR:CD1	1:C:184:VAL:HG22	2.44	0.52
1:D:290:HIS:HB2	1:D:315:ALA:HB3	1.90	0.52
1:B:346:SER:OG	1:B:386:LEU:HD11	2.09	0.52
1:D:215:GLY:HA3	1:D:265:ARG:NH1	2.24	0.52
1:C:114:TYR:CE1	2:C:501:HCS:CB	2.75	0.52
1:A:211:LLP:NZ	1:A:211:LLP:O3	2.43	0.52
1:D:204:LEU:HD23	1:D:226:GLY:HA3	1.92	0.52
1:D:359:TYR:CD1	1:D:359:TYR:N	2.78	0.52
1:D:359:TYR:N	1:D:359:TYR:HD1	2.08	0.51
1:B:163:ASN:HD22	1:B:163:ASN:N	2.09	0.51
1:D:386:LEU:O	1:D:390:VAL:HG13	2.09	0.51
1:D:238:GLY:O	1:D:243:THR:HB	2.10	0.51
1:D:339:VAL:O	1:D:340:SER:CB	2.59	0.51
1:A:93:ILE:CD1	1:A:117:THR:HG23	2.40	0.51
1:A:248:SER:HB3	3:A:412:HOH:O	2.10	0.51
1:C:84:LEU:HB2	1:C:231:VAL:HG13	1.91	0.51
1:A:98:TRP:O	1:A:242:MET:HE1	2.11	0.51
1:C:330:ASN:ND2	1:D:42:THR:HA	2.25	0.51
1:B:26:GLY:O	1:D:38:PHE:HA	2.10	0.50
1:D:95:SER:O	1:D:99:THR:HG22	2.10	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:289:ILE:N	1:B:289:ILE:HD12	2.27	0.50
1:A:284:PRO:O	1:A:319:LYS:HD2	2.11	0.50
1:B:34:GLN:HE22	1:B:250:HIS:CB	2.24	0.50
1:C:63:SER:OG	1:C:63:SER:O	2.27	0.50
1:C:86:LEU:HD13	1:C:92:ALA:HA	1.93	0.50
1:C:144:GLU:OE2	1:C:179:HIS:NE2	2.41	0.49
1:B:206:VAL:HG12	1:B:224:VAL:HG22	1.93	0.49
1:B:350:HIS:HD2	1:B:373:LEU:O	1.95	0.49
1:A:85:ALA:HB1	1:A:247:LEU:HD23	1.93	0.49
1:C:300:TYR:CZ	1:C:304:ARG:HD2	2.47	0.49
1:B:57:HIS:HD2	1:B:63:SER:OG	1.95	0.49
1:B:339:VAL:O	1:B:340:SER:HB2	2.12	0.49
1:C:328:PHE:CE2	1:C:394:LEU:HD13	2.48	0.49
1:B:42:THR:HG23	1:B:45:TYR:H	1.76	0.49
1:C:121:LEU:HD12	1:C:125:ILE:HD13	1.94	0.48
1:A:300:TYR:CZ	1:A:304:ARG:HD2	2.48	0.48
1:C:339:VAL:O	1:C:340:SER:HB3	2.12	0.48
1:B:335:PHE:CE1	1:B:386:LEU:HD12	2.48	0.48
1:C:87:ALA:HB2	1:C:246:VAL:O	2.14	0.48
1:D:57:HIS:HA	1:D:63:SER:HB3	1.95	0.48
1:D:360:THR:HB	1:D:361:PRO:HD2	1.96	0.48
1:C:111:ASN:ND2	1:C:134:HIS:HB3	2.29	0.47
1:D:370:SER:O	1:D:372:GLY:N	2.47	0.47
1:B:163:ASN:H	1:B:163:ASN:ND2	2.12	0.47
1:D:263:ASN:H	1:D:263:ASN:HD22	1.61	0.47
1:D:318:LEU:O	1:D:320:GLY:N	2.47	0.47
1:D:329:MET:O	1:D:337:ARG:NH1	2.41	0.47
1:A:121:LEU:HA	1:A:125:ILE:HD11	1.92	0.47
1:B:328:PHE:CE2	1:B:394:LEU:HD13	2.49	0.47
1:B:367:TYR:HB3	1:B:369:ILE:HD12	1.96	0.47
1:C:86:LEU:HD23	1:C:239:LEU:HD13	1.96	0.47
1:B:157:GLU:HG2	1:B:186:ASP:HB3	1.97	0.47
1:C:243:THR:HG23	1:C:245:ALA:H	1.79	0.47
1:D:213:LEU:HB3	1:D:255:LEU:HD11	1.96	0.47
1:B:57:HIS:CD2	1:B:63:SER:OG	2.67	0.47
1:C:326:ARG:HD3	1:D:44:GLU:OE1	2.15	0.47
1:A:108:LEU:HD12	1:A:133:ARG:HB3	1.97	0.47
1:A:116:HIS:HE1	1:B:240:LYS:HD2	1.80	0.47
1:A:210:THR:HG23	1:A:219:ILE:O	2.15	0.47
1:B:329:MET:CE	1:B:337:ARG:HG2	2.44	0.47
