Full wwPDB X-ray Structure Validation Report ⓘ

Apr 18, 2023 – 10:16 am BST

PDB ID	:	7ZJS
Title	:	Structural basis of centromeric cohesion protection by SGO1
Authors	:	Patel, A.; Panne, D.
Deposited on	:	2022-04-11
Resolution	:	3.24 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:

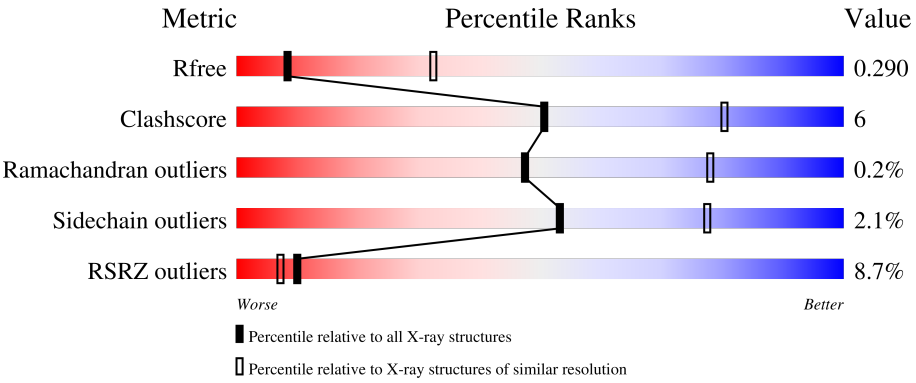
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.32.2
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.32.2

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 3.24 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	1619 (3.28-3.20)
Clashscore	141614	1755 (3.28-3.20)
Ramachandran outliers	138981	1728 (3.28-3.20)
Sidechain outliers	138945	1727 (3.28-3.20)
RSRZ outliers	127900	1567 (3.28-3.20)

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 <=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	1231	5% 67% 9% 25%
1	C	1231	7% 59% 13% 28%
2	B	631	% 10% 88%
2	D	631	11% 88%
3	E	11	45% 100%

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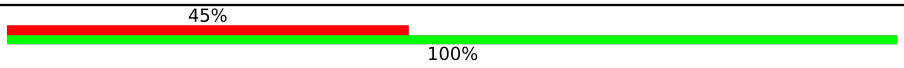
Mol	Chain	Length	Quality of chain
3	F	11	

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 32423 atoms, of which 16202 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 Cohesin subunit SA-2.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	929	Total	C	H	N	O	S	0	0	0
			15102	4813	7544	1261	1429	55			
1	C	891	Total	C	H	N	O	S	0	0	0
			14480	4615	7236	1206	1372	51			

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	545	ARG	LYS	conflict	UNP Q8N3U4
A	546	LYS	ARG	conflict	UNP Q8N3U4
C	545	ARG	LYS	conflict	UNP Q8N3U4
C	546	LYS	ARG	conflict	UNP Q8N3U4

- Molecule 2 is a protein called Double-strand-break repair protein rad21 homolog.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
2	B	74	Total	C	H	N	O	S	0	0	0
			1235	385	639	101	107	3			
2	D	74	Total	C	H	N	O	S	0	0	0
			1235	385	639	101	107	3			

- Molecule 3 is a protein called Shugoshin 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	E	11	Total	C	H	N	O	0	0	0
			164	56	72	14	22			
3	F	11	Total	C	H	N	O	0	0	0
			164	56	72	14	22			

- Molecule 4 is water.

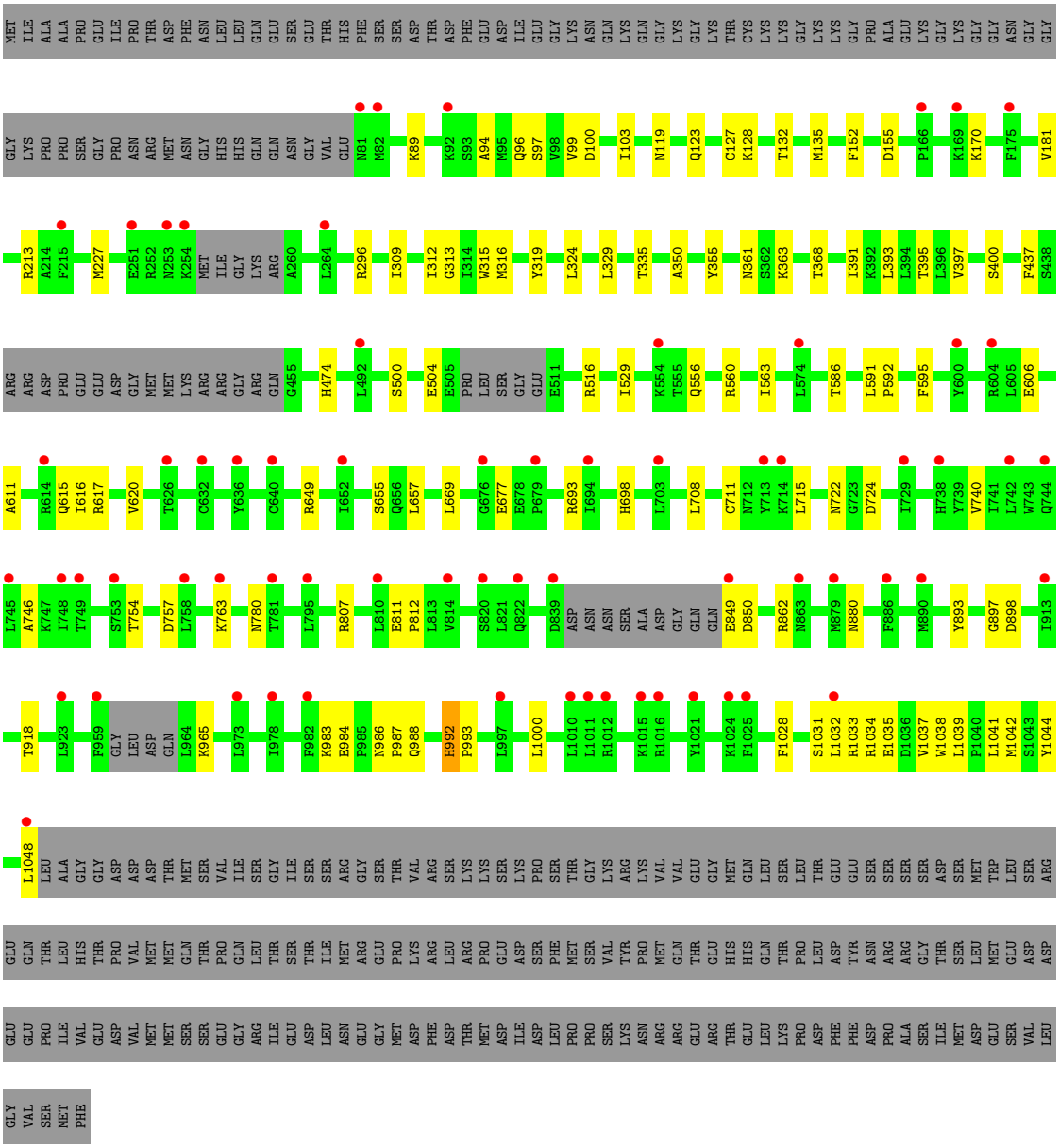
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	7	Total O 7 7	0	0
4	B	1	Total O 1 1	0	0
4	C	32	Total O 32 32	0	0
4	D	3	Total O 3 3	0	0

