Full wwPDB X-ray Structure Validation Report (i)

Jun 13, 2024 – 12:41 AM EDT

PDB ID	:	1KD0
Title	:	Crystal Structure of beta-methylaspartase from Clostridium tetanomorphum. Apo-structure.
Authors	:	Asuncion, M.; Blankenfeldt, W.; Barlow, J.N.; Gani, D.; Naismith, J.H.
Deposited on	:	2001-11-12
Resolution	:	1.90 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 types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

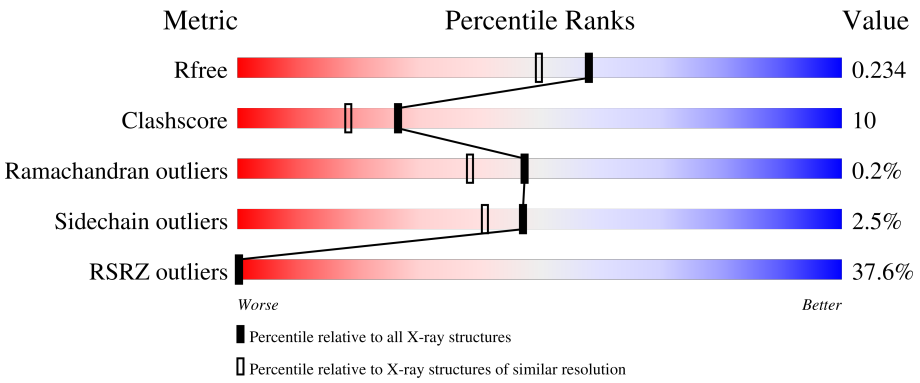
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

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 1.90 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	6207 (1.90-1.90)
Clashscore	141614	6847 (1.90-1.90)
Ramachandran outliers	138981	6760 (1.90-1.90)
Sidechain outliers	138945	6760 (1.90-1.90)
RSRZ outliers	127900	6082 (1.90-1.90)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	413	38% 81% 16% •
1	B	413	34% 80% 18% •

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	EDO	B	702[A]	-	-	-	X
2	EDO	B	702[B]	-	-	-	X

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 7136 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 beta-methylaspartase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	413	3226	2024	561	613	7	21	0	5	0
1	B	413	3235	2029	562	615	7	22	0	6	0

There are 34 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	112	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	119	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	150	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	184	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	254	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	276	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	285	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	288	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	327	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	346	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	353	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	376	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	389	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	395	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	396	MSE	MET	MODIFIED RESIDUE	UNP Q05514
A	402	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	1	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	112	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	119	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	150	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	184	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	254	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	276	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	285	MSE	MET	MODIFIED RESIDUE	UNP Q05514

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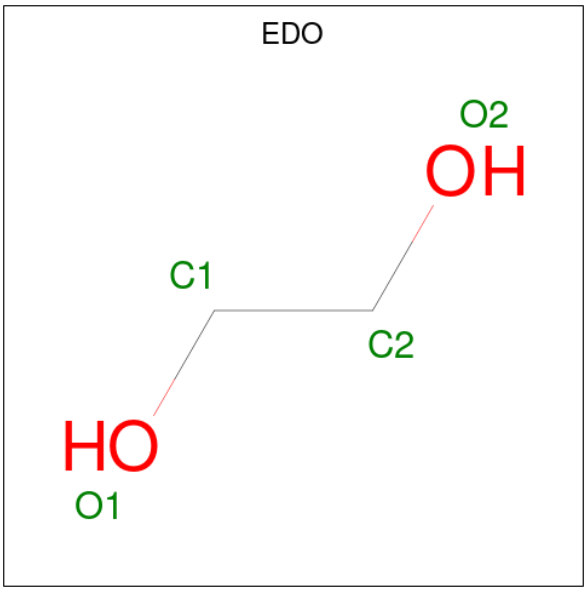
Chain	Residue	Modelled	Actual	Comment	Reference
B	288	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	327	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	346	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	353	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	376	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	389	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	395	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	396	MSE	MET	MODIFIED RESIDUE	UNP Q05514
B	402	MSE	MET	MODIFIED RESIDUE	UNP Q05514

- Molecule 2 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
2	A	1	8	4	4	0	1
			Total	C	O		
2	B	1	8	4	4	0	1

- Molecule 3 is water.

