



Full wwPDB X-ray Structure Validation Report

Feb 28, 2014 – 12:59 AM GMT

PDB ID : 3NXK
Title : Crystal Structure of Probable Cytoplasmic L-asparaginase from *Campylobacter jejuni*
Authors : Kim, Y.; Makowska-Grzyska, M.; Maltseva, N.; Papazisi, L.; Anderson, W.F.; Joachimiak, A.; Center for Structural Genomics of Infectious Diseases (CS-GID)
Deposited on : 2010-07-14
Resolution : 2.40 Å(reported)

This is a full wwPDB validation report for a publicly released PDB entry.
We welcome your comments at validation@mail.wwpdb.org
A user guide is available at <http://wwpdb.org/ValidationPDFNotes.html>

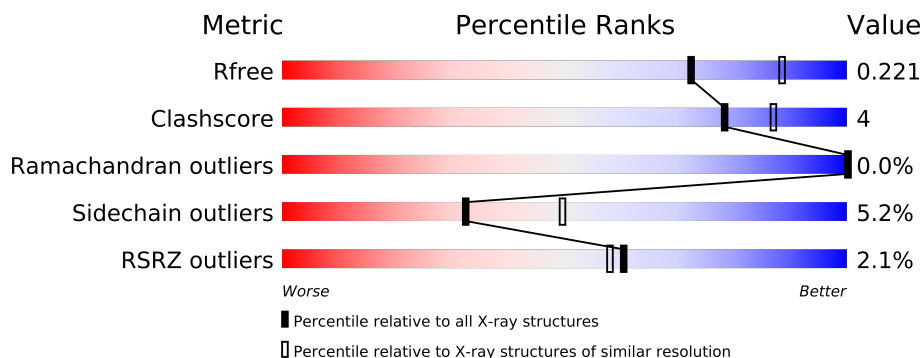
The following versions of software and data (see [references](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.15 2013
Xtriage (Phenix) : dev-1323
EDS : stable22639
Percentile statistics : 21963
Refmac : 5.8.0049
CCP4 : 6.3.0 (Settle)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP) : stable22683

1 Overall quality at a glance

The reported resolution of this entry is 2.40 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}	66092	2207 (2.40-2.40)
Clashscore	79885	2789 (2.40-2.40)
Ramachandran outliers	78287	2736 (2.40-2.40)
Sidechain outliers	78261	2737 (2.40-2.40)
RSRZ outliers	66119	2210 (2.40-2.40)

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 on the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density.

Mol	Chain	Length	Quality of chain
1	A	334	
1	B	334	
1	C	334	
1	D	334	
1	E	334	
1	F	334	
1	G	334	
1	H	334	

The following table lists non-polymeric compounds that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Geometry	Electron density
2	SO4	F	341	-	X

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Mol	Type	Chain	Res	Geometry	Electron density
3	ACY	C	344	-	X
4	GOL	A	344	-	X
4	GOL	B	343	-	X
4	GOL	B	344	-	X
4	GOL	B	345	-	X
4	GOL	C	343	-	X
4	GOL	D	343	-	X
4	GOL	D	344	-	X
4	GOL	E	332	-	X
4	GOL	E	343	-	X

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 20657 atoms, of which 0 are hydrogen and 0 are deuterium.

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 Cytoplasmic L-asparaginase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	327	Total	C	N	O	S	Se	0	0	0
			2459	1571	412	469	2	5			
1	B	327	Total	C	N	O	S	Se	0	1	0
			2469	1577	415	470	2	5			
1	C	327	Total	C	N	O	S	Se	0	1	0
			2467	1575	413	472	2	5			
1	D	325	Total	C	N	O	S	Se	0	1	0
			2451	1564	411	469	2	5			
1	E	314	Total	C	N	O	S	Se	0	1	0
			2383	1524	402	450	2	5			
1	F	306	Total	C	N	O	S	Se	0	0	0
			2311	1476	391	437	2	5			
1	G	324	Total	C	N	O	S	Se	0	0	0
			2437	1556	409	465	2	5			
1	H	327	Total	C	N	O	S	Se	0	1	0
			2468	1576	413	472	2	5			

There are 24 discrepancies between the modelled and reference sequences:

