Full wwPDB X-ray Structure Validation Report ⓘ

Apr 4, 2022 – 02:08 PM EDT

PDB ID	:	7MSN
Title	:	SunS glycosin S-glycosyltransferase
Authors	:	Garg, N.; Nair, S.K.
Deposited on	:	2021-05-11
Resolution	:	3.00 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*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

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

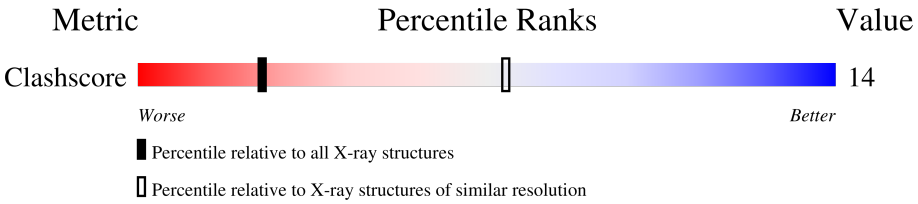
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	FAILED
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.27

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 3.00 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))
Clashscore	141614	2416 (3.00-3.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=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 <=5%

Note EDS failed to run properly.

Mol	Chain	Length	Quality of chain
1	A	422	71% 27% .
1	B	422	70% 27% ..

2 Entry composition (i)

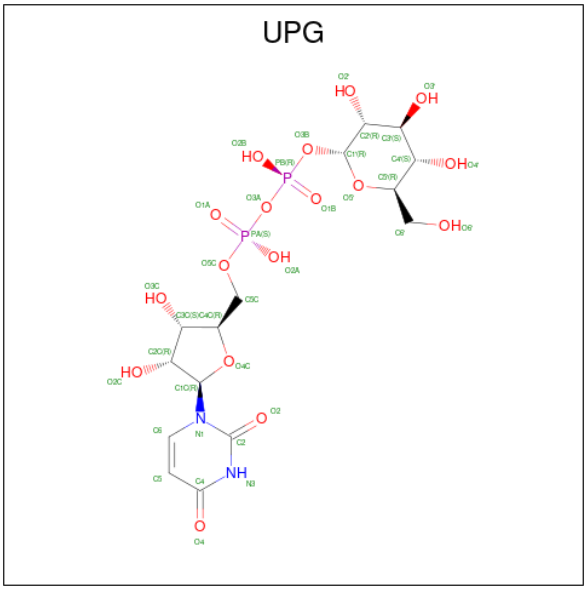
There are 2 unique types of molecules in this entry. The entry contains 6995 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 SPbeta prophage-derived glycosyltransferase SunS.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	417	Total	C	N	O	S	0	0	0
			3462	2218	570	659	15			
1	B	416	Total	C	N	O	S	0	0	0
			3461	2217	569	660	15			

- Molecule 2 is URIDINE-5'-DIPHOSPHATE-GLUCOSE (three-letter code: UPG) (formula: $C_{15}H_{24}N_2O_{17}P_2$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			36	15	2	17	2		
2	B	1	Total	C	N	O	P	0	0
			36	15	2	17	2		

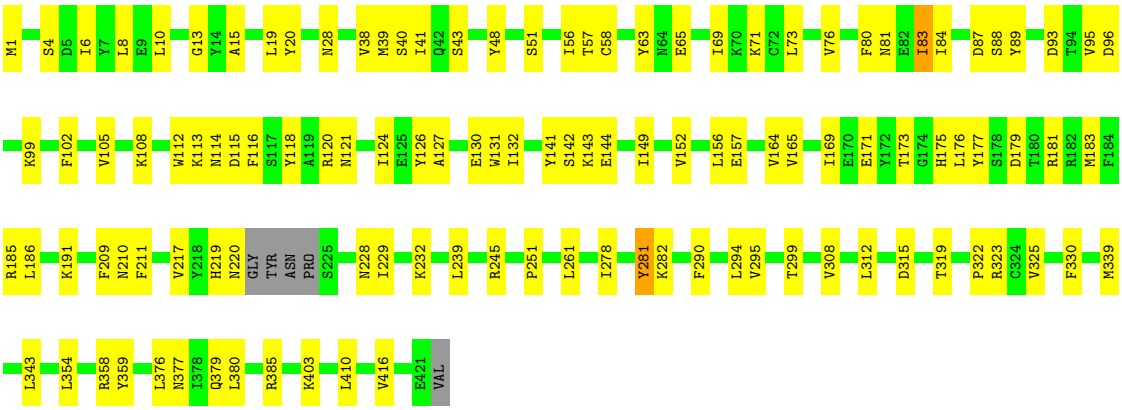
3 Residue-property plots (i)

