Full wwPDB X-ray Structure Validation Report (i)

Sep 14, 2020 – 01:14 AM BST

PDB ID	:	6FQB
Title	:	MurT/GatD peptidoglycan amidotransferase complex from Streptococcus pneumoniae R6
Authors	:	Morlot, C.; Contreras-Martel, C.; Leisico, F.; Straume, D.; Peters, K.; Hegnar, O.A.; Simon, N.; Villard, A.M.; Breukink, E.; Gravier-Pelletier, C.; Le Corre, L.; Vollmer, W.; Pietrancosta, N.; Havarstein, L.S.; Zapun, A.
Deposited on	:	2018-02-13
Resolution	:	3.00 Å(reported)

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

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

The following versions of software and data (see references (1)) were used in the production of this report:

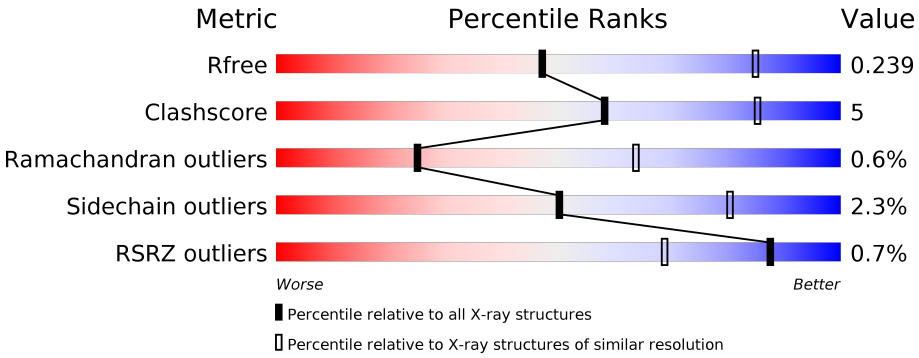
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.14.4.dev1
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.14.4.dev1

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.00 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}	130704	2092 (3.00-3.00)
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

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 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	465	% 71% 10% • 18%
1	B	465	% 72% 8% • 19%
1	C	465	% 71% 9% 19%
1	D	465	% 74% 8% 18%
2	E	260	87% 8% 5%
2	F	260	86% 9% 5%

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Mol	Chain	Length	Quality of chain
2	G	260	86% 9% 5%
2	H	260	84% 10% 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
3	GLN	F	301	-	-	-	X
3	GLN	G	301	-	-	-	X

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 19727 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 Mur ligase family protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	383	Total	C	N	O	S	0	0	0
			2989	1906	497	573	13			
1	B	378	Total	C	N	O	S	0	0	0
			2952	1886	489	564	13			
1	C	375	Total	C	N	O	S	0	0	0
			2937	1876	485	563	13			
1	D	380	Total	C	N	O	S	0	0	0
			2977	1900	494	570	13			

There are 72 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-17	MET	-	initiating methionine	UNP A0A0B7LND9
A	-16	HIS	-	expression tag	UNP A0A0B7LND9
A	-15	HIS	-	expression tag	UNP A0A0B7LND9
A	-14	HIS	-	expression tag	UNP A0A0B7LND9
A	-13	HIS	-	expression tag	UNP A0A0B7LND9
A	-12	HIS	-	expression tag	UNP A0A0B7LND9
A	-11	HIS	-	expression tag	UNP A0A0B7LND9
A	-10	HIS	-	expression tag	UNP A0A0B7LND9
A	-9	HIS	-	expression tag	UNP A0A0B7LND9
A	-8	GLU	-	expression tag	UNP A0A0B7LND9
A	-7	ASN	-	expression tag	UNP A0A0B7LND9
A	-6	LEU	-	expression tag	UNP A0A0B7LND9
A	-5	TYR	-	expression tag	UNP A0A0B7LND9
A	-4	PHE	-	expression tag	UNP A0A0B7LND9
A	-3	GLN	-	expression tag	UNP A0A0B7LND9
A	-2	GLY	-	expression tag	UNP A0A0B7LND9
A	-1	SER	-	expression tag	UNP A0A0B7LND9
A	0	HIS	-	expression tag	UNP A0A0B7LND9
B	-17	MET	-	initiating methionine	UNP A0A0B7LND9
B	-16	HIS	-	expression tag	UNP A0A0B7LND9
B	-15	HIS	-	expression tag	UNP A0A0B7LND9

