



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 8, 2024 – 01:01 am GMT

PDB ID : 6H8Q  
Title : Structural basis for Scc3-dependent cohesin recruitment to chromatin  
Authors : Li, Y.; Muir, K.; Panne, D.  
Deposited on : 2018-08-03  
Resolution : 3.63 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](mailto: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>.

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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 : 2.36  
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) : 2.36

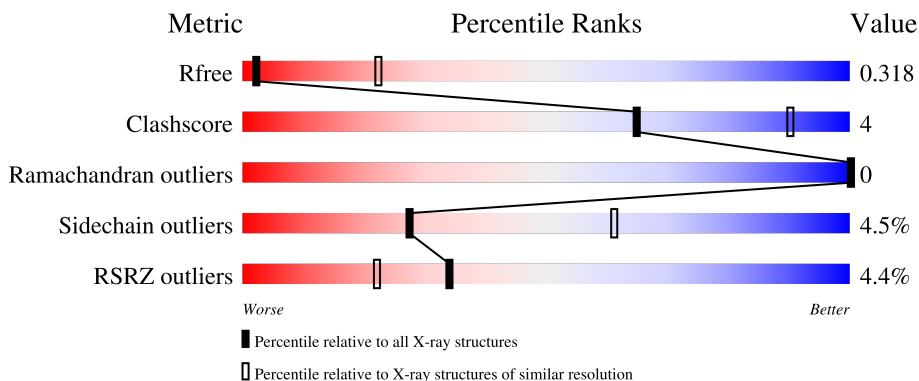
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.63 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	1341 (3.78-3.50)
Clashscore	141614	1439 (3.78-3.50)
Ramachandran outliers	138981	1391 (3.78-3.50)
Sidechain outliers	138945	1391 (3.78-3.50)
RSRZ outliers	127900	1242 (3.78-3.50)

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  $\geq 3$ , 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	1150	
1	B	1150	
2	G	100	
2	H	100	
3	E	19	

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Mol	Chain	Length	Quality of chain
4	F	19	 89% 11%
5	C	19	 42% 58%
6	D	19	 79% 21%

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 16363 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 Cohesin subunit SCC3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	879	Total 7182	C 4657	N 1161	O 1340	S 24	0	0	0
1	B	873	Total 7149	C 4639	N 1156	O 1330	S 24	0	0	0

- Molecule 2 is a protein called Sister chromatid cohesion protein 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	G	30	Total 248	C 162	N 38	O 47	S 1	0	0	0
2	H	27	Total 226	C 149	N 34	O 42	S 1	0	0	0

- Molecule 3 is a DNA chain called DNA (5'-D(P\*CP\*TP\*TP\*TP\*CP\*GP\*TP\*TP\*TP\*CP\*CP\*TP\*TP\*GP\*AP\*AP\*AP\*AP\*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
3	E	19	Total 393	C 187	N 77	O 110	P 19	0	0	0

- Molecule 4 is a DNA chain called DNA (5'-D(P\*CP\*TP\*TP\*TP\*TP\*CP\*GP\*TP\*TP\*TP\*CP\*CP\*TP\*TP\*GP\*AP\*AP\*AP\*AP\*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
4	F	19	Total 386	C 186	N 63	O 118	P 19	0	0	0

