



Full wwPDB X-ray Structure Validation Report ⓘ

Oct 17, 2021 – 04:18 AM EDT

PDB ID : 1JUS
Title : Crystal structure of the multidrug binding transcriptional repressor QacR bound to rhodamine 6G
Authors : Schumacher, M.A.; Miller, M.C.; Grkovic, S.; Brown, M.H.; Skurray, R.A.; Brennan, R.G.
Deposited on : 2001-08-27
Resolution : 2.84 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 ⓘ symbol.

The following versions of software and data (see [references ⓘ](#)) 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 : 2.23.2
buster-report : 1.1.7 (2018)
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) : 2.23.2

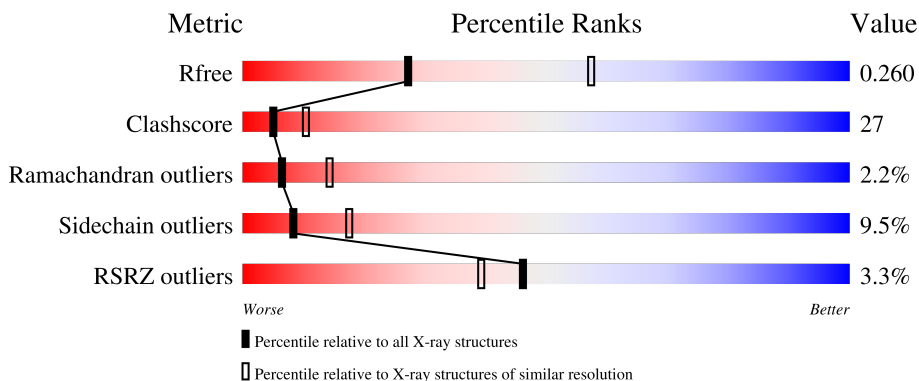
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.84 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	1031 (2.86-2.82)
Clashscore	141614	1078 (2.86-2.82)
Ramachandran outliers	138981	1050 (2.86-2.82)
Sidechain outliers	138945	1051 (2.86-2.82)
RSRZ outliers	127900	1019 (2.86-2.82)

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 $\leq 5\%$. 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	194	
1	B	194	
1	D	194	
1	E	194	

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	SO4	A	599	-	-	X	-
2	SO4	A	800	-	-	X	-
2	SO4	A	802	-	-	-	X
2	SO4	D	1000	-	-	-	X
2	SO4	D	900	-	-	X	-
2	SO4	E	399	-	-	-	X
3	RHQ	A	201	-	X	-	-

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 6398 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 HYPOTHETICAL TRANSCRIPTIONAL REGULATOR IN QACA 5'REGION.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	Se			
1	B	186	1547	998	252	295	2	0	0	0
1	D	186	1547	998	252	295	2	0	0	0
1	A	186	1547	998	252	295	2	0	0	0
1	E	186	1547	998	252	295	2	0	0	0

There are 32 discrepancies between the modelled and reference sequences:

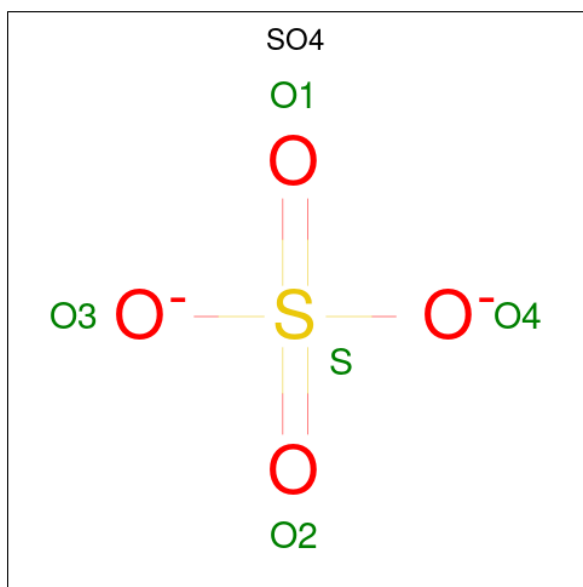
Chain	Residue	Modelled	Actual	Comment	Reference
B	72	ALA	CYS	engineered mutation	UNP P0A0N4
B	141	SER	CYS	engineered mutation	UNP P0A0N4
B	189	HIS	-	expression tag	UNP P0A0N4
B	190	HIS	-	expression tag	UNP P0A0N4
B	191	HIS	-	expression tag	UNP P0A0N4
B	192	HIS	-	expression tag	UNP P0A0N4
B	193	HIS	-	expression tag	UNP P0A0N4
B	194	HIS	-	expression tag	UNP P0A0N4
D	72	ALA	CYS	engineered mutation	UNP P0A0N4
D	141	SER	CYS	engineered mutation	UNP P0A0N4
D	189	HIS	-	expression tag	UNP P0A0N4
D	190	HIS	-	expression tag	UNP P0A0N4
D	191	HIS	-	expression tag	UNP P0A0N4
D	192	HIS	-	expression tag	UNP P0A0N4
D	193	HIS	-	expression tag	UNP P0A0N4
D	194	HIS	-	expression tag	UNP P0A0N4
A	72	ALA	CYS	engineered mutation	UNP P0A0N4
A	141	SER	CYS	engineered mutation	UNP P0A0N4
A	189	HIS	-	expression tag	UNP P0A0N4
A	190	HIS	-	expression tag	UNP P0A0N4

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Chain	Residue	Modelled	Actual	Comment	Reference
A	191	HIS	-	expression tag	UNP P0A0N4
A	192	HIS	-	expression tag	UNP P0A0N4
A	193	HIS	-	expression tag	UNP P0A0N4
A	194	HIS	-	expression tag	UNP P0A0N4
E	72	ALA	CYS	engineered mutation	UNP P0A0N4
E	141	SER	CYS	engineered mutation	UNP P0A0N4
E	189	HIS	-	expression tag	UNP P0A0N4
E	190	HIS	-	expression tag	UNP P0A0N4
E	191	HIS	-	expression tag	UNP P0A0N4
E	192	HIS	-	expression tag	UNP P0A0N4
E	193	HIS	-	expression tag	UNP P0A0N4
E	194	HIS	-	expression tag	UNP P0A0N4

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



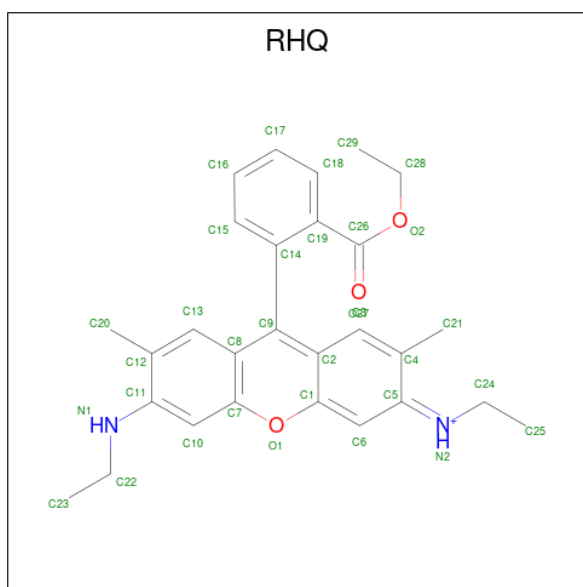
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	B	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		
2	B	1	Total	O	S	0	0
			5	4	1		

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

- Molecule 3 is RHODAMINE 6G (three-letter code: RHQ) (formula: $C_{28}H_{31}N_2O_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
3	A	1	33	28	2	3	0	0

