



# Full wwPDB X-ray Structure Validation Report

May 25, 2020 – 06:17 am BST

PDB ID : 6QZR  
Title : 14-3-3 sigma in complex with FOXO1 pT24 peptide  
Authors : Ottmann, C.; Wolter, M.; Lau, R.A.  
Deposited on : 2019-03-12  
Resolution : 2.30 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  
buster-report : 1.1.7 (2018)  
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

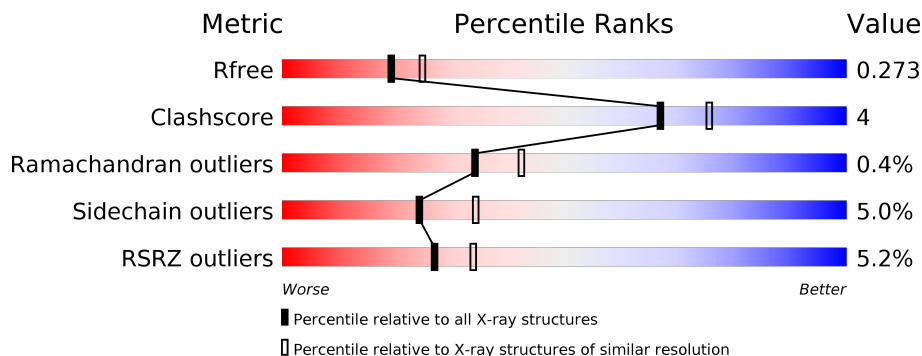
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.30 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	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

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	253	 80% 8% 12%
1	B	253	 80% 10% 9% 2%
1	C	253	 85% 6% 9% 3%
1	D	253	 77% 8% 13% 8%
1	E	253	 80% 8% 9% 4%
1	F	253	 81% 9% 9% 3%

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Mol	Chain	Length	Quality of chain
1	G	253	<p>8% 79% 10% 11%</p>
1	H	253	<p>5% 83% 7% 9%</p>
2	J	11	<p>9% 36% 27% 9% 27%</p>
2	M	11	<p>18% 45% 9% 27%</p>
2	N	11	<p>9% 55% 27% 18%</p>
2	O	11	<p>64% 9% 27%</p>
2	P	11	<p>36% 55% 9% 36%</p>
2	R	11	<p>18% 55% 9% 9% 27%</p>
2	T	11	<p>9% 73% 27%</p>
2	U	11	<p>9% 64% 18% 18%</p>

## 2 Entry composition i

There are 5 unique types of molecules in this entry. The entry contains 15184 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 14-3-3 protein sigma.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	223	Total 1692	C 1060	N 288	O 333	S 11	0	0	0
1	B	229	Total 1766	C 1102	N 299	O 354	S 11	0	1	0
1	C	230	Total 1756	C 1095	N 297	O 353	S 11	0	0	0
1	D	219	Total 1589	C 993	N 273	O 315	S 8	0	0	0
1	E	229	Total 1768	C 1107	N 300	O 350	S 11	0	0	0
1	F	231	Total 1792	C 1120	N 305	O 356	S 11	0	0	0
1	H	231	Total 1762	C 1098	N 299	O 355	S 10	0	0	0
1	G	226	Total 1708	C 1062	N 296	O 341	S 9	0	0	0

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-4	GLY	-	expression tag	UNP P31947
A	-3	ALA	-	expression tag	UNP P31947
A	-2	MET	-	expression tag	UNP P31947
A	-1	GLY	-	expression tag	UNP P31947
A	0	SER	-	expression tag	UNP P31947
B	-4	GLY	-	expression tag	UNP P31947
B	-3	ALA	-	expression tag	UNP P31947
B	-2	MET	-	expression tag	UNP P31947
B	-1	GLY	-	expression tag	UNP P31947
B	0	SER	-	expression tag	UNP P31947
C	-4	GLY	-	expression tag	UNP P31947
C	-3	ALA	-	expression tag	UNP P31947
C	-2	MET	-	expression tag	UNP P31947

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-1	GLY	-	expression tag	UNP P31947
C	0	SER	-	expression tag	UNP P31947
D	-4	GLY	-	expression tag	UNP P31947
D	-3	ALA	-	expression tag	UNP P31947
D	-2	MET	-	expression tag	UNP P31947
D	-1	GLY	-	expression tag	UNP P31947
D	0	SER	-	expression tag	UNP P31947
E	-4	GLY	-	expression tag	UNP P31947
E	-3	ALA	-	expression tag	UNP P31947
E	-2	MET	-	expression tag	UNP P31947
E	-1	GLY	-	expression tag	UNP P31947
E	0	SER	-	expression tag	UNP P31947
F	-4	GLY	-	expression tag	UNP P31947
F	-3	ALA	-	expression tag	UNP P31947
F	-2	MET	-	expression tag	UNP P31947
F	-1	GLY	-	expression tag	UNP P31947
F	0	SER	-	expression tag	UNP P31947
H	-4	GLY	-	expression tag	UNP P31947
H	-3	ALA	-	expression tag	UNP P31947
H	-2	MET	-	expression tag	UNP P31947
H	-1	GLY	-	expression tag	UNP P31947
H	0	SER	-	expression tag	UNP P31947
G	-4	GLY	-	expression tag	UNP P31947
G	-3	ALA	-	expression tag	UNP P31947
G	-2	MET	-	expression tag	UNP P31947
G	-1	GLY	-	expression tag	UNP P31947
G	0	SER	-	expression tag	UNP P31947

- Molecule 2 is a protein called Forkhead box protein O1.

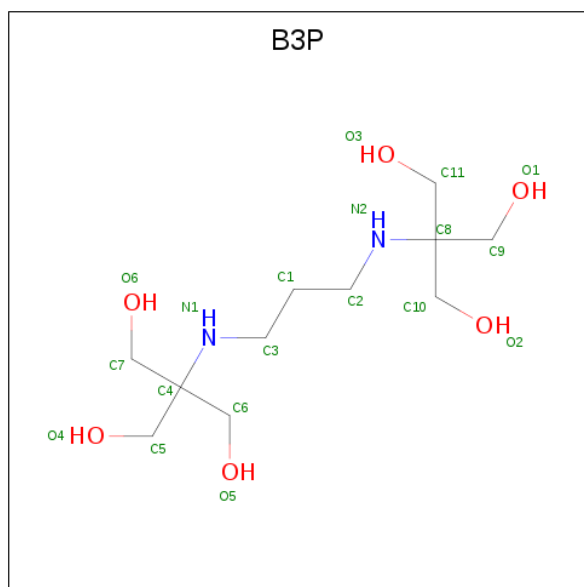
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	N	O	P				S
2	R	8	64	40	9	13	1	1	0	0	0
2	J	8	70	43	12	13	1	1	0	0	0
2	M	8	70	43	12	13	1	1	0	0	0
2	N	9	75	46	13	14	1	1	0	0	0
2	O	8	70	43	12	13	1	1	0	0	0
2	P	7	59	37	8	12	1	1	0	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	N	O	P				S
2	T	8	Total	C	N	O	P	S	0	0	0
			70	43	12	13	1	1			
2	U	9	Total	C	N	O	P	S	0	0	0
			75	46	13	14	1	1			

- Molecule 3 is 2-[3-(2-HYDROXY-1,1-DIHYDROXYMETHYL-ETHYLAMINO)-PROPYL AMINO]-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (three-letter code: B3P) (formula:  $C_{11}H_{26}N_2O_6$ ).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
3	A	1	Total	C	N	O	0	0
			19	11	2	6		
3	B	1	Total	C	N	O	0	0
			19	11	2	6		
3	F	1	Total	C	N	O	0	0
			19	11	2	6		
3	H	1	Total	C	N	O	0	0
			19	11	2	6		

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula:  $C_3H_8O_3$ ).