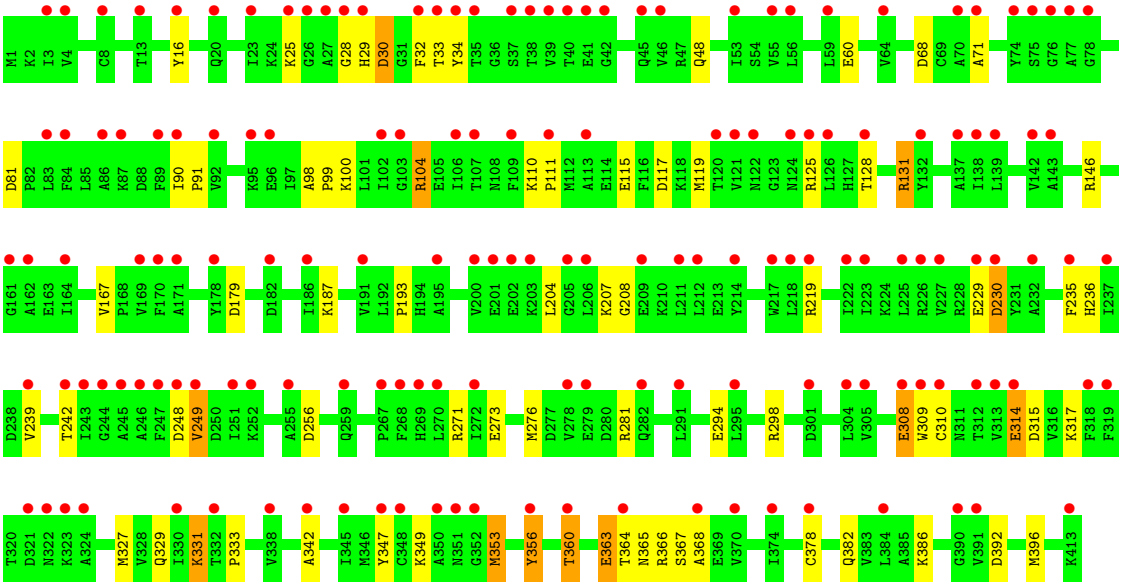
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
3	A	315	315	315	0	0
			Total	O		
3	B	344	344	344	0	0

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.

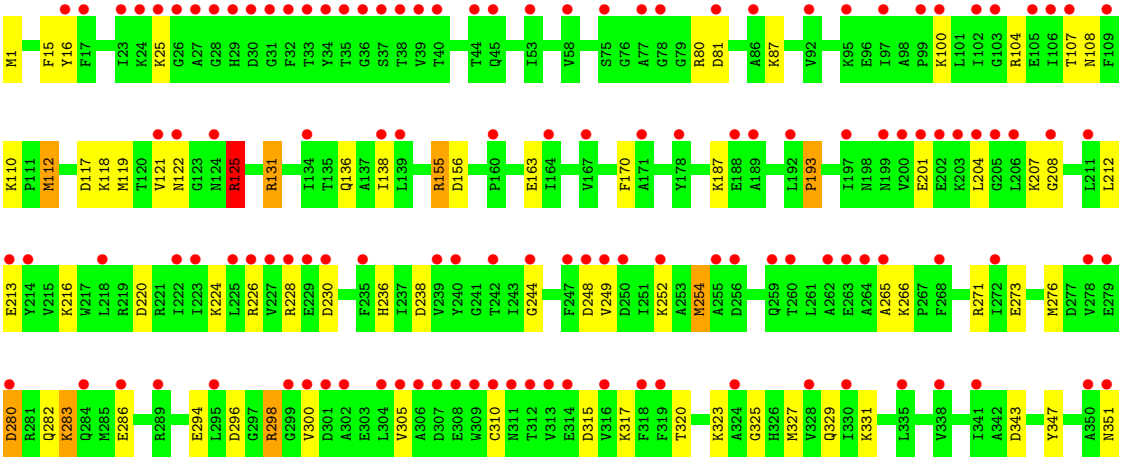
- Molecule 1: beta-methylaspartase

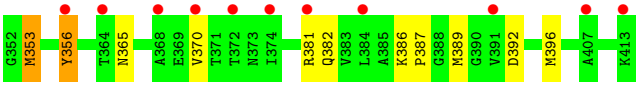
Chain A:



- Molecule 1: beta-methylaspartase

Chain B:




G352
M353
Y356
T364
N365
A368
E369
V370
T371
T372
N373
I374
R381
Q382
V383
L384
A385
K386
P387
G388
M389
G390
V391
D392
M396
A407
K413

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	67.28Å 109.26Å 108.99Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	57.74 – 1.90 30.84 – 1.90	Depositor EDS
% Data completeness (in resolution range)	99.9 (57.74-1.90) 99.9 (30.84-1.90)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.71 (at 1.91Å)	Xtriage
Refinement program	REFMAC 5.0	Depositor
R, R_{free}	0.175 , 0.222 0.185 , 0.234	Depositor DCC
R_{free} test set	3228 reflections (5.05%)	wwPDB-VP
Wilson B-factor (Å^2)	19.2	Xtriage
Anisotropy	0.077	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 74.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.000 for -h,l,k	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	7136	wwPDB-VP
Average B, all atoms (Å^2)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 22.10 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 6.1040e-03. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[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 (i)

5.1 Standard geometry (i)

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

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	1.21	7/3259 (0.2%)	1.14	21/4366 (0.5%)
1	B	1.24	8/3268 (0.2%)	1.22	19/4377 (0.4%)
All	All	1.22	15/6527 (0.2%)	1.18	40/8743 (0.5%)

