



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 24, 2025 – 07:16 pm BST

PDB ID : 5N89 / pdb\_00005n89  
Title : CRYSTAL STRUCTURE OF STREPTAVIDIN WITH PEPTIDE GNSFD-DWLASKG  
Authors : Lyamichev, V.; Goodrich, L.; Sullivan, E.; Bannen, R.; Benz, J.; Albert, T.; Patel, J.  
Deposited on : 2017-02-23  
Resolution : 1.27 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 : 4-5-2 with Phenix2.0rc1  
Mogul : 1.8.4, CSD as541be (2020)  
Xtriage (Phenix) : 2.0rc1  
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) : 2.44

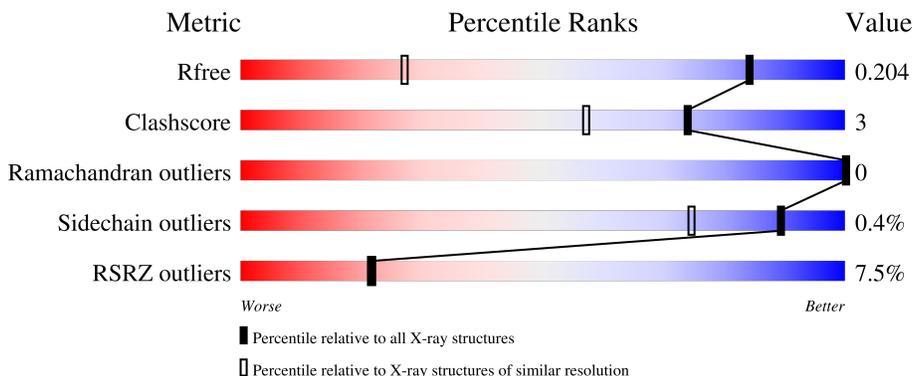
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 1.27 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	2484 (1.30-1.26)
Clashscore	180529	2694 (1.30-1.26)
Ramachandran outliers	177936	2628 (1.30-1.26)
Sidechain outliers	177891	2627 (1.30-1.26)
RSRZ outliers	164620	2481 (1.30-1.26)

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	183	
1	B	183	
1	D	183	
1	F	183	
1	H	183	

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Mol	Chain	Length	Quality of chain
1	K	183	<p>4% 63% 35%</p>
1	M	183	<p>8% 65% 33%</p>
1	O	183	<p>4% 63% 34%</p>
2	C	13	<p>8% 100%</p>
2	E	13	<p>8% 100%</p>
2	G	13	<p>100%</p>
2	I	13	<p>8% 100%</p>
2	J	13	<p>8% 100%</p>
2	L	13	<p>38% 92% 8%</p>
2	N	13	<p>8% 100%</p>
2	P	13	<p>8% 100%</p>

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 9309 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 Streptavidin.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
1	A	121	Total 928	C 581	N 158	O 189	0	7	0
1	B	122	Total 929	C 582	N 158	O 189	0	6	0
1	D	122	Total 937	C 588	N 159	O 190	0	7	0
1	F	122	Total 929	C 582	N 158	O 189	0	5	0
1	H	122	Total 929	C 582	N 158	O 189	0	6	0
1	K	119	Total 911	C 571	N 156	O 184	0	6	0
1	M	122	Total 936	C 587	N 159	O 190	0	7	0
1	O	120	Total 916	C 574	N 157	O 185	0	6	0

- Molecule 2 is a protein called GLY-ASN-SER-PHE-ASP-ASP-TRP-LEU-ALA-SER-LYS-GLY-NH<sub>2</sub>.