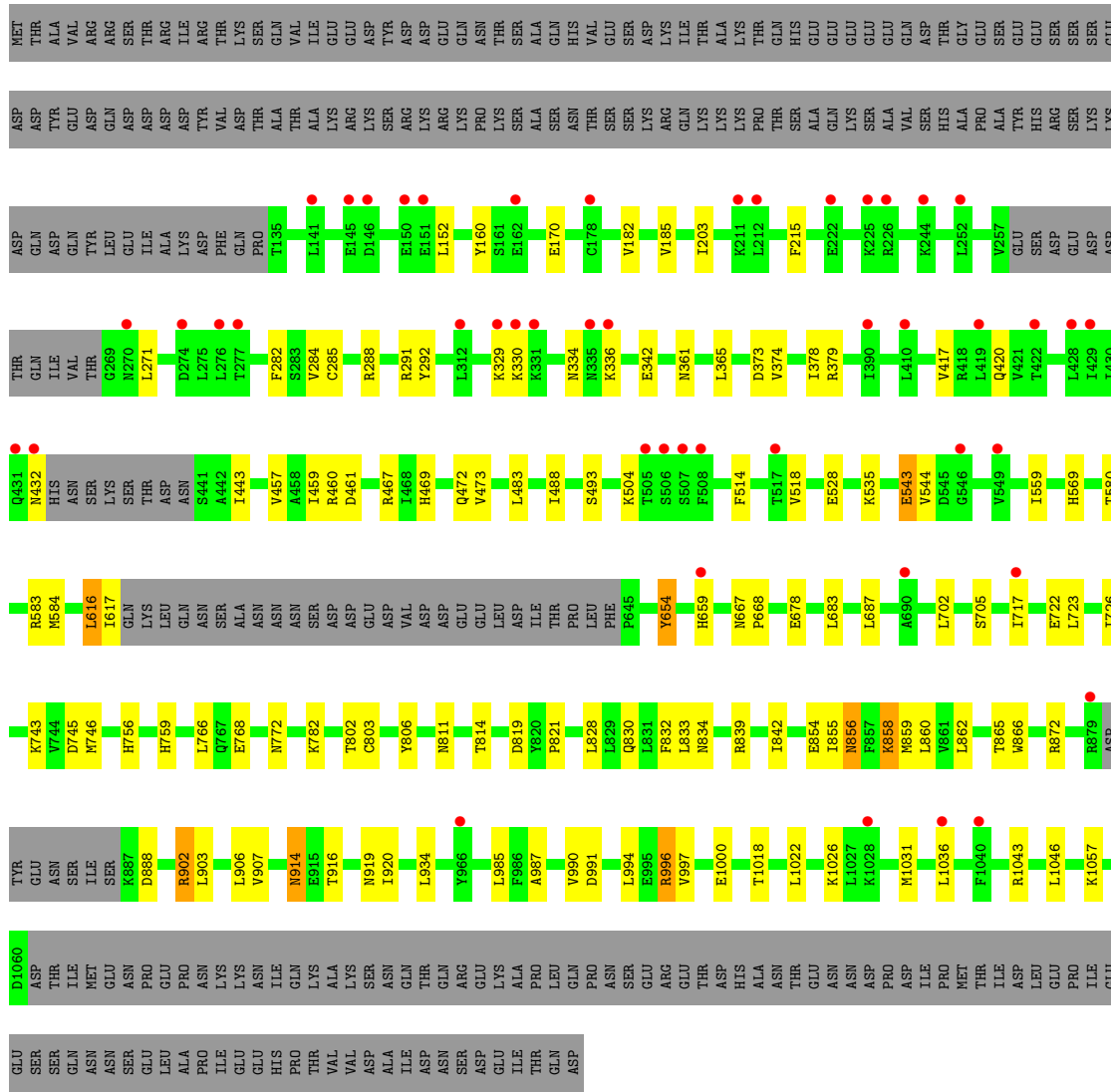
- Molecule 5 is a DNA chain called DNA (5'-D(P\*TP\*TP\*TP\*TP\*TP\*CP\*AP\*AP\*GP\*GP\*AP\*AP\*AP\*CP\*GP\*AP\*AP\*AP\*G)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
5	C	19	394	188	76	111	19	0	0	0

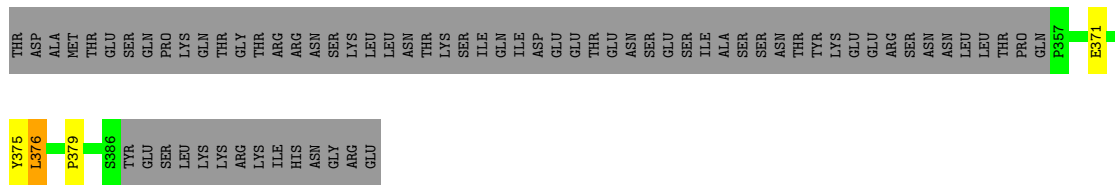
- Molecule 6 is a DNA chain called DNA (5'-D(P\*CP\*TP\*TP\*TP\*CP\*GP\*TP\*TP\*TP\*CP\*CP\*TP\*TP\*GP\*AP\*AP\*AP\*AP\*A)-3').

