Full wwPDB X-ray Structure Validation Report (i)

Nov 10, 2026 – 12:10 PM JST

PDB ID	:	47GO / pdb_000047go
Title	:	Orphan nuclear receptor PXR
Authors	:	Zhang, Y.; Wang, C.Y.
Deposited on	:	2026-10-22
Resolution	:	3.00 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 (i) 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 (i)) were used in the production of this report:

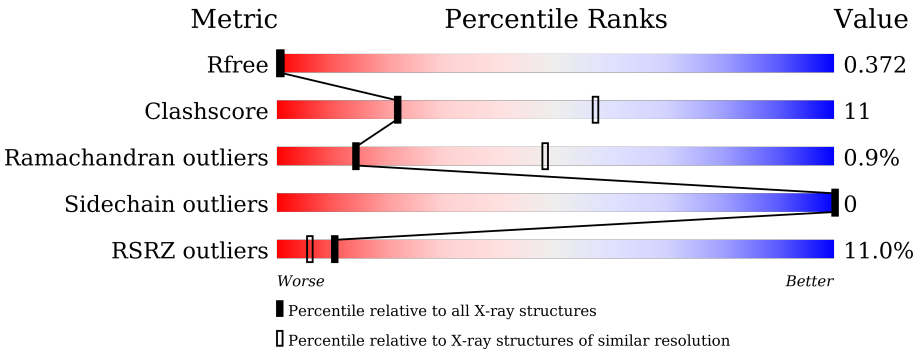
MolProbity	:	4-5-2 with Phenix2.2
Xtriage (Phenix)	:	2.2
EDS	:	3.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.015 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.51

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 3.00 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	2672 (3.00-3.00)
Clashscore	190562	2977 (3.00-3.00)
Ramachandran outliers	187476	2877 (3.00-3.00)
Sidechain outliers	187428	2880 (3.00-3.00)
RSRZ outliers	180081	2671 (3.00-3.00)

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	434	7% 47% 16% 36%
1	B	434	7% 47% 16% 37%
2	C	25	52% 8% 40%
2	D	25	12% 40% 20% 40%

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 4707 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 Nuclear receptor subfamily 1 group I member 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	276	Total	C	N	O	S	0	0	0
			2231	1435	377	401	18			
1	B	275	Total	C	N	O	S	0	0	0
			2218	1428	378	394	18			

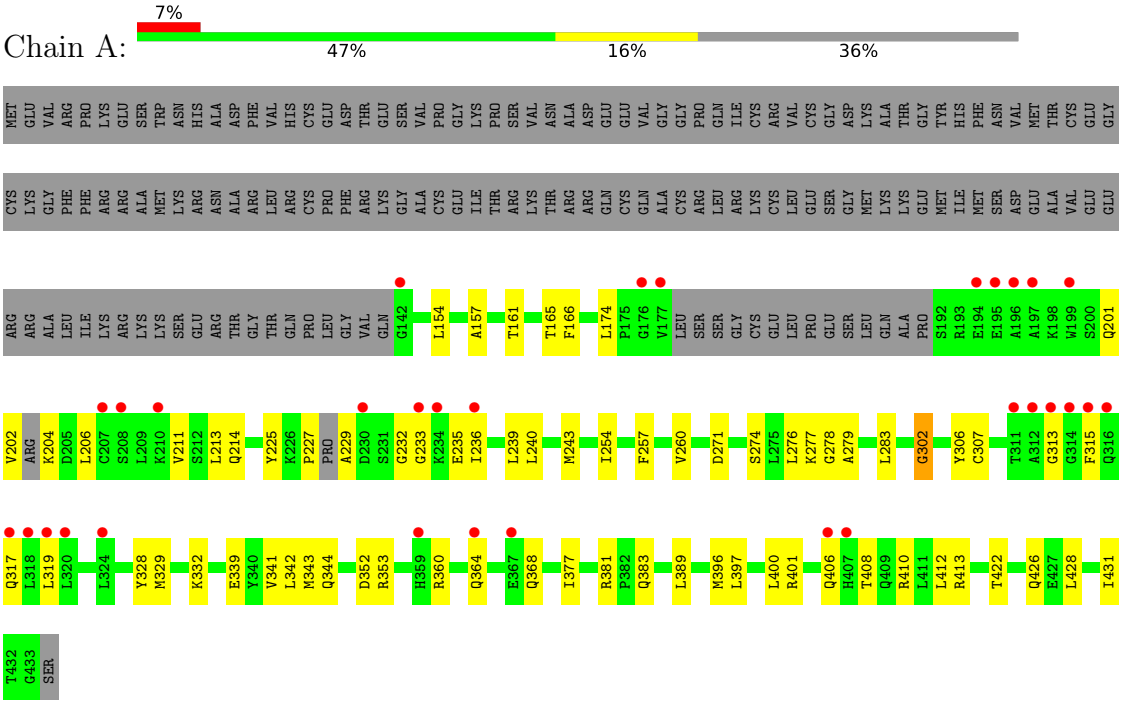
- Molecule 2 is a protein called Nuclear receptor coactivator 1.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	C	15	Total	C	N	O	0	0	0
			127	80	26	21			
2	D	15	Total	C	N	O	0	0	0
			131	82	27	22			