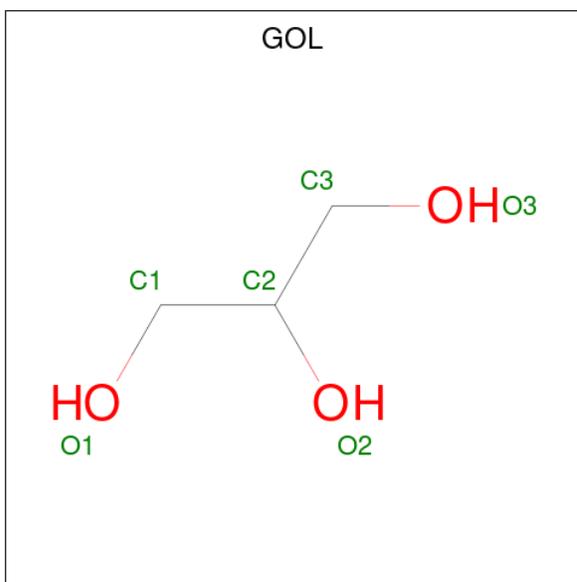
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
			Total	C	N	O			
2	C	13	Total 92	C 57	N 16	O 19	0	0	1
2	E	13	Total 92	C 57	N 16	O 19	0	0	1
2	G	13	Total 92	C 57	N 16	O 19	0	0	1
2	I	13	Total 92	C 57	N 16	O 19	0	0	1
2	J	13	Total 92	C 57	N 16	O 19	0	0	1
2	L	12	Total 88	C 55	N 15	O 18	0	0	1

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	N	13	Total	C	N	O	0	0	1
			92	57	16	19			
2	P	13	Total	C	N	O	0	0	1
			92	57	16	19			

- Molecule 3 is GLYCEROL (CCD ID: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



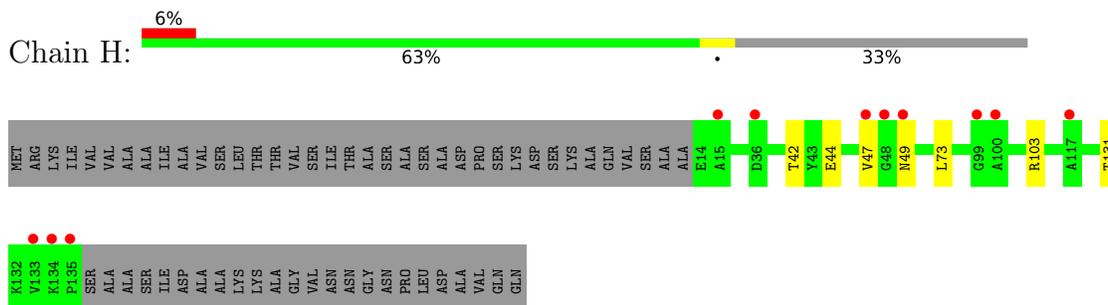
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			6	3	3		
3	B	1	Total	C	O	0	0
			6	3	3		
3	D	1	Total	C	O	0	0
			6	3	3		
3	F	1	Total	C	O	0	0
			6	3	3		
3	H	1	Total	C	O	0	0
			6	3	3		
3	K	1	Total	C	O	0	0
			6	3	3		
3	M	1	Total	C	O	0	0
			6	3	3		
3	O	1	Total	C	O	0	0
			6	3	3		

- Molecule 4 is water.

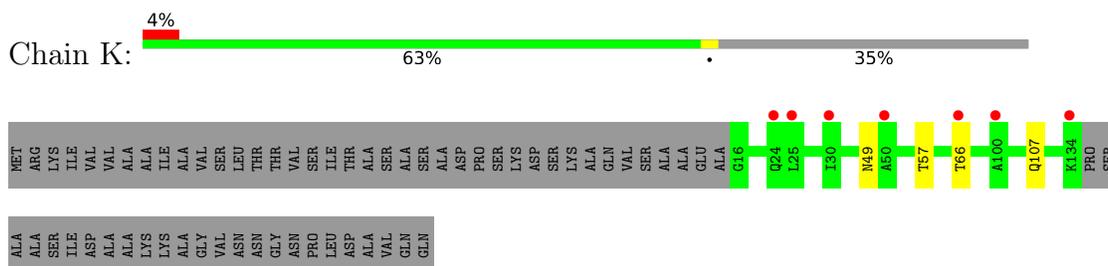
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	137	Total O 138 138	0	1
4	B	142	Total O 142 142	0	0
4	C	15	Total O 15 15	0	0
4	D	136	Total O 137 137	0	1
4	E	10	Total O 10 10	0	0
4	F	147	Total O 149 149	0	2
4	G	18	Total O 18 18	0	0
4	H	131	Total O 132 132	0	1
4	I	21	Total O 21 21	0	0
4	J	15	Total O 15 15	0	0
4	K	105	Total O 105 105	0	0
4	L	7	Total O 7 7	0	0
4	M	101	Total O 101 101	0	0
4	N	14	Total O 14 14	0	0
4	O	96	Total O 97 97	0	1
4	P	13	Total O 13 13	0	0