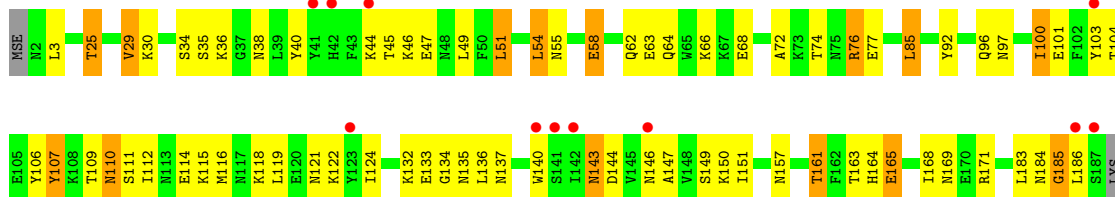
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	11	Total	O	0	0
			11	11		
4	D	10	Total	O	0	0
			10	10		
4	A	25	Total	O	0	0
			25	25		
4	E	16	Total	O	0	0
			16	16		

HIS
HIS
HIS

● Molecule 1: HYPOTHETICAL TRANSCRIPTIONAL REGULATOR IN QACA 5'REGION

Chain E:  6% 57% 31% 7%



HIS
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HIS

4 Data and refinement statistics

Property	Value	Source
Space group	P 42 21 2	Depositor
Cell constants a, b, c, α , β , γ	172.30Å 172.30Å 95.00Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	77.06 – 2.84 77.05 – 2.84	Depositor EDS
% Data completeness (in resolution range)	99.7 (77.06-2.84) 99.8 (77.05-2.84)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.05	Depositor
$\langle I/\sigma(I) \rangle$ ¹	5.65 (at 2.82Å)	Xtrriage
Refinement program	CNS	Depositor
R, R_{free}	0.230 , 0.272 0.223 , 0.260	Depositor DCC
R_{free} test set	3424 reflections (9.98%)	wwPDB-VP
Wilson B-factor (Å ²)	70.8	Xtrriage
Anisotropy	0.011	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 67.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	6398	wwPDB-VP
Average B, all atoms (Å ²)	68.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.28% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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	0.46	0/1576	0.60	0/2120
1	B	0.45	0/1576	0.69	0/2120
1	D	0.41	0/1576	0.62	0/2120
1	E	0.43	0/1576	0.61	0/2120
All	All	0.44	0/6304	0.63	0/8480

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	107	TYR	Sidechain
1	A	20	TYR	Sidechain

5.2 Too-close contacts [i](#)

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	1547	0	1536	80	0
1	B	1547	0	1536	107	0
1	D	1547	0	1536	81	0
1	E	1547	0	1536	93	0
2	A	35	0	0	6	0
2	B	30	0	0	1	0
2	D	25	0	0	4	0
2	E	25	0	0	0	0
3	A	33	0	31	10	0
4	A	25	0	0	0	0
4	B	11	0	0	0	0
4	D	10	0	0	0	0
4	E	16	0	0	1	1
All	All	6398	0	6175	339	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 27.