1:D:196:ARG:HB3	3:D:408:HOH:O	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:155:TYR:HD1	1:B:184:VAL:HG22	1.79	0.46
1:D:281:ALA:CA	1:D:289:ILE:HD11	2.43	0.46
1:A:114:TYR:CE1	2:A:501:HCS:HG2	2.50	0.46
1:A:187:ASN:HB3	1:A:207:HIS:CE1	2.51	0.46
1:D:219:ILE:CD1	1:D:255:LEU:HB2	2.46	0.46
1:D:339:VAL:O	1:D:340:SER:HB3	2.16	0.46
1:A:34:GLN:HG3	1:B:218:ASP:O	2.16	0.46
1:A:211:LLP:HD3	1:A:341:LEU:HG	1.98	0.46
1:B:211:LLP:NZ	1:B:211:LLP:O3	2.48	0.46
1:A:321:GLY:O	1:A:323:GLY:N	2.49	0.46
1:C:112:THR:CG2	1:C:161:ASN:O	2.63	0.46
1:D:90:MET:O	1:D:94:THR:HG23	2.16	0.46
1:A:70:LEU:HD23	1:A:85:ALA:HB2	1.97	0.46
1:C:121:LEU:HD12	1:C:125:ILE:HD11	1.97	0.46
1:D:58:PHE:CZ	1:D:62:ILE:HG21	2.51	0.46
1:C:58:PHE:CE2	1:C:62:ILE:HD13	2.51	0.46
1:C:94:THR:O	1:C:95:SER:C	2.55	0.45
1:A:340:SER:N	2:A:501:HCS:HB2	2.31	0.45
1:A:354:MET:HG3	1:B:43:VAL:HG22	1.97	0.45
1:C:112:THR:HB	1:C:161:ASN:O	2.17	0.45
1:C:335:PHE:CE2	1:C:346:SER:HB3	2.51	0.45
1:D:363:GLU:CD	1:D:363:GLU:H	2.20	0.45
1:A:78:GLU:HG2	1:A:192:PRO:HB3	1.99	0.45
1:B:28:LEU:HD11	1:C:345:GLU:HG3	1.97	0.45
1:B:108:LEU:HD12	1:B:108:LEU:HA	1.62	0.45
1:B:196:ARG:HD2	1:B:199:GLU:OE2	2.15	0.45
1:C:64:ASN:HB3	1:C:67:LEU:HB2	1.97	0.45
1:C:111:ASN:HD22	1:C:111:ASN:HA	1.50	0.45
1:C:135:VAL:HG12	1:C:136:ASP:N	2.32	0.45
1:D:250:HIS:HD2	1:D:251:ASP:OD2	2.00	0.45
1:D:276:LEU:HD23	1:D:387:LEU:HD23	1.97	0.45
1:C:116:HIS:HE1	1:D:240:LYS:CD	2.23	0.45
1:C:213:LEU:HD12	1:C:213:LEU:HA	1.81	0.45
1:C:184:VAL:HB	1:C:204:LEU:HB2	1.98	0.45
1:A:102:ARG:HB3	1:A:103:PRO:HD2	1.99	0.45
1:A:121:LEU:HD23	1:A:125:ILE:HD11	1.99	0.45
1:D:93:ILE:HD12	1:D:117:THR:HG23	1.99	0.45
1:B:335:PHE:CE2	1:B:346:SER:HB3	2.52	0.44
1:C:284:PRO:O	1:C:319:LYS:HE3	2.18	0.44
1:C:209:ALA:N	1:C:221:ALA:O	2.50	0.44
1:A:98:TRP:HB3	1:A:242:MET:HE3	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:241:ASP:O	1:D:120:PHE:HB2	2.18	0.44
1:C:7:LEU:HB3	1:C:8:PRO:HD3	1.99	0.44
1:C:197:PRO:HD2	1:C:205:VAL:HG11	1.98	0.44
1:C:238:GLY:O	1:C:243:THR:HB	2.17	0.44
1:A:31:PRO:HB2	1:C:31:PRO:HB2	2.00	0.44
1:A:300:TYR:CE2	1:A:304:ARG:HD2	2.53	0.44
1:A:363:GLU:O	1:A:367:TYR:CD1	2.68	0.44
1:C:64:ASN:HD21	1:C:66:THR:HB	1.82	0.44
1:C:114:TYR:CE2	1:C:116:HIS:HB2	2.53	0.44
1:D:114:TYR:CE1	2:D:501:HCS:HG2	2.52	0.44
1:A:86:LEU:HD23	1:A:239:LEU:HG	1.99	0.43
1:B:48:ALA:HB1	1:B:53:GLU:HB2	2.00	0.43
1:B:191:THR:HB	1:B:192:PRO:HD2	2.00	0.43
1:D:7:LEU:HA	1:D:8:PRO:HD2	1.90	0.43
1:D:263:ASN:HD22	1:D:263:ASN:N	2.16	0.43
1:C:19:TYR:HB2	1:C:69:LEU:HD21	2.00	0.43
1:D:212:TYR:CE2	1:D:341:LEU:HD12	2.54	0.43
1:B:297:PHE:HA	1:B:298:PRO:HD3	1.91	0.43
