



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 08:43 PM UTC

PDB ID : 7WKX / pdb_00007wkx
Title : IL-17A in complex with the humanized antibody HB0017
Authors : Xu, J.; Zhu, X.; He, Y.
Deposited on : 2022-01-12
Resolution : 2.81 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	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

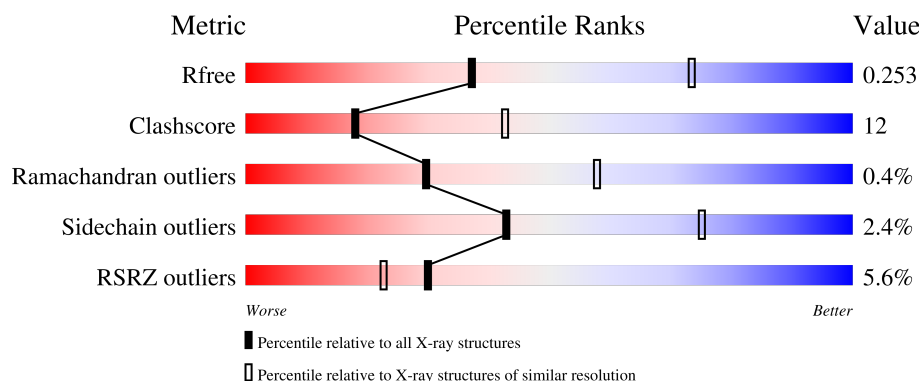
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.81 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}	180053	4591 (2.84-2.80)
Clashscore	190562	5010 (2.84-2.80)
Ramachandran outliers	187476	4916 (2.84-2.80)
Sidechain outliers	187428	4918 (2.84-2.80)
RSRZ outliers	180081	4594 (2.84-2.80)

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	217	
1	B	217	
2	C	219	
2	D	219	
3	E	151	

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Mol	Chain	Length	Quality of chain
3	F	151	

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 8260 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 Heavy chain of HB0017 Fab.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	217	Total	C	N	O	S	0	0	0
			1633	1039	263	325	6			
1	B	212	Total	C	N	O	S	0	0	0
			1595	1018	255	316	6			

- Molecule 2 is a protein called Light chain of HB0017 Fab.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	218	Total	C	N	O	S	0	2	0
			1692	1066	281	340	5			
2	D	216	Total	C	N	O	S	0	0	0
			1663	1048	278	332	5			

- Molecule 3 is a protein called Interleukin-17A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	E	95	Total	C	N	O	S	0	0	0
			773	481	144	142	6			
3	F	99	Total	C	N	O	S	0	0	0
			802	499	149	147	7			

There are 30 discrepancies between the modelled and reference sequences:

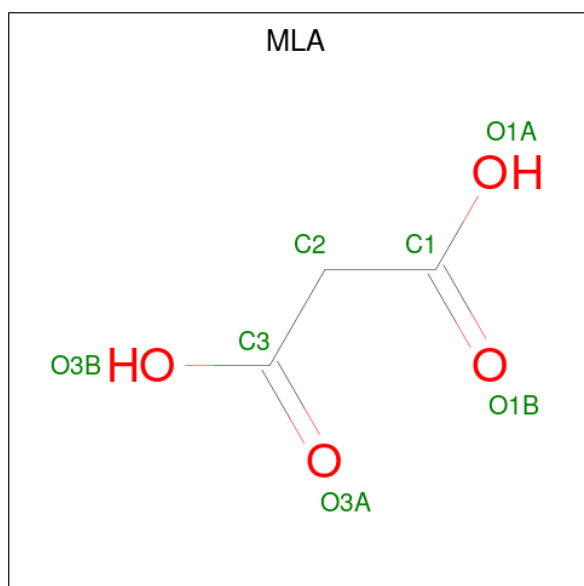
Chain	Residue	Modelled	Actual	Comment	Reference
E	5	MET	-	initiating methionine	UNP Q16552
E	6	GLY	-	expression tag	UNP Q16552
E	7	HIS	-	expression tag	UNP Q16552
E	8	HIS	-	expression tag	UNP Q16552
E	9	HIS	-	expression tag	UNP Q16552
E	10	HIS	-	expression tag	UNP Q16552
E	11	HIS	-	expression tag	UNP Q16552
E	12	HIS	-	expression tag	UNP Q16552

