



Full wwPDB X-ray Structure Validation Report ⓘ

May 14, 2020 – 07:13 am BST

PDB ID : 4HAR
Title : Crystal Structure of Rubella virus capsid protein (residues 127-277)
Authors : Mangala Prasad, V.; Fokine, A.; Rossmann, M.G.
Deposited on : 2012-09-27
Resolution : 2.66 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

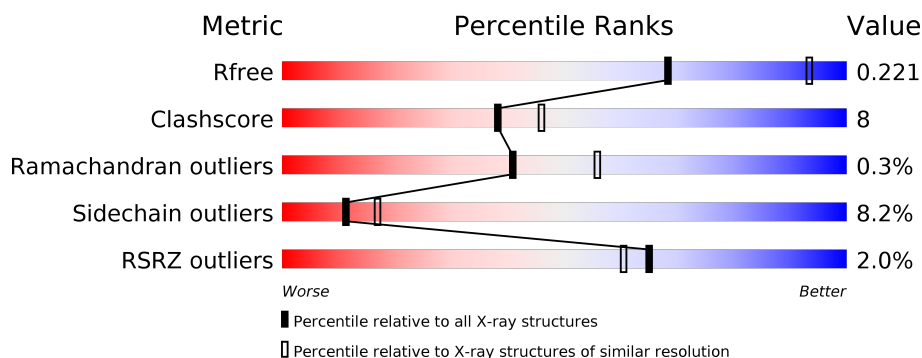
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.66 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	1332 (2.68-2.64)
Clashscore	141614	1374 (2.68-2.64)
Ramachandran outliers	138981	1349 (2.68-2.64)
Sidechain outliers	138945	1349 (2.68-2.64)
RSRZ outliers	127900	1318 (2.68-2.64)

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 $\leq 5\%$. 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	151	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 53%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 12%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 34%; height: 10px; background-color: grey;"></div> </div> <p style="font-size: small; margin-top: 5px;">3% 53% 12% 35%</p>
1	B	151	<div style="display: flex; align-items: center;"> <div style="width: 54%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 9%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 36%; height: 10px; background-color: grey;"></div> </div> <p style="font-size: small; margin-top: 5px;">54% 9% 36%</p>
1	C	151	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 54%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 10%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 3%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 34%; height: 10px; background-color: grey;"></div> </div> <p style="font-size: small; margin-top: 5px;">3% 54% 10% 34%</p>
1	D	151	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 3%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 51%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 12%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 3%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 34%; height: 10px; background-color: grey;"></div> </div> <p style="font-size: small; margin-top: 5px;">3% 3% 51% 12% 34%</p>
1	E	151	<div style="display: flex; align-items: center;"> <div style="width: 51%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 11%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 36%; height: 10px; background-color: grey;"></div> </div> <p style="font-size: small; margin-top: 5px;">51% 11% 36%</p>
1	F	151	<div style="display: flex; align-items: center;"> <div style="width: 3%; height: 10px; background-color: red; margin-right: 5px;"></div> <div style="width: 3%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 53%; height: 10px; background-color: green; margin-right: 5px;"></div> <div style="width: 11%; height: 10px; background-color: yellow; margin-right: 5px;"></div> <div style="width: 3%; height: 10px; background-color: orange; margin-right: 5px;"></div> <div style="width: 34%; height: 10px; background-color: grey;"></div> </div> <p style="font-size: small; margin-top: 5px;">3% 3% 53% 11% 34%</p>

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
3	CL	D	202	-	-	X	-
3	CL	E	201	-	-	X	-