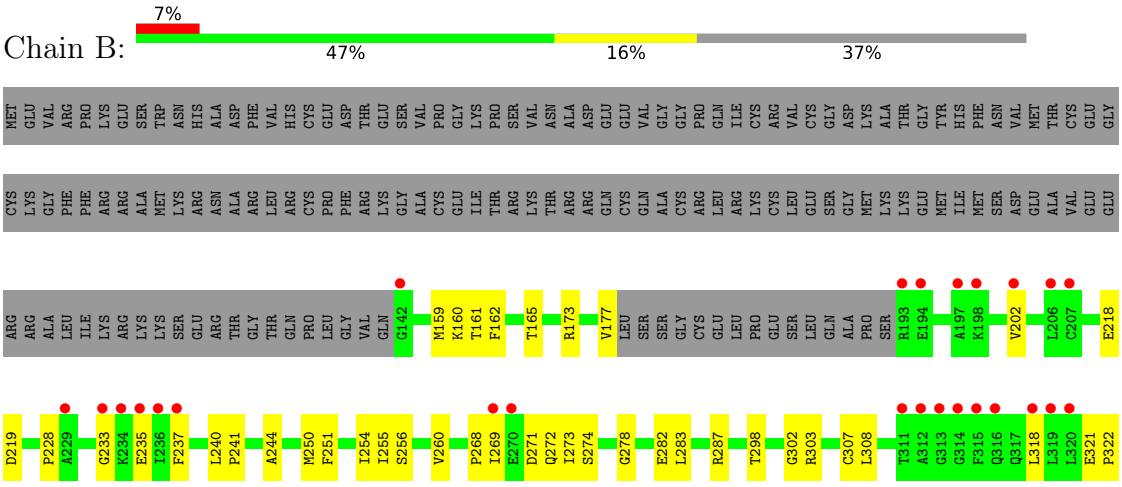
3 Residue-property plots (i)

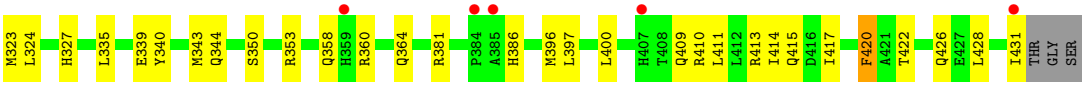
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Nuclear receptor subfamily 1 group I member 2



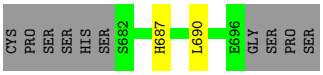
• Molecule 1: Nuclear receptor subfamily 1 group I member 2





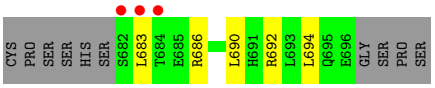
• Molecule 2: Nuclear receptor coactivator 1





• Molecule 2: Nuclear receptor coactivator 1





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	84.92Å 89.90Å 106.92Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	22.97 – 3.00 22.97 – 3.00	Depositor EDS
% Data completeness (in resolution range)	92.3 (22.97-3.00) 92.1 (22.97-3.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.55 (at 2.99Å)	Xtriage
Refinement program	REFMAC 5.8.0253	Depositor
R, R_{free}	0.276 , 0.359 0.296 , 0.372	Depositor DCC
R_{free} test set	809 reflections (4.77%)	wwPDB-VP
Wilson B-factor (Å^2)	41.0	Xtriage
Anisotropy	0.071	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.27 , 29.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.52$, $< L^2 > = 0.36$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.82	EDS
Total number of atoms	4707	wwPDB-VP
Average B, all atoms (Å^2)	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.13% 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	0.47	0/2278	0.71	0/3064
1	B	0.45	0/2268	0.65	0/3057
2	C	0.46	0/128	0.68	0/170
2	D	0.38	0/132	0.65	0/175
All	All	0.46	0/4806	0.68	0/6466

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	2231	0	2229	50	0
1	B	2218	0	2213	52	0
2	C	127	0	133	3	0
2	D	131	0	139	4	0
All	All	4707	0	4714	102	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 11.

