



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 3, 2024 – 07:41 pm GMT

PDB ID : 5A23
Title : SdsA sulfatase triclinic form
Authors : De la Mora, E.; Flores-Hernandez, E.; Jakoncik, J.; Stojanoff, V.; Sanchez-Puig, N.; Moreno, A.
Deposited on : 2015-05-11
Resolution : 2.41 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 types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.36
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

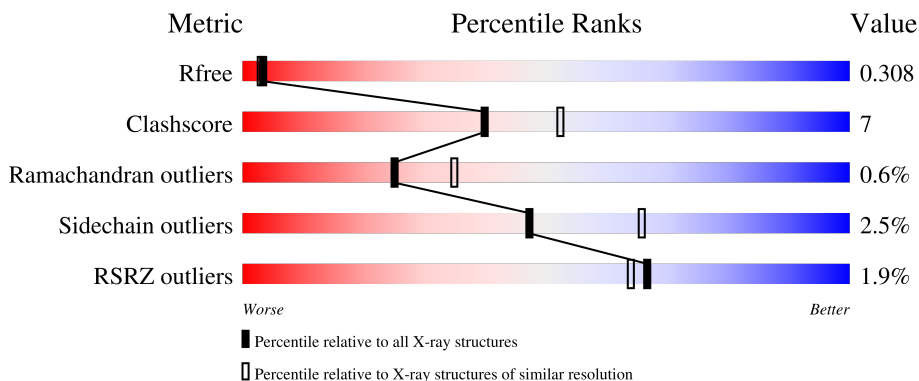
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.41 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	4647 (2.44-2.40)
Clashscore	141614	5161 (2.44-2.40)
Ramachandran outliers	138981	5073 (2.44-2.40)
Sidechain outliers	138945	5074 (2.44-2.40)
RSRZ outliers	127900	4543 (2.44-2.40)

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 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	658	 2% 79% 15% • 5%
1	B	658	 3% 77% 17% • 5%
1	C	658	 % 75% 19% • 5%
1	D	658	 % 78% 16% • 5%

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 19632 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.

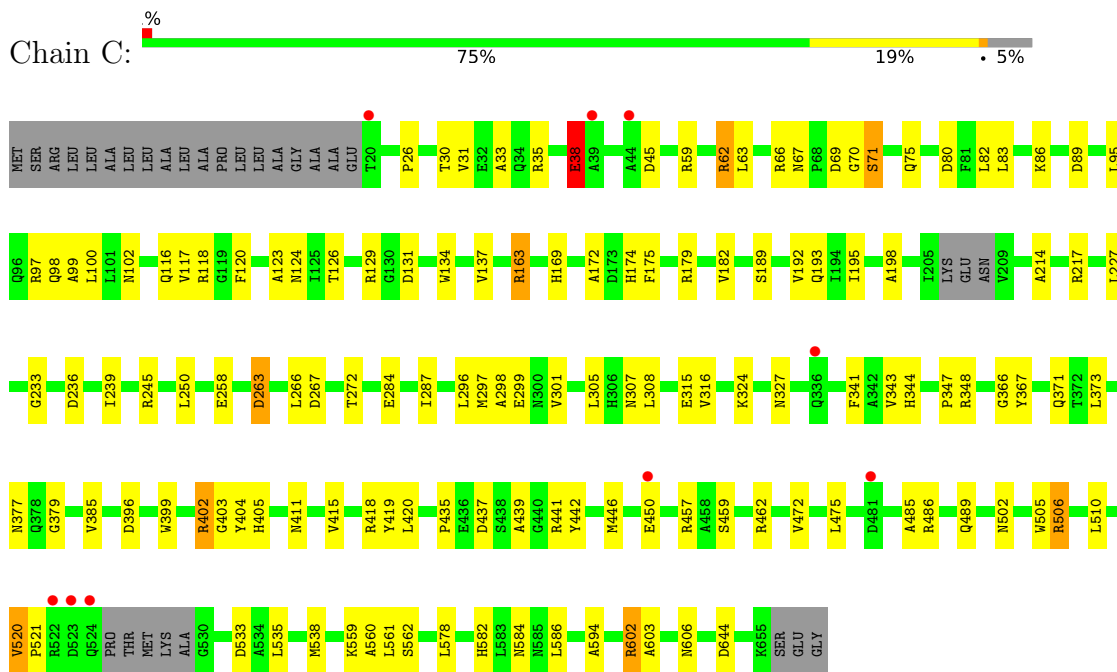
- Molecule 1 is a protein called SDS HYDROLASE SDSA1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	628	4906	3096	887	913	10	0	0	1
1	B	628	4906	3096	887	913	10	0	0	1
1	C	628	4906	3096	887	913	10	0	0	1
1	D	628	4906	3096	887	913	10	0	0	1