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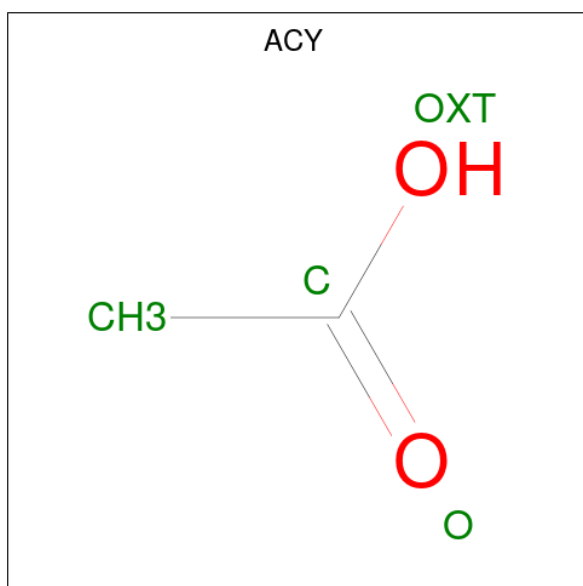
Chain	Residue	Modelled	Actual	Comment	Reference
E	13	GLU	-	expression tag	UNP Q16552
E	14	ASN	-	expression tag	UNP Q16552
E	15	LEU	-	expression tag	UNP Q16552
E	16	TYR	-	expression tag	UNP Q16552
E	17	PHE	-	expression tag	UNP Q16552
E	18	GLN	-	expression tag	UNP Q16552
E	19	GLY	-	expression tag	UNP Q16552
F	5	MET	-	initiating methionine	UNP Q16552
F	6	GLY	-	expression tag	UNP Q16552
F	7	HIS	-	expression tag	UNP Q16552
F	8	HIS	-	expression tag	UNP Q16552
F	9	HIS	-	expression tag	UNP Q16552
F	10	HIS	-	expression tag	UNP Q16552
F	11	HIS	-	expression tag	UNP Q16552
F	12	HIS	-	expression tag	UNP Q16552
F	13	GLU	-	expression tag	UNP Q16552
F	14	ASN	-	expression tag	UNP Q16552
F	15	LEU	-	expression tag	UNP Q16552
F	16	TYR	-	expression tag	UNP Q16552
F	17	PHE	-	expression tag	UNP Q16552
F	18	GLN	-	expression tag	UNP Q16552
F	19	GLY	-	expression tag	UNP Q16552

- Molecule 4 is MALONIC ACID (CCD ID: MLA) (formula: $C_3H_4O_4$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 7 3 4	0	0
4	B	1	Total C O 7 3 4	0	0
4	C	1	Total C O 7 3 4	0	0
4	C	1	Total C O 7 3 4	0	0
4	C	1	Total C O 7 3 4	0	0
4	E	1	Total C O 7 3 4	0	0
4	F	1	Total C O 7 3 4	0	0

- Molecule 5 is ACETIC ACID (CCD ID: ACY) (formula: $C_2H_4O_2$).



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

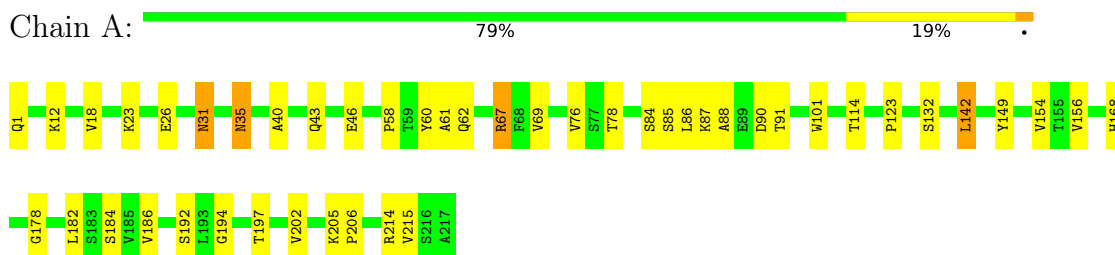
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	7	Total 7	O 7	0	0
6	B	3	Total 3	O 3	0	0
6	C	21	Total 21	O 21	0	0
6	D	5	Total 5	O 5	0	0
6	E	1	Total 1	O 1	0	0

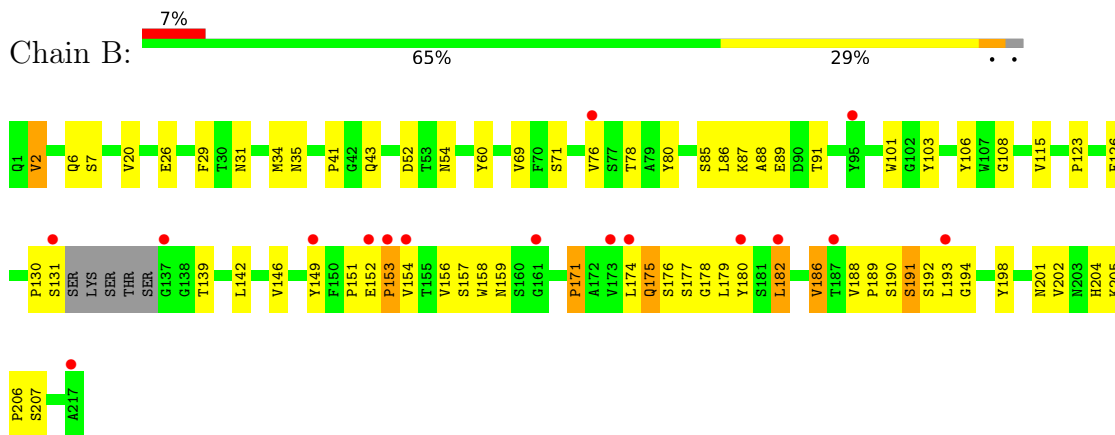
3 Residue-property plots

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.