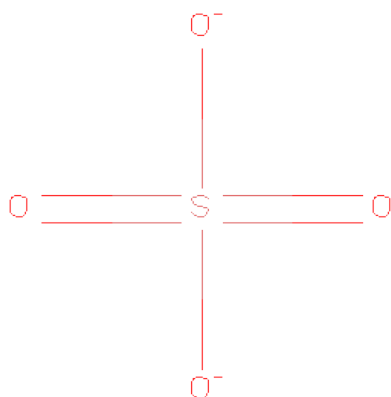
Chain	Residue	Modelled	Actual	Comment	Reference
A	-2	SER	-	EXPRESSION TAG	UNP Q0PC96
A	-1	ASN	-	EXPRESSION TAG	UNP Q0PC96
A	0	ALA	-	EXPRESSION TAG	UNP Q0PC96
B	-2	SER	-	EXPRESSION TAG	UNP Q0PC96
B	-1	ASN	-	EXPRESSION TAG	UNP Q0PC96
B	0	ALA	-	EXPRESSION TAG	UNP Q0PC96
C	-2	SER	-	EXPRESSION TAG	UNP Q0PC96
C	-1	ASN	-	EXPRESSION TAG	UNP Q0PC96
C	0	ALA	-	EXPRESSION TAG	UNP Q0PC96
D	-2	SER	-	EXPRESSION TAG	UNP Q0PC96
D	-1	ASN	-	EXPRESSION TAG	UNP Q0PC96
D	0	ALA	-	EXPRESSION TAG	UNP Q0PC96
E	-2	SER	-	EXPRESSION TAG	UNP Q0PC96

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Chain	Residue	Modelled	Actual	Comment	Reference
E	-1	ASN	-	EXPRESSION TAG	UNP Q0PC96
E	0	ALA	-	EXPRESSION TAG	UNP Q0PC96
F	-2	SER	-	EXPRESSION TAG	UNP Q0PC96
F	-1	ASN	-	EXPRESSION TAG	UNP Q0PC96
F	0	ALA	-	EXPRESSION TAG	UNP Q0PC96
G	-2	SER	-	EXPRESSION TAG	UNP Q0PC96
G	-1	ASN	-	EXPRESSION TAG	UNP Q0PC96
G	0	ALA	-	EXPRESSION TAG	UNP Q0PC96
H	-2	SER	-	EXPRESSION TAG	UNP Q0PC96
H	-1	ASN	-	EXPRESSION TAG	UNP Q0PC96
H	0	ALA	-	EXPRESSION TAG	UNP Q0PC96

- Molecule 2 is SULFATE ION (three-letter code: SO₄) (formula: O₄S).



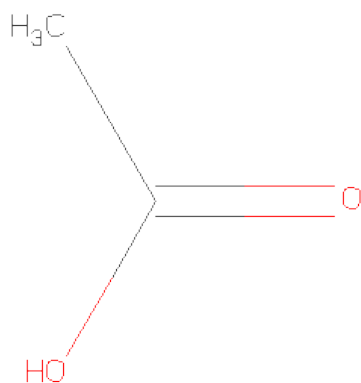
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		
2	A	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		
2	C	1	Total	O	S	0	0
			5	4	1		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	D	1	Total	O	S	0	0
			5	4	1		
2	D	1	Total	O	S	0	0
			5	4	1		
2	E	1	Total	O	S	0	0
			5	4	1		
2	E	1	Total	O	S	0	0
			5	4	1		
2	F	1	Total	O	S	0	0
			5	4	1		
2	F	1	Total	O	S	0	0
			5	4	1		
2	G	1	Total	O	S	0	0
			5	4	1		
2	G	1	Total	O	S	0	0
			5	4	1		
2	H	1	Total	O	S	0	0
			5	4	1		
2	H	1	Total	O	S	0	0
			5	4	1		

- Molecule 3 is ACETIC ACID (three-letter code: ACY) (formula: C₂H₄O₂).



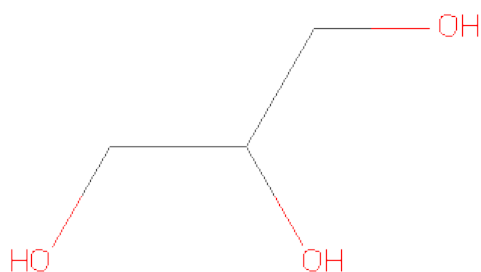
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			4	2	2		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	C	1	Total	C	O	0	0
			4	2	2		
3	F	1	Total	C	O	0	0
			4	2	2		

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



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			6	3	3		
4	B	1	Total	C	O	0	0
			6	3	3		
4	B	1	Total	C	O	0	0
			6	3	3		
4	B	1	Total	C	O	0	0
			6	3	3		
4	C	1	Total	C	O	0	0
			6	3	3		
4	D	1	Total	C	O	0	0
			6	3	3		
4	D	1	Total	C	O	0	0
			6	3	3		
4	E	1	Total	C	O	0	0
			6	3	3		
4	E	1	Total	C	O	0	0
			6	3	3		

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

- Molecule 5 is water.