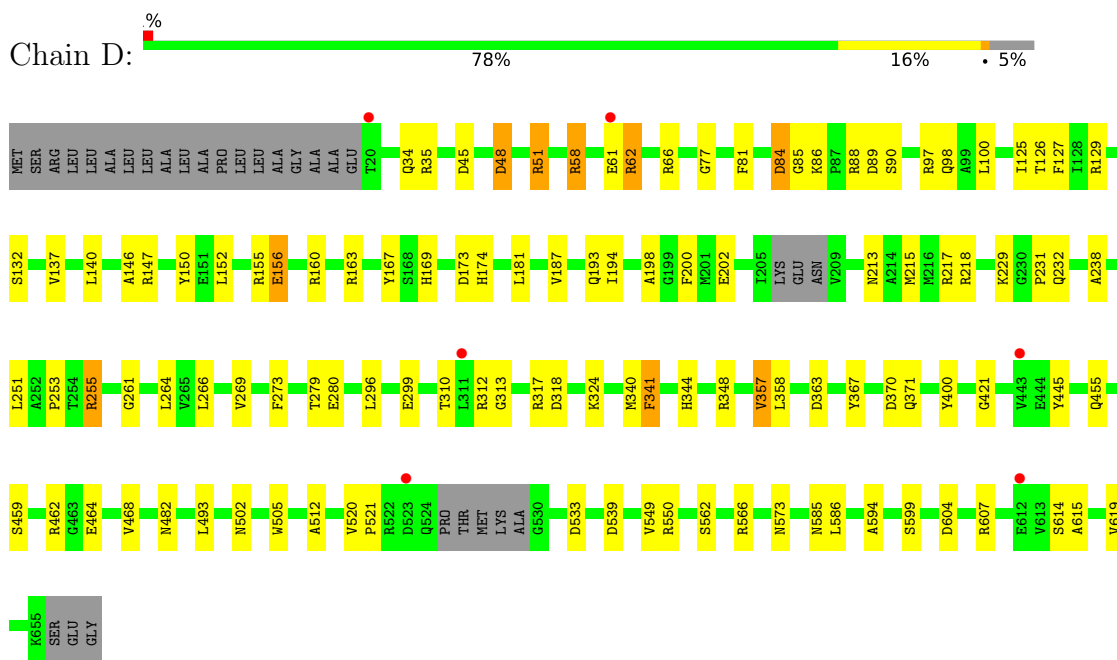
- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	2	Total	Zn	0	0
			2	2		
2	B	2	Total	Zn	0	0
			2	2		
2	C	2	Total	Zn	0	0
			2	2		
2	D	2	Total	Zn	0	0
			2	2		

• Molecule 1: SDS HYDROLASE SDSA1



• Molecule 1: SDS HYDROLASE SDSA1



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	86.90Å 86.80Å 129.03Å 107.59° 102.96° 95.59°	Depositor
Resolution (Å)	118.77 – 2.41 19.73 – 2.41	Depositor EDS
% Data completeness (in resolution range)	71.7 (118.77-2.41) 62.0 (19.73-2.41)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.27 (at 2.41Å)	Xtrriage
Refinement program	REFMAC 5.8.0107	Depositor
R, R_{free}	0.253 , 0.307 0.258 , 0.308	Depositor DCC
R_{free} test set	4958 reflections (5.19%)	wwPDB-VP
Wilson B-factor (Å ²)	41.1	Xtrriage
Anisotropy	0.154	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 21.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.39$, $\langle L^2 \rangle = 0.22$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.91	EDS
Total number of atoms	19632	wwPDB-VP
Average B, all atoms (Å ²)	46.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.32% 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:
ZN

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	0.97	1/5012 (0.0%)	1.07	21/6805 (0.3%)
1	B	0.82	2/5012 (0.0%)	0.95	4/6805 (0.1%)
1	C	0.85	0/5012	1.00	18/6805 (0.3%)
1	D	0.92	0/5012	1.02	18/6805 (0.3%)
All	All	0.89	3/20048 (0.0%)	1.01	61/27220 (0.2%)

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	1
1	B	0	1
1	C	0	1
All	All	0	3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	299	GLU	CD-OE2	5.89	1.32	1.25
1	B	299	GLU	CD-OE2	5.68	1.31	1.25
1	B	338	GLU	CD-OE1	5.33	1.31	1.25

