



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 18, 2025 – 04:07 pm BST

PDB ID : 8S6K / pdb\_00008s6k  
Title : Crystal structure of ScFv-G2D11 complexed to a bis-Tn glycopeptide  
Authors : Hurtado-Guerrero, R.; Macias-Leon, J.  
Deposited on : 2024-02-27  
Resolution : 1.75 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  
buster-report : 1.1.7 (2018)  
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

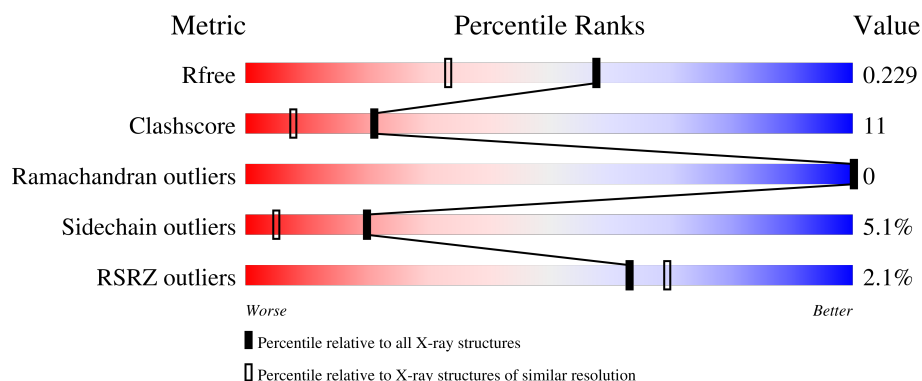
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

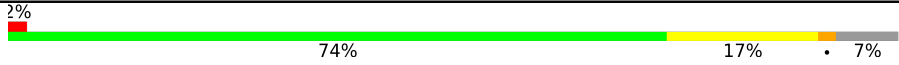



The reported resolution of this entry is 1.75 Å.

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	2888 (1.76-1.76)
Clashscore	180529	3097 (1.76-1.76)
Ramachandran outliers	177936	3072 (1.76-1.76)
Sidechain outliers	177891	3072 (1.76-1.76)
RSRZ outliers	164620	2887 (1.76-1.76)

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	250	 2% 74% 17% 7%
1	H	250	 2% 78% 12% 7%
2	M	8	 62% 25% 12%
2	N	8	 75% 12% 12%

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
3	EDO	A	301	-	X	X	-
3	EDO	A	307	-	X	-	-
3	EDO	H	301	-	-	X	-
3	EDO	H	303	-	-	X	-

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 4213 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 ScFv-G2D11.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	233	Total	C	N	O	S	0	2	0
			1788	1123	300	357	8			
1	H	232	Total	C	N	O	S	0	2	0
			1782	1120	299	355	8			

- Molecule 2 is a protein called Mucin-1 subunit alpha.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	M	8	Total	C	N	O	0	0	1
			42	25	8	9			
2	N	8	Total	C	N	O	0	0	1
			42	25	8	9			

There are 2 discrepancies between the modelled and reference sequences:

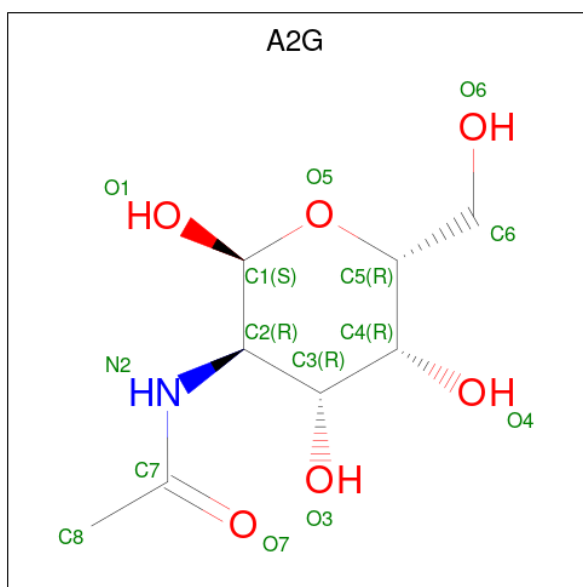
Chain	Residue	Modelled	Actual	Comment	Reference
M	8	NH2	-	amidation	UNP P15941
N	8	NH2	-	amidation	UNP P15941

- Molecule 3 is 1,2-ETHANEDIOL (CCD ID: EDO) (formula: C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	A	1	Total	C	O	0	0
			4	2	2		
3	H	1	Total	C	O	0	0
			4	2	2		
3	H	1	Total	C	O	0	0
			4	2	2		
3	H	1	Total	C	O	0	0
			4	2	2		
3	H	1	Total	C	O	0	0
			4	2	2		

- Molecule 4 is 2-acetamido-2-deoxy- $\alpha$ -D-galactopyranose (CCD ID: A2G) (formula:  $C_8H_{15}NO_6$ ) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	M	1	Total	C	N	O	0	0
			14	8	1	5		
4	M	1	Total	C	N	O	0	0
			14	8	1	5		
4	N	1	Total	C	N	O	0	0
			14	8	1	5		
4	N	1	Total	C	N	O	0	0
			14	8	1	5		