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	D	1	Total C O 6 3 3	0	0
4	D	1	Total C O 6 3 3	0	0
4	H	1	Total C O 6 3 3	0	0
4	H	1	Total C O 6 3 3	0	0
4	G	1	Total C O 6 3 3	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	103	Total O 103 103	0	0
5	B	89	Total O 89 89	0	0
5	C	107	Total O 107 107	0	0
5	D	43	Total O 43 43	0	0
5	E	82	Total O 82 82	0	0

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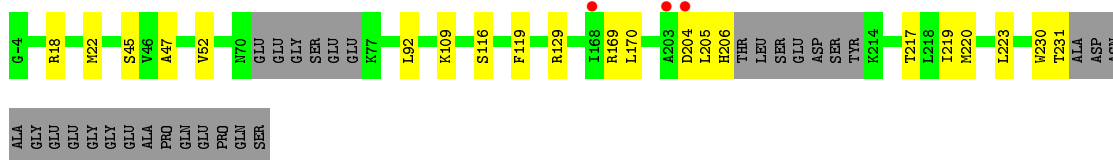
<b>Mol</b>	<b>Chain</b>	<b>Residues</b>	<b>Atoms</b>	<b>ZeroOcc</b>	<b>AltConf</b>
5	F	93	Total O 93 93	0	0
5	H	82	Total O 82 82	0	0
5	G	66	Total O 66 66	0	0
5	R	2	Total O 2 2	0	0
5	J	3	Total O 3 3	0	0
5	N	6	Total O 6 6	0	0
5	P	1	Total O 1 1	0	0
5	T	1	Total O 1 1	0	0
5	U	2	Total O 2 2	0	0



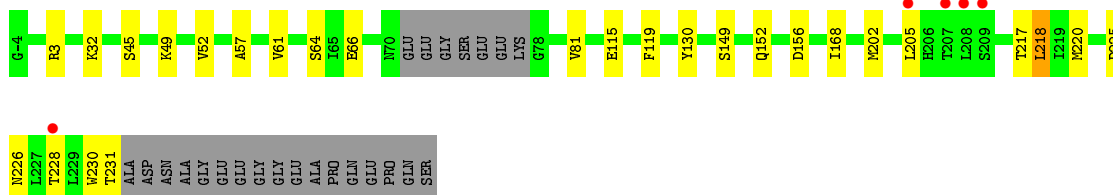
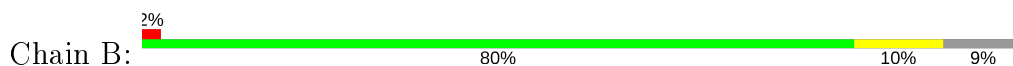
### 3 Residue-property plots [i](#)

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.

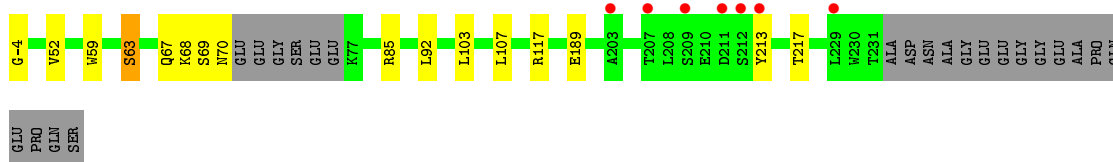
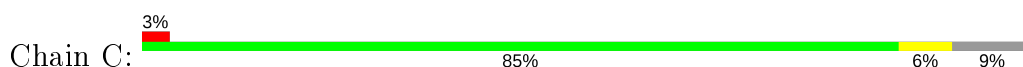
- Molecule 1: 14-3-3 protein sigma



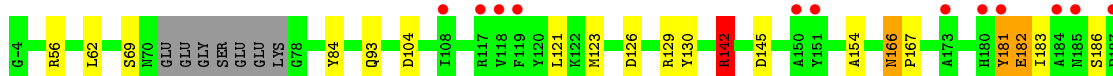
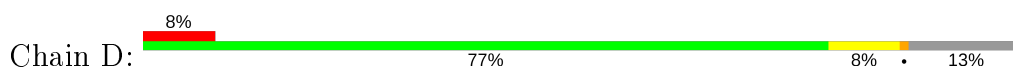
- Molecule 1: 14-3-3 protein sigma

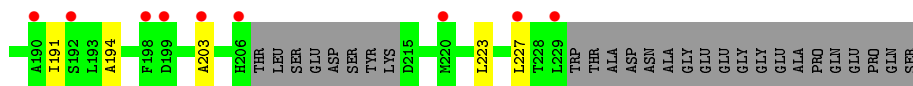


- Molecule 1: 14-3-3 protein sigma

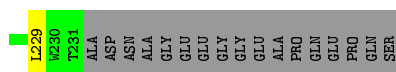
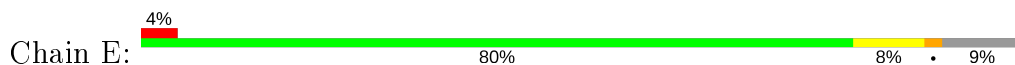


- Molecule 1: 14-3-3 protein sigma

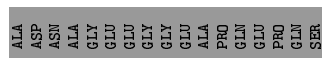
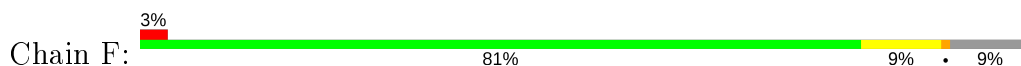




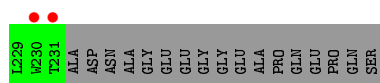
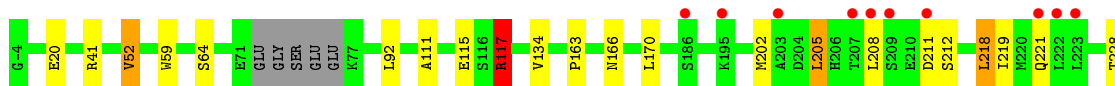
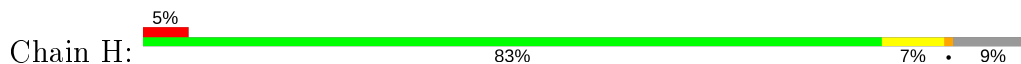
- Molecule 1: 14-3-3 protein sigma



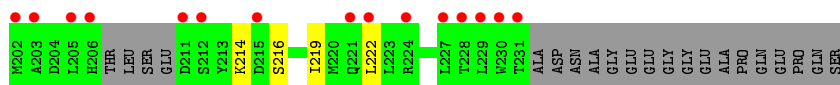
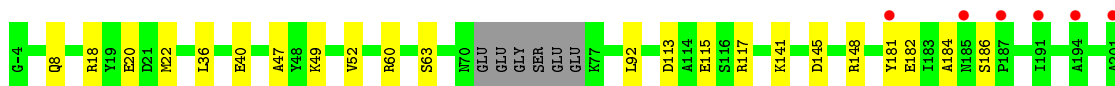
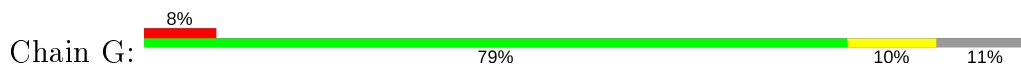
- Molecule 1: 14-3-3 protein sigma



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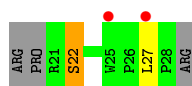


- Molecule 1: 14-3-3 protein sigma



- Molecule 2: Forkhead box protein O1

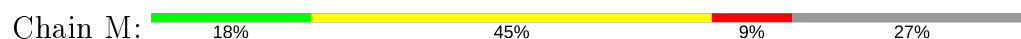




- Molecule 2: Forkhead box protein O1



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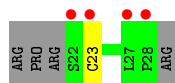
- Molecule 2: Forkhead box protein O1



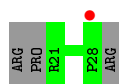
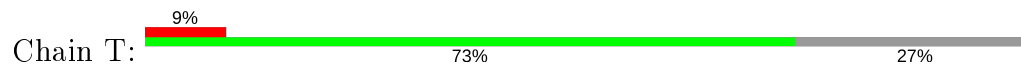
- Molecule 2: Forkhead box protein O1



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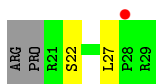


- Molecule 2: Forkhead box protein O1



- Molecule 2: Forkhead box protein O1





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	149.21Å 62.81Å 154.04Å 90.00° 103.24° 90.00°	Depositor
Resolution (Å)	118.81 – 2.30 118.81 – 2.30	Depositor EDS
% Data completeness (in resolution range)	99.9 (118.81-2.30) 97.4 (118.81-2.30)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.56 (at 2.29Å)	Xtrriage
Refinement program	REFMAC 5.8.0230	Depositor
R, $R_{free}$	0.221 , 0.267 0.229 , 0.273	Depositor DCC
$R_{free}$ test set	6282 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	32.0	Xtrriage
Anisotropy	0.250	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.33 , 39.6	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.000 for l,-k,h	Xtrriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	15184	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	42.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 40.66 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 2.6479e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

<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: TPO, GOL, CSO, B3P

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	0.68	0/1706	0.74	0/2299
1	B	0.67	0/1782	0.75	0/2402
1	C	0.72	0/1772	0.78	0/2390
1	D	0.65	0/1600	0.73	0/2163
1	E	0.64	0/1785	0.75	0/2403
1	F	0.66	1/1809 (0.1%)	0.76	1/2435 (0.0%)
1	G	0.61	0/1722	0.71	0/2321
1	H	0.69	0/1777	0.76	1/2396 (0.0%)
2	J	0.47	0/61	0.72	0/82
2	M	0.64	0/61	0.69	0/82
2	N	0.60	0/66	0.68	0/89
2	O	0.65	0/61	0.68	0/82
2	P	0.58	0/50	0.56	0/68
2	R	0.62	0/55	0.80	0/75
2	T	0.53	0/61	0.64	0/82
2	U	0.59	0/66	0.64	0/89
All	All	0.66	1/14434 (0.0%)	0.75	2/19458 (0.0%)

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	3
1	C	0	2
1	D	0	1
1	E	0	3
1	F	0	3
1	G	0	2
1	H	0	2

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Mol	Chain	#Chirality outliers	#Planarity outliers
2	M	0	1
All	All	0	17

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	F	2	GLU	CD-OE2	5.11	1.31	1.25

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	H	117	ARG	NE-CZ-NH1	-5.28	117.66	120.30
1	F	18	ARG	NE-CZ-NH1	-5.15	117.72	120.30

There are no chirality outliers.