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-14	HIS	-	expression tag	UNP A0A0B7LND9
B	-13	HIS	-	expression tag	UNP A0A0B7LND9
B	-12	HIS	-	expression tag	UNP A0A0B7LND9
B	-11	HIS	-	expression tag	UNP A0A0B7LND9
B	-10	HIS	-	expression tag	UNP A0A0B7LND9
B	-9	HIS	-	expression tag	UNP A0A0B7LND9
B	-8	GLU	-	expression tag	UNP A0A0B7LND9
B	-7	ASN	-	expression tag	UNP A0A0B7LND9
B	-6	LEU	-	expression tag	UNP A0A0B7LND9
B	-5	TYR	-	expression tag	UNP A0A0B7LND9
B	-4	PHE	-	expression tag	UNP A0A0B7LND9
B	-3	GLN	-	expression tag	UNP A0A0B7LND9
B	-2	GLY	-	expression tag	UNP A0A0B7LND9
B	-1	SER	-	expression tag	UNP A0A0B7LND9
B	0	HIS	-	expression tag	UNP A0A0B7LND9
C	-17	MET	-	initiating methionine	UNP A0A0B7LND9
C	-16	HIS	-	expression tag	UNP A0A0B7LND9
C	-15	HIS	-	expression tag	UNP A0A0B7LND9
C	-14	HIS	-	expression tag	UNP A0A0B7LND9
C	-13	HIS	-	expression tag	UNP A0A0B7LND9
C	-12	HIS	-	expression tag	UNP A0A0B7LND9
C	-11	HIS	-	expression tag	UNP A0A0B7LND9
C	-10	HIS	-	expression tag	UNP A0A0B7LND9
C	-9	HIS	-	expression tag	UNP A0A0B7LND9
C	-8	GLU	-	expression tag	UNP A0A0B7LND9
C	-7	ASN	-	expression tag	UNP A0A0B7LND9
C	-6	LEU	-	expression tag	UNP A0A0B7LND9
C	-5	TYR	-	expression tag	UNP A0A0B7LND9
C	-4	PHE	-	expression tag	UNP A0A0B7LND9
C	-3	GLN	-	expression tag	UNP A0A0B7LND9
C	-2	GLY	-	expression tag	UNP A0A0B7LND9
C	-1	SER	-	expression tag	UNP A0A0B7LND9
C	0	HIS	-	expression tag	UNP A0A0B7LND9
D	-17	MET	-	initiating methionine	UNP A0A0B7LND9
D	-16	HIS	-	expression tag	UNP A0A0B7LND9
D	-15	HIS	-	expression tag	UNP A0A0B7LND9
D	-14	HIS	-	expression tag	UNP A0A0B7LND9
D	-13	HIS	-	expression tag	UNP A0A0B7LND9
D	-12	HIS	-	expression tag	UNP A0A0B7LND9
D	-11	HIS	-	expression tag	UNP A0A0B7LND9
D	-10	HIS	-	expression tag	UNP A0A0B7LND9
D	-9	HIS	-	expression tag	UNP A0A0B7LND9

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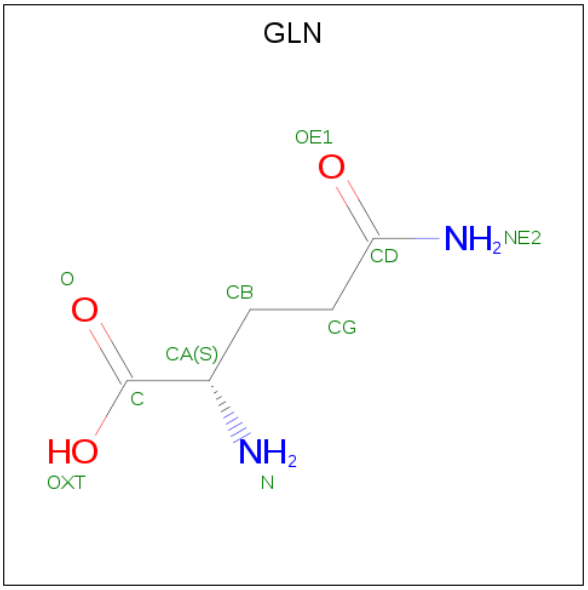
Chain	Residue	Modelled	Actual	Comment	Reference
D	-8	GLU	-	expression tag	UNP A0A0B7LND9
D	-7	ASN	-	expression tag	UNP A0A0B7LND9
D	-6	LEU	-	expression tag	UNP A0A0B7LND9
D	-5	TYR	-	expression tag	UNP A0A0B7LND9
D	-4	PHE	-	expression tag	UNP A0A0B7LND9
D	-3	GLN	-	expression tag	UNP A0A0B7LND9
D	-2	GLY	-	expression tag	UNP A0A0B7LND9
D	-1	SER	-	expression tag	UNP A0A0B7LND9
D	0	HIS	-	expression tag	UNP A0A0B7LND9

- Molecule 2 is a protein called Cobyric acid synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	E	247	Total	C	N	O	S	0	0	0
			1958	1242	326	385	5			
2	F	247	Total	C	N	O	S	0	0	0
			1958	1242	326	385	5			
2	G	247	Total	C	N	O	S	0	0	0
			1958	1242	326	385	5			
2	H	247	Total	C	N	O	S	0	0	0
			1958	1242	326	385	5			

- Molecule 3 is GLUTAMINE (three-letter code: GLN) (formula: $C_5H_{10}N_2O_3$).



