



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 02:46 PM UTC

PDB ID : 5A0T / pdb_00005a0t
Title : Catalysis and 5' end sensing by ribonuclease RNase J of the metallo- beta-lactamase family
Authors : Pei, X.Y.; Bralley, P.; Jones, G.H.; Luisi, B.F.
Deposited on : 2015-04-22
Resolution : 2.28 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

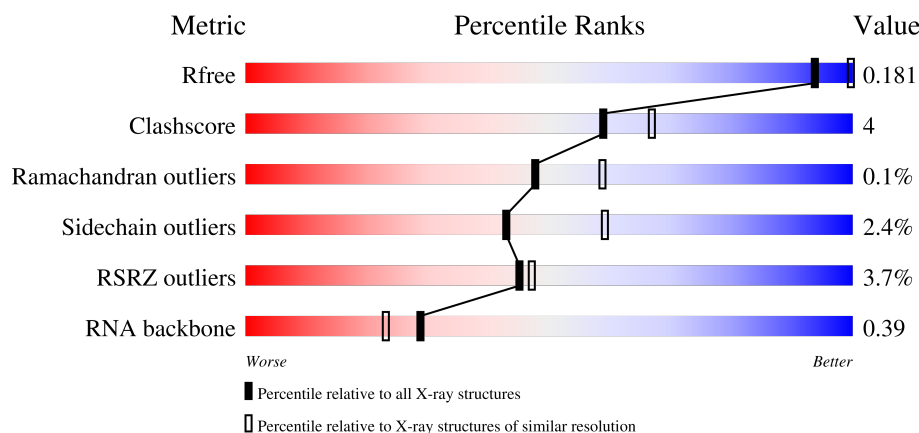
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.28 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	9078 (2.30-2.26)
Clashscore	190562	9802 (2.30-2.26)
Ramachandran outliers	187476	9690 (2.30-2.26)
Sidechain outliers	187428	9691 (2.30-2.26)
RSRZ outliers	180081	9085 (2.30-2.26)
RNA backbone	3983	1151 (2.60-1.96)

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	561	3% 71% 8% 19%
1	B	561	2% 73% 7% 20%
2	E	6	17% 33% 67%
2	F	6	17% 67% 33%

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 7742 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.

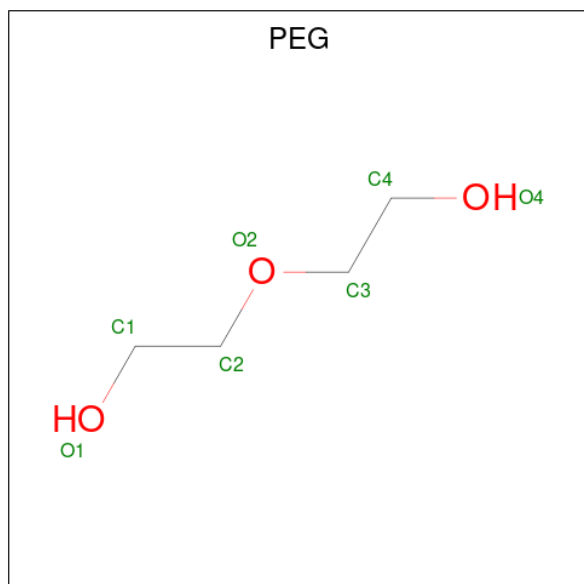
- Molecule 1 is a protein called RIBONUCLEASE J.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	454	Total	C	N	O	S	0	0	0
			3482	2201	634	635	12			
1	B	451	Total	C	N	O	S	0	0	0
			3468	2193	631	632	12			

- Molecule 2 is a RNA chain called 5'-R(*CP*GP*CP*CP*UP)-3'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	E	6	Total	C	N	O	P	0	0	0
			108	46	16	40	6			
2	F	6	Total	C	N	O	P	0	0	0
			108	46	16	40	6			

- Molecule 3 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula: C₄H₁₀O₃).