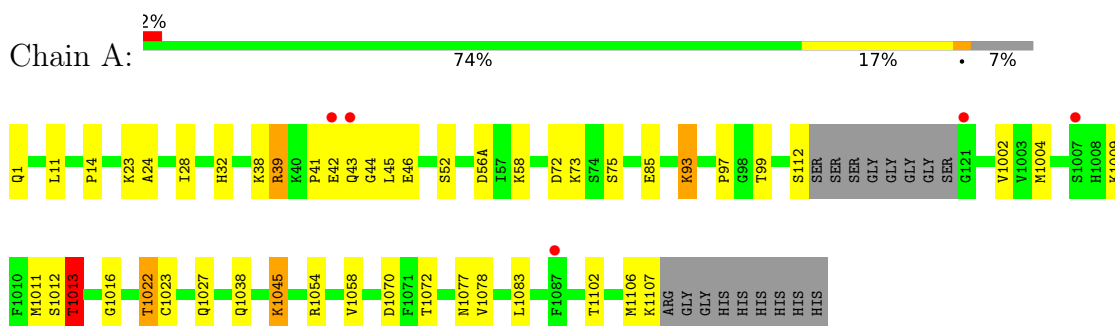
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	221	Total	O	0	0
			221	221		
5	H	207	Total	O	0	0
			207	207		
5	M	13	Total	O	0	0
			13	13		
5	N	14	Total	O	0	0
			14	14		

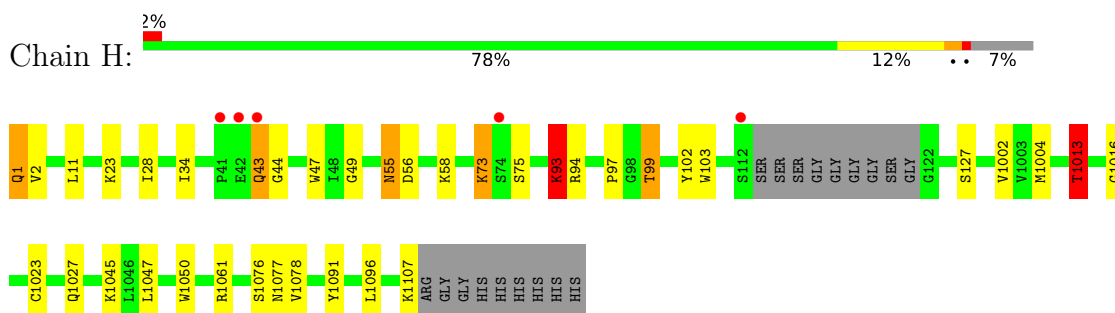
### 3 Residue-property plots [i](#)

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: ScFv-G2D11



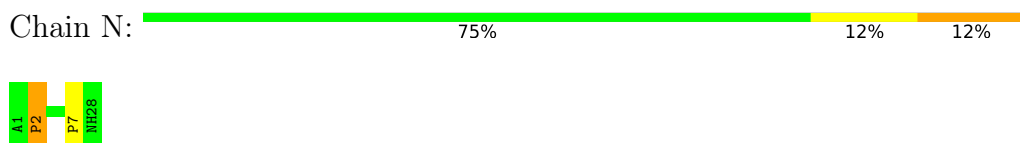
- Molecule 1: ScFv-G2D11



- Molecule 2: Mucin-1 subunit alpha



- Molecule 2: Mucin-1 subunit alpha



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	45.99Å 69.67Å 87.37Å 90.00° 102.99° 90.00°	Depositor
Resolution (Å)	19.90 – 1.75 19.90 – 1.75	Depositor EDS
% Data completeness (in resolution range)	96.0 (19.90-1.75) 96.1 (19.90-1.75)	Depositor EDS
$R_{merge}$	0.09	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.45 (at 1.74Å)	Xtriage
Refinement program	REFMAC 5.8.0267	Depositor
R, $R_{free}$	0.182 , 0.221 0.191 , 0.229	Depositor DCC
$R_{free}$ test set	2170 reflections (4.01%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	20.6	Xtriage
Anisotropy	0.519	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.37 , 47.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.51$ , $\langle L^2 \rangle = 0.34$	Xtriage
Estimated twinning fraction	0.024 for h,-k,-h-l	Xtriage
$F_o, F_c$ correlation	0.96	EDS
Total number of atoms	4213	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	25.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 10.28% 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: A2G, NH2, EDO

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	1.10	2/1834 (0.1%)	1.26	4/2479 (0.2%)
1	H	1.08	1/1828 (0.1%)	1.24	7/2471 (0.3%)
2	M	2.02	2/42 (4.8%)	1.79	0/58
2	N	2.00	2/42 (4.8%)	1.85	0/58
All	All	1.12	7/3746 (0.2%)	1.27	11/5066 (0.2%)

All (7) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	N	7	PRO	CA-C	-5.96	1.40	1.52
1	A	32	HIS	CE1-NE2	5.68	1.38	1.32
1	A	52	SER	CA-CB	-5.50	1.46	1.53
2	M	7	PRO	CA-C	-5.50	1.41	1.52
1	H	34	ILE	C-O	5.34	1.30	1.24
2	N	2	PRO	CA-C	-5.17	1.42	1.52
2	M	2	PRO	N-CD	5.08	1.54	1.47

