



# Full wwPDB X-ray Structure Validation Report ⓘ

May 22, 2020 – 05:31 am BST

PDB ID : 2P5V  
Title : Crystal Structure of Transcriptional Regulator NMB0573 from *Neisseria Meningitidis*  
Authors : Ren, J.; Sainsbury, S.; Owens, R.J.; Oxford Protein Production Facility (OPPF)  
Deposited on : 2007-03-16  
Resolution : 1.99 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.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

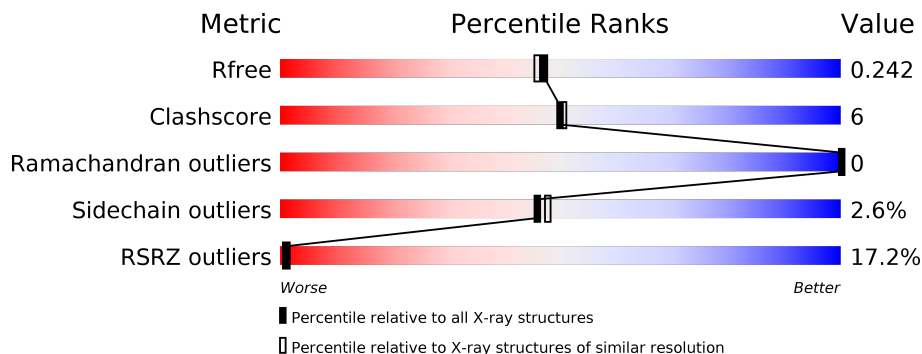
MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.11  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.11

# 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 1.99 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	8085 (2.00-2.00)
Clashscore	141614	9178 (2.00-2.00)
Ramachandran outliers	138981	9054 (2.00-2.00)
Sidechain outliers	138945	9053 (2.00-2.00)
RSRZ outliers	127900	7900 (2.00-2.00)

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 on 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	162	 15% 83% 12% . .
1	B	162	 10% 81% 14% . .
1	C	162	 16% 80% 14% . 5%
1	D	162	 18% 79% 16% . .
1	E	162	 17% 87% 9% .
1	F	162	 9% 85% 10% . 5%

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Mol	Chain	Length	Quality of chain
1	G	162	
1	H	162	

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
4	GOL	E	905	-	-	-	X

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 10670 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 Transcriptional regulator, LRP/AsnC family.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	156	1235	786	216	230	2	1	0	0	0
1	B	156	1235	786	216	230	2	1	0	0	0
1	C	154	1218	775	213	227	2	1	0	0	0
1	D	156	1235	786	216	230	2	1	0	0	0
1	E	156	1235	786	216	230	2	1	0	0	0
1	F	154	1218	775	213	227	2	1	0	0	0
1	G	158	1250	796	218	232	2	2	0	0	0
1	H	154	1218	775	213	227	2	1	0	0	0

There are 32 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	CLONING ARTIFACT	UNP Q9K0L9
A	0	PRO	-	CLONING ARTIFACT	UNP Q9K0L9
A	1	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
A	117	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
B	-1	GLY	-	CLONING ARTIFACT	UNP Q9K0L9
B	0	PRO	-	CLONING ARTIFACT	UNP Q9K0L9
B	1	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
B	117	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
C	-1	GLY	-	CLONING ARTIFACT	UNP Q9K0L9
C	0	PRO	-	CLONING ARTIFACT	UNP Q9K0L9
C	1	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
C	117	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
D	-1	GLY	-	CLONING ARTIFACT	UNP Q9K0L9

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Chain	Residue	Modelled	Actual	Comment	Reference
D	0	PRO	-	CLONING ARTIFACT	UNP Q9K0L9
D	1	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
D	117	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
E	-1	GLY	-	CLONING ARTIFACT	UNP Q9K0L9
E	0	PRO	-	CLONING ARTIFACT	UNP Q9K0L9
E	1	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
E	117	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
F	-1	GLY	-	CLONING ARTIFACT	UNP Q9K0L9
F	0	PRO	-	CLONING ARTIFACT	UNP Q9K0L9
F	1	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
F	117	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
G	-1	GLY	-	CLONING ARTIFACT	UNP Q9K0L9
G	0	PRO	-	CLONING ARTIFACT	UNP Q9K0L9
G	1	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
G	117	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
H	-1	GLY	-	CLONING ARTIFACT	UNP Q9K0L9
H	0	PRO	-	CLONING ARTIFACT	UNP Q9K0L9
H	1	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9
H	117	MSE	MET	MODIFIED RESIDUE	UNP Q9K0L9

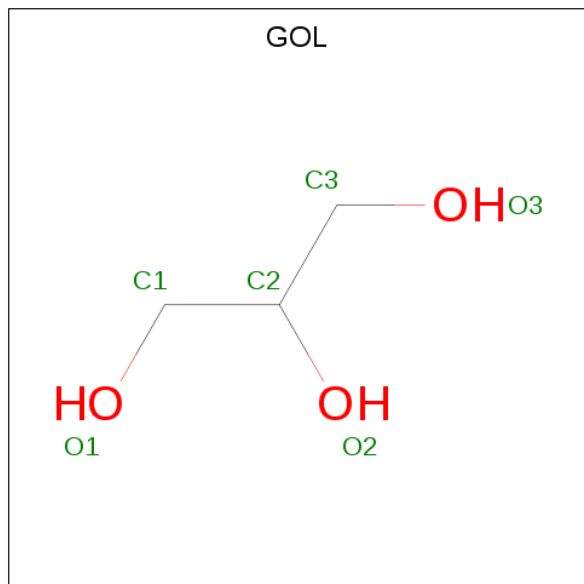
- Molecule 2 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	G	1	Total Ca 1 1	0	0
2	D	1	Total Ca 1 1	0	0
2	H	1	Total Ca 1 1	0	0
2	B	1	Total Ca 1 1	0	0
2	C	2	Total Ca 2 2	0	0
2	A	1	Total Ca 1 1	0	0
2	F	1	Total Ca 1 1	0	0

