



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 10:37 AM UTC

PDB ID : 7RY0 / pdb_00007ry0
Title : human Hsp90_MC domain structure
Authors : Peng, S.; Deng, J.; Matts, R.
Deposited on : 2021-08-24
Resolution : 2.20 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

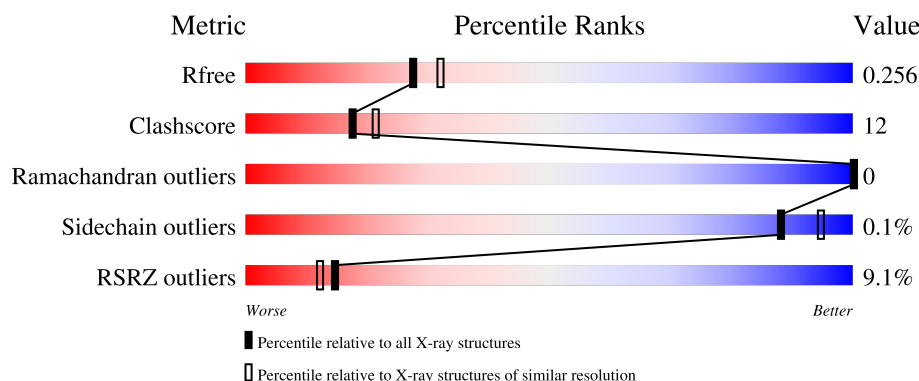
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 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	6164 (2.20-2.20)
Clashscore	190562	6851 (2.20-2.20)
Ramachandran outliers	187476	6768 (2.20-2.20)
Sidechain outliers	187428	6769 (2.20-2.20)
RSRZ outliers	180081	6166 (2.20-2.20)

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 $\leq 5\%$. 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	425	12% 65% 25% 9%
1	B	425	5% 76% 15% 10%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	DMS	A	802	-	-	X	-

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 6474 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 Heat shock protein HSP 90-alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	385	Total	C	N	O	S	139	0	0
			3165	2011	536	602	16			
1	B	383	Total	C	N	O	S	63	0	0
			3147	1996	532	603	16			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	290	GLY	-	expression tag	UNP P07900
A	291	HIS	-	expression tag	UNP P07900
A	292	MET	-	expression tag	UNP P07900
A	320	ALA	TRP	engineered mutation	UNP P07900
B	290	GLY	-	expression tag	UNP P07900
B	291	HIS	-	expression tag	UNP P07900
B	292	MET	-	expression tag	UNP P07900
B	320	ALA	TRP	engineered mutation	UNP P07900

- Molecule 2 is DIMETHYL SULFOXIDE (CCD ID: DMS) (formula: C₂H₆OS).



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

- Molecule 3 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	B	1	Total	C	O	0	0
			6	3	3		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	B	1	Total	C	O	0	0
			6	3	3		

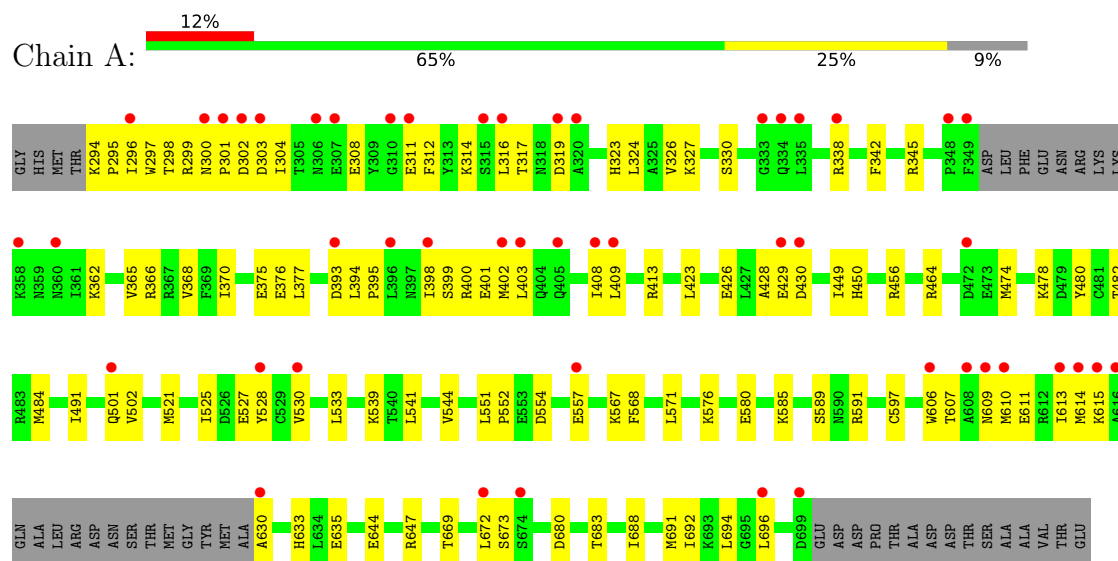
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	49	Total	O	0	0
			49	49		
4	B	89	Total	O	0	0
			89	89		