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. 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. 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.

Note EDS failed to run properly.

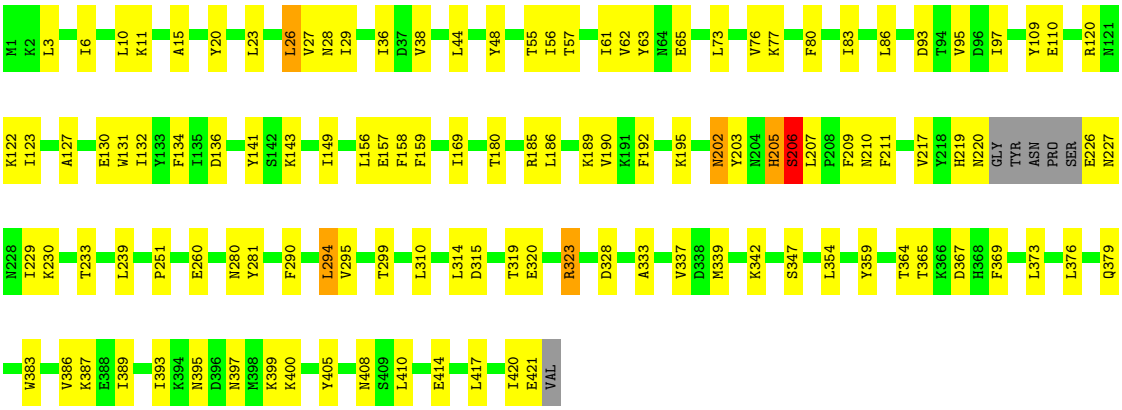
• Molecule 1: SPbeta prophage-derived glycosyltransferase SunS

Chain A:



• Molecule 1: SPbeta prophage-derived glycosyltransferase SunS

Chain B:



4 Data and refinement statistics (i)

EDS failed to run properly - this section is therefore incomplete.

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α, β, γ	108.73Å 108.73Å 210.70Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	47.38 – 3.00	Depositor
% Data completeness (in resolution range)	98.8 (47.38-3.00)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.19 (at 3.01Å)	Xtriage
Refinement program	PHENIX 1.18.2_3874	Depositor
R, R_{free}	0.204 , 0.280	Depositor
Wilson B-factor (Å^2)	70.6	Xtriage
Anisotropy	0.188	Xtriage
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	6995	wwPDB-VP
Average B, all atoms (Å^2)	64.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 10.20% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

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

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	0.53	0/3528	0.77	4/4760 (0.1%)
1	B	0.56	0/3527	0.82	6/4758 (0.1%)
All	All	0.54	0/7055	0.79	10/9518 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	B	0	5

There are no bond length outliers.

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	26	LEU	CB-CG-CD2	-7.31	98.57	111.00
1	B	294	LEU	CA-CB-CG	7.13	131.69	115.30
1	A	281	TYR	CB-CG-CD1	-6.84	116.89	121.00
1	B	281	TYR	CB-CG-CD1	-5.67	117.60	121.00
1	A	281	TYR	CB-CG-CD2	5.45	124.27	121.00
1	B	323	ARG	NE-CZ-NH2	-5.38	117.61	120.30
1	A	354	LEU	CA-CB-CG	5.31	127.52	115.30
1	B	206	SER	CB-CA-C	-5.28	100.07	110.10
1	A	83	ILE	CG1-CB-CG2	-5.18	100.01	111.40
1	B	281	TYR	CB-CG-CD2	5.03	124.02	121.00

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	202	ASN	Peptide
1	B	205	HIS	Peptide
1	B	206	SER	Peptide
1	B	27	VAL	Peptide
1	B	62	VAL	Peptide

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	3462	0	3450	100	0
1	B	3461	0	3452	101	0
2	A	36	0	21	2	0
2	B	36	0	21	5	0
All	All	6995	0	6944	190	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 14.