3 Residue-property plots (i)

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.

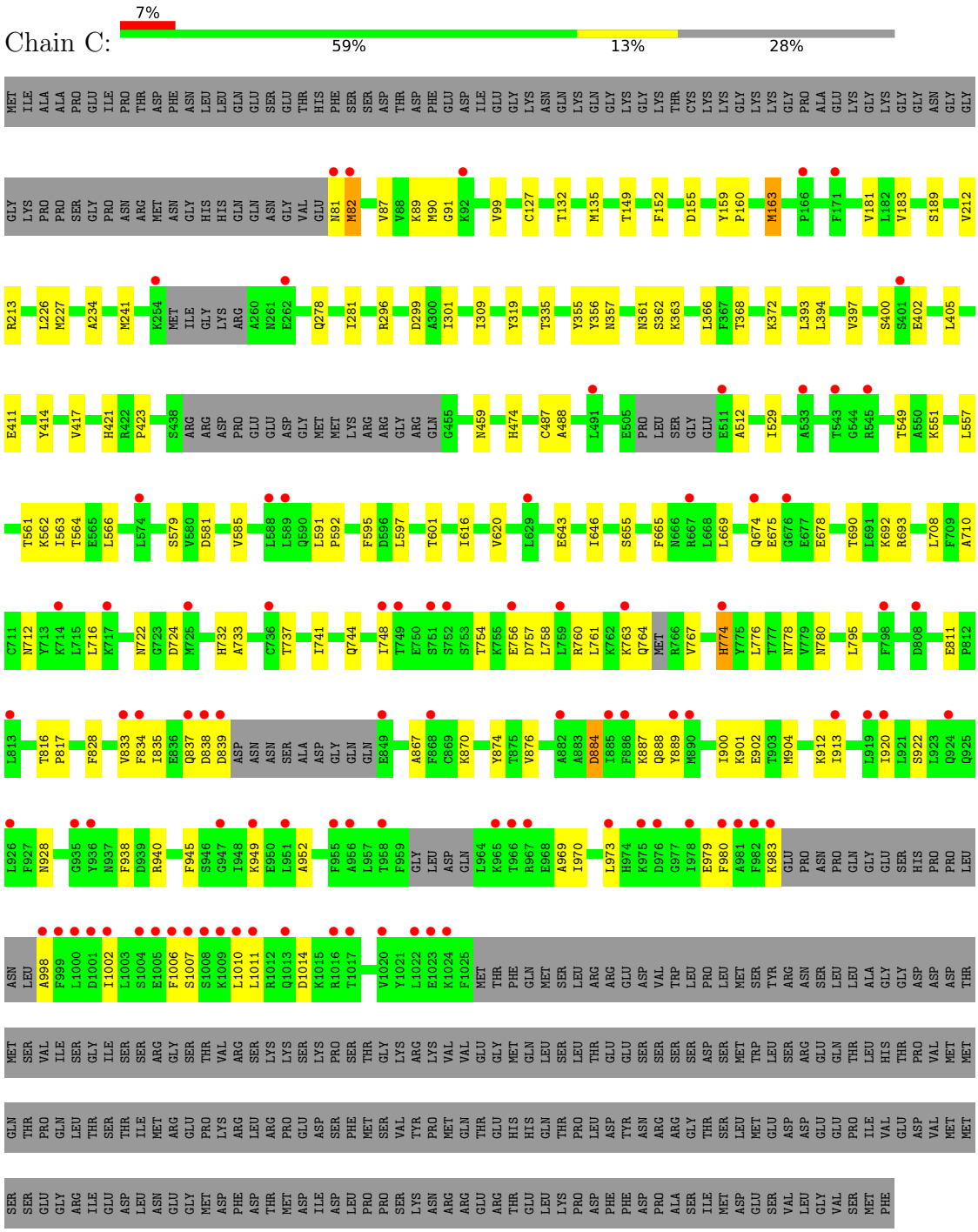
- Molecule 1: Cohesin subunit SA-2

Chain A:



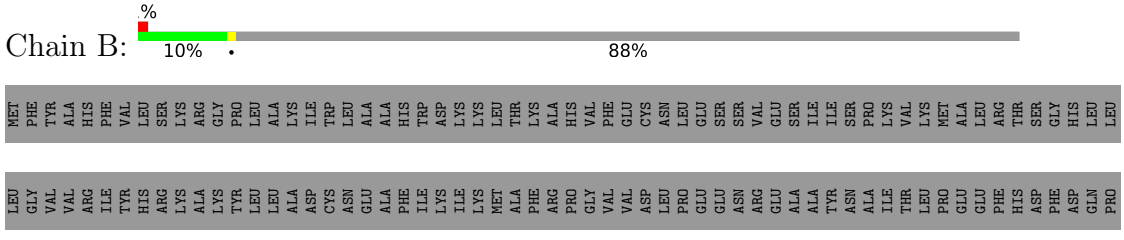
• Molecule 1: Cohesin subunit SA-2

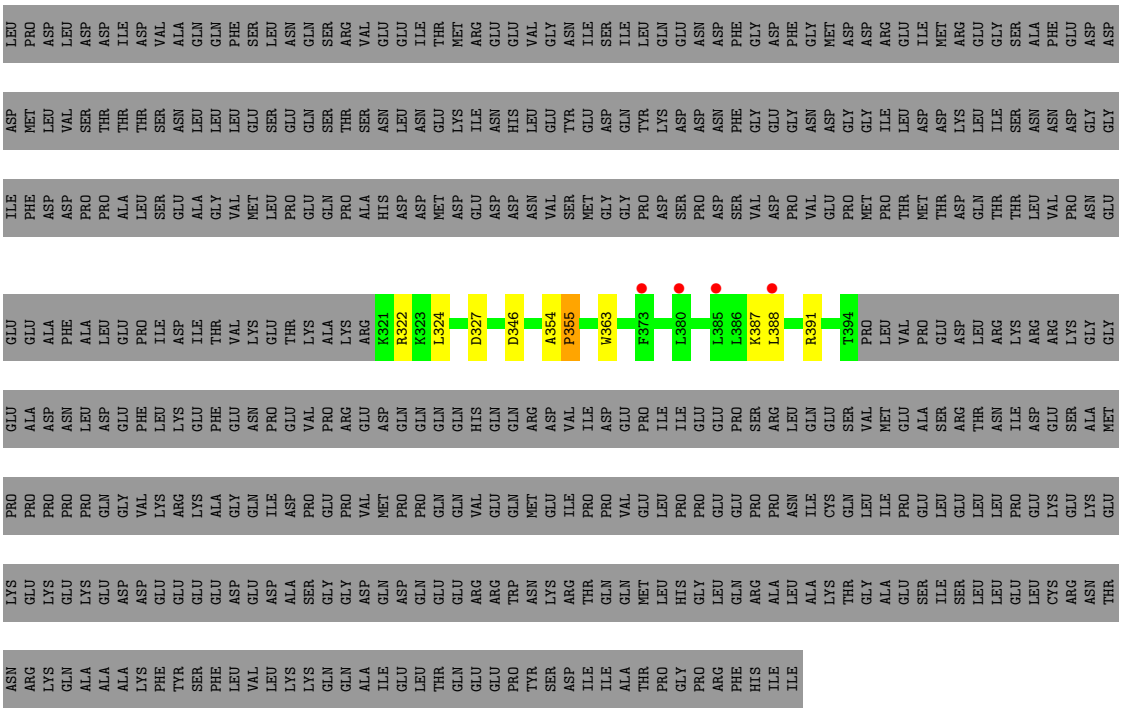
Chain C:



• Molecule 2: Double-strand-break repair protein rad21 homolog

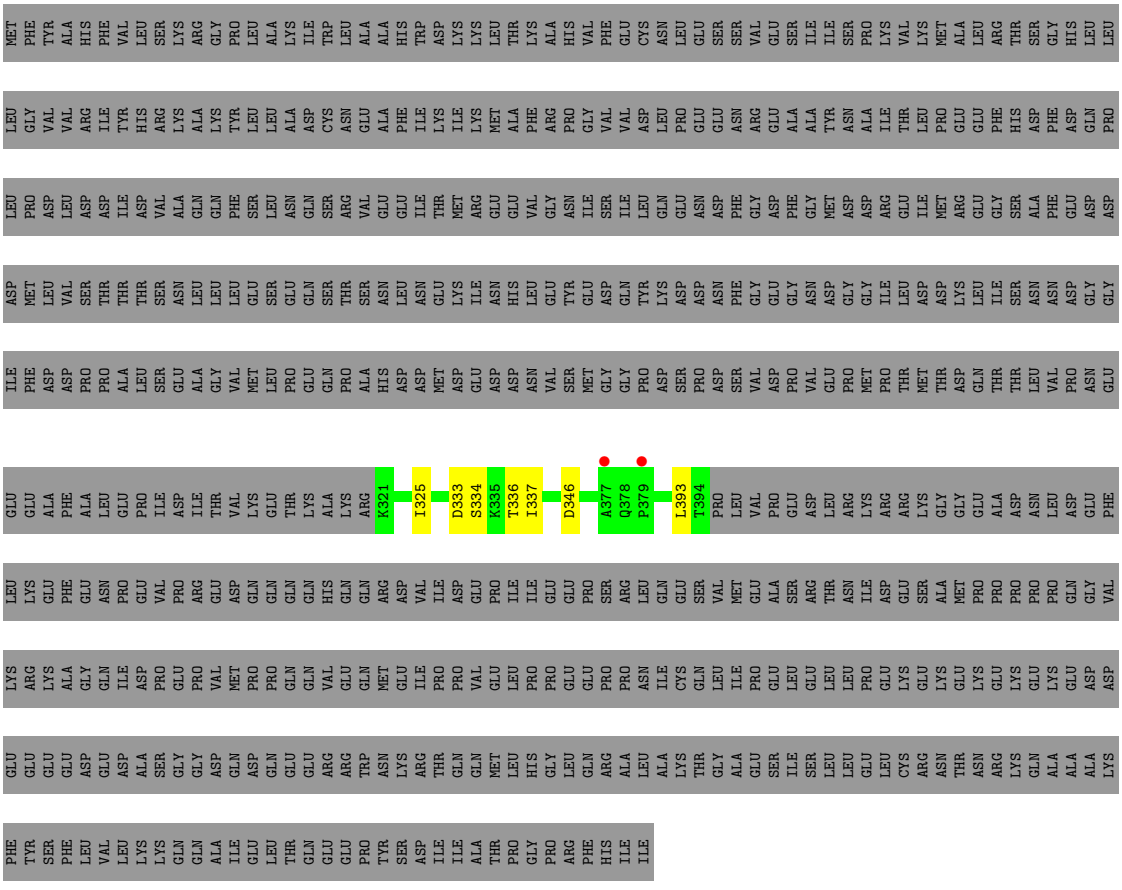
Chain B:





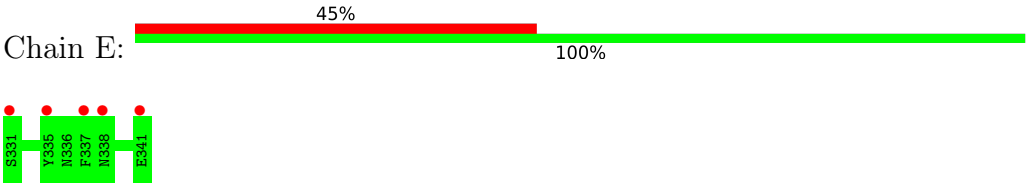
• Molecule 2: Double-strand-break repair protein rad21 homolog

Chain D:



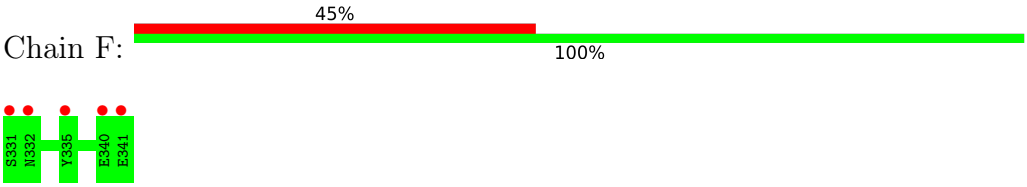
• Molecule 3: Shugoshin 1

Chain E:



• Molecule 3: Shugoshin 1

Chain F:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	78.81Å 181.10Å 111.37Å 90.00° 94.25° 90.00°	Depositor
Resolution (Å)	47.87 – 3.24 47.87 – 3.24	Depositor EDS
% Data completeness (in resolution range)	97.8 (47.87-3.24) 97.8 (47.87-3.24)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.23 (at 3.25Å)	Xtriage
Refinement program	PHENIX 1.19.2_4158	Depositor
R, R_{free}	0.269 , 0.289 0.266 , 0.290	Depositor DCC
R_{free} test set	2420 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	108.4	Xtriage
Anisotropy	0.434	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 71.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	32423	wwPDB-VP
Average B, all atoms (Å^2)	142.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.64% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

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	0.32	0/7690	0.51	0/10366
1	C	0.38	0/7364	0.55	0/9919
2	B	0.42	0/606	0.61	0/818
2	D	0.30	0/606	0.52	0/818
3	E	0.28	0/93	0.33	0/125
3	F	0.95	0/93	0.86	0/125
All	All	0.35	0/16452	0.53	0/22171

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

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	7558	7544	7544	73	1
1	C	7244	7236	7236	97	1
2	B	596	639	639	8	0
2	D	596	639	639	11	0
3	E	92	72	72	0	0
3	F	92	72	72	0	0
4	A	7	0	0	1	0
4	B	1	0	0	0	0
4	C	32	0	0	11	0
4	D	3	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	16221	16202	16202	183	1

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 6.