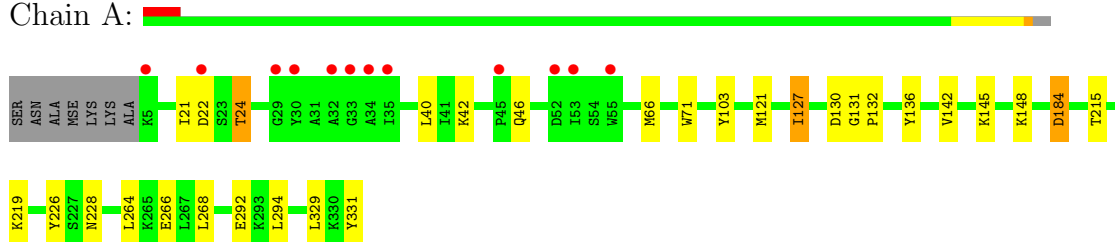
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	119	Total	O	0	0
			119	119		
5	B	138	Total	O	0	0
			138	138		
5	C	119	Total	O	0	0
			119	119		
5	D	147	Total	O	0	0
			147	147		
5	E	140	Total	O	0	0
			140	140		
5	F	117	Total	O	0	0
			117	117		
5	G	154	Total	O	0	0
			154	154		
5	H	126	Total	O	0	0
			126	126		

3 Residue-property plots

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

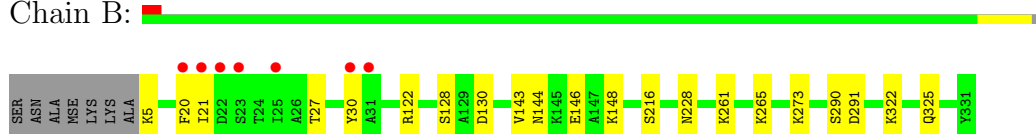
- Molecule 1: Cytoplasmic L-asparaginase

Chain A:



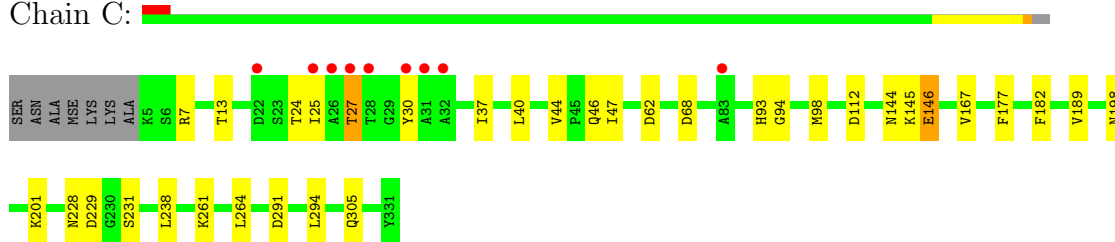
- Molecule 1: Cytoplasmic L-asparaginase

Chain B:



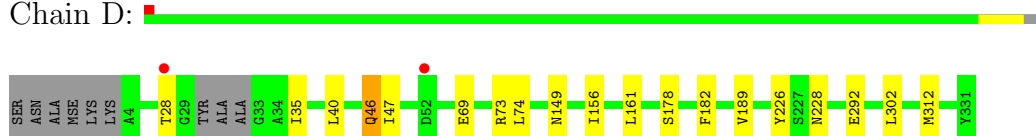
- Molecule 1: Cytoplasmic L-asparaginase

Chain C:



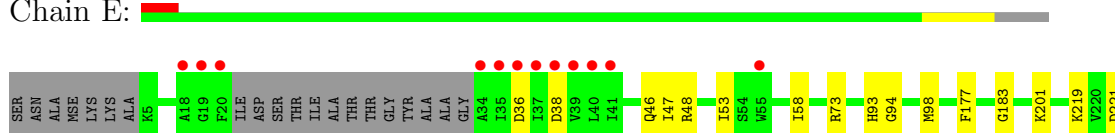
- Molecule 1: Cytoplasmic L-asparaginase

Chain D:



- Molecule 1: Cytoplasmic L-asparaginase

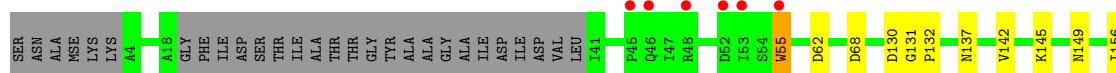
Chain E:





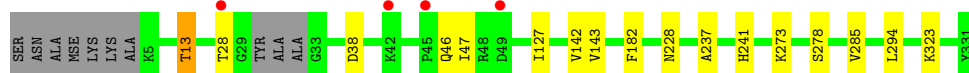
- Molecule 1: Cytoplasmic L-asparaginase

Chain F:



- Molecule 1: Cytoplasmic L-asparaginase

Chain G:



- Molecule 1: Cytoplasmic L-asparaginase

Chain H:



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	73.32Å 127.65Å 149.83Å 90.00° 103.05° 90.00°	Depositor
Resolution (Å)	36.91 – 2.40 36.91 – 2.40	Depositor EDS
% Data completeness (in resolution range)	99.5 (36.91-2.40) 99.5 (36.91-2.40)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.13	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.62 (at 2.39Å)	Xtriage
Refinement program	PHENIX (phenix.refine: 1.6.2_432)	Depositor
R, R_{free}	0.166 , 0.228 0.158 , 0.221	Depositor DCC
R_{free} test set	5210 reflections (4.99%)	DCC
Wilson B-factor (Å ²)	33.3	Xtriage
Anisotropy	0.010	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 30.8	EDS
Estimated twinning fraction	0.010 for h,-k,-h-l	Xtriage
L-test for twinning	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Outliers	1 of 104438 reflections (0.001%)	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	20657	wwPDB-VP
Average B, all atoms (Å ²)	35.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 11.01% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, ACY, SO4

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	0.41	0/2491	0.57	0/3360
1	B	0.41	0/2502	0.56	0/3375
1	C	0.39	0/2499	0.55	0/3371
1	D	0.40	0/2481	0.58	0/3344
1	E	0.44	1/2414 (0.0%)	0.57	0/3252
1	F	0.40	0/2340	0.57	0/3151
1	G	0.41	0/2467	0.57	0/3325
1	H	0.40	0/2500	0.57	0/3372
All	All	0.41	1/19694 (0.0%)	0.57	0/26550

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	266	GLU	CG-CD	5.57	1.60	1.51

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 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 hydrogens added by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, and the number in parentheses is this value normalized per 1000 atoms of the molecule in the chain. The Symm-Clashes column gives symmetry related clashes, in the same way as for the Clashes column.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2459	0	0	10	0
1	B	2469	0	0	9	0
1	C	2467	0	0	15	0
1	D	2451	0	0	4	0
1	E	2383	0	0	11	0
1	F	2311	0	0	8	0
1	G	2437	0	0	4	0
1	H	2468	0	0	12	0
2	A	10	0	0	0	0
2	B	10	0	0	0	0
2	C	10	0	0	1	0
2	D	10	0	0	0	0
2	E	10	0	0	0	0
2	F	10	0	0	0	0
2	G	10	0	0	0	0
2	H	10	0	0	0	0
3	A	4	0	0	0	0
3	C	4	0	0	0	0
3	F	4	0	0	0	0
4	A	6	0	0	0	0
4	B	18	0	0	2	0
4	C	6	0	0	0	0
4	D	12	0	0	0	0
4	E	18	0	0	0	0
5	A	119	0	0	1	0
5	B	138	0	0	0	0
5	C	119	0	0	1	0
5	D	147	0	0	0	0
5	E	140	0	0	6	0
5	F	117	0	0	2	0
5	G	154	0	0	1	0
5	H	126	0	0	2	0
All	All	20657	0	0	70	0

Clashscore is defined as the number of clashes calculated for the entry per 1000 atoms (including hydrogens) of the entry. The overall clashscore for this entry is 4.

All (70) close contacts within the same asymmetric unit are listed below.

Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:E:201:LYS:NZ	5:E:1026:HOH:O	2.26	0.68
1:C:25:ILE:CD1	1:D:46:GLN:CG	2.73	0.65
1:E:58:ILE:O	1:E:73:ARG:NH1	2.30	0.64
1:E:237:ALA:O	1:E:241[B]:HIS:ND1	2.32	0.63