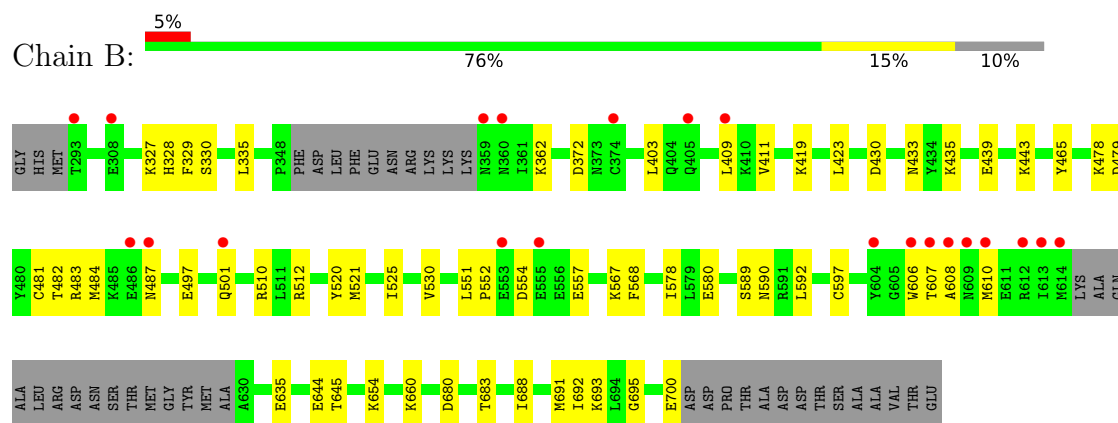
3 Residue-property plots

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: Heat shock protein HSP 90-alpha



• Molecule 1: Heat shock protein HSP 90-alpha



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	38.90Å 154.26Å 156.75Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.49 – 2.20 49.49 – 2.20	Depositor EDS
% Data completeness (in resolution range)	99.7 (49.49-2.20) 94.0 (49.49-2.20)	Depositor EDS
R_{merge}	0.11	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.96 (at 2.18Å)	Xtriage
Refinement program	PHENIX 1.10.1_2155	Depositor
R, R_{free}	0.205 , 0.254 0.214 , 0.256	Depositor DCC
R_{free} test set	2003 reflections (4.04%)	wwPDB-VP
Wilson B-factor (Å ²)	38.1	Xtriage
Anisotropy	0.595	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 59.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	0.000 for -h,l,k	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	6474	wwPDB-VP
Average B, all atoms (Å ²)	58.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 63.26 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 9.9276e-06. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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	0.42	0/3215	0.75	3/4315 (0.1%)
1	B	0.44	0/3196	0.68	1/4292 (0.0%)
All	All	0.43	0/6411	0.72	4/8607 (0.0%)

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	580	GLU	CB-CA-C	-6.27	109.35	116.63
1	A	580	GLU	N-CA-C	6.24	118.62	108.08
1	B	580	GLU	CB-CA-C	-5.72	110.00	116.63
1	A	303	ASP	N-CA-CB	-5.05	101.96	110.49