1:B:350:HIS:O	1:B:351:PRO:C	2.57	0.43
1:A:64:ASN:OD1	1:A:66:THR:HB	2.19	0.43
1:A:288:LEU:HB3	1:A:317:GLU:CG	2.43	0.43
1:A:62:ILE:O	1:A:235:ARG:NH1	2.52	0.43
1:A:191:THR:HB	1:A:192:PRO:HD2	2.01	0.43
1:B:58:PHE:CD1	1:B:58:PHE:N	2.87	0.43
1:C:57:HIS:ND1	1:C:63:SER:O	2.51	0.42
1:D:86:LEU:HD13	1:D:92:ALA:HA	2.00	0.42
1:D:219:ILE:HD11	1:D:255:LEU:HB2	1.99	0.42
1:B:141:GLN:CD	1:B:141:GLN:H	2.22	0.42
1:A:382:ASP:OD2	1:D:11:ALA:HB3	2.20	0.42
1:D:36:ALA:O	1:D:60:SER:CB	2.67	0.42
1:C:120:PHE:O	1:C:125:ILE:HD12	2.20	0.42
1:D:53:GLU:O	1:D:54:GLN:HB2	2.19	0.42
1:B:291:TYR:HA	1:B:292:PRO:HD3	1.92	0.42
1:A:321:GLY:O	1:A:322:ILE:C	2.58	0.42
1:B:134:HIS:O	1:B:135:VAL:HG23	2.19	0.42
1:A:349:GLN:HE21	1:A:351:PRO:HG3	1.85	0.42
1:B:155:TYR:CD2	1:B:155:TYR:C	2.93	0.42
1:C:243:THR:HG23	1:C:245:ALA:CB	2.49	0.42
1:A:338:ALA:HB2	1:B:39:THR:HG22	2.02	0.41
1:B:114:TYR:CE1	2:B:501:HCS:HG2	2.55	0.41
1:B:185:VAL:O	1:B:205:VAL:HA	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:161:ASN:HD22	1:C:162:PRO:HA	1.85	0.41
1:D:64:ASN:HA	1:D:65:PRO:HD3	1.93	0.41
1:B:230:LEU:O	1:B:234:ILE:HG13	2.20	0.41
1:B:363:GLU:HA	1:B:366:HIS:HB2	2.02	0.41
1:A:243:THR:HG22	1:A:245:ALA:N	2.22	0.41
1:D:211:LLP:HE3	2:D:501:HCS:HG3	2.03	0.41
1:D:356:HIS:O	1:D:364:ARG:NH1	2.53	0.41
1:C:120:PHE:CZ	1:C:125:ILE:HG13	2.56	0.41
1:C:272:ASN:HB3	1:C:378:VAL:HG11	2.02	0.41
1:A:345:GLU:OE2	1:D:260:LYS:NZ	2.47	0.41
1:C:98:TRP:HZ2	1:D:242:MET:HE2	1.85	0.41
1:D:329:MET:HG3	1:D:350:HIS:HB3	2.02	0.41
1:A:125:ILE:H	1:A:125:ILE:HG13	1.58	0.41
1:D:383:ILE:H	1:D:383:ILE:HG13	1.50	0.41
1:A:114:TYR:OH	2:A:501:HCS:SD	2.75	0.41
1:A:280:LEU:HB3	1:A:289:ILE:HD12	2.03	0.41
1:D:110:GLY:O	1:D:134:HIS:HD2	2.04	0.41
1:D:317:GLU:OE1	1:D:370:SER:HB3	2.20	0.41
1:D:349:GLN:HE21	1:D:375:ARG:NH2	2.18	0.41
1:A:169:ILE:H	1:A:306:GLN:NE2	2.05	0.41
1:D:230:LEU:O	1:D:234:ILE:HG13	2.21	0.41
1:D:196:ARG:NH1	1:D:196:ARG:HG3	2.35	0.40
1:D:350:HIS:CE1	1:D:352:ALA:HB3	2.57	0.40
1:D:301:THR:CB	3:D:403:HOH:O	2.49	0.40
1:A:174:LYS:NZ	1:A:177:ARG:HD2	2.36	0.40
1:B:215:GLY:HA3	1:B:265:ARG:NH1	2.36	0.40
1:C:67:LEU:O	1:C:71:GLU:HG3	2.22	0.40
1:A:360:THR:HB	1:A:361:PRO:CD	2.50	0.40
1:B:274:GLN:HE22	1:B:293:GLY:HA3	1.86	0.40
1:C:112:THR:O	1:C:113:LEU:HD23	2.21	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	389/398 (98%)	369 (95%)	16 (4%)	4 (1%)	15	30
1	B	393/398 (99%)	365 (93%)	26 (7%)	2 (0%)	29	50
1	C	389/398 (98%)	372 (96%)	15 (4%)	2 (0%)	29	50
1	D	389/398 (98%)	361 (93%)	18 (5%)	10 (3%)	5	8
All	All	1560/1592 (98%)	1467 (94%)	75 (5%)	18 (1%)	13	25