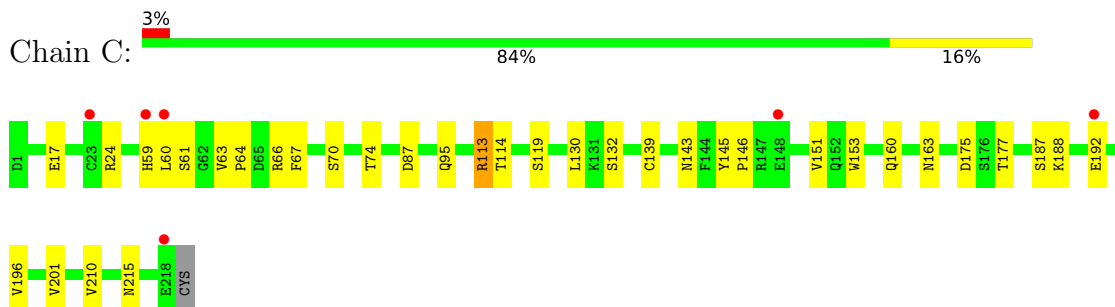
- Molecule 1: Heavy chain of HB0017 Fab



- Molecule 1: Heavy chain of HB0017 Fab

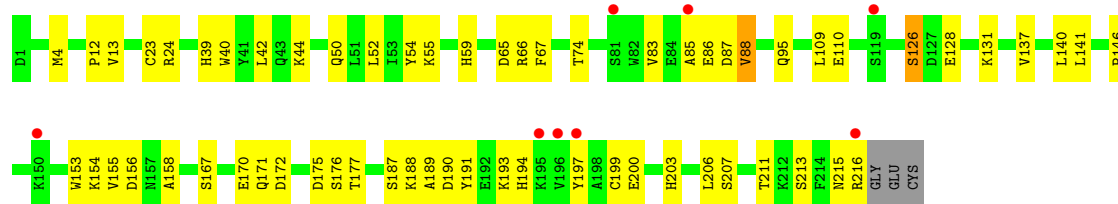


- Molecule 2: Light chain of HB0017 Fab

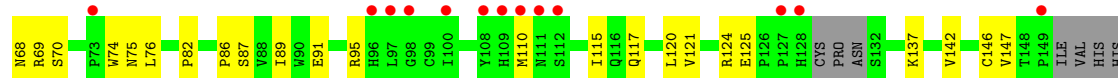
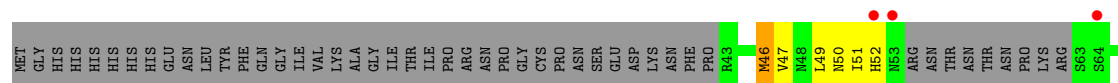
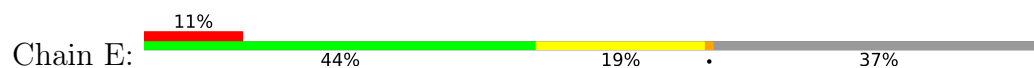


- Molecule 2: Light chain of HB0017 Fab

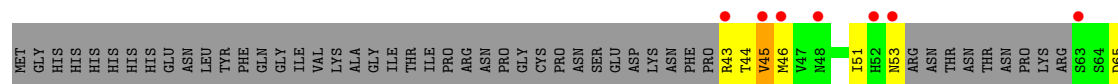




• Molecule 3: Interleukin-17A



• Molecule 3: Interleukin-17A



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	301.14Å 50.83Å 117.22Å 90.00° 101.27° 90.00°	Depositor
Resolution (Å)	45.20 – 2.81 45.20 – 2.81	Depositor EDS
% Data completeness (in resolution range)	95.1 (45.20-2.81) 95.5 (45.20-2.81)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.16 (at 2.81Å)	Xtriage
Refinement program	REFMAC 5.8.0238	Depositor
R, R_{free}	0.205 , 0.254 0.220 , 0.253	Depositor DCC
R_{free} test set	1997 reflections (4.60%)	wwPDB-VP
Wilson B-factor (Å ²)	62.3	Xtriage
Anisotropy	0.125	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.33 , 50.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	8260	wwPDB-VP
Average B, all atoms (Å ²)	68.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.39% 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

5.1 Standard geometry

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

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	0.91	0/1678	1.25	3/2290 (0.1%)
1	B	0.92	0/1639	1.24	1/2237 (0.0%)
2	C	0.97	0/1741	1.23	1/2370 (0.0%)
2	D	0.93	0/1706	1.21	0/2325
3	E	0.91	0/791	1.21	0/1075
3	F	0.90	0/822	1.22	3/1120 (0.3%)
All	All	0.93	0/8377	1.23	8/11417 (0.1%)

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	31	ASN	N-CA-C	-6.42	105.44	113.20
1	A	46	GLU	CB-CA-C	5.92	119.99	110.16
1	A	178	GLY	N-CA-C	-5.56	107.65	115.32
2	C	17	GLU	CB-CA-C	5.20	117.64	109.37
3	F	71	THR	N-CA-C	-5.17	105.77	111.71
3	F	128	HIS	CA-CB-CG	5.10	118.90	113.80
3	F	97	LEU	N-CA-C	-5.07	106.60	112.89
1	B	171	PRO	N-CA-C	-5.02	103.39	111.38

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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	1633	0	1569	36	0
1	B	1595	0	1522	61	0
2	C	1692	0	1635	21	0
2	D	1663	0	1603	42	0
3	E	773	0	743	33	0
3	F	802	0	773	33	0
4	A	7	0	2	0	0
4	B	7	0	2	0	0
4	C	21	0	6	1	0
4	E	7	0	2	0	0
4	F	7	0	2	1	0
5	A	4	0	3	1	0
5	B	4	0	3	0	0
5	C	4	0	3	0	0
5	D	4	0	3	0	0
6	A	7	0	0	0	0
6	B	3	0	0	0	0
6	C	21	0	0	0	0
6	D	5	0	0	0	0
6	E	1	0	0	0	0
All	All	8260	0	7871	197	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 12.

