Full wwPDB X-ray Structure Validation Report ⓘ

May 29, 2020 – 09:10 pm BST

PDB ID	:	3OJC
Title	:	Crystal structure of a putative Asp/Glu Racemase from Yersinia pestis
Authors	:	Anderson, S.M.; Wawrzak, Z.; Kudritska, M.; Kwon, K.; Anderson, W.F.; Savchenko, A.; Center for Structural Genomics of Infectious Diseases (CSGID)
Deposited on	:	2010-08-21
Resolution	:	1.75 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	:	2.11
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)	:	2.11

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 1.75 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.
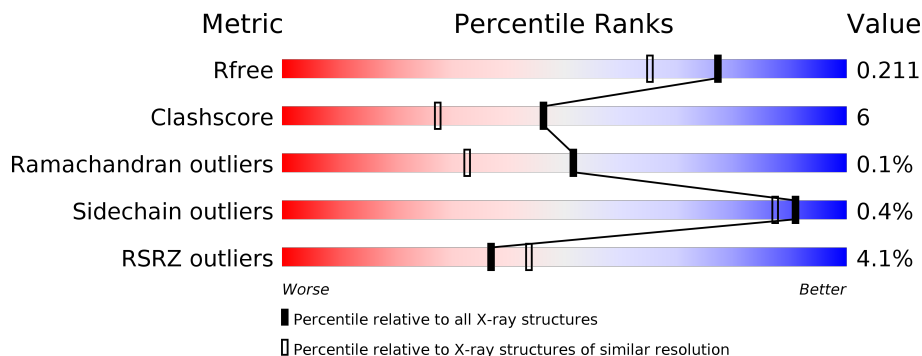
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	2340 (1.76-1.76)
Clashscore	141614	2466 (1.76-1.76)
Ramachandran outliers	138981	2437 (1.76-1.76)
Sidechain outliers	138945	2437 (1.76-1.76)
RSRZ outliers	127900	2298 (1.76-1.76)

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

Mol	Chain	Length	Quality of chain
1	A	231	
1	B	231	
1	C	231	
1	D	231	

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 8069 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 Putative aspartate/glutamate racemase.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	230	Total	C	N	O	S	Se	0	2	0
			1781	1125	308	339	4	5			
1	B	230	Total	C	N	O	S	Se	0	8	0
			1816	1153	310	343	5	5			
1	C	230	Total	C	N	O	S	Se	0	1	0
			1776	1122	308	337	4	5			
1	D	230	Total	C	N	O	S	Se	0	2	0
			1781	1125	308	339	4	5			

- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	B	1	Total	Ca	0	0
			1	1		
2	A	3	Total	Ca	0	0
			3	3		

- Molecule 3 is HEXANE-1,6-DIOL (three-letter code: HEZ) (formula: $C_6H_{14}O_2$).