All (18) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	55	ALA
1	A	340	SER
1	D	58	PHE
1	D	340	SER
1	A	322	ILE
1	B	340	SER
1	C	53	GLU
1	C	340	SER
1	D	57	HIS
1	D	282	ARG
1	D	371	GLU
1	D	320	GLY
1	D	319	LYS
1	A	59	TYR
1	D	115	GLY
1	D	361	PRO
1	B	191	THR
1	D	322	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 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.

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	301/306 (98%)	265 (88%)	36 (12%)	5	8
1	B	304/306 (99%)	270 (89%)	34 (11%)	6	10
1	C	301/306 (98%)	261 (87%)	40 (13%)	4	6
1	D	301/306 (98%)	270 (90%)	31 (10%)	7	12
All	All	1207/1224 (99%)	1066 (88%)	141 (12%)	5	9

All (141) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	7	LEU
1	A	28	LEU
1	A	53	GLU
1	A	93	ILE
1	A	99	THR
1	A	108	LEU
1	A	125	ILE
1	A	132	LEU
1	A	135	VAL
1	A	141	GLN
1	A	143	LEU
1	A	152	ARG
1	A	161	ASN
1	A	172	VAL
1	A	174	LYS
1	A	177	ARG
1	A	214	SER
1	A	219	ILE
1	A	239	LEU
1	A	243	THR
1	A	248	SER
1	A	262	LEU
1	A	264	LEU
1	A	278	GLU
1	A	280	LEU
1	A	285	GLN
1	A	317	GLU
1	A	340	SER
1	A	341	LEU
1	A	355	THR