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3165	0	3217	104	0
1	B	3147	0	3189	53	0
2	A	8	0	12	11	0
2	B	4	0	6	0	0
3	B	12	0	16	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	49	0	0	0	0
4	B	89	0	0	2	0
All	All	6474	0	6440	153	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 (153) 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:426:GLU:O	1:A:429:GLU:HG2	1.44	1.17
1:B:403:LEU:HD22	1:B:409:LEU:HD22	1.27	1.14
1:A:606:TRP:HE3	1:A:610:MET:HG3	1.14	1.07
1:A:606:TRP:CE3	1:A:610:MET:HG3	1.93	1.03
1:A:298:THR:HA	1:A:338:ARG:HH12	1.24	0.97
1:A:375:GLU:OE1	1:A:400:ARG:NH2	1.97	0.96
1:A:521:MET:SD	1:A:530:VAL:HG11	2.07	0.93
1:A:484:MET:HE1	1:A:539:LYS:HD3	1.53	0.91
1:A:398:ILE:HD13	1:A:403:LEU:HD13	1.60	0.84
1:A:297:TRP:O	1:A:338:ARG:NH2	2.10	0.84
1:A:298:THR:HA	1:A:338:ARG:NH1	1.92	0.83
1:B:589:SER:HB2	1:B:635:GLU:HB3	1.61	0.83
1:B:403:LEU:CD2	1:B:409:LEU:HD22	2.08	0.82
1:B:403:LEU:O	1:B:409:LEU:HD23	1.79	0.82
1:A:585:LYS:HG2	1:A:633:HIS:ND1	1.95	0.80
1:A:669:THR:O	1:A:672:LEU:HG	1.82	0.79
1:B:443:LYS:CD	1:B:525:ILE:HG21	2.14	0.77
1:A:585:LYS:CG	1:A:633:HIS:ND1	2.48	0.76
1:A:521:MET:SD	1:A:530:VAL:CG1	2.76	0.74
1:A:589:SER:HB2	1:A:635:GLU:HB3	1.70	0.73
1:A:399:SER:OG	1:A:402:MET:HB2	1.88	0.72
1:A:606:TRP:CE3	1:A:610:MET:CG	2.73	0.71
1:B:403:LEU:HD22	1:B:409:LEU:CD2	2.16	0.71
1:A:299:ARG:O	1:A:300:ASN:C	2.31	0.69
1:A:375:GLU:CD	1:A:400:ARG:HH22	1.99	0.69
1:A:398:ILE:CD1	1:A:403:LEU:HD13	2.22	0.68
2:A:802:DMS:C2	1:B:691:MET:HB3	2.23	0.68
1:B:335:LEU:HD12	1:B:411:VAL:HG11	1.76	0.68
1:A:491:ILE:HB	1:A:541:LEU:HD23	1.77	0.67
1:A:295:PRO:O	1:A:298:THR:OG1	2.10	0.67
1:A:484:MET:CE	1:A:539:LYS:HD3	2.24	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:428:ALA:C	1:A:430:ASP:H	2.01	0.66
1:A:449:ILE:O	1:A:456:ARG:NH2	2.28	0.66
1:B:693:LYS:HE2	1:B:700:GLU:HG2	1.77	0.66
1:A:299:ARG:C	1:A:300:ASN:O	2.39	0.65
1:A:401:GLU:C	1:A:403:LEU:H	2.06	0.63
1:A:365:VAL:O	1:A:368:VAL:HG22	1.99	0.63
1:B:443:LYS:HD2	1:B:525:ILE:HG21	1.80	0.63
1:B:512:ARG:NH2	1:B:520:TYR:OH	2.32	0.62
1:A:567:LYS:NZ	1:A:644:GLU:OE1	2.21	0.61
1:A:606:TRP:CZ3	1:A:614:MET:SD	2.93	0.61
1:B:443:LYS:HD3	1:B:525:ILE:HG21	1.82	0.61
1:A:606:TRP:HE3	1:A:610:MET:CG	2.01	0.60
1:A:691:MET:HB3	2:A:802:DMS:H13	1.83	0.60
2:A:802:DMS:H22	1:B:691:MET:HB3	1.82	0.59
1:A:302:ASP:O	1:A:304:ILE:HG13	2.02	0.59
1:A:323:HIS:CD2	1:A:326:VAL:HG23	2.37	0.59
1:A:299:ARG:O	1:A:300:ASN:O	2.21	0.58