All (17) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	129	ARG	Sidechain
1	A	169	ARG	Sidechain
1	A	18	ARG	Sidechain
1	C	117	ARG	Sidechain
1	C	85	ARG	Sidechain
1	D	142	ARG	Sidechain
1	E	148	ARG	Sidechain
1	E	41	ARG	Sidechain
1	E	85	ARG	Sidechain
1	F	117	ARG	Sidechain
1	F	148	ARG	Sidechain
1	F	41	ARG	Sidechain
1	G	117	ARG	Sidechain
1	G	18	ARG	Sidechain
1	H	117	ARG	Sidechain
1	H	41	ARG	Sidechain
2	M	21	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	1692	0	1632	9	0
1	B	1766	0	1703	20	0
1	C	1756	0	1680	8	0
1	D	1589	0	1466	13	0
1	E	1768	0	1731	12	0
1	F	1792	0	1752	17	0
1	G	1708	0	1628	9	0
1	H	1762	0	1692	7	0
2	J	70	0	62	1	0
2	M	70	0	62	4	0
2	N	75	0	64	1	0
2	O	70	0	62	0	0
2	P	59	0	50	1	0
2	R	64	0	51	1	0
2	T	70	0	62	0	0
2	U	75	0	64	0	0
3	A	19	0	26	4	0
3	B	19	0	26	2	0
3	F	19	0	26	2	0
3	H	19	0	26	3	0
4	A	12	0	16	1	0
4	D	12	0	16	0	0
4	G	6	0	8	0	0
4	H	12	0	16	1	0
5	A	103	0	0	2	0
5	B	89	0	0	0	0
5	C	107	0	0	1	0
5	D	43	0	0	2	0
5	E	82	0	0	2	0
5	F	93	0	0	0	0
5	G	66	0	0	1	0
5	H	82	0	0	0	0
5	J	3	0	0	0	0
5	N	6	0	0	0	0
5	P	1	0	0	0	0
5	R	2	0	0	0	0
5	T	1	0	0	0	0
5	U	2	0	0	0	0
All	All	15184	0	13921	110	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 4.



All (110) 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:D:166:ASN:HD22	1:D:167:PRO:HD2	1.29	0.97
4:A:303:GOL:H2	5:A:449:HOH:O	1.63	0.96
1:D:182:GLU:O	1:D:183:ILE:HD13	1.68	0.94
1:E:108:ILE:HG23	1:E:117:ARG:NH2	1.88	0.88
3:A:301:B3P:O2	3:A:301:B3P:H22	1.76	0.83
1:D:166:ASN:ND2	1:D:167:PRO:HD2	1.95	0.82
1:D:166:ASN:HD22	1:D:167:PRO:CD	1.93	0.80
1:B:217:THR:HG21	1:F:213:TYR:OH	1.83	0.78
1:F:205:LEU:HD23	1:F:208:LEU:HD12	1.65	0.78
1:F:182:GLU:OE2	2:R:22:SER:OG	2.08	0.69
1:B:205:LEU:HD23	1:F:217:THR:HB	1.75	0.67
1:B:225:ASP:O	1:B:228:THR:HB	1.97	0.65
1:B:49:LYS:HE3	1:B:130:TYR:OH	1.96	0.65
1:G:186:SER:O	1:G:186:SER:OG	2.14	0.64
1:F:210:GLU:HA	1:F:213:TYR:HB2	1.80	0.64
1:C:-4:GLY:N	5:C:304:HOH:O	2.32	0.62
1:E:206:HIS:CD2	1:E:207:THR:HG23	2.34	0.62
1:F:208:LEU:HD22	1:F:213:TYR:HA	1.83	0.61
1:E:49:LYS:HE3	1:E:130:TYR:OH	2.01	0.61
1:B:202:MET:CE	1:B:220:MET:CE	2.79	0.59
1:B:202:MET:CE	1:B:220:MET:HE2	2.31	0.59
1:E:97:ASP:OD2	3:H:301:B3P:H11	2.03	0.59
1:H:205:LEU:HD13	1:H:208:LEU:HD12	1.84	0.59
1:E:108:ILE:HG23	1:E:117:ARG:HH22	1.66	0.58
1:B:202:MET:HE2	1:B:220:MET:HE1	1.85	0.58
1:G:113:ASP:OD2	1:G:115:GLU:HB3	2.04	0.57
1:E:218:LEU:HD23	1:E:218:LEU:O	2.05	0.57
1:D:182:GLU:C	1:D:183:ILE:HD13	2.26	0.56
1:A:22:MET:HG2	1:A:47:ALA:HB2	1.87	0.55
1:B:202:MET:HA	1:B:202:MET:HE2	1.89	0.55
1:E:202:MET:CE	1:E:205:LEU:HG	2.38	0.54
1:A:217:THR:HG22	1:A:220:MET:HE3	1.91	0.53
1:B:226:ASN:HB3	1:B:230:TRP:CZ2	2.43	0.53
1:A:206:HIS:HA	5:E:360:HOH:O	2.08	0.52
1:H:218:LEU:O	1:H:221:GLN:N	2.42	0.52
1:G:92:LEU:HD23	1:G:92:LEU:C	2.31	0.51
3:F:301:B3P:H12	3:F:301:B3P:C9	2.41	0.51
2:M:21:ARG:NH1	2:M:21:ARG:HG2	2.26	0.51
1:B:57:ALA:O	1:B:61:VAL:HG23	2.11	0.50
1:E:170:LEU:HB3	1:E:219:ILE:HG21	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:M:24:TPO:O	2:M:27:LEU:HD23	2.13	0.49
3:A:301:B3P:H31	5:A:466:HOH:O	2.11	0.48
1:C:67:GLN:O	1:C:69:SER:N	2.46	0.48
3:A:301:B3P:H61	3:A:301:B3P:H12	1.93	0.48
1:C:67:GLN:C	1:C:69:SER:H	2.17	0.48
1:A:220:MET:HA	1:A:223:LEU:HD12	1.96	0.48
2:M:21:ARG:HG3	2:M:21:ARG:O	2.14	0.48
1:F:202:MET:SD	1:F:205:LEU:HD12	2.55	0.47
1:F:213:TYR:HD2	1:F:213:TYR:O	1.96	0.47
4:H:302:GOL:O2	4:H:303:GOL:H32	2.15	0.47
3:B:301:B3P:H71	3:B:301:B3P:H21	1.97	0.47
1:D:194:ALA:O	1:D:223:LEU:HD21	2.15	0.47
1:G:148:ARG:HH22	1:G:184:ALA:HB1	1.81	0.46
1:H:111:ALA:O	1:H:117:ARG:HD2	2.16	0.46
1:F:205:LEU:CD2	1:F:208:LEU:HD12	2.40	0.46
1:E:180:HIS:HE1	5:E:371:HOH:O	1.99	0.46
3:B:301:B3P:H11	3:B:301:B3P:H111	1.97	0.46
1:F:205:LEU:O	1:F:208:LEU:HB2	2.16	0.45
3:A:301:B3P:C2	3:A:301:B3P:O2	2.56	0.45
1:C:213:TYR:CE2	1:C:217:THR:HG21	2.50	0.45
1:F:121:LEU:HD13	1:F:153:GLU:HG2	1.98	0.45
1:F:52:VAL:CG2	1:F:92:LEU:CD1	2.95	0.45
1:H:170:LEU:HB3	1:H:219:ILE:HG21	1.97	0.45
1:D:126:ASP:O	1:D:129:ARG:HB3	2.17	0.45
1:E:213:TYR:CD1	1:E:213:TYR:C	2.88	0.45
1:A:230:TRP:O	1:A:231:THR:HG23	2.17	0.45
1:F:52:VAL:HG23	1:F:92:LEU:CD1	2.47	0.45
1:G:219:ILE:HA	1:G:222:LEU:HD12	1.98	0.45
1:C:103:LEU:HA	1:C:107:LEU:HB2	1.99	0.45
1:H:163:PRO:HG2	1:H:166:ASN:HB2	1.99	0.45
5:D:420:HOH:O	2:P:23:CYS:HB2	2.18	0.44
1:C:52:VAL:HG23	1:C:92:LEU:CD1	2.46	0.44
1:D:142:ARG:O	1:D:145:ASP:N	2.51	0.44
1:F:67:GLN:O	1:F:70:ASN:HB2	2.18	0.44
1:B:66:GLU:HA	1:B:81:VAL:HG11	1.99	0.43
1:H:52:VAL:HG22	1:H:92:LEU:CD1	2.47	0.43
1:D:121:LEU:HB3	1:D:154:ALA:HB2	2.00	0.43
1:D:93:GLN:NE2	5:D:403:HOH:O	2.48	0.43
1:B:217:THR:HG21	1:F:213:TYR:HH	1.82	0.43
1:G:60:ARG:CZ	5:G:415:HOH:O	2.66	0.43
1:E:165:THR:O	1:E:216:SER:OG	2.33	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:45:SER:HB2	1:A:119:PHE:HZ	1.84	0.42
1:B:202:MET:HE2	1:B:220:MET:CE	2.46	0.42
1:A:22:MET:CG	1:A:47:ALA:HB2	2.48	0.42
1:B:45:SER:HB2	1:B:119:PHE:HZ	1.85	0.42
1:G:181:TYR:HD2	1:G:182:GLU:HG3	1.85	0.42
2:J:24:TPO:O	2:J:27:LEU:HD13	2.20	0.42
1:A:170:LEU:HB3	1:A:219:ILE:HG21	2.02	0.42
1:D:56:ARG:CZ	1:D:130:TYR:CE1	3.03	0.42
1:B:3:ARG:HB2	1:B:32:LYS:HG3	2.01	0.41
1:C:67:GLN:C	1:C:69:SER:N	2.73	0.41
1:D:191:ILE:HA	1:D:227:LEU:HD21	2.02	0.41
1:B:152:GLN:NE2	1:B:156:ASP:OD1	2.54	0.41
1:B:115:GLU:HG3	1:B:168:ILE:HD13	2.02	0.41
1:E:202:MET:O	1:E:204:ASP:N	2.53	0.41
1:H:59:TRP:CE2	1:H:134:VAL:HG12	2.55	0.41
2:N:24:TPO:O	2:N:27:LEU:HD23	2.20	0.41
3:F:301:B3P:H12	3:F:301:B3P:H92	2.01	0.41
3:H:301:B3P:C2	3:H:301:B3P:H62	2.49	0.41
1:B:217:THR:HB	1:F:205:LEU:HD13	2.02	0.41
3:H:301:B3P:H22	3:H:301:B3P:H62	2.01	0.41
1:B:202:MET:CE	1:B:220:MET:HE1	2.45	0.41
1:G:22:MET:HG2	1:G:47:ALA:HB2	2.02	0.41
1:A:109:LYS:HA	1:A:109:LYS:HD3	1.93	0.41
1:B:218:LEU:O	1:B:218:LEU:HD12	2.20	0.41
1:F:213:TYR:HE2	1:F:217:THR:HG21	1.85	0.41
1:C:59:TRP:O	1:C:63:SER:HB2	2.21	0.40
2:M:25:TRP:CG	2:M:26:PRO:HA	2.56	0.40
1:D:62:LEU:HD11	1:D:84:TYR:CE2	2.56	0.40
1:G:36:LEU:HB3	1:G:40:GLU:HB2	2.04	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	216/253 (85%)	211 (98%)	5 (2%)	0	100	100
1	B	225/253 (89%)	221 (98%)	4 (2%)	0	100	100
1	C	225/253 (89%)	219 (97%)	5 (2%)	1 (0%)	34	42
1	D	212/253 (84%)	191 (90%)	18 (8%)	3 (1%)	11	11
1	E	224/253 (88%)	216 (96%)	6 (3%)	2 (1%)	17	20
1	F	226/253 (89%)	220 (97%)	6 (3%)	0	100	100
1	G	219/253 (87%)	206 (94%)	13 (6%)	0	100	100
1	H	226/253 (89%)	209 (92%)	16 (7%)	1 (0%)	34	42
2	J	5/11 (46%)	5 (100%)	0	0	100	100
2	M	5/11 (46%)	5 (100%)	0	0	100	100
2	N	6/11 (54%)	5 (83%)	1 (17%)	0	100	100
2	O	5/11 (46%)	5 (100%)	0	0	100	100
2	P	4/11 (36%)	3 (75%)	1 (25%)	0	100	100
2	R	5/11 (46%)	5 (100%)	0	0	100	100
2	T	5/11 (46%)	5 (100%)	0	0	100	100
2	U	6/11 (54%)	6 (100%)	0	0	100	100
All	All	1814/2112 (86%)	1732 (96%)	75 (4%)	7 (0%)	34	42