All (190) 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)
2:B:500:UPG:C4C	2:B:500:UPG:O4C	1.66	1.15
2:A:500:UPG:O4C	2:A:500:UPG:C4C	1.66	1.14
1:A:28:ASN:ND2	1:A:210:ASN:O	2.08	0.86
1:A:121:ASN:HA	1:A:191:LYS:HE2	1.67	0.77
1:A:165:VAL:HB	1:A:183:MET:HB3	1.68	0.76
1:B:323:ARG:HD3	1:B:323:ARG:H	1.52	0.75
1:B:195:LYS:HB3	1:B:239:LEU:HD12	1.70	0.74
1:A:323:ARG:HD3	1:A:323:ARG:H	1.53	0.73
1:A:114:ASN:HB3	1:A:239:LEU:HD21	1.70	0.72
1:A:57:THR:HG21	1:A:127:ALA:HB1	1.71	0.72
1:B:226:GLU:HG2	1:B:227:ASN:H	1.54	0.72
1:B:393:ILE:HG23	1:B:399:LYS:HE3	1.71	0.71
1:B:420:ILE:HG13	1:B:421:GLU:H	1.59	0.67
1:B:93:ASP:O	1:B:95:VAL:N	2.28	0.66
1:B:295:VAL:O	1:B:299:THR:HG23	1.95	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:3:LEU:HB2	1:B:36:ILE:HD11	1.78	0.65
1:A:156:LEU:HD21	1:A:211:PHE:CD2	2.31	0.65
1:A:93:ASP:O	1:A:95:VAL:N	2.30	0.65
1:B:315:ASP:O	1:B:319:THR:HG23	1.97	0.64
1:A:410:LEU:HD12	1:B:410:LEU:HD12	1.79	0.64
1:A:149:ILE:H	1:A:149:ILE:HD12	1.63	0.63
1:A:295:VAL:O	1:A:299:THR:HG23	1.98	0.63
1:A:10:LEU:HD21	1:A:19:LEU:HD23	1.81	0.62
1:B:347:SER:HB2	1:B:376:LEU:HD22	1.80	0.62
1:B:383:TRP:HA	1:B:386:VAL:HG22	1.80	0.61
1:B:28:ASN:ND2	1:B:210:ASN:O	2.33	0.61
1:B:393:ILE:HD13	1:B:399:LYS:HG3	1.83	0.60
1:A:13:GLY:O	1:A:15:ALA:N	2.33	0.60
2:B:500:UPG:H5C2	2:B:500:UPG:H6	1.84	0.60
1:B:86:LEU:HD22	1:B:123:ILE:HG13	1.84	0.59
1:B:143:LYS:HD3	1:B:143:LYS:H	1.68	0.59
1:A:176:LEU:H	1:B:364:THR:HG21	1.68	0.58
1:A:359:TYR:CE2	1:B:323:ARG:HG2	2.38	0.58
1:B:36:ILE:HG21	1:B:159:PHE:HD1	1.69	0.58
2:A:500:UPG:O4C	2:A:500:UPG:C5C	2.50	0.58
1:A:93:ASP:HB2	1:A:96:ASP:OD1	2.04	0.57
1:A:176:LEU:H	1:B:364:THR:CG2	2.17	0.57
1:B:209:PHE:CE2	1:B:211:PHE:CD1	2.93	0.56
1:A:175:HIS:HA	1:B:364:THR:HG22	1.87	0.56
1:A:157:GLU:HG2	1:A:185:ARG:NH1	2.20	0.56
1:B:110:GLU:OE2	1:B:122:LYS:HE3	2.05	0.55
1:A:73:LEU:HA	1:A:76:VAL:HG22	1.89	0.55
1:A:39:MET:HB2	1:A:43:SER:OG	2.07	0.55
1:A:156:LEU:HD21	1:A:211:PHE:HD2	1.69	0.54
1:A:278:ILE:HD13	1:A:294:LEU:HD13	1.90	0.54
1:B:28:ASN:HD22	1:B:211:PHE:HA	1.71	0.54
1:B:202:ASN:O	1:B:206:SER:HB3	2.08	0.54