All (339) 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:D:97:ASN:HB2	1:E:100:ILE:HD11	1.23	1.16
1:D:165:GLU:HB3	1:E:103:TYR:HE1	1.06	1.07
1:D:165:GLU:HB3	1:E:103:TYR:CE1	1.91	1.06
1:E:168:ILE:HD12	1:E:168:ILE:H	1.24	0.98
1:E:44:LYS:HG3	1:E:45:THR:HG23	1.45	0.98
1:B:51:LEU:HD23	1:B:115:LYS:HD2	1.49	0.94
1:B:106:TYR:O	1:B:112:ILE:HD11	1.67	0.94
1:A:123:TYR:HB2	3:A:201:RHQ:H282	1.47	0.94
1:B:47:GLU:HG2	1:B:106:TYR:CE1	2.04	0.93
1:B:47:GLU:HG2	1:B:106:TYR:HE1	1.31	0.93
1:B:142:ILE:HD11	1:B:186:LEU:HD13	1.49	0.92
1:B:18:ASN:HD22	1:B:23:THR:HG22	1.33	0.92
1:B:143:ASN:H	1:B:143:ASN:HD22	1.16	0.90
1:B:143:ASN:HD22	1:B:143:ASN:N	1.70	0.89
1:D:96:GLN:NE2	1:D:157:ASN:HD21	1.73	0.86
1:E:111:SER:O	1:E:115:LYS:HG2	1.76	0.86
1:A:135:ASN:HD21	1:A:142:ILE:H	1.22	0.84
1:E:124:ILE:HD11	1:E:149:SER:C	1.99	0.83
1:A:83:ASN:HB3	1:A:175:MSE:HE2	1.60	0.83
1:B:66:LYS:HA	1:B:69:GLN:HE21	1.44	0.82
1:E:114:GLU:HB2	1:E:115:LYS:HE2	1.62	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:103:TYR:HD2	1:D:116:MSE:HE2	1.45	0.81
1:E:54:LEU:HD23	1:E:116:MSE:HE1	1.62	0.80
1:B:96:GLN:HG2	1:B:157:ASN:HD21	1.44	0.80
1:B:24:THR:HG22	1:B:27:GLU:HG3	1.64	0.80
1:B:39:LEU:O	1:B:43:PHE:HB2	1.82	0.79
1:A:163:THR:HB	1:A:171:ARG:HH11	1.48	0.78
1:D:103:TYR:CD2	1:D:116:MSE:HE2	2.18	0.78
1:E:143:ASN:ND2	1:E:144:ASP:H	1.80	0.78
1:A:54:LEU:HB3	1:A:119:LEU:HD21	1.65	0.77
1:D:36:LYS:HG2	1:D:40:TYR:CE2	2.20	0.76
1:D:97:ASN:CB	1:E:100:ILE:HD11	2.12	0.76
1:A:163:THR:O	1:A:171:ARG:HD3	1.85	0.76
1:E:168:ILE:H	1:E:168:ILE:CD1	1.99	0.76
1:B:143:ASN:H	1:B:143:ASN:ND2	1.84	0.75
1:E:47:GLU:HG2	1:E:106:TYR:CZ	2.21	0.75
1:E:157:ASN:O	1:E:161:THR:HG23	1.87	0.74
1:B:64:GLN:OE1	1:B:89:THR:HG23	1.87	0.74
1:D:168:ILE:O	1:D:172:ILE:HG12	1.89	0.72
1:D:177:LYS:O	1:D:177:LYS:HD3	1.89	0.72
1:A:96:GLN:O	1:A:100:ILE:HG13	1.89	0.72
1:E:44:LYS:CG	1:E:45:THR:HG23	2.19	0.72
1:B:105:GLU:O	1:B:106:TYR:HD2	1.72	0.71
1:B:81:LEU:HG	1:B:85:LEU:CD2	2.20	0.71
1:B:81:LEU:HG	1:B:85:LEU:HD21	1.72	0.71
1:D:25:THR:HG21	2:D:899:SO4:O3	1.89	0.71
1:B:6:LYS:O	1:B:10:VAL:HG23	1.90	0.70
1:A:112:ILE:HD12	1:A:112:ILE:H	1.54	0.70
1:B:29:VAL:HG13	1:B:34:SER:O	1.92	0.69
1:E:100:ILE:O	1:E:104:THR:HG23	1.92	0.69
1:E:115:LYS:HZ3	1:E:118:LYS:HE3	1.57	0.69
1:A:24:THR:OG1	1:A:27:GLU:HG3	1.93	0.69
1:A:46:LYS:HE2	2:A:800:SO4:O3	1.92	0.69
1:B:81:LEU:O	1:B:85:LEU:HD22	1.93	0.69
1:E:58:GLU:OE2	1:E:62:GLN:NE2	2.26	0.68
1:B:55:ASN:HB2	1:B:118:LYS:NZ	2.09	0.68
1:D:96:GLN:HE21	1:D:157:ASN:HD21	1.41	0.68
3:A:201:RHQ:H211	3:A:201:RHQ:H242	1.77	0.67
1:B:72:ALA:HA	1:B:73:LYS:NZ	2.10	0.67
1:B:21:ASN:ND2	1:B:105:GLU:OE2	2.25	0.67
1:A:25:THR:HG23	2:A:800:SO4:O1	1.95	0.66
1:A:25:THR:O	1:A:29:VAL:HG23	1.94	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:173:LYS:O	1:A:173:LYS:HD3	1.94	0.66
1:B:104:THR:HG21	1:A:100:ILE:HD13	1.78	0.66
1:E:96:GLN:NE2	1:E:157:ASN:HD21	1.94	0.66
1:A:8:LEU:HD13	1:A:56:ILE:CD1	2.26	0.65
1:D:120:GLU:O	1:D:124:ILE:HG12	1.97	0.64
1:B:73:LYS:HD2	1:B:77:GLU:OE2	1.97	0.64
1:D:110:ASN:O	1:D:114:GLU:HG3	1.98	0.64
1:E:164:HIS:HA	1:E:171:ARG:NH1	2.12	0.64
1:B:154:ASN:HD22	1:A:162:PHE:HB2	1.62	0.64
1:E:76:ARG:HD2	1:E:183:LEU:HD23	1.80	0.64
1:D:101:GLU:HG2	1:E:97:ASN:HD21	1.61	0.64
1:E:163:THR:O	1:E:171:ARG:HD3	1.98	0.63
1:E:121:ASN:HA	1:E:124:ILE:HG22	1.80	0.63
1:B:120:GLU:O	1:B:124:ILE:HG23	1.98	0.63
1:A:112:ILE:HD12	1:A:112:ILE:N	2.13	0.63
1:A:175:MSE:HE1	1:A:178:PHE:HD2	1.64	0.62
1:D:73:LYS:HG3	1:D:74:THR:H	1.64	0.62
1:D:103:TYR:CZ	1:E:165:GLU:HG2	2.34	0.62
1:D:16:ILE:HD12	1:D:94:PRO:HB2	1.82	0.61
1:A:100:ILE:O	1:A:104:THR:HG23	2.00	0.61
1:B:103:TYR:O	1:B:107:TYR:HB3	2.01	0.61
1:D:147:ALA:O	1:D:151:ILE:HG13	1.99	0.61
1:A:163:THR:HG22	1:A:171:ARG:CD	2.30	0.61
1:E:121:ASN:O	1:E:124:ILE:HG22	2.00	0.61
1:A:132:LYS:O	1:A:135:ASN:HB2	2.00	0.61
1:B:112:ILE:O	1:B:116:MSE:CB	2.48	0.61
1:D:103:TYR:CE1	1:E:165:GLU:HG2	2.36	0.61
1:A:163:THR:HG22	1:A:171:ARG:HD2	1.82	0.61
1:B:143:ASN:N	1:B:143:ASN:ND2	2.43	0.60
1:D:76:ARG:HG2	1:D:183:LEU:HD13	1.83	0.60
1:A:167:ASN:ND2	1:A:169:ASN:H	1.99	0.60
1:E:114:GLU:O	1:E:118:LYS:HG3	2.01	0.60
1:D:156:VAL:HG13	1:D:175:MSE:HE1	1.83	0.60
1:B:142:ILE:CD1	1:B:186:LEU:HD13	2.29	0.60
1:A:175:MSE:HE1	1:A:178:PHE:CD2	2.36	0.60
1:A:83:ASN:CB	1:A:175:MSE:HE2	2.29	0.60
1:A:175:MSE:CE	1:A:178:PHE:HD2	2.15	0.60
1:B:2:ASN:OD1	1:B:3:LEU:N	2.34	0.59
1:A:79:PHE:CD2	1:A:183:LEU:HD13	2.37	0.59
1:B:45:THR:HG23	1:B:48:ASN:H	1.66	0.59
1:B:109:THR:O	1:B:112:ILE:HG12	2.02	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:84:GLU:HG3	1:D:172:ILE:HG23	1.84	0.59
1:D:156:VAL:HG13	1:D:175:MSE:CE	2.32	0.59
1:E:168:ILE:HD12	1:E:168:ILE:N	2.08	0.59
1:B:18:ASN:HB2	1:B:23:THR:CG2	2.33	0.58
1:A:90:GLU:OE1	1:A:164:HIS:NE2	2.35	0.58
1:B:47:GLU:O	1:B:51:LEU:HB2	2.03	0.58
1:A:54:LEU:CD1	3:A:201:RHQ:H161	2.33	0.58
1:A:54:LEU:HD12	3:A:201:RHQ:H161	1.84	0.58