2 Entry composition [i](#)

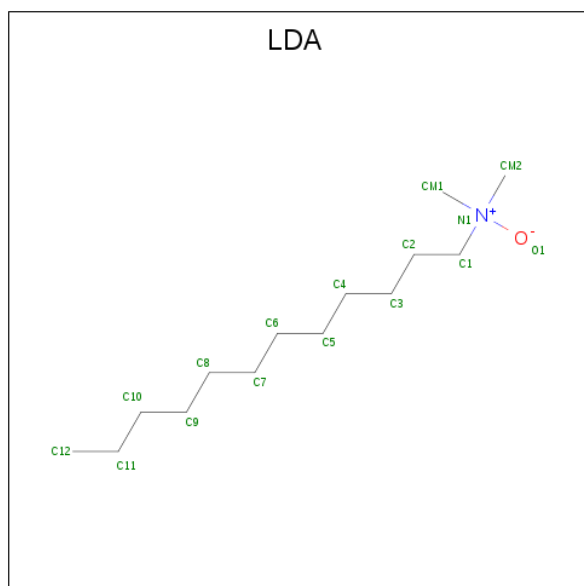
There are 4 unique types of molecules in this entry. The entry contains 5109 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Capsid protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	98	Total 779	C 495	N 142	O 138	S 4	0	0	0
1	B	97	Total 776	C 492	N 141	O 139	S 4	0	0	0
1	C	100	Total 801	C 508	N 147	O 142	S 4	0	0	0
1	D	99	Total 796	C 504	N 146	O 142	S 4	0	0	0
1	E	96	Total 767	C 487	N 140	O 136	S 4	0	0	0
1	F	99	Total 793	C 502	N 146	O 141	S 4	0	0	0

- Molecule 2 is LAURYL DIMETHYLAMINE-N-OXIDE (three-letter code: LDA) (formula: C₁₄H₃₁NO).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			16	14	1	1		
2	A	1	Total	C	N	O	0	0
			16	14	1	1		
2	A	1	Total	C	N	O	0	0
			16	14	1	1		
2	A	1	Total	C	N	O	0	0
			16	14	1	1		
2	A	1	Total	C	N	O	0	0
			16	14	1	1		
2	A	1	Total	C	N	O	0	0
			16	14	1	1		
2	B	1	Total	C	N	O	0	0
			16	14	1	1		
2	B	1	Total	C	N	O	0	0
			16	14	1	1		
2	B	1	Total	C	N	O	0	0
			16	14	1	1		
2	B	1	Total	C	N	O	0	0
			16	14	1	1		
2	D	1	Total	C	N	O	0	0
			16	14	1	1		
2	D	1	Total	C	N	O	0	0
			16	14	1	1		
2	E	1	Total	C	N	O	0	0
			16	14	1	1		
2	F	1	Total	C	N	O	0	0
			16	14	1	1		
2	F	1	Total	C	N	O	0	0
			16	14	1	1		
2	F	1	Total	C	N	O	0	0
			16	14	1	1		

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	B	1	Total	Cl	0	0
			1	1		
3	D	1	Total	Cl	0	0
			1	1		

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	E	1	Total Cl 1 1	0	0

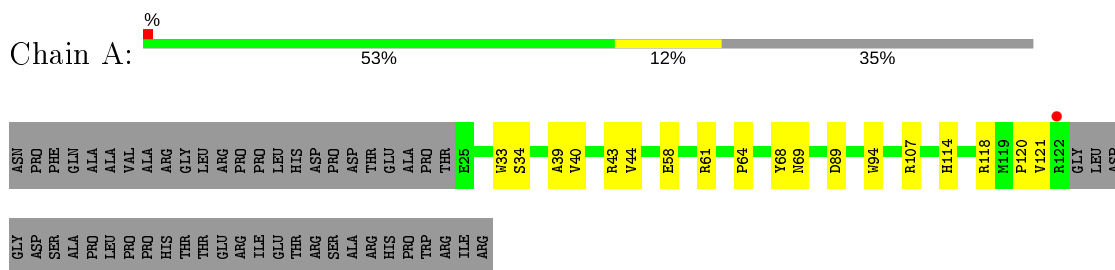
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	24	Total O 24 24	0	0
4	B	12	Total O 12 12	0	0
4	C	21	Total O 21 21	0	0
4	D	19	Total O 19 19	0	0
4	E	9	Total O 9 9	0	0
4	F	21	Total O 21 21	0	0

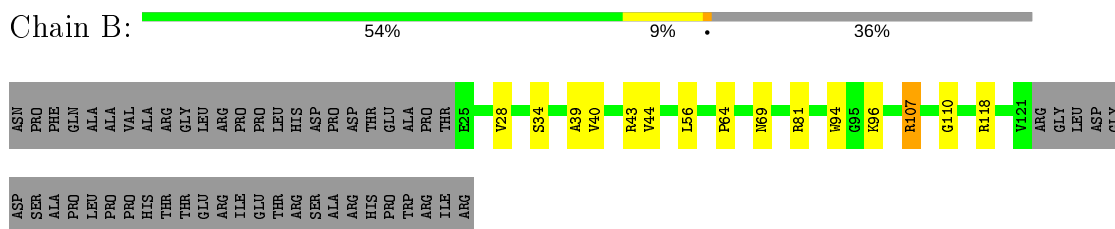
3 Residue-property plots [i](#)

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.