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	69	SER
1	E	203	ALA
1	E	213	TYR
1	D	181	TYR
1	C	68	LYS
1	D	203	ALA
1	H	228	THR

### 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	168/208 (81%)	163 (97%)	5 (3%)	41	57
1	B	180/208 (86%)	175 (97%)	5 (3%)	43	60
1	C	177/208 (85%)	174 (98%)	3 (2%)	60	76
1	D	144/208 (69%)	137 (95%)	7 (5%)	25	35
1	E	182/208 (88%)	171 (94%)	11 (6%)	19	26
1	F	185/208 (89%)	174 (94%)	11 (6%)	19	27
1	G	169/208 (81%)	160 (95%)	9 (5%)	22	31
1	H	178/208 (86%)	168 (94%)	10 (6%)	21	29
2	J	7/10 (70%)	4 (57%)	3 (43%)	0	0
2	M	7/10 (70%)	5 (71%)	2 (29%)	0	0
2	N	7/10 (70%)	6 (86%)	1 (14%)	3	3
2	O	7/10 (70%)	6 (86%)	1 (14%)	3	3
2	P	6/10 (60%)	6 (100%)	0	100	100
2	R	6/10 (60%)	4 (67%)	2 (33%)	0	0
2	T	7/10 (70%)	7 (100%)	0	100	100
2	U	7/10 (70%)	5 (71%)	2 (29%)	0	0
All	All	1437/1744 (82%)	1365 (95%)	72 (5%)	24	34

All (72) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	52	VAL
1	A	92	LEU
1	A	116	SER
1	A	204	ASP
1	A	205	LEU
1	B	52	VAL
1	B	64	SER
1	B	149	SER
1	B	218	LEU
1	B	231	THR
1	C	63	SER
1	C	70	ASN
1	C	189	GLU
1	D	104	ASP
1	D	123	MET
1	D	142	ARG

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
1	D	166	ASN
1	D	181	TYR
1	D	182	GLU
1	D	186	SER
1	E	20	GLU
1	E	49	LYS
1	E	52	VAL
1	E	104	ASP
1	E	117	ARG
1	E	149	SER
1	E	202	MET
1	E	204	ASP
1	E	205	LEU
1	E	224	ARG
1	E	229	LEU
1	F	49	LYS
1	F	87	LYS
1	F	104	ASP
1	F	109	LYS
1	F	141	LYS
1	F	188	GLU
1	F	205	LEU
1	F	208	LEU
1	F	213	TYR
1	F	218	LEU
1	F	231	THR
1	H	20	GLU
1	H	52	VAL
1	H	64	SER
1	H	115	GLU
1	H	117	ARG
1	H	202	MET
1	H	205	LEU
1	H	211	ASP
1	H	212	SER
1	H	218	LEU
1	G	8	GLN
1	G	20	GLU
1	G	49	LYS
1	G	52	VAL
1	G	63	SER
1	G	141	LYS

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Mol	Chain	Res	Type
1	G	145	ASP
1	G	214	LYS
1	G	216	SER
2	R	22	SER
2	R	27	LEU
2	J	21	ARG
2	J	22	SER
2	J	27	LEU
2	M	21	ARG
2	M	22	SER
2	N	22	SER
2	O	21	ARG
2	U	22	SER
2	U	27	LEU

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	221	GLN
1	C	185	ASN
1	D	93	GLN
1	D	166	ASN
1	E	180	HIS
1	F	152	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](#)