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	353	MSE	SE-CE	-12.19	1.23	1.95
1	B	353[A]	MSE	SE-CE	-9.46	1.39	1.95
1	B	353[B]	MSE	SE-CE	-9.46	1.39	1.95
1	B	125	ARG	CB-CG	6.85	1.71	1.52
1	B	131	ARG	CD-NE	-6.58	1.35	1.46
1	A	363	GLU	CB-CG	-6.13	1.40	1.52
1	A	131	ARG	CD-NE	-5.90	1.36	1.46
1	A	342	ALA	CA-CB	5.75	1.64	1.52
1	B	254	MSE	SE-CE	-5.64	1.62	1.95
1	B	170	PHE	CG-CD2	5.60	1.47	1.38
1	A	71	ALA	CA-CB	5.45	1.64	1.52
1	A	167	VAL	CB-CG1	-5.39	1.41	1.52
1	B	283	LYS	CD-CE	5.26	1.64	1.51
1	A	60	GLU	CD-OE1	5.05	1.31	1.25
1	B	323	LYS	CE-NZ	5.01	1.61	1.49

All (40) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	131	ARG	NE-CZ-NH1	19.79	130.19	120.30
1	B	131	ARG	NE-CZ-NH2	-19.59	110.51	120.30
1	A	131	ARG	NE-CZ-NH1	13.18	126.89	120.30
1	A	131	ARG	NE-CZ-NH2	-10.71	114.94	120.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	104	ARG	CG-CD-NE	-9.11	92.67	111.80
1	B	104	ARG	NE-CZ-NH2	-8.67	115.96	120.30
1	A	30	ASP	CB-CG-OD2	7.62	125.16	118.30
1	A	392	ASP	CB-CG-OD2	7.51	125.06	118.30
1	B	343	ASP	CB-CG-OD1	7.17	124.75	118.30
1	B	131	ARG	CD-NE-CZ	7.03	133.44	123.60
1	A	366	ARG	NE-CZ-NH1	6.98	123.79	120.30
1	A	235	PHE	CB-CG-CD1	6.94	125.66	120.80
1	A	235	PHE	CB-CG-CD2	-6.89	115.97	120.80
1	B	80	ARG	NE-CZ-NH1	-6.63	116.99	120.30
1	B	156	ASP	CB-CG-OD1	6.27	123.94	118.30
1	B	155	ARG	NE-CZ-NH1	6.24	123.42	120.30
1	B	81	ASP	CB-CG-OD2	6.23	123.91	118.30
1	A	146	ARG	NE-CZ-NH2	-6.19	117.20	120.30
1	A	230	ASP	CB-CG-OD2	6.10	123.79	118.30
1	B	283	LYS	CD-CE-NZ	6.03	125.56	111.70
1	B	104	ARG	NE-CZ-NH1	5.96	123.28	120.30
1	A	363	GLU	OE1-CD-OE2	5.84	130.31	123.30
1	A	366	ARG	NE-CZ-NH2	-5.82	117.39	120.30
1	A	68	ASP	CB-CG-OD1	5.74	123.47	118.30
1	A	131	ARG	CD-NE-CZ	5.65	131.51	123.60
1	A	248	ASP	CB-CG-OD2	5.64	123.37	118.30
1	A	179	ASP	CB-CG-OD1	5.55	123.29	118.30
1	A	353	MSE	CG-SE-CE	5.51	111.02	98.90
1	B	392	ASP	CB-CG-OD2	5.45	123.20	118.30
1	B	298	ARG	NE-CZ-NH1	5.41	123.00	120.30
1	A	81	ASP	CB-CG-OD2	5.38	123.14	118.30
1	B	238	ASP	CB-CG-OD1	5.35	123.11	118.30
1	B	280	ASP	CB-CG-OD2	5.24	123.02	118.30
1	A	104	ARG	NE-CZ-NH2	-5.20	117.70	120.30
1	A	281	ARG	NE-CZ-NH2	-5.19	117.70	120.30
1	A	219	ARG	NE-CZ-NH1	5.17	122.89	120.30
1	B	248	ASP	CB-CG-OD2	5.14	122.93	118.30
1	B	296	ASP	CB-CG-OD2	5.12	122.91	118.30
1	A	30	ASP	OD1-CG-OD2	-5.10	113.61	123.30
1	B	230	ASP	CB-CG-OD2	5.04	122.84	118.30

There are no chirality outliers.

There are no planarity outliers.

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	3226	0	3229	61	0
1	B	3235	0	3234	78	0
2	A	8	0	12	0	0
2	B	8	0	12	0	0
3	A	315	0	0	12	3
3	B	344	0	0	18	4
All	All	7136	0	6487	134	4

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 10.