HEZ
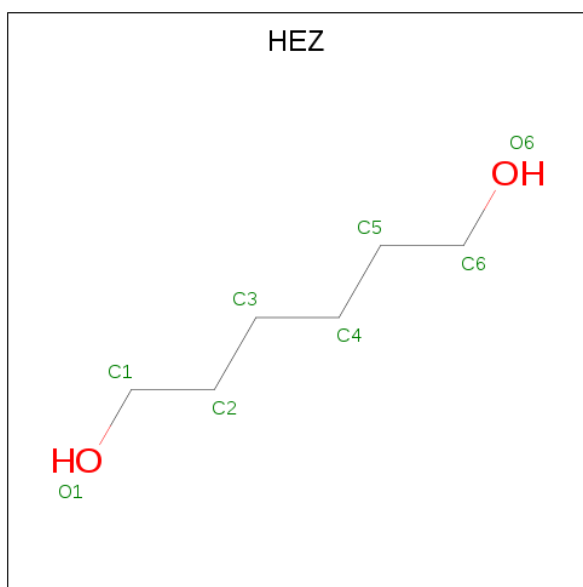
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 8	C 6	O 2	0	0
3	A	1	Total 8	C 6	O 2	0	0
3	A	1	Total 8	C 6	O 2	0	0
3	B	1	Total 8	C 6	O 2	0	0
3	B	1	Total 8	C 6	O 2	0	0
3	B	1	Total 8	C 6	O 2	0	0
3	B	1	Total 8	C 6	O 2	0	0
3	B	1	Total 8	C 6	O 2	0	0
3	B	1	Total 8	C 6	O 2	0	0
3	B	1	Total 8	C 6	O 2	0	0
3	B	1	Total 8	C 6	O 2	0	0
3	C	1	Total 8	C 6	O 2	0	0
3	C	1	Total 8	C 6	O 2	0	0
3	C	1	Total 8	C 6	O 2	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	C	1	Total 8	C 6	O 2			0	0
3	C	1	Total 8	C 6	O 2			0	0
3	D	1	Total 8	C 6	O 2			0	0
3	D	1	Total 8	C 6	O 2			0	0
3	D	1	Total 8	C 6	O 2			0	0
3	D	1	Total 8	C 6	O 2			0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	227	Total 227	O 227	0	0
4	B	179	Total 182	O 182	0	3
4	C	176	Total 179	O 179	0	3
4	D	161	Total 163	O 163	0	2

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of 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: Putative aspartate/glutamate racemase
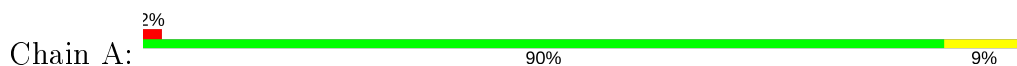
Chain A:

- Molecule 1: Putative aspartate/glutamate racemase

Chain B:

- Molecule 1: Putative aspartate/glutamate racemase

Chain C:

- Molecule 1: Putative aspartate/glutamate racemase

Chain D:
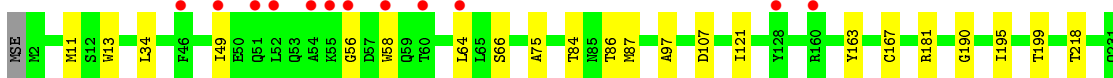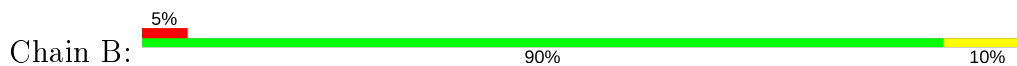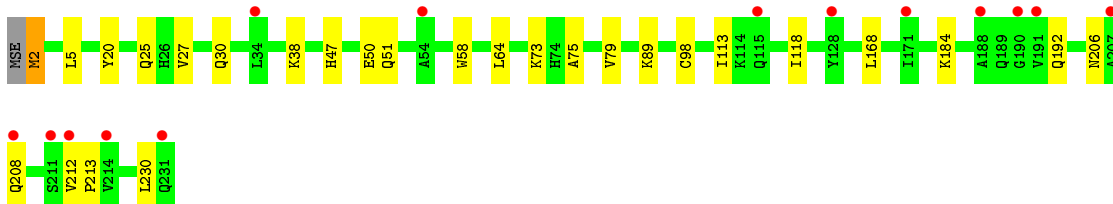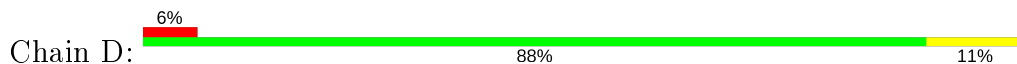
4 Data and refinement statistics (i)

