



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 12, 2024 – 06:45 PM EDT

PDB ID : 3LIM
Title : Crystal structure of the pore forming toxin frac from sea anemone actinia fragacea
Authors : Mechaly, A.E.; Bellomio, A.; Morante, K.; Gonzalez-Manas, J.M.; Guerin, D.M.A.
Deposited on : 2010-01-25
Resolution : 1.80 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
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 1.20.1
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

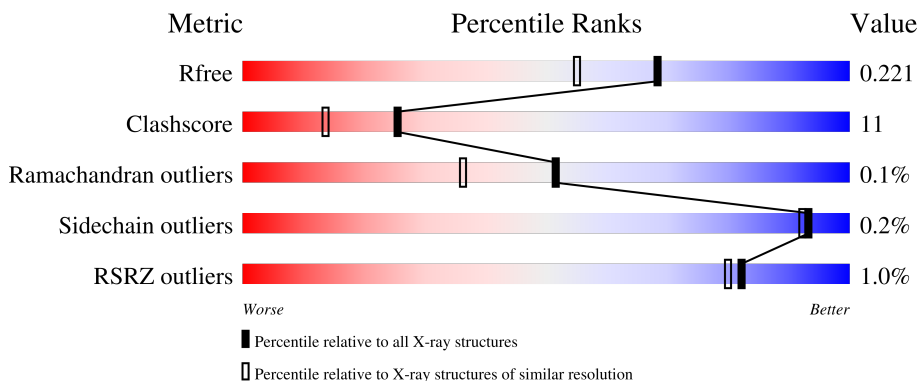
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.80 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	5950 (1.80-1.80)
Clashscore	141614	6793 (1.80-1.80)
Ramachandran outliers	138981	6697 (1.80-1.80)
Sidechain outliers	138945	6696 (1.80-1.80)
RSRZ outliers	127900	5850 (1.80-1.80)

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	178	88% 12%
1	B	178	87% 13%
1	C	178	87% 13%
1	D	178	88% 12%
1	E	178	89% 11%

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Mol	Chain	Length	Quality of chain
1	F	178	 % 87% 13%

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	LDA	A	201	-	-	X	-
2	LDA	B	201	-	-	X	-
2	LDA	E	201	-	-	X	-
2	LDA	F	201	-	-	X	-

2 Entry composition [i](#)

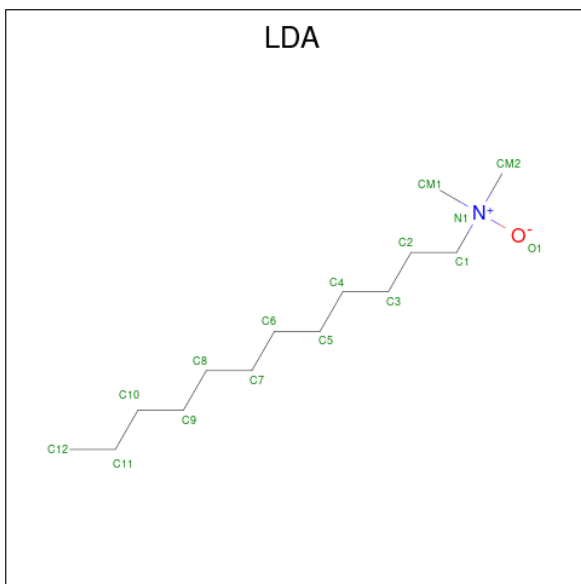
There are 3 unique types of molecules in this entry. The entry contains 9549 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Fragaceatoxin C.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	178	1389	883	250	252	4	4	0	0
1	B	178	1389	883	250	252	4	6	0	0
1	C	178	1389	883	250	252	4	3	0	0
1	D	178	1389	883	250	252	4	2	0	0
1	E	178	1389	883	250	252	4	5	0	0
1	F	178	1389	883	250	252	4	5	0	0

- Molecule 2 is LAURYL DIMETHYLAMINE-N-OXIDE (three-letter code: LDA) (formula: $C_{14}H_{31}NO$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			15	13	1	1		
2	A	1	Total	C	N	O	0	0
			15	13	1	1		
2	A	1	Total	C	N	O	0	0
			15	13	1	1		
2	B	1	Total	C	N	O	0	0
			15	13	1	1		
2	B	1	Total	C	N	O	0	0
			15	13	1	1		
2	B	1	Total	C	N	O	0	0
			15	13	1	1		
2	C	1	Total	C	N	O	0	0
			15	13	1	1		
2	C	1	Total	C	N	O	0	0
			15	13	1	1		
2	C	1	Total	C	N	O	0	0
			15	13	1	1		
2	D	1	Total	C	N	O	1	0
			15	13	1	1		
2	D	1	Total	C	N	O	0	0
			15	13	1	1		
2	D	1	Total	C	N	O	0	0
			15	13	1	1		
2	E	1	Total	C	N	O	0	0
			15	13	1	1		
2	E	1	Total	C	N	O	0	0
			15	13	1	1		
2	E	1	Total	C	N	O	0	0
			15	13	1	1		
2	F	1	Total	C	N	O	0	0
			15	13	1	1		
2	F	1	Total	C	N	O	0	0
			15	13	1	1		
2	F	1	Total	C	N	O	0	0
			15	13	1	1		