1:D:97:ASN:HD22	1:E:100:ILE:CD1	2.17	0.58
1:B:115:LYS:HA	1:B:118:LYS:HB3	1.86	0.58
1:D:137:ASN:HB3	1:D:139:GLU:HG3	1.85	0.58
1:B:66:LYS:HA	1:B:69:GLN:NE2	2.18	0.58
1:E:134:GLY:HA3	1:E:140:TRP:CZ2	2.39	0.58
1:D:180:GLN:HG2	1:D:184:ASN:ND2	2.19	0.57
1:B:154:ASN:ND2	1:A:162:PHE:HB2	2.19	0.57
1:B:112:ILE:O	1:B:116:MSE:HB3	2.05	0.57
1:A:8:LEU:HD13	1:A:56:ILE:HD11	1.86	0.56
1:D:12:LYS:O	1:D:16:ILE:HG12	2.04	0.56
1:A:112:ILE:H	1:A:112:ILE:CD1	2.17	0.56
1:D:133:GLU:O	1:D:137:ASN:HB2	2.05	0.56
1:A:170:GLU:OE2	1:A:170:GLU:HA	2.05	0.56
1:D:136:LEU:HD23	1:D:136:LEU:O	2.06	0.56
1:E:157:ASN:O	1:E:161:THR:CG2	2.55	0.55
1:E:112:ILE:O	1:E:116:MSE:HB2	2.06	0.55
1:A:6:LYS:HD3	1:A:32:SER:O	2.06	0.55
1:A:49:LEU:O	1:A:52:GLU:HB3	2.06	0.55
1:A:142:ILE:HD11	1:A:186:LEU:HD13	1.89	0.55
1:A:163:THR:HG23	1:A:166:GLN:CD	2.28	0.55
1:B:167:ASN:ND2	1:B:169:ASN:H	2.04	0.55
1:D:101:GLU:HG2	1:E:97:ASN:ND2	2.22	0.55
1:E:115:LYS:NZ	1:E:118:LYS:HE3	2.21	0.54
1:B:48:ASN:O	1:B:52:GLU:HB2	2.07	0.54
1:E:132:LYS:O	1:E:135:ASN:HB2	2.06	0.54
1:A:173:LYS:HD3	1:A:173:LYS:C	2.28	0.54
1:D:73:LYS:HG2	1:D:77:GLU:OE1	2.09	0.53
1:B:6:LYS:HE3	1:B:6:LYS:HA	1.89	0.53
1:B:73:LYS:NZ	1:B:73:LYS:H	2.07	0.53
1:D:54:LEU:HD11	1:D:99:ILE:HD11	1.91	0.53
1:D:51:LEU:HD11	1:D:112:ILE:HG23	1.91	0.53
1:E:25:THR:HG21	1:E:40:TYR:OH	2.08	0.53
1:B:7:ILE:HG21	1:B:39:LEU:HD11	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:6:LYS:HA	2:A:599:SO4:O4	2.08	0.53
1:B:61:TRP:HE3	1:B:89:THR:HG21	1.74	0.53
1:B:112:ILE:O	1:B:116:MSE:HB2	2.08	0.53
1:B:115:LYS:O	1:B:118:LYS:HB3	2.09	0.52
1:E:29:VAL:HG21	1:E:35:SER:C	2.29	0.52
1:B:4:LYS:HG3	1:B:5:ASP:N	2.24	0.52
1:B:10:VAL:HG21	1:B:32:SER:HA	1.90	0.52
1:B:55:ASN:HB2	1:B:118:LYS:HZ3	1.74	0.52
1:A:123:TYR:HB2	3:A:201:RHQ:C28	2.31	0.52
1:A:163:THR:CG2	1:A:171:ARG:HD2	2.39	0.52
1:B:80:TYR:O	1:B:84:GLU:HG3	2.08	0.52
1:D:103:TYR:OH	1:E:165:GLU:HG2	2.10	0.52
1:D:158:GLY:O	1:D:162:PHE:HD1	1.93	0.52
1:B:18:ASN:HB2	1:B:23:THR:HG23	1.92	0.52
1:B:109:THR:C	1:B:111:SER:H	2.14	0.52
1:B:14:LEU:C	1:B:23:THR:HG21	2.30	0.51
1:B:45:THR:OG1	1:B:46:LYS:N	2.41	0.51
1:D:27:GLU:O	1:D:31:LEU:HB2	2.10	0.51
1:E:96:GLN:NE2	1:E:157:ASN:ND2	2.58	0.51
1:D:118:LYS:NZ	1:D:118:LYS:HB3	2.25	0.51
1:B:100:ILE:O	1:B:104:THR:HG23	2.11	0.51
1:D:25:THR:O	1:D:29:VAL:HG23	2.11	0.51
1:B:44:LYS:H	1:B:48:ASN:HD22	1.59	0.51
1:E:124:ILE:HD11	1:E:150:LYS:N	2.24	0.51
1:D:153:ALA:O	1:D:157:ASN:HB2	2.10	0.50
1:A:163:THR:O	1:A:163:THR:HG22	2.11	0.50
1:A:144:ASP:N	1:A:144:ASP:OD1	2.44	0.50
1:E:114:GLU:HB2	1:E:115:LYS:CE	2.37	0.50
1:D:3:LEU:HB2	2:D:900:SO4:O3	2.12	0.50
1:E:135:ASN:C	1:E:137:ASN:H	2.14	0.50
1:E:3:LEU:HD13	1:E:34:SER:OG	2.12	0.50
1:E:72:ALA:HB1	1:E:77:GLU:HB3	1.93	0.50
1:B:55:ASN:HB2	1:B:118:LYS:HZ1	1.77	0.49
1:E:107:TYR:C	1:E:107:TYR:CD2	2.85	0.49
1:B:7:ILE:HG21	1:B:39:LEU:CD1	2.42	0.49
1:B:107:TYR:HA	1:B:112:ILE:CD1	2.43	0.49
1:A:132:LYS:O	1:A:136:LEU:HD13	2.13	0.49
1:A:14:LEU:HD21	1:A:31:LEU:HD12	1.93	0.49
1:E:109:THR:O	1:E:112:ILE:N	2.44	0.49
1:B:107:TYR:HA	1:B:112:ILE:HD11	1.95	0.49
1:D:54:LEU:HD11	1:D:99:ILE:CG1	2.43	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:54:LEU:HD11	1:D:99:ILE:HG12	1.95	0.49
1:D:165:GLU:HG2	1:D:166:GLN:N	2.27	0.49
1:B:35:SER:O	1:B:38:ASN:HB2	2.12	0.49
1:B:21:ASN:O	1:B:22:ALA:C	2.51	0.49
1:B:44:LYS:N	1:B:48:ASN:HD22	2.11	0.48
1:D:100:ILE:O	1:D:104:THR:HG23	2.12	0.48
1:A:99:ILE:CD1	3:A:201:RHQ:H151	2.43	0.48
1:D:58:GLU:OE2	1:D:119:LEU:HB3	2.13	0.48
1:E:116:MSE:HA	1:E:116:MSE:HE3	1.95	0.48
1:E:185:GLY:O	1:E:186:LEU:HD23	2.14	0.48
1:A:83:ASN:HB3	1:A:175:MSE:CE	2.37	0.48
1:A:17:LYS:HG2	1:A:18:ASN:OD1	2.13	0.48
1:A:10:VAL:O	1:A:13:GLU:HG2	2.13	0.48
1:A:136:LEU:N	1:A:136:LEU:CD1	2.76	0.48
1:B:11:ALA:HB3	1:B:53:ILE:HD11	1.95	0.48
1:D:36:LYS:HG2	1:D:40:TYR:HE2	1.74	0.48
1:E:147:ALA:O	1:E:151:ILE:HG13	2.13	0.48
1:E:143:ASN:HD22	1:E:144:ASP:H	1.60	0.48
1:D:165:GLU:CB	1:E:103:TYR:CE1	2.82	0.48
1:E:116:MSE:HE3	1:E:119:LEU:HD12	1.95	0.48
1:B:29:VAL:O	1:B:33:GLU:N	2.45	0.47
1:D:97:ASN:HD22	1:E:100:ILE:HG12	1.78	0.47
1:A:167:ASN:HD21	1:A:169:ASN:HB2	1.79	0.47
1:B:95:LEU:O	1:B:99:ILE:HG13	2.14	0.47
1:E:121:ASN:HA	1:E:124:ILE:CG2	2.44	0.47
1:B:12:LYS:HD2	2:B:600:SO4:O1	2.15	0.47
1:E:103:TYR:CD2	1:E:116:MSE:HG2	2.49	0.47
1:E:35:SER:OG	1:E:38:ASN:HB2	2.14	0.47
1:B:61:TRP:CE3	1:B:89:THR:HG21	2.49	0.47
1:B:104:THR:HG21	1:A:100:ILE:CD1	2.45	0.47
1:A:166:GLN:HE22	1:A:174:LEU:HD12	1.79	0.47
1:E:3:LEU:HD12	1:E:38:ASN:ND2	2.29	0.47
1:D:68:GLU:OE1	1:D:85:LEU:HD13	2.14	0.47
1:B:18:ASN:ND2	1:B:23:THR:HG22	2.15	0.46
1:A:5:ASP:HB3	2:A:599:SO4:O1	2.16	0.46
1:E:51:LEU:HD13	1:E:51:LEU:HA	1.81	0.46
1:E:124:ILE:HD11	1:E:149:SER:O	2.16	0.46
1:D:66:LYS:O	1:D:66:LYS:NZ	2.45	0.46
1:A:179:SER:O	1:A:183:LEU:HB2	2.15	0.46
1:D:134:GLY:HA3	1:D:140:TRP:CE2	2.51	0.45