All (134) 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:353:MSE:SE	1:A:353:MSE:CE	1.23	1.42
1:B:353[B]:MSE:SE	1:B:353[B]:MSE:CE	1.22	1.42
1:B:1:MSE:CE	1:B:1:MSE:SE	2.22	1.38
1:B:244:GLY:HA2	1:B:254:MSE:CE	1.53	1.38
1:A:353:MSE:SE	1:A:353:MSE:HE1	1.80	1.12
1:B:353[B]:MSE:SE	1:B:353[B]:MSE:HE3	1.80	1.09
1:B:353[B]:MSE:SE	1:B:353[B]:MSE:HE1	1.80	1.06
1:A:353:MSE:SE	1:A:353:MSE:HE2	1.80	1.05
1:A:353:MSE:SE	1:A:353:MSE:HE3	1.80	1.05
1:B:25:LYS:HE2	3:B:937:HOH:O	1.58	1.04
1:B:353[B]:MSE:SE	1:B:353[B]:MSE:HE2	1.80	1.04
1:B:244:GLY:HA2	1:B:254:MSE:HE2	1.36	1.02
1:B:244:GLY:CA	1:B:254:MSE:CE	2.37	1.01
1:B:244:GLY:HA2	1:B:254:MSE:HE3	1.47	0.94
1:B:244:GLY:CA	1:B:254:MSE:HE2	1.97	0.91
1:B:353[B]:MSE:CE	1:B:353[B]:MSE:CG	2.52	0.87
1:A:294:GLU:O	1:A:298:ARG:HG3	1.75	0.85
1:B:201:GLU:HB3	3:B:881:HOH:O	1.78	0.82
1:B:107:THR:HG22	1:B:108:ASN:H	1.43	0.82
1:B:117:ASP:O	1:B:131:ARG:HD3	1.81	0.79
1:B:325:GLY:O	1:B:353[B]:MSE:HE1	1.81	0.79