- Molecule 3 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	D	1	Total Cl 1 1	0	0
3	E	2	Total Cl 2 2	0	0
3	B	2	Total Cl 2 2	0	0
3	C	2	Total Cl 2 2	0	0
3	A	1	Total Cl 1 1	0	0
3	F	2	Total Cl 2 2	0	0

- Molecule 4 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
4	A	1	Total C O 6 3 3	0	0
4	A	1	Total C O 6 3 3	0	0
4	B	1	Total C O 6 3 3	0	0
4	D	1	Total C O 6 3 3	0	0
4	E	1	Total C O 6 3 3	0	0
4	E	1	Total C O 6 3 3	0	0

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	E	1	Total	C	O	0	0
			6	3	3		
4	G	1	Total	C	O	0	0
			6	3	3		

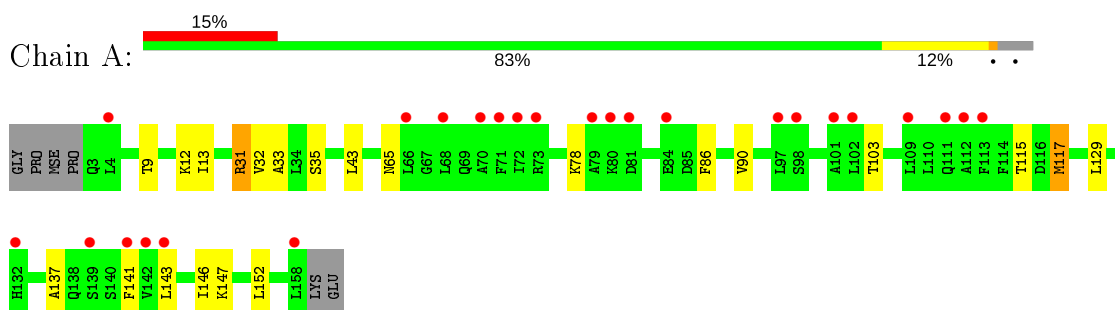
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	116	Total	O	0	0
			116	116		
5	B	123	Total	O	0	0
			123	123		
5	C	109	Total	O	0	0
			109	109		
5	D	82	Total	O	0	0
			82	82		
5	E	96	Total	O	0	0
			96	96		
5	F	93	Total	O	0	0
			93	93		
5	G	66	Total	O	0	0
			66	66		
5	H	75	Total	O	0	0
			75	75		

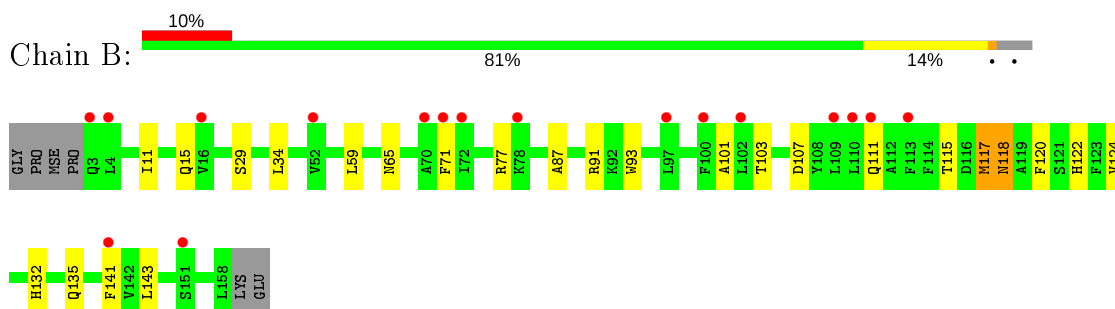
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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.

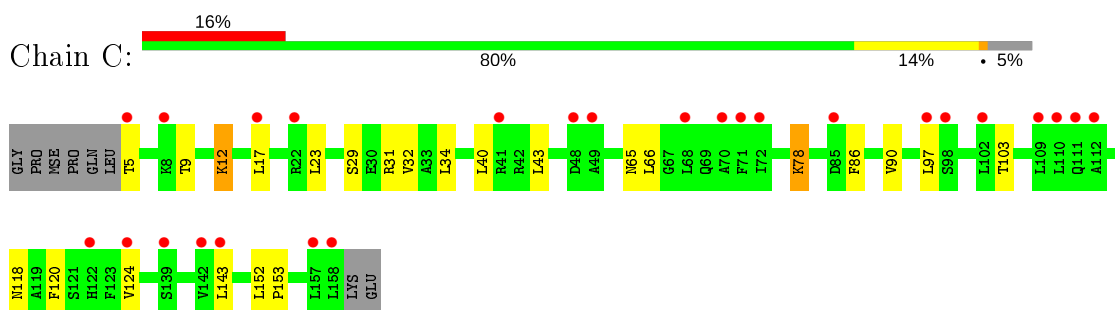
- Molecule 1: Transcriptional regulator, LRP/AsnC family