1:E:184:ASN:O	1:E:186:LEU:N	2.47	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:177:LYS:HD3	1:D:177:LYS:C	2.36	0.45
1:A:135:ASN:C	1:A:137:ASN:H	2.19	0.45
1:E:144:ASP:OD2	1:E:147:ALA:HB2	2.16	0.45
1:B:119:LEU:O	1:B:120:GLU:C	2.54	0.45
1:D:2:ASN:O	1:D:3:LEU:HD23	2.17	0.45
1:D:97:ASN:ND2	1:E:100:ILE:HG12	2.31	0.45
1:D:103:TYR:HE1	1:E:165:GLU:HB3	1.82	0.45
1:D:135:ASN:C	1:D:137:ASN:H	2.18	0.45
1:A:43:PHE:O	1:A:44:LYS:HB2	2.16	0.45
1:E:121:ASN:CA	1:E:124:ILE:HG22	2.46	0.45
1:B:47:GLU:HG2	1:B:106:TYR:CD1	2.50	0.45
1:B:75:ASN:HB2	1:B:139:GLU:OE2	2.16	0.45
1:B:3:LEU:CD1	1:B:4:LYS:N	2.80	0.45
1:D:54:LEU:HD11	1:D:99:ILE:CD1	2.47	0.44
1:D:103:TYR:CE1	1:E:165:GLU:CG	3.01	0.44
1:E:106:TYR:HB3	1:E:112:ILE:HG21	1.98	0.44
1:E:109:THR:O	1:E:109:THR:HG22	2.16	0.44
1:B:72:ALA:HA	1:B:73:LYS:HZ2	1.81	0.44
1:E:110:ASN:H	1:E:110:ASN:ND2	2.16	0.44
1:B:24:THR:HG23	1:B:27:GLU:H	1.82	0.44
1:A:93:TYR:HA	1:A:94:PRO:HD3	1.86	0.44
1:D:165:GLU:HG2	1:D:166:GLN:H	1.83	0.44
1:E:146:ASN:ND2	1:E:150:LYS:HE3	2.33	0.44
1:B:131:PHE:CE2	1:B:148:VAL:HG12	2.53	0.44
1:E:29:VAL:HG21	1:E:36:LYS:N	2.33	0.44
1:E:47:GLU:HG2	1:E:106:TYR:OH	2.18	0.44
1:E:135:ASN:O	1:E:137:ASN:N	2.48	0.44
1:A:47:GLU:CG	1:A:106:TYR:CZ	3.02	0.43
1:B:112:ILE:HG22	1:B:113:ASN:OD1	2.18	0.43
1:B:14:LEU:HB3	1:B:23:THR:HG21	2.01	0.43
1:B:168:ILE:HG23	1:B:169:ASN:N	2.32	0.43
1:E:63:GLU:OE1	1:E:66:LYS:HD3	2.18	0.43
1:B:135:ASN:OD1	1:B:141:SER:HA	2.18	0.43
1:B:181:ILE:HD13	1:A:186:LEU:HD21	2.00	0.43
1:A:90:GLU:CB	3:A:201:RHQ:H101	2.49	0.43
1:A:143:ASN:C	1:A:143:ASN:HD22	2.22	0.43
1:E:46:LYS:O	1:E:49:LEU:HB3	2.19	0.43
1:E:96:GLN:CD	1:E:157:ASN:HD21	2.22	0.43
1:B:112:ILE:HG22	1:B:113:ASN:N	2.33	0.43
1:B:168:ILE:O	1:B:172:ILE:HG12	2.19	0.43
1:D:55:ASN:ND2	1:D:119:LEU:HD21	2.34	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:146:ASN:O	1:E:150:LYS:HG3	2.18	0.43
1:D:97:ASN:HD22	1:E:100:ILE:CG1	2.32	0.43
1:D:180:GLN:HG2	1:D:184:ASN:HD21	1.83	0.43
1:A:24:THR:HA	2:A:800:SO4:O3	2.19	0.43
1:A:47:GLU:HG3	1:A:106:TYR:CZ	2.54	0.43
1:A:123:TYR:HA	3:A:201:RHQ:H291	2.00	0.43
1:B:10:VAL:O	1:B:14:LEU:HD13	2.19	0.42
1:B:21:ASN:OD1	1:B:105:GLU:OE1	2.37	0.42
1:D:73:LYS:HB2	1:D:73:LYS:NZ	2.33	0.42
1:A:54:LEU:HD12	1:A:54:LEU:HA	1.84	0.42
1:E:143:ASN:CG	1:E:144:ASP:H	2.23	0.42
1:B:89:THR:HG22	1:B:90:GLU:H	1.85	0.42
1:A:30:LYS:O	1:A:30:LYS:HD3	2.19	0.42
1:A:36:LYS:HG3	2:A:699:SO4:O3	2.19	0.42
1:E:163:THR:O	1:E:171:ARG:CD	2.66	0.42
1:B:147:ALA:O	1:B:151:ILE:HG13	2.19	0.42
1:B:18:ASN:HB2	1:B:23:THR:HG22	2.01	0.42
1:B:144:ASP:OD2	1:B:144:ASP:N	2.49	0.42
1:D:2:ASN:HB3	1:D:5:ASP:HB2	2.01	0.42
1:D:34:SER:OG	1:D:38:ASN:ND2	2.50	0.42
1:A:163:THR:HG22	1:A:171:ARG:HD3	2.02	0.42
1:E:29:VAL:HG12	1:E:30:LYS:N	2.34	0.42
1:E:74:THR:O	1:E:77:GLU:HB2	2.19	0.42
1:B:73:LYS:HD2	1:B:77:GLU:CD	2.40	0.42
1:E:47:GLU:CG	1:E:106:TYR:OH	2.67	0.42
1:B:3:LEU:HD13	1:B:3:LEU:C	2.40	0.42
1:D:51:LEU:HD23	1:D:51:LEU:HA	1.81	0.42
1:A:112:ILE:O	1:A:116:MSE:HG3	2.20	0.42
1:E:121:ASN:C	1:E:124:ILE:HG22	2.40	0.42
1:B:3:LEU:HD12	1:B:4:LYS:N	2.34	0.42
1:B:112:ILE:HD13	1:B:112:ILE:HA	1.91	0.42
1:D:54:LEU:HD12	1:D:54:LEU:HA	1.84	0.42
1:D:70:ILE:C	1:D:72:ALA:H	2.23	0.42
1:A:43:PHE:O	1:A:48:ASN:HB3	2.19	0.42
1:D:6:LYS:HA	2:D:999:SO4:O1	2.20	0.41
1:B:166:GLN:HG2	1:B:171:ARG:HD3	2.02	0.41
1:B:115:LYS:CA	1:B:118:LYS:HB3	2.49	0.41
1:A:163:THR:HG23	1:A:166:GLN:OE1	2.19	0.41
1:E:64:GLN:O	1:E:68:GLU:HB2	2.20	0.41
1:D:163:THR:O	1:D:171:ARG:HD2	2.20	0.41
1:E:68:GLU:HG2	1:E:85:LEU:HD21	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:23:THR:HA	1:B:27:GLU:OE2	2.20	0.41
1:B:75:ASN:N	1:B:139:GLU:OE2	2.53	0.41
1:D:3:LEU:HB2	2:D:900:SO4:S	2.60	0.41
1:D:57:GLU:HG3	1:D:95:LEU:HD12	2.03	0.41
1:D:96:GLN:HG2	1:D:161:THR:HG21	2.02	0.41
1:A:60:LYS:O	1:A:64:GLN:HG3	2.21	0.41
3:A:201:RHQ:H232	3:A:201:RHQ:H202	2.03	0.41
1:E:184:ASN:HD22	1:E:184:ASN:HA	1.71	0.41
1:B:173:LYS:HD3	1:B:173:LYS:HA	1.61	0.41
1:B:181:ILE:O	1:A:185:GLY:HA3	2.21	0.41
1:D:57:GLU:HG3	1:D:95:LEU:CD1	2.51	0.41
1:D:65:TRP:O	1:D:69:GLN:HB3	2.21	0.41
1:E:184:ASN:C	1:E:186:LEU:H	2.24	0.41
1:B:70:ILE:H	1:B:70:ILE:HG13	1.66	0.41
1:E:183:LEU:HD12	1:E:183:LEU:HA	1.85	0.41
1:D:101:GLU:OE2	1:E:101:GLU:OE2	2.39	0.40
1:A:184:ASN:HD22	1:A:184:ASN:HA	1.70	0.40
1:E:76:ARG:CD	1:E:183:LEU:HD23	2.48	0.40
1:A:64:GLN:OE1	3:A:201:RHQ:H242	2.22	0.40
1:A:85:LEU:HD12	1:A:85:LEU:HA	1.86	0.40
1:E:122:LYS:HE2	4:E:913:HOH:O	2.21	0.40
1:B:113:ASN:O	1:B:117:ASN:HB2	2.22	0.40
1:B:114:GLU:HB3	1:B:115:LYS:H	1.69	0.40
1:A:163:THR:CG2	1:A:166:GLN:CD	2.89	0.40
1:D:31:LEU:HD12	1:D:31:LEU:HA	1.91	0.40
1:B:11:ALA:O	1:B:12:LYS:C	2.60	0.40
1:B:64:GLN:O	1:B:68:GLU:HG3	2.21	0.40
1:D:10:VAL:HG11	1:D:31:LEU:HB3	2.03	0.40
1:D:96:GLN:O	1:D:100:ILE:HG13	2.21	0.40
1:D:97:ASN:HD22	1:E:100:ILE:HD11	1.86	0.40
1:A:14:LEU:HD12	1:A:14:LEU:HA	1.82	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)
4:E:907:HOH:O	4:E:907:HOH:O[7_556]	1.50	0.70