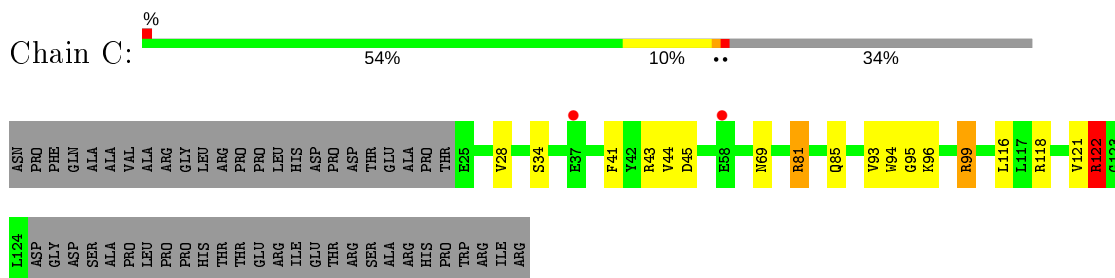
- Molecule 1: Capsid protein



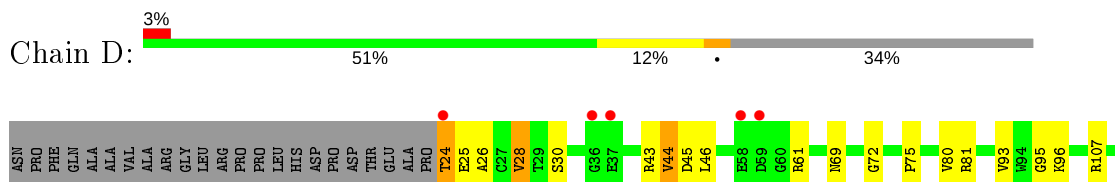
- Molecule 1: Capsid protein

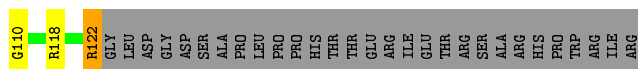


- Molecule 1: Capsid protein

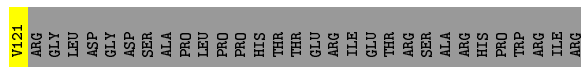


- Molecule 1: Capsid protein

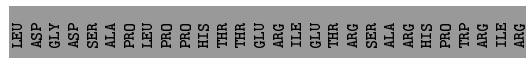




- Molecule 1: Capsid protein



- Molecule 1: Capsid protein



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	147.76Å 74.79Å 96.08Å 90.00° 97.53° 90.00°	Depositor
Resolution (Å)	47.62 – 2.66 47.62 – 2.66	Depositor EDS
% Data completeness (in resolution range)	97.5 (47.62-2.66) 93.5 (47.62-2.66)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.64 (at 2.65Å)	Xtrriage
Refinement program	PHENIX 1.7.3_928	Depositor
R, R_{free}	0.185 , 0.230 0.179 , 0.221	Depositor DCC
R_{free} test set	2020 reflections (6.91%)	wwPDB-VP
Wilson B-factor (Å ²)	45.1	Xtrriage
Anisotropy	0.507	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 48.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	5109	wwPDB-VP
Average B, all atoms (Å ²)	53.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.91% 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, CL

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	0.45	0/807	0.65	0/1104
1	B	0.41	0/804	0.63	0/1099
1	C	0.44	0/829	0.70	0/1132
1	D	0.43	0/824	0.63	0/1126
1	E	0.40	0/795	0.61	0/1087
1	F	0.46	0/821	0.67	0/1121
All	All	0.43	0/4880	0.65	0/6669

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	F	0	1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	F	72	GLY	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	779	0	721	14	0
1	B	776	0	716	10	0
1	C	801	0	750	18	0
1	D	796	0	743	15	0
1	E	767	0	710	11	0
1	F	793	0	739	11	0
2	A	112	0	217	6	0
2	B	80	0	155	6	0
2	D	32	0	62	2	0
2	E	16	0	31	0	0
2	F	48	0	93	4	0
3	B	1	0	0	1	0
3	D	1	0	0	2	0
3	E	1	0	0	2	0
4	A	24	0	0	3	0
4	B	12	0	0	0	0
4	C	21	0	0	2	0
4	D	19	0	0	2	0
4	E	9	0	0	0	0
4	F	21	0	0	2	0
All	All	5109	0	4937	75	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 8.