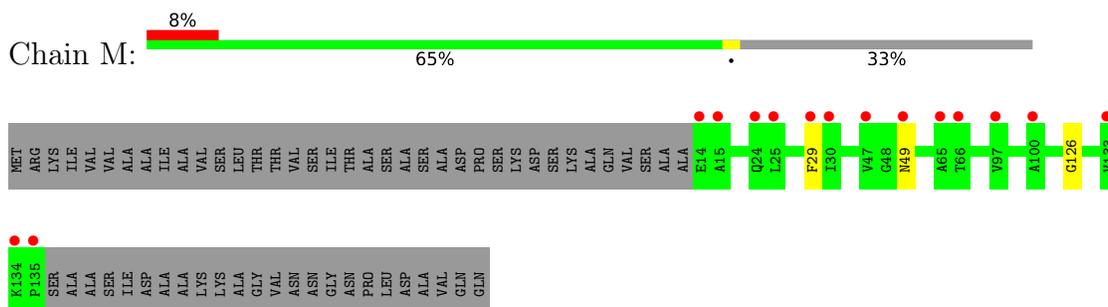
- Molecule 1: Streptavidin



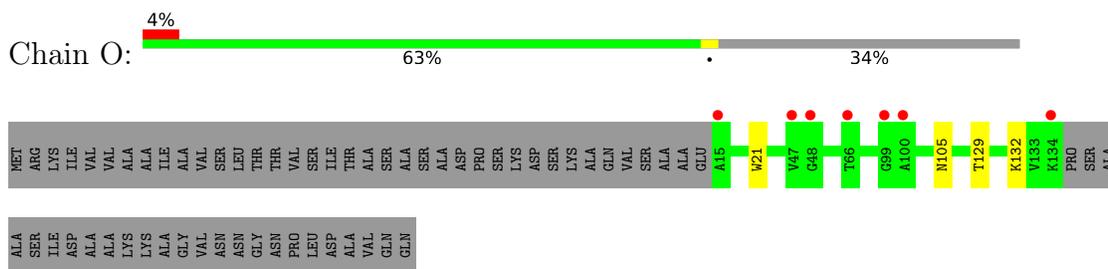
- Molecule 1: Streptavidin



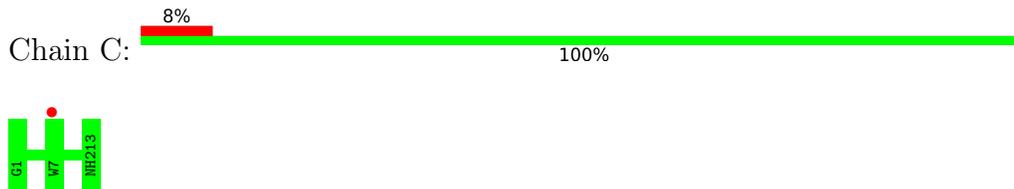
- Molecule 1: Streptavidin



- Molecule 1: Streptavidin



- Molecule 2: GLY-ASN-SER-PHE-ASP-ASP-TRP-LEU-ALA-SER-LYS-GLY-NH<sub>2</sub>



- Molecule 2: GLY-ASN-SER-PHE-ASP-ASP-TRP-LEU-ALA-SER-LYS-GLY-NH<sub>2</sub>



- Molecule 2: GLY-ASN-SER-PHE-ASP-ASP-TRP-LEU-ALA-SER-LYS-GLY-NH2



There are no outlier residues recorded for this chain.

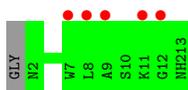
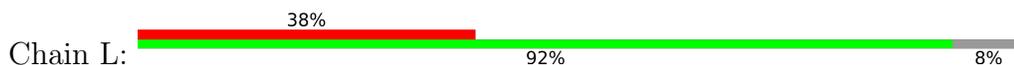
- Molecule 2: GLY-ASN-SER-PHE-ASP-ASP-TRP-LEU-ALA-SER-LYS-GLY-NH2