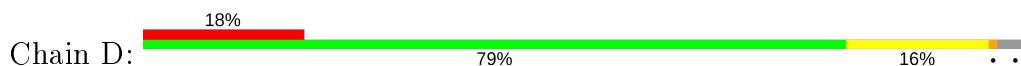
- Molecule 1: Transcriptional regulator, LRP/AsnC family



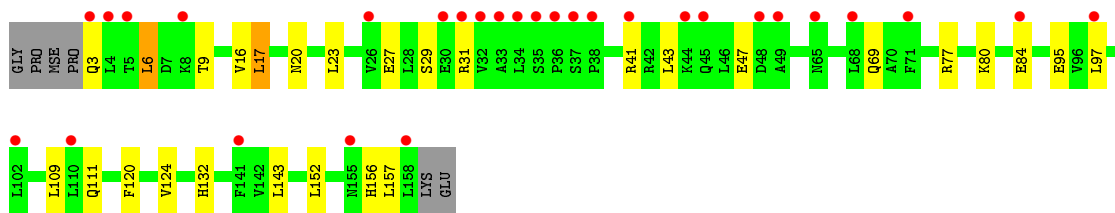
- Molecule 1: Transcriptional regulator, LRP/AsnC family



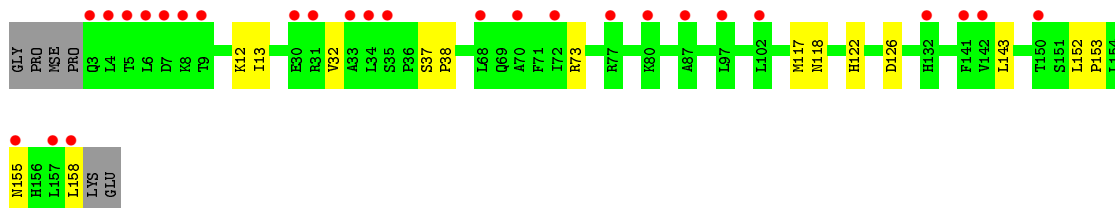
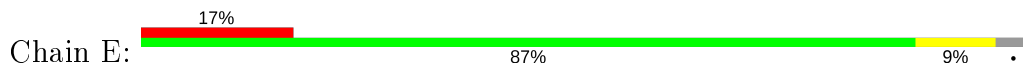
- Molecule 1: Transcriptional regulator, LRP/AsnC family



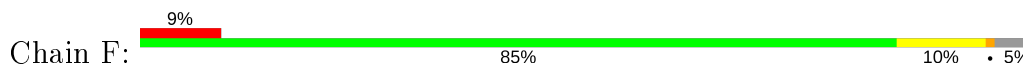




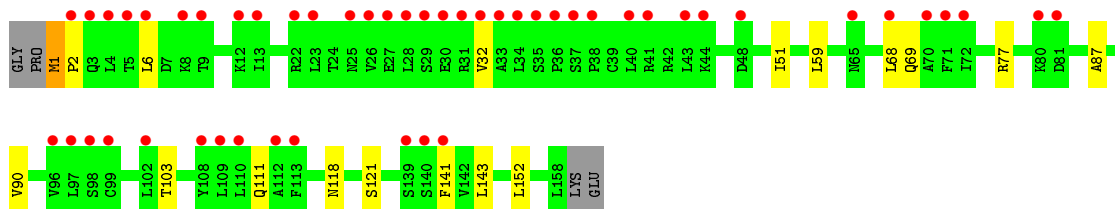
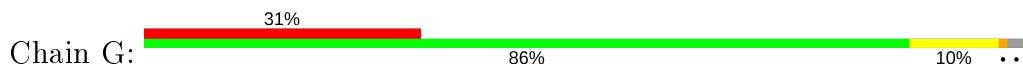
- Molecule 1: Transcriptional regulator, LRP/AsnC family



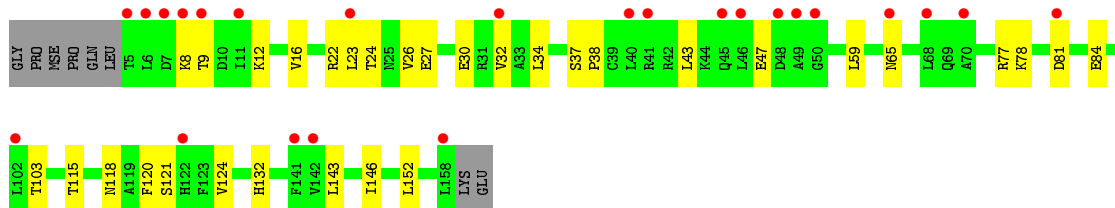
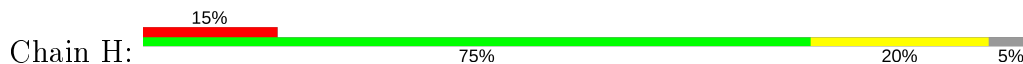
- Molecule 1: Transcriptional regulator, LRP/AsnC family



- Molecule 1: Transcriptional regulator, LRP/AsnC family



- Molecule 1: Transcriptional regulator, LRP/AsnC family



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	65.07Å 148.48Å 77.72Å 90.00° 106.41° 90.00°	Depositor
Resolution (Å)	29.59 – 1.99 29.60 – 1.99	Depositor EDS
% Data completeness (in resolution range)	77.1 (29.59-1.99) 77.1 (29.60-1.99)	Depositor EDS
$R_{merge}$	0.08	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.12 (at 2.00Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, $R_{free}$	0.176 , 0.238 0.187 , 0.242	Depositor DCC
$R_{free}$ test set	3804 reflections (5.09%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	25.8	Xtriage
Anisotropy	0.152	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 50.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	10670	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	50.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.64% 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](#)

