Full wwPDB X-ray Structure Validation Report ⓘ

May 16, 2020 – 08:58 pm BST

PDB ID	:	4F32
Title	:	Crystal structure of 3-oxoacyl-[acyl-carrier-protein] synthase II from Burkholderia vietnamiensis in complex with platencin
Authors	:	Seattle Structural Genomics Center for Infectious Disease (SSGCID)
Deposited on	:	2012-05-08
Resolution	:	1.90 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:

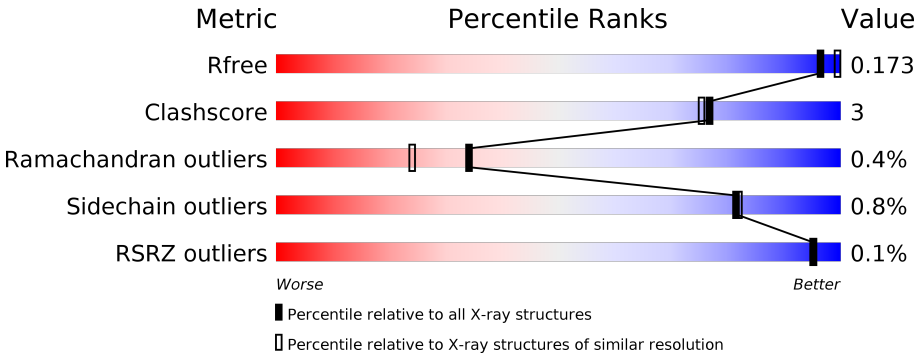
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.11
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.11

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 1.90 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	6207 (1.90-1.90)
Clashscore	141614	6847 (1.90-1.90)
Ramachandran outliers	138981	6760 (1.90-1.90)
Sidechain outliers	138945	6760 (1.90-1.90)
RSRZ outliers	127900	6082 (1.90-1.90)

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 >=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% 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	451	89% · 7%
1	B	451	88% 6% 6%
2	C	3	100%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 7050 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 3-oxoacyl-[acyl-carrier-protein] synthase 2.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	420	Total	C	N	O	S	0	8	0
			3056	1916	538	586	16			
1	B	423	Total	C	N	O	S	0	10	0
			3094	1939	547	591	17			

There are 42 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-20	MET	-	EXPRESSION TAG	UNP A4JL30
A	-19	ALA	-	EXPRESSION TAG	UNP A4JL30
A	-18	HIS	-	EXPRESSION TAG	UNP A4JL30
A	-17	HIS	-	EXPRESSION TAG	UNP A4JL30
A	-16	HIS	-	EXPRESSION TAG	UNP A4JL30
A	-15	HIS	-	EXPRESSION TAG	UNP A4JL30
A	-14	HIS	-	EXPRESSION TAG	UNP A4JL30
A	-13	HIS	-	EXPRESSION TAG	UNP A4JL30
A	-12	MET	-	EXPRESSION TAG	UNP A4JL30
A	-11	GLY	-	EXPRESSION TAG	UNP A4JL30
A	-10	THR	-	EXPRESSION TAG	UNP A4JL30
A	-9	LEU	-	EXPRESSION TAG	UNP A4JL30
A	-8	GLU	-	EXPRESSION TAG	UNP A4JL30
A	-7	ALA	-	EXPRESSION TAG	UNP A4JL30
A	-6	GLN	-	EXPRESSION TAG	UNP A4JL30
A	-5	THR	-	EXPRESSION TAG	UNP A4JL30
A	-4	GLN	-	EXPRESSION TAG	UNP A4JL30
A	-3	GLY	-	EXPRESSION TAG	UNP A4JL30
A	-2	PRO	-	EXPRESSION TAG	UNP A4JL30
A	-1	GLY	-	EXPRESSION TAG	UNP A4JL30
A	0	SER	-	EXPRESSION TAG	UNP A4JL30
B	-20	MET	-	EXPRESSION TAG	UNP A4JL30
B	-19	ALA	-	EXPRESSION TAG	UNP A4JL30
B	-18	HIS	-	EXPRESSION TAG	UNP A4JL30
B	-17	HIS	-	EXPRESSION TAG	UNP A4JL30