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Mol	Chain	Res	Type
1	A	359	TYR
1	A	362	GLU
1	A	373	LEU
1	A	374	VAL
1	A	376	LEU
1	A	397	SER
1	B	22	GLN
1	B	32	VAL
1	B	37	THR
1	B	42	THR
1	B	43	VAL
1	B	49	CYS
1	B	58	PHE
1	B	63	SER
1	B	73	ARG
1	B	108	LEU
1	B	152	ARG
1	B	153	VAL
1	B	163	ASN
1	B	164	MET
1	B	184	VAL
1	B	220	THR
1	B	230	LEU
1	B	233	ARG
1	B	239	LEU
1	B	287	GLU
1	B	289	ILE
1	B	302	LEU
1	B	322	ILE
1	B	330	ASN
1	B	340	SER
1	B	341	LEU
1	B	349	GLN
1	B	357	SER
1	B	360	THR
1	B	378	VAL
1	B	386	LEU
1	B	387	LEU
1	B	392	GLN
1	B	394	LEU
1	C	7	LEU
1	C	23	ASP

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Mol	Chain	Res	Type
1	C	44	GLU
1	C	69	LEU
1	C	70	LEU
1	C	84	LEU
1	C	99	THR
1	C	107	VAL
1	C	109	LEU
1	C	111	ASN
1	C	121	LEU
1	C	125	ILE
1	C	140	LEU
1	C	144	GLU
1	C	153	VAL
1	C	174	LYS
1	C	177	ARG
1	C	178	LYS
1	C	184	VAL
1	C	198	LEU
1	C	200	LEU
1	C	204	LEU
1	C	213	LEU
1	C	214	SER
1	C	230	LEU
1	C	236	LEU
1	C	240	LYS
1	C	243	THR
1	C	255	LEU
1	C	274	GLN
1	C	276	LEU
1	C	294	LEU
1	C	302	LEU
1	C	341	LEU
1	C	349	GLN
1	C	362	GLU
1	C	367	TYR
1	C	370	SER
1	C	387	LEU
1	C	394	LEU
1	D	7	LEU
1	D	58	PHE
1	D	84	LEU
1	D	93	ILE

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Mol	Chain	Res	Type
1	D	97	LEU
1	D	99	THR
1	D	133	ARG
1	D	161	ASN
1	D	177	ARG
1	D	178	LYS
1	D	213	LEU
1	D	214	SER
1	D	230	LEU
1	D	243	THR
1	D	254	LEU
1	D	263	ASN
1	D	264	LEU
1	D	275	VAL
1	D	280	LEU
1	D	289	ILE
1	D	304	ARG
1	D	322	ILE
1	D	334	LEU
1	D	341	LEU
1	D	346	SER
1	D	359	TYR
1	D	363	GLU
1	D	374	VAL
1	D	382	ASP
1	D	383	ILE
1	D	390	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (39) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	34	GLN
1	A	161	ASN
1	A	165	HIS
1	A	187	ASN
1	A	237	GLN
1	A	250	HIS
1	A	285	GLN
1	A	299	GLN
1	A	306	GLN
1	A	309	GLN
1	B	5	ASN

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Mol	Chain	Res	Type
1	B	34	GLN
1	B	57	HIS
1	B	68	ASN
1	B	116	HIS
1	B	163	ASN
1	B	187	ASN
1	B	195	GLN
1	B	207	HIS
1	B	237	GLN
1	B	274	GLN
1	B	330	ASN
1	B	350	HIS
1	C	64	ASN
1	C	111	ASN
1	C	116	HIS
1	C	161	ASN
1	C	163	ASN
1	C	207	HIS
1	C	237	GLN
1	C	299	GLN
1	C	330	ASN
1	D	57	HIS
1	D	134	HIS
1	D	161	ASN
1	D	207	HIS
1	D	250	HIS
1	D	263	ASN
1	D	349	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