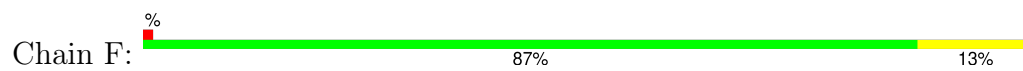
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	196	Total	O	0	0
			196	196		
3	B	174	Total	O	0	0
			174	174		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	C	192	Total 192	O 192	0	0
3	D	132	Total 132	O 132	0	0
3	E	117	Total 117	O 117	0	0
3	F	134	Total 134	O 134	0	0



4 Data and refinement statistics

Property	Value	Source
Space group	P 63 2 2	Depositor
Cell constants a, b, c, α , β , γ	117.90Å 117.90Å 343.23Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	49.91 – 1.80 49.91 – 1.80	Depositor EDS
% Data completeness (in resolution range)	97.5 (49.91-1.80) 97.5 (49.91-1.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.53 (at 1.79Å)	Xtrriage
Refinement program	PHENIX (PHENIX.REFINE)	Depositor
R, R_{free}	0.189 , 0.224 0.187 , 0.221	Depositor DCC
R_{free} test set	6427 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å ²)	21.1	Xtrriage
Anisotropy	0.487	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 52.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.28$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	9549	wwPDB-VP
Average B, all atoms (Å ²)	25.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 15.30% 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: LDA

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	0.31	0/1424	0.50	0/1926
1	B	0.31	0/1424	0.48	0/1926
1	C	0.34	0/1424	0.50	0/1926
1	D	0.28	0/1424	0.47	0/1926
1	E	0.28	0/1424	0.46	0/1926
1	F	0.29	0/1424	0.48	0/1926
All	All	0.30	0/8544	0.48	0/11556

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	1389	0	1358	32	0
1	B	1389	0	1358	28	0
1	C	1389	0	1358	24	0
1	D	1389	0	1358	22	0
1	E	1389	0	1358	24	0
1	F	1389	0	1358	23	0
2	A	45	0	78	19	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	45	0	78	14	0
2	C	45	0	78	11	0
2	D	45	0	78	7	0
2	E	45	0	78	16	0
2	F	45	0	78	12	0
3	A	196	0	0	10	2
3	B	174	0	0	10	1
3	C	192	0	0	10	2
3	D	132	0	0	12	0
3	E	117	0	0	7	0
3	F	134	0	0	3	1
All	All	9549	0	8616	181	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 11.

All (181) 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:53:ARG:HE	2:A:201:LDA:HM22	1.22	1.02
2:E:201:LDA:HM23	2:E:202:LDA:H101	1.43	1.01
1:B:133:TYR:HE2	2:B:201:LDA:H11	1.31	0.96
1:A:58:ASP:HB3	3:A:822:HOH:O	1.70	0.90
1:A:133:TYR:HE2	2:A:201:LDA:H11	1.39	0.85
1:D:82:VAL:HB	3:D:784:HOH:O	1.77	0.85
1:C:53:ARG:HH21	2:C:201:LDA:HM13	1.41	0.83
1:B:133:TYR:CE2	2:B:201:LDA:H11	2.14	0.82
2:F:201:LDA:HM12	2:F:202:LDA:H82	1.61	0.80
3:E:404:HOH:O	1:F:58:ASP:HB3	1.84	0.78
2:F:201:LDA:H31	2:F:201:LDA:HM13	1.65	0.78
2:E:201:LDA:HM23	2:E:202:LDA:C10	2.14	0.77
3:B:824:HOH:O	1:C:58:ASP:HB3	1.85	0.76
1:B:2:ALA:HB1	3:B:313:HOH:O	1.86	0.75
1:E:53:ARG:NH2	2:E:201:LDA:H22	2.02	0.74
1:A:2:ALA:HB3	1:A:9:ILE:HG22	1.69	0.73
1:D:113:TYR:CE1	2:D:201:LDA:H82	2.24	0.72
1:D:2:ALA:HB1	3:D:843:HOH:O	1.89	0.72
1:A:133:TYR:CE2	2:A:201:LDA:H11	2.22	0.72
1:E:2:ALA:HB3	1:E:9:ILE:HG22	1.71	0.71
1:D:53:ARG:HH21	2:D:201:LDA:HM13	1.57	0.70
1:C:2:ALA:HB1	3:C:345:HOH:O	1.90	0.70