All (197) 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)
3:E:115:ILE:HD12	3:F:115:ILE:HD12	1.50	0.94
3:E:52:HIS:HB3	3:F:136:GLU:HG2	1.58	0.84
1:B:76:VAL:HG13	1:B:78:THR:HG22	1.67	0.77
2:D:4:MET:HE3	2:D:23:CYS:SG	2.27	0.74
1:A:154:VAL:CG2	1:A:182:LEU:HD21	2.17	0.74
1:A:18:VAL:HG23	1:A:86:LEU:HD11	1.68	0.73
3:F:126:PRO:HG2	3:F:129:CYS:HB2	1.71	0.73
2:C:64:PRO:HB2	2:C:66:ARG:HG2	1.72	0.71
1:B:146:VAL:HB	1:B:182:LEU:HD13	1.73	0.69
3:E:46:MET:HG3	3:F:44:THR:HG22	1.73	0.69
1:B:88:ALA:O	1:B:91:THR:HG22	1.94	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:129:CYS:SG	4:F:201:MLA:HC21	2.34	0.68
3:E:120:LEU:HD23	3:E:137:LYS:HG2	1.77	0.67
1:B:89:GLU:H	1:B:89:GLU:CD	2.05	0.64
2:D:13:VAL:HG11	2:D:83:VAL:HG21	1.80	0.63
1:B:29:PHE:CD2	3:E:49:LEU:HD13	2.34	0.62
1:B:157:SER:OG	1:B:201:ASN:HB2	1.98	0.62
1:B:76:VAL:HG13	1:B:78:THR:CG2	2.29	0.62
1:B:146:VAL:HB	1:B:182:LEU:CD1	2.29	0.62
1:B:176:SER:C	1:B:178:GLY:H	2.08	0.61
2:C:66:ARG:HH12	2:C:87:ASP:CG	2.08	0.61
1:A:67:ARG:NH1	1:A:90:ASP:OD2	2.26	0.61
1:B:123:PRO:HB3	1:B:149:TYR:HB3	1.83	0.61
3:E:49:LEU:HD11	3:F:45:VAL:HG11	1.82	0.60
3:F:65:ASP:CG	3:F:69:ARG:HE	2.09	0.60
1:B:171:PRO:HG2	2:D:167:SER:OG	2.02	0.60
3:E:50:ASN:HB2	3:F:43:ARG:HD3	1.85	0.59
1:A:182:LEU:C	1:A:182:LEU:HD12	2.28	0.59
1:B:71:SER:OG	1:B:80:TYR:HB2	2.03	0.58
1:B:175:GLN:HG3	1:B:179:LEU:O	2.04	0.57
2:C:66:ARG:NH2	2:C:87:ASP:OD2	2.35	0.57
1:A:154:VAL:HG22	1:A:182:LEU:HD21	1.86	0.57
3:E:86:PRO:HG2	3:E:89:ILE:HG12	1.87	0.57
1:B:190:SER:O	1:B:192:SER:N	2.38	0.56
3:E:75:ASN:OD1	3:E:95:ARG:HG2	2.07	0.55
1:A:23:LYS:HG3	1:A:78:THR:HG22	1.88	0.54
2:D:59:HIS:CE1	2:D:67:PHE:O	2.60	0.54
2:D:172:ASP:HB3	2:D:175:ASP:OD1	2.06	0.54
2:C:196:VAL:HG22	2:C:215:ASN:ND2	2.22	0.54
1:B:103:TYR:HB3	2:D:39:HIS:CE1	2.43	0.54
1:B:176:SER:C	1:B:178:GLY:N	2.63	0.54
3:E:117:GLN:NE2	3:F:117:GLN:OE1	2.41	0.54
1:B:182:LEU:C	1:B:182:LEU:HD22	2.33	0.54
2:D:66:ARG:HH12	2:D:87:ASP:CG	2.15	0.54
1:A:1:GLN:HG3	1:A:26:GLU:OE2	2.07	0.54
1:B:142:LEU:CD1	1:B:186:VAL:HG22	2.38	0.53
2:D:85:ALA:O	2:D:88:VAL:HG13	2.08	0.53
2:C:59:HIS:CE1	2:C:67:PHE:O	2.61	0.53
3:F:53:ASN:OD1	3:F:53:ASN:C	2.52	0.53
2:C:215:ASN:ND2	4:C:302:MLA:O1A	2.39	0.53
3:E:46:MET:SD	3:F:46:MET:HG2	2.49	0.53
2:C:24:ARG:HA	2:C:74:THR:O	2.08	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:91:THR:HG23	1:A:114:THR:HA	1.89	0.52
1:B:76:VAL:HG22	1:B:76:VAL:O	2.10	0.52
1:A:35:ASN:HD22	1:A:35:ASN:N	2.08	0.52
1:B:130:PRO:O	1:B:131:SER:HB3	2.09	0.52
1:B:174:LEU:HG	1:B:180:TYR:CE1	2.45	0.52
2:C:60:LEU:HD12	2:C:61:SER:O	2.10	0.52
3:E:68:ASN:OD1	3:E:95:ARG:NH1	2.42	0.52
2:D:191:TYR:HA	2:D:197:TYR:OH	2.10	0.52
1:A:31:ASN:HB2	3:F:87:SER:HB3	1.92	0.51
1:B:101:TRP:HB3	3:E:124:ARG:HD2	1.91	0.51
2:D:197:TYR:O	2:D:213:SER:HB2	2.10	0.51
3:E:46:MET:HE1	3:F:46:MET:HE2	1.92	0.51
3:E:110:MET:HB3	3:E:146:CYS:SG	2.51	0.51