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:G:237:ALA:O	1:G:241:HIS:CD2	2.52	0.63
1:A:66:MSE:CE	1:A:71:TRP:CD1	2.83	0.62
1:F:55:TRP:N	1:F:55:TRP:CE3	2.70	0.59
1:F:189:VAL:CG2	1:F:189:VAL:O	2.51	0.58
1:A:24:THR:CG2	1:A:127:ILE:CG1	2.81	0.58
1:D:69:GLU:N	1:D:69:GLU:OE1	2.37	0.57
1:C:98:MSE:CE	1:C:177:PHE:CZ	2.88	0.57
1:E:270:LYS:NZ	5:E:1021:HOH:O	2.39	0.56
1:E:183:GLY:C	5:E:964:HOH:O	2.47	0.53
1:A:184:ASP:N	1:A:184:ASP:OD1	2.41	0.52
1:F:184:ASP:N	1:F:184:ASP:OD1	2.42	0.52
1:A:121:MSE:N	1:A:130:ASP:OD2	2.44	0.51
1:C:112:ASP:N	2:C:342:SO4:O1	2.45	0.50
1:C:261:LYS:NZ	1:C:291:ASP:OD2	2.45	0.49
1:H:37:ILE:N	1:H:57:GLN:NE2	2.60	0.49
1:F:213:LYS:NZ	5:F:981:HOH:O	2.47	0.48
1:C:27:THR:O	1:C:30:TYR:CE2	2.66	0.48
1:E:93:HIS:ND1	1:E:94:GLY:O	2.47	0.47
1:A:226:TYR:N	1:A:226:TYR:CD2	2.81	0.47
1:B:130:ASP:OD1	1:B:130:ASP:N	2.47	0.47
1:G:13:THR:CG2	5:G:340:HOH:O	2.61	0.47
1:F:68:ASP:N	1:G:228:ASN:ND2	2.62	0.47
1:E:219:LYS:NZ	5:E:757:HOH:O	2.47	0.47
1:C:144:ASN:ND2	1:C:146:GLU:N	2.62	0.47
1:D:226:TYR:N	1:D:226:TYR:CD2	2.82	0.47
1:A:131:GLY:N	1:A:132:PRO:CD	2.78	0.46
1:B:20:PHE:C	1:B:20:PHE:CD2	2.88	0.46
1:B:144:ASN:ND2	1:B:146:GLU:N	2.64	0.46
1:E:98:MSE:CE	1:E:177:PHE:CZ	2.99	0.46
1:E:38:ASP:CB	5:E:581:HOH:O	2.63	0.45
1:H:203:HIS:ND1	1:H:204:THR:OG1	2.50	0.45
1:B:261:LYS:NZ	1:B:291:ASP:OD2	2.50	0.45
1:F:137:ASN:ND2	5:F:977:HOH:O	2.49	0.44
1:D:182:PHE:CD2	1:D:182:PHE:N	2.86	0.44
1:G:182:PHE:N	1:G:182:PHE:CD2	2.87	0.43
1:E:219:LYS:NZ	1:E:221:ASP:OD2	2.51	0.43
1:F:130:ASP:N	1:F:130:ASP:OD1	2.51	0.43
1:C:229:ASP:OD1	1:C:231:SER:N	2.52	0.43
1:H:42:LYS:CG	1:H:48:ARG:NH2	2.82	0.43
1:B:228:ASN:ND2	1:C:68:ASP:N	2.67	0.43
1:H:62:ASP:OD1	1:H:64:SER:OG	2.36	0.43
1:B:265:LYS:NZ	4:B:344:GOL:C3	2.81	0.43

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Atom-1	Atom-2	Distance(Å)	Clash(Å)
1:A:103:TYR:OH	1:A:331:TYR:OXT	2.36	0.43
1:E:36:ASP:CB	5:E:581:HOH:O	2.66	0.42
1:C:305:GLN:N	1:C:305:GLN:OE1	2.52	0.42
1:A:46:GLN:OE1	1:A:46:GLN:N	2.52	0.42
1:A:136:TYR:C	1:A:136:TYR:CD2	2.92	0.42
1:C:25:ILE:O	1:C:25:ILE:CG2	2.68	0.42
1:B:122:ARG:NH1	1:B:128:SER:O	2.52	0.42
1:H:143:VAL:CG1	1:H:143:VAL:O	2.68	0.42
1:C:27:THR:O	1:C:30:TYR:CD2	2.73	0.42
1:C:46:GLN:OE1	1:C:46:GLN:N	2.53	0.42
1:B:27:THR:O	1:B:30:TYR:CE1	2.73	0.42
1:B:325:GLN:CG	4:B:345:GOL:C1	2.98	0.41
1:C:93:HIS:ND1	1:C:94:GLY:O	2.53	0.41
1:H:201:LYS:NZ	5:H:736:HOH:O	2.53	0.41
1:H:110:LYS:O	1:H:205:LYS:CG	2.68	0.41
1:C:201:LYS:NZ	5:C:993:HOH:O	2.53	0.41
1:H:130:ASP:OD1	1:H:130:ASP:N	2.54	0.41
1:C:182:PHE:N	1:C:182:PHE:CD1	2.89	0.41
1:H:265:LYS:NZ	5:H:761:HOH:O	2.54	0.41
1:H:226:TYR:N	1:H:226:TYR:CD2	2.88	0.41
1:A:148:LYS:NZ	5:A:363:HOH:O	2.54	0.40
1:F:131:GLY:N	1:F:132:PRO:CD	2.85	0.40
1:H:103:TYR:OH	1:H:331:TYR:OXT	2.40	0.40
1:H:27:THR:CG2	1:H:27:THR:O	2.69	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	325/334 (97%)	315 (97%)	10 (3%)	0	100	100
1	B	326/334 (98%)	317 (97%)	9 (3%)	0	100	100
1	C	326/334 (98%)	315 (97%)	11 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	322/334 (96%)	314 (98%)	8 (2%)	0	100	100
1	E	311/334 (93%)	303 (97%)	8 (3%)	0	100	100
1	F	302/334 (90%)	294 (97%)	7 (2%)	1 (0%)	50	68
1	G	320/334 (96%)	310 (97%)	10 (3%)	0	100	100
1	H	326/334 (98%)	312 (96%)	14 (4%)	0	100	100
All	All	2558/2672 (96%)	2480 (97%)	77 (3%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	184	ASP