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:53:ARG:HH21	2:C:201:LDA:CM1	2.05	0.69
1:A:2:ALA:HB1	3:A:932:HOH:O	1.92	0.68
1:C:18:VAL:HG23	3:C:439:HOH:O	1.94	0.68
1:E:138:TYR:OH	2:E:201:LDA:HM21	1.94	0.68
2:C:201:LDA:H32	2:C:201:LDA:H81	1.77	0.66
1:B:2:ALA:HB3	1:B:9:ILE:HG22	1.79	0.65
1:A:130:GLN:HE22	2:A:201:LDA:HM21	1.63	0.64
1:B:63:HIS:HD2	3:B:210:HOH:O	1.81	0.63
1:F:53:ARG:HH21	2:F:201:LDA:HM13	1.64	0.63
1:D:2:ALA:HB3	1:D:9:ILE:HG22	1.80	0.63
3:E:378:HOH:O	1:F:63:HIS:HD2	1.82	0.63
1:E:2:ALA:HB1	3:E:855:HOH:O	1.98	0.62
2:B:201:LDA:H21	2:B:201:LDA:H81	1.81	0.62
1:D:58:ASP:HB3	3:D:318:HOH:O	2.00	0.61
1:C:63:HIS:HD2	3:C:210:HOH:O	1.82	0.61
1:A:53:ARG:NE	2:A:201:LDA:HM22	2.06	0.60
1:C:2:ALA:HB3	1:C:9:ILE:HG22	1.81	0.60
1:A:16:PHE:CZ	1:B:59:ILE:HD13	2.35	0.60
1:A:63:HIS:HD2	3:A:219:HOH:O	1.84	0.60
2:F:201:LDA:H41	2:F:201:LDA:C8	2.30	0.59
1:C:138:TYR:OH	2:C:201:LDA:H12	2.02	0.59
1:D:4:VAL:HG23	3:D:913:HOH:O	2.03	0.59
3:A:238:HOH:O	1:B:63:HIS:HE1	1.85	0.59
3:E:239:HOH:O	1:F:63:HIS:HE1	1.84	0.59
1:A:16:PHE:HE1	1:B:58:ASP:O	1.85	0.58
1:E:112:TRP:CZ3	2:E:203:LDA:H81	2.38	0.58
1:D:120:ARG:NH1	1:D:152:ARG:HD3	2.19	0.58
1:B:138:TYR:OH	2:B:201:LDA:H12	2.04	0.58
1:F:53:ARG:NE	2:F:201:LDA:H21	2.18	0.58
1:E:53:ARG:HH21	2:E:201:LDA:HM13	1.69	0.57
1:D:63:HIS:HE1	3:D:231:HOH:O	1.86	0.57
1:A:112:TRP:CZ3	2:A:203:LDA:H91	2.39	0.57
2:A:201:LDA:H21	2:A:201:LDA:H81	1.85	0.56
1:D:17:ASP:O	1:D:21:THR:HG23	2.05	0.56
1:A:81:PRO:HB2	1:F:108:TYR:OH	2.05	0.56
2:F:201:LDA:H41	2:F:201:LDA:H81	1.88	0.56
1:A:130:GLN:HE22	2:A:201:LDA:CM2	2.18	0.56
1:F:133:TYR:OH	2:F:201:LDA:H22	2.05	0.56
1:B:17:ASP:O	1:B:21:THR:HG23	2.05	0.56
1:F:113:TYR:CE1	2:F:201:LDA:H82	2.41	0.56
1:A:17:ASP:O	1:A:21:THR:HG23	2.06	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:53:ARG:NH2	2:C:201:LDA:HM13	2.19	0.55
1:A:16:PHE:CE1	1:B:59:ILE:HA	2.42	0.55
1:C:63:HIS:HE1	3:C:222:HOH:O	1.88	0.55
1:C:16:PHE:CE2	1:C:20:LYS:HD2	2.42	0.55
1:A:16:PHE:CZ	1:A:20:LYS:HD2	2.42	0.54
1:B:133:TYR:OH	2:B:201:LDA:H42	2.06	0.54
1:C:131:ARG:CZ	3:C:251:HOH:O	2.55	0.54
1:D:4:VAL:HG22	3:D:843:HOH:O	2.06	0.54
1:E:16:PHE:CE2	1:E:20:LYS:HD2	2.42	0.54
1:F:17:ASP:O	1:F:21:THR:HG23	2.07	0.54
1:B:13:GLY:HA3	3:B:260:HOH:O	2.06	0.54
1:A:16:PHE:CE1	1:B:58:ASP:O	2.62	0.53
1:C:112:TRP:CE2	2:C:203:LDA:H61	2.43	0.53
2:A:201:LDA:H41	3:A:438:HOH:O	2.09	0.53
2:A:203:LDA:H52	2:E:203:LDA:H51	1.91	0.53
1:B:16:PHE:CE2	1:B:20:LYS:HD2	2.44	0.53
1:C:17:ASP:O	1:C:21:THR:HG23	2.09	0.53
3:D:217:HOH:O	1:E:63:HIS:HD2	1.92	0.53
1:A:30:LYS:NZ	1:F:81:PRO:HB3	2.23	0.52
1:A:30:LYS:HZ3	1:F:81:PRO:HB3	1.73	0.52
1:C:152:ARG:HD2	3:C:309:HOH:O	2.10	0.52
1:D:79:ARG:HG2	3:D:314:HOH:O	2.09	0.52
1:F:16:PHE:CE2	1:F:20:LYS:HD2	2.45	0.52
1:F:2:ALA:HB3	1:F:9:ILE:HG22	1.91	0.51
1:E:63:HIS:HE1	3:E:469:HOH:O	1.93	0.51
1:A:63:HIS:HE1	3:A:240:HOH:O	1.92	0.51
1:E:17:ASP:O	1:E:21:THR:HG23	2.10	0.51
1:D:16:PHE:CE2	1:D:20:LYS:HD2	2.46	0.51
1:A:152:ARG:HD2	3:A:478:HOH:O	2.11	0.50
1:E:16:PHE:CZ	1:E:20:LYS:HD2	2.45	0.50
1:F:152:ARG:HG2	1:F:153:GLY:O	2.12	0.50
1:B:82:VAL:HG21	3:B:578:HOH:O	2.10	0.50
1:B:16:PHE:CZ	1:B:20:LYS:HD2	2.47	0.50
1:F:120:ARG:HD2	1:F:140:ARG:NH2	2.27	0.49
1:E:133:TYR:HE2	2:E:201:LDA:HM22	1.78	0.48
1:C:125:GLN:HG2	3:C:302:HOH:O	2.13	0.48
1:A:2:ALA:HB3	1:A:9:ILE:CG2	2.40	0.48
2:A:203:LDA:H21	2:A:203:LDA:HM13	1.53	0.48
1:C:82:VAL:HG21	3:C:739:HOH:O	2.14	0.48
1:C:78:ASN:ND2	3:C:823:HOH:O	2.44	0.48
2:B:201:LDA:H41	3:B:642:HOH:O	2.12	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:201:LDA:HM23	2:A:202:LDA:H72	1.96	0.47