- Molecule 2: GLY-ASN-SER-PHE-ASP-ASP-TRP-LEU-ALA-SER-LYS-GLY-NH2



- Molecule 2: GLY-ASN-SER-PHE-ASP-ASP-TRP-LEU-ALA-SER-LYS-GLY-NH2



- Molecule 2: GLY-ASN-SER-PHE-ASP-ASP-TRP-LEU-ALA-SER-LYS-GLY-NH2



- Molecule 2: GLY-ASN-SER-PHE-ASP-ASP-TRP-LEU-ALA-SER-LYS-GLY-NH2



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	58.31Å 58.30Å 88.28Å 104.38° 91.03° 88.43°	Depositor
Resolution (Å)	85.51 – 1.27 85.51 – 1.27	Depositor EDS
% Data completeness (in resolution range)	97.0 (85.51-1.27) 96.9 (85.51-1.27)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.39 (at 1.27Å)	Xtrriage
Refinement program	REFMAC 5.8.0158	Depositor
R, $R_{free}$	0.180 , 0.204 0.180 , 0.204	Depositor DCC
$R_{free}$ test set	14626 reflections (4.93%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	15.0	Xtrriage
Anisotropy	0.210	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 41.2	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	0.018 for h,-k,-l	Xtrriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	9309	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	21.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.39% 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: NH2, GOL

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	0.84	0/968	0.79	0/1324
1	B	0.88	0/967	0.83	0/1324
1	D	0.82	0/978	0.78	0/1340
1	F	0.93	0/964	0.86	1/1321 (0.1%)
1	H	0.79	0/967	0.79	0/1324
1	K	0.71	0/948	0.76	0/1297
1	M	0.82	1/977 (0.1%)	0.79	0/1338
1	O	0.76	0/953	0.76	0/1304
2	C	0.72	0/93	0.68	0/124
2	E	0.80	0/93	0.93	0/124
2	G	0.71	0/93	0.71	0/124
2	I	0.76	0/93	0.73	0/124
2	J	0.79	0/93	0.71	0/124
2	L	0.61	0/89	0.83	0/119
2	N	0.74	0/93	0.71	0/124
2	P	0.78	0/93	0.87	0/124
All	All	0.82	1/8462 (0.0%)	0.80	1/11559 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	M	29	PHE	N-CA	5.14	1.52	1.46

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	29	PHE	N-CA-C	-5.28	98.79	108.02

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	928	0	883	11	0
1	B	929	0	882	9	0
1	D	937	0	894	10	0
1	F	929	0	878	12	0
1	H	929	0	882	7	0
1	K	911	0	867	3	0
1	M	936	0	892	1	0
1	O	916	0	872	2	0
2	C	92	0	80	0	0
2	E	92	0	80	0	0
2	G	92	0	80	0	0
2	I	92	0	80	0	0
2	J	92	0	80	0	0
2	L	88	0	74	0	0
2	N	92	0	80	0	0
2	P	92	0	80	0	0
3	A	6	0	8	1	0
3	B	6	0	8	0	0
3	D	6	0	8	0	0
3	F	6	0	8	1	0
3	H	6	0	8	0	0
3	K	6	0	8	0	0
3	M	6	0	8	0	0
3	O	6	0	8	0	0
4	A	138	0	0	4	0
4	B	142	0	0	0	0
4	C	15	0	0	0	0
4	D	137	0	0	1	0
4	E	10	0	0	0	0
4	F	149	0	0	3	0
4	G	18	0	0	0	0
4	H	132	0	0	5	0
4	I	21	0	0	0	0
4	J	15	0	0	0	0
4	K	105	0	0	0	0
4	L	7	0	0	0	0
4	M	101	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	N	14	0	0	0	0
4	O	97	0	0	0	0
4	P	13	0	0	0	0
All	All	9309	0	7748	40	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 3.