16 non-standard protein/DNA/RNA residues 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
1	CSO	G	38	1	3,6,7	0.81	0	0,6,8	0.00	-
1	CSO	H	38	1	3,6,7	0.67	0	0,6,8	0.00	-
2	TPO	R	24	2	8,10,11	0.89	1 (12%)	10,14,16	1.67	3 (30%)
2	TPO	P	24	2	8,10,11	1.04	0	10,14,16	2.20	6 (60%)
2	TPO	U	24	2	8,10,11	1.20	1 (12%)	10,14,16	2.12	4 (40%)
2	TPO	J	24	2	8,10,11	0.76	0	10,14,16	1.43	2 (20%)
2	TPO	O	24	2	8,10,11	0.98	1 (12%)	10,14,16	1.66	2 (20%)
2	TPO	N	24	2	8,10,11	0.63	0	10,14,16	1.64	2 (20%)
2	TPO	M	24	2	8,10,11	0.92	0	10,14,16	1.70	3 (30%)
1	CSO	A	38	1	3,6,7	0.97	0	0,6,8	0.00	-
1	CSO	B	38	1	3,6,7	0.72	0	0,6,8	0.00	-
1	CSO	E	38	1	3,6,7	0.56	0	0,6,8	0.00	-
1	CSO	F	38	1	3,6,7	0.88	0	0,6,8	0.00	-
1	CSO	C	38	1	3,6,7	0.58	0	0,6,8	0.00	-
1	CSO	D	38	1	3,6,7	0.70	0	0,6,8	0.00	-
2	TPO	T	24	2	8,10,11	1.06	1 (12%)	10,14,16	1.33	2 (20%)

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
1	CSO	G	38	1	-	0/1/5/7	-
1	CSO	H	38	1	-	0/1/5/7	-
2	TPO	R	24	2	-	3/9/11/13	-
2	TPO	P	24	2	-	2/9/11/13	-
2	TPO	U	24	2	-	2/9/11/13	-
2	TPO	J	24	2	-	2/9/11/13	-
2	TPO	O	24	2	-	2/9/11/13	-
2	TPO	N	24	2	-	2/9/11/13	-
2	TPO	M	24	2	-	3/9/11/13	-
1	CSO	A	38	1	-	0/1/5/7	-
1	CSO	B	38	1	-	0/1/5/7	-
1	CSO	E	38	1	-	0/1/5/7	-
1	CSO	F	38	1	-	0/1/5/7	-
1	CSO	C	38	1	-	0/1/5/7	-
1	CSO	D	38	1	-	0/1/5/7	-
2	TPO	T	24	2	-	1/9/11/13	-



All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	U	24	TPO	P-OG1	2.79	1.64	1.59
2	R	24	TPO	P-OG1	2.31	1.63	1.59
2	O	24	TPO	P-OG1	2.23	1.63	1.59
2	T	24	TPO	P-OG1	2.20	1.63	1.59

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	U	24	TPO	CG2-CB-CA	-4.16	104.95	113.16
2	N	24	TPO	CG2-CB-CA	-3.65	105.96	113.16
2	P	24	TPO	O2P-P-O1P	3.21	123.25	110.68
2	R	24	TPO	CG2-CB-CA	-3.00	107.24	113.16
2	O	24	TPO	CG2-CB-CA	-2.87	107.49	113.16
2	P	24	TPO	OG1-P-O1P	-2.82	98.52	109.39
2	M	24	TPO	CG2-CB-CA	-2.73	107.78	113.16
2	P	24	TPO	CG2-CB-CA	-2.65	107.92	113.16
2	U	24	TPO	O2P-P-O1P	2.61	120.89	110.68
2	P	24	TPO	O3P-P-O2P	-2.57	97.81	107.64
2	U	24	TPO	P-OG1-CB	-2.56	115.47	123.21
2	M	24	TPO	O3P-P-O2P	2.53	117.30	107.64
2	N	24	TPO	P-OG1-CB	-2.44	115.84	123.21
2	J	24	TPO	CG2-CB-CA	-2.43	108.37	113.16
2	R	24	TPO	OG1-P-O1P	-2.42	100.06	109.39
2	U	24	TPO	OG1-P-O1P	-2.33	100.40	109.39
2	P	24	TPO	O-C-CA	-2.31	118.71	124.78
2	P	24	TPO	P-OG1-CB	-2.31	116.24	123.21
2	M	24	TPO	P-OG1-CB	-2.28	116.31	123.21
2	T	24	TPO	O3P-P-O2P	2.20	116.05	107.64
2	R	24	TPO	P-OG1-CB	-2.19	116.58	123.21
2	T	24	TPO	CG2-CB-CA	-2.10	109.01	113.16
2	J	24	TPO	O-C-CA	-2.07	119.34	124.78
2	O	24	TPO	O-C-CA	-2.02	119.49	124.78

There are no chirality outliers.

All (17) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	R	24	TPO	O-C-CA-CB
2	R	24	TPO	CB-OG1-P-O1P
2	P	24	TPO	O-C-CA-CB
2	N	24	TPO	CB-OG1-P-O2P

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Mol	Chain	Res	Type	Atoms
2	P	24	TPO	CB-OG1-P-O1P
2	U	24	TPO	CB-OG1-P-O1P
2	R	24	TPO	CB-OG1-P-O2P
2	J	24	TPO	CB-OG1-P-O3P
2	M	24	TPO	CB-OG1-P-O2P
2	M	24	TPO	CB-OG1-P-O3P
2	O	24	TPO	CB-OG1-P-O3P
2	U	24	TPO	O-C-CA-CB
2	J	24	TPO	O-C-CA-CB
2	O	24	TPO	O-C-CA-CB
2	N	24	TPO	O-C-CA-CB
2	M	24	TPO	O-C-CA-CB
2	T	24	TPO	O-C-CA-CB

There are no ring outliers.

3 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	J	24	TPO	1	0
2	N	24	TPO	1	0
2	M	24	TPO	1	0

## 5.5 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

11 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	B3P	H	301	-	18,18,18	2.43	7 (38%)	21,23,23	1.55	8 (38%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
4	GOL	A	303	-	5,5,5	0.62	0	5,5,5	0.86	0
3	B3P	F	301	-	18,18,18	3.01	6 (33%)	21,23,23	1.77	6 (28%)
4	GOL	D	302	-	5,5,5	0.68	0	5,5,5	0.57	0
3	B3P	A	301	-	18,18,18	2.10	6 (33%)	21,23,23	1.82	3 (14%)
4	GOL	H	302	-	5,5,5	0.43	0	5,5,5	0.45	0
3	B3P	B	301	-	18,18,18	2.05	5 (27%)	21,23,23	1.18	0
4	GOL	D	301	-	5,5,5	0.34	0	5,5,5	0.54	0
4	GOL	G	301	-	5,5,5	0.89	0	5,5,5	1.18	1 (20%)
4	GOL	H	303	-	5,5,5	0.75	0	5,5,5	0.63	0
4	GOL	A	302	-	5,5,5	0.70	0	5,5,5	0.64	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	B3P	H	301	-	-	10/28/28/28	-
4	GOL	A	303	-	-	0/4/4/4	-
3	B3P	F	301	-	-	8/28/28/28	-
4	GOL	D	302	-	-	4/4/4/4	-
3	B3P	A	301	-	-	9/28/28/28	-
4	GOL	H	302	-	-	2/4/4/4	-
3	B3P	B	301	-	-	6/28/28/28	-
4	GOL	D	301	-	-	2/4/4/4	-
4	GOL	G	301	-	-	2/4/4/4	-
4	GOL	H	303	-	-	4/4/4/4	-
4	GOL	A	302	-	-	2/4/4/4	-

All (24) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	301	B3P	C3-N1	7.98	1.56	1.46
3	H	301	B3P	C3-N1	6.80	1.55	1.46
3	A	301	B3P	C3-N1	5.89	1.54	1.46
3	F	301	B3P	C6-C4	5.58	1.60	1.53
3	B	301	B3P	C3-N1	4.61	1.52	1.46
3	F	301	B3P	C5-C4	4.35	1.58	1.53
3	F	301	B3P	C7-C4	4.25	1.58	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	F	301	B3P	C9-C8	4.21	1.58	1.53
3	B	301	B3P	C7-C4	3.99	1.58	1.53
3	H	301	B3P	C2-N2	3.67	1.51	1.46
3	H	301	B3P	C7-C4	3.35	1.57	1.53
3	B	301	B3P	C6-C4	3.25	1.57	1.53
3	B	301	B3P	C9-C8	3.23	1.57	1.53
3	A	301	B3P	C2-N2	2.97	1.50	1.46
3	H	301	B3P	C1-C3	2.95	1.63	1.51
3	H	301	B3P	C11-C8	2.79	1.56	1.53
3	A	301	B3P	C10-C8	2.64	1.56	1.53
3	H	301	B3P	C1-C2	2.39	1.61	1.51
3	B	301	B3P	C10-C8	2.37	1.56	1.53
3	A	301	B3P	C9-C8	2.36	1.56	1.53
3	A	301	B3P	C6-C4	2.23	1.56	1.53
3	H	301	B3P	C4-N1	2.17	1.56	1.49
3	A	301	B3P	C7-C4	2.06	1.55	1.53
3	F	301	B3P	C1-C3	2.06	1.59	1.51