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

- Molecule 4 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	2	Total	Zn	0	0
			2	2		
4	B	2	Total	Zn	0	0
			2	2		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	291	Total	O	0	0
			291	291		
5	B	263	Total	O	0	0
			263	263		
5	E	3	Total	O	0	0
			3	3		
5	F	1	Total	O	0	0
			1	1		

- Molecule 2: 5'-R(*CP*GP*CP*CP*UP)-3'

Chain F:  17% 67% 33%



4 Data and refinement statistics

Property	Value	Source
Space group	P 43 2 2	Depositor
Cell constants a, b, c, α , β , γ	186.19Å 186.19Å 113.38Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.34 – 2.28 29.34 – 2.28	Depositor EDS
% Data completeness (in resolution range)	97.0 (29.34-2.28) 97.8 (29.34-2.28)	Depositor EDS
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.85 (at 2.29Å)	Xtriage
Refinement program	PHENIX 1.9_1692	Depositor
R, R_{free}	0.145 , 0.177 0.150 , 0.181	Depositor DCC
R_{free} test set	4440 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	51.7	Xtriage
Anisotropy	0.253	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.26 , 68.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.97	EDS
Total number of atoms	7742	wwPDB-VP
Average B, all atoms (Å ²)	57.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.67% 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: PEG, ZN

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	0.58	0/3555	0.87	6/4831 (0.1%)
1	B	0.55	4/3541 (0.1%)	0.87	7/4812 (0.1%)
2	E	0.36	0/118	0.73	0/180
2	F	0.35	0/118	0.69	0/180
All	All	0.56	4/7332 (0.1%)	0.87	13/10003 (0.1%)

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	56	GLU	CG-CD	-5.76	1.37	1.52
1	B	56	GLU	CD-OE2	5.57	1.35	1.25
1	B	56	GLU	CD-OE1	5.47	1.35	1.25
1	B	56	GLU	CB-CG	5.05	1.67	1.52

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	60	ILE	CG1-CB-CG2	-8.43	85.42	110.70
1	B	154	PRO	N-CA-C	7.10	123.23	113.65
1	B	56	GLU	CB-CG-CD	-7.04	100.63	112.60
1	B	100	LYS	CA-C-N	6.26	126.39	119.87
1	B	100	LYS	C-N-CA	6.26	126.39	119.87
1	B	56	GLU	CA-C-N	5.66	131.88	121.70
1	B	56	GLU	C-N-CA	5.66	131.88	121.70
1	A	100	LYS	CA-C-N	5.47	125.14	119.56
1	A	100	LYS	C-N-CA	5.47	125.14	119.56
1	A	422	ILE	CA-C-N	-5.24	116.28	123.14
1	A	422	ILE	C-N-CA	-5.24	116.28	123.14
1	A	303	VAL	N-CA-C	5.18	115.42	108.17
1	A	28	GLY	N-CA-C	-5.07	109.05	115.08

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	3482	0	3505	36	0
1	B	3468	0	3498	27	0
2	E	108	0	54	4	0
2	F	108	0	54	1	0
3	A	7	0	10	0	0
3	B	7	0	10	1	0
4	A	2	0	0	0	0
4	B	2	0	0	0	0
5	A	291	0	0	4	0
5	B	263	0	0	1	0
5	E	3	0	0	0	0
5	F	1	0	0	0	0
All	All	7742	0	7131	63	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 4.

