



# Full wwPDB X-ray Structure Validation Report ⓘ

Nov 7, 2024 – 03:52 pm GMT

PDB ID : 9EXF  
Title : Crystal structure of Yeast Clathrin Heavy Chain N-terminal domain bound to YAP1801 peptide (LIDM)  
Authors : Defelipe, L.A.; Bento, I.; Garcia Alai, M.M.  
Deposited on : 2024-04-08  
Resolution : 1.95 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  
Mogul : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 3.0  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
CCP4 : 9.0.003 (Gargrove)  
Density-Fitness : 1.0.11  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

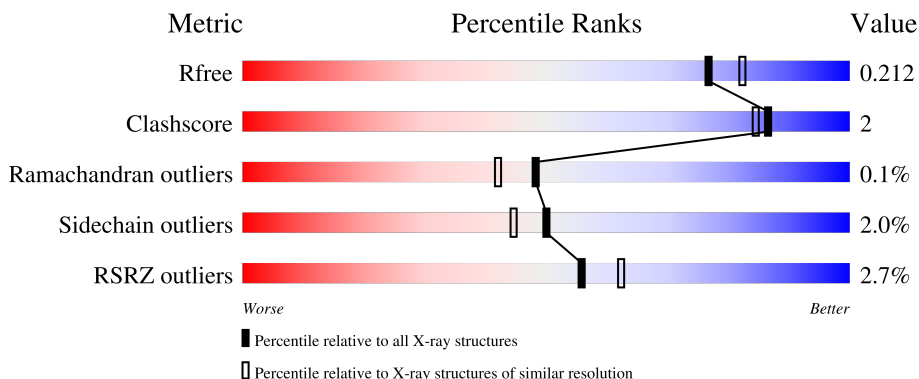
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.95 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))
$R_{free}$	164625	3187 (1.96-1.96)
Clashscore	180529	3412 (1.96-1.96)
Ramachandran outliers	177936	3390 (1.96-1.96)
Sidechain outliers	177891	3390 (1.96-1.96)
RSRZ outliers	164620	3186 (1.96-1.96)

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  $\geq 3$ , 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	373	 95%
1	B	373	 93% 7%
1	C	373	 94% 5%
1	D	373	 92% 6%
2	E	7	 29% 71% 14% 14%

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Mol	Chain	Length	Quality of chain
2	F	7	<p>29% 71% 14% 14%</p>
2	G	7	<p>29% 86% 14%</p>
2	H	7	<p>57% 29% 14%</p>
2	J	7	<p>14% 29% 29% 43%</p>
2	K	7	<p>29% 57% 43%</p>
2	M	7	<p>57% 29% 14%</p>
2	N	7	<p>14% 57% 43%</p>
2	O	7	<p>71% 57% 14% 29%</p>
2	P	7	<p>43% 57% 29% 14%</p>

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 24635 atoms, of which 12054 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 Clathrin heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
1	A	371	5764	1831	2888	487	551	7	79	0	0
1	B	372	5784	1836	2900	489	552	7	77	0	0
1	C	369	5776	1832	2898	490	549	7	77	3	0
1	D	368	5762	1831	2889	489	546	7	81	2	0

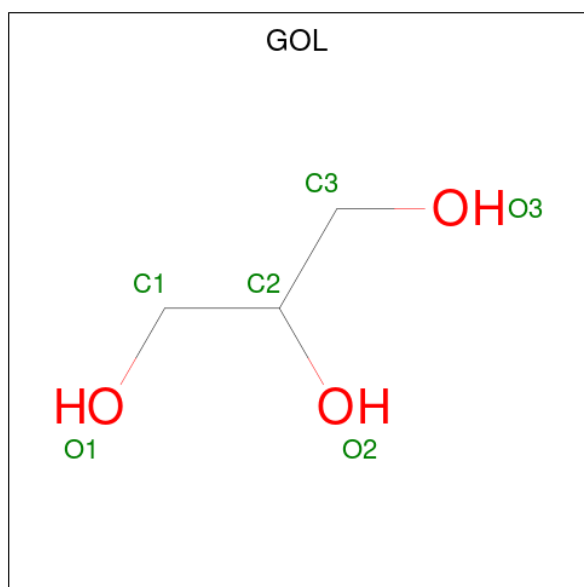
There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-3	GLY	-	expression tag	UNP P22137
A	-2	ALA	-	expression tag	UNP P22137
A	-1	MET	-	expression tag	UNP P22137
A	0	ALA	-	expression tag	UNP P22137
B	-3	GLY	-	expression tag	UNP P22137
B	-2	ALA	-	expression tag	UNP P22137
B	-1	MET	-	expression tag	UNP P22137
B	0	ALA	-	expression tag	UNP P22137
C	-3	GLY	-	expression tag	UNP P22137
C	-2	ALA	-	expression tag	UNP P22137
C	-1	MET	-	expression tag	UNP P22137
C	0	ALA	-	expression tag	UNP P22137
D	-3	GLY	-	expression tag	UNP P22137
D	-2	ALA	-	expression tag	UNP P22137
D	-1	MET	-	expression tag	UNP P22137
D	0	ALA	-	expression tag	UNP P22137