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	301	B3P	O3-C11-C8	-4.58	102.36	111.63
3	F	301	B3P	O5-C6-C4	3.80	119.33	111.63
3	A	301	B3P	C2-N2-C8	-3.76	110.75	116.08
3	A	301	B3P	O1-C9-C8	-3.44	104.67	111.63
3	H	301	B3P	C3-N1-C4	-2.71	112.24	116.08
3	F	301	B3P	O3-C11-C8	-2.66	106.25	111.63
3	H	301	B3P	C6-C4-C5	-2.58	104.60	110.04
3	F	301	B3P	C2-N2-C8	2.53	119.67	116.08
3	F	301	B3P	C6-C4-C5	-2.51	104.74	110.04
3	F	301	B3P	O2-C10-C8	-2.37	106.83	111.63
3	H	301	B3P	C2-N2-C8	-2.18	112.99	116.08
3	H	301	B3P	O3-C11-C8	2.14	115.96	111.63
3	H	301	B3P	C10-C8-C9	-2.13	105.54	110.04
3	H	301	B3P	C6-C4-N1	2.10	115.34	109.03
3	H	301	B3P	O6-C7-C4	-2.10	107.38	111.63
4	G	301	GOL	O3-C3-C2	2.08	120.17	110.20
3	F	301	B3P	O4-C5-C4	2.03	115.74	111.63
3	H	301	B3P	C3-C1-C2	2.03	121.66	114.26

There are no chirality outliers.

All (49) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	H	301	B3P	C1-C2-N2-C8
3	H	301	B3P	C1-C3-N1-C4
3	H	301	B3P	C5-C4-N1-C3
3	H	301	B3P	C6-C4-N1-C3
3	H	301	B3P	C7-C4-N1-C3
3	H	301	B3P	C9-C8-N2-C2
3	H	301	B3P	C10-C8-N2-C2
3	H	301	B3P	C11-C8-N2-C2
4	H	303	GOL	C1-C2-C3-O3
4	H	303	GOL	O2-C2-C3-O3
4	H	302	GOL	C1-C2-C3-O3
4	D	302	GOL	O1-C1-C2-C3
4	D	302	GOL	C1-C2-C3-O3
4	D	302	GOL	O2-C2-C3-O3
3	A	301	B3P	C1-C3-N1-C4
3	A	301	B3P	C5-C4-N1-C3
3	A	301	B3P	C6-C4-N1-C3
3	A	301	B3P	C7-C4-N1-C3
3	A	301	B3P	O3-C11-C8-C9
3	F	301	B3P	C1-C2-N2-C8
3	F	301	B3P	N1-C4-C6-O5
3	F	301	B3P	C5-C4-C6-O5
3	F	301	B3P	C7-C4-C6-O5
3	B	301	B3P	C1-C2-N2-C8
3	B	301	B3P	C9-C8-N2-C2
3	B	301	B3P	C10-C8-N2-C2
3	B	301	B3P	C11-C8-N2-C2
4	D	301	GOL	C1-C2-C3-O3
4	D	301	GOL	O2-C2-C3-O3
4	G	301	GOL	C1-C2-C3-O3
3	A	301	B3P	C3-C1-C2-N2
3	H	301	B3P	C3-C1-C2-N2
3	F	301	B3P	C3-C1-C2-N2
3	F	301	B3P	C6-C4-C7-O6
3	H	301	B3P	C2-C1-C3-N1
3	B	301	B3P	C1-C3-N1-C4
4	H	303	GOL	O1-C1-C2-C3
4	A	302	GOL	C1-C2-C3-O3
4	H	303	GOL	O1-C1-C2-O2
3	B	301	B3P	C2-C1-C3-N1
3	A	301	B3P	O3-C11-C8-C10
4	D	302	GOL	O1-C1-C2-O2
4	G	301	GOL	O2-C2-C3-O3

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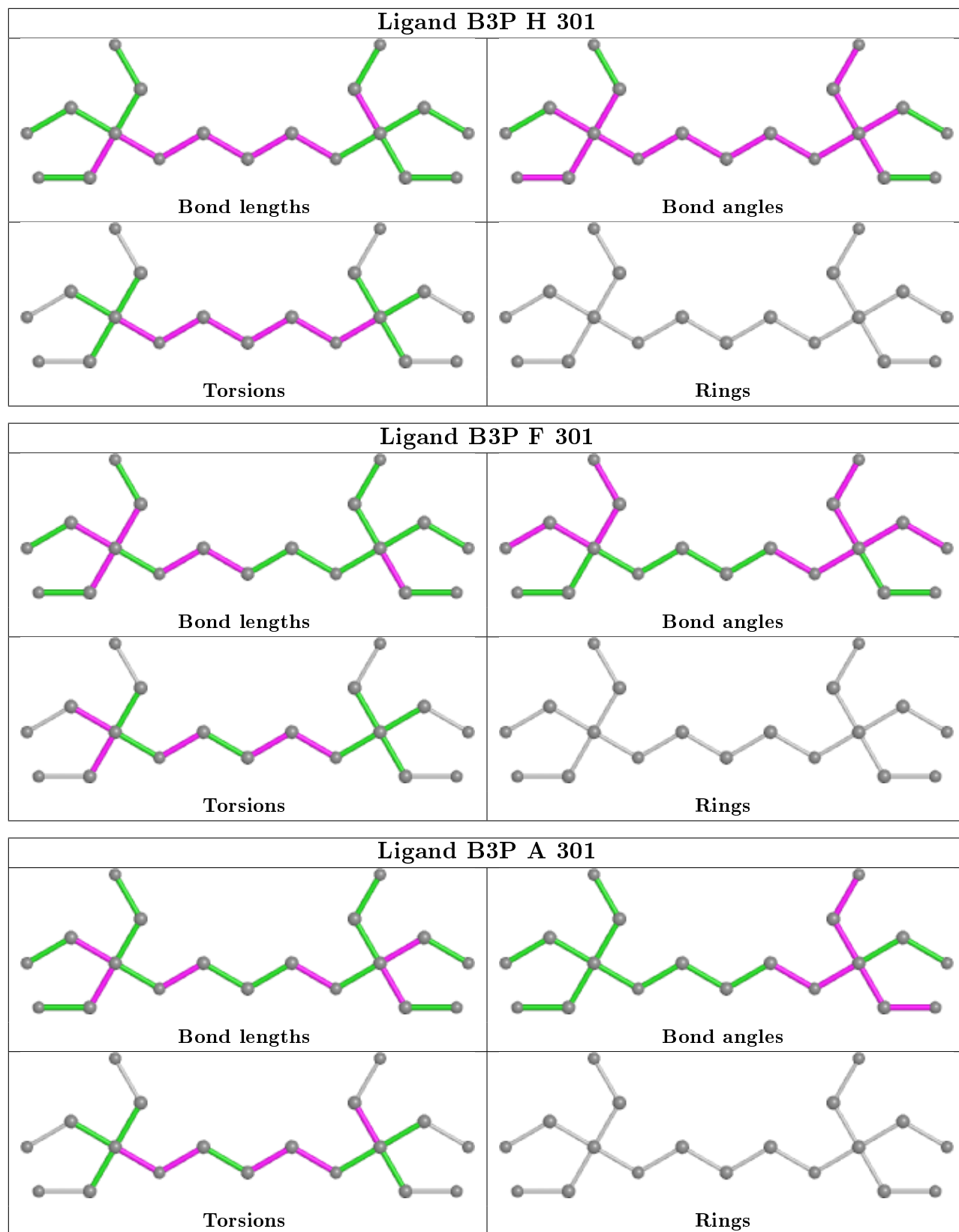
Mol	Chain	Res	Type	Atoms
3	A	301	B3P	C1-C2-N2-C8
3	F	301	B3P	C1-C3-N1-C4
4	H	302	GOL	O2-C2-C3-O3
4	A	302	GOL	O2-C2-C3-O3
3	A	301	B3P	O3-C11-C8-N2
3	F	301	B3P	N1-C4-C7-O6