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:236:HIS:CD2	1:B:382:GLN:HE22	2.03	0.76
1:A:308:GLU:HG2	3:A:976:HOH:O	1.87	0.74
1:B:110:LYS:NZ	3:B:1016:HOH:O	2.06	0.74
1:A:310:CYS:N	3:A:1009:HOH:O	2.21	0.73
1:A:236:HIS:HE1	1:A:273:GLU:OE1	1.72	0.73
1:B:125:ARG:HG2	3:B:712:HOH:O	1.90	0.71
1:A:349:LYS:HD2	1:A:378:CYS:O	1.89	0.71
1:B:244:GLY:N	1:B:254:MSE:HE2	2.06	0.71
1:A:104:ARG:NH2	1:A:115:GLU:OE1	2.24	0.70
1:A:353:MSE:CE	1:A:353:MSE:CG	2.70	0.69
1:A:117:ASP:O	1:A:131:ARG:HD3	1.94	0.68
1:A:331:LYS:NZ	3:A:1009:HOH:O	2.23	0.68
1:A:294:GLU:OE2	1:A:298:ARG:HD3	1.94	0.68
1:A:273:GLU:OE2	1:A:329:GLN:NE2	2.28	0.67
1:B:112[A]:MSE:HG2	1:B:138:ILE:HD13	1.77	0.67
1:A:349:LYS:NZ	3:A:994:HOH:O	2.28	0.66
1:B:244:GLY:HA2	1:B:254:MSE:HE1	1.71	0.65
1:A:236:HIS:CD2	1:A:382:GLN:HE22	2.14	0.65
1:B:305:VAL:CG2	1:B:327[B]:MSE:HE2	2.26	0.65
1:A:396[B]:MSE:SE	1:B:365:ASN:OD1	2.64	0.65
1:B:236:HIS:HD2	1:B:382:GLN:HE22	1.41	0.65
1:A:314:GLU:HG2	1:A:315:ASP:N	2.11	0.64
1:A:310:CYS:O	3:A:1009:HOH:O	2.15	0.64
1:B:305:VAL:HG22	1:B:327[B]:MSE:HE2	1.79	0.63
1:B:320:THR:HG23	1:B:353[B]:MSE:HG3	1.81	0.63
1:A:100:LYS:HD3	3:A:869:HOH:O	2.00	0.61
1:A:360:THR:CG2	1:A:363:GLU:HG3	2.30	0.61
1:B:249:VAL:HA	1:B:254:MSE:HE3	1.82	0.60
1:A:249:VAL:O	1:A:249:VAL:HG12	2.02	0.60
1:B:294:GLU:OE2	1:B:298:ARG:HD3	2.00	0.60
1:B:273:GLU:OE2	1:B:329:GLN:OE1	2.20	0.58
1:A:104:ARG:HH22	1:A:115:GLU:CD	2.05	0.58
1:A:360:THR:HG23	1:A:363:GLU:HG3	1.85	0.58
1:A:310:CYS:C	3:A:1009:HOH:O	2.41	0.58
1:A:365:ASN:OD1	1:B:396[B]:MSE:SE	2.71	0.58
1:A:30:ASP:O	1:A:33:THR:HG22	2.04	0.57
1:B:317:LYS:HE3	1:B:347:TYR:OH	2.02	0.57
1:B:283:LYS:HE3	3:B:932:HOH:O	2.02	0.57
1:A:207:LYS:NZ	3:A:875:HOH:O	2.34	0.57
1:B:121:VAL:O	1:B:122:ASN:HB2	2.05	0.57
1:B:317:LYS:HG3	1:B:347:TYR:CZ	2.40	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:308:GLU:O	1:A:309:TRP:HB2	2.05	0.56
1:B:163:GLU:HG2	3:B:987:HOH:O	2.04	0.56
1:A:294:GLU:O	1:A:298:ARG:CG	2.51	0.55
1:A:236:HIS:HD2	1:A:382:GLN:HE22	1.55	0.55
1:A:117:ASP:OD1	1:A:131:ARG:HD2	2.06	0.54
1:A:236:HIS:CE1	1:A:273:GLU:OE1	2.59	0.54
1:A:363:GLU:HB3	1:A:367:SER:OG	2.07	0.54
1:A:28:GLY:O	1:A:34:TYR:HA	2.08	0.54
1:B:155:ARG:HD2	1:B:155:ARG:C	2.28	0.53
1:B:244:GLY:CA	1:B:254:MSE:HE1	2.33	0.53
1:B:204:LEU:HG	1:B:208:GLY:HA2	1.92	0.52
1:A:110:LYS:HB3	1:A:111:PRO:HD3	1.92	0.51
1:B:226:ARG:HD2	1:B:228:ARG:O	2.11	0.51
1:B:118:LYS:NZ	3:B:944:HOH:O	2.22	0.51
1:B:327[B]:MSE:HE3	1:B:356:TYR:HB2	1.92	0.51
1:A:271:ARG:HD3	1:A:327[A]:MSE:SE	2.61	0.50
1:A:98:ALA:HB3	1:A:99:PRO:HD3	1.92	0.50
1:B:224:LYS:HG2	3:B:779:HOH:O	2.12	0.50
1:B:224:LYS:CG	3:B:779:HOH:O	2.59	0.49
1:B:317:LYS:HG3	1:B:347:TYR:CE2	2.46	0.49
1:B:294:GLU:O	1:B:298:ARG:HG3	2.14	0.48
1:B:117:ASP:OD1	1:B:131:ARG:HD2	2.13	0.48
1:A:100:LYS:HD2	1:A:119:MSE:HE3	1.95	0.48
1:B:212:LEU:O	1:B:216:LYS:HG3	2.14	0.48
1:B:254:MSE:HE1	1:B:276:MSE:HB3	1.95	0.48
1:A:90:ILE:N	1:A:91:PRO:CD	2.77	0.47
1:A:187:LYS:HE3	1:B:16:TYR:CZ	2.50	0.47
1:A:230:ASP:N	1:A:230:ASP:OD1	2.44	0.47
1:A:314:GLU:HB3	3:A:823:HOH:O	2.14	0.47
1:B:87:LYS:HE3	3:B:960:HOH:O	2.15	0.47
1:B:100:LYS:HE2	3:B:970:HOH:O	2.14	0.46
1:B:136:GLN:HG2	1:B:370:VAL:HG11	1.98	0.46
1:B:282:GLN:O	1:B:286:GLU:HG3	2.15	0.46
1:A:16:TYR:CE2	1:B:187:LYS:HE3	2.51	0.46
1:B:271:ARG:HD3	1:B:327[A]:MSE:SE	2.66	0.45
1:B:107:THR:HG22	1:B:108:ASN:N	2.21	0.45
1:A:128[A]:THR:HG22	1:A:333:PRO:O	2.17	0.45
1:B:305:VAL:HG21	1:B:327[B]:MSE:HE2	1.99	0.45
1:B:252:LYS:HB2	3:B:940:HOH:O	2.16	0.45
1:B:207:LYS:NZ	3:B:871:HOH:O	2.43	0.45
1:B:201:GLU:CB	3:B:881:HOH:O	2.49	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:98:ALA:N	1:A:99:PRO:CD	2.80	0.44
1:A:239:VAL:O	1:A:242:THR:HG23	2.17	0.44
1:B:117:ASP:O	1:B:131:ARG:CD	2.61	0.44
1:A:331:LYS:HA	3:A:899:HOH:O	2.17	0.44
1:B:213:GLU:CD	3:B:802:HOH:O	2.54	0.44
1:B:252:LYS:HD3	1:B:252:LYS:HA	1.72	0.44
1:A:368:ALA:HA	1:A:386:LYS:HE3	1.98	0.44
1:A:256:ASP:OD1	1:A:298:ARG:NH2	2.41	0.44
1:B:310:CYS:HA	1:B:315:ASP:HB3	1.99	0.43
1:B:381:ARG:NH1	3:B:1046:HOH:O	2.50	0.43
1:A:317:LYS:HG3	1:A:347:TYR:CZ	2.54	0.42
1:B:25:LYS:CE	3:B:937:HOH:O	2.39	0.42
1:B:386:LYS:HB2	1:B:387:PRO:HA	2.02	0.42
1:B:265:ALA:O	1:B:266:LYS:C	2.56	0.42
1:A:353:MSE:CE	1:A:353:MSE:CB	2.97	0.41
1:B:320:THR:CG2	1:B:351:ASN:HB2	2.50	0.41
1:A:329:GLN:HG3	1:A:356:TYR:CD2	2.55	0.41
1:A:25:LYS:NZ	3:A:874:HOH:O	2.31	0.41
1:A:360:THR:HG22	1:A:363:GLU:HG3	2.02	0.41
1:B:356:TYR:CD1	1:B:356:TYR:C	2.94	0.41
1:A:329:GLN:HG3	1:A:356:TYR:CE2	2.55	0.41
1:B:310:CYS:O	1:B:331:LYS:HE3	2.21	0.41
1:A:187:LYS:HE3	1:B:16:TYR:CE2	2.55	0.41
1:B:220:ASP:O	1:B:224:LYS:HG3	2.21	0.41
1:B:280:ASP:OD2	1:B:282:GLN:HB3	2.21	0.41
1:B:298:ARG:HB2	1:B:300:VAL:HG23	2.03	0.41
1:A:363:GLU:HB3	1:A:364:THR:H	1.76	0.40
1:A:204:LEU:HG	1:A:208:GLY:HA2	2.03	0.40
1:B:15:PHE:CD1	1:B:389[B]:MSE:HG3	2.56	0.40
1:B:201:GLU:CA	3:B:881:HOH:O	2.69	0.40
1:A:314:GLU:HG3	3:A:821:HOH:O	2.20	0.40