- Molecule 2 is a protein called Clathrin coat assembly protein AP180A.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
2	E	7	Total 117	C 35	H 60	N 9	O 12	S 1	0	0	0
2	F	6	Total 91	C 28	H 45	N 7	O 10	S 1	2	0	0
2	G	7	Total 117	C 35	H 60	N 9	O 12	S 1	0	0	0
2	H	7	Total 117	C 35	H 60	N 9	O 12	S 1	0	0	0
2	J	4	Total 64	C 20	H 32	N 5	O 7		0	0	0
2	K	4	Total 64	C 20	H 32	N 5	O 7		0	0	0
2	O	5	Total 83	C 26	H 43	N 6	O 8		0	0	0
2	N	4	Total 67	C 21	H 35	N 4	O 6	S 1	0	0	0
2	M	6	Total 100	C 31	H 52	N 7	O 9	S 1	0	0	0
2	P	6	Total 100	C 31	H 52	N 7	O 9	S 1	0	0	0

- Molecule 3 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	H	O		
3	A	1	Total 14	C 3	H 8	O 3	3	0

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	C	1	Total Cl 1 1	0	0

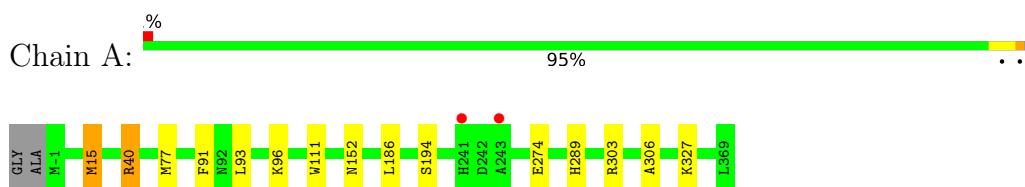
- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	203	Total O 203 203	0	0
5	B	161	Total O 161 161	0	0
5	C	130	Total O 130 130	0	0
5	D	114	Total O 114 114	0	0
5	E	4	Total O 4 4	0	0
5	H	1	Total O 1 1	0	0
5	P	1	Total O 1 1	0	0

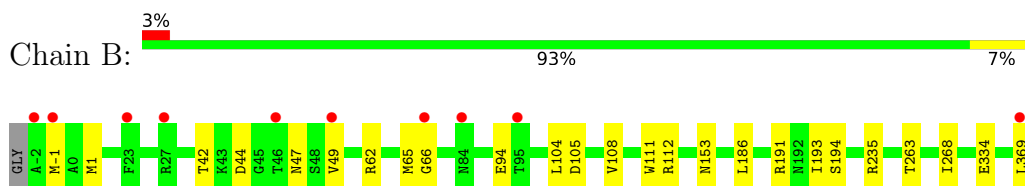
### 3 Residue-property plots [i](#)

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.