1:B:93:ASP:HB3	1:B:97:ILE:HG13	1.90	0.54
1:B:73:LEU:HA	1:B:76:VAL:HG12	1.90	0.54
1:A:379:GLN:CG	1:B:379:GLN:HG2	2.38	0.54
1:A:359:TYR:HE2	1:B:323:ARG:HG2	1.73	0.54
1:A:1:MET:HE1	1:A:38:VAL:HG21	1.90	0.53
1:A:173:THR:HA	1:B:395:ASN:HD21	1.73	0.53
1:A:179:ASP:OD1	1:A:181:ARG:NH1	2.42	0.53
1:B:55:THR:OG1	1:B:130:GLU:HG2	2.07	0.53
1:A:143:LYS:N	1:A:143:LYS:HD3	2.24	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1:MET:CE	1:A:38:VAL:HG21	2.39	0.52
1:A:323:ARG:H	1:A:323:ARG:CD	2.20	0.52
1:B:209:PHE:HE2	1:B:211:PHE:HD1	1.57	0.52
1:A:58:CYS:HB3	1:A:83:ILE:HG22	1.91	0.52
1:A:209:PHE:HE2	1:A:211:PHE:CD1	2.27	0.52
1:B:3:LEU:HG	1:B:29:ILE:HG23	1.92	0.52
1:B:219:HIS:CG	1:B:220:ASN:H	2.28	0.51
1:B:226:GLU:HG2	1:B:227:ASN:N	2.24	0.51
1:B:333:ALA:O	1:B:337:VAL:HG23	2.10	0.51
1:B:110:GLU:HG3	1:B:122:LYS:HG3	1.91	0.51
1:A:358:ARG:HH22	1:B:328:ASP:CG	2.14	0.51
1:B:209:PHE:CE2	1:B:211:PHE:CE1	2.99	0.51
1:B:143:LYS:HD3	1:B:143:LYS:N	2.27	0.50
1:B:56:ILE:HG13	1:B:131:TRP:HB2	1.92	0.50
1:A:88:SER:HB3	1:A:112:TRP:HB2	1.93	0.50
1:B:169:ILE:HG12	1:B:217:VAL:CG2	2.41	0.50
1:B:405:TYR:HA	1:B:408:ASN:ND2	2.27	0.50
1:A:228:ASN:ND2	1:A:232:LYS:HE2	2.27	0.50
1:B:23:LEU:HD12	1:B:26:LEU:HD22	1.94	0.49
1:A:219:HIS:CG	1:A:220:ASN:H	2.30	0.49
1:A:87:ASP:OD1	1:A:89:TYR:N	2.40	0.49
1:A:131:TRP:CE2	1:A:185:ARG:HG2	2.48	0.49
1:A:102:PHE:O	1:A:105:VAL:HG22	2.11	0.49
1:A:130:GLU:O	1:A:186:LEU:HB2	2.12	0.49
1:B:190:VAL:HG22	1:B:202:ASN:HB3	1.95	0.49
1:B:209:PHE:CE2	1:B:211:PHE:HD1	2.31	0.49
1:A:6:ILE:O	1:A:10:LEU:HD13	2.12	0.49
1:A:121:ASN:O	1:A:124:ILE:N	2.46	0.49
1:B:141:TYR:OH	1:B:149:ILE:HG12	2.12	0.49
1:A:169:ILE:HG12	1:A:217:VAL:HG13	1.94	0.49
1:A:385:ARG:HH11	1:A:385:ARG:HG3	1.77	0.49
1:B:10:LEU:HB3	1:B:20:TYR:HD1	1.78	0.48
1:B:310:LEU:O	1:B:314:LEU:HB2	2.13	0.48
1:B:323:ARG:H	1:B:323:ARG:CD	2.24	0.48
1:A:299:THR:HG22	1:A:330:PHE:HZ	1.77	0.48
1:A:84:ILE:HD13	1:A:126:TYR:HB2	1.96	0.48
1:A:124:ILE:HG23	1:A:186:LEU:CD2	2.43	0.48
1:B:373:LEU:HB3	1:B:389:ILE:HD13	1.95	0.48
1:B:3:LEU:HB2	1:B:36:ILE:CD1	2.43	0.48