All (183) 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:C:213:ARG:NE	4:C:1301:HOH:O	1.64	1.24
4:C:1301:HOH:O	2:D:325:ILE:CG2	2.08	1.01
4:C:1301:HOH:O	2:D:325:ILE:HG22	1.66	0.94
1:C:748:ILE:HD13	1:C:761:LEU:HD22	1.56	0.87
1:A:1039:LEU:HA	1:A:1042:MET:HE2	1.58	0.84
1:C:394:LEU:HD22	1:C:405:LEU:HD21	1.67	0.77
1:C:213:ARG:HB2	4:C:1301:HOH:O	1.85	0.74
1:C:213:ARG:CB	4:C:1301:HOH:O	2.35	0.74
4:C:1301:HOH:O	2:D:325:ILE:HG21	1.79	0.73
2:B:387:LYS:O	2:B:391:ARG:HG3	1.90	0.70
1:C:952:ALA:HB1	1:C:1002:ILE:HD11	1.75	0.68
1:A:746:ALA:HB2	2:B:388:LEU:HD11	1.76	0.68
1:A:807:ARG:HD3	2:B:391:ARG:NH1	2.08	0.68
1:C:355:TYR:OH	1:C:368:THR:HG21	1.92	0.68
1:A:993:PRO:HG3	1:A:1037:VAL:HG11	1.76	0.68
1:C:888:GLN:N	1:C:888:GLN:OE1	2.27	0.67
1:A:119:ASN:HB3	1:A:123:GLN:NE2	2.09	0.67
1:A:355:TYR:OH	1:A:368:THR:HG21	1.94	0.67
1:C:213:ARG:CD	4:C:1301:HOH:O	2.23	0.66
1:C:361:ASN:OD1	1:C:363:LYS:N	2.30	0.65
1:C:674:GLN:OE1	1:C:675:GLU:OE1	2.13	0.65
1:A:316:MET:HE1	1:A:329:LEU:HD23	1.79	0.64
1:A:620:VAL:O	1:A:693:ARG:NE	2.30	0.64
1:C:744:GLN:O	1:C:748:ILE:HD12	1.98	0.64
1:A:119:ASN:HB3	1:A:123:GLN:HE22	1.63	0.64
1:C:296:ARG:NH1	1:C:299:ASP:OD2	2.31	0.63
1:C:744:GLN:C	1:C:748:ILE:HD12	2.19	0.63
1:C:970:ILE:HD12	1:C:1006:PHE:CD2	2.33	0.63
1:A:361:ASN:OD1	1:A:363:LYS:N	2.33	0.61
1:C:620:VAL:O	1:C:693:ARG:NE	2.34	0.61
1:C:708:LEU:O	1:C:712:ASN:ND2	2.33	0.60
1:A:617:ARG:HD2	1:A:657:LEU:HD13	1.84	0.60
1:C:887:LYS:C	1:C:888:GLN:OE1	2.39	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:402:GLU:OE1	1:C:402:GLU:N	2.35	0.60
1:C:887:LYS:HG2	1:C:888:GLN:OE1	2.02	0.59
2:D:333:ASP:N	2:D:333:ASP:OD1	2.35	0.59
1:A:862:ARG:NH2	1:A:898:ASP:OD2	2.36	0.59
1:C:597:LEU:HB3	1:C:646:ILE:HD11	1.85	0.59
1:C:737:THR:O	1:C:741:ILE:HD13	2.02	0.59
1:C:1007:SER:HA	1:C:1010:LEU:HB2	1.85	0.59
1:C:309:ILE:HG13	1:C:335:THR:HG21	1.85	0.58
1:C:710:ALA:N	4:C:1302:HOH:O	2.37	0.58
1:C:1011:LEU:HB2	1:C:1014:ASP:OD1	2.04	0.57
1:C:87:VAL:O	1:C:91:GLY:N	2.38	0.56
1:A:1039:LEU:HA	1:A:1042:MET:CE	2.32	0.56
1:A:807:ARG:HD3	2:B:391:ARG:HH12	1.70	0.56
1:A:309:ILE:HG13	1:A:335:THR:HG21	1.88	0.56
1:C:913:ILE:HG22	1:C:969:ALA:HA	1.87	0.55
1:A:393:LEU:O	1:A:397:VAL:HG23	2.07	0.55
1:C:579:SER:N	4:C:1303:HOH:O	2.39	0.55
1:A:592:PRO:HA	1:A:595:PHE:CD2	2.42	0.55
1:A:992:HIS:CG	1:A:993:PRO:HD2	2.41	0.54
1:C:920:ILE:CG1	1:C:973:LEU:HG	2.37	0.54
2:D:337:ILE:H	2:D:337:ILE:HD12	1.73	0.54
1:C:1006:PHE:O	1:C:1010:LEU:N	2.39	0.53
1:C:678:GLU:O	1:C:678:GLU:HG2	2.09	0.53
1:A:395:THR:HG21	4:A:1303:HOH:O	2.09	0.53
1:A:669:LEU:CD2	1:A:715:LEU:HD11	2.39	0.52
1:C:592:PRO:HA	1:C:595:PHE:CD2	2.44	0.52
1:A:983:LYS:HG3	1:A:984:GLU:OE2	2.10	0.51
2:B:354:ALA:O	2:B:355:PRO:C	2.46	0.51
1:C:901:LYS:O	1:C:904:MET:HG2	2.10	0.51
1:C:867:ALA:HA	1:C:870:LYS:HE2	1.93	0.51
1:C:920:ILE:HD11	1:C:973:LEU:HD21	1.93	0.50
1:A:754:THR:HG23	1:A:757:ASP:CB	2.42	0.50
1:A:170:LYS:O	1:A:170:LYS:HD3	2.12	0.50
1:C:690:THR:HG22	4:C:1326:HOH:O	2.12	0.50
1:C:887:LYS:CG	1:C:888:GLN:OE1	2.59	0.50
1:A:1031:SER:O	1:A:1034:ARG:NH1	2.45	0.50
1:A:1000:LEU:HD22	1:A:1044:TYR:CD2	2.48	0.49
1:C:748:ILE:O	1:C:748:ILE:HG22	2.12	0.49
1:C:887:LYS:HB3	1:C:922:SER:HB3	1.95	0.49
2:D:333:ASP:OD1	2:D:336:THR:HG23	2.13	0.49
1:A:99:VAL:HG21	1:A:181:VAL:HG12	1.92	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:500:SER:HA	1:A:504:GLU:OE1	2.12	0.49
1:A:606:GLU:OE1	1:A:606:GLU:N	2.45	0.49
1:A:754:THR:HG23	1:A:757:ASP:HB2	1.94	0.49
1:A:529:ILE:HG23	1:A:563:ILE:HD13	1.93	0.49
1:C:81:ASN:O	1:C:82:MET:HG3	2.13	0.48
1:C:149:THR:HG23	1:C:212:VAL:HG21	1.95	0.48
1:A:1038:TRP:HE3	1:A:1041:LEU:HD12	1.78	0.47
1:C:616:ILE:O	1:C:620:VAL:HG23	2.14	0.47
1:C:748:ILE:HG23	1:C:758:LEU:HD11	1.94	0.47
1:C:874:TYR:CE1	2:D:393:LEU:HA	2.49	0.47
1:A:698:HIS:NE2	1:A:740:VAL:HG22	2.29	0.47
1:C:692:LYS:HG2	1:C:732:HIS:NE2	2.29	0.47
2:D:333:ASP:O	2:D:337:ILE:HD12	2.14	0.47
1:A:127:CYS:O	1:A:128:LYS:HB2	2.13	0.47
1:A:1033:ARG:NH1	1:A:1035:GLU:OE2	2.47	0.47
1:C:756:GLU:HG3	1:C:757:ASP:N	2.29	0.47