1:A:12:LYS:HG3	1:A:18:VAL:CG2	2.40	0.51
3:E:147:VAL:HA	3:F:69:ARG:O	2.11	0.51
2:D:42:LEU:HB2	2:D:52:LEU:HD11	1.91	0.51
3:F:86:PRO:HD2	3:F:121:VAL:HG12	1.92	0.51
2:D:155:VAL:O	2:D:156:ASP:C	2.53	0.51
3:E:86:PRO:HG2	3:E:89:ILE:CG1	2.40	0.51
2:D:155:VAL:HG23	2:D:197:TYR:CE2	2.46	0.50
1:B:205:LYS:C	1:B:207:SER:N	2.65	0.50
2:D:200:GLU:HG3	2:D:211:THR:OG1	2.12	0.50
1:B:188:VAL:HG11	1:B:198:TYR:CE1	2.47	0.49
1:B:205:LYS:O	1:B:207:SER:N	2.45	0.49
2:D:171:GLN:HG2	2:D:176:SER:HA	1.94	0.49
2:D:42:LEU:O	2:D:50:GLN:HG2	2.12	0.49
1:B:41:PRO:O	1:B:43:GLN:NE2	2.45	0.49
1:B:142:LEU:HD12	1:B:186:VAL:HG22	1.95	0.49
2:D:131:LYS:N	2:D:131:LYS:HE2	2.28	0.49
2:D:190:ASP:O	2:D:194:HIS:HD2	1.96	0.48
1:B:190:SER:C	1:B:192:SER:N	2.69	0.48
3:E:51:ILE:HG21	3:F:137:LYS:HG3	1.95	0.48
3:E:69:ARG:O	3:F:147:VAL:HA	2.13	0.48
1:B:176:SER:O	1:B:178:GLY:N	2.46	0.48
3:E:49:LEU:HD11	3:F:45:VAL:CG1	2.42	0.48
3:F:125:GLU:HA	3:F:126:PRO:C	2.38	0.48
1:B:189:PRO:O	1:B:192:SER:HB3	2.13	0.47
1:B:154:VAL:CG1	1:B:202:VAL:HG13	2.45	0.47
1:B:175:GLN:O	1:B:178:GLY:N	2.46	0.47
2:C:130:LEU:C	2:C:132:SER:H	2.21	0.47
1:A:156:VAL:HG22	1:A:202:VAL:HG22	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:74:TRP:HA	3:F:95:ARG:HG3	1.97	0.47
1:A:60:TYR:OH	1:A:69:VAL:HA	2.14	0.47
1:A:156:VAL:HG11	1:A:184:SER:CB	2.45	0.47
3:F:110:MET:HE1	3:F:148:THR:HG23	1.96	0.47
2:C:160:GLN:HB3	2:C:163:ASN:HD21	1.80	0.47
2:D:24:ARG:NH1	2:D:74:THR:OG1	2.48	0.47
3:E:76:LEU:HA	3:E:91:GLU:O	2.15	0.47
1:B:101:TRP:HA	3:E:82:PRO:O	2.15	0.47
1:A:58:PRO:HB2	1:A:60:TYR:CE2	2.50	0.46
1:B:78:THR:HG23	1:B:80:TYR:CE2	2.50	0.46
2:C:175:ASP:OD1	2:C:177:THR:HG23	2.14	0.46
2:D:23:CYS:HB2	2:D:40:TRP:CH2	2.51	0.46
3:E:137:LYS:HG3	3:F:51:ILE:HG22	1.97	0.46
2:D:154:LYS:HA	2:D:158:ALA:O	2.16	0.46
1:B:156:VAL:HA	1:B:201:ASN:O	2.16	0.46
1:B:193:LEU:HD12	1:B:194:GLY:N	2.31	0.46
1:B:205:LYS:C	1:B:207:SER:H	2.24	0.46
1:B:182:LEU:HD13	1:B:182:LEU:H	1.80	0.46
1:A:142:LEU:HD13	1:A:215:VAL:HG21	1.98	0.46
2:C:139:CYS:HB2	2:C:153:TRP:CZ2	2.51	0.46
3:E:86:PRO:HD2	3:E:121:VAL:HG12	1.97	0.46
1:B:152:GLU:OE2	1:B:153:PRO:HA	2.15	0.45
2:D:126:SER:HB2	2:D:128:GLU:OE2	2.16	0.45
2:D:12:PRO:HA	2:D:110:GLU:O	2.16	0.45
1:B:190:SER:O	1:B:191:SER:C	2.59	0.45
2:C:66:ARG:NH1	2:C:87:ASP:OD1	2.42	0.45
3:E:70:SER:HA	3:F:146:CYS:O	2.17	0.45
1:A:154:VAL:HG21	1:A:182:LEU:HD21	1.97	0.45
1:B:87:LYS:O	1:B:115:VAL:HG21	2.16	0.45
1:B:20:VAL:O	1:B:80:TYR:HA	2.17	0.45
2:C:145:TYR:CG	2:C:146:PRO:HA	2.52	0.45
2:C:113:ARG:HG2	2:C:114:THR:H	1.82	0.44
1:B:6:GLN:HG3	1:B:108:GLY:HA3	1.99	0.44
1:A:23:LYS:CG	1:A:78:THR:HG22	2.48	0.44
1:B:205:LYS:O	1:B:206:PRO:C	2.59	0.44
1:B:149:TYR:CE2	1:B:182:LEU:HD12	2.53	0.44
2:D:13:VAL:HG21	2:D:109:LEU:HD11	1.99	0.44
2:D:215:ASN:O	2:D:216:ARG:HB2	2.17	0.44
3:E:51:ILE:HG21	3:F:137:LYS:NZ	2.33	0.44
3:E:47:VAL:HA	3:F:133:PHE:O	2.17	0.43