1:A:120:ARG:NH2	1:A:140:ARG:NH2	2.62	0.47
1:E:13:GLY:HA3	3:E:543:HOH:O	2.14	0.47
1:A:16:PHE:CE2	1:A:20:LYS:HD2	2.49	0.47
2:B:201:LDA:HM23	2:B:202:LDA:C11	2.45	0.47
1:A:112:TRP:CE2	2:A:203:LDA:H82	2.51	0.46
1:A:130:GLN:NE2	2:A:201:LDA:HM21	2.29	0.46
2:B:202:LDA:H71	2:B:202:LDA:H102	1.31	0.46
2:E:201:LDA:C3	2:E:201:LDA:H81	2.46	0.46
1:A:161:ARG:HD2	1:B:63:HIS:CE1	2.51	0.46
2:C:202:LDA:H52	2:C:202:LDA:H82	1.54	0.46
1:E:87:VAL:HG21	2:E:201:LDA:H52	1.98	0.46
2:F:201:LDA:HM23	2:F:202:LDA:C11	2.45	0.46
2:C:201:LDA:HM13	2:C:201:LDA:H21	1.54	0.45
1:E:152:ARG:HD2	3:E:752:HOH:O	2.15	0.45
2:B:201:LDA:H51	2:B:201:LDA:H82	1.29	0.45
2:B:202:LDA:H31	2:B:202:LDA:H62	1.51	0.45
1:A:78:ASN:ND2	3:A:840:HOH:O	2.49	0.45
1:B:74:ASN:OD1	1:B:74:ASN:C	2.55	0.45
1:F:13:GLY:HA3	3:F:733:HOH:O	2.17	0.45
1:F:16:PHE:CZ	1:F:20:LYS:HD2	2.52	0.45
2:F:203:LDA:H21	2:F:203:LDA:HM13	1.61	0.45
1:D:161:ARG:HD2	1:E:63:HIS:CE1	2.52	0.44
1:C:123:LYS:HG3	1:C:156:TYR:OH	2.17	0.44
2:E:201:LDA:H92	2:E:201:LDA:H31	1.99	0.44
2:E:203:LDA:HM13	2:E:203:LDA:H21	1.49	0.44
1:B:112:TRP:CE2	2:B:203:LDA:H61	2.52	0.44
2:F:201:LDA:H81	2:F:201:LDA:C4	2.47	0.44
2:C:202:LDA:H71	2:C:202:LDA:H102	1.46	0.44
2:D:201:LDA:H51	2:D:201:LDA:H81	1.44	0.44
2:F:202:LDA:HM11	2:F:202:LDA:H21	1.40	0.44
1:F:152:ARG:HD2	3:F:263:HOH:O	2.18	0.44
1:B:78:ASN:ND2	3:B:635:HOH:O	2.51	0.43
1:E:53:ARG:CZ	2:E:201:LDA:H22	2.47	0.43
1:E:74:ASN:OD1	1:E:74:ASN:C	2.56	0.43
2:A:203:LDA:C5	2:E:203:LDA:H51	2.48	0.43
1:F:122:TYR:HB3	1:F:126:LYS:HD2	1.99	0.43
2:A:202:LDA:HM13	2:A:202:LDA:H21	1.38	0.43
1:D:78:ASN:ND2	3:D:828:HOH:O	2.50	0.43
1:A:125:GLN:HG2	3:A:460:HOH:O	2.18	0.43
1:B:125:GLN:HG2	3:B:476:HOH:O	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:201:LDA:H81	2:C:201:LDA:H51	1.68	0.43
1:D:16:PHE:CZ	1:D:20:LYS:HD2	2.54	0.43
1:D:152:ARG:HD2	3:D:603:HOH:O	2.19	0.43
1:B:122:TYR:HB3	1:B:126:LYS:HD2	2.01	0.42
2:E:203:LDA:H91	2:E:203:LDA:H62	1.75	0.42
1:B:18:VAL:HG23	3:B:561:HOH:O	2.18	0.42
1:C:112:TRP:CE3	2:C:203:LDA:H82	2.55	0.42
1:D:74:ASN:OD1	1:D:74:ASN:C	2.58	0.42
1:E:152:ARG:HG2	1:E:153:GLY:O	2.20	0.42
1:D:13:GLY:HA3	3:D:745:HOH:O	2.19	0.42
2:D:201:LDA:H92	2:D:201:LDA:H31	2.01	0.42
1:A:53:ARG:HE	2:A:201:LDA:CM2	2.11	0.42
1:B:161:ARG:HD2	1:C:63:HIS:CE1	2.55	0.42
1:C:108:TYR:OH	1:D:81:PRO:HB2	2.19	0.42
1:D:82:VAL:HG21	3:D:734:HOH:O	2.20	0.42
1:E:16:PHE:CZ	1:F:59:ILE:HD13	2.55	0.41
1:F:78:ASN:ND2	3:F:607:HOH:O	2.52	0.41
2:D:202:LDA:H21	2:D:202:LDA:HM13	1.34	0.41
2:B:202:LDA:H22	2:B:202:LDA:HM13	1.78	0.41
2:D:203:LDA:H41	2:D:203:LDA:H72	1.58	0.41
1:E:16:PHE:HE1	1:F:58:ASP:O	2.04	0.41
1:B:2:ALA:HB2	3:B:552:HOH:O	2.20	0.41
1:E:120:ARG:NH2	1:E:140:ARG:NH2	2.68	0.41
1:F:74:ASN:C	1:F:74:ASN:OD1	2.59	0.41
2:A:201:LDA:H82	2:A:201:LDA:H51	1.57	0.41
1:C:13:GLY:HA3	3:C:270:HOH:O	2.20	0.41
1:E:2:ALA:HB3	1:E:9:ILE:CG2	2.45	0.41
1:A:4:VAL:HG22	3:A:932:HOH:O	2.21	0.41
2:A:203:LDA:H71	2:A:203:LDA:H102	1.90	0.41
1:B:152:ARG:HG2	1:B:153:GLY:O	2.21	0.41
2:E:201:LDA:CM2	2:E:202:LDA:H101	2.32	0.41
1:C:120:ARG:NH2	1:C:140:ARG:NH2	2.69	0.40
1:B:138:TYR:CE2	2:B:201:LDA:H12	2.56	0.40
2:B:201:LDA:HM13	2:B:201:LDA:H22	1.52	0.40
1:D:138:TYR:OH	2:D:201:LDA:H12	2.22	0.40
1:E:140:ARG:HD3	1:E:140:ARG:HA	1.84	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:B:204:HOH:O	3:B:204:HOH:O[12_555]	1.63	0.57
3:A:212:HOH:O	3:C:791:HOH:O[12_555]	2.18	0.02
3:A:790:HOH:O	3:C:189:HOH:O[12_555]	2.19	0.01
3:F:189:HOH:O	3:F:189:HOH:O[7_555]	2.19	0.01