1:B:229:ILE:HG13	1:B:230:LYS:N	2.28	0.48
1:A:379:GLN:HG2	1:B:379:GLN:HG2	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:164:VAL:HG21	1:A:181:ARG:HG2	1.95	0.48
1:A:343:LEU:HD22	1:A:376:LEU:HD22	1.96	0.48
1:B:57:THR:HG21	1:B:127:ALA:HB1	1.95	0.47
1:A:63:TYR:O	1:A:65:GLU:N	2.47	0.47
1:A:69:ILE:HG13	1:A:73:LEU:HD12	1.95	0.47
1:B:132:ILE:HB	1:B:186:LEU:HD11	1.96	0.47
1:A:339:MET:CE	1:B:342:LYS:HB3	2.45	0.47
1:A:19:LEU:HA	1:A:48:TYR:CD2	2.50	0.46
1:A:71:LYS:N	1:A:71:LYS:HD2	2.31	0.46
1:B:48:TYR:HD1	1:B:158:PHE:CD2	2.31	0.46
1:B:219:HIS:CG	1:B:220:ASN:N	2.84	0.46
1:A:10:LEU:HD23	1:A:20:TYR:HB2	1.98	0.46
1:B:209:PHE:HE2	1:B:211:PHE:CD1	2.30	0.46
1:A:308:VAL:O	1:A:312:LEU:HD13	2.16	0.46
1:A:121:ASN:HB2	1:A:191:LYS:HZ1	1.80	0.46
1:A:290:PHE:CE1	1:A:294:LEU:HD21	2.51	0.46
1:B:189:LYS:O	1:B:190:VAL:HB	2.16	0.46
1:A:171:GLU:OE2	1:A:177:TYR:HE1	1.98	0.45
1:B:141:TYR:OH	1:B:149:ILE:CG1	2.64	0.45
1:A:118:TYR:O	1:A:121:ASN:HB3	2.17	0.45
1:A:131:TRP:CZ2	1:A:185:ARG:HG2	2.52	0.45
1:A:96:ASP:HA	1:A:99:LYS:HD2	1.99	0.45
1:A:113:LYS:O	1:A:115:ASP:N	2.50	0.45
1:B:95:VAL:HG11	1:B:109:TYR:OH	2.17	0.45
1:A:416:VAL:HG23	1:B:387:LYS:HA	1.99	0.45
1:A:141:TYR:OH	1:A:149:ILE:CG1	2.65	0.45
1:B:233:THR:HG23	1:B:260:GLU:HG2	1.99	0.45
1:B:354:LEU:HD21	1:B:369:PHE:CG	2.52	0.45
1:A:80:PHE:O	1:A:81:ASN:HB2	2.17	0.44
1:A:105:VAL:HG23	1:A:105:VAL:O	2.16	0.44
1:A:171:GLU:HB3	1:A:173:THR:H	1.81	0.44
1:B:169:ILE:HG13	1:B:180:THR:HG21	1.98	0.44
1:B:189:LYS:HA	1:B:203:TYR:CD1	2.53	0.44
1:B:219:HIS:ND1	1:B:220:ASN:N	2.65	0.44
2:B:500:UPG:O4C	2:B:500:UPG:C5C	2.51	0.44
1:A:176:LEU:HB2	1:B:364:THR:HG21	1.99	0.44
1:B:414:GLU:HA	1:B:417:LEU:HB3	1.99	0.44
1:A:143:LYS:HD3	1:A:143:LYS:H	1.82	0.44
1:A:229:ILE:H	1:A:229:ILE:HD12	1.82	0.44
1:B:207:LEU:HD12	1:B:207:LEU:HA	1.86	0.44
1:B:63:TYR:O	1:B:65:GLU:N	2.50	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:149:ILE:H	1:B:149:ILE:HD12	1.83	0.44
1:A:4:SER:O	1:A:8:LEU:HD23	2.18	0.44
1:B:314:LEU:HA	1:B:314:LEU:HD12	1.81	0.44
1:A:315:ASP:O	1:A:319:THR:HG23	2.18	0.43
1:A:377:ASN:HA	1:A:380:LEU:HB2	1.99	0.43