2:D:95:GLN:CD	2:D:95:GLN:C	2.86	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:187:SER:O	2:D:188:LYS:C	2.61	0.43
3:F:96:HIS:O	3:F:112:SER:HB2	2.18	0.43
2:C:187:SER:O	2:C:188:LYS:C	2.60	0.43
1:B:78:THR:HG21	1:B:80:TYR:OH	2.18	0.43
1:A:87:LYS:HG2	1:A:90:ASP:OD2	2.18	0.43
1:A:88:ALA:C	1:A:90:ASP:H	2.27	0.43
2:C:60:LEU:HG	2:C:63:VAL:HG23	2.01	0.43
1:A:197:THR:HG23	1:A:214:ARG:NE	2.34	0.43
1:B:190:SER:C	1:B:192:SER:H	2.26	0.43
2:D:191:TYR:C	2:D:193:LYS:H	2.27	0.43
3:F:81:ASP:C	3:F:83:GLU:H	2.27	0.43
1:A:123:PRO:HB3	1:A:149:TYR:HB3	2.01	0.43
1:A:168:HIS:HD1	5:A:302:ACY:CH3	2.32	0.43
1:B:6:GLN:HE21	1:B:6:GLN:HB3	1.66	0.43
1:B:123:PRO:HB3	1:B:149:TYR:CB	2.48	0.43
2:C:151:VAL:HG22	2:C:201:VAL:HG22	2.00	0.43
2:D:44:LYS:HE2	2:D:86:GLU:O	2.18	0.43
1:B:126:PHE:HB3	2:D:126:SER:OG	2.19	0.42
1:A:192:SER:C	1:A:194:GLY:N	2.77	0.42
1:A:205:LYS:N	1:A:206:PRO:CD	2.82	0.42
1:B:171:PRO:HG2	2:D:167:SER:HG	1.84	0.42
2:D:140:LEU:C	2:D:141:LEU:HD12	2.44	0.42
2:D:189:ALA:O	2:D:190:ASP:C	2.61	0.42
2:D:199:CYS:O	2:D:211:THR:HA	2.19	0.42
2:D:65:ASP:C	2:D:67:PHE:N	2.76	0.42
1:A:31:ASN:OD1	1:A:31:ASN:N	2.48	0.42
1:B:34:MET:HE2	1:B:34:MET:HB2	1.81	0.42
1:B:205:LYS:N	1:B:206:PRO:HD2	2.34	0.42
1:A:31:ASN:ND2	3:F:82:PRO:O	2.49	0.42
1:A:76:VAL:O	1:A:78:THR:HG23	2.19	0.42
1:B:31:ASN:HB2	3:E:87:SER:HB3	2.00	0.42
1:B:158:TRP:O	1:B:159:ASN:C	2.63	0.42
1:B:60:TYR:OH	1:B:69:VAL:HA	2.18	0.42
2:C:188:LYS:HE2	2:C:192[A]:GLU:OE2	2.19	0.42
2:D:137:VAL:HG12	2:D:153:TRP:CH2	2.54	0.42
3:F:75:ASN:ND2	3:F:95:ARG:HG2	2.35	0.42
1:B:85:SER:O	1:B:86:LEU:C	2.62	0.42
2:C:130:LEU:C	2:C:132:SER:N	2.77	0.42
2:D:146:PRO:HD2	2:D:203:HIS:CE1	2.56	0.41
2:D:170:GLU:OE2	2:D:170:GLU:HA	2.19	0.41
1:A:88:ALA:C	1:A:90:ASP:N	2.78	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:215:VAL:HG23	1:A:215:VAL:O	2.20	0.41
3:E:51:ILE:CG2	3:F:137:LYS:HG3	2.50	0.41
1:A:101:TRP:HA	3:F:82:PRO:O	2.21	0.41
2:C:95:GLN:CD	2:C:95:GLN:C	2.87	0.41
2:D:175:ASP:O	2:D:177:THR:HG23	2.21	0.41
3:E:120:LEU:CD2	3:E:137:LYS:HG2	2.47	0.41
3:E:125:GLU:HA	3:E:125:GLU:OE2	2.21	0.41
1:B:151:PRO:O	1:B:204:HIS:NE2	2.50	0.41
3:E:142:VAL:HG13	3:F:117:GLN:HG3	2.03	0.41
1:B:52:ASP:C	1:B:54:ASN:H	2.29	0.41
1:B:2:VAL:HG22	1:B:106:TYR:CD2	2.56	0.40
1:A:84:SER:O	1:A:85:SER:C	2.63	0.40
2:D:189:ALA:C	2:D:191:TYR:N	2.79	0.40
1:A:192:SER:C	1:A:194:GLY:H	2.28	0.40
1:B:31:ASN:OD1	1:B:31:ASN:N	2.54	0.40
2:D:54:TYR:O	2:D:55:LYS:C	2.62	0.40
1:A:40:ALA:HB3	1:A:43:GLN:HG3	2.02	0.40
1:A:61:ALA:O	1:A:62:GLN:C	2.64	0.40
1:A:205:LYS:HB2	1:A:206:PRO:HD3	2.02	0.40
2:D:206:LEU:O	2:D:207:SER:C	2.63	0.40
3:E:74:TRP:HA	3:E:95:ARG:HG3	2.03	0.40
3:F:75:ASN:OD1	3:F:95:ARG:NE	2.47	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	215/217 (99%)	203 (94%)	12 (6%)	0	100	100
1	B	208/217 (96%)	192 (92%)	13 (6%)	3 (1%)	9	27
2	C	218/219 (100%)	210 (96%)	7 (3%)	1 (0%)	24	53