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	267/266 (100%)	249 (93%)	18 (7%)	23	35
1	B	268/266 (101%)	260 (97%)	8 (3%)	53	75
1	C	268/266 (101%)	250 (93%)	18 (7%)	23	35
1	D	267/266 (100%)	251 (94%)	16 (6%)	27	41
1	E	260/266 (98%)	249 (96%)	11 (4%)	40	60
1	F	252/266 (95%)	239 (95%)	13 (5%)	32	49
1	G	266/266 (100%)	253 (95%)	13 (5%)	35	53
1	H	268/266 (101%)	256 (96%)	12 (4%)	38	57
All	All	2116/2128 (99%)	2007 (95%)	109 (5%)	32	49

All (109) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	21	ILE
1	A	22	ASP
1	A	24	THR

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Mol	Chain	Res	Type
1	A	40	LEU
1	A	42	LYS
1	A	127	ILE
1	A	142	VAL
1	A	145	LYS
1	A	184	ASP
1	A	215	THR
1	A	219	LYS
1	A	228	ASN
1	A	264	LEU
1	A	266	GLU
1	A	268	LEU
1	A	292	GLU
1	A	294	LEU
1	A	329	LEU
1	B	5	LYS
1	B	21	ILE
1	B	143	VAL
1	B	148	LYS
1	B	216	SER
1	B	273	LYS
1	B	290	SER
1	B	322	LYS
1	C	7	ARG
1	C	13	THR
1	C	24	THR
1	C	27	THR
1	C	37	ILE
1	C	40	LEU
1	C	44	VAL
1	C	47	ILE
1	C	62	ASP
1	C	145	LYS
1	C	146	GLU
1	C	167	VAL
1	C	189	VAL
1	C	198	ASN
1	C	228	ASN
1	C	238	LEU
1	C	264	LEU
1	C	294	LEU
1	D	28	THR

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Mol	Chain	Res	Type
1	D	35	ILE
1	D	40	LEU
1	D	46	GLN
1	D	47	ILE
1	D	73	ARG
1	D	74	LEU
1	D	149	ASN
1	D	156	ILE
1	D	161	LEU
1	D	178	SER
1	D	189	VAL
1	D	228	ASN
1	D	292	GLU
1	D	302	LEU
1	D	312	MSE
1	E	46	GLN
1	E	47	ILE
1	E	48	ARG
1	E	53	ILE
1	E	228	ASN
1	E	265	LYS
1	E	273	LYS
1	E	281	VAL
1	E	312	MSE
1	E	315	LEU
1	E	329	LEU
1	F	55	TRP
1	F	62	ASP
1	F	142	VAL
1	F	145	LYS
1	F	149	ASN
1	F	156	ILE
1	F	178	SER
1	F	189	VAL
1	F	284	CYS
1	F	285	VAL
1	F	292	GLU
1	F	294	LEU
1	F	316	THR
1	G	13	THR
1	G	28	THR
1	G	38	ASP

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Mol	Chain	Res	Type
1	G	46	GLN
1	G	47	ILE
1	G	127	ILE
1	G	142	VAL
1	G	143	VAL
1	G	273	LYS
1	G	278	SER
1	G	285	VAL
1	G	294	LEU
1	G	323	LYS
1	H	13	THR
1	H	22	ASP
1	H	24	THR
1	H	27	THR
1	H	156	ILE
1	H	161	LEU
1	H	216	SER
1	H	258	LYS
1	H	302	LEU
1	H	312	MSE
1	H	315	LEU
1	H	329	LEU

Some 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 chains 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 carbohydrates in this entry.