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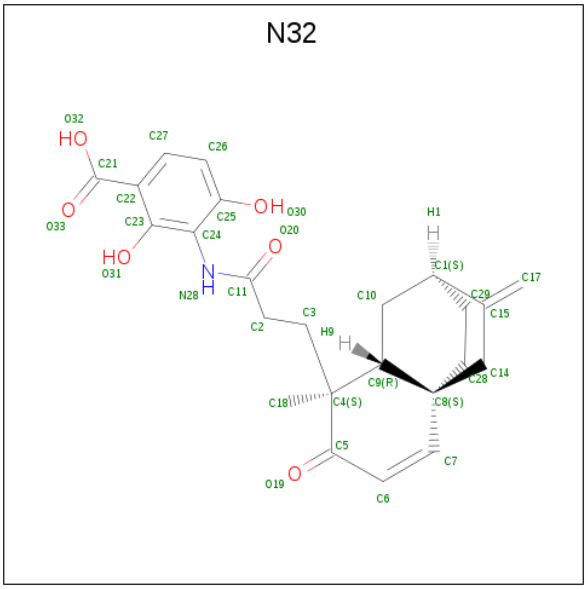
Chain	Residue	Modelled	Actual	Comment	Reference
B	-16	HIS	-	EXPRESSION TAG	UNP A4JL30
B	-15	HIS	-	EXPRESSION TAG	UNP A4JL30
B	-14	HIS	-	EXPRESSION TAG	UNP A4JL30
B	-13	HIS	-	EXPRESSION TAG	UNP A4JL30
B	-12	MET	-	EXPRESSION TAG	UNP A4JL30
B	-11	GLY	-	EXPRESSION TAG	UNP A4JL30
B	-10	THR	-	EXPRESSION TAG	UNP A4JL30
B	-9	LEU	-	EXPRESSION TAG	UNP A4JL30
B	-8	GLU	-	EXPRESSION TAG	UNP A4JL30
B	-7	ALA	-	EXPRESSION TAG	UNP A4JL30
B	-6	GLN	-	EXPRESSION TAG	UNP A4JL30
B	-5	THR	-	EXPRESSION TAG	UNP A4JL30
B	-4	GLN	-	EXPRESSION TAG	UNP A4JL30
B	-3	GLY	-	EXPRESSION TAG	UNP A4JL30
B	-2	PRO	-	EXPRESSION TAG	UNP A4JL30
B	-1	GLY	-	EXPRESSION TAG	UNP A4JL30
B	0	SER	-	EXPRESSION TAG	UNP A4JL30

- Molecule 2 is a protein called Unknown peptide.

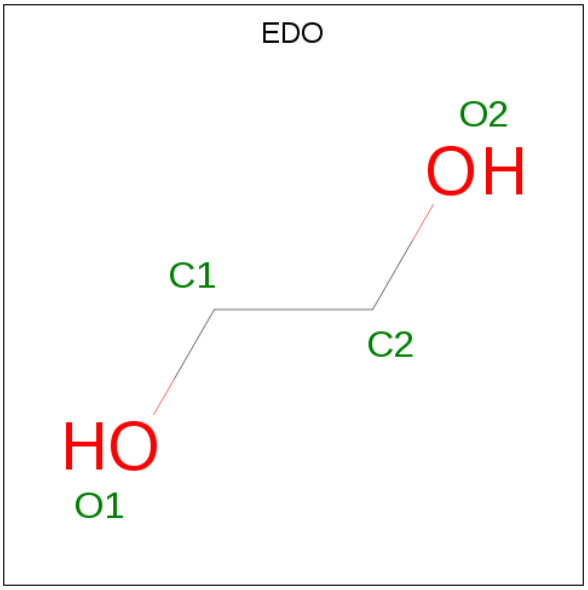
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	C	3	Total	C	N	O	0	0	0
			14	8	3	3			

- Molecule 3 is 2,4-dihydroxy-3-({3-[(2S,4aS,8S,8aR)-8-methyl-3-methylidene-7-oxo-1,3,4,7,8,8a-hexahydro-2H-2,4a-ethanonaphthalen-8-yl]propanoyl}amino)benzoic acid (three-letter code: N32) (formula: $C_{24}H_{27}NO_6$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			31	24	1	6		
3	B	1	Total	C	N	O	0	0
			31	24	1	6		

- Molecule 4 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).