All (61) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	59	ARG	NE-CZ-NH1	10.62	125.61	120.30
1	A	370	ASP	CB-CG-OD2	9.75	127.07	118.30
1	A	59	ARG	NE-CZ-NH2	-9.45	115.58	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	370	ASP	CB-CG-OD1	-9.26	109.97	118.30
1	C	217	ARG	NE-CZ-NH1	8.78	124.69	120.30
1	D	255	ARG	NE-CZ-NH1	8.67	124.63	120.30
1	D	370	ASP	CB-CG-OD2	8.40	125.86	118.30
1	A	69	ASP	CB-CG-OD1	7.88	125.39	118.30
1	C	602	ARG	NE-CZ-NH1	7.88	124.24	120.30
1	D	255	ARG	NE-CZ-NH2	-7.64	116.48	120.30
1	D	318	ASP	CB-CG-OD2	-7.44	111.60	118.30
1	D	51	ARG	NE-CZ-NH1	7.33	123.97	120.30
1	A	255	ARG	NE-CZ-NH2	-7.11	116.75	120.30
1	D	129	ARG	NE-CZ-NH1	6.85	123.72	120.30
1	B	48	ASP	CB-CG-OD2	-6.84	112.14	118.30
1	B	550	ARG	CB-CA-C	-6.73	96.93	110.40
1	A	173	ASP	CB-CG-OD2	6.70	124.33	118.30
1	A	370	ASP	CB-CG-OD1	-6.46	112.48	118.30
1	C	462	ARG	NE-CZ-NH1	6.44	123.52	120.30
1	A	255	ARG	NE-CZ-NH1	6.33	123.47	120.30
1	D	217	ARG	NE-CZ-NH1	6.32	123.46	120.30
1	C	129	ARG	NE-CZ-NH1	6.26	123.43	120.30
1	C	263	ASP	CB-CG-OD1	6.23	123.91	118.30
1	D	550	ARG	NE-CZ-NH1	6.08	123.34	120.30
1	C	217	ARG	NE-CZ-NH2	-6.07	117.27	120.30
1	A	299	GLU	OE1-CD-OE2	6.04	130.54	123.30
1	C	506	ARG	NE-CZ-NH1	5.98	123.29	120.30
1	C	486	ARG	NE-CZ-NH1	5.95	123.28	120.30
1	A	348	ARG	NE-CZ-NH2	-5.95	117.33	120.30
1	C	66	ARG	NE-CZ-NH1	5.95	123.27	120.30
1	A	533	ASP	CB-CG-OD1	5.90	123.61	118.30
1	D	533	ASP	CB-CG-OD1	5.88	123.59	118.30
1	B	66	ARG	NE-CZ-NH1	5.87	123.24	120.30
1	A	218	ARG	NE-CZ-NH1	5.82	123.21	120.30
1	A	363	ASP	CB-CG-OD2	-5.81	113.07	118.30
1	C	402	ARG	NE-CZ-NH2	-5.74	117.43	120.30
1	C	402	ARG	NE-CZ-NH1	5.65	123.12	120.30
1	A	129	ARG	NE-CZ-NH2	-5.64	117.48	120.30
1	D	156	GLU	OE1-CD-OE2	5.58	130.00	123.30
1	D	58	ARG	NE-CZ-NH2	-5.56	117.52	120.30
1	A	97	ARG	NE-CZ-NH1	5.56	123.08	120.30
1	C	97	ARG	NE-CZ-NH1	5.52	123.06	120.30
1	C	533	ASP	CB-CG-OD1	5.47	123.22	118.30
1	D	357	VAL	CG1-CB-CG2	-5.45	102.18	110.90
1	C	163	ARG	NE-CZ-NH1	5.43	123.01	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	131	ASP	CB-CG-OD1	5.39	123.15	118.30
1	B	517	ARG	NE-CZ-NH2	-5.38	117.61	120.30
1	A	348	ARG	NE-CZ-NH1	5.35	122.98	120.30
1	A	587	ARG	NE-CZ-NH1	5.32	122.96	120.30
1	A	245	ARG	NE-CZ-NH2	-5.31	117.64	120.30
1	D	140	LEU	CB-CG-CD2	5.24	119.91	111.00
1	D	550	ARG	NE-CZ-NH2	-5.21	117.69	120.30
1	D	48	ASP	CB-CG-OD1	5.20	122.98	118.30
1	C	348	ARG	NE-CZ-NH1	5.20	122.90	120.30
1	C	457	ARG	NE-CZ-NH1	5.20	122.90	120.30
1	C	561	LEU	CA-CB-CG	5.17	127.20	115.30
1	D	66	ARG	NE-CZ-NH1	5.16	122.88	120.30
1	A	54	ARG	NE-CZ-NH2	-5.13	117.74	120.30
1	A	66	ARG	NE-CZ-NH1	5.12	122.86	120.30
1	D	363	ASP	CB-CG-OD1	5.08	122.88	118.30
1	A	58	ARG	NE-CZ-NH1	5.00	122.80	120.30

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	40	GLU	Peptide
1	B	523	ASP	Peptide
1	C	134	TRP	Peptide

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	4906	0	4818	52	0
1	B	4906	0	4818	100	0
1	C	4906	0	4818	87	0
1	D	4906	0	4818	66	0
2	A	2	0	0	0	0
2	B	2	0	0	0	0
2	C	2	0	0	0	0
2	D	2	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	19632	0	19272	280	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 7.