All (102) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:202:VAL:O	1:A:204:LYS:N	2.11	0.84
1:B:173:ARG:HD2	1:B:241:PRO:HB3	1.61	0.82
1:B:278:GLY:HA3	1:B:353:ARG:HD2	1.62	0.80
1:B:308:LEU:HD23	1:B:318:LEU:HD13	1.64	0.77
1:B:271:ASP:O	1:B:274:SER:N	2.18	0.77
1:A:329:MET:HE2	1:A:396:MET:HE2	1.69	0.75
1:A:227:PRO:O	1:A:229:ALA:N	2.24	0.70
1:B:350:SER:HB2	1:B:353:ARG:HE	1.56	0.69
1:B:237:PHE:HB3	1:B:240:LEU:HD12	1.79	0.65
1:B:218:GLU:OE1	1:B:303:ARG:NH2	2.30	0.65
1:B:339:GLU:O	1:B:343:MET:HG3	2.01	0.61
1:B:254:ILE:HD11	1:B:287:ARG:HD2	1.82	0.60
1:B:202:VAL:HG21	1:B:417:ILE:HD12	1.84	0.59
1:B:244:ALA:HB1	1:B:422:THR:HG23	1.84	0.59
1:A:232:GLY:N	1:A:235:GLU:OE2	2.37	0.58
1:B:283:LEU:CD1	1:B:344:GLN:HB3	2.34	0.58
1:A:211:VAL:HA	1:A:307:CYS:O	2.04	0.58
1:B:360:ARG:O	1:B:364:GLN:HG2	2.03	0.57
1:B:228:PRO:HG3	1:B:235:GLU:HB2	1.87	0.57
1:A:313:GLY:HA3	1:A:317:GLN:HB2	1.86	0.56
1:B:282:GLU:HG2	1:B:400:LEU:HG	1.87	0.56
1:B:350:SER:HB2	1:B:353:ARG:NE	2.21	0.55
1:B:159:MET:HE2	1:B:160:LYS:HG3	1.87	0.54
1:A:283:LEU:CD1	1:A:344:GLN:HB3	2.37	0.54
1:A:426:GLN:HA	1:A:431:ILE:HD12	1.89	0.54
1:A:339:GLU:OE2	1:A:381:ARG:NH1	2.41	0.54
1:A:254:ILE:HD12	1:A:283:LEU:HB3	1.90	0.54
1:B:269:ILE:HD11	2:D:694:LEU:HB3	1.90	0.54
1:A:406:GLN:OE1	1:A:410:ARG:NE	2.41	0.53
1:B:250:MET:O	1:B:254:ILE:HG12	2.08	0.53
1:A:279:ALA:O	1:A:283:LEU:HD23	2.09	0.53
1:B:323:MET:HE2	1:B:327:HIS:CD2	2.45	0.52
1:B:411:LEU:HD12	1:B:420:PHE:HZ	1.74	0.52
1:B:415:GLN:HG2	1:B:431:ILE:HD13	1.90	0.52
1:A:201:GLN:HA	1:A:204:LYS:HD2	1.91	0.52
1:A:352:ASP:CG	1:A:401:ARG:HH22	2.19	0.51
1:A:277:LYS:HD2	2:C:687:HIS:NE2	2.25	0.51
1:A:360:ARG:HA	1:A:360:ARG:HE	1.75	0.51
1:A:283:LEU:HD13	1:A:344:GLN:HB3	1.92	0.50
1:A:271:ASP:O	1:A:274:SER:N	2.44	0.50
1:B:308:LEU:HD21	1:B:324:LEU:HG	1.93	0.50
1:A:410:ARG:HG2	1:A:413:ARG:HH21	1.76	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:157:ALA:HA	1:A:260:VAL:HG21	1.92	0.49
1:B:256:SER:O	1:B:260:VAL:HG22	2.12	0.49
1:B:411:LEU:HD12	1:B:420:PHE:CZ	2.46	0.49
1:A:213:LEU:HB3	1:A:225:TYR:HB3	1.95	0.49
1:B:339:GLU:OE2	1:B:381:ARG:HD2	2.13	0.49
1:A:422:THR:O	1:A:426:GLN:HG3	2.13	0.48
1:B:283:LEU:HD13	1:B:344:GLN:HB3	1.94	0.48
1:B:428:LEU:HD23	2:D:690:LEU:HD11	1.95	0.48
1:A:165:THR:O	1:A:302:GLY:HA3	2.13	0.47
1:B:254:ILE:HD12	1:B:283:LEU:HB3	1.95	0.47
1:B:298:THR:HG22	1:B:307:CYS:CB	2.44	0.47
1:B:318:LEU:HB3	1:B:324:LEU:HD23	1.96	0.47