Bond lengths and bond angles in the following residue types are not validated in this section: GOL, CA, 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	0.43	0/1255	0.62	0/1698
1	B	0.48	0/1255	0.61	0/1698
1	C	0.41	0/1238	0.57	0/1675
1	D	0.42	0/1255	0.58	0/1698
1	E	0.41	0/1255	0.56	0/1698
1	F	0.44	0/1238	0.60	0/1675
1	G	0.38	0/1271	0.55	0/1720
1	H	0.41	0/1238	0.58	0/1675
All	All	0.42	0/10005	0.59	0/13537

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	1235	0	1260	15	0
1	B	1235	0	1260	18	0
1	C	1218	0	1241	18	0
1	D	1235	0	1260	19	0
1	E	1235	0	1260	21	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	F	1218	0	1241	10	0
1	G	1250	0	1279	22	0
1	H	1218	0	1241	20	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	2	0	0	0	0
2	D	1	0	0	0	0
2	F	1	0	0	0	0
2	G	1	0	0	0	0
2	H	1	0	0	0	0
3	A	1	0	0	0	0
3	B	2	0	0	0	0
3	C	2	0	0	0	0
3	D	1	0	0	0	0
3	E	2	0	0	0	0
3	F	2	0	0	0	0
4	A	12	0	16	0	0
4	B	6	0	8	2	0
4	D	6	0	8	1	0
4	E	18	0	24	4	0
4	G	6	0	8	0	0
5	A	116	0	0	0	0
5	B	123	0	0	3	0
5	C	109	0	0	0	0
5	D	82	0	0	2	0
5	E	96	0	0	0	0
5	F	93	0	0	1	0
5	G	66	0	0	1	0
5	H	75	0	0	1	0
All	All	10670	0	10106	115	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 6.

All (115) 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:117:MSE:HE1	1:A:141:PHE:CZ	2.09	0.88
1:E:117:MSE:HE1	1:G:103:THR:CG2	2.12	0.78
1:E:13:ILE:HD13	1:E:32:VAL:HG11	1.71	0.73
1:G:69:GLN:NE2	1:G:111:GLN:HE21	1.87	0.72