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

- Molecule 5 is water.

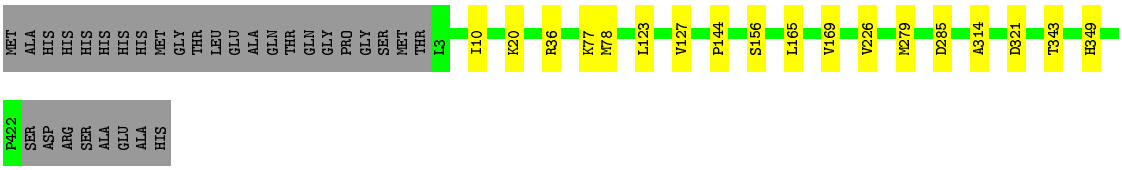
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	412	Total	O	0	0
			412	412		
5	B	404	Total	O	0	0
			404	404		

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.

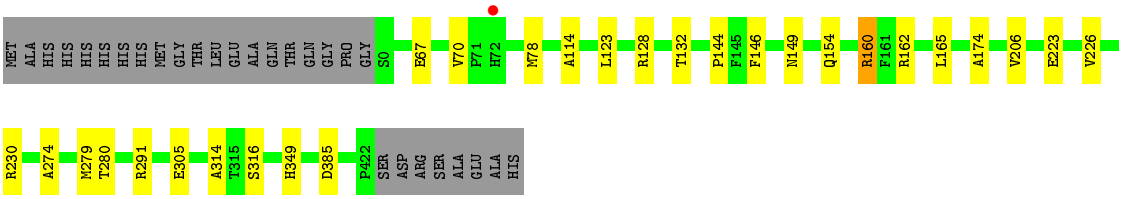
- Molecule 1: 3-oxoacyl-[acyl-carrier-protein] synthase 2

Chain A:



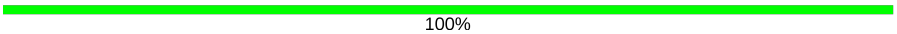
- Molecule 1: 3-oxoacyl-[acyl-carrier-protein] synthase 2

Chain B:



- Molecule 2: Unknown peptide

Chain C:



There are no outlier residues recorded for this chain.

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	55.49Å 100.84Å 143.42Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 1.90 43.89 – 1.90	Depositor EDS
% Data completeness (in resolution range)	98.9 (50.00-1.90) 98.9 (43.89-1.90)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	4.83 (at 1.89Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.137 , 0.170 0.146 , 0.173	Depositor DCC
R_{free} test set	3215 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å^2)	10.4	Xtriage
Anisotropy	0.037	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 48.4	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	7050	wwPDB-VP
Average B, all atoms (Å^2)	10.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.11% 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: CSU, N32, 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	0.69	0/3124	0.82	4/4235 (0.1%)
1	B	0.71	1/3172 (0.0%)	0.81	7/4299 (0.2%)
All	All	0.70	1/6296 (0.0%)	0.82	11/8534 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	305	GLU	CD-OE1	5.95	1.32	1.25

All (11) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	162	ARG	NE-CZ-NH2	-6.50	117.05	120.30
1	B	162	ARG	NE-CZ-NH1	6.20	123.40	120.30
1	B	291	ARG	NE-CZ-NH1	5.65	123.12	120.30
1	A	285	ASP	CB-CG-OD1	5.46	123.22	118.30
1	B	230	ARG	NE-CZ-NH1	5.38	122.99	120.30
1	A	78	MET	CG-SD-CE	5.28	108.64	100.20
1	B	78	MET	CG-SD-CE	5.28	108.64	100.20
1	B	385	ASP	CB-CG-OD1	5.25	123.03	118.30
1	A	321	ASP	CB-CG-OD1	5.21	122.98	118.30
1	A	36	ARG	NE-CZ-NH1	5.03	122.82	120.30
1	B	128	ARG	NE-CZ-NH1	5.02	122.81	120.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3056	0	3036	22	0
1	B	3094	0	3086	30	0
2	C	14	0	5	0	0
3	A	31	0	25	1	0
3	B	31	0	24	1	0
4	A	4	0	6	0	0
4	B	4	0	6	0	0
5	A	412	0	0	2	0
5	B	404	0	0	2	0
All	All	7050	0	6188	37	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