All (280) 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:299:GLU:OE2	2:D:1001:ZN:ZN	1.17	0.91
1:C:35:ARG:C	1:C:38:GLU:HG2	2.00	0.82
1:C:35:ARG:NH2	1:C:89:ASP:OD1	2.12	0.81
1:C:35:ARG:O	1:C:38:GLU:HG2	1.82	0.78
1:B:146:ALA:HB1	1:B:181:LEU:HD21	1.65	0.77
1:D:562:SER:OG	1:D:594:ALA:HA	1.83	0.77
1:B:213:ASN:ND2	1:C:377:ASN:O	2.18	0.75
1:C:35:ARG:O	1:C:38:GLU:N	2.18	0.73
1:A:377:ASN:O	1:D:213:ASN:ND2	2.23	0.72
1:B:550:ARG:HE	1:B:640:LEU:HD22	1.55	0.72
1:B:169:HIS:CE1	1:B:299:GLU:HG3	2.26	0.71
1:B:547:LEU:CA	1:B:550:ARG:HD3	2.20	0.71
1:B:327:ASN:ND2	1:C:586:LEU:HD22	2.06	0.70
1:B:340:MET:SD	1:B:358:LEU:HD21	2.32	0.70
1:D:58:ARG:HH22	1:D:155:ARG:HB2	1.56	0.70
1:B:608:LEU:HD21	1:B:615:ALA:HB2	1.74	0.69
1:B:169:HIS:CD2	1:B:280:GLU:OE2	2.46	0.68
1:C:31:VAL:HG11	1:C:89:ASP:HB3	1.76	0.68
1:D:604:ASP:OD1	1:D:607:ARG:NH2	2.23	0.68
1:C:227:LEU:HD21	1:C:510:LEU:O	1.94	0.68
1:C:118:ARG:HG2	1:C:124:ASN:OD1	1.93	0.67
1:D:58:ARG:CZ	1:D:156:GLU:HG2	2.24	0.67
1:D:84:ASP:OD2	1:D:88:ARG:NH1	2.28	0.66
1:A:545:ASP:OD1	1:D:324:LYS:NZ	2.24	0.66
1:B:299:GLU:HG2	1:B:343:VAL:CG2	2.25	0.66
1:C:35:ARG:O	1:C:38:GLU:CG	2.45	0.65
1:D:81:PHE:O	1:D:88:ARG:NH1	2.29	0.65
1:C:45:ASP:OD1	1:C:399:TRP:NE1	2.29	0.65
1:C:367:TYR:CZ	1:C:371:GLN:HG3	2.32	0.65
1:D:98:GLN:NE2	1:D:238:ALA:O	2.30	0.65
1:B:198:ALA:HB2	1:B:258:GLU:HG3	1.78	0.65
1:A:566:ARG:HG3	1:A:573:ASN:OD1	1.97	0.64
1:A:30:THR:OG1	1:A:495:GLN:OE1	2.14	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:538:MET:O	1:C:602:ARG:NH1	2.29	0.63
1:C:62:ARG:NH2	1:C:80:ASP:OD1	2.31	0.63
1:B:547:LEU:HB3	1:B:550:ARG:HD3	1.80	0.63
1:D:169:HIS:CD2	1:D:280:GLU:OE1	2.51	0.63
1:B:47:ALA:HA	1:B:50:GLU:OE2	1.99	0.62
1:C:63:LEU:O	1:C:75:GLN:HG3	1.99	0.62
1:B:547:LEU:CB	1:B:550:ARG:HD3	2.30	0.62
1:D:296:LEU:HA	1:D:341:PHE:O	2.00	0.62
1:C:31:VAL:CG1	1:C:89:ASP:HB3	2.30	0.61
1:A:297:MET:O	1:A:298:ALA:C	2.37	0.61
1:B:382:ILE:HA	1:B:416:LEU:HD13	1.83	0.61
1:C:316:VAL:HG11	1:C:418:ARG:HB2	1.83	0.60
1:B:290:PRO:O	1:B:293:LYS:NZ	2.25	0.60
1:A:264:LEU:HD12	1:A:273:PHE:CE2	2.37	0.60
1:A:496:LEU:HD23	1:A:509:TYR:CE1	2.37	0.60
1:B:190:GLY:HA3	1:D:255:ARG:HD2	1.82	0.59
1:A:367:TYR:CZ	1:A:392:PRO:HD3	2.36	0.59
1:C:535:LEU:O	1:C:602:ARG:NH2	2.36	0.58
1:D:90:SER:OG	1:D:231:PRO:O	2.21	0.58
1:C:80:ASP:HA	1:C:83:LEU:HD12	1.85	0.57
1:B:190:GLY:HA3	1:D:255:ARG:CD	2.34	0.57
1:C:118:ARG:CG	1:C:124:ASN:OD1	2.52	0.57
1:B:547:LEU:C	1:B:550:ARG:HD3	2.25	0.57
1:B:547:LEU:O	1:B:550:ARG:CD	2.53	0.57
1:C:437:ASP:O	1:C:441:ARG:NH2	2.31	0.57
1:D:566:ARG:HG2	1:D:573:ASN:OD1	2.04	0.57
1:B:586:LEU:HD22	1:C:327:ASN:ND2	2.19	0.57
1:A:122:LEU:HD22	1:A:243:LEU:HD13	1.86	0.57
1:B:539:ASP:OD2	1:B:541:GLY:N	2.37	0.57
1:A:39:ALA:O	1:A:40:GLU:HG2	2.05	0.56
1:B:547:LEU:O	1:B:550:ARG:HD3	2.05	0.56
1:B:550:ARG:HE	1:B:640:LEU:CD2	2.18	0.56
1:B:463:GLY:HA2	1:B:465:TYR:CE1	2.40	0.56
1:B:547:LEU:C	1:B:550:ARG:HH11	2.08	0.56
1:A:34:GLN:NE2	1:A:89:ASP:O	2.39	0.56
1:C:239:ILE:HD12	1:C:344:HIS:CE1	2.41	0.55
1:A:264:LEU:HD12	1:A:273:PHE:HE2	1.70	0.55
1:D:174:HIS:NE2	1:D:299:GLU:OE2	2.39	0.55
1:B:146:ALA:HB1	1:B:181:LEU:CD2	2.36	0.55