1:B:290:PHE:CE1	1:B:294:LEU:HD21	2.54	0.43
1:A:108:LYS:HG3	1:A:126:TYR:CD1	2.53	0.43
1:B:11:LYS:O	1:B:15:ALA:HB2	2.17	0.43
1:A:149:ILE:O	1:A:152:VAL:HB	2.17	0.43
1:A:156:LEU:HD21	1:A:211:PHE:CE2	2.53	0.43
1:A:19:LEU:HA	1:A:48:TYR:CE2	2.53	0.43
1:A:142:SER:OG	1:A:144:GLU:HG2	2.19	0.43
1:B:38:VAL:HG21	1:B:44:LEU:HD22	2.02	0.42
1:B:109:TYR:O	1:B:110:GLU:HG2	2.19	0.42
1:B:120:ARG:NH2	1:B:136:ASP:OD1	2.52	0.42
1:B:251:PRO:HG3	1:B:280:ASN:HB3	2.00	0.42
1:A:56:ILE:HD13	1:A:149:ILE:HG22	2.01	0.42
1:A:325:VAL:HG12	1:B:359:TYR:O	2.19	0.42
1:B:77:LYS:HA	1:B:83:ILE:CD1	2.50	0.42
1:A:28:ASN:HD22	1:A:211:PHE:HA	1.84	0.42
1:A:219:HIS:ND1	1:A:220:ASN:N	2.67	0.42
1:B:61:ILE:HG13	2:B:500:UPG:O4C	2.19	0.42
1:B:169:ILE:HG12	1:B:217:VAL:HG22	2.01	0.42
1:A:281:TYR:O	1:A:282:LYS:C	2.57	0.42
1:B:157:GLU:HG2	1:B:185:ARG:NH1	2.35	0.42
1:B:156:LEU:HD21	1:B:211:PHE:CD2	2.55	0.42
2:B:500:UPG:H5C2	2:B:500:UPG:C6	2.50	0.42
1:A:132:ILE:O	1:A:183:MET:HA	2.19	0.42
1:B:397:ASN:HA	1:B:400:LYS:HB3	2.01	0.42
1:A:48:TYR:O	1:A:51:SER:OG	2.19	0.42
1:B:203:TYR:C	1:B:205:HIS:H	2.22	0.42
1:B:393:ILE:HD11	1:B:399:LYS:N	2.35	0.42
1:A:116:PHE:O	1:A:120:ARG:HG2	2.21	0.41
1:A:403:LYS:HE2	1:B:421:GLU:O	2.20	0.41
1:A:83:ILE:HG21	1:A:83:ILE:HD13	1.79	0.41
1:B:143:LYS:HE2	1:B:143:LYS:HB2	1.96	0.41
1:B:320:GLU:HA	1:B:320:GLU:OE1	2.19	0.41
1:A:245:ARG:HB3	1:A:245:ARG:NH1	2.35	0.41
1:A:343:LEU:HD23	1:B:339:MET:SD	2.60	0.41
1:B:365:THR:OG1	1:B:367:ASP:HB2	2.21	0.41
1:A:164:VAL:CG2	1:A:181:ARG:HG2	2.51	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:261:LEU:HD23	1:A:261:LEU:HA	1.92	0.41
1:A:403:LYS:HE2	1:B:421:GLU:C	2.41	0.41
1:B:76:VAL:HG23	1:B:80:PHE:HE2	1.86	0.40
1:B:251:PRO:HG3	1:B:280:ASN:CB	2.51	0.40
1:A:251:PRO:HB2	1:A:281:TYR:CD2	2.57	0.40
1:B:6:ILE:O	1:B:10:LEU:HD13	2.22	0.40
1:B:134:PHE:CE1	1:B:192:PHE:HE1	2.39	0.40
1:A:40:SER:OG	1:A:41:ILE:N	2.54	0.40
1:A:185:ARG:HE	1:A:185:ARG:HB3	1.72	0.40
1:A:322:PRO:HD2	1:A:323:ARG:HH21	1.87	0.40
1:B:86:LEU:HB2	1:B:123:ILE:HD11	2.02	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