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1013	THR	CB-CA-C	-7.96	92.92	110.67
1	H	93	LYS	CG-CD-CE	-7.83	93.29	111.30
1	H	1013	THR	CB-CA-C	-7.75	93.38	110.67
1	H	99	THR	CA-CB-OG1	-7.65	98.12	109.60
1	A	99	THR	CA-CB-OG1	-7.46	98.41	109.60
1	H	93	LYS	N-CA-CB	-6.14	102.05	111.56
1	A	1022	THR	CA-CB-OG1	-6.08	100.48	109.60
1	H	93	LYS	CB-CG-CD	5.25	123.38	111.30
1	H	127	SER	CA-C-N	5.20	125.28	120.34
1	H	127	SER	C-N-CA	5.20	125.28	120.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1013	THR	CA-CB-OG1	5.02	117.13	109.60

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	1788	0	1726	43	1
1	H	1782	0	1724	35	0
2	M	42	0	39	4	0
2	N	42	0	39	1	0
3	A	28	0	41	12	0
3	H	20	0	29	17	0
4	M	28	0	23	0	0
4	N	28	0	24	0	0
5	A	221	0	0	5	0
5	H	207	0	0	4	0
5	M	13	0	0	1	0
5	N	14	0	0	0	0
All	All	4213	0	3645	80	1

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 11.

All (80) 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:28:ILE:HD11	1:H:28:ILE:HD11	1.35	1.08
3:H:301:EDO:H21	2:M:7:PRO:HD2	1.48	0.91
1:H:1:GLN:HA	1:H:1:GLN:OE1	1.72	0.90
1:H:94:ARG:HH12	3:H:301:EDO:H11	1.42	0.84
3:H:301:EDO:C2	2:M:7:PRO:HD2	2.11	0.81
1:H:93:LYS:CE	3:H:303:EDO:H21	2.13	0.78
1:H:93:LYS:HE3	3:H:303:EDO:H21	1.66	0.76

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:93:LYS:NZ	3:A:301:EDO:H21	2.02	0.74
1:A:1013:THR:HG23	5:A:557:HOH:O	1.87	0.74
1:H:93:LYS:NZ	3:H:303:EDO:H21	2.06	0.70
1:H:43:GLN:HE21	1:H:44:GLY:H	1.41	0.68
1:A:28:ILE:CD1	1:H:28:ILE:HD11	2.22	0.66
1:A:1016:GLY:HA2	1:A:1077:ASN:HD22	1.60	0.66
1:A:1083:LEU:HD11	1:A:1106:MET:HG2	1.78	0.64
1:H:1013:THR:HG23	5:H:546:HOH:O	1.99	0.62
1:H:1045:LYS:HD2	5:H:485:HOH:O	1.99	0.62
1:A:44:GLY:HA3	5:A:516:HOH:O	2.00	0.61
1:A:28:ILE:HD11	1:H:28:ILE:CD1	2.23	0.61
1:H:1016:GLY:HA2	1:H:1077:ASN:HD22	1.64	0.61
1:A:39:ARG:NH2	1:A:39:ARG:HG2	2.14	0.61
1:A:39:ARG:HG2	1:A:39:ARG:HH21	1.66	0.60
1:A:93:LYS:CE	3:A:301:EDO:H21	2.32	0.60
1:H:23:LYS:HE2	1:H:75:SER:O	2.03	0.58
1:A:23:LYS:HE2	1:A:24:ALA:O	2.03	0.58
1:H:94:ARG:HH12	3:H:301:EDO:C1	2.15	0.55
1:A:1011:MET:HE3	1:A:1102:THR:HG21	1.89	0.55
1:A:93:LYS:HZ1	3:A:301:EDO:H21	1.71	0.54
1:A:39:ARG:NH2	1:A:43:GLN:O	2.40	0.54
1:H:93:LYS:HE3	3:H:303:EDO:C2	2.37	0.54
1:A:38:LYS:HG2	3:A:302:EDO:H12	1.90	0.53
1:A:46:GLU:OE1	3:A:302:EDO:O1	2.22	0.53
1:H:97:PRO:HD3	3:H:303:EDO:H22	1.93	0.51
3:H:304:EDO:H12	5:H:415:HOH:O	2.10	0.50
1:A:1004:MET:HE3	1:A:1023:CYS:SG	2.52	0.50
1:A:58:LYS:HB2	3:A:305:EDO:H22	1.93	0.49
1:H:94:ARG:HH22	3:H:301:EDO:C2	2.25	0.49
1:H:2:VAL:HG21	3:H:301:EDO:H11	1.95	0.49
1:H:1004:MET:HE3	1:H:1023:CYS:SG	2.52	0.49
1:A:14:PRO:HD3	1:A:112:SER:HB2	1.94	0.49
1:H:43:GLN:HE21	1:H:44:GLY:N	2.09	0.49
1:A:1077:ASN:HD21	3:A:307:EDO:H12	1.78	0.49
1:H:94:ARG:NH1	3:H:301:EDO:H11	2.19	0.49
1:A:1022:THR:HG22	1:A:1072:THR:OG1	2.13	0.48
1:H:55:ASN:HD22	1:H:55:ASN:H	1.62	0.48
1:A:1045:LYS:HD3	5:A:447:HOH:O	2.12	0.48
1:H:102:TYR:CD1	3:H:302:EDO:H22	2.50	0.47
1:A:23:LYS:HE3	1:A:75:SER:O	2.15	0.47
1:A:38:LYS:O	3:A:302:EDO:O2	2.34	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:1013:THR:CG2	5:H:546:HOH:O	2.58	0.46
1:A:1077:ASN:HD21	3:A:307:EDO:C1	2.28	0.46
1:A:1083:LEU:CD1	1:A:1106:MET:HG2	2.44	0.46
1:A:1054[B]:ARG:HG2	1:A:1058:VAL:HB	1.98	0.45
1:A:1013:THR:HG21	1:A:1078:VAL:HG11	1.98	0.45
1:A:39:ARG:HG3	1:A:45:LEU:CD2	2.47	0.44
1:H:56:ASP:OD1	1:H:73:LYS:NZ	2.50	0.44
1:A:97:PRO:HD3	3:A:301:EDO:H22	2.00	0.44
1:H:93:LYS:HZ1	3:H:303:EDO:H21	1.82	0.44
1:A:85:GLU:OE2	5:A:401:HOH:O	2.21	0.44
1:A:1077:ASN:ND2	3:A:307:EDO:H12	2.33	0.44
1:H:1050:TRP:CH2	2:N:2:PRO:HB2	2.53	0.44
1:A:39:ARG:HH21	1:A:39:ARG:CG	2.32	0.43
1:A:1054[A]:ARG:HG2	1:A:1058:VAL:HB	1.99	0.43
1:A:1013:THR:CG2	5:A:557:HOH:O	2.55	0.43
1:H:1061:ARG:HB2	1:H:1076:SER:O	2.19	0.43
1:H:1013:THR:HG21	1:H:1078:VAL:HG11	1.99	0.43
1:H:1002:VAL:HG22	1:H:1027:GLN:CG	2.49	0.43
1:A:1011:MET:HE3	1:A:1011:MET:HB2	1.91	0.42
2:M:6:ALA:HA	5:M:206:HOH:O	2.20	0.42
3:H:301:EDO:H22	2:M:7:PRO:HD2	1.99	0.42
1:A:1012:SER:HB3	1:A:1107:LYS:HG3	2.00	0.42
1:A:56(A):ASP:OD1	3:A:305:EDO:H21	2.19	0.41
1:A:41:PRO:O	1:A:43:GLN:HG3	2.20	0.41
1:H:1091:TYR:HA	1:H:1096:LEU:HD22	2.01	0.41
1:A:1016:GLY:HA2	1:A:1077:ASN:ND2	2.31	0.41
1:A:39:ARG:HE	1:A:1038:GLN:HE22	1.68	0.41
1:H:93:LYS:HG3	1:H:103:TRP:CE2	2.56	0.40
1:H:102:TYR:CE1	3:H:302:EDO:H22	2.56	0.40
1:H:1002:VAL:HG22	1:H:1027:GLN:HG3	2.04	0.40
1:A:1002:VAL:HG22	1:A:1027:GLN:CG	2.52	0.40
1:H:47:TRP:CZ2	1:H:49:GLY:HA2	2.56	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:72:ASP:OD1	1:A:1070[B]:ASP:OD2[1_655]	1.94	0.26