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:118:ASN:OD1	4:E:907:GOL:H2	1.91	0.70
1:E:13:ILE:HD11	1:E:32:VAL:HG21	1.72	0.70
1:G:69:GLN:HE21	1:G:111:GLN:HE21	1.38	0.70
1:E:73:ARG:HD2	4:E:905:GOL:O1	1.93	0.67
4:B:902:GOL:H32	5:B:1221:HOH:O	1.97	0.65
1:C:103:THR:HG22	1:D:143:LEU:HD21	1.79	0.64
1:E:117:MSE:HE1	1:G:103:THR:HG21	1.78	0.63
1:A:117:MSE:HE1	1:A:141:PHE:CE2	2.34	0.63
1:E:155:ASN:HD22	1:E:158:LEU:HD12	1.64	0.62
1:D:77:ARG:HD2	1:D:132:HIS:O	2.01	0.59
1:H:24:THR:HG23	1:H:27:GLU:H	1.68	0.59
1:D:23:LEU:HD22	1:D:27:GLU:HB3	1.84	0.58
1:E:117:MSE:CE	1:G:103:THR:CG2	2.82	0.57
1:D:69:GLN:HE21	1:D:111:GLN:HE21	1.53	0.57
1:H:77:ARG:HD3	1:H:132:HIS:O	2.04	0.57
1:E:118:ASN:OD1	4:E:907:GOL:C2	2.53	0.57
1:A:143:LEU:HD21	1:B:103:THR:HG22	1.87	0.55
1:A:103:THR:HG22	1:B:143:LEU:HD21	1.87	0.55
1:B:118:ASN:O	1:B:122:HIS:ND1	2.35	0.55
1:G:1:MSE:HE2	1:G:2:PRO:HD2	1.89	0.55
1:G:32:VAL:O	1:G:32:VAL:HG12	2.07	0.55
1:G:1:MSE:HE2	1:G:2:PRO:CD	2.38	0.54
1:G:6:LEU:HD11	1:G:51:ILE:HD13	1.88	0.54
1:D:111:GLN:HG2	5:D:584:HOH:O	2.07	0.54
1:C:152:LEU:HD23	1:D:97:LEU:HD21	1.89	0.53
1:E:73:ARG:HD2	4:E:905:GOL:C1	2.38	0.52
1:A:152:LEU:HD12	1:B:59:LEU:HB2	1.92	0.52
1:E:117:MSE:HE1	1:G:103:THR:HG22	1.91	0.52
1:H:65:ASN:ND2	5:H:637:HOH:O	2.40	0.51
1:F:12:LYS:HG3	1:F:32:VAL:HG12	1.92	0.51
1:G:87:ALA:HB1	1:H:146:ILE:HG23	1.91	0.51
1:A:32:VAL:O	1:A:33:ALA:HB3	2.11	0.51
1:F:45:GLN:NE2	5:F:280:HOH:O	2.43	0.51
1:A:146:ILE:N	1:A:146:ILE:HD12	2.27	0.50
1:A:117:MSE:HE1	1:A:141:PHE:CE1	2.45	0.50
1:C:66:LEU:HD21	1:D:156:HIS:CE1	2.47	0.49
1:E:152:LEU:HD12	1:F:59:LEU:HB2	1.93	0.49
1:C:9:THR:HG21	1:C:34:LEU:HD11	1.93	0.49
1:D:69:GLN:HE21	1:D:111:GLN:NE2	2.11	0.49
1:G:1:MSE:HE3	5:G:1147:HOH:O	2.12	0.49
1:E:12:LYS:HG3	1:E:32:VAL:HG12	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:117:MSE:HE1	1:B:141:PHE:CZ	2.49	0.47
1:E:153:PRO:HG3	1:F:95:GLU:HA	1.96	0.47
1:B:15:GLN:HG2	5:B:289:HOH:O	2.14	0.47
1:C:23:LEU:HD21	1:C:31:ARG:NH1	2.29	0.47
1:C:86:PHE:O	1:C:90:VAL:HG23	2.14	0.47
1:A:65:ASN:O	1:A:115:THR:HG22	2.15	0.47
1:H:12:LYS:HG3	1:H:32:VAL:HG12	1.95	0.47
1:B:65:ASN:O	1:B:115:THR:HG22	2.15	0.46
1:D:6:LEU:HD22	1:D:157:LEU:HD13	1.97	0.46
1:G:152:LEU:HD12	1:H:59:LEU:HB2	1.97	0.46
1:H:26:VAL:O	1:H:30:GLU:OE1	2.33	0.46
1:H:65:ASN:O	1:H:115:THR:HG22	2.16	0.46
1:E:117:MSE:CE	1:G:103:THR:HG21	2.43	0.46
1:C:78:LYS:N	1:C:78:LYS:HD2	2.31	0.46
1:A:78:LYS:HE2	1:G:77:ARG:HH12	1.80	0.46
1:A:12:LYS:NZ	1:A:31:ARG:O	2.49	0.46
1:D:109:LEU:HD13	4:D:903:GOL:H11	1.98	0.46
1:H:120:PHE:CE2	1:H:124:VAL:HG21	2.51	0.46
1:F:71:PHE:CE1	1:F:111:GLN:HG2	2.51	0.46
1:C:12:LYS:HG3	1:C:32:VAL:HG12	1.98	0.45
1:H:43:LEU:O	1:H:47:GLU:HG3	2.17	0.45
1:E:143:LEU:HD22	1:H:121:SER:HA	1.97	0.45
1:B:135:GLN:HG3	1:H:78:LYS:CD	2.47	0.45
1:C:143:LEU:HD22	1:F:121:SER:HA	1.99	0.44
1:E:37:SER:HB3	1:E:38:PRO:HD3	2.00	0.44
1:D:17:LEU:HD21	1:D:43:LEU:CD1	2.46	0.44
1:E:117:MSE:HE3	1:H:143:LEU:HD23	1.99	0.44
1:D:16:VAL:HG21	1:D:31:ARG:HB3	2.00	0.44
1:G:141:PHE:O	1:H:103:THR:HG23	2.17	0.44
1:H:16:VAL:CG1	1:H:23:LEU:HD12	2.47	0.44
1:D:69:GLN:NE2	1:D:111:GLN:HE21	2.15	0.44
1:F:92:LYS:O	1:F:94:PRO:HD3	2.18	0.43
1:F:69:GLN:HE21	1:F:111:GLN:NE2	2.16	0.43
1:G:59:LEU:HB2	1:H:152:LEU:HD12	2.00	0.43
1:H:81:ASP:HA	1:H:84:GLU:HG2	1.99	0.43
1:A:86:PHE:O	1:A:90:VAL:HG23	2.17	0.43
1:G:143:LEU:HD21	1:H:103:THR:HG22	1.99	0.43
1:H:9:THR:HG21	1:H:34:LEU:HD11	2.00	0.43
1:A:147:LYS:NZ	1:B:93:TRP:O	2.52	0.43
1:B:120:PHE:CE2	1:B:124:VAL:HG21	2.53	0.43
1:C:153:PRO:HG3	1:D:95:GLU:HA	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:23:LEU:HD11	1:C:31:ARG:NH1	2.33	0.43
1:C:17:LEU:CD1	1:C:43:LEU:HD13	2.49	0.43
1:C:120:PHE:CE2	1:C:124:VAL:HG21	2.54	0.43
1:B:77:ARG:HD3	1:B:132:HIS:O	2.18	0.42
1:B:29:SER:HB2	1:B:34:LEU:O	2.19	0.42
1:E:155:ASN:HA	1:E:155:ASN:HD22	1.70	0.42
1:A:9:THR:O	1:A:13:ILE:HG13	2.20	0.42
1:D:120:PHE:CE2	1:D:124:VAL:HG21	2.54	0.42
1:C:97:LEU:HD21	1:D:152:LEU:HD23	2.01	0.42
1:F:120:PHE:CE2	1:F:124:VAL:HG21	2.55	0.42
1:A:129:LEU:HD21	1:A:137:ALA:HB3	2.02	0.42
1:C:29:SER:HB2	1:C:34:LEU:O	2.20	0.42
1:B:143:LEU:HD22	1:G:121:SER:HA	2.02	0.41
1:C:65:ASN:HD21	1:D:3:GLN:HG2	1.84	0.41
1:E:122:HIS:ND1	1:E:126:ASP:OD2	2.48	0.41
1:B:101:ALA:HA	1:B:107:ASP:O	2.21	0.41
1:G:77:ARG:HB2	1:G:77:ARG:NH1	2.35	0.41
1:E:13:ILE:CD1	1:E:32:VAL:HG21	2.47	0.41
1:F:69:GLN:HE21	1:F:111:GLN:HE22	1.69	0.41
1:G:87:ALA:O	1:G:90:VAL:HG12	2.21	0.41
1:B:11:ILE:O	1:B:15:GLN:HG3	2.20	0.41
4:B:902:GOL:O1	1:G:118:ASN:ND2	2.53	0.41
1:B:71:PHE:CE1	1:B:111:GLN:HG2	2.56	0.41
1:B:122:HIS:HB3	5:B:336:HOH:O	2.21	0.41
1:H:37:SER:HB2	1:H:38:PRO:HD3	2.03	0.41
1:C:65:ASN:HD21	1:D:3:GLN:CG	2.34	0.41
1:D:41:ARG:HG3	5:D:1106:HOH:O	2.20	0.40
1:C:23:LEU:HA	1:C:23:LEU:HD23	1.96	0.40
1:B:87:ALA:O	1:B:91:ARG:HG3	2.20	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	154/162 (95%)	148 (96%)	6 (4%)	0	100	100
1	B	154/162 (95%)	152 (99%)	2 (1%)	0	100	100
1	C	152/162 (94%)	147 (97%)	5 (3%)	0	100	100
1	D	154/162 (95%)	147 (96%)	7 (4%)	0	100	100
1	E	154/162 (95%)	150 (97%)	4 (3%)	0	100	100
1	F	152/162 (94%)	149 (98%)	3 (2%)	0	100	100
1	G	156/162 (96%)	153 (98%)	3 (2%)	0	100	100
1	H	152/162 (94%)	150 (99%)	2 (1%)	0	100	100
All	All	1228/1296 (95%)	1196 (97%)	32 (3%)	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	138/141 (98%)	134 (97%)	4 (3%)	42	43
1	B	138/141 (98%)	136 (99%)	2 (1%)	67	72
1	C	136/141 (96%)	131 (96%)	5 (4%)	34	32
1	D	138/141 (98%)	130 (94%)	8 (6%)	20	15
1	E	138/141 (98%)	138 (100%)	0	100	100
1	F	136/141 (96%)	131 (96%)	5 (4%)	34	32
1	G	140/141 (99%)	138 (99%)	2 (1%)	67	72
1	H	136/141 (96%)	133 (98%)	3 (2%)	52	55
All	All	1100/1128 (98%)	1071 (97%)	29 (3%)	46	48