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	176/178 (99%)	172 (98%)	4 (2%)	0	100	100
1	B	176/178 (99%)	172 (98%)	4 (2%)	0	100	100
1	C	176/178 (99%)	171 (97%)	5 (3%)	0	100	100
1	D	176/178 (99%)	172 (98%)	4 (2%)	0	100	100
1	E	176/178 (99%)	173 (98%)	3 (2%)	0	100	100
1	F	176/178 (99%)	170 (97%)	5 (3%)	1 (1%)	25	12
All	All	1056/1068 (99%)	1030 (98%)	25 (2%)	1 (0%)	51	36

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	F	3	ASP

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	141/141 (100%)	140 (99%)	1 (1%)	84	81
1	B	141/141 (100%)	141 (100%)	0	100	100
1	C	141/141 (100%)	141 (100%)	0	100	100
1	D	141/141 (100%)	141 (100%)	0	100	100
1	E	141/141 (100%)	140 (99%)	1 (1%)	84	81
1	F	141/141 (100%)	141 (100%)	0	100	100
All	All	846/846 (100%)	844 (100%)	2 (0%)	93	92

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	72	LEU
1	E	72	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	28	ASN
1	A	63	HIS
1	A	78	ASN
1	A	147	ASN
1	B	28	ASN
1	B	63	HIS
1	B	78	ASN
1	B	147	ASN
1	C	28	ASN
1	C	63	HIS
1	C	78	ASN
1	C	147	ASN
1	D	28	ASN
1	D	63	HIS
1	D	78	ASN
1	D	147	ASN
1	E	28	ASN
1	E	63	HIS
1	E	78	ASN
1	E	147	ASN
1	F	28	ASN
1	F	63	HIS
1	F	78	ASN

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Mol	Chain	Res	Type
1	F	147	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](#)