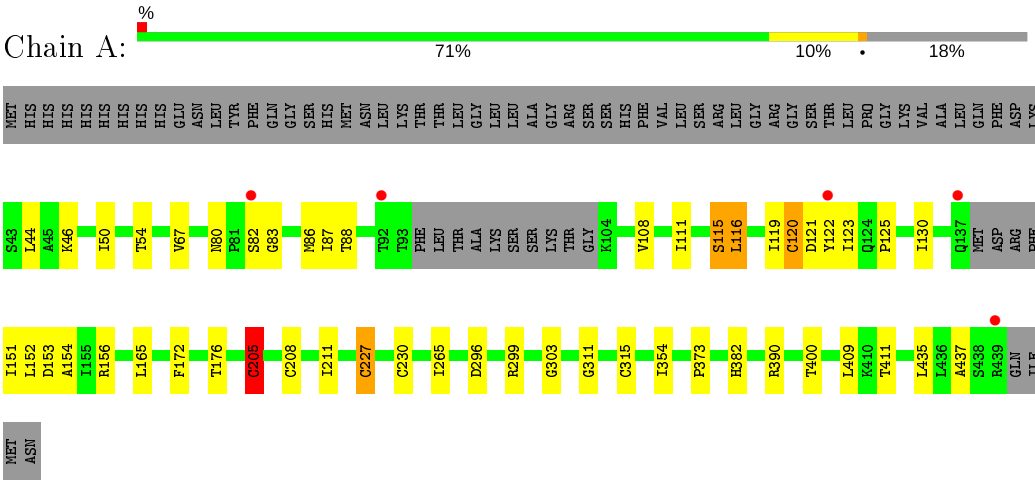
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	E	1	Total	C	N	O	0	0
			10	5	2	3		
3	F	1	Total	C	N	O	0	0
			10	5	2	3		
3	G	1	Total	C	N	O	0	0
			10	5	2	3		
3	H	1	Total	C	N	O	0	0
			10	5	2	3		

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

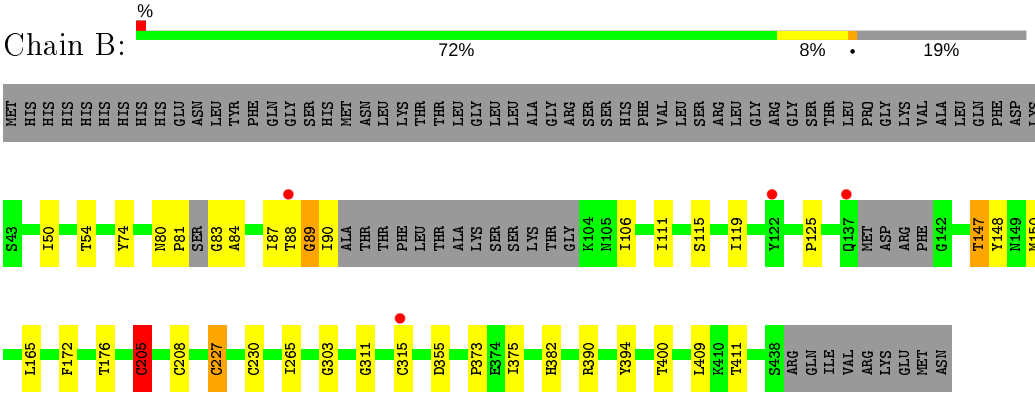
- Molecule 1: Mur ligase family protein

Chain A:



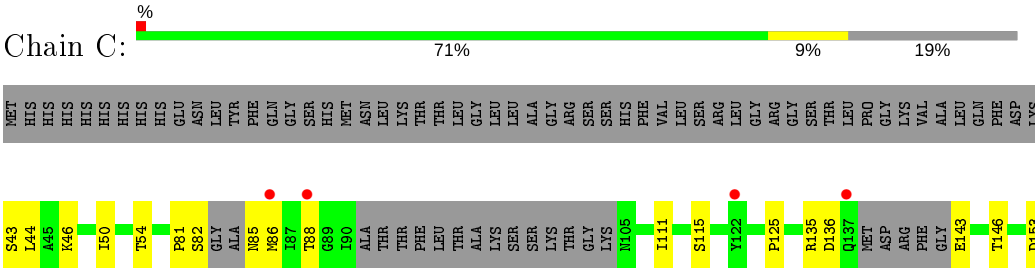
- Molecule 1: Mur ligase family protein

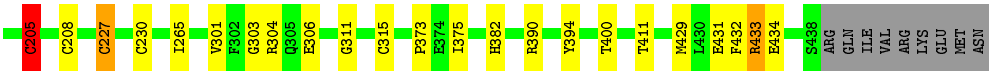
Chain B:



- Molecule 1: Mur ligase family protein

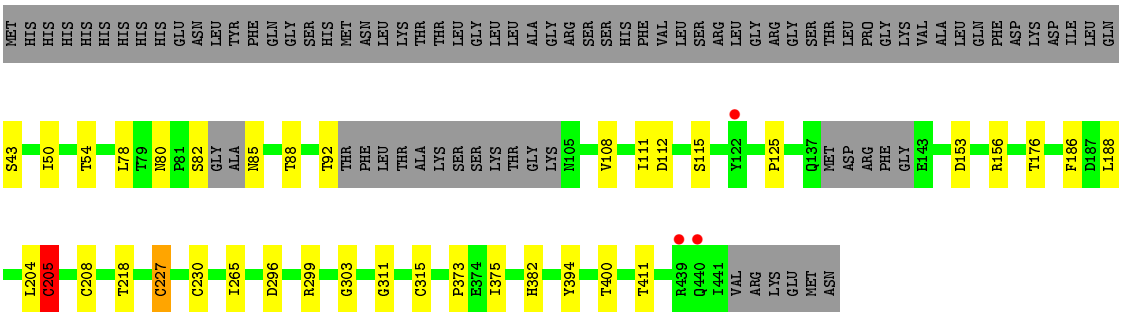
Chain C:





• Molecule 1: Mur ligase family protein

Chain D:



• Molecule 2: Cobyric acid synthase

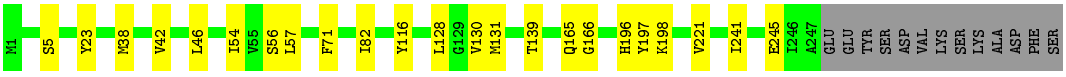
Chain E:

• Molecule 2: Cobyric acid synthase

Chain F:

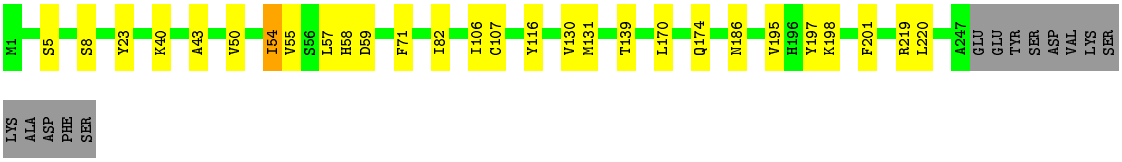
• Molecule 2: Cobyric acid synthase

Chain G:



• Molecule 2: Cobyric acid synthase

Chain H:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	H 3	Depositor
Cell constants a, b, c, α, β, γ	288.43Å 288.43Å 115.10Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	50.00 – 3.00 49.14 – 3.00	Depositor EDS
% Data completeness (in resolution range)	96.2 (50.00-3.00) 96.2 (49.14-3.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.06	Depositor
$< I/\sigma(I) >$ [1]	1.16 (at 3.01Å)	Xtriage
Refinement program	REFMAC 5.8.0189	Depositor
R, R_{free}	0.189 , 0.228 0.204 , 0.239	Depositor DCC
R_{free} test set	6854 reflections (9.97%)	wwPDB-VP
Wilson B-factor (Å^2)	88.4	Xtriage
Anisotropy	0.049	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 50.6	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	0.011 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	19727	wwPDB-VP
Average B, all atoms (Å^2)	88.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.35% of the height of the origin peak. No significant pseudotranslation is detected.*

[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

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	0.59	0/3043	0.78	1/4133 (0.0%)
1	B	0.55	0/3005	0.78	1/4080 (0.0%)
1	C	0.56	0/2990	0.77	1/4061 (0.0%)
1	D	0.58	0/3030	0.77	1/4115 (0.0%)
2	E	0.62	0/2001	0.72	0/2707
2	F	0.56	0/2001	0.72	0/2707
2	G	0.59	0/2001	0.75	0/2707
2	H	0.58	0/2001	0.72	0/2707
All	All	0.58	0/20072	0.76	4/27217 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	205	CYS	CA-CB-SG	5.26	123.47	114.00
1	D	205	CYS	CA-CB-SG	5.25	123.44	114.00
1	B	205	CYS	CA-CB-SG	5.24	123.44	114.00
1	C	205	CYS	CA-CB-SG	5.13	123.23	114.00

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	2989	0	2986	48	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	B	2952	0	2945	28	0
1	C	2937	0	2929	24	0
1	D	2977	0	2973	17	0
2	E	1958	0	1857	22	0
2	F	1958	0	1857	14	1
2	G	1958	0	1857	18	0
2	H	1958	0	1857	24	1
3	E	10	0	7	0	0
3	F	10	0	7	1	0
3	G	10	0	7	0	0
3	H	10	0	7	3	0
All	All	19727	0	19289	189	1

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 5.