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	P			
6	D	19	385	186	63	117	19	0	0	0

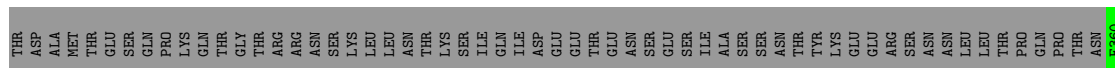


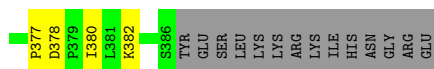


● Molecule 2: Sister chromatid cohesion protein 1



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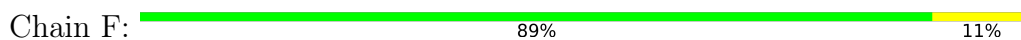




- Molecule 3: DNA (5'-D(P\*CP\*TP\*TP\*TP\*CP\*GP\*TP\*TP\*TP\*CP\*CP\*TP\*TP\*GP\*AP\*A P\*AP\*AP\*A)-3')



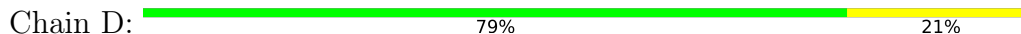
- Molecule 4: DNA (5'-D(P\*CP\*TP\*TP\*TP\*CP\*GP\*TP\*TP\*TP\*CP\*CP\*TP\*TP\*GP\*AP\*A P\*AP\*AP\*A)-3')



- Molecule 5: DNA (5'-D(P\*TP\*TP\*TP\*TP\*TP\*CP\*AP\*AP\*GP\*GP\*AP\*AP\*AP\*CP\*GP\*A P\*AP\*AP\*G)-3')



- Molecule 6: DNA (5'-D(P\*CP\*TP\*TP\*TP\*CP\*GP\*TP\*TP\*TP\*CP\*CP\*TP\*TP\*GP\*AP\*A P\*AP\*AP\*A)-3')





## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	296.24Å 110.02Å 115.16Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 3.63 148.12 – 3.63	Depositor EDS
% Data completeness (in resolution range)	48.3 (50.00-3.63) 48.4 (148.12-3.63)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.62 (at 3.67Å)	Xtrriage
Refinement program	PHENIX (1.13_2998: ???)	Depositor
R, $R_{free}$	0.283 , 0.319 0.288 , 0.318	Depositor DCC
$R_{free}$ test set	1094 reflections (5.22%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	173.1	Xtrriage
Anisotropy	0.210	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.28 , 155.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.43$ , $\langle L^2 \rangle = 0.26$	Xtrriage
Estimated twinning fraction	0.025 for -h,l,k	Xtrriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	16363	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	214.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 11.81% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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](#)

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	0.24	0/7316	0.38	0/9882
1	B	0.24	0/7283	0.38	0/9835
2	G	0.24	0/255	0.44	0/346
2	H	0.24	0/232	0.38	0/314
3	E	0.49	0/442	0.89	0/680
4	F	0.48	0/430	0.99	0/661
5	C	0.47	0/443	0.90	0/682
6	D	0.49	0/429	0.98	0/659
All	All	0.27	0/16830	0.48	0/23059