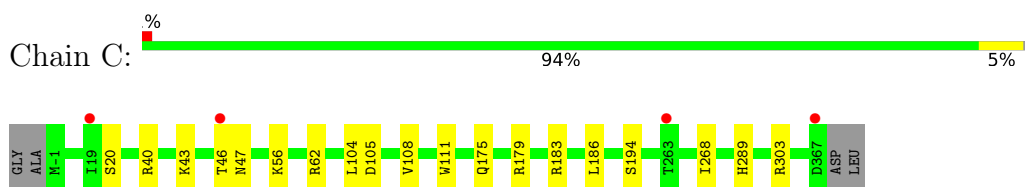
- Molecule 1: Clathrin heavy chain



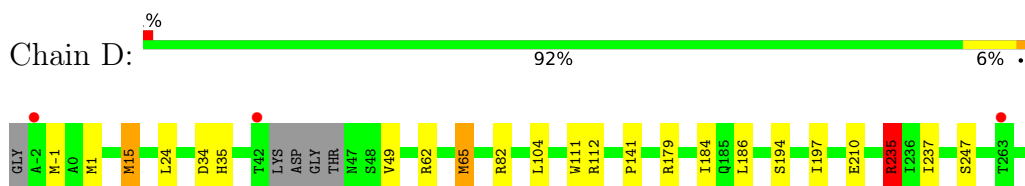
- Molecule 1: Clathrin heavy chain



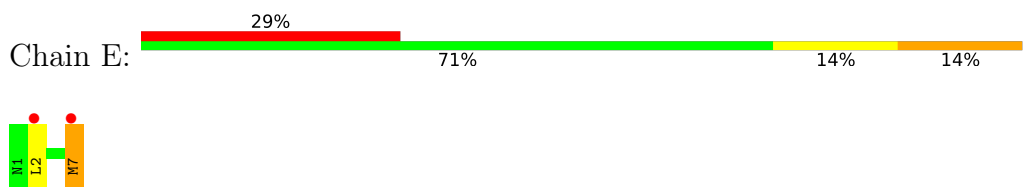
- Molecule 1: Clathrin heavy chain



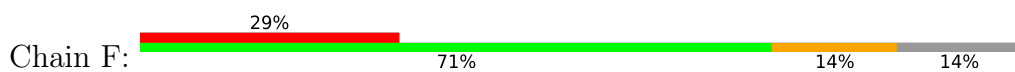
- Molecule 1: Clathrin heavy chain



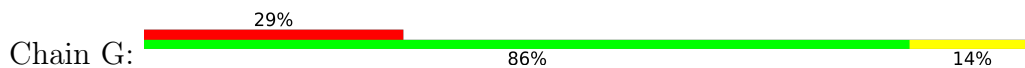
- Molecule 2: Clathrin coat assembly protein AP180A



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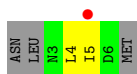
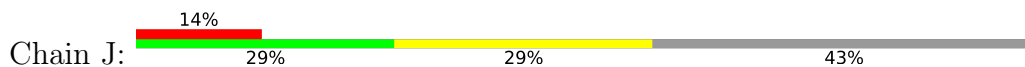
- Molecule 2: Clathrin coat assembly protein AP180A



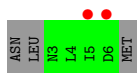
- Molecule 2: Clathrin coat assembly protein AP180A



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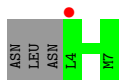
- Molecule 2: Clathrin coat assembly protein AP180A



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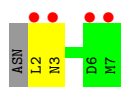


- Molecule 2: Clathrin coat assembly protein AP180A

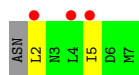
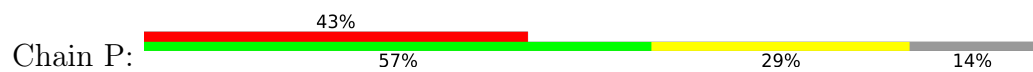


- Molecule 2: Clathrin coat assembly protein AP180A





- Molecule 2: Clathrin coat assembly protein AP180A



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	51.08Å 89.74Å 188.12Å 90.00° 90.39° 90.00°	Depositor
Resolution (Å)	65.01 – 1.95 65.01 – 1.95	Depositor EDS
% Data completeness (in resolution range)	94.4 (65.01-1.95) 94.4 (65.01-1.95)	Depositor EDS
$R_{merge}$	0.11	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.79 (at 1.95Å)	Xtrriage
Refinement program	REFMAC 5.8.0430 (refmacat 0.4.82)	Depositor
R, $R_{free}$	0.181 , 0.212 0.181 , 0.212	Depositor DCC
$R_{free}$ test set	6260 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	29.9	Xtrriage
Anisotropy	0.151	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.43 , 40.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.34$	Xtrriage
Estimated twinning fraction	0.019 for h,-k,-l	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	24635	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	37.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.70% 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

### 5.1 Standard geometry

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

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	0.45	0/2929	0.87	4/3983 (0.1%)
1	B	0.45	0/2937	0.81	2/3993 (0.1%)
1	C	0.41	0/2942	0.81	2/4000 (0.1%)
1	D	0.42	0/2942	0.80	6/3999 (0.2%)
2	E	0.60	0/56	1.38	1/73 (1.4%)
2	F	0.45	0/45	0.80	0/58
2	G	0.49	0/56	1.09	0/73
2	H	0.42	0/56	0.98	0/73
2	J	0.47	0/31	0.85	0/41
2	K	0.60	0/31	1.07	0/41
2	M	0.46	0/47	0.78	0/62
2	N	0.50	0/31	0.83	0/40
2	O	0.40	0/39	0.88	0/52
2	P	0.43	0/47	0.76	0/62
All	All	0.44	0/12189	0.83	15/16550 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	C	0	2
1	D	0	2
All	All	0	5

There are no bond length outliers.