All (37) 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:123:LEU:CD2	1:B:123[A]:LEU:HD22	1.59	1.31
1:B:160[A]:ARG:HG2	1:B:160[A]:ARG:HH11	1.01	1.16
1:A:123:LEU:HD22	1:B:123[A]:LEU:CD2	1.79	1.13
1:B:160[A]:ARG:CG	1:B:160[A]:ARG:HH11	1.61	1.10
1:A:123:LEU:CD2	1:B:123[A]:LEU:CD2	2.31	1.08
1:A:123:LEU:HD21	1:B:123[A]:LEU:HD22	1.24	1.08
1:A:123:LEU:HD22	1:B:123[A]:LEU:HD22	1.40	0.99
1:B:160[A]:ARG:HG2	1:B:160[A]:ARG:NH1	1.84	0.90
1:A:123:LEU:HD22	1:B:123[A]:LEU:HD21	1.56	0.87
1:B:160[A]:ARG:CG	1:B:160[A]:ARG:NH1	2.31	0.83
1:B:123[B]:LEU:HD21	1:B:146:PHE:CE1	2.24	0.73
1:A:279[A]:MET:HE2	1:B:154:GLN:OE1	1.91	0.70
1:A:279[A]:MET:CE	1:B:154:GLN:OE1	2.43	0.67
1:B:132:THR:HG23	5:B:997:HOH:O	2.02	0.58
1:B:160[A]:ARG:HG3	1:B:160[A]:ARG:NH1	2.20	0.54
1:A:279[B]:MET:HE2	1:B:144:PRO:HB2	1.92	0.52
1:A:77:LYS:HD3	1:B:279[A]:MET:CE	2.38	0.52
1:B:226:VAL:HG22	5:B:905:HOH:O	2.08	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:500:N32:H16	3:B:500:N32:H19	1.93	0.51
1:B:279[A]:MET:HG3	1:B:280:THR:HG23	1.92	0.51
1:A:226:VAL:HG22	5:A:679:HOH:O	2.11	0.51
1:A:144:PRO:HB2	1:B:279[B]:MET:CE	2.41	0.51
3:A:501:N32:H19	3:A:501:N32:H16	1.91	0.50
1:B:223[B]:GLU:H	1:B:223[B]:GLU:CD	2.15	0.49
1:A:77:LYS:HD3	1:B:279[A]:MET:HE3	1.94	0.48
1:A:127:VAL:HA	1:B:206:VAL:HG21	1.96	0.46
1:B:114:ALA:HB1	1:B:174:ALA:HB1	1.98	0.45
1:A:144:PRO:HB2	1:B:279[B]:MET:HE3	1.99	0.45
1:A:10:ILE:HB	1:A:20:LYS:HD3	1.99	0.44
1:A:169:VAL:HG12	1:A:169:VAL:O	2.18	0.43
1:B:160[A]:ARG:HG3	1:B:160[A]:ARG:HH11	1.68	0.43
1:A:279[A]:MET:HE1	1:B:154:GLN:OE1	2.16	0.43
1:A:343:THR:HA	5:A:815:HOH:O	2.20	0.41
1:B:67:GLU:HA	1:B:70:VAL:O	2.20	0.41
1:A:123:LEU:C	1:A:123:LEU:HD23	2.41	0.41
1:A:165[B]:LEU:HG	1:B:274:ALA:HB2	2.02	0.41
1:A:169:VAL:O	1:B:149:ASN:HB3	2.21	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	425/451 (94%)	412 (97%)	12 (3%)	1 (0%)	47 38
1	B	431/451 (96%)	420 (97%)	9 (2%)	2 (0%)	29 18
All	All	856/902 (95%)	832 (97%)	21 (2%)	3 (0%)	34 24

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	314	ALA
1	B	314	ALA
1	B	316	SER

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	301/322 (94%)	298 (99%)	3 (1%)	76	76
1	B	307/322 (95%)	302 (98%)	5 (2%)	62	60
All	All	608/644 (94%)	600 (99%)	8 (1%)	81	68

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	156[A]	SER
1	A	156[B]	SER
1	A	349	HIS
1	B	160[A]	ARG
1	B	160[B]	ARG
1	B	160[C]	ARG
1	B	165	LEU
1	B	349	HIS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	25	GLN
1	A	154	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)