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 [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	7182	0	7295	53	0
1	B	7149	0	7288	59	0
2	G	248	0	248	1	0
2	H	226	0	227	3	0
3	E	393	0	214	5	0
4	F	386	0	218	1	0
5	C	394	0	215	10	0
6	D	385	0	218	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
All	All	16363	0	15923	131	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 (131) 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:834:ASN:OD1	1:A:902:ARG:NH2	2.22	0.71
1:A:493:SER:HB2	1:A:569:HIS:HB2	1.80	0.62
1:B:768:GLU:O	1:B:772:ASN:ND2	2.30	0.61
1:B:756:HIS:NE2	2:H:378:ASP:OD2	2.30	0.61
1:B:865:THR:HB	2:H:380:ILE:HG21	1.83	0.59
1:B:782:LYS:HB2	1:B:828:LEU:HD12	1.84	0.58
6:D:17:DA:H2''	6:D:18:DA:C8	2.37	0.58
1:B:834:ASN:OD1	1:B:902:ARG:NH2	2.24	0.58
1:B:806:TYR:HE1	1:B:858:LYS:HZ3	1.50	0.57
1:B:493:SER:HB2	1:B:569:HIS:HB2	1.86	0.57
1:B:543:GLU:OE1	1:B:544:VAL:N	2.34	0.57
1:A:782:LYS:HB2	1:A:828:LEU:HD12	1.87	0.56
1:A:461:ASP:O	1:A:467:ARG:NH2	2.40	0.55
1:A:833:LEU:HB3	1:A:902:ARG:HG2	1.88	0.55
1:A:379:ARG:HD2	1:A:417:VAL:HG21	1.88	0.55
1:B:292:TYR:HD1	1:B:378:ILE:HG12	1.72	0.55
1:B:987:ALA:HA	1:B:990:VAL:HG22	1.90	0.54
1:A:888:ASP:O	1:A:892:VAL:N	2.39	0.53
1:B:916:THR:OG1	1:B:919:ASN:OD1	2.26	0.53
1:A:373:ASP:OD1	1:A:374:VAL:N	2.41	0.53
1:A:916:THR:OG1	1:A:919:ASN:OD1	2.25	0.53
1:A:987:ALA:HA	1:A:990:VAL:HG22	1.90	0.53
1:B:379:ARG:HD2	1:B:417:VAL:HG21	1.90	0.52
3:E:9:DG:H2''	3:E:10:DA:C8	2.45	0.52
1:A:935:MET:HG2	1:A:1030:LEU:HD11	1.93	0.51
1:B:373:ASP:OD1	1:B:374:VAL:N	2.43	0.51
5:C:16:DA:H2''	5:C:17:DA:C8	2.45	0.51
1:A:459:ILE:HG22	1:A:460:ARG:HG3	1.93	0.51
1:B:833:LEU:HB3	1:B:902:ARG:HG2	1.93	0.51
1:B:373:ASP:O	1:B:379:ARG:NH2	2.43	0.51
6:D:18:DA:H2''	6:D:19:DA:C8	2.46	0.51
1:A:224:LYS:HG3	1:A:231:MET:H	1.76	0.51
1:A:889:LEU:HD22	1:A:889:LEU:H	1.76	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:457:VAL:O	1:A:461:ASP:HB2	2.11	0.50
5:C:7:DA:H2''	5:C:8:DA:C8	2.47	0.50
1:A:292:TYR:HD1	1:A:378:ILE:HG12	1.75	0.50
1:A:921:ASN:ND2	1:A:1009:GLU:O	2.44	0.50
1:B:461:ASP:O	1:B:467:ARG:NH2	2.45	0.49
1:B:1043:ARG:HD2	1:B:1046:LEU:HD12	1.94	0.49
1:B:903:LEU:HB3	1:B:934:LEU:HG	1.94	0.49
1:B:459:ILE:HG22	1:B:460:ARG:HG3	1.94	0.49
1:A:154:ARG:HG3	1:A:252:LEU:HD11	1.95	0.49
1:A:806:TYR:O	1:A:811:ASN:ND2	2.35	0.49
5:C:12:DA:H2''	5:C:13:DA:C8	2.46	0.49
1:A:768:GLU:O	1:A:772:ASN:ND2	2.26	0.48
3:E:6:DA:H2''	3:E:7:DA:C8	2.48	0.48
3:E:15:DA:H2''	3:E:16:DA:C8	2.49	0.48
1:A:830:GLN:O	1:A:834:ASN:HB2	2.14	0.48
1:A:329:LYS:HA	1:A:330:LYS:HA	1.65	0.47
1:B:759:HIS:CG	1:B:819:ASP:HB3	2.49	0.47
1:B:997:VAL:HG13	1:B:1000:GLU:HB2	1.96	0.47
3:E:5:DC:H2''	3:E:6:DA:C8	2.48	0.47
1:A:407:GLY:O	1:A:453:LYS:NZ	2.41	0.47
1:B:830:GLN:O	1:B:834:ASN:HB2	2.15	0.47
1:A:759:HIS:CG	1:A:819:ASP:HB3	2.50	0.47
1:A:514:PHE:O	1:A:518:VAL:HG23	2.15	0.47
1:B:802:THR:HG21	1:B:855:ILE:HD11	1.97	0.47
1:B:862:LEU:HD22	2:H:377:PRO:HD3	1.96	0.47
3:E:5:DC:H2''	3:E:6:DA:H8	1.80	0.46
1:A:999:ASP:OD1	1:A:999:ASP:N	2.48	0.46
1:A:745:ASP:OD1	1:A:746:MET:N	2.47	0.46
5:C:10:DG:H2''	5:C:11:DA:C8	2.50	0.46
1:B:514:PHE:O	1:B:518:VAL:HG23	2.16	0.46
1:B:457:VAL:O	1:B:461:ASP:HB2	2.16	0.46