All (75) 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)
4:A:310:HOH:O	3:B:202:CL:CL	2.11	1.06
3:E:201:CL:CL	4:F:304:HOH:O	2.15	1.01
4:C:204:HOH:O	3:D:202:CL:CL	2.21	0.94
1:C:43:ARG:NH2	1:D:69:ASN:O	2.09	0.85
1:A:43:ARG:NH2	1:B:69:ASN:O	2.10	0.85
1:E:69:ASN:O	1:F:43:ARG:NH2	2.10	0.83
1:E:43:ARG:NH2	1:F:69:ASN:O	2.10	0.83
1:C:99:ARG:HH11	1:C:99:ARG:HG2	1.45	0.81
1:B:64:PRO:HG3	2:B:203:LDA:H122	1.64	0.79
1:D:95:GLY:O	4:D:306:HOH:O	2.01	0.79
1:A:69:ASN:O	1:B:43:ARG:NH2	2.19	0.76
1:D:61:ARG:HD2	1:E:95:GLY:HA3	1.68	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:69:ASN:O	1:D:43:ARG:NH2	2.18	0.74
1:F:121:VAL:HG22	1:F:122:ARG:HB2	1.71	0.70
1:F:30:SER:HB2	1:F:44:VAL:HG13	1.74	0.68
4:C:209:HOH:O	3:D:202:CL:CL	2.50	0.67
1:C:95:GLY:HA3	1:F:61:ARG:HD2	1.77	0.65
3:E:201:CL:CL	4:F:305:HOH:O	2.51	0.65
1:A:64:PRO:HG3	2:A:205:LDA:H101	1.78	0.65
1:C:95:GLY:HA3	1:F:61:ARG:HH21	1.61	0.64
1:F:68:TYR:O	2:F:203:LDA:H111	1.99	0.62
1:C:99:ARG:HH11	1:C:99:ARG:CG	2.13	0.60
1:E:120:PRO:HA	1:E:121:VAL:CB	2.35	0.56
2:A:203:LDA:H91	2:A:205:LDA:H92	1.88	0.56
1:D:72:GLY:N	4:D:319:HOH:O	2.13	0.55
1:C:81:ARG:NH1	1:C:85:GLN:OE1	2.36	0.54
1:A:68:TYR:HA	2:A:206:LDA:H91	1.90	0.54
1:A:89:ASP:HB2	1:C:121:VAL:HG22	1.91	0.53
1:A:94:TRP:HB3	2:A:202:LDA:H92	1.90	0.53
1:C:94:TRP:HB3	2:F:202:LDA:H101	1.91	0.53
1:D:30:SER:HB2	1:D:44:VAL:HG13	1.91	0.52
1:A:89:ASP:HB2	1:C:121:VAL:CG2	2.40	0.52
1:B:94:TRP:CG	2:B:206:LDA:H82	2.44	0.52
1:C:116:LEU:HD21	2:F:202:LDA:H82	1.92	0.51
1:E:99:ARG:HH12	1:F:70:PRO:HG3	1.74	0.51
1:C:121:VAL:O	1:C:122:ARG:HB3	2.09	0.51
1:B:34:SER:HB2	1:B:39:ALA:HA	1.94	0.49
2:A:204:LDA:H92	2:A:207:LDA:H101	1.95	0.48
1:F:81:ARG:HG3	1:F:108:VAL:HG11	1.95	0.48
1:B:107:ARG:HH12	1:B:110:GLY:HA2	1.79	0.48
1:C:41:PHE:CZ	2:D:201:LDA:H42	2.49	0.48
2:B:203:LDA:H123	2:B:203:LDA:H91	1.41	0.47
1:E:34:SER:HB2	1:E:39:ALA:HA	1.97	0.47
1:D:122:ARG:H	1:D:122:ARG:HG3	1.41	0.46
1:D:43:ARG:HD3	1:D:45:ASP:OD2	2.16	0.45
1:E:34:SER:HB2	1:E:40:VAL:H	1.82	0.45
2:D:201:LDA:H52	2:F:202:LDA:H51	1.99	0.45
1:A:120:PRO:HA	1:A:121:VAL:HA	1.72	0.45
1:C:43:ARG:HD3	1:C:45:ASP:OD2	2.16	0.45
1:A:61:ARG:NH1	4:A:321:HOH:O	2.48	0.45
1:A:89:ASP:OD1	1:C:122:ARG:HD3	2.16	0.45
1:B:34:SER:OG	1:B:40:VAL:HG22	2.16	0.45
1:E:30:SER:HB2	1:E:44:VAL:HG13	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:107:ARG:HH12	1:D:110:GLY:HA2	1.83	0.44
1:D:75:PRO:HG2	1:D:80:VAL:CG2	2.48	0.43
1:D:24:THR:HG22	1:D:25:GLU:HA	2.00	0.43
1:D:28:VAL:HG23	1:D:46:LEU:HB2	1.99	0.43
1:E:81:ARG:HG3	1:E:108:VAL:HG11	2.01	0.43
2:A:202:LDA:H21	4:A:307:HOH:O	2.18	0.42
1:D:24:THR:HA	1:D:26:ALA:N	2.34	0.42
1:E:54:PRO:HG2	1:E:62:TRP:CD1	2.54	0.42
1:A:58:GLU:CD	1:A:58:GLU:H	2.22	0.42
1:C:122:ARG:O	1:C:122:ARG:HG2	2.18	0.42
2:B:201:LDA:HM23	2:B:201:LDA:H21	1.74	0.42
1:C:99:ARG:NH1	1:C:99:ARG:CG	2.80	0.41
1:C:95:GLY:CA	1:F:61:ARG:HH21	2.32	0.41
1:B:94:TRP:HB3	2:B:206:LDA:H102	2.02	0.41
1:F:35:GLU:OE1	1:F:112:ARG:HD2	2.20	0.41
1:A:34:SER:HB2	1:A:40:VAL:H	1.85	0.41
1:A:34:SER:HB2	1:A:39:ALA:HA	2.03	0.41
1:B:94:TRP:CE2	2:B:206:LDA:H62	2.55	0.41
1:D:61:ARG:HH21	1:E:95:GLY:HA3	1.86	0.41
1:B:96:LYS:HA	1:B:96:LYS:HE3	2.03	0.41
1:A:33:TRP:CE2	1:A:114:HIS:HB2	2.56	0.41
1:D:75:PRO:HG2	1:D:80:VAL:HG22	2.03	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	96/151 (64%)	93 (97%)	3 (3%)	0	100	100
1	B	95/151 (63%)	93 (98%)	2 (2%)	0	100	100
1	C	98/151 (65%)	93 (95%)	4 (4%)	1 (1%)	15	23