There are no protein backbone outliers to report in this entry.

5.3.2 Protein sidechains (i)

There are no protein residues with a non-rotameric sidechain to report in this entry.

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 monosaccharides in this entry.

5.6 Ligand geometry (i)

2 ligands are modelled in this entry.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

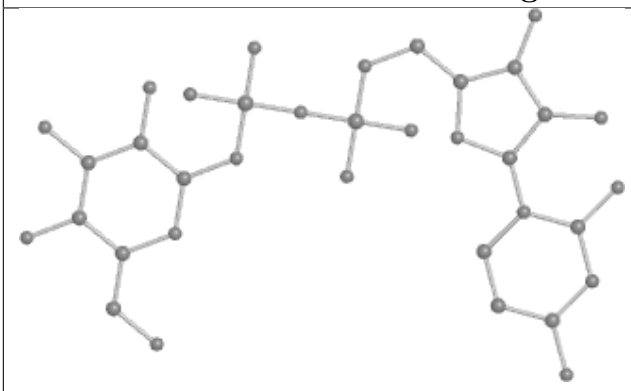
There are no torsion outliers.

There are no ring outliers.

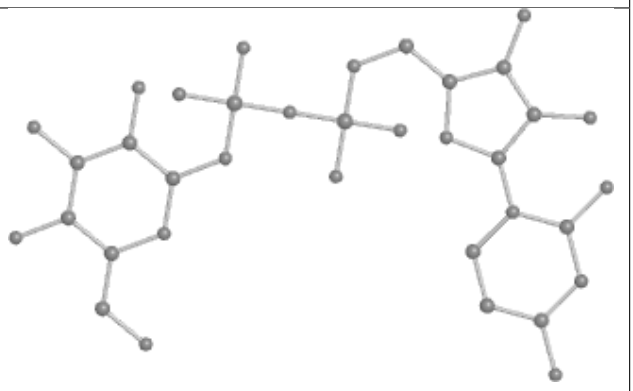
No monomer is involved in short contacts.

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 then 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.