2 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	CSU	A	172	1	6,9,10	1.14	1 (16%)	3,12,14	2.33	2 (66%)
1	CSU	B	172	1	6,9,10	2.53	2 (33%)	3,12,14	1.92	2 (66%)

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	CSU	A	172	1	-	3/4/8/10	-
1	CSU	B	172	1	-	1/4/8/10	-

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	172	CSU	OD3-S	5.65	1.62	1.45
1	A	172	CSU	CB-SG	-2.45	1.78	1.82
1	B	172	CSU	CB-SG	-2.12	1.78	1.82

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	172	CSU	OD2-S-OD3	-3.06	101.71	112.78
1	A	172	CSU	OD2-S-OD1	-2.31	104.40	112.78
1	B	172	CSU	OD2-S-OD1	-2.11	105.13	112.78
1	B	172	CSU	OD2-S-OD3	-2.04	105.37	112.78

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	172	CSU	OD2-S-SG-CB
1	A	172	CSU	OD3-S-SG-CB
1	A	172	CSU	OD1-S-SG-CB
1	B	172	CSU	OD3-S-SG-CB

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no carbohydrates in this entry.

5.6 Ligand geometry (i)

4 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	$\#\|Z\| > 2$
4	EDO	A	502	-	3,3,3	0.73	0	2,2,2	0.47	0
3	N32	A	501	-	30,34,34	0.91	2 (6%)	39,53,53	1.41	7 (17%)
4	EDO	B	501	-	3,3,3	0.53	0	2,2,2	0.57	0
3	N32	B	500	-	30,34,34	1.38	2 (6%)	39,53,53	1.29	3 (7%)

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
4	EDO	A	502	-	-	1/1/1/1	-
3	N32	A	501	-	-	0/10/57/57	0/5/4/4
4	EDO	B	501	-	-	1/1/1/1	-
3	N32	B	500	-	-	0/10/57/57	0/5/4/4

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	500	N32	C22-C21	5.93	1.53	1.47
3	B	500	N32	C24-C25	2.74	1.48	1.40
3	A	501	N32	C24-N28	-2.62	1.38	1.43
3	A	501	N32	C22-C21	2.05	1.49	1.47

All (10) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	501	N32	C14-C15-C1	3.83	115.70	111.58
3	B	500	N32	C14-C15-C1	3.37	115.21	111.58
3	A	501	N32	C10-C1-C29	-3.09	105.69	109.86
3	A	501	N32	C18-C4-C5	-2.89	100.09	106.83
3	B	500	N32	O20-C11-C2	-2.67	117.13	122.02
3	A	501	N32	C14-C8-C7	-2.45	105.09	111.82
3	A	501	N32	C27-C22-C23	2.28	120.23	117.96
3	B	500	N32	C29-C28-C8	-2.25	108.83	112.50
3	A	501	N32	O19-C5-C6	-2.19	117.53	121.40
3	A	501	N32	C24-N28-C11	-2.03	118.67	123.42

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	502	EDO	O1-C1-C2-O2
4	B	501	EDO	O1-C1-C2-O2

There are no ring outliers.