All (4) 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)
3:A:986:HOH:O	3:B:1025:HOH:O[1_455]	1.84	0.36
3:A:949:HOH:O	3:B:1024:HOH:O[1_455]	2.00	0.20
3:A:1016:HOH:O	3:B:797:HOH:O[2_554]	2.06	0.14
3:B:960:HOH:O	3:B:962:HOH:O[3_655]	2.15	0.05

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	416/413 (101%)	399 (96%)	16 (4%)	1 (0%)	47	38
1	B	417/413 (101%)	402 (96%)	14 (3%)	1 (0%)	47	38
All	All	833/826 (101%)	801 (96%)	30 (4%)	2 (0%)	47	38

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	249	VAL
1	B	193	PRO

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	339/317 (107%)	327 (96%)	12 (4%)	36	27
1	B	340/317 (107%)	334 (98%)	6 (2%)	59	55
All	All	679/634 (107%)	661 (97%)	18 (3%)	47	38

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	29	HIS
1	A	32	PHE
1	A	48	GLN
1	A	125	ARG

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Mol	Chain	Res	Type
1	A	193	PRO
1	A	229	GLU
1	A	276	MSE
1	A	308	GLU
1	A	314	GLU
1	A	331	LYS
1	A	356	TYR
1	A	360	THR
1	B	112[A]	MSE
1	B	112[B]	MSE
1	B	119	MSE
1	B	125	ARG
1	B	193	PRO
1	B	356	TYR

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

Mol	Chain	Res	Type
1	A	236	HIS
1	B	236	HIS

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)

4 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and

the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	EDO	B	702[A]	-	3,3,3	0.59	0	2,2,2	0.55	0
2	EDO	B	702[B]	-	3,3,3	0.34	0	2,2,2	0.30	0
2	EDO	A	701[A]	-	3,3,3	0.76	0	2,2,2	0.21	0
2	EDO	A	701[B]	-	3,3,3	0.48	0	2,2,2	0.21	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	EDO	B	702[A]	-	-	0/1/1/1	-
2	EDO	B	702[B]	-	-	1/1/1/1	-
2	EDO	A	701[A]	-	-	1/1/1/1	-
2	EDO	A	701[B]	-	-	1/1/1/1	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	701[B]	EDO	O1-C1-C2-O2
2	B	702[B]	EDO	O1-C1-C2-O2
2	A	701[A]	EDO	O1-C1-C2-O2

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 (i)

6.1 Protein, DNA and RNA chains (i)

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	396/413 (95%)	1.94	158 (39%)	0	0	29, 35, 48, 59	0
1	B	396/413 (95%)	1.87	140 (35%)	0	0	28, 35, 48, 58	0
All	All	792/826 (95%)	1.90	298 (37%)	0	0	28, 35, 48, 59	0

All (298) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	310	CYS	9.2
1	A	310	CYS	9.0
1	B	122	ASN	8.2
1	B	308	GLU	8.0
1	A	201	GLU	7.8
1	B	309	TRP	7.1
1	B	227	VAL	6.9
1	B	229	GLU	6.8
1	A	347	TYR	6.7
1	A	248	ASP	6.7
1	A	28	GLY	6.6
1	A	27	ALA	6.3
1	A	35	THR	5.8
1	A	247	PHE	5.8
1	B	279	GLU	5.8
1	B	107	THR	5.7
1	A	308	GLU	5.6
1	A	37	SER	5.6
1	B	37	SER	5.6
1	B	201	GLU	5.4
1	A	202	GLU	5.4
1	A	122	ASN	5.2
1	A	252	LYS	5.2
1	B	248	ASP	5.2