1:A:544:PHE:CD1	1:A:547:LEU:HD12	2.40	0.55
1:C:67:ASN:HB2	1:C:69:ASP:CG	2.27	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:263:ASP:OD1	1:C:272:THR:HG23	2.06	0.54
1:A:222:GLN:OE1	1:A:312:ARG:N	2.41	0.54
1:A:274:GLN:OE1	1:A:286:ASN:ND2	2.41	0.54
1:B:197:PRO:HG2	1:B:283:ALA:HB1	1.90	0.54
1:B:547:LEU:O	1:B:550:ARG:CG	2.56	0.54
1:C:126:THR:HB	1:C:137:VAL:HB	1.89	0.53
1:A:327:ASN:ND2	1:D:586:LEU:HD22	2.24	0.53
1:B:602:ARG:NE	1:B:606:ASN:OD1	2.40	0.53
1:A:387:ASN:OD1	1:A:466:ARG:NH2	2.37	0.53
1:A:598:VAL:HG21	1:A:633:LEU:HD22	1.89	0.53
1:D:202:GLU:OE1	1:D:202:GLU:N	2.42	0.53
1:D:232:GLN:N	1:D:232:GLN:OE1	2.36	0.52
1:C:472:VAL:HB	1:C:489:GLN:OE1	2.09	0.52
1:D:150:TYR:OH	1:D:160:ARG:O	2.21	0.52
1:B:90:SER:HA	1:B:498:TYR:HB3	1.92	0.52
1:D:84:ASP:OD1	1:D:85:GLY:N	2.43	0.52
1:C:82:LEU:O	1:C:100:LEU:HD21	2.10	0.52
1:C:396:ASP:OD1	1:C:402:ARG:NH1	2.42	0.51
1:B:496:LEU:CD2	1:B:509:TYR:CZ	2.93	0.51
1:B:453:LEU:HD11	1:B:475:LEU:HD21	1.93	0.51
1:B:512:ALA:O	1:B:516:LEU:HD12	2.10	0.51
1:C:193:GLN:NE2	1:C:195:ILE:HD11	2.26	0.50
1:A:80:ASP:HA	1:A:83:LEU:HD12	1.93	0.50
1:B:521:PRO:HG2	1:B:646:TRP:CD2	2.46	0.50
1:D:279:THR:O	1:D:317:ARG:NE	2.32	0.50
1:B:496:LEU:HD22	1:B:509:TYR:CE1	2.47	0.50
1:B:138:ASP:OD2	1:B:174:HIS:ND1	2.44	0.50
1:C:179:ARG:HA	1:C:182:VAL:O	2.12	0.50
1:D:187:VAL:HG21	1:D:251:LEU:HD22	1.93	0.50
1:B:550:ARG:HD2	1:B:640:LEU:HD13	1.94	0.49
1:B:196:ALA:HB1	1:B:197:PRO:HD2	1.93	0.49
1:B:647:PHE:CD1	1:C:379:GLY:HA3	2.47	0.49
1:B:127:PHE:CZ	1:B:153:VAL:HG21	2.48	0.49
1:D:464:GLU:O	1:D:468:VAL:HG23	2.11	0.49
1:D:367:TYR:CZ	1:D:371:GLN:HG3	2.48	0.49
1:D:146:ALA:HB1	1:D:181:LEU:HG	1.93	0.49
1:B:316:VAL:HG11	1:B:418:ARG:HB2	1.95	0.49
1:C:69:ASP:OD1	1:C:70:GLY:N	2.46	0.49
1:C:123:ALA:HB2	1:C:344:HIS:CE1	2.48	0.49
1:C:341:PHE:HB3	1:C:347:PRO:HB3	1.95	0.48
1:B:97:ARG:NH2	1:B:399:TRP:CD1	2.80	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:261:GLY:HA3	1:D:273:PHE:O	2.14	0.48
1:B:164:THR:HG23	1:B:193:GLN:CG	2.43	0.48
1:D:167:TYR:CD2	1:D:200:PHE:CZ	3.01	0.48
1:A:141:THR:O	1:A:176:GLY:HA3	2.14	0.48
1:C:298:ALA:O	1:C:343:VAL:HG22	2.14	0.48
1:C:308:LEU:HD12	1:C:411:ASN:HB3	1.95	0.48
1:D:340:MET:SD	1:D:358:LEU:HD21	2.53	0.48
1:B:522:ARG:O	1:B:524:GLN:NE2	2.46	0.48
1:C:266:LEU:O	1:C:267:ASP:C	2.51	0.48
1:A:423:TYR:O	1:D:218:ARG:NH2	2.32	0.47
1:B:545:ASP:OD1	1:C:324:LYS:NZ	2.36	0.47
1:C:69:ASP:OD1	1:C:71:SER:N	2.47	0.47
1:C:367:TYR:CE2	1:C:371:GLN:HG3	2.49	0.47
1:C:193:GLN:HE22	1:C:266:LEU:CD2	2.28	0.47
1:C:198:ALA:HB2	1:C:258:GLU:CG	2.44	0.47
1:A:249:SER:HA	1:A:533:ASP:OD2	2.14	0.47
1:B:189:SER:HB2	1:D:193:GLN:HE22	1.79	0.47
1:B:496:LEU:CD2	1:B:509:TYR:CE2	2.97	0.47
1:B:174:HIS:NE2	1:B:299:GLU:OE2	2.41	0.47
1:A:451:ARG:O	1:A:455:GLN:NE2	2.38	0.46
1:D:493:LEU:HD13	1:D:512:ALA:HB3	1.97	0.46
1:A:353:GLU:O	1:A:357:VAL:HG23	2.14	0.46
1:B:163:ARG:O	1:B:192:VAL:HA	2.15	0.46
1:C:95:LEU:HD11	1:C:236:ASP:HB3	1.96	0.46
1:C:99:ALA:HB2	1:C:236:ASP:HB2	1.96	0.46
1:B:173:ASP:HB3	1:B:174:HIS:CD2	2.50	0.46
1:D:299:GLU:OE2	1:D:344:HIS:NE2	2.49	0.46
1:C:307:ASN:ND2	1:C:405:HIS:CD2	2.83	0.46
1:C:435:PRO:O	1:C:439:ALA:HB2	2.16	0.46