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	97/151 (64%)	94 (97%)	3 (3%)	0	100	100
1	E	94/151 (62%)	92 (98%)	2 (2%)	0	100	100
1	F	97/151 (64%)	95 (98%)	1 (1%)	1 (1%)	15	23
All	All	577/906 (64%)	560 (97%)	15 (3%)	2 (0%)	41	56

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	122	ARG
1	F	73	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	78/124 (63%)	75 (96%)	3 (4%)	33	49
1	B	78/124 (63%)	72 (92%)	6 (8%)	13	20
1	C	81/124 (65%)	72 (89%)	9 (11%)	6	8
1	D	81/124 (65%)	73 (90%)	8 (10%)	8	11
1	E	77/124 (62%)	71 (92%)	6 (8%)	12	20
1	F	80/124 (64%)	73 (91%)	7 (9%)	10	14
All	All	475/744 (64%)	436 (92%)	39 (8%)	11	17

All (39) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	44	VAL
1	A	107	ARG
1	A	118	ARG
1	B	28	VAL
1	B	44	VAL
1	B	56	LEU

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Mol	Chain	Res	Type
1	B	81	ARG
1	B	107	ARG
1	B	118	ARG
1	C	28	VAL
1	C	34	SER
1	C	44	VAL
1	C	81	ARG
1	C	93	VAL
1	C	96	LYS
1	C	99	ARG
1	C	118	ARG
1	C	122	ARG
1	D	24	THR
1	D	28	VAL
1	D	44	VAL
1	D	81	ARG
1	D	93	VAL
1	D	96	LYS
1	D	118	ARG
1	D	122	ARG
1	E	28	VAL
1	E	44	VAL
1	E	81	ARG
1	E	91	ARG
1	E	93	VAL
1	E	118	ARG
1	F	28	VAL
1	F	34	SER
1	F	44	VAL
1	F	96	LYS
1	F	118	ARG
1	F	121	VAL
1	F	122	ARG