1:B:914:ASN:N	1:B:914:ASN:OD1	2.47	0.46
1:B:285:CYS:O	1:B:291:ARG:NH1	2.49	0.46
1:B:483:LEU:HD23	1:B:488:ILE:HG12	1.98	0.45
1:B:745:ASP:OD1	1:B:746:MET:N	2.50	0.45
5:C:6:DC:H2''	5:C:7:DA:H8	1.80	0.45
5:C:6:DC:H2''	5:C:7:DA:C8	2.51	0.45
1:B:667:ASN:HB2	1:B:668:PRO:HD3	1.97	0.45
1:A:917:PHE:CE1	1:A:1008:PRO:HB3	2.52	0.45
1:A:1043:ARG:HD2	1:A:1046:LEU:HD12	1.98	0.45
1:B:329:LYS:HA	1:B:330:LYS:HA	1.62	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:545:ASP:N	1:A:545:ASP:OD1	2.49	0.45
1:A:655:LEU:O	1:A:659:HIS:ND1	2.29	0.45
1:A:821:PRO:HA	1:A:866:TRP:CE2	2.52	0.45
1:B:994:LEU:O	1:B:996:ARG:NH2	2.50	0.45
1:A:994:LEU:O	1:A:996:ARG:NH2	2.50	0.45
1:B:580:THR:O	1:B:584:MET:HG2	2.17	0.45
1:B:616:LEU:HD23	1:B:617:ILE:H	1.81	0.45
1:B:334:ASN:O	1:B:336:LYS:N	2.45	0.44
1:A:903:LEU:HB3	1:A:934:LEU:HG	1.98	0.44
1:B:659:HIS:NE2	1:B:702:LEU:HD23	2.32	0.44
1:A:580:THR:O	1:A:584:MET:HG2	2.18	0.44
1:A:837:VAL:HG13	1:A:906:LEU:HD13	1.99	0.44
1:A:932:THR:HG23	1:A:1026:LYS:HE3	2.00	0.44
1:A:334:ASN:O	1:A:336:LYS:N	2.43	0.44
1:A:659:HIS:NE2	1:A:702:LEU:HD23	2.33	0.44
1:B:1031:MET:HG3	1:B:1036:LEU:HD12	2.00	0.43
1:A:722:GLU:O	1:A:726:ILE:HG12	2.18	0.43
1:A:987:ALA:O	1:A:991:ASP:N	2.52	0.43
1:B:678:GLU:HA	1:B:717:ILE:HD12	2.00	0.43
1:B:888:ASP:OD1	1:B:888:ASP:N	2.50	0.43
1:A:483:LEU:HD23	1:A:488:ILE:HG12	1.99	0.43
1:A:895:PRO:HG2	1:A:896:ILE:HD12	2.01	0.43
1:B:1057:LYS:HE2	1:B:1057:LYS:HB2	1.87	0.43
1:B:432:ASN:HD21	1:B:443:ILE:HD13	1.83	0.43
5:C:5:DT:H2"	5:C:6:DC:C6	2.54	0.43
1:B:907:VAL:HG21	1:B:934:LEU:HD12	2.01	0.42
1:B:559:ILE:HG12	1:B:654:TYR:CE2	2.55	0.42
1:A:469:HIS:O	1:A:473:VAL:HG23	2.20	0.42
1:B:683:LEU:O	1:B:687:LEU:HG	2.20	0.42
1:A:160:TYR:CZ	1:A:271:LEU:HD23	2.55	0.42
1:A:758:ILE:O	1:A:761:PHE:HB2	2.20	0.42
1:B:806:TYR:O	1:B:811:ASN:ND2	2.35	0.42
1:A:683:LEU:O	1:A:687:LEU:HG	2.20	0.42
1:B:361:ASN:O	1:B:365:LEU:HG	2.20	0.42
1:A:464:LEU:HG	1:A:467:ARG:HH12	1.83	0.42
1:B:723:LEU:HD21	1:B:766:LEU:HD11	2.02	0.42
1:A:1007:LEU:HD23	1:A:1007:LEU:HA	1.85	0.41
1:B:856:ASN:O	1:B:858:LYS:NZ	2.33	0.41
1:B:814:THR:HG23	1:B:862:LEU:HD11	2.02	0.41
1:B:469:HIS:HA	1:B:472:GLN:HB2	2.03	0.41
4:F:15:DG:H2"	4:F:16:DA:C8	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:832:PHE:HE2	1:B:860:LEU:HD21	1.86	0.41
5:C:11:DA:H2''	5:C:12:DA:C8	2.56	0.41
1:A:361:ASN:O	1:A:365:LEU:HG	2.21	0.41
1:A:469:HIS:HA	1:A:472:GLN:HB2	2.02	0.41
1:B:722:GLU:O	1:B:726:ILE:HG12	2.21	0.41
1:B:821:PRO:HA	1:B:866:TRP:CE2	2.56	0.41
5:C:7:DA:H2''	5:C:8:DA:H8	1.86	0.41
1:A:471:ILE:HD13	1:A:518:VAL:HG22	2.02	0.41
1:A:274:ASP:O	1:A:278:TRP:HD1	2.04	0.40
1:B:469:HIS:O	1:B:473:VAL:HG23	2.21	0.40
1:B:858:LYS:HD2	1:B:859:MET:H	1.85	0.40
1:B:839:ARG:HG3	1:B:842:ILE:HD11	2.03	0.40
2:G:376:LEU:HB2	2:G:379:PRO:HD2	2.04	0.40
1:B:160:TYR:CZ	1:B:271:LEU:HD23	2.56	0.40
1:B:1018:THR:O	1:B:1022:LEU:HG	2.21	0.40
5:C:15:DG:C2	6:D:6:DG:C2	3.09	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	869/1150 (76%)	816 (94%)	53 (6%)	0	100	100
1	B	863/1150 (75%)	809 (94%)	54 (6%)	0	100	100
2	G	28/100 (28%)	26 (93%)	2 (7%)	0	100	100
2	H	25/100 (25%)	23 (92%)	2 (8%)	0	100	100
All	All	1785/2500 (71%)	1674 (94%)	111 (6%)	0	100	100