1:D:357:VAL:HG22	1:D:400:TYR:CE2	2.51	0.46
1:B:23:PRO:HG2	1:B:232:GLN:HG3	1.98	0.46
1:D:169:HIS:CE1	1:D:299:GLU:HG3	2.51	0.46
1:B:305:LEU:HB3	1:B:403:GLY:HA2	1.98	0.46
1:D:45:ASP:O	1:D:97:ARG:NH2	2.46	0.46
1:A:121:ASP:OD2	1:A:140:LEU:HB3	2.16	0.46
1:B:547:LEU:HA	1:B:550:ARG:HD3	1.96	0.46
1:B:82:LEU:O	1:B:100:LEU:HD21	2.16	0.46
1:C:603:ALA:O	1:C:606:ASN:HB2	2.15	0.46
1:D:169:HIS:NE2	1:D:280:GLU:OE1	2.49	0.45
1:B:186:GLN:HB3	1:B:192:VAL:HG23	1.99	0.45
1:D:132:SER:OG	1:D:163:ARG:NE	2.47	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:445:TYR:HB3	1:C:446:MET:HG2	1.98	0.45
1:B:445:TYR:HH	1:C:459:SER:HG	1.64	0.45
1:C:299:GLU:HG2	1:C:343:VAL:CG2	2.47	0.45
1:D:615:ALA:O	1:D:619:VAL:HG23	2.17	0.45
1:A:523:ASP:HA	1:A:524:GLN:HE21	1.81	0.45
1:B:193:GLN:HE22	1:B:266:LEU:HD22	1.81	0.45
1:C:124:ASN:HD22	1:C:344:HIS:HA	1.82	0.45
1:A:169:HIS:HE1	1:A:174:HIS:CE1	2.35	0.45
1:D:310:THR:HG21	1:D:312:ARG:CZ	2.46	0.45
1:D:549:VAL:HG12	1:D:549:VAL:O	2.16	0.45
1:A:494:GLU:HG2	1:A:498:TYR:CE2	2.52	0.45
1:D:194:ILE:HB	1:D:253:PRO:HA	1.98	0.45
1:D:215:MET:HG2	1:D:313:GLY:O	2.17	0.45
1:A:376:ALA:HA	1:A:380:VAL:O	2.17	0.44
1:B:272:THR:HB	1:B:288:TRP:HB3	1.99	0.44
1:D:34:GLN:HA	1:D:34:GLN:OE1	2.17	0.44
1:A:495:GLN:O	1:A:499:GLN:HG3	2.17	0.44
1:B:164:THR:HG23	1:B:193:GLN:HG3	1.99	0.44
1:D:81:PHE:O	1:D:84:ASP:OD2	2.35	0.44
1:A:91:ILE:HD11	1:A:231:PRO:HA	2.00	0.44
1:A:361:GLN:O	1:A:364:LEU:HB3	2.18	0.44
1:A:407:SER:HB3	1:A:410:HIS:ND1	2.32	0.44
1:D:493:LEU:HD13	1:D:512:ALA:CB	2.47	0.44
1:A:169:HIS:CE1	1:A:174:HIS:NE2	2.86	0.44
1:B:129:ARG:O	1:B:269:VAL:HG21	2.18	0.44
1:C:172:ALA:HA	1:C:175:PHE:CZ	2.52	0.44
1:D:566:ARG:NH1	1:D:573:ASN:HD21	2.14	0.44
1:B:90:SER:HB2	1:B:498:TYR:CD1	2.53	0.44
1:B:250:LEU:HB3	1:B:533:ASP:HB3	2.00	0.43
1:B:535:LEU:O	1:B:602:ARG:NH2	2.51	0.43
1:B:211:ALA:HB1	1:C:420:LEU:HD21	1.99	0.43
1:A:544:PHE:HA	1:A:547:LEU:HB2	1.99	0.43
1:B:353:GLU:O	1:B:357:VAL:HG23	2.18	0.43
1:B:127:PHE:CE1	1:B:153:VAL:HG21	2.54	0.43
1:B:598:VAL:HG21	1:B:633:LEU:HD22	2.00	0.43
1:B:496:LEU:HD22	1:B:509:TYR:CZ	2.54	0.43
1:B:546:TYR:O	1:B:547:LEU:C	2.56	0.43
1:C:163:ARG:O	1:C:192:VAL:HA	2.18	0.43
1:C:193:GLN:NE2	1:C:266:LEU:HD22	2.34	0.43
1:C:562:SER:OG	1:C:594:ALA:HA	2.19	0.43
1:C:169:HIS:CE1	1:C:299:GLU:HG3	2.53	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:198:ALA:HB2	1:C:258:GLU:HG3	2.00	0.43
1:A:91:ILE:HG22	1:A:92:ASN:O	2.18	0.43
1:B:250:LEU:CB	1:B:533:ASP:HB3	2.48	0.43
1:B:311:LEU:HD21	1:B:410:HIS:CD2	2.54	0.43
1:D:125:ILE:HG12	1:D:127:PHE:CE1	2.54	0.43
1:B:403:GLY:CA	1:B:406:GLY:O	2.66	0.43
1:B:470:GLU:HG2	1:C:442:TYR:OH	2.19	0.43
1:B:556:ALA:HB1	1:B:581:SER:HA	2.01	0.43
1:D:147:ARG:HD3	1:D:147:ARG:HA	1.80	0.43
1:A:547:LEU:O	1:A:550:ARG:HB2	2.19	0.42
1:A:589:VAL:O	1:A:589:VAL:HG23	2.19	0.42
1:C:399:TRP:O	1:C:402:ARG:HG2	2.19	0.42
1:D:566:ARG:NH1	1:D:573:ASN:ND2	2.67	0.42
1:A:296:LEU:HD23	1:A:342:ALA:HA	2.01	0.42
1:B:138:ASP:CG	1:B:174:HIS:HB3	2.40	0.42
1:C:117:VAL:CG1	1:C:120:PHE:CD1	3.03	0.42
1:D:367:TYR:CE1	1:D:371:GLN:HG3	2.54	0.42
1:A:426:ASN:HA	1:A:427:PRO:HD3	1.91	0.42