18 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	LDA	A	203	-	12,14,15	2.55	2 (16%)	13,16,17	0.59	0
2	LDA	A	201	-	12,14,15	2.63	2 (16%)	13,16,17	0.58	0
2	LDA	C	202	-	12,14,15	2.61	2 (16%)	13,16,17	0.49	0
2	LDA	B	202	-	12,14,15	2.56	2 (16%)	13,16,17	0.50	0
2	LDA	E	202	-	12,14,15	2.58	2 (16%)	13,16,17	0.48	0
2	LDA	F	201	-	12,14,15	2.47	2 (16%)	13,16,17	0.55	0
2	LDA	B	203	-	12,14,15	2.53	2 (16%)	13,16,17	0.53	0
2	LDA	C	201	-	12,14,15	2.55	2 (16%)	13,16,17	0.62	0
2	LDA	C	203	-	12,14,15	2.52	2 (16%)	13,16,17	0.54	0
2	LDA	F	202	-	12,14,15	2.55	2 (16%)	13,16,17	0.51	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	LDA	B	201	-	12,14,15	2.56	2 (16%)	13,16,17	0.62	0
2	LDA	D	202	-	12,14,15	2.57	2 (16%)	13,16,17	0.53	0
2	LDA	D	203	-	12,14,15	2.50	2 (16%)	13,16,17	0.50	0
2	LDA	E	203	-	12,14,15	2.55	2 (16%)	13,16,17	0.51	0
2	LDA	A	202	-	12,14,15	2.57	2 (16%)	13,16,17	0.52	0
2	LDA	D	201	-	12,14,15	2.68	2 (16%)	13,16,17	0.57	0
2	LDA	E	201	-	12,14,15	2.54	2 (16%)	13,16,17	0.60	0
2	LDA	F	203	-	12,14,15	2.60	2 (16%)	13,16,17	0.54	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	LDA	A	203	-	-	10/12/12/13	-
2	LDA	A	201	-	-	9/12/12/13	-
2	LDA	C	202	-	-	8/12/12/13	-
2	LDA	B	202	-	-	10/12/12/13	-
2	LDA	E	202	-	-	8/12/12/13	-
2	LDA	F	201	-	-	5/12/12/13	-
2	LDA	B	203	-	-	7/12/12/13	-
2	LDA	C	201	-	-	5/12/12/13	-
2	LDA	C	203	-	-	7/12/12/13	-
2	LDA	F	202	-	-	6/12/12/13	-
2	LDA	B	201	-	-	8/12/12/13	-
2	LDA	D	202	-	-	5/12/12/13	-
2	LDA	D	203	-	-	8/12/12/13	-
2	LDA	E	203	-	-	7/12/12/13	-
2	LDA	A	202	-	-	7/12/12/13	-
2	LDA	D	201	-	-	7/12/12/13	-
2	LDA	E	201	-	-	6/12/12/13	-
2	LDA	F	203	-	-	6/12/12/13	-

All (36) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	201	LDA	O1-N1	-6.94	1.25	1.42
2	C	202	LDA	O1-N1	-6.92	1.25	1.42
2	A	202	LDA	O1-N1	-6.89	1.25	1.42
2	C	203	LDA	O1-N1	-6.87	1.25	1.42
2	A	201	LDA	O1-N1	-6.85	1.25	1.42
2	F	201	LDA	O1-N1	-6.85	1.25	1.42
2	F	203	LDA	O1-N1	-6.84	1.25	1.42
2	B	201	LDA	O1-N1	-6.83	1.25	1.42
2	A	203	LDA	O1-N1	-6.82	1.25	1.42
2	E	202	LDA	O1-N1	-6.81	1.25	1.42
2	E	201	LDA	O1-N1	-6.80	1.25	1.42
2	B	203	LDA	O1-N1	-6.79	1.25	1.42
2	D	203	LDA	O1-N1	-6.78	1.25	1.42
2	F	202	LDA	O1-N1	-6.78	1.25	1.42
2	E	203	LDA	O1-N1	-6.77	1.25	1.42
2	B	202	LDA	O1-N1	-6.76	1.25	1.42
2	C	201	LDA	O1-N1	-6.76	1.25	1.42
2	D	202	LDA	O1-N1	-6.74	1.25	1.42
2	D	201	LDA	C1-N1	-6.12	1.45	1.51
2	A	201	LDA	C1-N1	-5.95	1.45	1.51
2	F	203	LDA	C1-N1	-5.81	1.45	1.51
2	C	202	LDA	C1-N1	-5.76	1.45	1.51
2	D	202	LDA	C1-N1	-5.75	1.45	1.51
2	E	202	LDA	C1-N1	-5.75	1.45	1.51
2	B	202	LDA	C1-N1	-5.70	1.45	1.51
2	E	203	LDA	C1-N1	-5.63	1.45	1.51
2	C	201	LDA	C1-N1	-5.61	1.45	1.51
2	A	202	LDA	C1-N1	-5.60	1.45	1.51
2	B	201	LDA	C1-N1	-5.59	1.45	1.51
2	F	202	LDA	C1-N1	-5.58	1.45	1.51
2	E	201	LDA	C1-N1	-5.55	1.45	1.51
2	A	203	LDA	C1-N1	-5.55	1.45	1.51
2	B	203	LDA	C1-N1	-5.46	1.45	1.51
2	D	203	LDA	C1-N1	-5.36	1.45	1.51
2	C	203	LDA	C1-N1	-5.35	1.45	1.51
2	F	201	LDA	C1-N1	-5.03	1.46	1.51

There are no bond angle outliers.

There are no chirality outliers.