1:A:304:ILE:HG23	1:A:308:GLU:HG3	1.86	0.58
1:B:680:ASP:OD2	1:B:683:THR:OG1	2.11	0.56
1:A:533:LEU:O	1:A:541:LEU:HD12	2.06	0.56
1:A:614:MET:HG3	1:A:615:LYS:H	1.72	0.55
1:A:376:GLU:O	1:A:413:ARG:HD2	2.07	0.55
1:A:606:TRP:HZ3	1:A:610:MET:SD	2.29	0.55
1:A:365:VAL:HG12	1:A:366:ARG:HG3	1.88	0.55
1:A:585:LYS:HD3	1:A:633:HIS:CE1	2.42	0.54
1:A:376:GLU:HB3	1:A:409:LEU:HD21	1.89	0.54
1:A:680:ASP:OD2	1:A:683:THR:OG1	2.17	0.54
1:B:403:LEU:O	1:B:409:LEU:CD2	2.55	0.54
1:B:443:LYS:HD3	4:B:902:HOH:O	2.08	0.53
1:A:393:ASP:O	1:A:408:ILE:HD13	2.09	0.53
1:A:294:LYS:HB3	1:A:298:THR:OG1	2.09	0.53
1:A:428:ALA:C	1:A:430:ASP:N	2.64	0.53
1:A:692:ILE:HG13	2:A:802:DMS:H12	1.90	0.53
1:A:295:PRO:HG2	1:A:298:THR:HG23	1.91	0.53
1:A:501:GLN:HG3	1:A:502:VAL:N	2.22	0.53
1:B:567:LYS:NZ	1:B:644:GLU:OE2	2.33	0.53
1:A:394:LEU:HD12	1:A:395:PRO:HD2	1.90	0.52
1:A:607:THR:HG22	1:A:609:ASN:N	2.24	0.52
1:A:527:GLU:HG2	1:A:610:MET:HE2	1.91	0.52
1:A:567:LYS:HE2	1:A:568:PHE:CE2	2.44	0.52
1:A:567:LYS:HE2	1:A:568:PHE:CZ	2.45	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:487:ASN:O	1:B:552:PRO:HB3	2.10	0.51
1:B:578:ILE:HG23	1:B:660:LYS:HG3	1.91	0.51
1:A:607:THR:HG22	1:A:609:ASN:H	1.76	0.50
1:A:606:TRP:CH2	1:A:614:MET:SD	3.05	0.50
1:B:497:GLU:HB2	1:B:501:GLN:OE1	2.11	0.50
1:A:327:LYS:HB2	1:A:423:LEU:HD22	1.94	0.50
1:A:326:VAL:HG22	1:A:342:PHE:CD2	2.47	0.49
2:A:802:DMS:H21	1:B:688:ILE:HG23	1.95	0.49
1:A:478:LYS:O	1:A:482:THR:HG23	2.13	0.49
1:A:611:GLU:O	1:A:611:GLU:HG2	2.11	0.48
1:B:362:LYS:NZ	1:B:372:ASP:OD2	2.45	0.48
1:A:691:MET:HB3	2:A:802:DMS:C1	2.44	0.48
1:A:672:LEU:C	1:A:672:LEU:HD12	2.39	0.48
1:B:607:THR:HG22	1:B:608:ALA:N	2.28	0.48
1:A:301:PRO:O	1:A:302:ASP:CG	2.57	0.47
1:A:576:LYS:HG2	2:A:801:DMS:H22	1.95	0.47
1:B:478:LYS:O	1:B:482:THR:HG23	2.14	0.47
1:B:329:PHE:CE2	1:B:419:LYS:HG3	2.49	0.47
1:A:296:ILE:HG21	1:A:312:PHE:CG	2.49	0.47
1:A:394:LEU:CD1	1:A:395:PRO:HD2	2.45	0.47
1:A:394:LEU:HD12	1:A:395:PRO:CD	2.45	0.47
1:B:481:CYS:HA	1:B:484:MET:HG3	1.97	0.47
1:A:317:THR:C	1:A:319:ASP:H	2.24	0.46
1:A:585:LYS:HG3	1:A:633:HIS:ND1	2.30	0.46
1:A:401:GLU:C	1:A:403:LEU:N	2.69	0.46
1:A:311:GLU:HA	1:A:314:LYS:HB2	1.98	0.46
1:A:691:MET:HE3	1:B:695:GLY:HA3	1.98	0.46
1:A:480:TYR:CE1	1:A:491:ILE:HG23	2.51	0.45
2:A:802:DMS:O	1:B:691:MET:HG3	2.16	0.45
1:B:567:LYS:HE2	1:B:568:PHE:CZ	2.52	0.45
1:A:525:ILE:HD12	1:A:528:TYR:HD2	1.81	0.45
1:A:464:ARG:HB3	1:A:474:MET:HB3	1.98	0.45
1:A:551:LEU:HB3	1:A:552:PRO:HD2	1.99	0.45