All (189) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:116:LEU:O	1:A:116:LEU:HD12	1.70	0.91
2:H:219:ARG:HH11	2:H:219:ARG:HG3	1.34	0.91
1:B:115:SER:OG	1:B:119:ILE:CD1	2.22	0.88
1:B:81:PRO:O	1:B:83:GLY:N	2.07	0.88
1:C:431:GLU:O	1:C:434:GLU:HG2	1.75	0.86
1:A:87:ILE:HG22	1:A:87:ILE:O	1.76	0.83
1:A:86:MET:HE1	1:A:122:TYR:CE2	2.13	0.83
2:F:25:ASN:C	2:F:26:LEU:HD23	1.98	0.82
1:A:86:MET:CE	1:A:122:TYR:CE2	2.65	0.80
1:A:205:CYS:SG	1:A:208:CYS:N	2.60	0.74
1:C:306:GLU:OE2	1:C:433:ARG:NH1	2.21	0.74
1:D:205:CYS:SG	1:D:208:CYS:N	2.61	0.74
1:B:205:CYS:SG	1:B:208:CYS:N	2.60	0.73
1:A:46:LYS:HG2	1:A:46:LYS:O	1.88	0.72
2:H:219:ARG:NH1	2:H:219:ARG:HG3	2.02	0.72
1:B:115:SER:OG	1:B:119:ILE:HD11	1.88	0.71
2:F:26:LEU:HD23	2:F:26:LEU:N	2.06	0.70
1:A:130:ILE:HD11	1:A:151:ILE:HD13	1.72	0.70
2:G:23:TYR:HA	2:G:56:SER:HB2	1.73	0.70
1:C:205:CYS:SG	1:C:208:CYS:N	2.62	0.69
2:F:130:VAL:HG23	2:F:131:MET:HG3	1.74	0.69
1:A:296:ASP:HA	1:A:299:ARG:HD3	1.74	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:198:LYS:O	2:E:198:LYS:HG3	1.93	0.69
2:E:116:TYR:OH	2:G:116:TYR:OH	1.92	0.69
2:G:23:TYR:HA	2:G:56:SER:CB	2.23	0.68
1:A:86:MET:HE1	1:A:122:TYR:CD2	2.29	0.67
2:E:23:TYR:CD1	2:E:82:ILE:HD13	2.28	0.67
2:H:5:SER:HB3	2:H:54:ILE:HG13	1.75	0.67
1:A:86:MET:CE	1:A:122:TYR:CD2	2.77	0.67
1:A:44:LEU:HD12	1:A:44:LEU:C	2.16	0.67
1:A:116:LEU:C	1:A:116:LEU:HD12	2.13	0.66
1:B:88:THR:O	1:B:89:GLY:C	2.34	0.66
1:B:115:SER:OG	1:B:119:ILE:HD12	1.93	0.65
1:D:296:ASP:HA	1:D:299:ARG:HD3	1.77	0.65
2:H:170:LEU:HD23	2:H:195:VAL:HG23	1.78	0.65
2:H:198:LYS:HG3	2:H:198:LYS:O	1.96	0.65
1:A:86:MET:HE1	1:A:122:TYR:HE2	1.60	0.65
1:A:44:LEU:O	1:A:44:LEU:HD12	1.97	0.65
1:A:115:SER:O	1:A:119:ILE:HD12	1.97	0.64
1:A:211:ILE:HD13	2:E:25:ASN:HD22	1.63	0.63
2:G:128:LEU:HB3	2:G:130:VAL:HG13	1.80	0.63
2:E:167:ARG:HD2	2:E:188:GLU:OE1	1.99	0.62
1:B:87:ILE:HG22	1:B:87:ILE:O	2.00	0.61
1:A:116:LEU:HD11	1:A:120:CYS:SG	2.39	0.61
1:C:135:ARG:NH1	1:C:136:ASP:O	2.34	0.60
1:B:88:THR:O	1:B:90:ILE:N	2.34	0.60
2:H:107:CYS:SG	3:H:301:GLN:OE1	2.61	0.59
2:G:165:GLN:HG3	2:G:166:GLY:N	2.18	0.59
1:A:156:ARG:NH2	1:A:176:THR:O	2.37	0.58
2:G:54:ILE:O	2:G:54:ILE:HG22	2.01	0.58
1:D:50:ILE:HG23	1:D:125:PRO:HA	1.86	0.57
1:D:156:ARG:NH2	1:D:176:THR:O	2.37	0.57
1:B:156:ARG:NH2	1:B:176:THR:O	2.37	0.57
1:B:115:SER:O	1:B:119:ILE:HD12	2.04	0.57
1:B:50:ILE:HG23	1:B:125:PRO:HA	1.85	0.57
1:C:156:ARG:NH2	1:C:176:THR:O	2.37	0.57
2:H:55:VAL:O	2:H:55:VAL:HG12	2.04	0.57
2:H:170:LEU:HD11	2:H:186:ASN:ND2	2.20	0.57
1:A:119:ILE:O	1:A:122:TYR:N	2.37	0.57
1:A:50:ILE:HG23	1:A:125:PRO:HA	1.86	0.56
1:D:80:ASN:O	1:D:82:SER:N	2.38	0.56
2:F:165:GLN:HG3	2:F:166:GLY:N	2.20	0.56
2:G:42:VAL:HG12	2:G:221:VAL:HG11	1.86	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:50:ILE:HG23	1:C:125:PRO:HA	1.86	0.56