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	184/194 (95%)	174 (95%)	9 (5%)	1 (0%)	29	51
1	B	184/194 (95%)	156 (85%)	22 (12%)	6 (3%)	4	8
1	D	184/194 (95%)	163 (89%)	17 (9%)	4 (2%)	6	14
1	E	184/194 (95%)	163 (89%)	16 (9%)	5 (3%)	5	11
All	All	736/776 (95%)	656 (89%)	64 (9%)	16 (2%)	6	14

All (16) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	44	LYS
1	D	186	LEU
1	E	110	ASN
1	B	41	TYR
1	B	89	THR
1	D	44	LYS
1	D	110	ASN
1	E	143	ASN
1	B	92	TYR
1	B	114	GLU
1	D	92	TYR
1	B	110	ASN
1	A	111	SER
1	E	92	TYR
1	E	136	LEU
1	E	185	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	169/174 (97%)	154 (91%)	15 (9%)	9	20
1	B	169/174 (97%)	148 (88%)	21 (12%)	4	9
1	D	169/174 (97%)	155 (92%)	14 (8%)	11	24
1	E	169/174 (97%)	155 (92%)	14 (8%)	11	24
All	All	676/696 (97%)	612 (90%)	64 (10%)	8	17

All (64) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	3	LEU
1	B	5	ASP
1	B	6	LYS
1	B	42	HIS
1	B	51	LEU
1	B	73	LYS
1	B	85	LEU
1	B	89	THR
1	B	95	LEU
1	B	107	TYR
1	B	108	LYS
1	B	110	ASN
1	B	113	ASN
1	B	114	GLU
1	B	120	GLU
1	B	143	ASN
1	B	146	ASN
1	B	157	ASN
1	B	165	GLU
1	B	167	ASN
1	B	169	ASN
1	D	2	ASN
1	D	3	LEU
1	D	4	LYS
1	D	43	PHE
1	D	45	THR
1	D	55	ASN
1	D	66	LYS
1	D	71	LYS
1	D	73	LYS

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Mol	Chain	Res	Type
1	D	104	THR
1	D	137	ASN
1	D	164	HIS
1	D	167	ASN
1	D	177	LYS
1	A	14	LEU
1	A	25	THR
1	A	39	LEU
1	A	49	LEU
1	A	54	LEU
1	A	58	GLU
1	A	85	LEU
1	A	90	GLU
1	A	105	GLU
1	A	107	TYR
1	A	108	LYS
1	A	135	ASN
1	A	143	ASN
1	A	167	ASN
1	A	173	LYS
1	E	25	THR
1	E	29	VAL
1	E	51	LEU
1	E	54	LEU
1	E	55	ASN
1	E	58	GLU
1	E	76	ARG
1	E	85	LEU
1	E	100	ILE
1	E	107	TYR
1	E	133	GLU
1	E	161	THR
1	E	165	GLU
1	E	169	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (49) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	18	ASN
1	B	48	ASN
1	B	62	GLN
1	B	69	GLN

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Mol	Chain	Res	Type
1	B	83	ASN
1	B	96	GLN
1	B	110	ASN
1	B	143	ASN
1	B	154	ASN
1	B	157	ASN
1	B	167	ASN
1	B	169	ASN
1	B	184	ASN
1	D	55	ASN
1	D	64	GLN
1	D	75	ASN
1	D	83	ASN
1	D	96	GLN
1	D	97	ASN
1	D	154	ASN
1	D	167	ASN
1	D	176	ASN
1	D	184	ASN
1	A	21	ASN
1	A	38	ASN
1	A	83	ASN
1	A	121	ASN
1	A	135	ASN
1	A	143	ASN
1	A	146	ASN
1	A	154	ASN
1	A	166	GLN
1	A	167	ASN
1	A	180	GLN
1	A	184	ASN
1	E	18	ASN
1	E	38	ASN
1	E	62	GLN
1	E	64	GLN
1	E	83	ASN
1	E	96	GLN
1	E	97	ASN
1	E	110	ASN
1	E	117	ASN
1	E	121	ASN
1	E	143	ASN

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Mol	Chain	Res	Type
1	E	146	ASN
1	E	169	ASN
1	E	184	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

24 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	B	600	-	4,4,4	0.25	0	6,6,6	0.09	0
2	SO4	B	700	-	4,4,4	0.26	0	6,6,6	0.08	0
2	SO4	B	601	-	4,4,4	0.29	0	6,6,6	0.07	0
2	SO4	E	900	-	4,4,4	0.27	0	6,6,6	0.12	0
2	SO4	A	799	-	4,4,4	0.22	0	6,6,6	0.09	0
2	SO4	E	901	-	4,4,4	0.23	0	6,6,6	0.10	0
2	SO4	A	801	-	4,4,4	0.29	0	6,6,6	0.06	0
3	RHQ	A	201	-	33,36,36	6.95	26 (78%)	43,51,51	4.10	21 (48%)
2	SO4	A	800	-	4,4,4	0.31	0	6,6,6	0.09	0
2	SO4	B	199	-	4,4,4	0.19	0	6,6,6	0.13	0
2	SO4	E	399	-	4,4,4	0.24	0	6,6,6	0.10	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	SO4	D	899	-	4,4,4	0.33	0	6,6,6	0.07	0
2	SO4	A	299	-	4,4,4	0.27	0	6,6,6	0.08	0
2	SO4	D	901	-	4,4,4	0.28	0	6,6,6	0.08	0
2	SO4	A	699	-	4,4,4	0.26	0	6,6,6	0.09	0
2	SO4	B	1000	-	4,4,4	0.23	0	6,6,6	0.05	0
2	SO4	A	802	-	4,4,4	0.29	0	6,6,6	0.09	0
2	SO4	D	999	-	4,4,4	0.28	0	6,6,6	0.09	0
2	SO4	D	1000	-	4,4,4	0.25	0	6,6,6	0.08	0
2	SO4	D	900	-	4,4,4	0.27	0	6,6,6	0.07	0
2	SO4	A	599	-	4,4,4	0.20	0	6,6,6	0.09	0
2	SO4	E	902	-	4,4,4	0.26	0	6,6,6	0.06	0
2	SO4	B	499	-	4,4,4	0.24	0	6,6,6	0.07	0
2	SO4	E	903	-	4,4,4	0.25	0	6,6,6	0.07	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	RHQ	A	201	-	-	3/15/21/21	0/4/4/4