All (129) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	201	LDA	C2-C1-N1-CM1
2	A	201	LDA	N1-C1-C2-C3
2	A	203	LDA	C2-C1-N1-CM1
2	A	203	LDA	C2-C1-N1-CM2
2	A	203	LDA	N1-C1-C2-C3
2	B	201	LDA	C2-C1-N1-O1
2	B	201	LDA	C2-C1-N1-CM1
2	B	201	LDA	C2-C1-N1-CM2
2	B	201	LDA	N1-C1-C2-C3
2	B	202	LDA	C2-C1-N1-CM1
2	B	202	LDA	C2-C1-N1-CM2
2	B	203	LDA	C2-C1-N1-O1
2	B	203	LDA	C2-C1-N1-CM1
2	B	203	LDA	C2-C1-N1-CM2
2	C	202	LDA	C2-C1-N1-O1
2	C	202	LDA	C2-C1-N1-CM1
2	C	203	LDA	C2-C1-N1-CM1
2	C	203	LDA	C2-C1-N1-CM2
2	D	202	LDA	C2-C1-N1-CM1
2	D	202	LDA	C2-C1-N1-CM2
2	D	203	LDA	C2-C1-N1-O1
2	D	203	LDA	C2-C1-N1-CM1
2	D	203	LDA	C2-C1-N1-CM2
2	D	203	LDA	N1-C1-C2-C3
2	E	201	LDA	C2-C1-N1-O1
2	E	201	LDA	C2-C1-N1-CM1
2	E	201	LDA	C2-C1-N1-CM2
2	E	202	LDA	C2-C1-N1-CM2
2	E	203	LDA	C2-C1-N1-O1
2	E	203	LDA	C2-C1-N1-CM1
2	E	203	LDA	C2-C1-N1-CM2
2	F	201	LDA	N1-C1-C2-C3
2	F	202	LDA	C2-C1-N1-O1
2	F	202	LDA	C2-C1-N1-CM1
2	F	202	LDA	N1-C1-C2-C3
2	F	203	LDA	C2-C1-N1-CM1
2	A	201	LDA	C5-C6-C7-C8
2	C	202	LDA	C5-C6-C7-C8
2	B	202	LDA	C1-C2-C3-C4
2	C	202	LDA	C7-C8-C9-C10
2	B	201	LDA	C5-C6-C7-C8
2	B	202	LDA	C7-C8-C9-C10
2	D	201	LDA	C5-C6-C7-C8

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Mol	Chain	Res	Type	Atoms
2	C	201	LDA	C5-C6-C7-C8
2	B	202	LDA	C5-C6-C7-C8
2	D	203	LDA	C4-C5-C6-C7
2	D	201	LDA	C6-C7-C8-C9
2	A	203	LDA	C4-C5-C6-C7
2	E	202	LDA	C5-C6-C7-C8
2	E	201	LDA	C4-C5-C6-C7
2	C	203	LDA	C7-C8-C9-C10
2	D	201	LDA	C7-C8-C9-C10
2	F	202	LDA	C7-C8-C9-C10
2	B	201	LDA	C4-C5-C6-C7
2	E	202	LDA	C6-C7-C8-C9
2	A	202	LDA	C1-C2-C3-C4
2	F	202	LDA	C1-C2-C3-C4
2	A	202	LDA	C2-C3-C4-C5
2	D	202	LDA	C1-C2-C3-C4
2	A	203	LDA	C5-C6-C7-C8
2	A	201	LDA	C11-C10-C9-C8
2	D	202	LDA	C7-C8-C9-C10
2	B	202	LDA	C3-C4-C5-C6
2	B	202	LDA	C6-C7-C8-C9
2	E	201	LDA	C5-C6-C7-C8
2	E	203	LDA	C7-C8-C9-C10
2	F	203	LDA	C1-C2-C3-C4
2	B	201	LDA	C1-C2-C3-C4
2	A	202	LDA	C3-C4-C5-C6
2	A	203	LDA	C3-C4-C5-C6
2	F	203	LDA	C7-C8-C9-C10
2	C	202	LDA	C1-C2-C3-C4
2	F	203	LDA	C3-C4-C5-C6
2	A	203	LDA	C6-C7-C8-C9
2	D	201	LDA	C1-C2-C3-C4
2	D	203	LDA	C7-C8-C9-C10
2	E	202	LDA	C11-C10-C9-C8
2	A	201	LDA	C4-C5-C6-C7
2	B	202	LDA	C4-C5-C6-C7
2	B	202	LDA	C11-C10-C9-C8
2	C	203	LDA	C1-C2-C3-C4
2	A	201	LDA	C7-C8-C9-C10
2	F	202	LDA	C11-C10-C9-C8
2	F	201	LDA	C7-C8-C9-C10
2	C	203	LDA	C4-C5-C6-C7