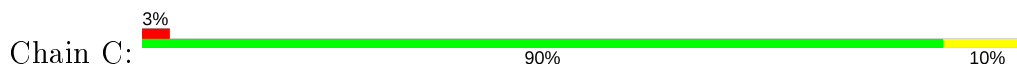| Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	66.52Å 95.41Å 142.62Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	38.77 – 1.75 38.77 – 1.75	Depositor EDS
% Data completeness (in resolution range)	99.8 (38.77-1.75) 99.8 (38.77-1.75)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.89 (at 1.75Å)	Xtriage
Refinement program	PHENIX 1.6.2_432	Depositor
R, R_{free}	0.170 , 0.202 0.183 , 0.211	Depositor DCC
R_{free} test set	4598 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	18.8	Xtriage
Anisotropy	0.471	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.38 , 60.5	EDS
L-test for twinning[2]	$< \|L\| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	8069	wwPDB-VP
Average B, all atoms (Å^2)	26.0	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 44.75 % 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 1.4597e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

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[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: CA, HEZ

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	0.36	0/1810	0.49	0/2443
1	B	0.39	0/1864	0.55	0/2516
1	C	0.35	0/1802	0.51	0/2432
1	D	0.34	0/1809	0.49	0/2440
All	All	0.36	0/7285	0.51	0/9831

There are no bond length outliers.

There are no bond angle outliers.

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	1781	0	1802	19	0
1	B	1816	0	1849	22	0
1	C	1776	0	1798	17	0
1	D	1781	0	1802	25	0
2	A	3	0	0	0	0
2	B	1	0	0	0	0
3	A	24	0	42	8	0
3	B	64	0	112	14	0
3	C	40	0	70	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	D	32	0	56	2	0
4	A	227	0	0	3	0
4	B	182	0	0	8	0
4	C	179	0	0	7	0
4	D	163	0	0	1	0
All	All	8069	0	7531	93	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 6.