## 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	231/250 (92%)	225 (97%)	6 (3%)	0	100	100
1	H	230/250 (92%)	222 (96%)	8 (4%)	0	100	100
2	M	6/8 (75%)	6 (100%)	0	0	100	100
2	N	6/8 (75%)	6 (100%)	0	0	100	100
All	All	473/516 (92%)	459 (97%)	14 (3%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	196/205 (96%)	187 (95%)	9 (5%)	23	7
1	H	196/205 (96%)	185 (94%)	11 (6%)	17	4
2	M	4/4 (100%)	4 (100%)	0	100	100
2	N	4/4 (100%)	4 (100%)	0	100	100
All	All	400/418 (96%)	380 (95%)	20 (5%)	20	5

All (20) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	GLN
1	A	11	LEU

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Mol	Chain	Res	Type
1	A	39	ARG
1	A	42	GLU
1	A	73	LYS
1	A	93	LYS
1	A	1009	LYS
1	A	1013	THR
1	A	1045	LYS
1	H	1	GLN
1	H	11	LEU
1	H	43	GLN
1	H	55	ASN
1	H	58	LYS
1	H	73	LYS
1	H	93	LYS
1	H	99	THR
1	H	1013	THR
1	H	1047	LEU
1	H	1107	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1038	GLN
1	A	1042	GLN
1	A	1077	ASN
1	A	1079	GLN
1	A	1089	GLN
1	H	43	GLN
1	H	55	ASN
1	H	1038	GLN
1	H	1042	GLN
1	H	1055	HIS
1	H	1077	ASN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

## 5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry ⓘ

16 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	EDO	A	301	-	3,3,3	1.99	2 (66%)	2,2,2	1.07	0
3	EDO	H	301	-	3,3,3	1.05	0	2,2,2	0.15	0
3	EDO	A	307	-	3,3,3	2.28	1 (33%)	2,2,2	1.78	1 (50%)
3	EDO	H	302	-	3,3,3	0.52	0	2,2,2	0.11	0
3	EDO	H	303	-	3,3,3	1.49	1 (33%)	2,2,2	0.88	0
4	A2G	M	101	2	14,14,15	2.02	4 (28%)	17,19,21	2.08	4 (23%)
3	EDO	A	304	-	3,3,3	0.14	0	2,2,2	0.50	0
3	EDO	H	304	-	3,3,3	0.50	0	2,2,2	0.21	0
3	EDO	A	302	-	3,3,3	0.38	0	2,2,2	0.36	0
3	EDO	H	305	-	3,3,3	0.28	0	2,2,2	0.12	0
3	EDO	A	305	-	3,3,3	0.30	0	2,2,2	0.28	0
3	EDO	A	306	-	3,3,3	0.18	0	2,2,2	0.23	0
4	A2G	N	101	2	14,14,15	0.77	0	17,19,21	1.34	1 (5%)
3	EDO	A	303	-	3,3,3	0.73	0	2,2,2	0.49	0
4	A2G	M	102	2	14,14,15	1.20	2 (14%)	17,19,21	1.80	6 (35%)
4	A2G	N	102	2	14,14,15	1.25	1 (7%)	17,19,21	2.06	3 (17%)