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Mol	Chain	Res	Type	RSRZ
1	A	230	ASP	5.1
1	B	29	HIS	5.0
1	B	413	LYS	5.0
1	B	247	PHE	5.0
1	B	230	ASP	4.9
1	A	413	LYS	4.7
1	B	28	GLY	4.7
1	A	309	TRP	4.7
1	A	124	ASN	4.6
1	B	121	VAL	4.6
1	B	31	GLY	4.5
1	B	316	VAL	4.4
1	B	312	THR	4.3
1	A	351	ASN	4.3
1	A	161	GLY	4.3
1	B	206	LEU	4.2
1	B	25	LYS	4.2
1	A	243	ILE	4.2
1	B	24	LYS	4.2
1	A	55	VAL	4.1
1	A	34	TYR	4.1
1	A	182	ASP	4.1
1	B	307	ASP	4.0
1	A	178	TYR	4.0
1	A	200	VAL	3.9
1	B	105	GLU	3.9
1	A	244	GLY	3.9
1	B	30	ASP	3.8
1	B	202	GLU	3.8
1	B	223	ILE	3.8
1	B	86	ALA	3.8
1	B	263	GLU	3.8
1	A	384	LEU	3.8
1	B	222	ILE	3.8
1	A	304	LEU	3.7
1	B	199	ASN	3.7
1	B	33	THR	3.7
1	B	38	THR	3.7
1	B	278	VAL	3.7
1	A	279	GLU	3.7
1	B	313	VAL	3.7
1	B	299	GLY	3.7

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Mol	Chain	Res	Type	RSRZ
1	B	272	ILE	3.7
1	A	186	ILE	3.6
1	A	225	LEU	3.6
1	A	92	VAL	3.6
1	A	314	GLU	3.5
1	A	322	ASN	3.5
1	A	169	VAL	3.5
1	A	211	LEU	3.5
1	B	200	VAL	3.5
1	A	319	PHE	3.4
1	A	33	THR	3.4
1	B	34	TYR	3.4
1	A	278	VAL	3.4
1	A	212	LEU	3.4
1	B	249	VAL	3.4
1	A	128[A]	THR	3.3
1	A	272	ILE	3.3
1	A	324	ALA	3.3
1	B	226	ARG	3.3
1	A	312	THR	3.3
1	B	23	ILE	3.3
1	A	249	VAL	3.3
1	B	225	LEU	3.3
1	B	242	THR	3.3
1	B	32	PHE	3.3
1	B	235	PHE	3.3
1	A	218	LEU	3.3
1	B	39	VAL	3.3
1	A	143	ALA	3.2
1	A	350	ALA	3.2
1	A	323	LYS	3.2
1	A	242	THR	3.2
1	B	44	THR	3.2
1	B	341	ILE	3.2
1	B	99	PRO	3.1
1	A	245	ALA	3.1
1	B	228	ARG	3.1
1	B	35	THR	3.1
1	A	227	VAL	3.1
1	A	102	ILE	3.1
1	A	107	THR	3.1
1	A	229	GLU	3.1

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Mol	Chain	Res	Type	RSRZ
1	B	124	ASN	3.1
1	B	370	VAL	3.0
1	A	29	HIS	3.0
1	A	205	GLY	3.0
1	A	223	ILE	3.0
1	B	109	PHE	3.0
1	B	302	ALA	3.0
1	B	244	GLY	3.0
1	B	268	PHE	3.0
1	A	214	TYR	3.0
1	A	86	ALA	3.0
1	B	214	TYR	3.0
1	B	27	ALA	3.0
1	B	95	LYS	3.0
1	B	26	GLY	2.9
1	B	319	PHE	2.9
1	A	301	ASP	2.9
1	B	311	ASN	2.9
1	B	103	GLY	2.9
1	B	300	VAL	2.9
1	A	217	TRP	2.9
1	B	384	LEU	2.9
1	B	301[A]	ASP	2.9
1	B	305	VAL	2.9
1	B	295	LEU	2.9
1	B	264	ALA	2.9
1	A	75	SER	2.8
1	A	84	PHE	2.8
1	A	171	ALA	2.8
1	A	125	ARG	2.8
1	B	45	GLN	2.8
1	A	64	VAL	2.8
1	A	121	VAL	2.8
1	B	239	VAL	2.8
1	A	206	LEU	2.8
1	B	171	ALA	2.8
1	B	36	GLY	2.8
1	B	324	ALA	2.7
1	A	222	ILE	2.7
1	A	318	PHE	2.7
1	B	318	PHE	2.7
1	A	70	ALA	2.7