All (26) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	201	RHQ	C2-C9	15.73	1.65	1.39
3	A	201	RHQ	C14-C9	13.97	1.66	1.50
3	A	201	RHQ	C8-C7	11.81	1.57	1.41
3	A	201	RHQ	C19-C14	11.55	1.58	1.40
3	A	201	RHQ	C16-C15	9.46	1.58	1.38
3	A	201	RHQ	C13-C8	9.01	1.60	1.42
3	A	201	RHQ	C3-C4	8.98	1.52	1.37
3	A	201	RHQ	O1-C7	8.52	1.51	1.36
3	A	201	RHQ	C11-C12	7.88	1.56	1.40
3	A	201	RHQ	C6-C1	7.73	1.53	1.36
3	A	201	RHQ	C10-C11	7.67	1.52	1.37
3	A	201	RHQ	C6-C5	6.90	1.48	1.40
3	A	201	RHQ	C3-C2	6.86	1.51	1.39
3	A	201	RHQ	O2-C26	6.62	1.50	1.33
3	A	201	RHQ	C21-C4	5.87	1.62	1.51
3	A	201	RHQ	C9-C8	5.76	1.54	1.43
3	A	201	RHQ	C15-C14	5.57	1.48	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	201	RHQ	C17-C16	5.57	1.52	1.38
3	A	201	RHQ	C18-C19	4.41	1.46	1.39
3	A	201	RHQ	O27-C26	4.01	1.33	1.22
3	A	201	RHQ	C19-C26	-3.59	1.42	1.50
3	A	201	RHQ	C20-C12	3.41	1.57	1.51
3	A	201	RHQ	C17-C18	3.34	1.45	1.38
3	A	201	RHQ	C22-N1	2.96	1.56	1.46
3	A	201	RHQ	C13-C12	2.93	1.45	1.37
3	A	201	RHQ	C10-C7	2.30	1.42	1.37

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	201	RHQ	C2-C9-C8	-15.55	106.39	119.63
3	A	201	RHQ	C12-C11-N1	7.90	129.40	119.38
3	A	201	RHQ	C9-C8-C7	7.52	126.29	119.21
3	A	201	RHQ	C18-C19-C14	6.84	127.60	119.74
3	A	201	RHQ	C15-C14-C19	-6.65	110.49	118.03
3	A	201	RHQ	C10-C11-N1	-5.92	112.26	121.58
3	A	201	RHQ	C14-C9-C8	5.87	129.30	119.42
3	A	201	RHQ	C3-C2-C9	-5.11	116.97	123.97
3	A	201	RHQ	C5-C6-C1	-4.74	114.94	119.46
3	A	201	RHQ	C28-O2-C26	4.71	127.42	116.46
3	A	201	RHQ	C18-C19-C26	-4.57	109.28	118.66
3	A	201	RHQ	O1-C1-C6	-4.08	111.19	116.03
3	A	201	RHQ	C11-C10-C7	3.45	122.75	119.46
3	A	201	RHQ	C22-N1-C11	3.21	129.87	123.21
3	A	201	RHQ	O1-C7-C8	2.63	123.73	121.03
3	A	201	RHQ	C20-C12-C11	2.40	123.97	121.25
3	A	201	RHQ	C6-C1-C2	2.37	123.01	118.69
3	A	201	RHQ	O2-C26-C19	2.20	116.57	112.21
3	A	201	RHQ	C13-C8-C9	-2.16	118.58	122.24
3	A	201	RHQ	C2-C3-C4	-2.05	118.56	122.00
3	A	201	RHQ	C16-C17-C18	-2.04	117.09	120.19

There are no chirality outliers.

All (3) torsion outliers are listed below:

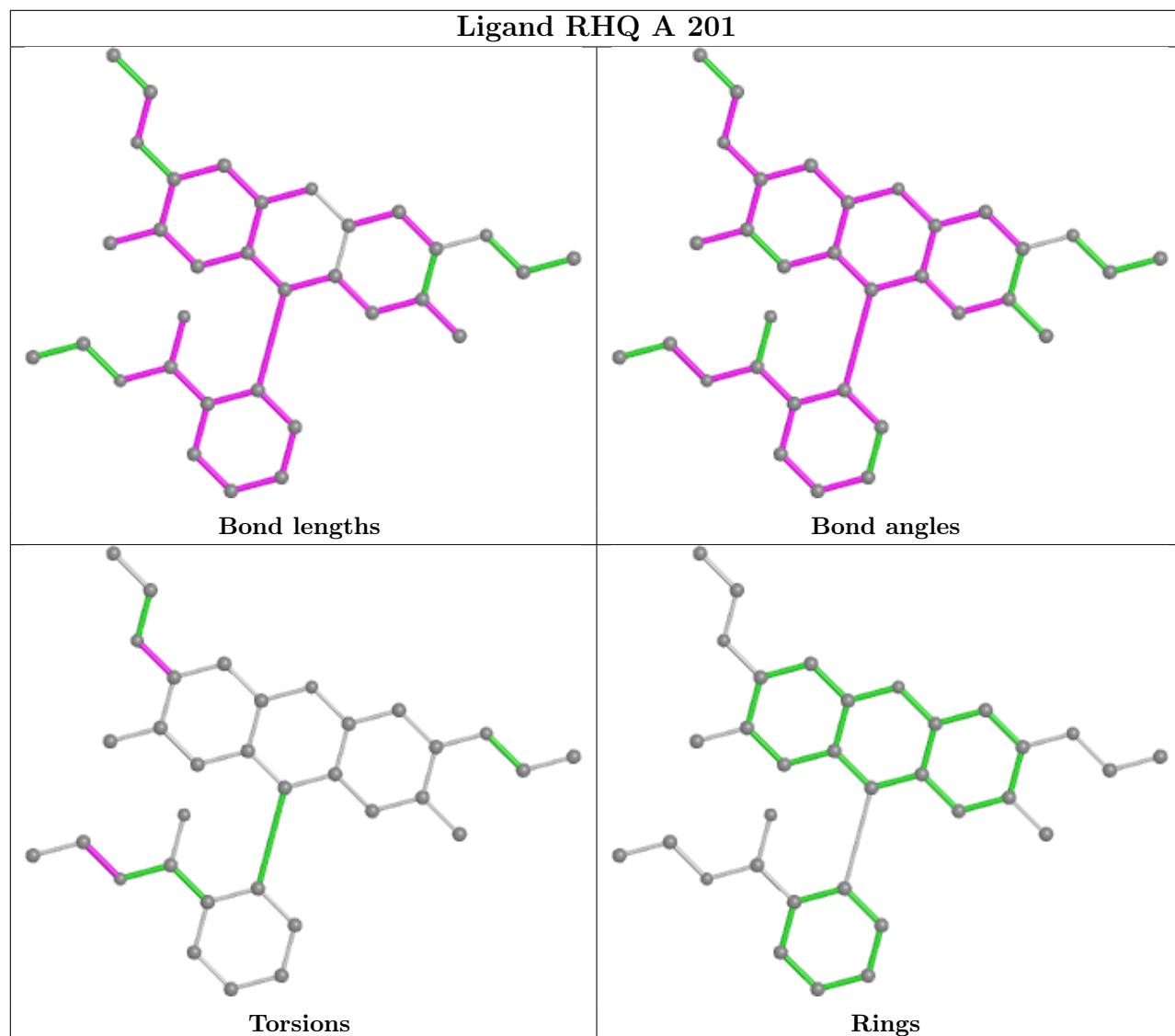
Mol	Chain	Res	Type	Atoms
3	A	201	RHQ	C10-C11-N1-C22
3	A	201	RHQ	C12-C11-N1-C22
3	A	201	RHQ	C29-C28-O2-C26

There are no ring outliers.