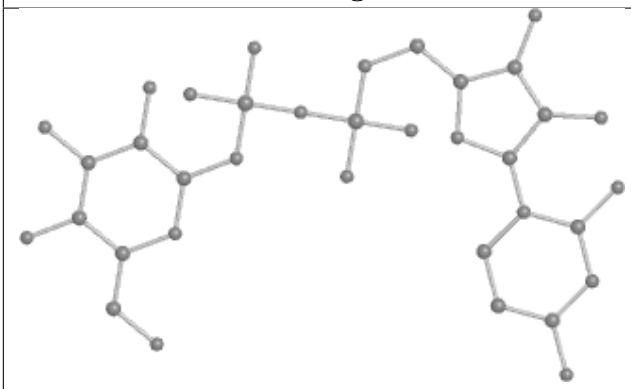
Ligand UPG A 500



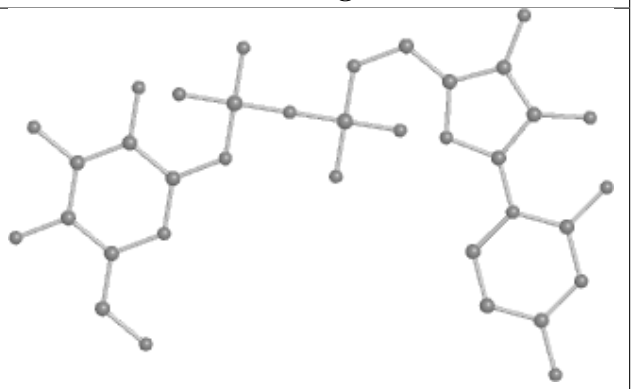
Bond lengths



Bond angles

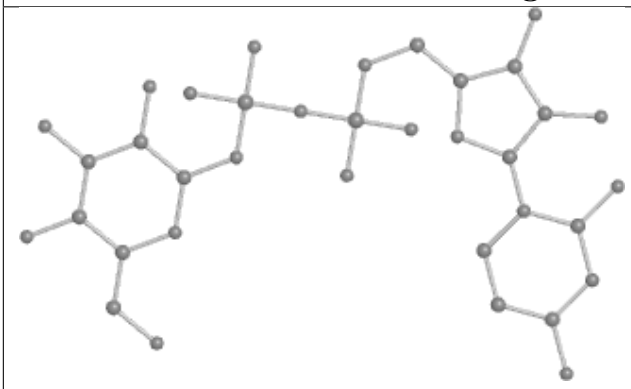


Torsions

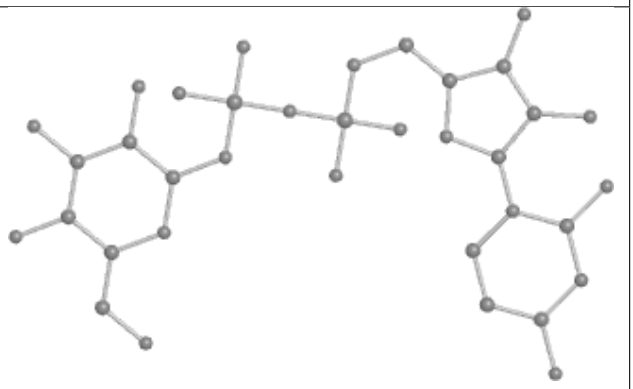


Rings

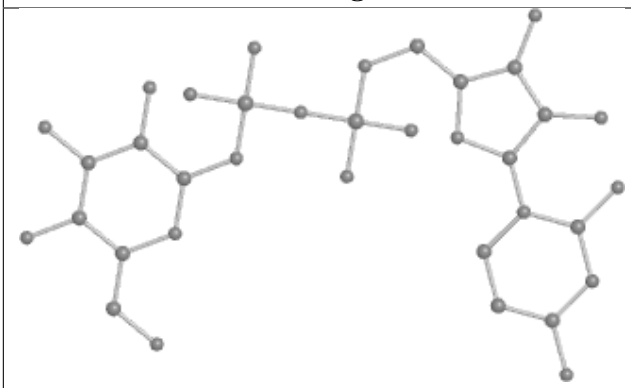
Ligand UPG B 500



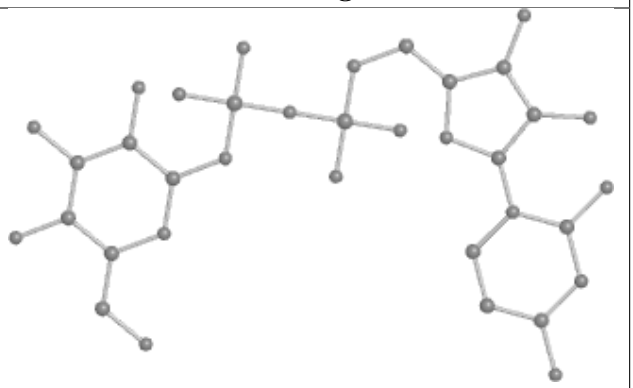
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

EDS failed to run properly - this section is therefore empty.

6.2 Non-standard residues in protein, DNA, RNA chains

EDS failed to run properly - this section is therefore empty.

6.3 Carbohydrates

EDS failed to run properly - this section is therefore empty.

6.4 Ligands

EDS failed to run properly - this section is therefore empty.

6.5 Other polymers

EDS failed to run properly - this section is therefore empty.