4 non-standard protein/DNA/RNA residues 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	$\#|Z| > 2$
1	LLP	C	211	1	23,24,25	2.11	4 (17%)	25,32,34	1.83	5 (20%)
1	LLP	A	211	1	23,24,25	2.28	5 (21%)	25,32,34	1.58	3 (12%)
1	LLP	B	211	1	23,24,25	2.50	6 (26%)	25,32,34	1.77	6 (24%)
1	LLP	D	211	1	23,24,25	2.36	4 (17%)	25,32,34	1.83	5 (20%)

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
1	LLP	C	211	1	-	5/16/17/19	0/1/1/1
1	LLP	A	211	1	-	4/16/17/19	0/1/1/1
1	LLP	B	211	1	-	6/16/17/19	0/1/1/1
1	LLP	D	211	1	-	5/16/17/19	0/1/1/1

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	211	LLP	C4'-NZ	6.96	1.50	1.27
1	B	211	LLP	C4'-NZ	6.69	1.49	1.27
1	A	211	LLP	C4'-NZ	6.41	1.48	1.27
1	B	211	LLP	C2'-C2	-6.34	1.39	1.50
1	C	211	LLP	C4'-NZ	6.10	1.47	1.27
1	D	211	LLP	C2'-C2	-5.42	1.41	1.50
1	C	211	LLP	C2'-C2	-5.38	1.41	1.50
1	A	211	LLP	C2'-C2	-5.22	1.41	1.50
1	B	211	LLP	C5'-C5	-4.21	1.39	1.50
1	A	211	LLP	C6-N1	4.14	1.43	1.34
1	A	211	LLP	C5'-C5	-3.93	1.40	1.50
1	D	211	LLP	C5'-C5	-3.60	1.41	1.50
1	C	211	LLP	C6-N1	3.45	1.41	1.34
1	D	211	LLP	C6-N1	3.18	1.41	1.34
1	B	211	LLP	C3-C2	-3.12	1.37	1.40
1	C	211	LLP	C5'-C5	-3.02	1.42	1.50
1	B	211	LLP	C6-N1	2.91	1.40	1.34
1	B	211	LLP	C4-C4'	-2.73	1.41	1.46
1	A	211	LLP	P-OP2	-2.04	1.47	1.54

All (19) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	211	LLP	C4-C3-C2	5.72	123.73	120.19
1	D	211	LLP	C4-C3-C2	5.63	123.67	120.19
1	A	211	LLP	C4-C3-C2	4.53	122.99	120.19
1	B	211	LLP	C4-C3-C2	4.15	122.76	120.19
1	B	211	LLP	C4-C4'-NZ	-3.37	108.82	124.31
1	D	211	LLP	C4-C4'-NZ	-3.16	109.82	124.31
1	B	211	LLP	OP2-P-OP4	-3.14	98.37	106.73
1	A	211	LLP	CE-NZ-C4'	-2.52	111.16	118.90
1	B	211	LLP	C5-C6-N1	-2.51	119.64	123.82
1	C	211	LLP	C4-C4'-NZ	-2.46	113.02	124.31
1	D	211	LLP	OP2-P-OP4	-2.39	100.38	106.73
1	C	211	LLP	CD-CE-NZ	2.30	116.56	110.93
1	C	211	LLP	C3-C2-N1	-2.22	117.90	120.77
1	D	211	LLP	OP3-P-OP1	2.13	119.03	110.68
1	B	211	LLP	C3-C2-N1	-2.11	118.05	120.77
1	C	211	LLP	OP4-P-OP1	-2.08	100.65	106.47
1	A	211	LLP	OP3-P-OP1	2.07	118.78	110.68
1	B	211	LLP	OP3-P-OP2	2.07	115.54	107.64
1	D	211	LLP	C3-C4-C5	-2.07	116.67	118.26

There are no chirality outliers.