1:C:564:THR:HA	1:C:595:PHE:CD1	2.50	0.47
1:A:94:ALA:O	1:A:97:SER:N	2.41	0.47
1:C:393:LEU:O	1:C:397:VAL:HG23	2.15	0.46
1:C:562:LYS:O	1:C:566:LEU:HD13	2.16	0.46
1:C:884:ASP:O	1:C:888:GLN:OE1	2.33	0.46
1:A:616:ILE:O	1:A:620:VAL:HG23	2.16	0.46
1:C:760:ARG:O	1:C:764:GLN:N	2.49	0.46
1:A:983:LYS:O	1:A:983:LYS:HD2	2.16	0.45
1:A:606:GLU:HG2	1:A:649:ARG:NH2	2.31	0.45
1:A:708:LEU:HD23	1:A:711:CYS:SG	2.56	0.45
1:C:89:LYS:HE2	1:C:90:MET:CE	2.46	0.45
1:C:581:ASP:O	1:C:585:VAL:HG22	2.16	0.45
1:C:716:LEU:HD21	1:C:733:ALA:HB3	1.98	0.45
1:A:965:LYS:O	1:A:965:LYS:HG3	2.17	0.45
1:C:362:SER:O	1:C:366:LEU:HD23	2.17	0.45
1:A:677:GLU:O	1:A:677:GLU:HG3	2.16	0.45
1:A:992:HIS:ND1	1:A:993:PRO:HD2	2.32	0.45
1:C:811:GLU:HG3	4:C:1317:HOH:O	2.16	0.44
1:C:1010:LEU:CD2	1:C:1014:ASP:OD2	2.65	0.44
2:D:346:ASP:OD1	2:D:346:ASP:N	2.46	0.44
1:A:722:ASN:HB2	1:A:724:ASP:OD1	2.17	0.44
1:C:89:LYS:HE2	1:C:90:MET:HE2	1.99	0.44
1:C:234:ALA:HB2	1:C:281:ILE:HG21	2.00	0.44
1:C:368:THR:O	1:C:372:LYS:HB2	2.16	0.44
1:A:669:LEU:HD21	1:A:715:LEU:HD11	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:665:PHE:O	1:C:669:LEU:HG	2.17	0.44
1:A:986:ASN:HB2	1:A:993:PRO:O	2.17	0.44
1:C:299:ASP:OD1	1:C:301:ILE:N	2.51	0.44
1:C:1010:LEU:HD22	1:C:1014:ASP:OD2	2.17	0.44
1:C:414:TYR:O	1:C:417:VAL:HG22	2.18	0.44
1:C:928:ASN:OD1	1:C:980:PHE:HZ	2.01	0.44
1:C:421:HIS:CE1	1:C:423:PRO:HG2	2.53	0.43
1:C:795:LEU:HD22	1:C:817:PRO:HG3	1.99	0.43
1:C:876:VAL:HG12	1:C:876:VAL:O	2.18	0.43
2:D:334:SER:HA	2:D:337:ILE:HD13	1.99	0.43
1:A:316:MET:CE	1:A:329:LEU:HD23	2.47	0.43
1:A:391:ILE:O	1:A:395:THR:HG23	2.18	0.43
1:C:778:ASN:ND2	1:C:780:ASN:HB3	2.33	0.43
1:A:127:CYS:O	1:A:152:PHE:HA	2.17	0.43
1:A:811:GLU:N	1:A:812:PRO:HD2	2.33	0.43
1:A:880:ASN:HA	1:A:918:THR:HG22	1.99	0.43
1:A:1032:LEU:HA	1:A:1034:ARG:HH12	1.83	0.43
1:C:838:ASP:O	1:C:839:ASP:C	2.57	0.43
1:C:132:THR:OG1	1:C:135:MET:HG3	2.18	0.43
1:C:557:LEU:O	1:C:561:THR:HG23	2.19	0.43
1:C:591:LEU:N	1:C:592:PRO:CD	2.82	0.43
1:A:96:GLN:NE2	1:A:100:ASP:OD2	2.52	0.43
1:A:754:THR:CG2	1:A:757:ASP:HB2	2.49	0.43
1:A:987:PRO:HB2	1:A:988:GLN:OE1	2.19	0.43
2:D:333:ASP:OD1	2:D:336:THR:CG2	2.66	0.43
1:A:119:ASN:O	1:A:123:GLN:NE2	2.52	0.42
1:C:99:VAL:HG21	1:C:181:VAL:HG12	1.99	0.42
1:A:780:ASN:OD1	1:A:780:ASN:C	2.58	0.42
1:C:487:CYS:SG	1:C:488:ALA:N	2.92	0.42
1:C:912:LYS:O	1:C:912:LYS:HD2	2.19	0.42
1:C:601:THR:CG2	1:C:646:ILE:HG23	2.49	0.42
1:C:754:THR:O	1:C:758:LEU:HD13	2.19	0.42
1:A:335:THR:HG22	1:A:335:THR:O	2.20	0.42
1:A:132:THR:OG1	1:A:135:MET:HG3	2.19	0.42
1:A:1044:TYR:O	1:A:1048:LEU:HD12	2.20	0.42
1:C:127:CYS:O	1:C:152:PHE:HA	2.18	0.42
1:C:763:LYS:O	1:C:763:LYS:HD2	2.20	0.42
1:C:159:TYR:O	1:C:163:MET:SD	2.77	0.42
1:C:741:ILE:HD12	1:C:741:ILE:N	2.35	0.42
1:C:183:VAL:HG21	1:C:226:LEU:CD1	2.49	0.42
1:C:241:MET:CE	1:C:278:GLN:OE1	2.68	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:591:LEU:N	1:A:592:PRO:CD	2.82	0.42
1:A:893:TYR:O	1:A:897:GLY:N	2.49	0.42
1:C:529:ILE:HG23	1:C:563:ILE:HD13	2.02	0.41
1:A:669:LEU:HD22	1:A:715:LEU:HD11	2.00	0.41
1:C:1014:ASP:OD1	1:C:1014:ASP:N	2.42	0.41
1:A:437:PHE:N	1:A:437:PHE:CD1	2.88	0.41
2:B:322:ARG:NH2	2:B:324:LEU:HD22	2.35	0.41
1:C:737:THR:HG22	1:C:741:ILE:CD1	2.49	0.41
1:A:324:LEU:HD22	1:A:361:ASN:ND2	2.35	0.41
1:C:722:ASN:HB2	1:C:724:ASP:OD1	2.20	0.41
1:C:949:LYS:HG2	1:C:998:ALA:HB2	2.02	0.41
1:C:979:GLU:O	1:C:983:LYS:HB2	2.21	0.41
1:C:889:TYR:HB2	1:C:900:ILE:HG21	2.01	0.41
1:A:213:ARG:NH2	2:B:327:ASP:OD1	2.47	0.41
1:C:549:THR:HG22	1:C:551:LYS:H	1.86	0.41
1:A:312:ILE:HA	1:A:315:TRP:CE3	2.56	0.41
1:A:313:GLY:HA3	1:A:350:ALA:HB1	2.01	0.41
1:A:849:GLU:OE2	1:C:512:ALA:HB3	2.20	0.41
1:C:411:GLU:HA	1:C:414:TYR:CD2	2.56	0.41
1:A:99:VAL:O	1:A:103:ILE:HG13	2.21	0.40
1:A:1032:LEU:CA	1:A:1034:ARG:HH12	2.34	0.40
2:B:346:ASP:OD1	2:B:346:ASP:N	2.51	0.40
1:C:938:PHE:CZ	1:C:945:PHE:CZ	3.09	0.40
1:A:724:ASP:OD1	1:A:724:ASP:O	2.39	0.40
1:A:556:GLN:O	1:A:560:ARG:HG3	2.22	0.40
1:A:611:ALA:O	1:A:615:GLN:HG2	2.21	0.40
1:C:763:LYS:HD2	1:C:767:VAL:CG2	2.51	0.40