8 monomers are involved in 21 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	600	SO4	1	0
3	A	201	RHQ	10	0
2	A	800	SO4	3	0
2	D	899	SO4	1	0
2	A	699	SO4	1	0
2	D	999	SO4	1	0
2	D	900	SO4	2	0
2	A	599	SO4	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [\(i\)](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	184/194 (94%)	0.08	3 (1%) 72 68	34, 53, 89, 118	0
1	B	184/194 (94%)	0.25	3 (1%) 72 68	36, 70, 121, 145	0
1	D	184/194 (94%)	0.42	7 (3%) 40 32	42, 70, 105, 119	0
1	E	184/194 (94%)	0.42	11 (5%) 21 15	39, 60, 97, 111	0
All	All	736/776 (94%)	0.29	24 (3%) 46 39	34, 62, 108, 145	0

All (24) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	187	SER	4.6
1	E	187	SER	3.4
1	D	186	LEU	3.2
1	D	131	PHE	2.8
1	A	187	SER	2.8
1	E	141	SER	2.7
1	B	28	ILE	2.7
1	E	41	TYR	2.7
1	B	110	ASN	2.6
1	A	123	TYR	2.6
1	E	44	LYS	2.5
1	D	123	TYR	2.4
1	D	58	GLU	2.4
1	E	186	LEU	2.4
1	E	140	TRP	2.3
1	E	146	ASN	2.3
1	E	142	ILE	2.3
1	A	107	TYR	2.3
1	E	123	TYR	2.3
1	D	140	TRP	2.2
1	D	142	ILE	2.2

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Mol	Chain	Res	Type	RSRZ
1	E	42	HIS	2.1
1	B	41	TYR	2.1
1	E	103	TYR	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, 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.

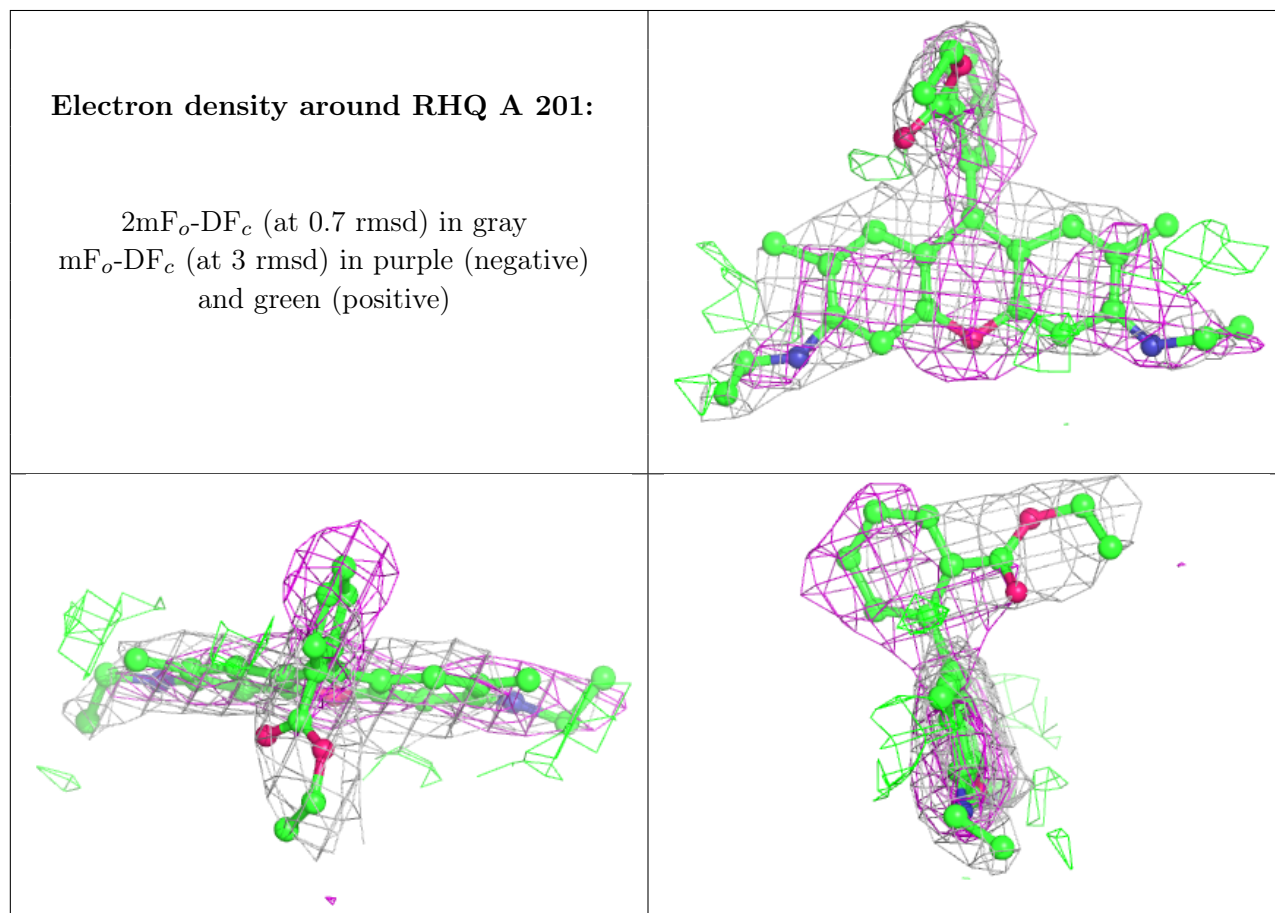
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	SO4	D	1000	5/5	0.58	0.48	144,144,145,145	0
2	SO4	A	802	5/5	0.67	0.54	145,145,146,146	0
2	SO4	B	1000	5/5	0.72	0.37	199,199,199,199	0
2	SO4	E	901	5/5	0.73	0.29	137,137,137,138	0
2	SO4	D	899	5/5	0.75	0.37	118,119,121,122	0
2	SO4	E	399	5/5	0.76	0.63	175,175,176,176	0
2	SO4	A	699	5/5	0.77	0.38	142,143,143,144	0
2	SO4	A	299	5/5	0.78	0.24	130,130,130,130	0
2	SO4	B	499	5/5	0.79	0.22	137,137,138,138	0
2	SO4	B	600	5/5	0.80	0.37	143,143,143,144	0
2	SO4	E	903	5/5	0.80	0.33	174,174,174,174	0
2	SO4	B	700	5/5	0.81	0.21	174,174,174,174	0
3	RHQ	A	201	33/33	0.82	0.47	30,38,44,48	0
2	SO4	A	801	5/5	0.83	0.19	129,129,129,129	0
2	SO4	E	902	5/5	0.83	0.21	138,138,138,138	0
2	SO4	B	601	5/5	0.84	0.22	133,133,133,134	0
2	SO4	D	901	5/5	0.87	0.41	131,131,132,132	0
2	SO4	E	900	5/5	0.89	0.18	116,116,116,116	0
2	SO4	B	199	5/5	0.89	0.33	123,124,124,124	0
2	SO4	A	599	5/5	0.89	0.28	121,122,123,124	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	SO4	D	999	5/5	0.91	0.19	122,122,123,123	0
2	SO4	A	800	5/5	0.91	0.26	98,98,99,100	0
2	SO4	D	900	5/5	0.92	0.18	127,127,128,128	0
2	SO4	A	799	5/5	0.98	0.32	83,83,85,85	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.



6.5 Other polymers [\(i\)](#)

There are no such residues in this entry.