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Mol	Chain	Res	Type	Atoms
2	C	201	LDA	C4-C5-C6-C7
2	E	203	LDA	C1-C2-C3-C4
2	A	201	LDA	C1-C2-C3-C4
2	C	202	LDA	C11-C10-C9-C8
2	B	203	LDA	C1-C2-C3-C4
2	E	201	LDA	C7-C8-C9-C10
2	D	201	LDA	C3-C4-C5-C6
2	A	202	LDA	C6-C7-C8-C9
2	B	203	LDA	C7-C8-C9-C10
2	E	202	LDA	C7-C8-C9-C10
2	F	203	LDA	C4-C5-C6-C7
2	A	203	LDA	C11-C10-C9-C8
2	A	202	LDA	C7-C8-C9-C10
2	F	201	LDA	C6-C7-C8-C9
2	B	203	LDA	C4-C5-C6-C7
2	E	202	LDA	C2-C3-C4-C5
2	F	201	LDA	C5-C6-C7-C8
2	A	201	LDA	C2-C1-N1-CM2
2	A	202	LDA	C2-C1-N1-CM1
2	C	202	LDA	C2-C1-N1-CM2
2	E	202	LDA	C2-C1-N1-CM1
2	D	201	LDA	C11-C10-C9-C8
2	C	201	LDA	C2-C3-C4-C5
2	B	201	LDA	C6-C7-C8-C9
2	A	203	LDA	C2-C1-N1-O1
2	B	202	LDA	C2-C1-N1-O1
2	E	202	LDA	C2-C1-N1-O1
2	A	203	LDA	C1-C2-C3-C4
2	D	202	LDA	C4-C5-C6-C7
2	E	203	LDA	C6-C7-C8-C9
2	D	203	LDA	C11-C10-C9-C8
2	F	203	LDA	C2-C3-C4-C5
2	A	202	LDA	N1-C1-C2-C3
2	F	201	LDA	C4-C5-C6-C7
2	D	201	LDA	C4-C5-C6-C7
2	C	201	LDA	C3-C4-C5-C6
2	C	201	LDA	C7-C8-C9-C10
2	B	203	LDA	C2-C3-C4-C5
2	C	203	LDA	C2-C3-C4-C5
2	C	202	LDA	C6-C7-C8-C9
2	D	203	LDA	C1-C2-C3-C4
2	E	203	LDA	C2-C3-C4-C5

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Mol	Chain	Res	Type	Atoms
2	A	201	LDA	C2-C1-N1-O1
2	C	203	LDA	C2-C1-N1-O1

There are no ring outliers.

18 monomers are involved in 77 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	203	LDA	6	0
2	A	201	LDA	12	0
2	C	202	LDA	2	0
2	B	202	LDA	4	0
2	E	202	LDA	3	0
2	F	201	LDA	10	0
2	B	203	LDA	1	0
2	C	201	LDA	7	0
2	C	203	LDA	2	0
2	F	202	LDA	3	0
2	B	201	LDA	10	0
2	D	202	LDA	1	0
2	D	203	LDA	1	0
2	E	203	LDA	5	0
2	A	202	LDA	2	0
2	D	201	LDA	5	0
2	E	201	LDA	11	0
2	F	203	LDA	1	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

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	178/178 (100%)	-0.42	1 (0%) 89 87	13, 20, 33, 48	29 (16%)
1	B	178/178 (100%)	-0.47	2 (1%) 80 78	14, 21, 35, 43	24 (13%)
1	C	178/178 (100%)	-0.44	3 (1%) 70 66	13, 19, 33, 45	21 (11%)
1	D	178/178 (100%)	-0.52	1 (0%) 89 87	17, 24, 35, 45	65 (36%)
1	E	178/178 (100%)	-0.52	3 (1%) 70 66	18, 25, 38, 49	100 (56%)
1	F	178/178 (100%)	-0.54	1 (0%) 89 87	18, 24, 35, 47	65 (36%)
All	All	1068/1068 (100%)	-0.48	11 (1%) 82 80	13, 23, 35, 49	304 (28%)

All (11) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	2	ALA	5.4
1	D	2	ALA	4.1
1	F	2	ALA	3.4
1	E	2	ALA	2.7
1	A	2	ALA	2.5
1	B	28	ASN	2.3
1	C	28	ASN	2.3
1	C	5	ALA	2.1
1	E	139	HIS	2.1
1	C	2	ALA	2.1
1	E	28	ASN	2.0

6.2 Non-standard residues in protein, DNA, RNA chains

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	LDA	A	201	15/16	0.76	0.24	28,35,42,47	5
2	LDA	B	201	15/16	0.76	0.23	34,39,43,46	6
2	LDA	E	201	15/16	0.80	0.25	38,41,43,45	9
2	LDA	F	202	15/16	0.80	0.29	44,45,51,52	6
2	LDA	C	201	15/16	0.81	0.21	31,36,45,50	5
2	LDA	A	203	15/16	0.82	0.17	44,49,62,62	5
2	LDA	E	202	15/16	0.82	0.33	38,43,55,56	9
2	LDA	C	202	15/16	0.82	0.24	37,41,51,56	10
2	LDA	F	203	15/16	0.83	0.24	42,48,63,64	8
2	LDA	A	202	15/16	0.84	0.26	36,42,62,63	6
2	LDA	B	202	15/16	0.85	0.33	38,40,44,48	8
2	LDA	D	201	15/16	0.85	0.23	33,42,45,46	7
2	LDA	D	202	15/16	0.86	0.35	38,44,67,70	8
2	LDA	E	203	15/16	0.87	0.22	42,47,58,60	8
2	LDA	B	203	15/16	0.88	0.16	43,47,52,53	7
2	LDA	F	201	15/16	0.88	0.20	34,38,42,47	9
2	LDA	C	203	15/16	0.89	0.20	37,42,53,53	6
2	LDA	D	203	15/16	0.91	0.20	37,46,50,50	7

6.5 Other polymers [i](#)

There are no such residues in this entry.