1:B:551:LEU:HB3	1:B:552:PRO:HD2	1.99	0.45
1:A:324:LEU:HB2	1:A:345:ARG:HG2	1.98	0.44
1:B:435:LYS:O	1:B:439:GLU:HG3	2.17	0.44
1:A:692:ILE:O	1:A:696:LEU:HD12	2.18	0.44
1:B:606:TRP:CD1	1:B:610:MET:SD	3.10	0.44
1:A:450:HIS:CD2	1:A:528:TYR:CE1	3.05	0.44
1:A:688:ILE:O	2:A:802:DMS:H13	2.17	0.44
1:B:592:LEU:HD11	1:B:597:CYS:C	2.42	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:544:VAL:O	1:A:591:ARG:NH1	2.49	0.44
1:A:672:LEU:HD12	1:A:673:SER:N	2.33	0.44
1:B:328:HIS:N	3:B:803:GOL:O2	2.48	0.44
1:A:304:ILE:CG2	1:A:308:GLU:HG3	2.47	0.43
1:A:376:GLU:HB3	1:A:409:LEU:CD2	2.48	0.43
1:A:554:ASP:OD2	1:A:557:GLU:CD	2.61	0.43
1:A:295:PRO:HG2	1:A:298:THR:CG2	2.48	0.43
1:A:316:LEU:HD11	1:A:362:LYS:HD2	2.00	0.43
1:A:376:GLU:HB2	1:A:409:LEU:HD11	2.01	0.43
1:B:330:SER:HB3	3:B:802:GOL:H2	2.00	0.43
1:B:479:ASP:OD1	1:B:483:ARG:NH1	2.52	0.43
1:A:571:LEU:HD22	1:A:647:ARG:HB2	2.01	0.43
1:B:567:LYS:HE2	1:B:568:PHE:CE2	2.54	0.42
1:A:609:ASN:HD21	1:A:613:ILE:HD11	1.84	0.42
1:B:329:PHE:CZ	1:B:419:LYS:HG3	2.53	0.42
1:A:614:MET:HG3	1:A:615:LYS:N	2.34	0.42
1:A:688:ILE:HD12	1:B:688:ILE:HD12	2.02	0.42
1:A:585:LYS:HG2	1:A:633:HIS:CE1	2.55	0.42
1:A:606:TRP:HB2	1:A:630:ALA:HB2	2.01	0.42
1:B:430:ASP:OD2	1:B:433:ASN:ND2	2.53	0.42
2:A:802:DMS:C2	1:B:688:ILE:HA	2.50	0.42
1:B:510:ARG:NH1	1:B:590:ASN:O	2.51	0.41
1:A:377:LEU:HD12	1:A:377:LEU:HA	1.87	0.41
1:A:527:GLU:CG	1:A:610:MET:HE2	2.50	0.41
1:B:512:ARG:NH1	4:B:908:HOH:O	2.54	0.41
1:A:330:SER:OG	1:A:338:ARG:HD2	2.20	0.41
1:A:691:MET:HE2	1:B:692:ILE:HA	2.03	0.41
1:B:554:ASP:HB3	1:B:557:GLU:HB2	2.02	0.41
1:A:606:TRP:CZ3	1:A:610:MET:CG	3.04	0.41
1:B:465:TYR:CE1	1:B:521:MET:HG2	2.56	0.41
1:B:592:LEU:HD11	1:B:597:CYS:CA	2.51	0.41
1:A:330:SER:OG	1:A:338:ARG:CD	2.69	0.41
1:A:696:LEU:HD23	1:B:645:THR:HG21	2.03	0.40
2:A:802:DMS:H22	1:B:688:ILE:O	2.20	0.40
1:A:365:VAL:HG23	1:A:370:ILE:HG13	2.03	0.40
1:A:597:CYS:HA	1:A:635:GLU:O	2.20	0.40
1:B:327:LYS:HB2	1:B:423:LEU:HD22	2.03	0.40
1:B:521:MET:SD	1:B:530:VAL:CG1	3.10	0.40
1:B:403:LEU:HD23	1:B:403:LEU:HA	1.94	0.40
1:B:654:LYS:H	1:B:654:LYS:HG2	1.64	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	379/425 (89%)	365 (96%)	14 (4%)	0	100	100
1	B	377/425 (89%)	372 (99%)	5 (1%)	0	100	100
All	All	756/850 (89%)	737 (98%)	19 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	357/390 (92%)	356 (100%)	1 (0%)	86	93
1	B	356/390 (91%)	356 (100%)	0	100	100
All	All	713/780 (91%)	712 (100%)	1 (0%)	88	95