All (63) 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:154:PRO:O	5:B:2121:HOH:O	2.05	0.73
1:A:57:GLN:HB3	1:A:58:PRO:HD2	1.71	0.71
1:A:308:THR:HG21	2:E:4:U:OP1	1.93	0.69
1:B:57:GLN:HG2	1:B:60:ILE:HD12	1.76	0.67
1:A:53:PRO:HB2	1:A:56:GLU:HB2	1.76	0.67
1:B:420:ASP:O	1:B:437:LYS:NZ	2.29	0.66
1:B:295:LEU:HD13	1:B:303:VAL:HG13	1.83	0.61
1:A:334:ASP:OD1	5:A:2196:HOH:O	2.16	0.61
1:B:57:GLN:OE1	1:B:60:ILE:HD11	2.02	0.59
1:B:151:HIS:CG	1:B:152:SER:H	2.22	0.57
1:A:60:ILE:HG23	1:A:450:TYR:HD1	1.69	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:308:THR:HG23	1:A:316:ALA:HB1	1.86	0.56
1:B:308:THR:HB	2:F:3:C:H5"	1.87	0.56
1:B:62:LEU:HB2	1:B:451:VAL:HG23	1.87	0.56
1:A:62:LEU:HB2	1:A:451:VAL:CG1	2.36	0.55
1:B:57:GLN:OE1	1:B:60:ILE:CD1	2.55	0.55
1:A:62:LEU:HB2	1:A:451:VAL:HG13	1.89	0.54
1:A:323:ASN:ND2	5:A:2244:HOH:O	2.29	0.54
1:B:430:VAL:HG22	1:B:441:THR:HG22	1.89	0.53
1:A:57:GLN:CB	1:A:58:PRO:HD2	2.37	0.52
1:B:60:ILE:HG23	1:B:450:TYR:HD1	1.75	0.51
1:B:421:ARG:HD3	1:B:437:LYS:HZ2	1.76	0.51
1:A:20:ARG:HB3	1:A:38:GLU:HB3	1.93	0.51
1:A:222:SER:O	1:A:226:ARG:HG3	2.10	0.50
1:B:30:ILE:HD13	1:B:400:GLY:HA2	1.94	0.50
1:B:60:ILE:HG23	1:B:450:TYR:CD1	2.47	0.50
1:B:432:ASP:OD2	1:B:441:THR:HG21	2.13	0.49
1:A:151:HIS:CG	1:A:152:SER:H	2.31	0.48
1:A:396:MET:HG2	1:A:423:VAL:HG22	1.96	0.48
1:B:421:ARG:HD3	1:B:437:LYS:NZ	2.29	0.47
1:A:315:MET:HE2	1:A:315:MET:HA	1.97	0.47
1:A:317:ALA:O	1:A:321:MET:HG3	2.16	0.46
1:A:234:LYS:HB3	5:A:2196:HOH:O	2.15	0.46
1:A:244:HIS:HE1	5:A:2201:HOH:O	1.99	0.46
1:A:112:LEU:HA	1:A:115:ILE:HG22	1.98	0.45
1:A:57:GLN:HB3	1:A:58:PRO:CD	2.45	0.45
1:A:341:SER:HB3	2:E:0:C:OP3	2.15	0.45
1:B:291:ASP:OD2	1:B:293:LYS:HG2	2.16	0.45
1:B:406:ARG:O	1:B:410:GLU:HG2	2.16	0.45
1:B:20:ARG:HB3	1:B:38:GLU:HB3	1.99	0.44
1:A:432:ASP:OD2	1:A:441:THR:HG21	2.18	0.44
1:A:86:HIS:CE1	2:E:1:G:H5"	2.53	0.44
1:A:443:LYS:HB2	1:A:443:LYS:HE2	1.68	0.44
1:A:60:ILE:HG23	1:A:450:TYR:CD1	2.52	0.43
1:B:12:PRO:HD2	1:B:441:THR:HG23	2.01	0.43
1:A:203:LEU:HA	1:A:396:MET:O	2.17	0.43
1:B:235:ARG:HB3	1:B:334:ASP:OD1	2.18	0.43
1:A:308:THR:HG21	2:E:4:U:P	2.59	0.43
1:A:317:ALA:HB1	1:A:321:MET:HE3	2.00	0.43
1:A:60:ILE:HD13	1:A:60:ILE:HG21	1.79	0.43
1:A:406:ARG:O	1:A:410:GLU:HG2	2.19	0.43
1:B:153:ILE:HA	1:B:154:PRO:HD3	1.89	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:112:LEU:HA	1:B:115:ILE:HG22	2.00	0.42
1:B:203:LEU:HA	1:B:396:MET:O	2.19	0.42
1:A:263:ALA:HB3	1:A:295:LEU:HD11	2.01	0.42
1:A:14:LEU:HD13	1:A:20:ARG:HB2	2.01	0.42
1:A:78:GLU:HB3	1:A:139:VAL:HG12	2.02	0.41
1:A:291:ASP:OD2	1:A:293:LYS:HB2	2.20	0.41
1:A:248:ILE:HA	1:A:251:ILE:HD12	2.01	0.41
1:B:318:LEU:HD12	1:B:318:LEU:HA	1.93	0.41
1:B:231:ASN:OD1	3:B:1453:PEG:H41	2.20	0.41
1:A:195:SER:HB2	1:A:390:CYS:O	2.21	0.40
1:B:341:SER:HB3	1:B:373:HIS:NE2	2.36	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	452/561 (81%)	437 (97%)	14 (3%)	1 (0%)	43	53
1	B	449/561 (80%)	436 (97%)	13 (3%)	0	100	100
All	All	901/1122 (80%)	873 (97%)	27 (3%)	1 (0%)	48	59