1:D:227:CYS:SG	1:D:230:CYS:N	2.79	0.56
2:E:42:VAL:HG12	2:E:221:VAL:HG11	1.88	0.56
1:A:227:CYS:SG	1:A:230:CYS:N	2.78	0.56
2:F:42:VAL:HG12	2:F:221:VAL:HG11	1.88	0.56
2:G:5:SER:HB3	2:G:54:ILE:HG13	1.88	0.55
1:B:147:THR:O	1:B:148:TYR:C	2.43	0.55
1:C:429:MET:O	1:C:433:ARG:HG3	2.06	0.55
1:D:54:THR:HG22	1:D:111:ILE:O	2.07	0.55
2:G:130:VAL:HG23	2:G:131:MET:HG3	1.89	0.55
1:C:227:CYS:SG	1:C:230:CYS:N	2.79	0.54
1:B:227:CYS:SG	1:B:230:CYS:N	2.78	0.54
2:E:167:ARG:HH11	2:E:188:GLU:CD	2.10	0.54
1:A:86:MET:HE3	1:A:122:TYR:CD2	2.43	0.54
2:E:167:ARG:NH1	2:E:188:GLU:OE1	2.37	0.54
2:E:40:LYS:HG3	2:E:50:VAL:HG21	1.90	0.54
2:F:25:ASN:O	2:F:26:LEU:HD23	2.07	0.54
1:C:434:GLU:HA	1:C:434:GLU:OE1	2.07	0.54
2:F:128:LEU:HB3	2:F:130:VAL:HG13	1.89	0.53
2:H:40:LYS:HG3	2:H:50:VAL:HG21	1.88	0.53
2:G:197:TYR:CD2	2:G:198:LYS:HG2	2.44	0.53
2:H:107:CYS:HG	3:H:301:GLN:CD	2.11	0.53
2:H:8:SER:OG	2:H:50:VAL:HG22	2.09	0.53
2:E:165:GLN:HG3	2:E:166:GLY:H	1.74	0.53
2:F:167:ARG:HD2	2:F:188:GLU:OE1	2.09	0.52
1:A:130:ILE:CD1	1:A:151:ILE:HD13	2.39	0.52
1:C:431:GLU:O	1:C:434:GLU:CG	2.52	0.52
1:A:119:ILE:H	1:A:119:ILE:HD12	1.75	0.52
1:A:119:ILE:O	1:A:121:ASP:N	2.42	0.52
2:E:165:GLN:HG3	2:E:166:GLY:N	2.25	0.52
1:A:211:ILE:HD13	2:E:25:ASN:ND2	2.24	0.52
2:E:8:SER:OG	2:E:50:VAL:HG22	2.09	0.52
2:H:107:CYS:SG	3:H:301:GLN:CD	2.88	0.52
1:A:148:TYR:O	1:A:151:ILE:HG13	2.10	0.51
1:A:46:LYS:O	1:A:46:LYS:CG	2.58	0.51
1:B:74:TYR:CD1	1:B:106:ILE:HG21	2.45	0.51
2:H:219:ARG:CG	2:H:219:ARG:NH1	2.73	0.51
2:E:26:LEU:HB2	2:E:82:ILE:HD11	1.92	0.51
1:B:80:ASN:ND2	1:B:84:ALA:HB3	2.26	0.51
1:C:143:GLU:N	1:C:146:THR:HG1	2.09	0.50
2:E:198:LYS:CG	2:E:198:LYS:O	2.56	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:55:VAL:O	2:F:55:VAL:HG12	2.10	0.50
1:C:44:LEU:HD13	1:C:46:LYS:HG3	1.92	0.50
1:B:80:ASN:HD22	1:B:84:ALA:HB3	1.76	0.49
1:C:85:ASN:O	1:C:88:THR:HG23	2.12	0.49
2:G:23:TYR:HA	2:G:56:SER:HB3	1.95	0.49
1:A:435:LEU:C	1:A:437:ALA:H	2.16	0.49
1:A:87:ILE:O	1:A:87:ILE:CG2	2.49	0.49
1:A:115:SER:O	1:A:119:ILE:CD1	2.60	0.48
1:A:82:SER:OG	1:A:83:GLY:N	2.41	0.48
1:D:111:ILE:CG2	1:D:112:ASP:N	2.77	0.48
1:D:85:ASN:O	1:D:88:THR:HG23	2.13	0.48
1:A:208:CYS:HB3	1:A:230:CYS:HB3	1.71	0.47
1:A:80:ASN:N	1:A:80:ASN:OD1	2.40	0.47
2:E:23:TYR:CD1	2:E:82:ILE:CD1	2.97	0.47
2:H:57:LEU:O	2:H:59:ASP:N	2.48	0.47
2:H:198:LYS:CG	2:H:198:LYS:O	2.63	0.47
2:E:128:LEU:HB3	2:E:130:VAL:HG13	1.96	0.47
1:A:119:ILE:HG22	1:A:123:ILE:HG12	1.97	0.47
2:H:201:PHE:CD1	2:H:220:LEU:HD21	2.50	0.47
1:A:116:LEU:CD1	1:A:120:CYS:SG	3.02	0.46
2:G:23:TYR:CD1	2:G:82:ILE:HD13	2.50	0.46
2:E:143:PHE:HD2	2:E:164:HIS:CE1	2.32	0.46
1:C:301:VAL:O	1:C:301:VAL:HG12	2.15	0.46
1:D:188:LEU:N	1:D:188:LEU:HD12	2.31	0.46