All (40) 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)
3:A:201:GOL:O3	4:A:301:HOH:O	1.75	0.77
1:F:24:GLN:NE2	4:F:301:HOH:O	2.19	0.75
1:F:128[B]:ASP:OD2	3:F:201:GOL:O1	2.04	0.72
1:F:42[A]:THR:HG22	4:F:352:HOH:O	1.93	0.68
1:A:42[A]:THR:HG22	4:A:398:HOH:O	1.94	0.67
1:A:57[A]:THR:HG21	1:D:57[A]:THR:CG2	2.25	0.66
1:H:42[A]:THR:HG22	4:H:317:HOH:O	1.99	0.63
1:A:57[A]:THR:CG2	1:D:57[A]:THR:HG21	2.30	0.62
1:A:57[A]:THR:HG21	1:D:57[A]:THR:HG21	1.82	0.60
1:A:57[A]:THR:CG2	1:D:57[A]:THR:CG2	2.79	0.60
1:B:57[A]:THR:HG21	1:F:57[A]:THR:CG2	2.32	0.60
1:B:57[A]:THR:CG2	1:F:57[A]:THR:CG2	2.81	0.59
1:F:131[B]:THR:HG21	4:F:420:HOH:O	2.06	0.55
1:B:57[A]:THR:CG2	1:F:57[A]:THR:HG21	2.37	0.54
1:K:107[B]:GLN:HE22	1:M:126:GLY:HA2	1.73	0.53
1:A:128:ASP:HB2	4:A:301:HOH:O	2.09	0.52
1:D:105:ASN:OD1	1:D:129[B]:THR:HG22	2.12	0.50
1:B:57[A]:THR:CG2	1:F:57[A]:THR:HG22	2.40	0.50
1:D:42[A]:THR:HG22	4:D:362:HOH:O	2.11	0.50
1:A:57[A]:THR:HG21	1:D:57[A]:THR:HG22	1.95	0.49
1:H:42[A]:THR:HG23	4:H:367:HOH:O	2.12	0.49
1:B:57[A]:THR:HG21	1:F:57[A]:THR:HG21	1.95	0.48
1:K:49:ASN:C	1:K:49:ASN:HD22	2.21	0.47
1:A:57[A]:THR:CG2	1:D:57[A]:THR:HG22	2.46	0.46
1:A:128:ASP:CB	4:A:301:HOH:O	2.64	0.46
1:B:57[A]:THR:HG22	1:F:57[A]:THR:CG2	2.45	0.45
1:H:103:ARG:HD3	1:H:131:THR:HG22	1.98	0.45
1:H:44:GLU:OE1	4:H:301:HOH:O	2.21	0.45
1:O:105:ASN:OD1	1:O:129[A]:THR:HG23	2.16	0.44
1:H:49:ASN:N	1:H:49:ASN:OD1	2.52	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:O:21:TRP:CZ2	1:O:132:LYS:HE3	2.53	0.43
1:A:107[B]:GLN:NE2	1:B:126:GLY:HA2	2.33	0.43
1:H:47:VAL:HA	4:H:301:HOH:O	2.18	0.42
1:H:73:LEU:C	1:H:73:LEU:HD12	2.44	0.42
1:A:57[A]:THR:HG22	1:D:57[A]:THR:CG2	2.49	0.42
1:D:73:LEU:C	1:D:73:LEU:HD12	2.44	0.42
1:B:57[A]:THR:HG21	1:F:57[A]:THR:HG22	1.99	0.42
1:B:73:LEU:C	1:B:73:LEU:HD12	2.44	0.42
1:F:103:ARG:NH2	1:F:131[B]:THR:HG23	2.37	0.40
4:H:362:HOH:O	1:K:57:THR:HG21	2.22	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	125/183 (68%)	123 (98%)	2 (2%)	0	100	100
1	B	125/183 (68%)	123 (98%)	2 (2%)	0	100	100
1	D	126/183 (69%)	125 (99%)	1 (1%)	0	100	100
1	F	124/183 (68%)	121 (98%)	3 (2%)	0	100	100
1	H	125/183 (68%)	123 (98%)	2 (2%)	0	100	100
1	K	122/183 (67%)	121 (99%)	1 (1%)	0	100	100
1	M	126/183 (69%)	125 (99%)	1 (1%)	0	100	100
1	O	123/183 (67%)	123 (100%)	0	0	100	100
2	C	11/13 (85%)	11 (100%)	0	0	100	100
2	E	10/13 (77%)	10 (100%)	0	0	100	100
2	G	11/13 (85%)	11 (100%)	0	0	100	100
2	I	10/13 (77%)	10 (100%)	0	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	J	11/13 (85%)	11 (100%)	0	0	100	100
2	L	9/13 (69%)	9 (100%)	0	0	100	100
2	N	10/13 (77%)	10 (100%)	0	0	100	100
2	P	10/13 (77%)	10 (100%)	0	0	100	100
All	All	1078/1568 (69%)	1066 (99%)	12 (1%)	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	95/134 (71%)	95 (100%)	0	100	100
1	B	95/134 (71%)	94 (99%)	1 (1%)	70	39
1	D	96/134 (72%)	96 (100%)	0	100	100
1	F	94/134 (70%)	94 (100%)	0	100	100
1	H	95/134 (71%)	95 (100%)	0	100	100
1	K	93/134 (69%)	92 (99%)	1 (1%)	70	39
1	M	96/134 (72%)	95 (99%)	1 (1%)	73	43
1	O	93/134 (69%)	93 (100%)	0	100	100
2	C	9/9 (100%)	9 (100%)	0	100	100
2	E	9/9 (100%)	9 (100%)	0	100	100
2	G	9/9 (100%)	9 (100%)	0	100	100
2	I	9/9 (100%)	9 (100%)	0	100	100
2	J	9/9 (100%)	9 (100%)	0	100	100
2	L	9/9 (100%)	9 (100%)	0	100	100
2	N	9/9 (100%)	9 (100%)	0	100	100
2	P	9/9 (100%)	9 (100%)	0	100	100
All	All	829/1144 (72%)	826 (100%)	3 (0%)	89	74