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

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 21 ligands modelled in this entry, 3 are monoatomic - leaving 18 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
2	LDA	B	201	-	12,15,15	2.12	1 (8%)	14,17,17	0.47	0
2	LDA	F	201	-	12,15,15	2.06	1 (8%)	14,17,17	0.78	0
2	LDA	F	203	-	12,15,15	2.07	1 (8%)	14,17,17	0.56	0
2	LDA	F	202	-	12,15,15	2.00	1 (8%)	14,17,17	0.72	0
2	LDA	A	205	-	12,15,15	2.09	1 (8%)	14,17,17	0.64	0
2	LDA	B	203	-	12,15,15	2.04	1 (8%)	14,17,17	0.77	0
2	LDA	D	203	-	12,15,15	2.08	1 (8%)	14,17,17	0.59	0
2	LDA	A	201	-	12,15,15	2.06	1 (8%)	14,17,17	0.61	0
2	LDA	B	206	-	12,15,15	2.02	1 (8%)	14,17,17	0.86	0
2	LDA	A	206	-	12,15,15	2.16	1 (8%)	14,17,17	0.72	0
2	LDA	D	201	-	12,15,15	2.08	1 (8%)	14,17,17	0.52	0
2	LDA	A	207	-	12,15,15	2.06	1 (8%)	14,17,17	0.79	0
2	LDA	A	202	-	12,15,15	2.05	1 (8%)	14,17,17	0.55	0
2	LDA	E	202	-	12,15,15	2.07	1 (8%)	14,17,17	0.75	0
2	LDA	A	203	-	12,15,15	2.09	1 (8%)	14,17,17	0.50	0
2	LDA	B	205	-	12,15,15	2.06	1 (8%)	14,17,17	0.62	0
2	LDA	A	204	-	12,15,15	2.06	1 (8%)	14,17,17	0.75	0
2	LDA	B	204	-	12,15,15	2.05	1 (8%)	14,17,17	0.49	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	B	201	-	-	3/13/13/13	-
2	LDA	F	201	-	-	7/13/13/13	-
2	LDA	F	203	-	-	5/13/13/13	-
2	LDA	F	202	-	-	4/13/13/13	-
2	LDA	A	205	-	-	4/13/13/13	-
2	LDA	B	203	-	-	8/13/13/13	-
2	LDA	D	203	-	-	4/13/13/13	-
2	LDA	A	201	-	-	5/13/13/13	-
2	LDA	B	206	-	-	3/13/13/13	-
2	LDA	A	206	-	-	9/13/13/13	-
2	LDA	D	201	-	-	7/13/13/13	-
2	LDA	A	207	-	-	3/13/13/13	-
2	LDA	A	202	-	-	5/13/13/13	-
2	LDA	E	202	-	-	6/13/13/13	-
2	LDA	A	203	-	-	6/13/13/13	-
2	LDA	B	205	-	-	5/13/13/13	-
2	LDA	A	204	-	-	5/13/13/13	-
2	LDA	B	204	-	-	2/13/13/13	-

All (18) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	206	LDA	O1-N1	-7.45	1.24	1.42
2	B	201	LDA	O1-N1	-7.29	1.25	1.42
2	A	205	LDA	O1-N1	-7.19	1.25	1.42
2	D	201	LDA	O1-N1	-7.17	1.25	1.42
2	A	203	LDA	O1-N1	-7.14	1.25	1.42
2	D	203	LDA	O1-N1	-7.13	1.25	1.42
2	F	203	LDA	O1-N1	-7.13	1.25	1.42
2	E	202	LDA	O1-N1	-7.12	1.25	1.42
2	A	207	LDA	O1-N1	-7.11	1.25	1.42
2	A	204	LDA	O1-N1	-7.10	1.25	1.42
2	F	201	LDA	O1-N1	-7.09	1.25	1.42
2	A	201	LDA	O1-N1	-7.08	1.25	1.42
2	B	205	LDA	O1-N1	-7.06	1.25	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	204	LDA	O1-N1	-7.04	1.25	1.42
2	A	202	LDA	O1-N1	-7.04	1.25	1.42
2	B	203	LDA	O1-N1	-6.98	1.25	1.42
2	B	206	LDA	O1-N1	-6.96	1.25	1.42
2	F	202	LDA	O1-N1	-6.90	1.26	1.42

There are no bond angle outliers.