All (93) 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:B:11:MSE:HE3	1:B:87:MSE:SE	1.91	1.20
3:B:233:HEZ:H11	4:B:625:HOH:O	1.59	1.03
1:B:87:MSE:HE2	1:B:87:MSE:HA	1.50	0.94
1:B:49:ILE:HD11	1:B:64:LEU:HD22	1.49	0.93
3:C:233:HEZ:H11	4:C:591:HOH:O	1.73	0.87
1:B:190:GLY:HA2	3:B:236:HEZ:H12	1.61	0.82
3:B:236:HEZ:H42	4:B:625:HOH:O	1.79	0.82
1:C:73:LYS:HE2	4:C:430:HOH:O	1.80	0.81
1:B:34:LEU:H	1:D:47:HIS:HD2	1.27	0.80
3:B:236:HEZ:H11	4:B:625:HOH:O	1.83	0.78
3:B:233:HEZ:H12	3:B:236:HEZ:H51	1.64	0.77
1:D:206:ASN:OD1	1:D:208:GLN:HG2	1.86	0.74
3:C:233:HEZ:H42	4:C:591:HOH:O	1.90	0.71
1:B:86[B]:THR:HG21	3:B:240:HEZ:C4	2.23	0.68
1:B:86[B]:THR:HG21	3:B:240:HEZ:H42	1.77	0.66
1:C:116:GLN:NE2	3:C:233:HEZ:H22	2.11	0.65
1:A:65:LEU:HD12	1:A:87:MSE:HE2	1.79	0.65
1:B:87:MSE:CE	1:B:87:MSE:HA	2.26	0.62
1:D:118:ILE:HG23	1:D:192:GLN:HB2	1.81	0.62
1:A:65:LEU:CD1	1:A:87:MSE:HE2	2.31	0.61
3:B:239:HEZ:H31	4:B:482:HOH:O	1.99	0.61
1:A:26:HIS:CE1	3:A:235:HEZ:H42	2.36	0.60
1:A:177:ASP:HB3	1:A:181:ARG:NH1	2.17	0.60
1:D:30:GLN:HG2	1:D:230:LEU:HD13	1.84	0.60
1:C:70:ILE:HG23	1:C:73:LYS:HZ1	1.68	0.59
1:B:181[A]:ARG:HD3	4:B:494[A]:HOH:O	2.01	0.59
1:B:199:THR:HG23	1:B:218:THR:HB	1.85	0.59
1:D:2:MSE:HE1	1:D:27:VAL:CG1	2.33	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:59:GLN:H	1:A:59:GLN:CD	2.07	0.58
1:B:107:ASP:HB3	3:B:235:HEZ:H31	1.86	0.57
1:B:34:LEU:H	1:D:47:HIS:CD2	2.17	0.57
1:C:26:HIS:HD2	4:C:640:HOH:O	1.88	0.57
1:B:121[B]:ILE:HG12	1:B:195:ILE:HG13	1.87	0.56
1:A:113:ILE:HG23	1:A:118:ILE:HB	1.87	0.56
1:A:172:SER:OG	1:A:174:THR:HG22	2.05	0.56
1:A:127:ARG:NH2	1:A:156:GLU:OE1	2.40	0.55
3:A:235:HEZ:H21	4:A:641:HOH:O	2.06	0.55
1:C:172:SER:OG	1:C:174:THR:HG22	2.06	0.55
1:A:118:ILE:HG23	1:A:192:GLN:HB2	1.88	0.54
3:B:237:HEZ:H31	4:B:645:HOH:O	2.08	0.54
1:A:177:ASP:HB3	1:A:181:ARG:HH12	1.72	0.53
1:B:56:GLY:O	1:B:58[B]:TRP:CE3	2.62	0.52
3:A:236:HEZ:H52	4:A:249:HOH:O	2.10	0.52
4:C:311:HOH:O	1:D:168:LEU:HD22	2.09	0.52