There are no Ramachandran outliers to report.

### 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	815/1075 (76%)	776 (95%)	39 (5%)	25	59
1	B	814/1075 (76%)	781 (96%)	33 (4%)	30	63
2	G	30/96 (31%)	27 (90%)	3 (10%)	7	34
2	H	27/96 (28%)	26 (96%)	1 (4%)	34	65
All	All	1686/2342 (72%)	1610 (96%)	76 (4%)	27	61

All (76) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	152	LEU
1	A	158	GLU
1	A	185	VAL
1	A	203	ILE
1	A	215	PHE
1	A	282	PHE
1	A	284	VAL
1	A	288	ARG
1	A	342	GLU
1	A	408	TRP
1	A	420	GLN
1	A	535	LYS
1	A	583	ARG
1	A	616	LEU
1	A	654	TYR
1	A	673	LYS
1	A	743	LYS
1	A	757	HIS
1	A	760	HIS
1	A	796	ASP
1	A	803	CYS
1	A	829	LEU
1	A	854	GLU
1	A	862	LEU

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	863	LEU
1	A	872	ARG
1	A	875	ILE
1	A	888	ASP
1	A	889	LEU
1	A	902	ARG
1	A	906	LEU
1	A	942	LYS
1	A	959	MET
1	A	985	LEU
1	A	991	ASP
1	A	993	GLN
1	A	996	ARG
1	A	1022	LEU
1	A	1057	LYS
1	B	152	LEU
1	B	170	GLU
1	B	182	VAL
1	B	185	VAL
1	B	203	ILE
1	B	215	PHE
1	B	282	PHE
1	B	284	VAL
1	B	288	ARG
1	B	342	GLU
1	B	420	GLN
1	B	504	LYS
1	B	528	GLU
1	B	535	LYS
1	B	543	GLU
1	B	583	ARG
1	B	616	LEU
1	B	654	TYR
1	B	705	SER
1	B	743	LYS
1	B	803	CYS
1	B	854	GLU
1	B	856	ASN
1	B	858	LYS
1	B	872	ARG
1	B	902	ARG
1	B	906	LEU