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	40	ARG	NE-CZ-NH1	-19.19	110.71	120.30
1	A	40	ARG	NE-CZ-NH2	7.85	124.22	120.30
1	A	15	MET	CG-SD-CE	7.03	111.45	100.20
1	D	112	ARG	NE-CZ-NH1	6.64	123.62	120.30
1	D	112	ARG	NE-CZ-NH2	-6.58	117.01	120.30
1	B	1	MET	CG-SD-CE	-6.21	90.27	100.20
1	D	-1	MET	CG-SD-CE	6.19	110.10	100.20
2	E	7	MET	CG-SD-CE	-5.99	90.62	100.20
1	D	15	MET	CG-SD-CE	5.78	109.45	100.20
1	B	112	ARG	NE-CZ-NH2	-5.73	117.43	120.30
1	C	303	ARG	NE-CZ-NH1	-5.67	117.46	120.30
1	A	303	ARG	NE-CZ-NH1	-5.64	117.48	120.30
1	D	235	ARG	NE-CZ-NH2	-5.55	117.53	120.30
1	C	183	ARG	NE-CZ-NH2	-5.30	117.65	120.30
1	D	1	MET	CG-SD-CE	-5.14	91.98	100.20

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	40	ARG	Sidechain
1	C	179	ARG	Sidechain
1	C	62	ARG	Sidechain
1	D	179	ARG	Sidechain
1	D	82	ARG	Sidechain

## 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	2876	2888	2881	9	0
1	B	2884	2900	2895	15	0
1	C	2878	2898	2881	10	0
1	D	2873	2889	2870	15	0
2	E	57	60	60	2	0
2	F	46	45	42	2	0
2	G	57	60	60	2	0
2	H	57	60	60	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	J	32	32	31	1	0
2	K	32	32	31	0	0
2	M	48	52	51	0	0
2	N	32	35	34	0	0
2	O	40	43	42	0	0
2	P	48	52	51	1	0
3	A	6	8	8	0	0
4	C	1	0	0	0	0
5	A	203	0	0	4	0
5	B	161	0	0	1	0
5	C	130	0	0	1	0
5	D	114	0	0	2	0
5	E	4	0	0	0	0
5	H	1	0	0	0	0
5	P	1	0	0	0	0
All	All	12581	12054	11997	47	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 2.