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	EDO	A	301	-	-	1/1/1/1	-
3	EDO	H	301	-	-	1/1/1/1	-
3	EDO	A	307	-	-	1/1/1/1	-
3	EDO	H	302	-	-	0/1/1/1	-
3	EDO	H	303	-	-	1/1/1/1	-
4	A2G	M	101	2	-	1/6/23/26	0/1/1/1
3	EDO	A	304	-	-	1/1/1/1	-
3	EDO	H	304	-	-	0/1/1/1	-
3	EDO	A	302	-	-	1/1/1/1	-
3	EDO	H	305	-	-	1/1/1/1	-
3	EDO	A	305	-	-	0/1/1/1	-
3	EDO	A	306	-	-	0/1/1/1	-
4	A2G	N	101	2	-	1/6/23/26	0/1/1/1
3	EDO	A	303	-	-	0/1/1/1	-
4	A2G	M	102	2	-	0/6/23/26	0/1/1/1
4	A2G	N	102	2	-	0/6/23/26	0/1/1/1

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	M	101	A2G	C1-C2	4.63	1.59	1.52
3	A	307	EDO	O1-C1	-3.95	1.21	1.42
4	N	102	A2G	C4-C3	3.30	1.60	1.52
4	M	101	A2G	O5-C1	-3.17	1.38	1.43
4	M	102	A2G	C4-C5	-2.87	1.47	1.53
4	M	101	A2G	C3-C2	2.87	1.58	1.52
4	M	101	A2G	C2-N2	-2.60	1.41	1.46
3	A	301	EDO	O2-C2	2.52	1.55	1.42
4	M	102	A2G	C3-C2	2.29	1.57	1.52
3	A	301	EDO	O1-C1	2.07	1.52	1.42
3	H	303	EDO	O2-C2	2.05	1.52	1.42

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	N	102	A2G	C1-O5-C5	5.60	119.78	112.19
4	M	101	A2G	O5-C5-C6	5.28	115.48	107.20
4	M	101	A2G	C4-C3-C2	-3.89	105.32	111.02
4	N	102	A2G	O5-C1-C2	-3.86	105.20	111.29
4	M	102	A2G	C2-N2-C7	-3.50	117.92	122.90
4	N	101	A2G	C2-N2-C7	-3.13	118.44	122.90
4	M	101	A2G	C1-O5-C5	3.11	116.41	112.19
4	M	101	A2G	O3-C3-C2	-2.92	103.43	109.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	M	102	A2G	C1-O5-C5	2.54	115.63	112.19
3	A	307	EDO	O2-C2-C1	-2.41	94.58	111.91
4	N	102	A2G	C2-N2-C7	-2.40	119.49	122.90
4	M	102	A2G	O3-C3-C4	2.26	115.58	110.35
4	M	102	A2G	C1-C2-N2	-2.25	106.64	110.49
4	M	102	A2G	C6-C5-C4	-2.08	108.13	113.00
4	M	102	A2G	O5-C5-C6	-2.04	104.01	107.20

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	301	EDO	O1-C1-C2-O2
3	A	307	EDO	O1-C1-C2-O2
3	A	302	EDO	O1-C1-C2-O2
3	A	304	EDO	O1-C1-C2-O2
3	H	303	EDO	O1-C1-C2-O2
3	H	305	EDO	O1-C1-C2-O2
4	N	101	A2G	C4-C5-C6-O6
4	M	101	A2G	C4-C5-C6-O6
3	H	301	EDO	O1-C1-C2-O2