All (1) 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)
1:A:1028:PHE:CE1	1:C:774:HIS:NE2[2_455]	2.12	0.08

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	917/1231 (74%)	887 (97%)	30 (3%)	0	100 100
1	C	875/1231 (71%)	847 (97%)	25 (3%)	3 (0%)	41 73
2	B	72/631 (11%)	69 (96%)	3 (4%)	0	100 100
2	D	72/631 (11%)	72 (100%)	0	0	100 100
3	E	9/11 (82%)	7 (78%)	2 (22%)	0	100 100
3	F	9/11 (82%)	7 (78%)	2 (22%)	0	100 100
All	All	1954/3746 (52%)	1889 (97%)	62 (3%)	3 (0%)	47 78

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	833	VAL
1	C	189	SER
1	C	835	ILE

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	840/1106 (76%)	827 (98%)	13 (2%)	65 83
1	C	803/1106 (73%)	781 (97%)	22 (3%)	44 73
2	B	69/566 (12%)	67 (97%)	2 (3%)	42 71
2	D	69/566 (12%)	69 (100%)	0	100 100
3	E	10/10 (100%)	10 (100%)	0	100 100
3	F	10/10 (100%)	10 (100%)	0	100 100
All	All	1801/3364 (54%)	1764 (98%)	37 (2%)	53 77

All (37) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	89	LYS
1	A	155	ASP
1	A	227	MET
1	A	296	ARG
1	A	319	TYR
1	A	400	SER
1	A	474	HIS
1	A	516	ARG
1	A	586	THR
1	A	655	SER
1	A	763	LYS
1	A	850	ASP
1	A	992	HIS
2	B	355	PRO
2	B	363	TRP
1	C	82	MET
1	C	155	ASP
1	C	160	PRO
1	C	163	MET
1	C	227	MET
1	C	319	TYR
1	C	356	TYR
1	C	357	ASN
1	C	400	SER
1	C	459	ASN
1	C	474	HIS
1	C	643	GLU
1	C	655	SER
1	C	774	HIS
1	C	776	LEU
1	C	816	THR
1	C	828	PHE
1	C	834	PHE
1	C	837	GLN
1	C	884	ASP
1	C	902	GLU
1	C	940	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	770	GLN

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 monosaccharides in this entry.

5.6 Ligand geometry

There are no ligands in this entry.

5.7 Other polymers

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

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, 95^{th} 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	929/1231 (75%)	0.63	67 (7%) 15 10	67, 136, 184, 215	0
1	C	891/1231 (72%)	0.78	91 (10%) 6 5	67, 126, 214, 348	0
2	B	74/631 (11%)	0.66	4 (5%) 25 16	69, 110, 164, 172	0
2	D	74/631 (11%)	0.57	2 (2%) 54 42	75, 104, 137, 155	0
3	E	11/11 (100%)	1.74	5 (45%) 0 0	93, 114, 158, 158	0
3	F	11/11 (100%)	1.94	5 (45%) 0 0	110, 120, 138, 149	0
All	All	1990/3746 (53%)	0.71	174 (8%) 10 7	67, 129, 198, 348	0

All (174) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	1023	GLU	8.3
1	A	600	TYR	6.8
1	C	982	PHE	6.2
1	C	1000	LEU	6.1
1	C	749	THR	5.8
1	C	1007	SER	5.7
1	C	1004	SER	5.6
1	C	774	HIS	5.6
1	A	92	LYS	5.4
1	C	1024	LYS	5.1
1	C	1020	VAL	5.0
1	C	885	ILE	4.9
1	C	973	LEU	4.7
1	C	1009	LYS	4.6
1	C	882	ALA	4.5
1	C	808	ASP	4.4
1	A	636	TYR	4.3
1	A	81	ASN	4.3
1	A	1025	PHE	4.3