All (47) 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:153:ASN:HD21	1:C:175:GLN:H	1.32	0.78
1:A:274:GLU:OE2	5:A:501:HOH:O	2.04	0.74
1:D:34:ASP:C	1:D:35[B]:HIS:CA	2.57	0.72
1:B:191:ARG:O	1:B:193:ILE:HD12	1.92	0.70
1:D:274:GLU:OE2	5:D:401:HOH:O	2.14	0.66
1:B:235:ARG:CZ	2:F:7:MET:HG3	2.33	0.59
1:C:289:HIS:HD2	5:C:559:HOH:O	1.88	0.56
1:B:334:GLU:HB2	5:B:507:HOH:O	2.06	0.56
1:B:66:GLY:HA2	1:C:47:ASN:HD21	1.71	0.55
1:D:49:VAL:HG21	1:D:65:MET:SD	2.47	0.55
1:B:235:ARG:NH1	2:F:7:MET:HG3	2.25	0.51
1:B:66:GLY:HA3	1:C:47:ASN:OD1	2.10	0.51
1:D:104:LEU:HD21	1:D:141:PRO:HD2	1.93	0.50
1:D:49:VAL:CG2	1:D:65:MET:SD	3.00	0.49
1:A:289:HIS:HD2	5:A:586:HOH:O	1.96	0.49
1:D:237:ILE:HD13	2:H:7:MET:HG3	1.95	0.48
1:B:49:VAL:CG2	1:B:65:MET:SD	3.02	0.48
1:A:15:MET:HE3	1:A:327:LYS:HA	1.95	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:49:VAL:HG21	1:B:65:MET:SD	2.55	0.47
1:B:42:THR:HG21	2:J:4:LEU:CD2	2.43	0.47
1:D:289:HIS:HD2	5:D:472:HOH:O	1.98	0.46
1:B:47:ASN:HD22	1:C:47:ASN:HD22	1.61	0.46
1:A:96:LYS:HG2	2:G:7:MET:HG2	1.98	0.45
2:E:7:MET:CG	2:E:7:MET:OXT	2.65	0.45
1:D:237:ILE:CD1	2:H:7:MET:HG3	2.48	0.44
1:A:152:ASN:HA	5:A:502:HOH:O	2.18	0.44
1:A:306:ALA:HB3	5:A:540:HOH:O	2.18	0.44
1:C:43:LYS:O	1:C:46:THR:HG22	2.17	0.43
1:C:104:LEU:CD1	1:C:108:VAL:HG23	2.49	0.43
1:B:186:LEU:O	1:B:194:SER:HA	2.19	0.43
1:D:186:LEU:O	1:D:194:SER:HA	2.19	0.43
1:A:186:LEU:O	1:A:194:SER:HA	2.19	0.42
1:B:104:LEU:HD12	1:B:108:VAL:HG23	2.00	0.42
1:B:268:ILE:HD11	2:P:5:ILE:HG23	2.02	0.42
1:D:15:MET:CE	1:D:24:LEU:HD11	2.50	0.41
1:D:235:ARG:HG3	1:D:235:ARG:NH1	2.36	0.41
1:A:77:MET:HG3	1:A:93:LEU:HB2	2.03	0.41
1:D:49:VAL:HG23	1:D:65:MET:HE2	2.02	0.41
1:A:91:PHE:HB3	2:G:7:MET:HE3	2.03	0.41
1:D:184:ILE:HB	1:D:197:ILE:HG13	2.03	0.41
2:E:7:MET:OXT	2:E:7:MET:HG3	2.21	0.41
1:B:66:GLY:HA2	1:C:47:ASN:ND2	2.36	0.41
1:C:104:LEU:HD12	1:C:108:VAL:HG23	2.03	0.41
1:C:186:LEU:O	1:C:194:SER:HA	2.21	0.40
1:D:210:GLU:O	1:D:247:SER:OG	2.34	0.40
2:H:2:LEU:HD13	2:H:2:LEU:N	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	369/373 (99%)	366 (99%)	3 (1%)	0	100	100
1	B	370/373 (99%)	364 (98%)	6 (2%)	0	100	100
1	C	370/373 (99%)	364 (98%)	6 (2%)	0	100	100
1	D	367/373 (98%)	362 (99%)	5 (1%)	0	100	100
2	E	5/7 (71%)	5 (100%)	0	0	100	100
2	F	4/7 (57%)	4 (100%)	0	0	100	100
2	G	5/7 (71%)	5 (100%)	0	0	100	100
2	H	5/7 (71%)	4 (80%)	0	1 (20%)	0	0
2	J	2/7 (29%)	2 (100%)	0	0	100	100
2	K	2/7 (29%)	2 (100%)	0	0	100	100
2	M	4/7 (57%)	4 (100%)	0	0	100	100
2	N	2/7 (29%)	2 (100%)	0	0	100	100
2	O	3/7 (43%)	2 (67%)	1 (33%)	0	100	100
2	P	4/7 (57%)	4 (100%)	0	0	100	100
All	All	1512/1562 (97%)	1490 (98%)	21 (1%)	1 (0%)	48	42

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	H	3	ASN

### 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	318/319 (100%)	317 (100%)	1 (0%)	91	91
1	B	319/319 (100%)	311 (98%)	8 (2%)	42	34
1	C	320/319 (100%)	314 (98%)	6 (2%)	52	47
1	D	319/319 (100%)	315 (99%)	4 (1%)	65	62
2	E	7/7 (100%)	6 (86%)	1 (14%)	2	0

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	F	5/7 (71%)	4 (80%)	1 (20%)	1	0
2	G	7/7 (100%)	7 (100%)	0	100	100
2	H	7/7 (100%)	6 (86%)	1 (14%)	2	0
2	J	4/7 (57%)	3 (75%)	1 (25%)	0	0
2	K	4/7 (57%)	4 (100%)	0	100	100
2	M	6/7 (86%)	4 (67%)	2 (33%)	0	0
2	N	4/7 (57%)	4 (100%)	0	100	100
2	O	5/7 (71%)	4 (80%)	1 (20%)	1	0
2	P	6/7 (86%)	5 (83%)	1 (17%)	2	0
All	All	1331/1346 (99%)	1304 (98%)	27 (2%)	50	44