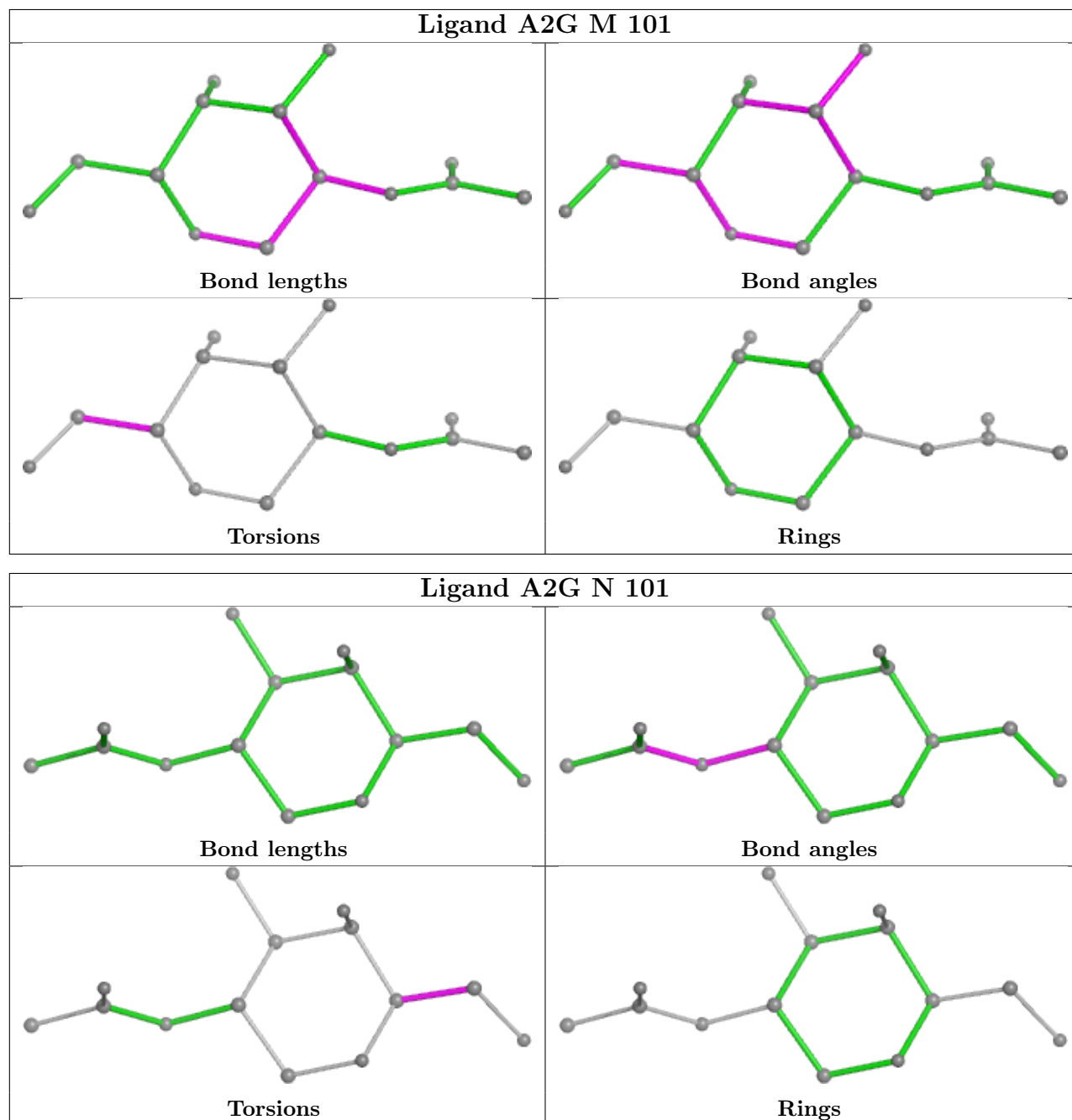
There are no ring outliers.

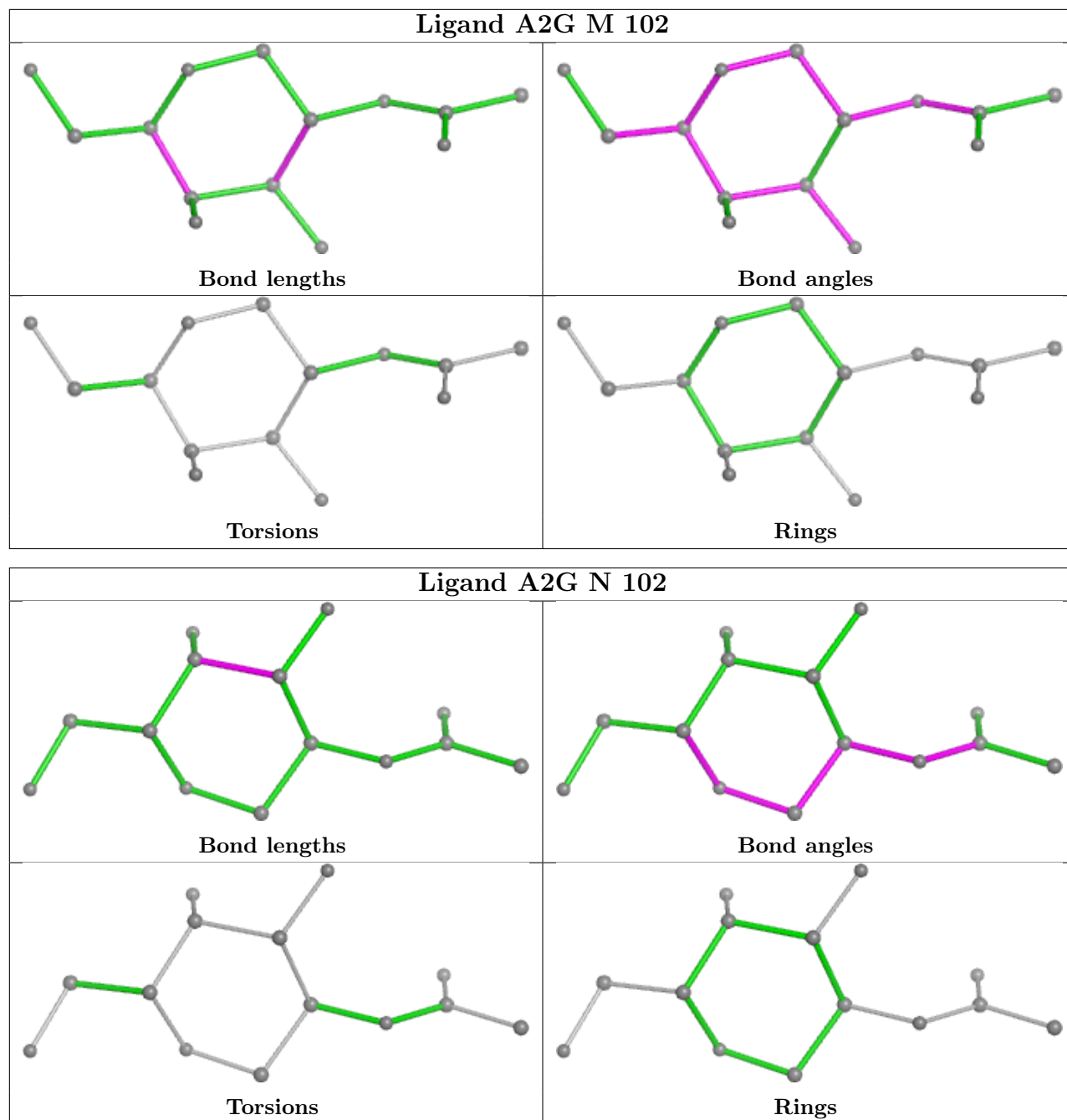
8 monomers are involved in 29 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	301	EDO	4	0
3	H	301	EDO	8	0
3	A	307	EDO	3	0
3	H	302	EDO	2	0
3	H	303	EDO	6	0
3	H	304	EDO	1	0
3	A	302	EDO	3	0
3	A	305	EDO	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring

in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





## 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	233/250 (93%)	-0.03	5 (2%) 63 69	12, 20, 36, 60	2 (0%)
1	H	232/250 (92%)	0.17	5 (2%) 62 68	11, 25, 43, 79	2 (0%)
2	M	7/8 (87%)	-0.18	0 100 100	17, 19, 22, 24	0
2	N	7/8 (87%)	0.06	0 100 100	19, 20, 25, 25	0
All	All	479/516 (92%)	0.06	10 (2%) 63 69	11, 23, 41, 79	4 (0%)

All (10) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	121	GLY	3.2
1	H	43	GLN	2.8
1	A	1087	PHE	2.7
1	H	41	PRO	2.6
1	A	42	GLU	2.5
1	H	74	SER	2.5
1	H	42	GLU	2.3
1	A	1007	SER	2.2
1	H	112	SER	2.1
1	A	43	GLN	2.1

### 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 ⓘ

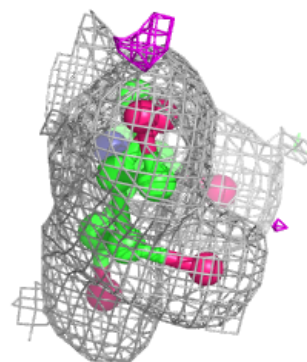
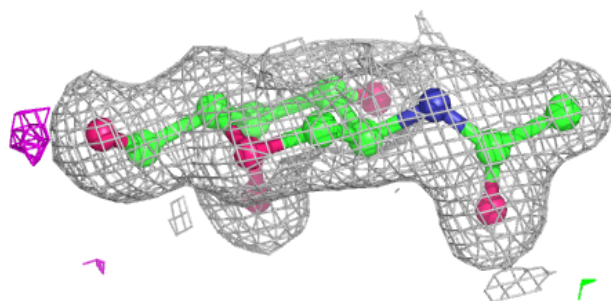
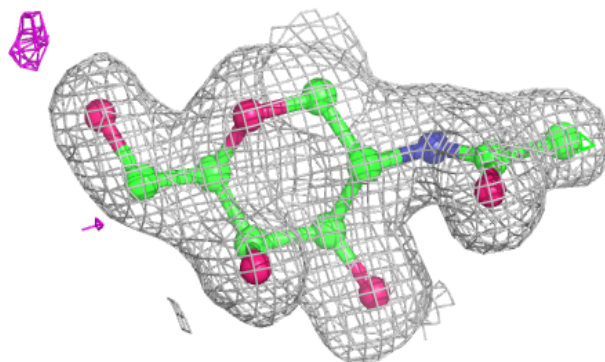
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 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	EDO	H	303	4/4	0.61	0.18	30,32,33,33	0
3	EDO	A	305	4/4	0.63	0.16	45,47,47,48	0
3	EDO	A	302	4/4	0.68	0.18	53,54,55,57	0
3	EDO	H	305	4/4	0.74	0.21	45,46,47,48	0
3	EDO	A	306	4/4	0.75	0.15	46,47,48,48	0
3	EDO	H	304	4/4	0.78	0.13	31,34,34,35	0
3	EDO	A	301	4/4	0.81	0.13	22,23,25,27	0
3	EDO	A	307	4/4	0.84	0.13	24,25,27,28	0
3	EDO	A	304	4/4	0.85	0.14	45,46,48,51	0
3	EDO	H	301	4/4	0.89	0.14	28,30,32,33	0
3	EDO	H	302	4/4	0.91	0.12	31,38,41,44	0
3	EDO	A	303	4/4	0.96	0.06	16,17,17,18	0
4	A2G	M	102	14/15	0.97	0.05	15,17,19,19	0
4	A2G	N	102	14/15	0.97	0.04	18,19,21,21	0
4	A2G	N	101	14/15	0.98	0.04	17,17,19,19	0
4	A2G	M	101	14/15	0.98	0.04	13,15,16,17	0