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	103	ARG
1	K	66	THR
1	M	49	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	82	ASN
1	B	82	ASN
1	D	82	ASN
1	F	82	ASN
1	H	82	ASN
1	K	49	ASN
1	K	82	ASN
1	M	82	ASN
1	O	82	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](#)

8 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
3	GOL	A	201	-	5,5,5	0.32	0	5,5,5	0.56	0
3	GOL	M	201	-	5,5,5	0.47	0	5,5,5	0.36	0
3	GOL	B	201	-	5,5,5	0.49	0	5,5,5	0.57	0
3	GOL	K	201	-	5,5,5	0.25	0	5,5,5	0.65	0
3	GOL	H	201	-	5,5,5	0.39	0	5,5,5	0.58	0
3	GOL	O	201	-	5,5,5	0.44	0	5,5,5	0.63	0
3	GOL	D	201	-	5,5,5	0.60	0	5,5,5	0.48	0
3	GOL	F	201	-	5,5,5	0.29	0	5,5,5	0.74	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	201	-	-	0/4/4/4	-
3	GOL	M	201	-	-	0/4/4/4	-
3	GOL	B	201	-	-	0/4/4/4	-
3	GOL	K	201	-	-	1/4/4/4	-
3	GOL	H	201	-	-	0/4/4/4	-
3	GOL	O	201	-	-	0/4/4/4	-
3	GOL	D	201	-	-	0/4/4/4	-
3	GOL	F	201	-	-	0/4/4/4	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	K	201	GOL	C1-C2-C3-O3

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	201	GOL	1	0
3	F	201	GOL	1	0

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
2	L	1
2	N	1
2	P	1
2	E	1
2	I	1
2	C	1
2	J	1
2	G	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	L	12:GLY	C	13:NH2	N	2.59
1	N	12:GLY	C	13:NH2	N	2.59
1	P	12:GLY	C	13:NH2	N	2.25
1	E	12:GLY	C	13:NH2	N	2.23
1	I	12:GLY	C	13:NH2	N	2.10
1	C	12:GLY	C	13:NH2	N	1.88
1	J	12:GLY	C	13:NH2	N	1.70
1	G	12:GLY	C	13:NH2	N	1.61

## 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	121/183 (66%)	0.15	4 (3%) 49 50	6, 15, 30, 52	7 (5%)
1	B	122/183 (66%)	0.33	9 (7%) 22 22	7, 16, 31, 54	6 (4%)
1	D	122/183 (66%)	0.37	8 (6%) 26 26	6, 17, 33, 52	7 (5%)
1	F	122/183 (66%)	0.21	8 (6%) 26 26	8, 14, 32, 50	5 (4%)
1	H	122/183 (66%)	0.31	11 (9%) 17 15	8, 15, 38, 57	6 (4%)
1	K	119/183 (65%)	0.57	7 (5%) 29 30	8, 19, 42, 73	6 (5%)
1	M	122/183 (66%)	0.59	15 (12%) 9 8	7, 19, 42, 54	7 (5%)
1	O	120/183 (65%)	0.61	7 (5%) 30 30	7, 22, 41, 58	6 (5%)
2	C	12/13 (92%)	0.60	1 (8%) 19 18	16, 20, 30, 37	0
2	E	12/13 (92%)	0.83	1 (8%) 19 18	16, 23, 35, 40	0
2	G	12/13 (92%)	0.36	0 100 100	15, 19, 30, 33	0
2	I	12/13 (92%)	0.53	1 (8%) 19 18	14, 18, 28, 38	0
2	J	12/13 (92%)	0.52	1 (8%) 19 18	16, 18, 34, 35	0
2	L	11/13 (84%)	1.72	5 (45%) 1 0	22, 35, 42, 53	0
2	N	12/13 (92%)	0.51	1 (8%) 19 18	16, 20, 38, 41	0
2	P	12/13 (92%)	0.62	1 (8%) 19 18	16, 20, 32, 37	0
All	All	1065/1568 (67%)	0.42	80 (7%) 22 21	6, 18, 39, 73	50 (4%)