All (20) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	211	LLP	O-C-CA-CB
1	B	211	LLP	O-C-CA-CB
1	C	211	LLP	N-CA-CB-CG
1	C	211	LLP	O-C-CA-CB
1	D	211	LLP	O-C-CA-CB
1	A	211	LLP	C4-C4'-NZ-CE
1	C	211	LLP	C4-C4'-NZ-CE
1	C	211	LLP	CG-CD-CE-NZ
1	D	211	LLP	CG-CD-CE-NZ
1	A	211	LLP	CA-CB-CG-CD
1	B	211	LLP	CA-CB-CG-CD
1	B	211	LLP	C4-C4'-NZ-CE
1	B	211	LLP	CD-CE-NZ-C4'
1	A	211	LLP	N-CA-CB-CG
1	C	211	LLP	C3-C4-C4'-NZ
1	D	211	LLP	C3-C4-C4'-NZ
1	D	211	LLP	CD-CE-NZ-C4'

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Mol	Chain	Res	Type	Atoms
1	B	211	LLP	C3-C4-C4'-NZ
1	B	211	LLP	N-CA-CB-CG
1	D	211	LLP	N-CA-CB-CG

There are no ring outliers.

3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	211	LLP	2	0
1	B	211	LLP	1	0
1	D	211	LLP	1	0

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

4 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	HCS	B	501	-	6,7,7	0.85	0	7,8,8	1.91	1 (14%)
2	HCS	A	501	-	6,7,7	0.89	0	7,8,8	2.40	2 (28%)
2	HCS	D	501	-	6,7,7	0.85	0	7,8,8	1.33	1 (14%)
2	HCS	C	501	-	6,7,7	0.85	0	7,8,8	2.10	2 (28%)

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	HCS	B	501	-	-	7/7/7/7	-
2	HCS	A	501	-	-	5/7/7/7	-
2	HCS	D	501	-	-	7/7/7/7	-
2	HCS	C	501	-	-	3/7/7/7	-

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	501	HCS	CB-CG-SD	-4.81	108.73	113.74
2	C	501	HCS	CB-CG-SD	-4.63	108.92	113.74
2	B	501	HCS	CB-CG-SD	-4.40	109.16	113.74
2	A	501	HCS	CG-CB-CA	3.78	119.31	113.14
2	D	501	HCS	CB-CG-SD	-2.57	111.06	113.74
2	C	501	HCS	CB-CA-N	-2.00	104.92	110.17

There are no chirality outliers.

All (22) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	HCS	N-CA-CB-CG
2	A	501	HCS	C-CA-CB-CG
2	B	501	HCS	CA-CB-CG-SD
2	C	501	HCS	N-CA-CB-CG
2	D	501	HCS	N-CA-CB-CG
2	D	501	HCS	C-CA-CB-CG
2	D	501	HCS	O-C-CA-N
2	C	501	HCS	CA-CB-CG-SD
2	A	501	HCS	CA-CB-CG-SD
2	D	501	HCS	OXT-C-CA-N
2	B	501	HCS	C-CA-CB-CG
2	C	501	HCS	C-CA-CB-CG
2	B	501	HCS	O-C-CA-N
2	A	501	HCS	OXT-C-CA-CB
2	B	501	HCS	N-CA-CB-CG
2	D	501	HCS	O-C-CA-CB
2	A	501	HCS	O-C-CA-CB
2	D	501	HCS	OXT-C-CA-CB
2	B	501	HCS	O-C-CA-CB
2	B	501	HCS	OXT-C-CA-N
2	B	501	HCS	OXT-C-CA-CB

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Mol	Chain	Res	Type	Atoms
2	D	501	HCS	CA-CB-CG-SD

There are no ring outliers.

4 monomers are involved in 21 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	501	HCS	3	0
2	A	501	HCS	5	0
2	D	501	HCS	8	0
2	C	501	HCS	5	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.