There are no chirality outliers.

All (91) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	F	201	LDA	C2-C1-N1-O1
2	F	201	LDA	C2-C1-N1-CM2
2	F	203	LDA	C2-C1-N1-CM1
2	F	203	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	B	206	LDA	C2-C1-N1-O1
2	B	206	LDA	C2-C1-N1-CM1
2	B	206	LDA	C2-C1-N1-CM2
2	A	206	LDA	C2-C1-N1-CM1
2	A	206	LDA	C2-C1-N1-CM2
2	B	205	LDA	C2-C1-N1-CM2
2	A	204	LDA	C2-C1-N1-O1
2	A	204	LDA	C2-C1-N1-CM2
2	A	202	LDA	C1-C2-C3-C4
2	B	203	LDA	C11-C10-C9-C8
2	F	203	LDA	C2-C3-C4-C5
2	B	204	LDA	C2-C3-C4-C5
2	B	205	LDA	C11-C10-C9-C8
2	E	202	LDA	C4-C5-C6-C7
2	F	201	LDA	C7-C8-C9-C10
2	A	205	LDA	C6-C7-C8-C9
2	A	203	LDA	C4-C5-C6-C7
2	B	205	LDA	C1-C2-C3-C4
2	F	202	LDA	C1-C2-C3-C4
2	A	206	LDA	C11-C10-C9-C8
2	A	207	LDA	C1-C2-C3-C4
2	A	206	LDA	C2-C3-C4-C5
2	A	201	LDA	C1-C2-C3-C4

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Mol	Chain	Res	Type	Atoms
2	B	203	LDA	C9-C10-C11-C12
2	B	203	LDA	C1-C2-C3-C4
2	A	202	LDA	C4-C5-C6-C7
2	D	201	LDA	C7-C8-C9-C10
2	F	201	LDA	C11-C10-C9-C8
2	A	205	LDA	C1-C2-C3-C4
2	A	203	LDA	C5-C6-C7-C8
2	A	206	LDA	C7-C8-C9-C10
2	D	203	LDA	C1-C2-C3-C4
2	A	206	LDA	C1-C2-C3-C4
2	F	201	LDA	C9-C10-C11-C12
2	E	202	LDA	C11-C10-C9-C8
2	A	207	LDA	C9-C10-C11-C12
2	F	202	LDA	C7-C8-C9-C10
2	F	202	LDA	C9-C10-C11-C12
2	E	202	LDA	C9-C10-C11-C12
2	B	204	LDA	C1-C2-C3-C4
2	B	201	LDA	C1-C2-C3-C4
2	D	201	LDA	C5-C6-C7-C8
2	E	202	LDA	C3-C4-C5-C6
2	B	203	LDA	C2-C3-C4-C5
2	D	203	LDA	C6-C7-C8-C9
2	A	203	LDA	C11-C10-C9-C8
2	D	201	LDA	C4-C5-C6-C7
2	E	202	LDA	C1-C2-C3-C4
2	A	204	LDA	C9-C10-C11-C12
2	F	203	LDA	C1-C2-C3-C4
2	A	206	LDA	C4-C5-C6-C7
2	D	203	LDA	C9-C10-C11-C12
2	A	202	LDA	C5-C6-C7-C8
2	A	204	LDA	C7-C8-C9-C10
2	F	201	LDA	C2-C1-N1-CM1
2	A	201	LDA	C2-C1-N1-CM2
2	D	201	LDA	C2-C1-N1-CM2
2	B	201	LDA	C7-C8-C9-C10
2	E	202	LDA	C7-C8-C9-C10
2	B	203	LDA	C6-C7-C8-C9
2	A	201	LDA	C7-C8-C9-C10
2	A	203	LDA	C2-C3-C4-C5
2	B	205	LDA	C7-C8-C9-C10
2	A	202	LDA	C2-C3-C4-C5
2	A	207	LDA	C11-C10-C9-C8