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Mol	Chain	Res	Type	RSRZ
1	A	1016	ARG	4.2
1	C	966	THR	4.2
1	C	955	PHE	4.1
1	A	253	ASN	4.1
1	C	999	PHE	4.1
1	A	82	MET	4.0
1	C	998	ALA	4.0
3	E	341	GLU	4.0
1	A	839	ASP	4.0
1	A	652	ILE	3.9
1	C	886	PHE	3.9
1	A	676	GLY	3.9
1	C	676	GLY	3.9
1	C	748	ILE	3.9
1	C	951	LEU	3.8
1	A	748	ILE	3.7
1	A	626	THR	3.7
1	C	978	ILE	3.7
1	C	81	ASN	3.6
1	C	956	ALA	3.5
1	C	759	LEU	3.5
1	A	264	LEU	3.4
1	C	1016	ARG	3.4
1	C	1010	LEU	3.3
1	C	889	TYR	3.3
3	F	341	GLU	3.3
1	C	543	THR	3.3
1	A	810	LEU	3.3
3	E	331	SER	3.3
3	E	337	PHE	3.3
1	C	401	SER	3.3
1	C	751	SER	3.3
1	C	1011	LEU	3.2
1	C	262	GLU	3.2
1	A	814	VAL	3.2
3	F	332	ASN	3.2
1	C	588	LEU	3.1
1	C	849	GLU	3.1
1	A	1024	LYS	3.1
1	C	674	GLN	3.1
1	A	713	TYR	3.1
1	A	1012	ARG	3.1

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Mol	Chain	Res	Type	RSRZ
1	A	574	LEU	3.1
3	F	331	SER	3.1
1	C	714	LYS	3.1
1	C	920	ILE	3.0
1	C	82	MET	3.0
1	C	837	GLN	3.0
1	A	1032	LEU	3.0
1	C	1005	GLU	3.0
3	E	338	ASN	3.0
1	A	729	ILE	2.9
1	C	254	LYS	2.9
1	A	251	GLU	2.9
1	A	820	SER	2.9
1	C	981	ALA	2.9
1	C	1002	ILE	2.9
1	C	1006	PHE	2.9
1	C	913	ILE	2.9
1	A	959	PHE	2.9
1	C	838	ASP	2.8
1	A	1048	LEU	2.8
1	A	744	GLN	2.8
1	A	492	LEU	2.8
1	A	863	ASN	2.8
1	A	923	LEU	2.8
1	A	254	LYS	2.8
1	A	758	LEU	2.8
1	C	1022	LEU	2.8
1	A	604	ARG	2.8
1	A	997	LEU	2.7
1	A	1011	LEU	2.7
2	B	385	LEU	2.7
1	A	973	LEU	2.7
1	C	947	GLY	2.7
1	C	92	LYS	2.7
1	A	982	PHE	2.7
1	C	958	THR	2.7
1	A	175	PHE	2.6
1	C	890	MET	2.6
1	A	1021	TYR	2.6
1	C	834	PHE	2.6
1	C	936	TYR	2.6
1	A	640	CYS	2.6

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Mol	Chain	Res	Type	RSRZ
1	C	752	SER	2.6
1	C	924	GLN	2.6
1	A	714	LYS	2.6
1	C	725	MET	2.6
1	A	1015	LYS	2.6
1	A	978	ILE	2.6
1	C	975	LYS	2.5
1	C	1008	SER	2.5
1	A	1010	LEU	2.5
1	A	632	CYS	2.5
1	C	166	PRO	2.5
1	C	868	PHE	2.5
1	C	813	LEU	2.5
1	A	886	PHE	2.4
1	C	717	LYS	2.4
1	C	980	PHE	2.4
1	A	614	ARG	2.4
1	A	745	LEU	2.4
1	C	798	PHE	2.4
1	A	215	PHE	2.4
1	C	667	ARG	2.4
1	C	967	ARG	2.3
2	D	379	PRO	2.3
1	C	935	GLY	2.3
1	C	919	LEU	2.3
1	C	976	ASP	2.3
1	C	1001	ASP	2.3
1	C	1017	THR	2.3
3	F	340	GLU	2.2
1	C	574	LEU	2.2
1	A	913	ILE	2.2
1	A	679	PRO	2.2
1	C	171	PHE	2.2
2	B	373	PHE	2.2
1	A	703	LEU	2.2
1	C	589	LEU	2.2
2	B	388	LEU	2.2
1	C	545	ARG	2.2
1	A	694	ILE	2.2
1	C	736	CYS	2.2
1	A	742	LEU	2.2
1	A	763	LYS	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	166	PRO	2.2
1	C	949	LYS	2.2
2	B	380	LEU	2.1
1	C	533	ALA	2.1
1	A	890	MET	2.1
1	A	822	GLN	2.1
1	A	849	GLU	2.1
1	C	1013	GLN	2.1
1	C	511	GLU	2.1
1	C	833	VAL	2.1
1	A	781	THR	2.1
1	A	738	HIS	2.1
2	D	377	ALA	2.1
3	F	335	TYR	2.1
1	A	753	SER	2.1
1	C	629	LEU	2.1
1	C	763	LYS	2.1
1	A	795	LEU	2.1
3	E	335	TYR	2.1
1	C	926	LEU	2.1
1	C	839	ASP	2.1
1	A	554	LYS	2.0
1	C	983	LYS	2.0
1	A	749	THR	2.0
1	C	965	LYS	2.0
1	A	169	LYS	2.0
1	A	879	MET	2.0
1	C	756	GLU	2.0
1	C	491	LEU	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 monosaccharides in this entry.

6.4 Ligands (i)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.