Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 01:33 AM UTC

PDB ID	:	6VHW / pdb_00006vhw
Title	:	Klebsiella oxytoca NpsA N-terminal subdomain in complex with 3-hydroxybenzoyl-AMSN
Authors	:	Kreitler, D.F.; Gulick, A.M.
Deposited on	:	2020-01-10
Resolution	:	1.83 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 types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

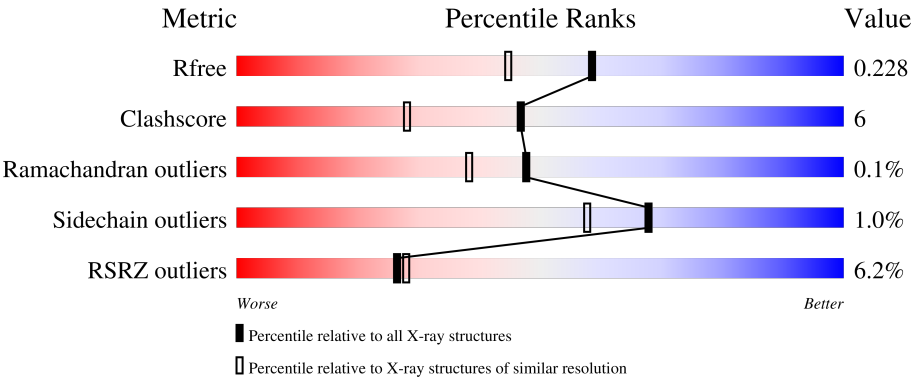
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 1.83 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}	180053	1296 (1.84-1.84)
Clashscore	190562	1329 (1.84-1.84)
Ramachandran outliers	187476	1318 (1.84-1.84)
Sidechain outliers	187428	1318 (1.84-1.84)
RSRZ outliers	180081	1296 (1.84-1.84)

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% 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	406	5% 86% 11%
1	B	406	7% 87% 8%

2 Entry composition (i)

There are 8 unique types of molecules in this entry. The entry contains 6265 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.

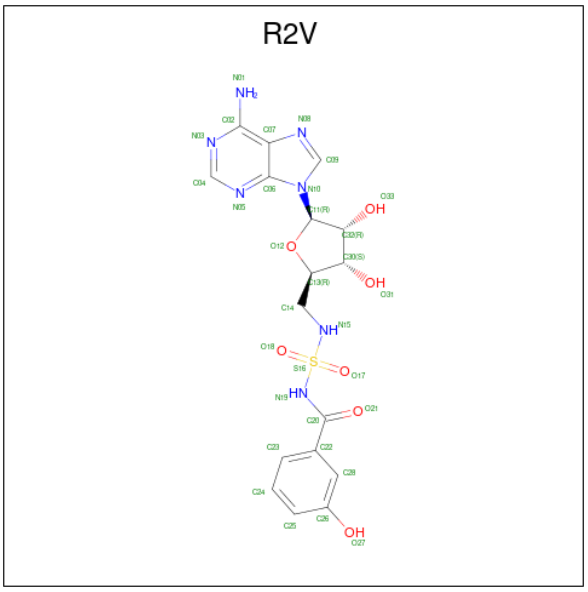
- Molecule 1 is a protein called NpsA Adenylation Domain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	396	Total	C	N	O	S	0	3	0
			2991	1914	499	559	19			
1	B	392	Total	C	N	O	S	0	1	0
			2915	1867	484	545	19			

There are 12 discrepancies between the modelled and reference sequences:

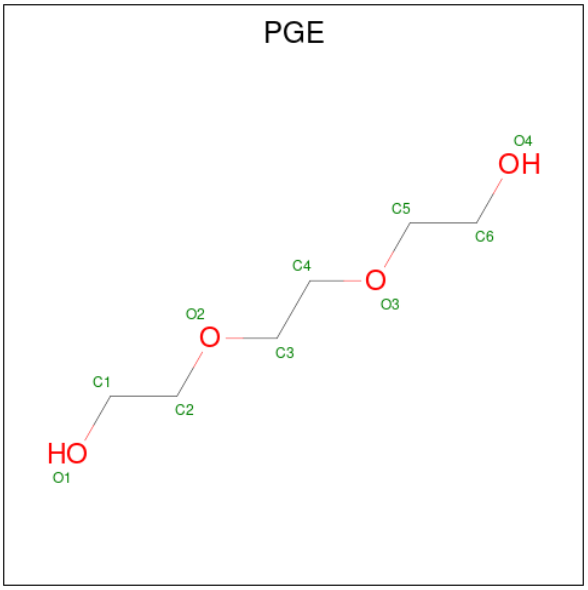
Chain	Residue	Modelled	Actual	Comment	Reference
A	-1	GLY	-	expression tag	UNP A0A2U4DY99
A	0	HIS	-	expression tag	UNP A0A2U4DY99
A	258	SER	LEU	variant	UNP A0A2U4DY99
A	312	ALA	GLU	engineered mutation	UNP A0A2U4DY99
A	313	ALA	GLU	engineered mutation	UNP A0A2U4DY99
A	314	ALA	GLN	engineered mutation	UNP A0A2U4DY99
B	-1	GLY	-	expression tag	UNP A0A2U4DY99
B	0	HIS	-	expression tag	UNP A0A2U4DY99
B	258	SER	LEU	variant	UNP A0A2U4DY99
B	312	ALA	GLU	engineered mutation	UNP A0A2U4DY99
B	313	ALA	GLU	engineered mutation	UNP A0A2U4DY99
B	314	ALA	GLN	engineered mutation	UNP A0A2U4DY99