1:D:212:VAL:HB	1:D:213:PRO:HD2	1.90	0.51
1:D:38:LYS:NZ	4:D:557:HOH:O	2.43	0.51
3:B:237:HEZ:H22	4:B:644:HOH:O	2.10	0.50
3:B:235:HEZ:H61	4:B:644:HOH:O	2.11	0.49
1:A:73:LYS:HG2	3:A:236:HEZ:H31	1.94	0.49
1:B:86[B]:THR:HG21	3:B:240:HEZ:H41	1.94	0.49
1:C:192:GLN:O	1:C:213:PRO:HD2	2.14	0.48
1:D:25:GLN:CB	3:D:232:HEZ:H51	2.43	0.48
1:C:26:HIS:HE1	4:C:269:HOH:O	1.97	0.47
1:C:76:GLY:HA2	3:C:232:HEZ:H42	1.96	0.47
1:D:2:MSE:HE1	1:D:27:VAL:HG11	1.96	0.47
3:B:235:HEZ:O6	3:B:237:HEZ:O6	2.30	0.46
1:B:13:TRP:HB2	1:D:20:TYR:CE2	2.51	0.46
1:C:116:GLN:HE22	3:C:233:HEZ:H22	1.77	0.46
3:C:232:HEZ:H32	4:C:505:HOH:O	2.14	0.46
1:D:73:LYS:HD2	1:D:98:CYS:O	2.16	0.45
1:B:34:LEU:HD12	1:D:50:GLU:HG3	1.99	0.44
1:A:64:LEU:C	1:A:64:LEU:HD23	2.38	0.44
1:B:163:TYR:O	1:B:167[B]:CYS:SG	2.75	0.44
1:D:2:MSE:HE1	1:D:27:VAL:HG13	1.98	0.44
1:A:128:TYR:CE2	1:A:132:GLN:HG3	2.53	0.43
3:A:235:HEZ:H51	3:A:235:HEZ:H22	1.75	0.43
1:A:28:LYS:HD3	4:A:287:HOH:O	2.18	0.43
1:B:49:ILE:HD13	1:B:64:LEU:HD13	2.00	0.43
1:C:58:TRP:CE3	1:C:89:LYS:HD3	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:64:LEU:C	1:D:64:LEU:HD23	2.39	0.43
1:B:75:ALA:HB2	1:D:75:ALA:HB2	2.01	0.43
1:A:87:MSE:HE3	1:A:90:VAL:HG22	2.01	0.42
1:C:176:ARG:HD3	1:C:180:ARG:NH2	2.34	0.42
1:C:183:ILE:HG23	1:C:194:ILE:CD1	2.49	0.42
1:D:25:GLN:HB2	3:D:232:HEZ:H51	2.01	0.42
1:C:110:ALA:O	1:C:114:LYS:HG3	2.19	0.42
1:A:73:LYS:NZ	3:A:236:HEZ:H31	2.35	0.42
1:D:206:ASN:OD1	1:D:208:GLN:N	2.39	0.42
1:D:47:HIS:O	1:D:51:GLN:HG3	2.20	0.42
1:C:198:CYS:HB3	1:C:201:ILE:HD12	2.02	0.41
1:D:113:ILE:HG23	1:D:118:ILE:HB	2.03	0.41
1:C:58:TRP:CD2	1:C:89:LYS:HD3	2.55	0.41
1:C:84:THR:HG23	1:C:87:MSE:HB2	2.02	0.41
1:D:58:TRP:CE3	1:D:89:LYS:HD2	2.55	0.41
1:A:73:LYS:HE2	3:A:236:HEZ:H51	2.02	0.41
1:D:58:TRP:CD2	1:D:89:LYS:HD2	2.56	0.41
1:B:66:SER:HB3	1:B:97:ALA:CB	2.51	0.40
1:D:5:LEU:HD23	1:D:79:VAL:CG1	2.52	0.40
1:A:202:THR:HA	1:A:205:VAL:O	2.21	0.40
1:A:73:LYS:HZ1	3:A:237:HEZ:H41	1.87	0.40
1:D:184:LYS:HB3	1:D:184:LYS:HE2	1.85	0.40