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	391/398 (98%)	-0.26	22 (5%)	24	19	10, 23, 68, 96	0
1	B	395/398 (99%)	-0.26	27 (6%)	17	13	7, 21, 76, 88	0
1	C	391/398 (98%)	-0.33	20 (5%)	28	22	8, 22, 67, 91	0
1	D	391/398 (98%)	-0.12	22 (5%)	24	19	12, 30, 77, 92	0
All	All	1568/1592 (98%)	-0.25	91 (5%)	23	18	7, 24, 71, 96	0

All (91) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	59	TYR	10.9
1	A	51	ALA	8.7
1	A	52	GLY	8.5
1	C	55	ALA	8.4
1	D	53	GLU	8.1
1	B	365	ALA	7.7
1	B	51	ALA	6.0
1	D	362	GLU	6.0
1	C	53	GLU	5.9
1	B	55	ALA	5.7
1	D	62	ILE	5.7
1	A	54	GLN	5.6
1	D	55	ALA	5.6
1	A	62	ILE	5.4
1	C	54	GLN	5.4
1	A	55	ALA	5.3
1	B	366	HIS	5.2
1	D	54	GLN	5.1
1	A	60	SER	5.1
1	A	53	GLU	5.1
1	D	61	ARG	5.0

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Mol	Chain	Res	Type	RSRZ
1	A	57	HIS	5.0
1	B	54	GLN	4.9
1	D	366	HIS	4.9
1	A	59	TYR	4.8
1	A	56	GLY	4.8
1	B	360	THR	4.7
1	B	362	GLU	4.7
1	D	60	SER	4.7
1	C	60	SER	4.6
1	A	398	ALA	4.5
1	B	58	PHE	4.2
1	B	368	GLY	4.1
1	D	358	SER	4.1
1	B	63	SER	4.1
1	C	52	GLY	4.0
1	C	51	ALA	4.0
1	C	362	GLU	4.0
1	B	56	GLY	3.9
1	C	48	ALA	3.9
1	C	358	SER	3.8
1	D	58	PHE	3.8
1	D	361	PRO	3.8
1	D	56	GLY	3.7
1	D	52	GLY	3.7
1	D	367	TYR	3.6
1	B	361	PRO	3.5
1	C	44	GLU	3.2
1	C	45	TYR	3.2
1	C	49	CYS	3.2
1	B	52	GLY	3.1
1	B	48	ALA	3.1
1	A	366	HIS	3.1
1	A	362	GLU	3.0
1	D	363	GLU	3.0
1	B	45	TYR	3.0
1	D	365	ALA	3.0
1	D	359	TYR	3.0
1	B	53	GLU	2.9
1	C	359	TYR	2.9
1	A	45	TYR	2.9
1	B	47	ALA	2.7
1	A	367	TYR	2.7

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Mol	Chain	Res	Type	RSRZ
1	B	62	ILE	2.7
1	A	58	PHE	2.6
1	C	63	SER	2.6
1	C	59	TYR	2.6
1	D	368	GLY	2.6
1	B	359	TYR	2.5
1	C	61	ARG	2.5
1	B	41	PRO	2.5
1	B	44	GLU	2.5
1	B	358	SER	2.5
1	C	56	GLY	2.4
1	C	47	ALA	2.4
1	C	58	PHE	2.4
1	B	57	HIS	2.3
1	D	301	THR	2.3
1	A	63	SER	2.3
1	A	7	LEU	2.2
1	D	57	HIS	2.2
1	A	48	ALA	2.1
1	B	364	ARG	2.1
1	A	61	ARG	2.1
1	B	50	PHE	2.1
1	B	371	GLU	2.1
1	B	398	ALA	2.1
1	A	50	PHE	2.1
1	C	367	TYR	2.1
1	A	365	ALA	2.1
1	D	287	GLU	2.1

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

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(Å²)	Q<0.9
1	LLP	A	211	24/25	0.97	0.15	11,17,20,21	0
1	LLP	B	211	24/25	0.98	0.11	9,14,16,17	0
1	LLP	C	211	24/25	0.98	0.15	10,19,23,26	0
1	LLP	D	211	24/25	0.98	0.13	17,21,24,26	0

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	HCS	C	501	8/8	0.64	0.47	90,90,91,92	0
2	HCS	D	501	8/8	0.72	0.37	75,75,75,77	0
2	HCS	A	501	8/8	0.75	0.42	69,69,70,74	0
2	HCS	B	501	8/8	0.77	0.35	86,87,87,87	0

6.5 Other polymers (i)

There are no such residues in this entry.