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Mol	Chain	Res	Type	Atoms
2	A	205	LDA	C7-C8-C9-C10
2	A	206	LDA	C9-C10-C11-C12
2	A	206	LDA	N1-C1-C2-C3
2	A	203	LDA	C7-C8-C9-C10
2	D	201	LDA	C9-C10-C11-C12
2	A	201	LDA	C9-C10-C11-C12
2	F	201	LDA	C3-C4-C5-C6
2	F	203	LDA	C9-C10-C11-C12
2	B	205	LDA	C9-C10-C11-C12
2	F	202	LDA	C2-C3-C4-C5
2	D	201	LDA	C1-C2-C3-C4
2	D	203	LDA	C4-C5-C6-C7
2	A	202	LDA	C6-C7-C8-C9
2	A	204	LDA	C2-C1-N1-CM1
2	A	203	LDA	N1-C1-C2-C3
2	D	201	LDA	C2-C3-C4-C5
2	B	201	LDA	C9-C10-C11-C12
2	A	205	LDA	C4-C5-C6-C7
2	A	201	LDA	C2-C1-N1-O1

There are no ring outliers.

12 monomers are involved in 17 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	201	LDA	1	0
2	F	203	LDA	1	0
2	F	202	LDA	3	0
2	A	205	LDA	2	0
2	B	203	LDA	2	0
2	B	206	LDA	3	0
2	A	206	LDA	1	0
2	D	201	LDA	2	0
2	A	207	LDA	1	0
2	A	202	LDA	2	0
2	A	203	LDA	1	0
2	A	204	LDA	1	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

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	98/151 (64%)	-0.51	1 (1%) 82 81	32, 44, 81, 106	0
1	B	97/151 (64%)	-0.50	0 100 100	32, 44, 85, 111	0
1	C	100/151 (66%)	-0.32	2 (2%) 65 60	33, 46, 81, 106	0
1	D	99/151 (65%)	-0.30	5 (5%) 28 25	34, 48, 97, 117	0
1	E	96/151 (63%)	-0.46	0 100 100	35, 52, 90, 112	0
1	F	99/151 (65%)	-0.13	4 (4%) 38 34	37, 52, 90, 127	0
All	All	589/906 (65%)	-0.37	12 (2%) 65 60	32, 48, 90, 127	0

All (12) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	123	GLY	3.8
1	D	37	GLU	3.4
1	F	25	GLU	3.3
1	F	37	GLU	3.0
1	D	24	THR	2.8
1	A	122	ARG	2.6
1	C	58	GLU	2.5
1	C	37	GLU	2.5
1	F	122	ARG	2.5
1	D	58	GLU	2.3
1	D	59	ASP	2.3
1	D	36	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
2	LDA	A	201	16/16	0.90	0.33	34,49,129,131	0
2	LDA	A	207	16/16	0.90	0.39	39,60,121,126	0
2	LDA	B	203	16/16	0.91	0.31	36,59,85,90	0
2	LDA	B	206	16/16	0.92	0.21	34,48,81,82	0
2	LDA	A	205	16/16	0.92	0.23	37,52,87,89	0
2	LDA	A	202	16/16	0.92	0.21	31,51,85,87	0
2	LDA	B	205	16/16	0.92	0.30	32,86,121,124	0
2	LDA	A	204	16/16	0.92	0.41	34,58,115,116	0
2	LDA	F	201	16/16	0.93	0.22	34,55,117,119	0
2	LDA	D	203	16/16	0.94	0.18	33,59,106,110	0
2	LDA	E	202	16/16	0.94	0.20	35,52,86,91	0
2	LDA	D	201	16/16	0.94	0.21	37,50,87,88	0
2	LDA	B	201	16/16	0.94	0.22	30,43,84,86	0
2	LDA	F	203	16/16	0.95	0.18	36,54,88,92	0
2	LDA	F	202	16/16	0.96	0.17	33,52,75,91	0
2	LDA	A	203	16/16	0.96	0.20	35,46,80,81	0
2	LDA	B	204	16/16	0.96	0.20	34,43,74,80	0
2	LDA	A	206	16/16	0.97	0.19	37,47,67,73	0
3	CL	B	202	1/1	0.97	0.17	60,60,60,60	0
3	CL	E	201	1/1	0.97	0.12	74,74,74,74	0
3	CL	D	202	1/1	0.98	0.09	67,67,67,67	0

6.5 Other polymers [i](#)

There are no such residues in this entry.