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	D	214/219 (98%)	203 (95%)	11 (5%)	0	100	100
3	E	89/151 (59%)	88 (99%)	1 (1%)	0	100	100
3	F	95/151 (63%)	91 (96%)	4 (4%)	0	100	100
All	All	1039/1174 (88%)	987 (95%)	48 (5%)	4 (0%)	30	58

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	7	SER
1	B	191	SER
1	B	177	SER
2	C	143	ASN

5.3.2 Protein sidechains ⓘ

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	181/181 (100%)	176 (97%)	5 (3%)	38	71
1	B	175/181 (97%)	167 (95%)	8 (5%)	24	56
2	C	196/195 (100%)	192 (98%)	4 (2%)	48	79
2	D	192/195 (98%)	190 (99%)	2 (1%)	68	88
3	E	90/140 (64%)	89 (99%)	1 (1%)	65	86
3	F	94/140 (67%)	92 (98%)	2 (2%)	47	78
All	All	928/1032 (90%)	906 (98%)	22 (2%)	43	75

All (22) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	35	ASN
1	A	67	ARG
1	A	132	SER
1	A	142	LEU

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Mol	Chain	Res	Type
1	A	186	VAL
1	B	2	VAL
1	B	26	GLU
1	B	35	ASN
1	B	139	THR
1	B	153	PRO
1	B	175	GLN
1	B	182	LEU
1	B	186	VAL
2	C	70	SER
2	C	113	ARG
2	C	119	SER
2	C	210	VAL
2	D	88	VAL
2	D	126	SER
3	E	46	MET
3	F	45	VAL
3	F	150	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	39	GLN
1	A	43	GLN
1	B	3	GLN
1	B	39	GLN
1	B	43	GLN
1	B	54	ASN
1	B	196	GLN
2	C	14	ASN
2	C	47	GLN
2	C	59	HIS
2	C	129	GLN
2	C	165	GLN
2	C	215	ASN
2	D	14	ASN
2	D	59	HIS
2	D	143	ASN
2	D	215	ASN
3	E	111	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

11 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	$\# Z > 2$
5	ACY	B	302	-	3,3,3	1.23	0	3,3,3	0.69	0
4	MLA	F	201	-	6,6,6	1.68	1 (16%)	7,7,7	1.27	1 (14%)
5	ACY	A	302	-	3,3,3	1.52	1 (33%)	3,3,3	0.93	0
4	MLA	B	301	-	6,6,6	2.56	2 (33%)	7,7,7	1.03	0
4	MLA	A	301	-	6,6,6	1.60	1 (16%)	7,7,7	1.70	2 (28%)
4	MLA	C	304	-	6,6,6	1.49	1 (16%)	7,7,7	1.72	2 (28%)
5	ACY	D	301	-	3,3,3	1.20	0	3,3,3	0.92	0
4	MLA	C	303	-	6,6,6	1.52	0	7,7,7	1.31	1 (14%)
4	MLA	C	302	-	6,6,6	1.65	2 (33%)	7,7,7	1.38	2 (28%)
5	ACY	C	301	-	3,3,3	1.41	1 (33%)	3,3,3	1.04	0
4	MLA	E	201	-	6,6,6	1.55	0	7,7,7	1.28	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
4	MLA	F	201	-	-	2/4/4/4	-
4	MLA	B	301	-	-	0/4/4/4	-
4	MLA	A	301	-	-	0/4/4/4	-
4	MLA	C	304	-	-	2/4/4/4	-
4	MLA	C	303	-	-	4/4/4/4	-
4	MLA	C	302	-	-	2/4/4/4	-
4	MLA	E	201	-	-	2/4/4/4	-

All (9) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	301	MLA	C2-C3	4.72	1.58	1.51
4	B	301	MLA	C2-C1	3.19	1.56	1.51
4	F	201	MLA	C2-C1	2.79	1.55	1.51
4	C	302	MLA	C2-C3	2.70	1.55	1.51
4	A	301	MLA	C2-C1	2.64	1.55	1.51
5	A	302	ACY	CH3-C	2.32	1.58	1.49
4	C	304	MLA	O1A-C1	-2.27	1.23	1.30
5	C	301	ACY	CH3-C	2.10	1.57	1.49
4	C	302	MLA	O1A-C1	-2.10	1.23	1.30