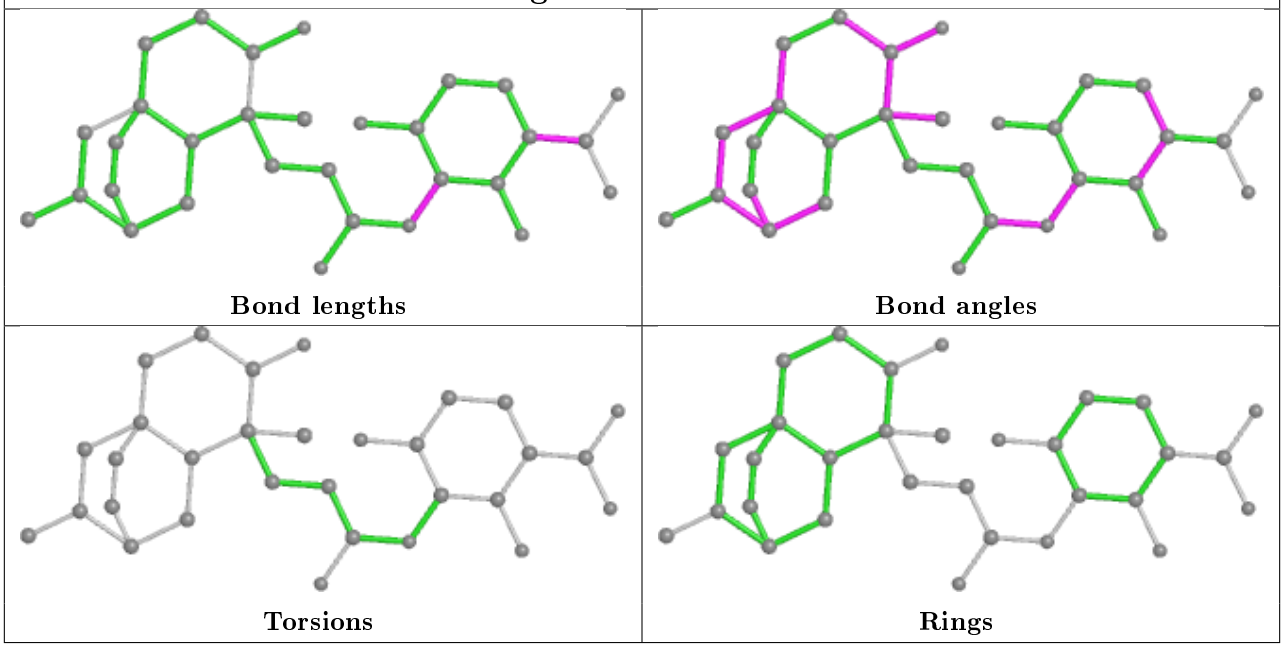
2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	501	N32	1	0
3	B	500	N32	1	0

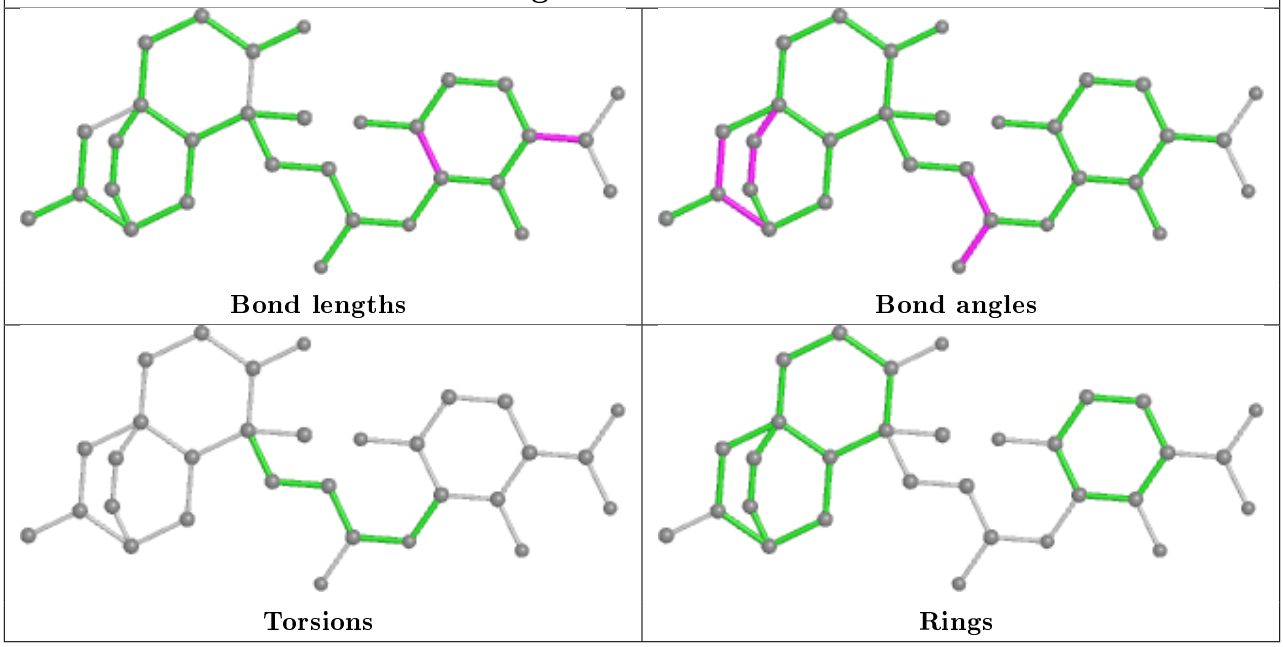
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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 N32 A 501