1:A:502:ASN:OD1	1:A:504:GLY:N	2.52	0.42
1:B:188:ALA:O	1:D:264:LEU:HD22	2.19	0.42
1:B:472:VAL:HB	1:B:489:GLN:OE1	2.20	0.42
1:C:169:HIS:CE1	1:C:174:HIS:CD2	3.07	0.42
1:B:483:ARG:HE	1:B:483:ARG:HB2	1.69	0.42
1:C:116:GLN:HG2	1:C:126:THR:OG1	2.19	0.42
1:C:296:LEU:HA	1:C:341:PHE:O	2.19	0.42
1:C:411:ASN:O	1:C:415:VAL:HG23	2.20	0.42
1:C:502:ASN:HB3	1:C:505:TRP:HB2	2.00	0.42
1:D:126:THR:HB	1:D:137:VAL:HB	2.01	0.42
1:A:107:LEU:HB2	1:A:152:LEU:CD2	2.49	0.42
1:B:544:PHE:HA	1:B:547:LEU:HB2	2.02	0.42
1:B:637:PHE:O	1:B:640:LEU:HG	2.19	0.42
1:A:446:MET:HG2	1:D:445:TYR:HB3	2.02	0.42
1:A:472:VAL:O	1:A:476:VAL:HG23	2.20	0.42
1:B:382:ILE:HB	1:B:416:LEU:HD22	2.01	0.42
1:C:582:HIS:CE1	1:C:584:ASN:OD1	2.73	0.42
1:B:189:SER:HB2	1:D:193:GLN:NE2	2.35	0.42
1:B:305:LEU:HD13	1:B:364:LEU:HD21	2.01	0.42
1:C:233:GLY:O	1:C:506:ARG:NE	2.49	0.42
1:B:366:GLY:HA3	1:C:582:HIS:CE1	2.55	0.42
1:C:26:PRO:HB2	1:C:31:VAL:CG1	2.50	0.42
1:B:130:GLY:HA3	1:B:267:ASP:HB3	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:30:THR:O	1:C:33:ALA:HB3	2.20	0.41
1:B:272:THR:O	1:B:287:ILE:HA	2.20	0.41
1:A:164:THR:HG23	1:A:193:GLN:HB2	2.02	0.41
1:B:173:ASP:CB	1:B:174:HIS:CD2	3.03	0.41
1:A:169:HIS:CE1	1:A:174:HIS:CD2	3.09	0.41
1:C:560:ALA:HA	1:C:578:LEU:O	2.20	0.41
1:D:48:ASP:HA	1:D:51:ARG:HB2	2.02	0.41
1:C:475:LEU:CD2	1:C:485:ALA:HB2	2.51	0.41
1:C:402:ARG:HB2	1:C:404:TYR:CE2	2.56	0.41
1:D:502:ASN:HB3	1:D:505:TRP:HB2	2.02	0.41
1:B:103:LEU:HG	1:B:241:LYS:HD3	2.03	0.41
1:B:376:ALA:O	1:C:214:ALA:HB2	2.21	0.41
1:B:469:VAL:O	1:B:473:ASN:HB2	2.21	0.41
1:B:582:HIS:CE1	1:C:366:GLY:HA3	2.55	0.41
1:B:640:LEU:N	1:B:640:LEU:HD23	2.36	0.41
1:C:284:GLU:OE2	1:C:298:ALA:HB1	2.20	0.41
1:C:305:LEU:HB3	1:C:403:GLY:HA2	2.01	0.41
1:C:373:LEU:HD11	1:C:419:TYR:CE2	2.56	0.41
1:A:515:GLU:O	1:A:519:GLY:N	2.45	0.41
1:C:538:MET:O	1:C:602:ARG:NH2	2.50	0.41
1:D:266:LEU:O	1:D:269:VAL:N	2.48	0.41
1:A:35:ARG:NH2	1:A:38:GLU:OE2	2.43	0.41
1:B:280:GLU:OE2	1:B:284:GLU:OE1	2.39	0.41
1:B:550:ARG:CD	1:B:640:LEU:HD13	2.51	0.41
1:C:98:GLN:HE21	1:C:102:ASN:HD21	1.68	0.41
1:C:287:ILE:HD12	1:C:296:LEU:HD13	2.02	0.41
1:D:35:ARG:NH2	1:D:89:ASP:OD1	2.51	0.41
1:D:62:ARG:NH2	1:D:77:GLY:HA2	2.35	0.41
1:D:586:LEU:HD12	1:D:586:LEU:HA	1.95	0.41
1:C:373:LEU:HD21	1:C:419:TYR:CD2	2.56	0.41
1:A:309:TYR:CZ	1:D:421:GLY:HA3	2.57	0.40
1:B:168:SER:OG	1:B:169:HIS:N	2.54	0.40
1:A:172:ALA:C	1:A:174:HIS:H	2.24	0.40
1:A:407:SER:O	1:A:411:ASN:HB2	2.22	0.40
1:C:297:MET:HE2	1:C:301:VAL:CG2	2.51	0.40
1:B:540:THR:HG22	1:B:544:PHE:CE2	2.56	0.40
1:D:58:ARG:NH2	1:D:152:LEU:O	2.55	0.40
1:D:459:SER:HA	1:D:462:ARG:HD2	2.03	0.40
1:B:280:GLU:HG3	1:B:284:GLU:OE1	2.22	0.40
1:C:520:VAL:O	1:C:521:PRO:C	2.57	0.40
1:A:445:TYR:HA	1:D:455:GLN:OE1	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:366:GLY:HA3	1:C:582:HIS:NE2	2.36	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	622/658 (94%)	581 (93%)	37 (6%)	4 (1%)	25	35
1	B	622/658 (94%)	586 (94%)	33 (5%)	3 (0%)	29	40
1	C	622/658 (94%)	571 (92%)	49 (8%)	2 (0%)	41	54
1	D	622/658 (94%)	575 (92%)	41 (7%)	6 (1%)	15	22
All	All	2488/2632 (94%)	2313 (93%)	160 (6%)	15 (1%)	25	35