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	C	304	MLA	O3A-C3-C2	-3.08	113.33	122.11
4	A	301	MLA	O1B-C1-C2	-2.63	114.61	122.11
4	C	304	MLA	C3-C2-C1	-2.46	104.25	112.95
4	A	301	MLA	O3A-C3-C2	-2.38	115.35	122.11
4	C	302	MLA	O1B-C1-C2	-2.29	115.58	122.11
4	F	201	MLA	O3A-C3-C2	-2.25	115.71	122.11
4	C	302	MLA	O1A-C1-C2	2.16	121.22	114.51
4	C	303	MLA	C3-C2-C1	-2.12	105.48	112.95

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	C	303	MLA	O1B-C1-C2-C3
4	F	201	MLA	C1-C2-C3-O3B
4	C	303	MLA	O1A-C1-C2-C3
4	F	201	MLA	C1-C2-C3-O3A

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Mol	Chain	Res	Type	Atoms
4	C	302	MLA	C1-C2-C3-O3A
4	C	302	MLA	C1-C2-C3-O3B
4	C	303	MLA	C1-C2-C3-O3B
4	C	304	MLA	C1-C2-C3-O3B
4	C	303	MLA	C1-C2-C3-O3A
4	C	304	MLA	C1-C2-C3-O3A
4	E	201	MLA	O1A-C1-C2-C3
4	E	201	MLA	O1B-C1-C2-C3

There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	F	201	MLA	1	0
5	A	302	ACY	1	0
4	C	302	MLA	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	217/217 (100%)	0.12	0 100 100	35, 55, 82, 123	0
1	B	212/217 (97%)	0.78	16 (7%) 20 14	47, 77, 106, 125	0
2	C	218/219 (99%)	-0.04	6 (2%) 55 44	34, 47, 73, 100	2 (0%)
2	D	216/219 (98%)	0.61	8 (3%) 45 36	47, 72, 108, 134	0
3	E	95/151 (62%)	1.16	16 (16%) 4 3	53, 80, 121, 136	0
3	F	99/151 (65%)	0.88	13 (13%) 7 5	47, 75, 112, 128	0
All	All	1057/1174 (90%)	0.49	59 (5%) 30 23	34, 65, 106, 136	2 (0%)

All (59) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	F	150	ILE	5.5
3	E	149	PRO	5.3
3	E	97	LEU	5.0
2	C	148[A]	GLU	4.4
3	F	53	ASN	3.7
3	F	43	ARG	3.6
3	E	128	HIS	3.4
3	E	53	ASN	3.3
3	F	52	HIS	3.2
2	D	119	SER	3.1
1	B	193	LEU	2.9
3	E	98	GLY	2.8
1	B	180	TYR	2.8
3	E	52	HIS	2.8
1	B	153	PRO	2.8
3	E	100	ILE	2.8
1	B	152	GLU	2.7
2	D	197	TYR	2.7
2	C	192[A]	GLU	2.7

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Mol	Chain	Res	Type	RSRZ
3	E	96	HIS	2.6
1	B	131	SER	2.6
1	B	173	VAL	2.6
2	D	196	VAL	2.5
3	F	97	LEU	2.5
3	E	127	PRO	2.4
3	F	77	HIS	2.4
1	B	76	VAL	2.4
3	F	45	VAL	2.4
1	B	182	LEU	2.4
2	D	150	LYS	2.4
3	E	112	SER	2.3
3	E	111	ASN	2.3
3	F	48	ASN	2.3
1	B	95	TYR	2.3
1	B	161	GLY	2.3
3	E	110	MET	2.3
3	F	146	CYS	2.3
1	B	154	VAL	2.3
1	B	137	GLY	2.3
1	B	217	ALA	2.2
2	D	81	SER	2.2
3	F	63	SER	2.2
3	F	93	LYS	2.2
3	E	108	TYR	2.2
2	C	23	CYS	2.2
1	B	149	TYR	2.2
1	B	174	LEU	2.2
3	E	64	SER	2.2
3	F	46	MET	2.1
2	D	195	LYS	2.1
2	C	59	HIS	2.1
3	E	73	PRO	2.1
3	F	126	PRO	2.1
2	D	85	ALA	2.1
2	D	216	ARG	2.1
3	E	109	HIS	2.1
2	C	218	GLU	2.1
2	C	60	LEU	2.1
1	B	187	THR	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 oligosaccharides 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($\text{\AA}^2$)	Q<0.9
5	ACY	A	302	4/4	0.51	0.26	69,75,82,93	0
5	ACY	D	301	4/4	0.60	0.26	86,91,91,97	0
4	MLA	F	201	7/7	0.65	0.11	95,100,106,106	0
5	ACY	C	301	4/4	0.77	0.20	68,74,75,81	0
5	ACY	B	302	4/4	0.77	0.20	75,77,77,79	0
4	MLA	E	201	7/7	0.85	0.12	85,95,99,102	0
4	MLA	C	304	7/7	0.87	0.16	63,69,78,84	0
4	MLA	C	303	7/7	0.91	0.14	68,80,90,96	0
4	MLA	C	302	7/7	0.91	0.15	61,70,87,91	0
4	MLA	B	301	7/7	0.92	0.16	63,68,80,83	0
4	MLA	A	301	7/7	0.95	0.09	46,53,65,70	0

6.5 Other polymers [i](#)

There are no such residues in this entry.