5.6 Ligand geometry ⓘ

29 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	SO4	A	341	-	4,4,4	0.23	0	6,6,6	0.09	0
2	SO4	A	342	-	4,4,4	0.19	0	6,6,6	0.17	0
3	ACY	A	343	-	3,3,3	0.63	0	3,3,3	0.81	0
4	GOL	A	344	-	5,5,5	0.31	0	5,5,5	0.44	0
2	SO4	B	341	-	4,4,4	0.25	0	6,6,6	0.26	0
2	SO4	B	342	-	4,4,4	0.27	0	6,6,6	0.20	0
4	GOL	B	343	-	5,5,5	0.40	0	5,5,5	0.44	0
4	GOL	B	344	-	5,5,5	0.21	0	5,5,5	0.37	0
4	GOL	B	345	-	5,5,5	0.21	0	5,5,5	0.34	0
2	SO4	C	341	-	4,4,4	0.22	0	6,6,6	0.24	0
2	SO4	C	342	-	4,4,4	0.11	0	6,6,6	0.19	0
4	GOL	C	343	-	5,5,5	0.32	0	5,5,5	0.35	0
3	ACY	C	344	-	3,3,3	0.68	0	3,3,3	0.51	0
2	SO4	D	341	-	4,4,4	0.43	0	6,6,6	0.24	0
2	SO4	D	342	-	4,4,4	0.18	0	6,6,6	0.15	0
4	GOL	D	343	-	5,5,5	0.29	0	5,5,5	0.52	0
4	GOL	D	344	-	5,5,5	0.35	0	5,5,5	0.46	0
4	GOL	E	332	-	5,5,5	0.29	0	5,5,5	0.59	0
2	SO4	E	341	-	4,4,4	0.19	0	6,6,6	0.28	0
2	SO4	E	342	-	4,4,4	0.17	0	6,6,6	0.44	0
4	GOL	E	343	-	5,5,5	0.37	0	5,5,5	0.30	0
4	GOL	E	344	-	5,5,5	0.27	0	5,5,5	0.23	0
2	SO4	F	341	-	4,4,4	0.16	0	6,6,6	0.13	0
2	SO4	F	342	-	4,4,4	0.17	0	6,6,6	0.16	0
3	ACY	F	343	-	3,3,3	0.64	0	3,3,3	0.69	0
2	SO4	G	341	-	4,4,4	0.35	0	6,6,6	0.38	0
2	SO4	G	342	-	4,4,4	0.17	0	6,6,6	0.16	0
2	SO4	H	341	-	4,4,4	0.22	0	6,6,6	0.37	0
2	SO4	H	342	-	4,4,4	0.13	0	6,6,6	0.34	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
2	SO4	A	341	-	-	0/0/0/0	0/0/0/0
2	SO4	A	342	-	-	0/0/0/0	0/0/0/0
3	ACY	A	343	-	-	0/0/0/0	0/0/0/0
4	GOL	A	344	-	-	0/4/4/4	0/0/0/0
2	SO4	B	341	-	-	0/0/0/0	0/0/0/0
2	SO4	B	342	-	-	0/0/0/0	0/0/0/0
4	GOL	B	343	-	-	0/4/4/4	0/0/0/0
4	GOL	B	344	-	-	0/4/4/4	0/0/0/0
4	GOL	B	345	-	-	0/4/4/4	0/0/0/0
2	SO4	C	341	-	-	0/0/0/0	0/0/0/0
2	SO4	C	342	-	-	0/0/0/0	0/0/0/0
4	GOL	C	343	-	-	0/4/4/4	0/0/0/0
3	ACY	C	344	-	-	0/0/0/0	0/0/0/0
2	SO4	D	341	-	-	0/0/0/0	0/0/0/0
2	SO4	D	342	-	-	0/0/0/0	0/0/0/0
4	GOL	D	343	-	-	0/4/4/4	0/0/0/0
4	GOL	D	344	-	-	0/4/4/4	0/0/0/0
4	GOL	E	332	-	-	0/4/4/4	0/0/0/0
2	SO4	E	341	-	-	0/0/0/0	0/0/0/0
2	SO4	E	342	-	-	0/0/0/0	0/0/0/0
4	GOL	E	343	-	-	0/4/4/4	0/0/0/0
4	GOL	E	344	-	-	0/4/4/4	0/0/0/0
2	SO4	F	341	-	-	0/0/0/0	0/0/0/0
2	SO4	F	342	-	-	0/0/0/0	0/0/0/0
3	ACY	F	343	-	-	0/0/0/0	0/0/0/0
2	SO4	G	341	-	-	0/0/0/0	0/0/0/0
2	SO4	G	342	-	-	0/0/0/0	0/0/0/0
2	SO4	H	341	-	-	0/0/0/0	0/0/0/0
2	SO4	H	342	-	-	0/0/0/0	0/0/0/0

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.

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(Å ²)	Q<0.9
1	A	327/334 (97%)	-0.24	12 (3%) 39 38	14, 33, 69, 94	0
1	B	327/334 (97%)	-0.34	7 (2%) 60 58	16, 29, 57, 92	0
1	C	327/334 (97%)	-0.12	9 (2%) 50 48	17, 36, 70, 102	0
1	D	325/334 (97%)	-0.26	2 (0%) 86 86	17, 30, 57, 81	0
1	E	314/334 (94%)	-0.29	12 (3%) 38 36	14, 28, 70, 110	0
1	F	306/334 (91%)	-0.35	6 (1%) 62 59	17, 31, 61, 111	0
1	G	324/334 (97%)	-0.39	4 (1%) 75 75	13, 28, 57, 82	0
1	H	327/334 (97%)	-0.32	3 (0%) 81 81	15, 31, 61, 74	0
All	All	2577/2672 (96%)	-0.29	55 (2%) 60 58	13, 31, 64, 111	0