1:A:265:ILE:HD13	1:A:303:GLY:O	2.15	0.46
2:E:167:ARG:NH1	2:E:188:GLU:CD	2.68	0.46
1:A:390:ARG:NH1	2:E:245:GLU:OE1	2.49	0.45
2:F:27:MET:HE1	2:F:79:GLN:HA	1.97	0.45
2:H:106:ILE:O	2:H:107:CYS:C	2.53	0.45
1:B:147:THR:O	1:B:150:MET:N	2.50	0.45
1:B:81:PRO:C	1:B:83:GLY:N	2.69	0.45
1:D:188:LEU:N	1:D:188:LEU:CD1	2.80	0.45
1:D:265:ILE:HD13	1:D:303:GLY:O	2.17	0.45
2:F:23:TYR:CD1	2:F:82:ILE:HD13	2.52	0.45
2:H:23:TYR:CD1	2:H:82:ILE:HD13	2.52	0.45
1:B:265:ILE:HD13	1:B:303:GLY:O	2.16	0.44
2:G:56:SER:OG	2:G:57:LEU:N	2.50	0.44
2:H:5:SER:HB3	2:H:54:ILE:CG1	2.44	0.44
1:A:116:LEU:HG	1:A:154:ALA:CB	2.47	0.44
1:A:67:VAL:HG22	1:A:108:VAL:CG2	2.47	0.44
1:B:88:THR:C	1:B:90:ILE:N	2.71	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:265:ILE:HD13	1:C:303:GLY:O	2.17	0.44
1:D:111:ILE:HG22	1:D:112:ASP:N	2.32	0.44
2:H:130:VAL:HG23	2:H:131:MET:HG3	1.99	0.44
1:A:44:LEU:CD1	1:A:44:LEU:C	2.85	0.44
1:C:432:PHE:O	1:C:432:PHE:CD2	2.70	0.44
2:E:57:LEU:HD23	2:E:57:LEU:HA	1.73	0.44
1:A:86:MET:CE	1:A:122:TYR:HE2	2.18	0.44
1:C:81:PRO:O	1:C:82:SER:HB2	2.18	0.44
1:D:186:PHE:CD2	1:D:218:THR:CG2	3.01	0.43
2:H:57:LEU:C	2:H:59:ASP:H	2.21	0.43
1:B:115:SER:HG	1:B:119:ILE:HD11	1.83	0.43
1:B:208:CYS:HB3	1:B:230:CYS:HB3	1.72	0.43
1:A:151:ILE:HD12	1:A:152:LEU:N	2.33	0.43
1:D:78:LEU:HD21	1:D:92:THR:HG22	2.01	0.43
1:A:108:VAL:HG23	1:A:108:VAL:O	2.19	0.42
1:C:208:CYS:HB3	1:C:230:CYS:HB3	1.70	0.42
1:B:390:ARG:NH1	2:F:245:GLU:OE1	2.52	0.42
1:C:153:ASP:OD1	1:C:156:ARG:NH1	2.53	0.42
2:F:41:TYR:CZ	2:F:45:LYS:HE2	2.54	0.42
2:H:131:MET:HE2	2:H:174:GLN:NE2	2.35	0.42
1:C:81:PRO:O	1:C:82:SER:CB	2.68	0.42
2:E:40:LYS:CG	2:E:50:VAL:HG21	2.50	0.42
2:G:57:LEU:HD12	2:G:57:LEU:HA	1.92	0.42
2:H:43:ALA:HB3	2:H:50:VAL:HG11	2.02	0.42
1:A:409:LEU:O	1:A:409:LEU:HD23	2.20	0.41
1:C:375:ILE:HD12	1:C:394:TYR:CE2	2.55	0.41
1:B:54:THR:HG22	1:B:111:ILE:O	2.20	0.41
1:D:375:ILE:HD12	1:D:394:TYR:CE2	2.55	0.41
1:B:153:ASP:OD1	1:B:156:ARG:NH1	2.54	0.41
1:D:153:ASP:OD1	1:D:156:ARG:NH1	2.53	0.41
2:H:40:LYS:CG	2:H:50:VAL:HG21	2.50	0.41
1:A:153:ASP:OD1	1:A:156:ARG:NH1	2.54	0.41
1:C:54:THR:HG22	1:C:111:ILE:O	2.21	0.41
1:C:390:ARG:NH1	2:G:245:GLU:OE1	2.54	0.41
1:A:165:LEU:HD13	1:A:172:PHE:HB3	2.02	0.41
1:B:375:ILE:HD12	1:B:394:TYR:CE2	2.56	0.41
1:A:54:THR:HG22	1:A:111:ILE:O	2.20	0.41
1:B:165:LEU:HD13	1:B:172:PHE:HB3	2.02	0.41
2:F:165:GLN:HG3	3:F:301:GLN:OXT	2.21	0.41
2:G:38:MET:HE2	2:G:38:MET:HB3	1.88	0.41
2:G:46:LEU:HD11	2:G:241:ILE:CD1	2.51	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:409:LEU:HD23	1:B:409:LEU:O	2.20	0.40
2:G:198:LYS:O	2:G:198:LYS:HG3	2.21	0.40
1:C:434:GLU:OE1	1:C:434:GLU:CA	2.69	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:116:TYR:OH	2:H:116:TYR:OH[2_555]	2.05	0.15