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Mol	Chain	Res	Type
1	B	914	ASN
1	B	920	ILE
1	B	985	LEU
1	B	991	ASP
1	B	996	ARG
1	B	1026	LYS
2	G	371	GLU
2	G	375	TYR
2	G	376	LEU
2	H	382	LYS

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

### 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 monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

### 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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	879/1150 (76%)	0.03	36 (4%) 37 24	78, 196, 281, 329	0
1	B	873/1150 (75%)	0.10	47 (5%) 25 16	104, 216, 293, 335	0
2	G	30/100 (30%)	-0.11	0 100 100	147, 188, 245, 255	0
2	H	27/100 (27%)	-0.34	0 100 100	175, 198, 242, 259	0
3	E	19/19 (100%)	-1.00	0 100 100	227, 251, 287, 291	0
4	F	19/19 (100%)	-1.06	0 100 100	232, 247, 279, 291	0
5	C	19/19 (100%)	-0.77	0 100 100	259, 273, 298, 300	0
6	D	19/19 (100%)	-0.76	0 100 100	253, 266, 282, 290	0
All	All	1885/2576 (73%)	0.02	83 (4%) 34 22	78, 209, 288, 335	0

All (83) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	506	SER	12.8
1	B	506	SER	12.4
1	A	505	THR	10.1
1	B	432	ASN	7.8
1	B	508	PHE	7.5
1	A	202	GLU	7.3
1	B	431	GLN	6.8
1	A	510	LYS	6.4
1	B	274	ASP	5.2
1	A	226	ARG	5.2
1	B	546	GLY	4.9
1	A	139	ASP	4.9
1	A	211	LYS	4.7
1	B	549	VAL	4.7
1	B	331	LYS	4.5
1	B	505	THR	4.5

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Mol	Chain	Res	Type	RSRZ
1	A	141	LEU	4.5
1	A	252	LEU	4.4
1	A	212	LEU	4.2
1	A	146	ASP	4.2
1	B	428	LEU	4.2
1	A	140	ILE	4.1
1	A	227	LYS	4.0
1	A	511	ARG	3.9
1	A	173	ASN	3.9
1	B	270	ASN	3.8
1	A	508	PHE	3.7
1	A	503	PHE	3.7
1	B	244	LYS	3.6
1	A	507	SER	3.6
1	B	419	LEU	3.6
1	B	226	ARG	3.6
1	B	507	SER	3.4
1	B	879	ARG	3.4
1	B	690	ALA	3.4
1	B	151	GLU	3.4
1	B	330	LYS	3.3
1	A	229	PHE	3.3
1	A	504	LYS	3.3
1	A	181	SER	3.2
1	A	176	LEU	3.2
1	B	410	LEU	3.2
1	B	329	LYS	3.1
1	A	145	GLU	3.1
1	B	178	CYS	3.1
1	B	1040	PHE	3.0
1	A	232	GLY	3.0
1	B	422	THR	3.0
1	A	150	GLU	3.0
1	B	390	ILE	2.9
1	B	966	TYR	2.7
1	B	252	LEU	2.7
1	B	211	LYS	2.7
1	B	145	GLU	2.7
1	B	717	ILE	2.6
1	A	147	VAL	2.6
1	B	162	GLU	2.5
1	B	212	LEU	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	236	GLN	2.5
1	B	225	LYS	2.5
1	B	146	ASP	2.5
1	A	422	THR	2.4
1	B	659	HIS	2.4
1	A	251	ASP	2.4
1	B	150	GLU	2.4
1	B	336	LYS	2.4
1	A	149	ILE	2.4
1	B	312	LEU	2.4
1	B	429	ILE	2.4
1	B	277	THR	2.4
1	B	222	GLU	2.3
1	A	169	GLN	2.3
1	A	157	LEU	2.3
1	B	517	THR	2.3
1	B	1036	LEU	2.2
1	A	225	LYS	2.2
1	A	228	ASN	2.1
1	B	276	LEU	2.1
1	A	182	VAL	2.1
1	B	1028	LYS	2.1
1	A	966	TYR	2.1
1	B	335	ASN	2.1
1	B	141	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.