All (80) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	K	25	LEU	5.4
1	D	135	PRO	4.8
1	H	100	ALA	4.5
1	M	135	PRO	4.5
1	O	15	ALA	4.3

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	K	134	LYS	4.2
1	F	135	PRO	4.2
1	F	29	PHE	4.1
1	H	134	LYS	4.1
1	H	135	PRO	4.1
1	A	100	ALA	3.9
1	B	135	PRO	3.9
1	A	134	LYS	3.7
1	K	30	ILE	3.7
2	L	7	TRP	3.6
1	K	100	ALA	3.5
1	F	25	LEU	3.5
1	F	47	VAL	3.4
1	B	134	LYS	3.4
1	H	47	VAL	3.2
1	M	47	VAL	3.2
1	M	15	ALA	3.2
1	O	47	VAL	3.1
1	M	29	PHE	3.1
1	M	25	LEU	3.1
1	D	134	LYS	3.1
1	B	133	VAL	3.0
1	F	134	LYS	3.0
1	D	100	ALA	3.0
1	O	66	THR	2.9
1	F	24	GLN	2.9
1	K	24	GLN	2.9
2	E	1	GLY	2.9
1	K	50	ALA	2.8
2	L	9	ALA	2.8
1	M	66	THR	2.8
1	F	49	ASN	2.8
1	O	99	GLY	2.8
1	M	134	LYS	2.8
1	O	100	ALA	2.7
1	H	49	ASN	2.7
2	C	7	TRP	2.7
1	A	47	VAL	2.7
1	M	30	ILE	2.6
2	L	11	LYS	2.6
1	M	97[A]	VAL	2.6
1	M	24	GLN	2.5

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Mol	Chain	Res	Type	RSRZ
2	J	1	GLY	2.5
1	H	36	ASP	2.5
1	M	49	ASN	2.5
2	P	1	GLY	2.5
1	B	47	VAL	2.5
1	D	15	ALA	2.5
1	K	66	THR	2.5
2	I	1	GLY	2.4
1	O	134	LYS	2.4
2	N	12	GLY	2.4
1	H	133	VAL	2.4
1	M	133	VAL	2.4
1	A	14	GLU	2.4
1	H	48	GLY	2.4
2	L	12	GLY	2.4
1	H	15	ALA	2.3
1	M	65	ALA	2.3
1	M	100	ALA	2.3
1	D	24	GLN	2.3
1	B	48	GLY	2.3
1	B	35	ALA	2.3
1	O	48	GLY	2.2
1	B	14	GLU	2.2
1	B	66	THR	2.2
1	F	48	GLY	2.2
1	D	14	GLU	2.2
2	L	8	LEU	2.2
1	H	99	GLY	2.1
1	B	24	GLN	2.1
1	D	35	ALA	2.0
1	D	98	GLY	2.0
1	M	14	GLU	2.0
1	H	117	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, 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	K	201	6/6	0.87	0.13	20,24,30,34	0
3	GOL	H	201	6/6	0.89	0.12	19,21,27,29	0
3	GOL	F	201	6/6	0.93	0.08	14,15,20,23	0
3	GOL	M	201	6/6	0.96	0.07	14,15,18,19	0
3	GOL	B	201	6/6	0.97	0.06	12,13,15,15	0
3	GOL	D	201	6/6	0.97	0.05	12,13,14,15	0
3	GOL	A	201	6/6	0.97	0.06	12,13,14,15	0
3	GOL	O	201	6/6	0.97	0.06	14,14,15,17	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.