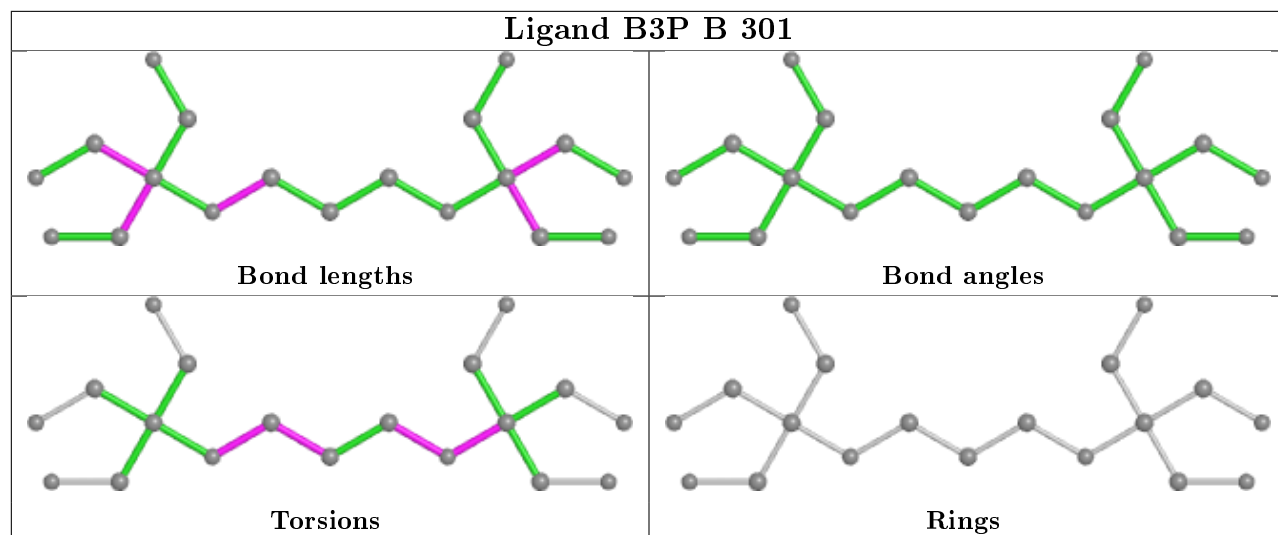
There are no ring outliers.

7 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	H	301	B3P	3	0
4	A	303	GOL	1	0
3	F	301	B3P	2	0
3	A	301	B3P	4	0
4	H	302	GOL	1	0
3	B	301	B3P	2	0
4	H	303	GOL	1	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	222/253 (87%)	0.34	3 (1%) 75 80	18, 32, 68, 76	0
1	B	228/253 (90%)	0.35	5 (2%) 62 69	23, 34, 71, 93	0
1	C	229/253 (90%)	0.38	7 (3%) 49 56	18, 30, 77, 127	0
1	D	218/253 (86%)	0.79	21 (9%) 8 10	24, 48, 110, 128	0
1	E	228/253 (90%)	0.41	10 (4%) 34 41	21, 35, 79, 114	0
1	F	230/253 (90%)	0.31	8 (3%) 44 51	19, 31, 65, 101	0
1	G	225/253 (88%)	0.65	21 (9%) 8 11	21, 43, 91, 116	0
1	H	230/253 (90%)	0.46	12 (5%) 27 34	19, 37, 76, 99	0
2	J	7/11 (63%)	0.62	1 (14%) 2 3	40, 45, 63, 73	0
2	M	7/11 (63%)	0.83	0 100 100	38, 51, 73, 75	0
2	N	8/11 (72%)	1.15	1 (12%) 3 5	44, 51, 78, 87	0
2	O	7/11 (63%)	0.92	0 100 100	37, 45, 67, 72	0
2	P	6/11 (54%)	2.48	4 (66%) 0 0	71, 90, 94, 96	0
2	R	7/11 (63%)	1.07	2 (28%) 0 0	36, 44, 54, 57	0
2	T	7/11 (63%)	1.55	1 (14%) 2 3	56, 62, 83, 92	0
2	U	8/11 (72%)	1.37	1 (12%) 3 5	47, 58, 86, 88	0
All	All	1867/2112 (88%)	0.48	97 (5%) 27 34	18, 36, 86, 128	0

All (97) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	211	ASP	7.5
1	F	77	LYS	6.0
1	D	185	ASN	6.0
1	G	230	TRP	5.9
1	G	228	THR	5.5

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	H	231	THR	5.5
1	E	211	ASP	5.3
1	D	220	MET	4.9
1	G	191	ILE	4.9
1	B	209	SER	4.7
1	D	150	ALA	4.5
1	E	205	LEU	4.4
1	G	185	ASN	4.4
1	D	203	ALA	4.3
1	E	208	LEU	4.3
1	G	222	LEU	4.1
1	F	213	TYR	4.1
1	B	208	LEU	4.0
1	C	229	LEU	3.9
1	F	211	ASP	3.8
1	D	184	ALA	3.7
2	T	28	PRO	3.7
1	E	206	HIS	3.7
1	F	212	SER	3.6
1	D	199	ASP	3.5
1	H	230	TRP	3.5
2	U	28	PRO	3.5
1	G	211	ASP	3.5
1	G	212	SER	3.5
1	G	224	ARG	3.4
1	E	213	TYR	3.4
1	H	209	SER	3.4
2	P	22	SER	3.4
1	G	215	ASP	3.3
1	D	206	HIS	3.3
1	G	231	THR	3.3
1	G	194	ALA	3.3
2	P	28	PRO	3.2
1	C	203	ALA	3.2
1	B	207	THR	3.1
1	C	212	SER	3.1
1	D	198	PHE	3.1
1	C	213	TYR	3.0
1	G	181	TYR	3.0
1	A	203	ALA	3.0
2	P	23	CYS	2.9
1	H	222	LEU	2.9

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
1	H	207	THR	2.9
1	E	212	SER	2.9
1	D	173	ALA	2.8
1	C	207	THR	2.8
1	A	168	ILE	2.8
2	J	28	PRO	2.7
1	B	205	LEU	2.7
1	G	203	ALA	2.7
1	F	70	ASN	2.7
1	D	118	VAL	2.7
1	D	192	SER	2.6
1	D	229	LEU	2.6
1	G	227	LEU	2.6
1	F	208	LEU	2.6
1	H	221	GLN	2.5
1	G	202	MET	2.5
1	D	190	ALA	2.5
1	D	108	ILE	2.5
1	D	227	LEU	2.5
1	E	70	ASN	2.5
2	P	27	LEU	2.5
1	D	151	TYR	2.4
1	H	208	LEU	2.4
1	G	229	LEU	2.4
1	D	187	PRO	2.4
1	A	204	ASP	2.4
1	F	76	GLU	2.4
2	N	29	ARG	2.4
1	E	209	SER	2.4
2	R	27	LEU	2.4
1	G	205	LEU	2.3
1	D	117	ARG	2.3
1	D	181	TYR	2.3
1	F	205	LEU	2.3
1	C	209	SER	2.3
1	G	187	PRO	2.3
1	G	201	ALA	2.3
1	H	203	ALA	2.3
1	G	221	GLN	2.3
1	D	119	PHE	2.2
1	D	180	HIS	2.2
2	R	25	TRP	2.2

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Mol	Chain	Res	Type	RSRZ
1	H	223	LEU	2.2
1	E	207	THR	2.1
1	H	211	ASP	2.1
1	H	195	LYS	2.1
1	B	228	THR	2.1
1	H	186	SER	2.1
1	E	203	ALA	2.0
1	G	206	HIS	2.0

## 6.2 Non-standard residues in protein, DNA, RNA chains [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
1	CSO	D	38	7/8	0.76	0.20	42,47,52,57	0
1	CSO	A	38	7/8	0.86	0.20	33,39,52,52	0
1	CSO	G	38	7/8	0.87	0.19	37,40,56,58	0
1	CSO	H	38	7/8	0.88	0.17	33,34,48,52	0
1	CSO	B	38	7/8	0.90	0.15	34,36,45,49	0
1	CSO	E	38	7/8	0.92	0.17	35,39,42,52	0
1	CSO	C	38	7/8	0.93	0.13	27,29,40,46	0
1	CSO	F	38	7/8	0.94	0.12	31,34,41,53	0
2	TPO	U	24	11/12	0.94	0.15	28,31,39,41	0
2	TPO	P	24	11/12	0.94	0.16	43,61,74,86	0
2	TPO	T	24	11/12	0.94	0.14	35,35,49,49	0
2	TPO	O	24	11/12	0.96	0.12	23,26,31,32	0
2	TPO	J	24	11/12	0.96	0.14	25,29,34,34	0
2	TPO	N	24	11/12	0.97	0.16	21,28,32,33	0
2	TPO	M	24	11/12	0.97	0.14	25,28,32,34	0
2	TPO	R	24	11/12	0.97	0.14	21,25,30,31	0