All (15) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	140	LEU
1	B	81	PHE
1	B	138	ASP
1	B	173	ASP
1	C	38	GLU
1	A	173	ASP
1	A	460	TYR
1	D	173	ASP
1	D	539	ASP
1	D	84	ASP
1	D	198	ALA
1	D	482	ASN
1	A	301	VAL
1	D	521	PRO

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Mol	Chain	Res	Type
1	C	385	VAL

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	499/521 (96%)	486 (97%)	13 (3%)	46	64
1	B	499/521 (96%)	487 (98%)	12 (2%)	49	67
1	C	499/521 (96%)	486 (97%)	13 (3%)	46	64
1	D	499/521 (96%)	488 (98%)	11 (2%)	52	69
All	All	1996/2084 (96%)	1947 (98%)	49 (2%)	47	66

All (49) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	32	GLU
1	A	34	GLN
1	A	69	ASP
1	A	250	LEU
1	A	280	GLU
1	A	310	THR
1	A	341	PHE
1	A	348	ARG
1	A	483	ARG
1	A	518	HIS
1	A	522	ARG
1	A	523	ASP
1	A	524	GLN
1	B	69	ASP
1	B	75	GLN
1	B	205	ILE
1	B	250	LEU
1	B	255	ARG
1	B	258	GLU
1	B	341	PHE

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Mol	Chain	Res	Type
1	B	516	LEU
1	B	540	THR
1	B	550	ARG
1	B	608	LEU
1	B	614	SER
1	C	38	GLU
1	C	59	ARG
1	C	62	ARG
1	C	71	SER
1	C	86	LYS
1	C	189	SER
1	C	245	ARG
1	C	250	LEU
1	C	315	GLU
1	C	450	GLU
1	C	520	VAL
1	C	559	LYS
1	C	644	ASP
1	D	61	GLU
1	D	62	ARG
1	D	86	LYS
1	D	100	LEU
1	D	229	LYS
1	D	341	PHE
1	D	348	ARG
1	D	520	VAL
1	D	585	ASN
1	D	599	SER
1	D	614	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (12) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	524	GLN
1	B	193	GLN
1	B	331	HIS
1	B	384	GLN
1	B	524	GLN
1	C	102	ASN
1	C	185	GLN
1	C	193	GLN
1	C	307	ASN

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Mol	Chain	Res	Type
1	C	345	ASN
1	C	405	HIS
1	D	307	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](#)

Of 8 ligands modelled in this entry, 8 are monoatomic - leaving 0 for Mogul analysis.

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.

No monomer is involved in short contacts.

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	628/658 (95%)	-0.33	13 (2%) 63 60	13, 38, 73, 104	0
1	B	628/658 (95%)	-0.08	19 (3%) 50 48	23, 50, 84, 118	0
1	C	628/658 (95%)	-0.24	9 (1%) 75 73	20, 45, 75, 123	0
1	D	628/658 (95%)	-0.30	6 (0%) 82 80	18, 42, 73, 107	0
All	All	2512/2632 (95%)	-0.24	47 (1%) 66 64	13, 44, 79, 123	0

All (47) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	522	ARG	7.7
1	B	492	ALA	5.3
1	B	530	GLY	4.1
1	C	524	GLN	4.1
1	B	484	ALA	3.9
1	C	450	GLU	3.6
1	B	191	ALA	3.5
1	A	36	ARG	3.5
1	D	523	ASP	3.4
1	B	449	ALA	3.2
1	C	522	ARG	2.9
1	A	85	GLY	2.9
1	B	493	LEU	2.9
1	A	22	ALA	2.9
1	B	514	TYR	2.8
1	C	481	ASP	2.8
1	D	443	VAL	2.8
1	B	653	ALA	2.8
1	C	20	THR	2.8
1	C	523	ASP	2.8
1	A	20	THR	2.7

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Mol	Chain	Res	Type	RSRZ
1	B	523	ASP	2.7
1	C	39	ALA	2.6
1	A	462	ARG	2.6
1	D	61	GLU	2.6
1	B	520	VAL	2.5
1	A	484	ALA	2.5
1	A	83	LEU	2.5
1	A	523	ASP	2.5
1	D	20	THR	2.5
1	A	516	LEU	2.4
1	D	612	GLU	2.4
1	B	22	ALA	2.3
1	B	467	TRP	2.3
1	A	652	PRO	2.3
1	B	453	LEU	2.3
1	A	445	TYR	2.3
1	B	20	THR	2.2
1	B	550	ARG	2.2
1	C	44	ALA	2.2
1	B	481	ASP	2.1
1	B	518	HIS	2.1
1	B	39	ALA	2.1
1	D	311	LEU	2.1
1	A	485	ALA	2.1
1	A	29	PHE	2.1
1	C	336	GLN	2.1

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

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

6.3 Carbohydrates [\(i\)](#)

There are no monosaccharides in this entry.

6.4 Ligands [\(i\)](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	ZN	B	1002	1/1	0.97	0.11	52,52,52,52	0
2	ZN	C	1002	1/1	0.97	0.16	50,50,50,50	0
2	ZN	C	1001	1/1	0.98	0.13	52,52,52,52	0
2	ZN	D	1002	1/1	0.98	0.12	48,48,48,48	1
2	ZN	A	1001	1/1	0.99	0.15	39,39,39,39	0
2	ZN	D	1001	1/1	0.99	0.14	27,27,27,27	1
2	ZN	B	1001	1/1	0.99	0.10	57,57,57,57	0
2	ZN	A	1002	1/1	1.00	0.12	44,44,44,44	0

6.5 Other polymers [i](#)

There are no such residues in this entry.