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	377/465 (81%)	342 (91%)	32 (8%)	3 (1%)	19	57
1	B	370/465 (80%)	334 (90%)	33 (9%)	3 (1%)	19	57
1	C	367/465 (79%)	332 (90%)	32 (9%)	3 (1%)	19	57
1	D	372/465 (80%)	338 (91%)	32 (9%)	2 (0%)	29	68
2	E	245/260 (94%)	230 (94%)	15 (6%)	0	100	100
2	F	245/260 (94%)	228 (93%)	16 (6%)	1 (0%)	34	72
2	G	245/260 (94%)	229 (94%)	16 (6%)	0	100	100
2	H	245/260 (94%)	230 (94%)	13 (5%)	2 (1%)	19	57
All	All	2466/2900 (85%)	2263 (92%)	189 (8%)	14 (1%)	25	64

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	H	58	HIS
1	B	89	GLY

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Mol	Chain	Res	Type
2	F	58	HIS
1	A	120	CYS
1	D	373	PRO
2	H	197	TYR
1	A	373	PRO
1	B	373	PRO
1	C	86	MET
1	C	311	GLY
1	C	373	PRO
1	D	311	GLY
1	A	311	GLY
1	B	311	GLY

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	323/395 (82%)	313 (97%)	10 (3%)	40	75
1	B	318/395 (80%)	310 (98%)	8 (2%)	47	79
1	C	319/395 (81%)	309 (97%)	10 (3%)	40	75
1	D	323/395 (82%)	313 (97%)	10 (3%)	40	75
2	E	207/219 (94%)	206 (100%)	1 (0%)	88	96
2	F	207/219 (94%)	204 (99%)	3 (1%)	67	88
2	G	207/219 (94%)	204 (99%)	3 (1%)	67	88
2	H	207/219 (94%)	204 (99%)	3 (1%)	67	88
All	All	2111/2456 (86%)	2063 (98%)	48 (2%)	50	80

All (48) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	88	THR
1	A	115	SER
1	A	116	LEU

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Mol	Chain	Res	Type
1	A	205	CYS
1	A	227	CYS
1	A	315	CYS
1	A	354	ILE
1	A	382	HIS
1	A	400	THR
1	A	411	THR
2	E	71	PHE
1	B	147	THR
1	B	205	CYS
1	B	227	CYS
1	B	315	CYS
1	B	355	ASP
1	B	382	HIS
1	B	400	THR
1	B	411	THR
2	F	71	PHE
2	F	139	THR
2	F	196	HIS
1	C	43	SER
1	C	115	SER
1	C	205	CYS
1	C	227	CYS
1	C	304	ARG
1	C	315	CYS
1	C	382	HIS
1	C	400	THR
1	C	411	THR
1	C	433	ARG
2	G	71	PHE
2	G	139	THR
2	G	196	HIS
1	D	43	SER
1	D	108	VAL
1	D	115	SER
1	D	204	LEU
1	D	205	CYS
1	D	227	CYS
1	D	315	CYS
1	D	382	HIS
1	D	400	THR
1	D	411	THR

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Mol	Chain	Res	Type
2	H	54	ILE
2	H	71	PHE
2	H	139	THR

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

Mol	Chain	Res	Type
1	A	85	ASN
2	E	25	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

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	$\#\|Z\| > 2$
3	GLN	G	301	-	5,9,9	0.98	1 (20%)	5,11,11	0.25	0
3	GLN	H	301	-	5,9,9	0.82	0	5,11,11	0.18	0
3	GLN	E	301	-	5,9,9	0.74	0	5,11,11	0.44	0
3	GLN	F	301	-	5,9,9	0.94	1 (20%)	5,11,11	0.19	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
3	GLN	G	301	-	-	2/5/9/9	-
3	GLN	H	301	-	-	2/5/9/9	-
3	GLN	E	301	-	-	2/5/9/9	-
3	GLN	F	301	-	-	2/5/9/9	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	G	301	GLN	CA-N	2.10	1.51	1.47
3	F	301	GLN	CA-N	2.05	1.51	1.47

There are no bond angle outliers.

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	E	301	GLN	NE2-CD-CG-CB
3	F	301	GLN	OE1-CD-CG-CB
3	F	301	GLN	NE2-CD-CG-CB
3	E	301	GLN	OE1-CD-CG-CB
3	G	301	GLN	OE1-CD-CG-CB
3	G	301	GLN	NE2-CD-CG-CB
3	H	301	GLN	NE2-CD-CG-CB
3	H	301	GLN	OE1-CD-CG-CB

There are no ring outliers.

2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	H	301	GLN	3	0
3	F	301	GLN	1	0

5.7 Other polymers (i)

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, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	383/465 (82%)	-0.23	5 (1%) 77 51	30, 83, 130, 162	0
1	B	378/465 (81%)	-0.23	4 (1%) 80 56	66, 94, 132, 161	0
1	C	375/465 (80%)	-0.22	4 (1%) 80 56	30, 90, 134, 165	0
1	D	380/465 (81%)	-0.25	3 (0%) 86 65	58, 89, 131, 162	0
2	E	247/260 (95%)	-0.39	0 100 100	46, 67, 95, 143	0
2	F	247/260 (95%)	-0.27	1 (0%) 92 79	56, 85, 124, 143	0
2	G	247/260 (95%)	-0.36	0 100 100	51, 78, 122, 146	0
2	H	247/260 (95%)	-0.31	0 100 100	51, 82, 117, 143	0
All	All	2504/2900 (86%)	-0.27	17 (0%) 87 69	30, 85, 127, 165	0

All (17) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	439	ARG	4.6
1	C	122	TYR	3.4
1	B	122	TYR	3.0
1	A	439	ARG	3.0
1	A	137	GLN	2.8
1	A	82	SER	2.7
1	D	440	GLN	2.6
1	B	315	CYS	2.6
1	B	137	GLN	2.5
1	C	88	THR	2.5
1	C	137	GLN	2.3
1	A	122	TYR	2.3
1	A	92	THR	2.2
1	B	88	THR	2.1
1	D	122	TYR	2.0
2	F	1	MET	2.0

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Mol	Chain	Res	Type	RSRZ
1	C	86	MET	2.0

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

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

6.3 Carbohydrates (i)

There are no 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, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	GLN	F	301	10/10	0.65	0.49	111,140,151,153	0
3	GLN	G	301	10/10	0.68	0.41	102,124,137,140	0
3	GLN	H	301	10/10	0.69	0.39	97,120,132,139	0
3	GLN	E	301	10/10	0.87	0.30	88,105,125,125	0

6.5 Other polymers (i)

There are no such residues in this entry.