1:A:342:LEU:HD23	1:A:342:LEU:HA	1.77	0.46
1:A:240:LEU:HA	1:A:240:LEU:HD23	1.58	0.46
1:A:328:TYR:O	1:A:332:LYS:HB2	2.16	0.46
1:B:271:ASP:O	1:B:272:GLN:C	2.58	0.46
1:B:251:PHE:O	1:B:255:ILE:HG13	2.15	0.45
1:B:410:ARG:O	1:B:414:ILE:HG13	2.16	0.45
1:A:343:MET:HB3	1:A:397:LEU:HD21	1.96	0.45
1:B:269:ILE:O	1:B:273:ILE:HG13	2.16	0.45
1:B:202:VAL:HG13	1:B:414:ILE:HG12	1.97	0.45
1:B:381:ARG:HB3	1:B:386:HIS:ND1	2.32	0.45
1:A:235:GLU:HB2	1:B:219:ASP:HB2	1.97	0.45
1:A:396:MET:O	1:A:400:LEU:N	2.30	0.45
1:B:409:GLN:HB3	1:B:413:ARG:NH2	2.33	0.44
1:B:339:GLU:OE1	1:B:381:ARG:NH1	2.50	0.44
1:A:278:GLY:HA3	1:A:353:ARG:HD2	1.98	0.44
1:A:243:MET:HE1	1:A:306:TYR:CE2	2.51	0.44
1:A:154:LEU:HB3	1:A:341:VAL:HG22	1.98	0.44
1:B:162:PHE:CZ	1:B:287:ARG:HB3	2.53	0.44
1:B:321:GLU:OE2	1:B:322:PRO:HD2	2.17	0.44
1:A:165:THR:O	1:A:166:PHE:HB2	2.18	0.43
1:B:343:MET:HE2	1:B:343:MET:HB3	1.73	0.43
1:A:174:LEU:HD11	1:B:177:VAL:HG21	2.00	0.43
1:A:206:LEU:HD11	1:A:236:ILE:HD12	2.01	0.43
1:A:408:THR:O	1:A:412:LEU:HG	2.18	0.43
1:B:396:MET:HB3	1:B:396:MET:HE2	1.76	0.43
1:A:383:GLN:CD	1:A:383:GLN:H	2.26	0.43
1:A:213:LEU:HD12	1:A:214:GLN:H	1.84	0.43
1:B:268:PRO:O	1:B:272:GLN:HG3	2.18	0.43
1:B:360:ARG:HD3	1:B:360:ARG:HA	1.88	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:154:LEU:HB3	1:A:341:VAL:CG2	2.50	0.42
1:A:161:THR:HG21	1:A:257:PHE:HA	2.01	0.42
1:A:239:LEU:HD12	1:A:239:LEU:HA	1.77	0.42
2:D:683:LEU:HD23	2:D:686:ARG:NH1	2.35	0.42
1:A:428:LEU:CD2	2:C:690:LEU:HD11	2.50	0.42
1:A:352:ASP:N	1:A:352:ASP:OD1	2.40	0.41
1:B:161:THR:HG22	1:B:256:SER:HB3	2.03	0.41
1:B:397:LEU:HD23	1:B:397:LEU:HA	1.83	0.41
1:B:426:GLN:HB3	1:B:431:ILE:HB	2.01	0.41
1:A:364:GLN:O	1:A:368:GLN:HG3	2.21	0.41
1:B:335:LEU:HB2	1:B:340:TYR:CE1	2.56	0.41
1:A:428:LEU:HD23	1:A:428:LEU:HA	1.75	0.41
2:D:692:ARG:HH11	2:D:692:ARG:HD3	1.74	0.41
1:A:315:PHE:O	1:A:319:LEU:HG	2.21	0.41
1:A:276:LEU:HD23	1:A:276:LEU:HA	1.91	0.40
1:A:377:ILE:HD13	1:A:389:LEU:HD23	2.02	0.40
1:B:165:THR:O	1:B:302:GLY:HA3	2.21	0.40
1:A:235:GLU:H	1:A:235:GLU:CD	2.30	0.40
1:A:428:LEU:HD23	2:C:690:LEU:HD11	2.04	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	268/434 (62%)	246 (92%)	20 (8%)	2 (1%)	18 53
1	B	271/434 (62%)	247 (91%)	21 (8%)	3 (1%)	11 43
2	C	13/25 (52%)	12 (92%)	1 (8%)	0	100 100
2	D	13/25 (52%)	12 (92%)	1 (8%)	0	100 100
All	All	565/918 (62%)	517 (92%)	43 (8%)	5 (1%)	14 48