There are no symmetry-related clashes.

5.3   Torsion angles ⓘ

5.3.1   Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	230/231 (100%)	226 (98%)	4 (2%)	0	100	100
1	B	236/231 (102%)	233 (99%)	2 (1%)	1 (0%)	34	17
1	C	229/231 (99%)	223 (97%)	6 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	230/231 (100%)	223 (97%)	7 (3%)	0	100	100
All	All	925/924 (100%)	905 (98%)	19 (2%)	1 (0%)	51	33

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	84	THR

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	188/181 (104%)	188 (100%)	0	100	100
1	B	194/181 (107%)	194 (100%)	0	100	100
1	C	187/181 (103%)	185 (99%)	2 (1%)	73	60
1	D	188/181 (104%)	187 (100%)	1 (0%)	88	83
All	All	757/724 (105%)	754 (100%)	3 (0%)	91	87

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	46	PHE
1	C	84	THR
1	D	2	MSE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	74	HIS
1	B	47	HIS
1	C	26	HIS
1	C	116	GLN
1	D	47	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 carbohydrates in this entry.

5.6 Ligand geometry (i)

Of 24 ligands modelled in this entry, 4 are monoatomic - leaving 20 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
3	HEZ	B	236	-	7,7,7	0.18	0	6,6,6	0.58	0
3	HEZ	B	239	-	7,7,7	0.26	0	6,6,6	0.52	0
3	HEZ	D	232	-	7,7,7	0.28	0	6,6,6	0.54	0
3	HEZ	C	233	-	7,7,7	0.23	0	6,6,6	0.50	0
3	HEZ	C	234	-	7,7,7	0.28	0	6,6,6	0.53	0
3	HEZ	B	233	-	7,7,7	0.18	0	6,6,6	0.62	0
3	HEZ	A	237	-	7,7,7	0.28	0	6,6,6	0.50	0
3	HEZ	B	237	-	7,7,7	0.30	0	6,6,6	0.42	0
3	HEZ	D	234	-	7,7,7	0.30	0	6,6,6	0.48	0
3	HEZ	B	234	-	7,7,7	0.28	0	6,6,6	0.61	0
3	HEZ	C	232	-	7,7,7	0.30	0	6,6,6	0.43	0
3	HEZ	B	240	-	7,7,7	0.32	0	6,6,6	0.42	0
3	HEZ	C	236	-	7,7,7	0.31	0	6,6,6	0.47	0
3	HEZ	D	233	-	7,7,7	0.29	0	6,6,6	0.49	0
3	HEZ	A	236	-	7,7,7	0.32	0	6,6,6	0.45	0
3	HEZ	B	238	-	7,7,7	0.26	0	6,6,6	0.44	0
3	HEZ	D	235	-	7,7,7	0.29	0	6,6,6	0.45	0
3	HEZ	A	235	-	7,7,7	0.28	0	6,6,6	0.60	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
3	HEZ	C	235	-	7,7,7	0.29	0	6,6,6	0.48	0
3	HEZ	B	235	-	7,7,7	0.18	0	6,6,6	0.78	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	HEZ	B	236	-	-	3/5/5/5	-
3	HEZ	B	239	-	-	2/5/5/5	-
3	HEZ	D	232	-	-	1/5/5/5	-
3	HEZ	C	233	-	-	1/5/5/5	-
3	HEZ	C	234	-	-	1/5/5/5	-
3	HEZ	B	233	-	-	2/5/5/5	-
3	HEZ	A	237	-	-	2/5/5/5	-
3	HEZ	B	237	-	-	2/5/5/5	-
3	HEZ	D	234	-	-	2/5/5/5	-
3	HEZ	B	234	-	-	1/5/5/5	-
3	HEZ	C	232	-	-	1/5/5/5	-
3	HEZ	B	240	-	-	0/5/5/5	-
3	HEZ	C	236	-	-	2/5/5/5	-
3	HEZ	D	233	-	-	1/5/5/5	-
3	HEZ	A	236	-	-	0/5/5/5	-
3	HEZ	B	238	-	-	1/5/5/5	-
3	HEZ	D	235	-	-	1/5/5/5	-
3	HEZ	A	235	-	-	2/5/5/5	-
3	HEZ	C	235	-	-	1/5/5/5	-
3	HEZ	B	235	-	-	0/5/5/5	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (26) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	239	HEZ	C3-C4-C5-C6
3	D	235	HEZ	C2-C3-C4-C5
3	D	234	HEZ	C2-C3-C4-C5

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Mol	Chain	Res	Type	Atoms
3	C	234	HEZ	C1-C2-C3-C4
3	A	237	HEZ	C1-C2-C3-C4
3	B	234	HEZ	C1-C2-C3-C4
3	B	239	HEZ	C1-C2-C3-C4
3	C	233	HEZ	C3-C4-C5-C6
3	B	233	HEZ	C2-C3-C4-C5
3	C	235	HEZ	C2-C3-C4-C5
3	B	236	HEZ	C4-C5-C6-O6
3	B	238	HEZ	C1-C2-C3-C4
3	B	233	HEZ	C4-C5-C6-O6
3	D	232	HEZ	C4-C5-C6-O6
3	B	237	HEZ	C4-C5-C6-O6
3	B	236	HEZ	C2-C3-C4-C5
3	B	236	HEZ	C3-C4-C5-C6
3	C	236	HEZ	O1-C1-C2-C3
3	B	237	HEZ	O1-C1-C2-C3
3	C	236	HEZ	C3-C4-C5-C6
3	A	237	HEZ	C3-C4-C5-C6
3	A	235	HEZ	C3-C4-C5-C6
3	D	234	HEZ	C3-C4-C5-C6
3	A	235	HEZ	C1-C2-C3-C4
3	C	232	HEZ	C3-C4-C5-C6
3	D	233	HEZ	C3-C4-C5-C6

There are no ring outliers.