All (29) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	31	ARG
1	A	35	SER

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	43	LEU
1	A	117	MSE
1	B	117	MSE
1	B	118	ASN
1	C	5	THR
1	C	12	LYS
1	C	40	LEU
1	C	78	LYS
1	C	118	ASN
1	D	6	LEU
1	D	9	THR
1	D	17	LEU
1	D	20	ASN
1	D	29	SER
1	D	47	GLU
1	D	80	LYS
1	D	84	GLU
1	F	43	LEU
1	F	111	GLN
1	F	118	ASN
1	F	125	LEU
1	F	140	SER
1	G	1	MSE
1	G	68	LEU
1	H	8	LYS
1	H	22	ARG
1	H	118	ASN

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (23) such sidechains are listed below:

<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	A	3	GLN
1	A	54	GLN
1	A	69	GLN
1	A	111	GLN
1	B	3	GLN
1	B	54	GLN
1	B	118	ASN
1	C	65	ASN
1	C	111	GLN
1	C	155	ASN
1	D	3	GLN

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Mol	Chain	Res	Type
1	D	25	ASN
1	D	111	GLN
1	E	25	ASN
1	E	45	GLN
1	E	135	GLN
1	E	155	ASN
1	F	45	GLN
1	F	69	GLN
1	F	111	GLN
1	G	69	GLN
1	G	148	HIS
1	H	138	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 carbohydrates in this entry.

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

Of 26 ligands modelled in this entry, 18 are monoatomic - leaving 8 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	$\# Z  > 2$
4	GOL	A	904	-	5,5,5	0.32	0	5,5,5	0.48	0
4	GOL	E	905	-	5,5,5	0.45	0	5,5,5	1.29	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	GOL	D	903	-	5,5,5	0.48	0	5,5,5	0.37	0
4	GOL	G	906	-	5,5,5	0.37	0	5,5,5	0.30	0
4	GOL	B	902	-	5,5,5	0.28	0	5,5,5	0.96	0
4	GOL	E	909	-	5,5,5	0.39	0	5,5,5	0.49	0
4	GOL	A	901	-	5,5,5	0.33	0	5,5,5	0.42	0
4	GOL	E	907	-	5,5,5	0.30	0	5,5,5	0.48	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. '2' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GOL	A	904	-	-	1/4/4/4	-
4	GOL	E	905	-	-	2/4/4/4	-
4	GOL	D	903	-	-	3/4/4/4	-
4	GOL	G	906	-	-	4/4/4/4	-
4	GOL	B	902	-	-	4/4/4/4	-
4	GOL	E	909	-	-	1/4/4/4	-
4	GOL	A	901	-	-	2/4/4/4	-
4	GOL	E	907	-	-	2/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (19) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	E	905	GOL	O1-C1-C2-C3
4	E	907	GOL	O1-C1-C2-O2
4	E	907	GOL	O1-C1-C2-C3
4	A	901	GOL	O1-C1-C2-C3
4	G	906	GOL	C1-C2-C3-O3
4	G	906	GOL	O2-C2-C3-O3
4	B	902	GOL	O2-C2-C3-O3
4	G	906	GOL	O1-C1-C2-O2
4	B	902	GOL	O1-C1-C2-C3
4	B	902	GOL	C1-C2-C3-O3
4	D	903	GOL	C1-C2-C3-O3

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Mol	Chain	Res	Type	Atoms
4	G	906	GOL	O1-C1-C2-C3
4	E	905	GOL	O1-C1-C2-O2
4	B	902	GOL	O1-C1-C2-O2
4	A	901	GOL	O1-C1-C2-O2
4	E	909	GOL	O1-C1-C2-C3
4	D	903	GOL	O1-C1-C2-C3
4	D	903	GOL	O2-C2-C3-O3
4	A	904	GOL	C1-C2-C3-O3

There are no ring outliers.