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	694	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	306	ASN
1	A	609	ASN

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Mol	Chain	Res	Type
1	A	648	GLN
1	A	686	ASN
1	B	433	ASN
1	B	488	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

5 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	$\# Z > 2$
2	DMS	A	801	-	3,3,3	0.69	0	3,3,3	0.69	0
3	GOL	B	803	-	5,5,5	0.50	0	5,5,5	0.16	0
3	GOL	B	802	-	5,5,5	0.41	0	5,5,5	0.57	0
2	DMS	A	802	-	3,3,3	0.45	0	3,3,3	1.81	1 (33%)
2	DMS	B	801	-	3,3,3	0.67	0	3,3,3	0.53	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
3	GOL	B	803	-	-	0/4/4/4	-
3	GOL	B	802	-	-	4/4/4/4	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	802	DMS	O-S-C2	2.59	119.45	106.49

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	802	GOL	C1-C2-C3-O3
3	B	802	GOL	O1-C1-C2-O2
3	B	802	GOL	O1-C1-C2-C3
3	B	802	GOL	O2-C2-C3-O3

There are no ring outliers.

4 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	801	DMS	1	0
3	B	803	GOL	1	0
3	B	802	GOL	1	0
2	A	802	DMS	10	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	385/425 (90%)	0.71	49 (12%) 8 6	29, 55, 98, 126	47 (12%)
1	B	383/425 (90%)	0.38	21 (5%) 30 27	28, 48, 80, 126	23 (6%)
All	All	768/850 (90%)	0.54	70 (9%) 15 12	28, 51, 91, 126	70 (9%)

All (70) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	609	ASN	5.3
1	B	606	TRP	5.0
1	A	614	MET	4.7
1	A	606	TRP	4.3
1	A	613	ILE	4.3
1	A	610	MET	4.2
1	B	614	MET	4.2
1	B	610	MET	3.8
1	A	699	ASP	3.7
1	B	553	GLU	3.7
1	B	608	ALA	3.7
1	A	301	PRO	3.7
1	B	487	ASN	3.7
1	A	408	ILE	3.6
1	A	608	ALA	3.5
1	A	360	ASN	3.5
1	B	613	ILE	3.5
1	A	303	ASP	3.4
1	A	672	LEU	3.3
1	A	306	ASN	3.1
1	A	320	ALA	3.1
1	B	486	GLU	3.1
1	A	393	ASP	3.1
1	A	335	LEU	3.1

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Mol	Chain	Res	Type	RSRZ
1	B	501	GLN	3.0
1	A	616	ALA	3.0
1	A	349	PHE	2.9
1	A	398	ILE	2.9
1	A	302	ASP	2.9
1	A	409	LEU	2.7
1	A	528	TYR	2.7
1	B	359	ASN	2.7
1	A	311	GLU	2.7
1	B	607	THR	2.7
1	A	358	LYS	2.6
1	A	530	VAL	2.6
1	A	310	GLY	2.6
1	A	296	ILE	2.6
1	A	674	SER	2.6
1	A	405	GLN	2.6
1	A	396	LEU	2.6
1	B	612	ARG	2.6
1	A	609	ASN	2.6
1	A	300	ASN	2.5
1	A	403	LEU	2.5
1	A	402	MET	2.5
1	A	430	ASP	2.5
1	A	429	GLU	2.5
1	A	615	LYS	2.5
1	B	405	GLN	2.5
1	A	348	PRO	2.4
1	B	555	GLU	2.4
1	B	360	ASN	2.4
1	A	338	ARG	2.3
1	B	374	CYS	2.3
1	A	472	ASP	2.3
1	A	316	LEU	2.3
1	B	293	THR	2.3
1	A	501	GLN	2.3
1	B	409	LEU	2.2
1	A	319	ASP	2.2
1	B	308	GLU	2.2
1	A	333	GLY	2.1
1	B	604	TYR	2.1
1	A	334	GLN	2.1
1	A	315	SER	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	307	GLU	2.1
1	A	696	LEU	2.1
1	A	557	GLU	2.0
1	A	630	ALA	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	GOL	B	803	6/6	0.82	0.17	60,69,73,79	0
3	GOL	B	802	6/6	0.87	0.17	77,80,81,85	0
2	DMS	B	801	4/4	0.88	0.20	97,97,101,102	0
2	DMS	A	801	4/4	0.89	0.19	71,75,76,80	0
2	DMS	A	802	4/4	0.93	0.23	98,99,102,106	0

6.5 Other polymers [i](#)

There are no such residues in this entry.