12 monomers are involved in 30 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	236	HEZ	4	0
3	B	239	HEZ	1	0
3	D	232	HEZ	2	0
3	C	233	HEZ	4	0
3	B	233	HEZ	2	0
3	A	237	HEZ	1	0
3	B	237	HEZ	3	0
3	C	232	HEZ	2	0
3	B	240	HEZ	3	0
3	A	236	HEZ	4	0
3	A	235	HEZ	3	0
3	B	235	HEZ	3	0

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	225/231 (97%)	-0.02	4 (1%)	68	76	11, 19, 43, 61	0
1	B	225/231 (97%)	0.18	12 (5%)	26	32	10, 18, 46, 150	0
1	C	225/231 (97%)	0.12	7 (3%)	49	55	10, 21, 41, 66	0
1	D	225/231 (97%)	0.31	14 (6%)	20	26	11, 26, 53, 75	0
All	All	900/924 (97%)	0.15	37 (4%)	37	44	10, 21, 48, 150	0

All (37) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	58[A]	TRP	8.0
1	B	52	LEU	6.6
1	B	46	PHE	5.1
1	C	54	ALA	4.9
1	D	54	ALA	4.7
1	B	51	GLN	4.0
1	D	191	VAL	3.7
1	C	168	LEU	3.4
1	A	231	GLN	3.2
1	D	208	GLN	3.1
1	D	188	ALA	3.1
1	A	59	GLN	3.0
1	D	231	GLN	3.0
1	B	128	TYR	3.0
1	A	208	GLN	2.9
1	D	128	TYR	2.9
1	B	56	GLY	2.7
1	B	49	ILE	2.7
1	B	54	ALA	2.7
1	D	34	LEU	2.7
1	D	171	ILE	2.6

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Mol	Chain	Res	Type	RSRZ
1	B	64	LEU	2.6
1	C	174	THR	2.6
1	D	214	VAL	2.6
1	B	55	LYS	2.5
1	C	172	SER	2.5
1	D	207	ALA	2.4
1	C	170	ILE	2.4
1	B	160	ARG	2.3
1	D	211	SER	2.3
1	C	160[A]	ARG	2.2
1	D	115	GLN	2.2
1	C	167	CYS	2.1
1	B	60	THR	2.0
1	A	54	ALA	2.0
1	D	212	VAL	2.0
1	D	190	GLY	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 carbohydrates 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
3	HEZ	B	240	8/8	0.44	0.26	55,57,61,61	0
3	HEZ	D	233	8/8	0.64	0.22	52,56,62,63	0
3	HEZ	C	236	8/8	0.67	0.23	65,67,70,71	0
3	HEZ	C	232	8/8	0.73	0.15	52,55,58,59	0
3	HEZ	D	232	8/8	0.73	0.19	55,56,59,60	0
3	HEZ	D	234	8/8	0.76	0.22	44,53,63,64	0
3	HEZ	C	234	8/8	0.76	0.22	52,60,62,63	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å²)	Q<0.9
3	HEZ	C	235	8/8	0.77	0.20	38,49,63,64	0
3	HEZ	A	236	8/8	0.78	0.20	51,55,56,57	0
3	HEZ	B	234	8/8	0.79	0.20	42,58,70,76	0
3	HEZ	A	235	8/8	0.81	0.17	56,58,61,62	0
3	HEZ	B	238	8/8	0.81	0.16	35,48,57,57	0
3	HEZ	A	237	8/8	0.81	0.21	45,55,61,62	0
3	HEZ	B	233	8/8	0.83	0.16	33,41,47,55	0
3	HEZ	D	235	8/8	0.83	0.21	49,56,68,71	0
3	HEZ	B	236	8/8	0.86	0.16	32,39,51,58	0
3	HEZ	C	233	8/8	0.87	0.16	49,54,61,69	0
3	HEZ	B	237	8/8	0.88	0.19	28,40,50,52	0
3	HEZ	B	239	8/8	0.90	0.14	28,36,45,49	0
3	HEZ	B	235	8/8	0.90	0.20	19,26,36,48	0
2	CA	A	234	1/1	0.97	0.05	26,26,26,26	0
2	CA	A	233	1/1	0.98	0.03	35,35,35,35	0
2	CA	A	232	1/1	0.99	0.03	27,27,27,27	0
2	CA	B	232	1/1	0.99	0.03	22,22,22,22	0

6.5 Other polymers (i)

There are no such residues in this entry.