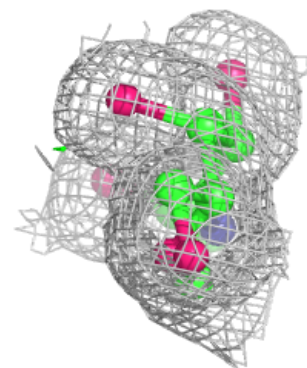
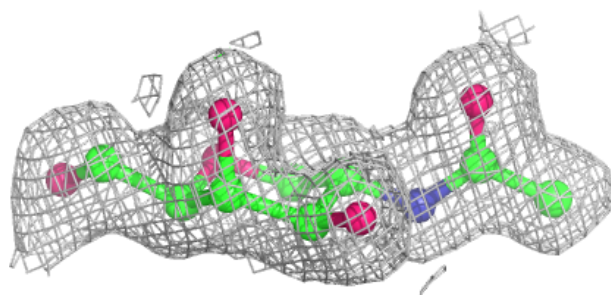
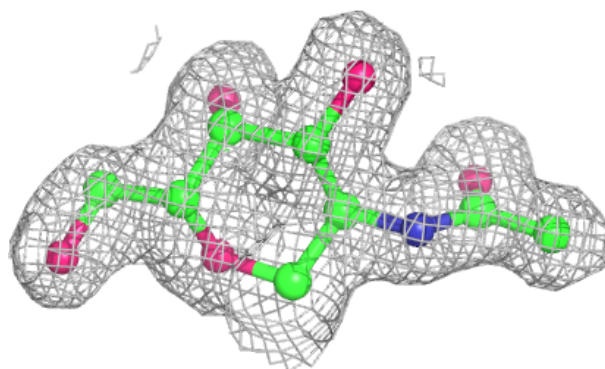
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

**Electron density around A2G M 102:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

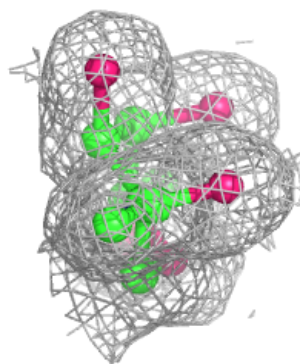
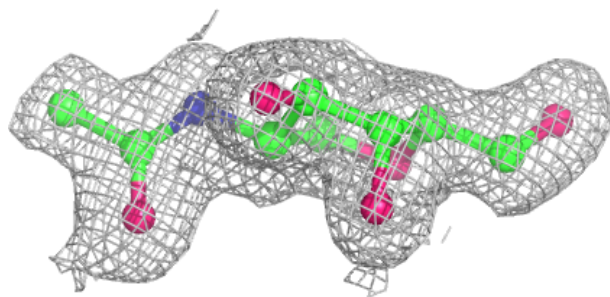
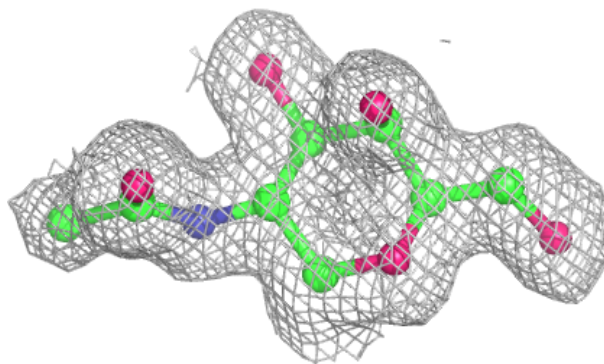
**Electron density around A2G N 102:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

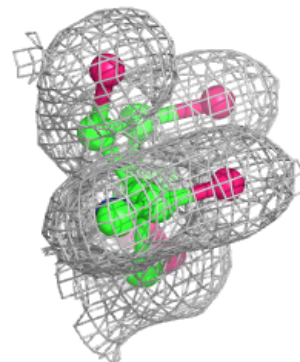
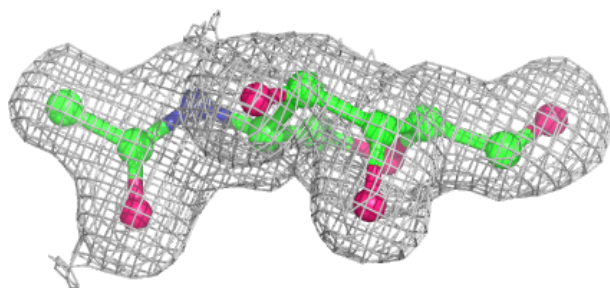
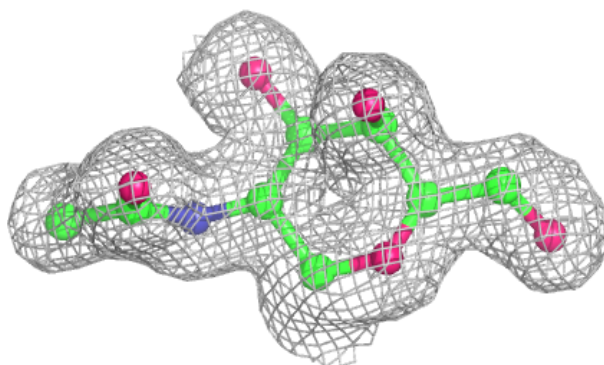


**Electron density around A2G N 101:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

**Electron density around A2G M 101:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



## 6.5 Other polymers [i](#)

There are no such residues in this entry.