## 6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

## 6.4 Ligands

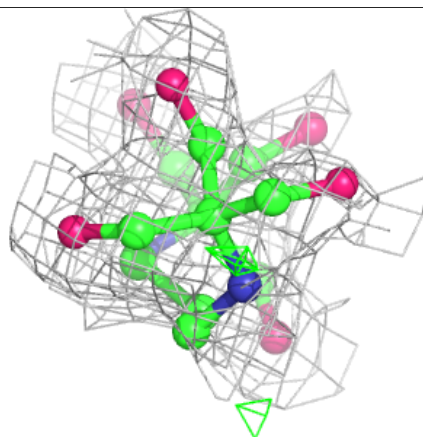
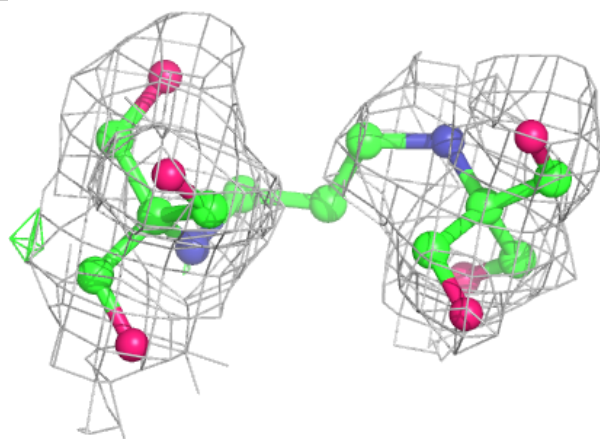
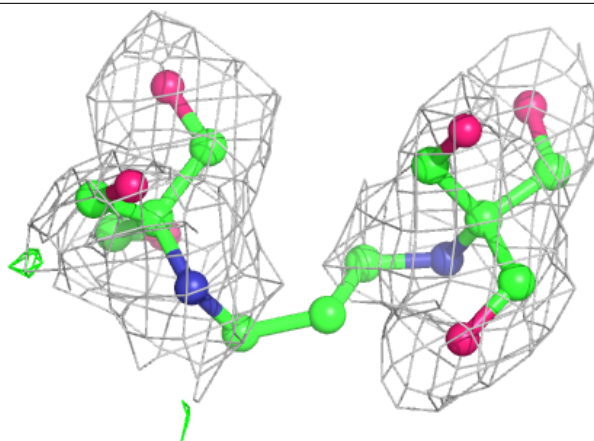
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<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
4	GOL	G	301	6/6	0.66	0.17	45,57,63,63	0
4	GOL	A	302	6/6	0.76	0.17	35,48,50,56	0
4	GOL	H	303	6/6	0.77	0.19	39,45,48,48	0
4	GOL	D	301	6/6	0.77	0.18	52,56,66,66	0
4	GOL	D	302	6/6	0.78	0.18	36,48,50,50	0
3	B3P	B	301	19/19	0.83	0.21	40,52,59,61	0
4	GOL	H	302	6/6	0.85	0.14	48,54,57,58	0
3	B3P	H	301	19/19	0.86	0.21	32,39,53,54	0
3	B3P	F	301	19/19	0.87	0.22	31,42,55,56	0
3	B3P	A	301	19/19	0.89	0.21	27,35,49,50	0
4	GOL	A	303	6/6	0.91	0.20	36,43,47,48	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.

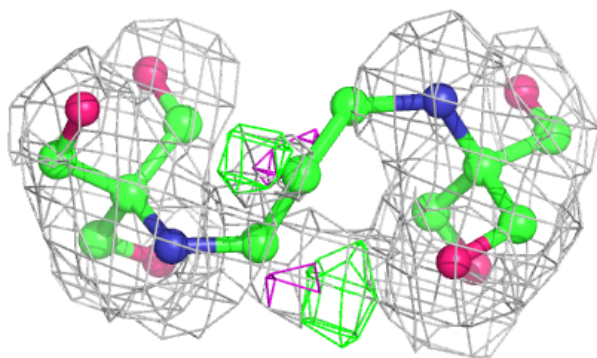
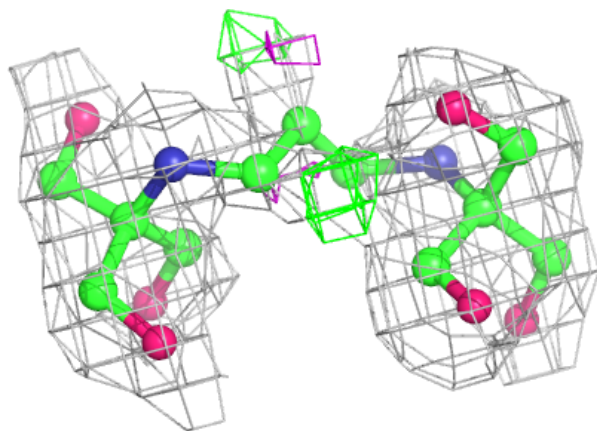
**Electron density around B3P B 301:**

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



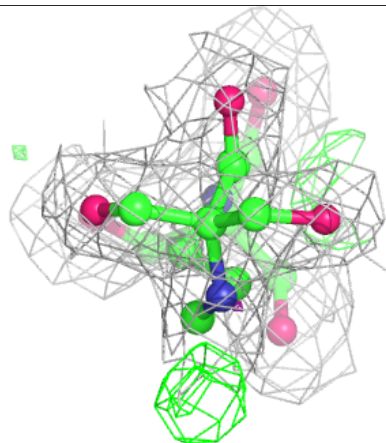
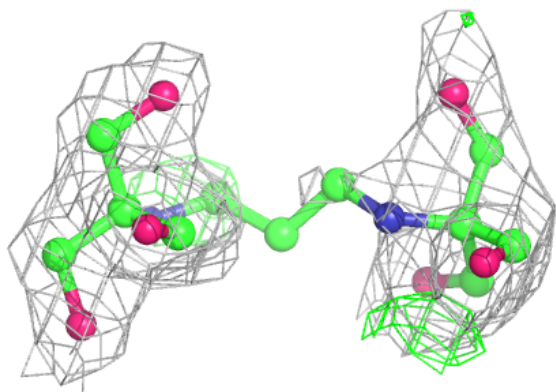
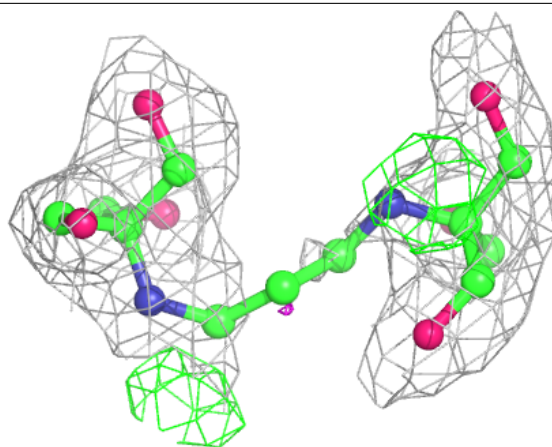
**Electron density around B3P H 301:**

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

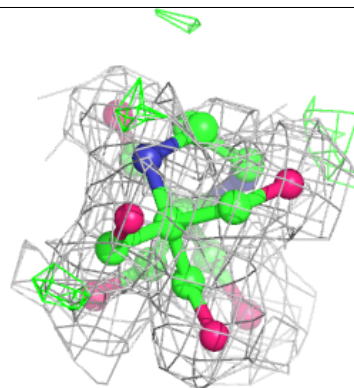
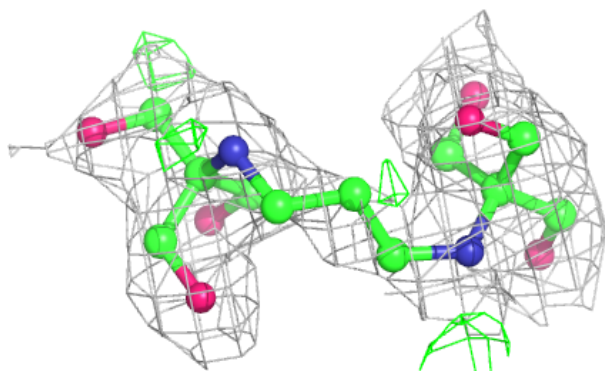
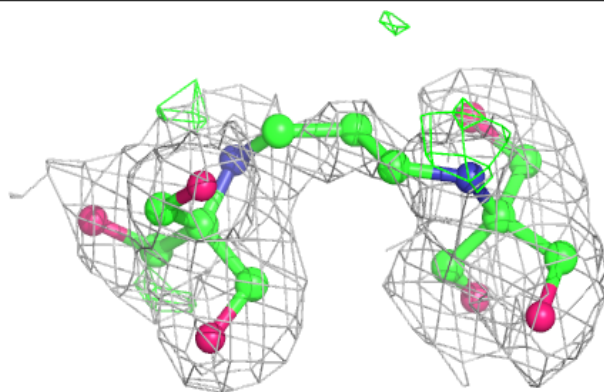


**Electron density around B3P F 301:**

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

**Electron density around B3P A 301:**

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





## 6.5 Other polymers

There are no such residues in this entry.