4 monomers are involved in 7 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	E	905	GOL	2	0
4	D	903	GOL	1	0
4	B	902	GOL	2	0
4	E	907	GOL	2	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, 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	155/162 (95%)	1.00	25 (16%) 1 1	41, 48, 63, 81	0
1	B	155/162 (95%)	0.96	17 (10%) 5 5	39, 48, 60, 83	0
1	C	153/162 (94%)	1.00	26 (16%) 1 1	37, 48, 61, 76	0
1	D	155/162 (95%)	1.17	29 (18%) 1 1	42, 49, 62, 69	0
1	E	155/162 (95%)	1.11	27 (17%) 1 1	39, 48, 63, 96	0
1	F	153/162 (94%)	0.91	15 (9%) 7 7	38, 49, 61, 76	0
1	G	156/162 (96%)	1.57	50 (32%) 0 0	38, 49, 62, 76	0
1	H	153/162 (94%)	1.11	24 (15%) 2 1	38, 48, 63, 76	0
All	All	1235/1296 (95%)	1.11	213 (17%) 1 1	37, 48, 62, 96	0

All (213) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	G	26	VAL	9.7
1	E	4	LEU	9.3
1	E	158	LEU	8.6
1	G	34	LEU	7.5
1	F	158	LEU	7.4
1	G	33	ALA	6.8
1	H	5	THR	6.6
1	E	3	GLN	6.2
1	D	34	LEU	6.1
1	G	36	PRO	6.1
1	D	38	PRO	5.6
1	D	33	ALA	5.5
1	D	37	SER	5.1
1	D	3	GLN	5.0
1	G	4	LEU	5.0
1	H	158	LEU	5.0

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	A	71	PHE	4.9
1	D	44	LYS	4.8
1	B	71	PHE	4.8
1	A	80	LYS	4.7
1	B	4	LEU	4.7
1	G	23	LEU	4.6
1	G	9	THR	4.5
1	G	37	SER	4.4
1	A	97	LEU	4.4
1	G	110	LEU	4.4
1	E	33	ALA	4.3
1	A	109	LEU	4.3
1	G	32	VAL	4.2
1	G	25	ASN	4.2
1	H	7	ASP	4.2
1	G	35	SER	4.1
1	C	5	THR	4.0
1	E	5	THR	4.0
1	C	158	LEU	3.9
1	E	142	VAL	3.9
1	G	65	ASN	3.8
1	F	6	LEU	3.8
1	A	72	ILE	3.8
1	G	43	LEU	3.7
1	D	36	PRO	3.7
1	E	77	ARG	3.7
1	H	48	ASP	3.7
1	D	4	LEU	3.7
1	D	158	LEU	3.6
1	H	6	LEU	3.6
1	G	28	LEU	3.6
1	C	112	ALA	3.5
1	G	109	LEU	3.5
1	H	81	ASP	3.4
1	E	87	ALA	3.4
1	F	5	THR	3.4
1	H	8	LYS	3.4
1	H	142	VAL	3.4
1	G	41	ARG	3.3
1	E	35	SER	3.3
1	F	33	ALA	3.3
1	B	109	LEU	3.3

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	C	109	LEU	3.3
1	A	81	ASP	3.2
1	D	45	GLN	3.2
1	B	70	ALA	3.2
1	H	49	ALA	3.2
1	A	79	ALA	3.2
1	A	112	ALA	3.2
1	F	109	LEU	3.1
1	G	68	LEU	3.1
1	E	8	LYS	3.1
1	A	141	PHE	3.1
1	C	102	LEU	3.1
1	G	27	GLU	3.1
1	A	70	ALA	3.1
1	A	142	VAL	3.1
1	G	98	SER	3.1
1	D	65	ASN	3.1
1	H	40	LEU	3.0
1	D	31	ARG	3.0
1	E	9	THR	3.0
1	B	97	LEU	3.0
1	G	29	SER	3.0
1	F	92	LYS	3.0
1	C	157	LEU	3.0
1	E	31	ARG	3.0
1	A	113	PHE	3.0
1	H	50	GLY	3.0
1	G	30	GLU	3.0
1	C	70	ALA	2.9
1	E	6	LEU	2.9
1	G	13	ILE	2.9
1	C	48	ASP	2.9
1	C	110	LEU	2.9
1	F	97	LEU	2.9
1	G	81	ASP	2.9
1	G	3	GLN	2.9
1	H	9	THR	2.9
1	G	71	PHE	2.9
1	G	8	LYS	2.9
1	G	5	THR	2.8
1	B	52	VAL	2.8
1	D	26	VAL	2.8