All (27) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	111	TRP
1	B	-1	MET
1	B	44	ASP
1	B	62	ARG
1	B	94	GLU
1	B	105	ASP
1	B	111	TRP
1	B	263	THR
1	B	369	LEU
1	C	20	SER
1	C	40	ARG
1	C	56	LYS
1	C	105	ASP
1	C	111	TRP
1	C	268	ILE
1	D	62	ARG
1	D	65	MET
1	D	111	TRP
1	D	235	ARG
2	E	2	LEU
2	F	7	MET
2	H	2	LEU
2	J	5	ILE
2	O	2	LEU
2	M	2	LEU

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Mol	Chain	Res	Type
2	M	3	ASN
2	P	2	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	131	ASN
1	A	289	HIS
1	A	298	ASN
1	A	319	ASN
1	B	153	ASN
1	B	264	ASN
1	B	289	HIS
1	B	298	ASN
1	B	319	ASN
1	C	64	ASN
1	C	319	ASN
1	D	64	ASN
1	D	289	HIS
1	D	319	ASN

### 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](#)

Of 2 ligands modelled in this entry, 1 is monoatomic - leaving 1 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	GOL	A	401	-	5,5,5	0.22	0	5,5,5	0.43	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	A	401	-	-	0/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 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 [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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	371/373 (99%)	-0.42	2 (0%) 87 89	19, 29, 51, 69	0
1	B	372/373 (99%)	-0.16	10 (2%) 56 62	20, 33, 61, 101	0
1	C	369/373 (98%)	-0.05	4 (1%) 77 82	14, 37, 62, 94	2 (0%)
1	D	368/373 (98%)	-0.17	3 (0%) 82 85	12, 35, 56, 67	1 (0%)
2	E	7/7 (100%)	1.11	2 (28%) 1 1	26, 30, 57, 59	0
2	F	6/7 (85%)	1.99	2 (33%) 1 1	33, 36, 40, 71	5 (83%)
2	G	7/7 (100%)	0.75	2 (28%) 1 1	29, 45, 61, 70	0
2	H	7/7 (100%)	0.45	0 100 100	37, 40, 56, 57	0
2	J	4/7 (57%)	1.51	1 (25%) 2 2	61, 64, 73, 81	0
2	K	4/7 (57%)	1.96	2 (50%) 0 0	52, 53, 57, 67	0
2	M	6/7 (85%)	2.98	4 (66%) 0 0	64, 73, 80, 89	0
2	N	4/7 (57%)	1.76	1 (25%) 2 2	62, 64, 66, 82	0
2	O	5/7 (71%)	2.81	5 (100%) 0 0	77, 80, 87, 89	0
2	P	6/7 (85%)	2.69	3 (50%) 0 0	59, 69, 78, 88	0
All	All	1536/1562 (98%)	-0.13	41 (2%) 56 62	12, 34, 61, 101	8 (0%)

All (41) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	-2	ALA	6.4
2	P	2	LEU	6.3
2	M	2	LEU	5.6
2	F	2	LEU	4.5
2	P	5	ILE	4.0
1	B	369	LEU	3.9
1	D	-2	ALA	3.6
2	O	5	ILE	3.3

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Mol	Chain	Res	Type	RSRZ
1	B	66	GLY	3.3
2	O	4	LEU	3.3
2	F	7	MET	3.2
2	M	7	MET	3.2
2	M	3	ASN	3.1
1	B	46	THR	2.9
2	K	6	ASP	2.9
2	N	4	LEU	2.8
1	B	95	THR	2.8
1	B	49	VAL	2.8
1	A	243	ALA	2.7
1	C	46	THR	2.7
2	O	2	LEU	2.6
2	E	7	MET	2.6
2	O	3	ASN	2.6
2	M	6	ASP	2.6
1	B	23	PHE	2.5
2	G	5	ILE	2.4
2	K	5	ILE	2.3
1	C	263	THR	2.3
1	C	367	ASP	2.3
1	A	241	HIS	2.3
2	O	6	ASP	2.3
1	B	27	ARG	2.2
2	J	5	ILE	2.2
1	D	42	THR	2.2
1	B	-1	MET	2.2
1	C	19	ILE	2.2
1	B	84	ASN	2.1
2	P	4	LEU	2.1
2	E	2	LEU	2.1
1	D	263	THR	2.1
2	G	7	MET	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](#)

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, 95<sup>th</sup> 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(Å <sup>2</sup> )	Q<0.9
3	GOL	A	401	6/6	0.89	0.15	30,48,52,52	3
4	CL	C	401	1/1	0.89	0.19	65,65,65,65	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.