All (55) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	55	TRP	6.8
1	E	35	ILE	6.8
1	E	20	PHE	5.3
1	E	19	GLY	5.1
1	E	39	VAL	4.9
1	B	22	ASP	4.8
1	E	34	ALA	4.7
1	E	40	LEU	4.1
1	F	45	PRO	4.0
1	G	28	THR	3.9
1	A	29	GLY	3.9
1	C	28	THR	3.8
1	E	37	ILE	3.7
1	C	22	ASP	3.7
1	B	25	ILE	3.5
1	F	48	ARG	3.5

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Mol	Chain	Res	Type	RSRZ
1	C	32	ALA	3.3
1	A	33	GLY	3.3
1	A	34	ALA	3.2
1	F	46	GLN	3.1
1	B	21	ILE	3.1
1	B	31	ALA	3.1
1	C	30	TYR	3.0
1	H	31	ALA	3.0
1	A	45	PRO	2.8
1	E	18	ALA	2.8
1	A	53	ILE	2.8
1	E	36	ASP	2.7
1	A	55	TRP	2.7
1	A	35	ILE	2.6
1	B	20	PHE	2.6
1	F	53	ILE	2.6
1	D	28	THR	2.6
1	E	38	ASP	2.6
1	A	52	ASP	2.5
1	B	23	SER	2.5
1	E	41	ILE	2.5
1	E	55	TRP	2.5
1	F	52	ASP	2.4
1	G	45	PRO	2.4
1	A	5	LYS	2.4
1	B	30	TYR	2.4
1	A	32	ALA	2.3
1	H	32	ALA	2.3
1	C	25	ILE	2.3
1	H	22	ASP	2.2
1	C	26	ALA	2.2
1	A	22	ASP	2.2
1	A	30	TYR	2.2
1	C	31	ALA	2.2
1	C	27	THR	2.2
1	D	52	ASP	2.1
1	C	83	ALA	2.0
1	G	49	ASP	2.0
1	G	42	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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	RSR	LLDF	B-factors(Å ²)	Q<0.9
3	ACY	C	344	4/4	0.27	9.11	71,79,81,83	0
4	GOL	A	344	6/6	0.40	9.06	73,81,87,92	0
4	GOL	D	343	6/6	0.32	8.41	59,64,66,69	0
4	GOL	E	332	6/6	0.21	6.61	45,56,57,60	0
4	GOL	B	343	6/6	0.31	5.79	43,58,61,69	0
4	GOL	B	345	6/6	0.39	4.88	38,47,49,52	0
4	GOL	C	343	6/6	0.40	4.78	73,79,81,81	0
4	GOL	B	344	6/6	0.24	3.69	51,52,62,64	0
4	GOL	E	343	6/6	0.23	2.56	46,53,55,62	0
2	SO4	F	341	5/5	0.16	2.49	52,68,69,78	0
4	GOL	D	344	6/6	0.25	2.07	53,66,72,74	0
4	GOL	E	344	6/6	0.17	1.47	63,65,66,67	0
2	SO4	G	341	5/5	0.14	0.80	28,28,34,36	0
2	SO4	H	342	5/5	0.26	0.71	53,60,66,76	0
2	SO4	F	342	5/5	0.18	0.16	73,75,79,80	0
2	SO4	E	342	5/5	0.17	0.09	55,57,62,65	0
2	SO4	D	341	5/5	0.14	-0.02	34,35,36,42	0
2	SO4	E	341	5/5	0.12	-0.04	44,48,63,66	0
2	SO4	B	342	5/5	0.15	-0.16	58,59,63,65	0
2	SO4	A	342	5/5	0.13	-0.27	41,62,71,71	0
2	SO4	C	342	5/5	0.17	-0.45	76,79,82,85	0
2	SO4	C	341	5/5	0.10	-0.64	38,45,48,53	0
2	SO4	A	341	5/5	0.09	-0.64	45,49,53,54	0
2	SO4	H	341	5/5	0.08	-0.77	34,40,42,48	0
2	SO4	G	342	5/5	0.10	-0.85	51,53,61,65	0

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Mol	Type	Chain	Res	Atoms	RSR	LLDF	B-factors(\AA^2)	Q<0.9
2	SO4	D	342	5/5	0.09	-0.90	55,62,67,73	0
2	SO4	B	341	5/5	0.09	-1.12	26,32,37,42	0
3	ACY	F	343	4/4	0.09	-1.29	30,42,44,52	0
3	ACY	A	343	4/4	0.10	-2.35	47,51,52,52	0

6.5 Other polymers ⓘ

There are no such residues in this entry.