Ligand N32 B 500



5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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^2)	Q<0.9
1	A	419/451 (92%)	-0.41	0 100 100	3, 8, 16, 25	0
1	B	422/451 (93%)	-0.42	1 (0%) 95 95	3, 7, 17, 33	0
2	C	0/3	-	-	-	-
All	All	841/905 (92%)	-0.41	1 (0%) 95 95	3, 7, 17, 33	0

All (1) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	72	HIS	2.6

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

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^{th} 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^2)	Q<0.9
1	CSU	B	172	10/11	0.90	0.21	6,8,9,10	4
1	CSU	A	172	10/11	0.93	0.17	7,8,9,9	4

6.3 Carbohydrates

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,

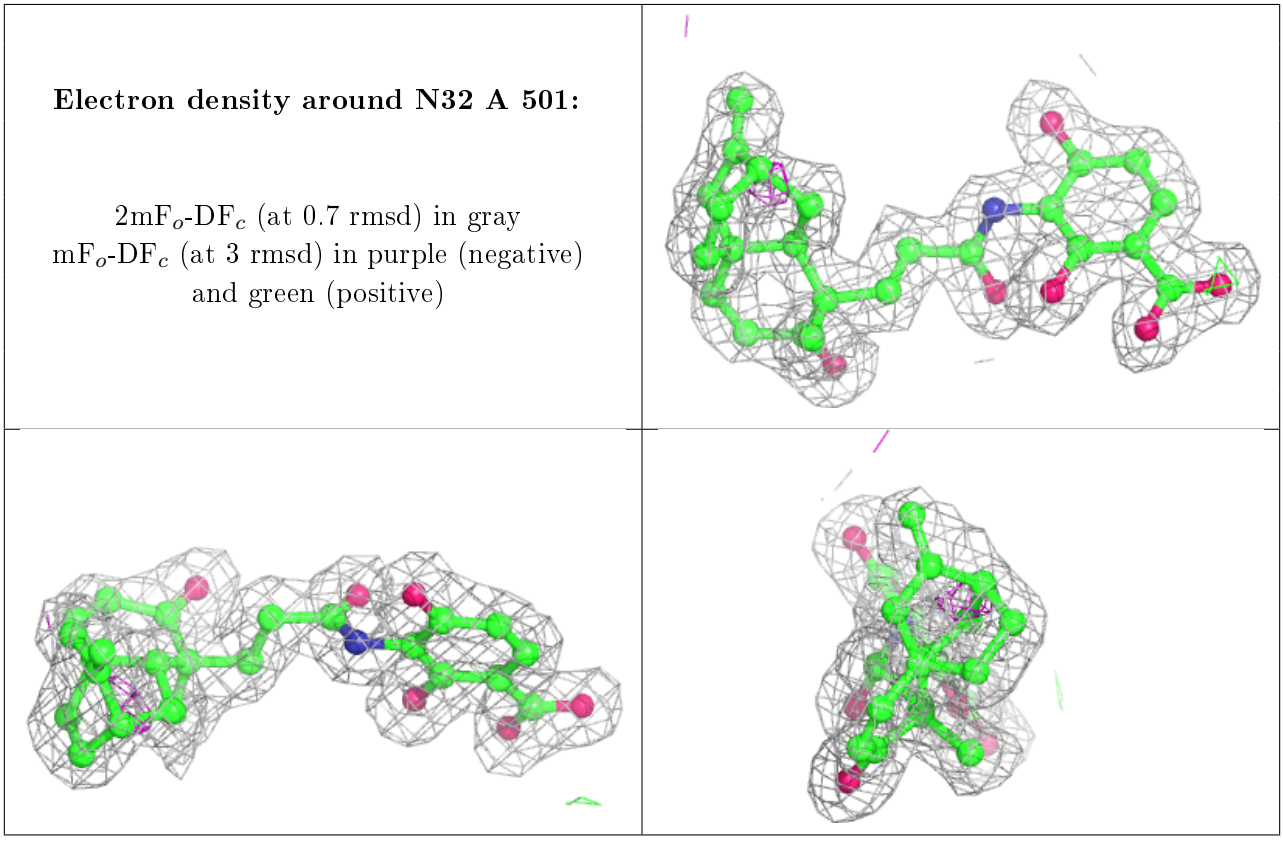
median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	EDO	A	502	4/4	0.76	0.24	26,28,28,30	0
4	EDO	B	501	4/4	0.89	0.15	22,25,26,27	0
3	N32	A	501	31/31	0.95	0.10	8,10,14,14	0
3	N32	B	500	31/31	0.97	0.09	7,8,10,10	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.