All (5) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	233	GLY
1	B	358	GLN
1	B	420	PHE
1	B	233	GLY
1	A	302	GLY

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	243/381 (64%)	243 (100%)	0	100	100
1	B	240/381 (63%)	240 (100%)	0	100	100
2	C	14/24 (58%)	14 (100%)	0	100	100
2	D	15/24 (62%)	15 (100%)	0	100	100
All	All	512/810 (63%)	512 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

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

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

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	276/434 (63%)	0.79	31 (11%) 10 6	13, 33, 78, 115	0
1	B	275/434 (63%)	0.82	30 (10%) 10 6	14, 35, 79, 107	0
2	C	15/25 (60%)	0.92	0 100 100	23, 34, 58, 59	0
2	D	15/25 (60%)	1.19	3 (20%) 3 2	29, 36, 71, 74	0
All	All	581/918 (63%)	0.82	64 (11%) 10 6	13, 34, 76, 115	0

All (64) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	314	GLY	6.1
1	A	208	SER	4.5
1	B	194	GLU	4.3
1	A	318	LEU	4.2
1	B	318	LEU	4.2
1	B	314	GLY	4.1
1	B	313	GLY	4.0
1	B	233	GLY	3.9
1	A	315	PHE	3.9
1	A	236	ILE	3.8
1	A	319	LEU	3.5
1	A	313	GLY	3.5
1	A	196	ALA	3.2
1	B	207	CYS	3.2
1	B	407	HIS	3.1
1	A	311	THR	3.1
2	D	683	LEU	3.1
1	B	315	PHE	3.1
1	B	384	PRO	3.0
1	A	199	TRP	2.9
1	B	385	ALA	2.9

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Mol	Chain	Res	Type	RSRZ
1	A	320	LEU	2.9
2	D	682	SER	2.9
1	A	407	HIS	2.8
1	B	234	LYS	2.8
1	A	230	ASP	2.7
1	B	312	ALA	2.7
1	A	142	GLY	2.6
1	B	316	GLN	2.6
1	B	229	ALA	2.6
1	B	319	LEU	2.6
1	A	177	VAL	2.6
1	B	197	ALA	2.6
1	B	142	GLY	2.5
1	A	195	GLU	2.5
1	A	359	HIS	2.5
1	A	176	GLY	2.5
1	A	234	LYS	2.5
1	A	210	LYS	2.5
1	A	364	GLN	2.5
1	B	270	GLU	2.4
1	B	198	LYS	2.4
1	A	207	CYS	2.4
1	B	269	ILE	2.4
1	A	194	GLU	2.4
1	A	312	ALA	2.3
1	A	233	GLY	2.3
1	B	235	GLU	2.2
1	B	359	HIS	2.2
1	B	431	ILE	2.2
1	B	320	LEU	2.2
1	B	237	PHE	2.2
1	B	236	ILE	2.2
1	A	317	GLN	2.2
1	A	316	GLN	2.2
1	B	206	LEU	2.2
1	B	311	THR	2.1
1	A	367	GLU	2.1
1	A	324	LEU	2.1
1	A	197	ALA	2.1
1	B	193	ARG	2.1
1	A	406	GLN	2.0
2	D	684	THR	2.0

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Mol	Chain	Res	Type	RSRZ
1	B	202	VAL	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)

There are no ligands in this entry.

6.5 Other polymers (i)

There are no such residues in this entry.