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	58	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	371/462 (80%)	363 (98%)	8 (2%)	45	62
1	B	371/462 (80%)	361 (97%)	10 (3%)	39	55
All	All	742/924 (80%)	724 (98%)	18 (2%)	43	59

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

Mol	Chain	Res	Type
1	A	2	SER
1	A	56	GLU
1	A	155	ASP
1	A	293	LYS
1	A	308	THR
1	A	391	ARG
1	A	423	VAL
1	A	443	LYS
1	B	30	ILE
1	B	57	GLN
1	B	277	ARG
1	B	324	ARG
1	B	391	ARG
1	B	398	VAL
1	B	423	VAL
1	B	430	VAL
1	B	441	THR
1	B	451	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	122	HIS
1	A	419	HIS
1	B	120	GLN
1	B	323	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	E	4/6 (66%)	1 (25%)	0
2	F	4/6 (66%)	1 (25%)	0
All	All	8/12 (66%)	2 (25%)	0

All (2) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	E	2	C
2	F	2	C

There are no RNA pucker outliers to report.

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 6 ligands modelled in this entry, 4 are monoatomic - leaving 2 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	PEG	A	1456	-	6,6,6	1.34	1 (16%)	5,5,5	1.47	1 (20%)
3	PEG	B	1453	-	6,6,6	1.37	1 (16%)	5,5,5	1.35	1 (20%)

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	PEG	A	1456	-	-	3/4/4/4	-
3	PEG	B	1453	-	-	2/4/4/4	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	1453	PEG	C2-C1	-2.74	1.34	1.49
3	A	1456	PEG	C2-C1	-2.68	1.35	1.49

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	1456	PEG	O2-C2-C1	2.70	122.02	110.11
3	B	1453	PEG	O2-C2-C1	2.38	120.61	110.11

There are no chirality outliers.

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1456	PEG	O2-C3-C4-O4
3	B	1453	PEG	O2-C3-C4-O4
3	A	1456	PEG	C4-C3-O2-C2
3	B	1453	PEG	C4-C3-O2-C2
3	A	1456	PEG	C1-C2-O2-C3

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	1453	PEG	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	454/561 (80%)	-0.33	19 (4%)	40 42	26, 42, 54, 98	281 (61%)
1	B	451/561 (80%)	-0.29	13 (2%)	53 55	32, 48, 62, 82	298 (66%)
2	E	6/6 (100%)	0.62	1 (16%)	4 4	37, 38, 67, 71	6 (100%)
2	F	6/6 (100%)	1.55	1 (16%)	4 4	36, 51, 85, 85	6 (100%)
All	All	917/1134 (80%)	-0.29	34 (3%)	45 47	26, 45, 60, 98	591 (64%)

All (34) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	453	GLY	9.6
1	A	454	LEU	8.7
1	A	455	SER	8.7
1	B	58	PRO	6.1
1	B	60	ILE	5.5
1	A	57	GLN	5.2
1	B	2	SER	4.9
2	F	0	C	4.8
1	B	57	GLN	4.8
1	A	56	GLU	4.5
1	B	452	ASP	4.2
1	A	58	PRO	4.1
1	B	56	GLU	4.1
1	A	2	SER	4.0
1	A	55	GLU	3.9
1	A	59	GLY	3.8
1	A	60	ILE	3.5
1	B	55	GLU	3.5
1	A	452	ASP	3.2
1	A	61	ASP	3.1
1	A	54	GLU	2.9

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Mol	Chain	Res	Type	RSRZ
2	E	0	C	2.9
1	A	5	HIS	2.5
1	A	315	MET	2.4
1	B	4	PRO	2.4
1	B	61	ASP	2.3
1	B	6	PRO	2.3
1	A	451	VAL	2.3
1	A	6	PRO	2.3
1	A	7	GLU	2.3
1	B	5	HIS	2.2
1	B	59	GLY	2.1
1	B	451	VAL	2.1
1	A	4	PRO	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
3	PEG	A	1456	7/7	0.79	0.19	80,89,103,106	0
3	PEG	B	1453	7/7	0.83	0.15	87,94,99,100	0
4	ZN	B	1455	1/1	0.98	0.09	59,59,59,59	0
4	ZN	A	1458	1/1	0.99	0.14	61,61,61,61	0
4	ZN	B	1454	1/1	0.99	0.10	53,53,53,53	1
4	ZN	A	1457	1/1	0.99	0.11	49,49,49,49	1

6.5 Other polymers [i](#)

There are no such residues in this entry.