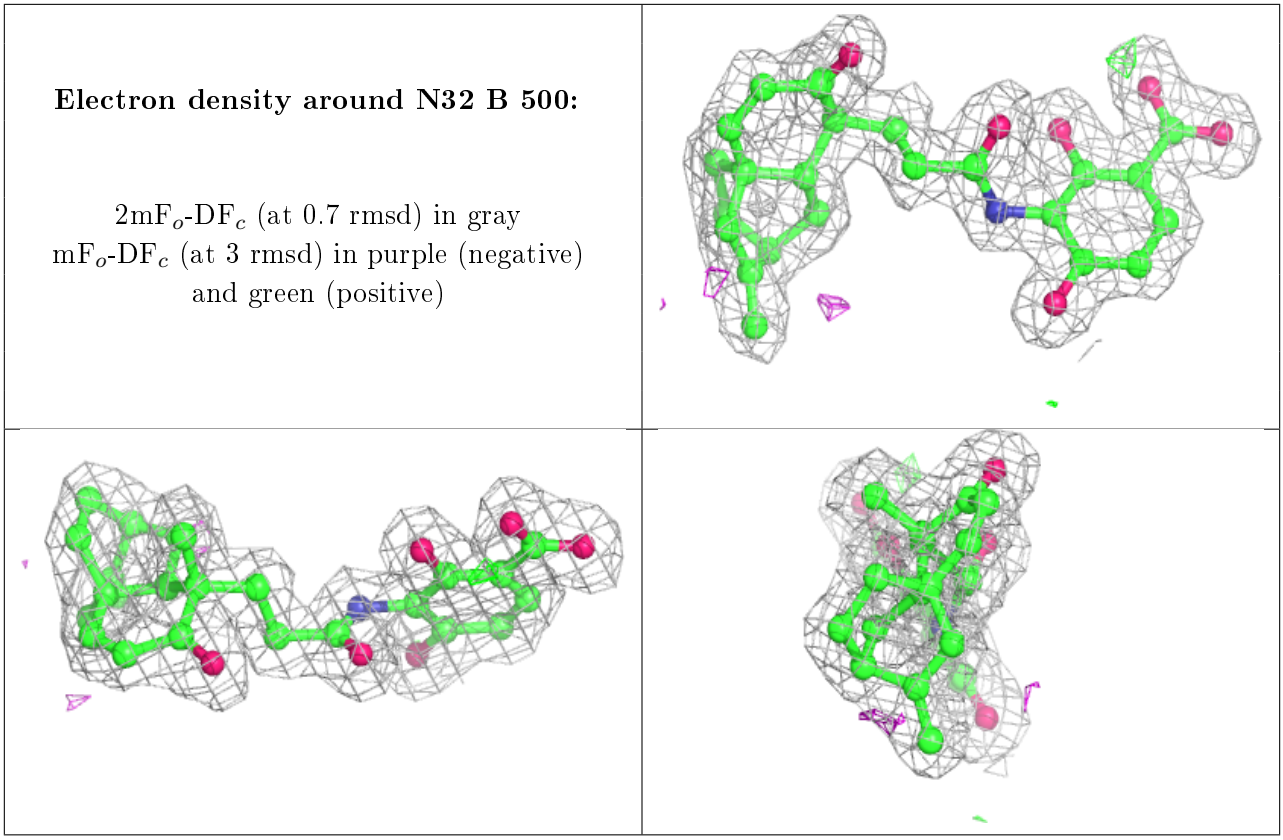
Electron density around N32 A 501:

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



Electron density around N32 B 500:

$2mF_o$-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.