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	G	31	ARG	2.8
1	C	22	ARG	2.8
1	D	35	SER	2.8
1	C	72	ILE	2.8
1	D	41	ARG	2.8
1	C	97	LEU	2.8
1	D	155	ASN	2.8
1	H	46	LEU	2.7
1	B	78	LYS	2.7
1	G	141	PHE	2.7
1	B	3	GLN	2.7
1	G	2	PRO	2.7
1	B	102	LEU	2.7
1	G	40	LEU	2.7
1	G	102	LEU	2.7
1	G	48	ASP	2.7
1	A	111	GLN	2.7
1	H	11	ILE	2.7
1	C	85	ASP	2.7
1	D	30	GLU	2.7
1	E	157	LEU	2.7
1	F	102	LEU	2.7
1	E	155	ASN	2.7
1	G	112	ALA	2.6
1	C	143	LEU	2.6
1	D	68	LEU	2.6
1	G	97	LEU	2.6
1	H	102	LEU	2.6
1	B	100	PHE	2.6
1	G	70	ALA	2.6
1	B	141	PHE	2.5
1	H	122	HIS	2.5
1	A	98	SER	2.5
1	F	35	SER	2.5
1	C	122	HIS	2.5
1	A	73	ARG	2.5
1	G	96	VAL	2.5
1	A	4	LEU	2.5
1	E	132	HIS	2.5
1	D	5	THR	2.5
1	C	17	LEU	2.5
1	H	70	ALA	2.5

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	B	113	PHE	2.5
1	C	139	SER	2.5
1	E	30	GLU	2.5
1	E	80	LYS	2.4
1	G	80	LYS	2.4
1	F	32	VAL	2.4
1	A	102	LEU	2.4
1	D	71	PHE	2.4
1	C	49	ALA	2.4
1	F	31	ARG	2.4
1	D	49	ALA	2.4
1	G	22	ARG	2.4
1	A	66	LEU	2.3
1	D	32	VAL	2.3
1	G	140	SER	2.3
1	G	44	LYS	2.3
1	D	110	LEU	2.3
1	G	6	LEU	2.3
1	F	98	SER	2.3
1	H	32	VAL	2.3
1	E	68	LEU	2.3
1	G	38	PRO	2.3
1	H	65	ASN	2.3
1	C	124	VAL	2.2
1	G	139	SER	2.2
1	F	43	LEU	2.2
1	H	141	PHE	2.2
1	E	70	ALA	2.2
1	B	72	ILE	2.2
1	G	72	ILE	2.2
1	B	110	LEU	2.2
1	D	102	LEU	2.2
1	H	68	LEU	2.2
1	A	132	HIS	2.2
1	F	96	VAL	2.2
1	E	97	LEU	2.2
1	H	41	ARG	2.2
1	A	139	SER	2.2
1	G	108	TYR	2.2
1	D	141	PHE	2.2
1	E	141	PHE	2.2
1	E	102	LEU	2.2

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Mol	Chain	Res	Type	RSRZ
1	D	48	ASP	2.2
1	C	142	VAL	2.2
1	E	150	THR	2.1
1	H	23	LEU	2.1
1	B	16	VAL	2.1
1	C	41	ARG	2.1
1	E	7	ASP	2.1
1	E	34	LEU	2.1
1	B	111	GLN	2.1
1	A	143	LEU	2.1
1	C	68	LEU	2.1
1	A	84	GLU	2.1
1	D	8	LYS	2.1
1	D	84	GLU	2.1
1	G	12	LYS	2.1
1	C	111	GLN	2.1
1	E	72	ILE	2.1
1	G	99	CYS	2.1
1	H	45	GLN	2.0
1	C	71	PHE	2.0
1	F	100	PHE	2.0
1	A	101	ALA	2.0
1	C	8	LYS	2.0
1	C	98	SER	2.0
1	G	113	PHE	2.0
1	A	68	LEU	2.0
1	A	158	LEU	2.0
1	D	97	LEU	2.0
1	B	151	SER	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 carbohydrates 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
4	GOL	B	902	6/6	0.43	0.29	81,85,89,101	0
4	GOL	E	905	6/6	0.66	0.46	68,71,78,88	0
4	GOL	A	904	6/6	0.70	0.31	77,91,96,99	0
4	GOL	E	907	6/6	0.73	0.26	66,72,81,83	0
4	GOL	A	901	6/6	0.74	0.18	60,69,79,79	0
4	GOL	D	903	6/6	0.77	0.24	55,71,74,76	0
4	GOL	G	906	6/6	0.80	0.19	81,96,97,104	0
4	GOL	E	909	6/6	0.85	0.18	51,80,86,87	0
2	CA	D	1007	1/1	0.93	0.10	53,53,53,53	0
2	CA	B	1008	1/1	0.93	0.13	62,62,62,62	0
3	CL	E	1017	1/1	0.94	0.06	65,65,65,65	0
2	CA	G	1003	1/1	0.94	0.07	57,57,57,57	0
2	CA	A	1004	1/1	0.95	0.08	69,69,69,69	0
2	CA	C	1001	1/1	0.95	0.09	59,59,59,59	0
3	CL	E	1020	1/1	0.96	0.05	56,56,56,56	0
2	CA	H	1006	1/1	0.96	0.11	58,58,58,58	0
3	CL	C	1016	1/1	0.96	0.11	56,56,56,56	0
2	CA	F	1005	1/1	0.97	0.23	64,64,64,64	0
3	CL	F	1018	1/1	0.98	0.07	68,68,68,68	0
3	CL	B	1012	1/1	0.98	0.10	53,53,53,53	0
2	CA	C	1002	1/1	0.98	0.05	48,48,48,48	0
3	CL	C	1009	1/1	0.98	0.06	47,47,47,47	0
3	CL	A	1011	1/1	0.99	0.04	41,41,41,41	0
3	CL	D	1014	1/1	0.99	0.11	60,60,60,60	0
3	CL	F	1019	1/1	0.99	0.04	56,56,56,56	0
3	CL	B	1015	1/1	1.00	0.17	64,64,64,64	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.