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Mol	Chain	Res	Type	RSRZ
1	A	246	ALA	2.7
1	A	270	LEU	2.7
1	B	306	ALA	2.7
1	B	328	VAL	2.7
1	B	205	GLY	2.7
1	A	96	GLU	2.7
1	B	350	ALA	2.7
1	B	314	GLU	2.7
1	A	345	ILE	2.7
1	B	97	ILE	2.7
1	B	255	ALA	2.7
1	A	42	GLY	2.7
1	A	16	TYR	2.6
1	A	313	VAL	2.6
1	A	295	LEU	2.6
1	B	192	LEU	2.6
1	A	95	LYS	2.6
1	A	89	PHE	2.6
1	A	39	VAL	2.6
1	A	106	ILE	2.6
1	A	25	LYS	2.6
1	A	268	PHE	2.6
1	A	364	THR	2.6
1	A	74	TYR	2.6
1	B	139	LEU	2.6
1	B	289	ARG	2.6
1	A	332	THR	2.6
1	A	162	ALA	2.5
1	A	282	GLN	2.5
1	B	284	GLN	2.5
1	A	53	ILE	2.5
1	A	126	LEU	2.5
1	B	364	THR	2.5
1	A	237	ILE	2.5
1	A	255	ALA	2.5
1	A	109	PHE	2.5
1	A	139	LEU	2.5
1	A	352	GLY	2.5
1	B	78	GLY	2.5
1	A	195	ALA	2.5
1	A	32	PHE	2.5
1	A	56	LEU	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	45	GLN	2.5
1	A	330	ILE	2.5
1	B	407	ALA	2.5
1	A	103	GLY	2.5
1	B	178	TYR	2.5
1	A	3	ILE	2.4
1	A	164	ILE	2.4
1	A	219	ARG	2.4
1	B	372	THR	2.4
1	B	204	LEU	2.4
1	A	20	GLN	2.4
1	A	348	CYS	2.4
1	A	38	THR	2.4
1	A	120	THR	2.4
1	A	226	ARG	2.4
1	B	250	ASP	2.4
1	B	368	ALA	2.4
1	B	188	GLU	2.4
1	A	251	ILE	2.4
1	B	374	ILE	2.4
1	B	265	ALA	2.3
1	B	17	PHE	2.3
1	A	76	GLY	2.3
1	A	267	PRO	2.3
1	B	58	VAL	2.3
1	B	330	ILE	2.3
1	B	351	ASN	2.3
1	A	137	ALA	2.3
1	A	138	ILE	2.3
1	B	102	ILE	2.3
1	B	134	ILE	2.3
1	B	167	VAL	2.3
1	A	23	ILE	2.3
1	A	90	ILE	2.3
1	A	374	ILE	2.3
1	B	280	ASP	2.3
1	B	203	LYS	2.3
1	A	26	GLY	2.3
1	B	164	ILE	2.3
1	A	77	ALA	2.2
1	A	87	LYS	2.2
1	B	92	VAL	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	321	ASP	2.2
1	B	256	ASP	2.2
1	A	83	LEU	2.2
1	B	208	GLY	2.2
1	B	77	ALA	2.2
1	A	142	VAL	2.2
1	A	191	VAL	2.2
1	A	305	VAL	2.2
1	A	13	THR	2.2
1	A	390	GLY	2.2
1	B	338	VAL	2.2
1	B	240	TYR	2.2
1	A	232	ALA	2.2
1	A	338	VAL	2.2
1	B	381	ARG	2.2
1	B	391	VAL	2.2
1	B	213	GLU	2.2
1	B	53	ILE	2.2
1	B	356	TYR	2.2
1	A	8	CYS	2.2
1	B	160	PRO	2.1
1	A	40	THR	2.1
1	A	78	GLY	2.1
1	A	71	ALA	2.1
1	B	100	LYS	2.1
1	A	259	GLN	2.1
1	A	235	PHE	2.1
1	B	286	GLU	2.1
1	B	81	ASP	2.1
1	B	106	ILE	2.1
1	A	356	TYR	2.1
1	A	391	VAL	2.1
1	B	335	LEU	2.1
1	A	111	PRO	2.1
1	A	170	PHE	2.1
1	A	113	ALA	2.1
1	A	342	ALA	2.1
1	B	197	ILE	2.1
1	A	132	TYR	2.1
1	B	40	THR	2.1
1	B	252	LYS	2.1
1	A	4	VAL	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	138	ILE	2.1
1	A	291	LEU	2.1
1	A	378	CYS	2.1
1	B	260	THR	2.0
1	A	209	GLU	2.0
1	B	16	TYR	2.0
1	A	46	VAL	2.0
1	A	269	HIS	2.0
1	B	189	ALA	2.0
1	B	262	ALA	2.0
1	B	211	LEU	2.0
1	B	304	LEU	2.0
1	A	360	THR	2.0
1	B	259	GLN	2.0
1	A	239	VAL	2.0
1	A	370	VAL	2.0
1	A	368	ALA	2.0
1	A	59	LEU	2.0
1	B	218	LEU	2.0
1	A	203	LYS	2.0
1	B	75	SER	2.0
1	A	41	GLU	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	EDO	B	702[A]	4/4	0.57	0.46	33,37,38,41	4

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	EDO	B	702[B]	4/4	0.57	0.46	53,56,56,56	4
2	EDO	A	701[A]	4/4	0.61	0.35	29,33,34,39	4
2	EDO	A	701[B]	4/4	0.61	0.35	36,36,38,38	4

6.5 Other polymers (i)

There are no such residues in this entry.