- Molecule 2 is 5'-deoxy-5'-{[(3-hydroxybenzene-1-carbonyl)sulfamoyl]amino}adenosine (CCD ID: R2V) (formula: $C_{17}H_{19}N_7O_7S$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			32	17	7	7	1		
2	B	1	Total	C	N	O	S	0	0
			32	17	7	7	1		

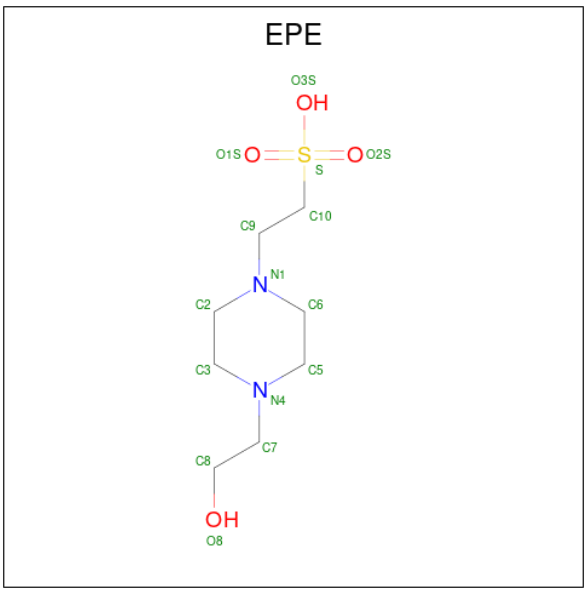
- Molecule 3 is TRIETHYLENE GLYCOL (CCD ID: PGE) (formula: $C_6H_{14}O_4$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	O		0	0
			10	6	4			

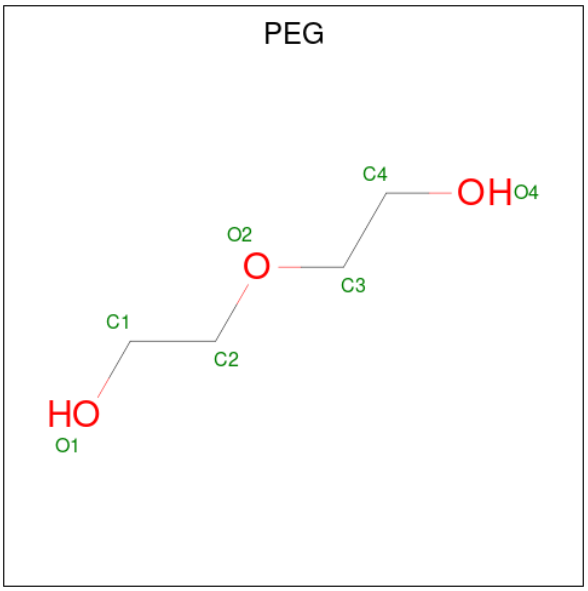
- Molecule 4 is 4-(2-HYDROXYETHYL)-1-PIPERAZINE ETHANESULFONIC ACID (CCD

ID: EPE) (formula: $C_8H_{18}N_2O_4S$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	N	O	S	0	0
			15	8	2	4	1		

- Molecule 5 is DI(HYDROXYETHYL)ETHER (CCD ID: PEG) (formula: $C_4H_{10}O_3$).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
5	A	1	Total	C	O		0	0
			7	4	3			
5	B	1	Total	C	O		0	0
			6	4	2			

- Molecule 6 is BROMIDE ION (CCD ID: BR) (formula: Br).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total Br 1 1	0	0
6	B	2	Total Br 2 2	0	0

- Molecule 7 is CHLORIDE ION (CCD ID: CL) (formula: Cl).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	3	Total Cl 3 3	0	0
7	B	1	Total Cl 1 1	0	0

- Molecule 8 is water.

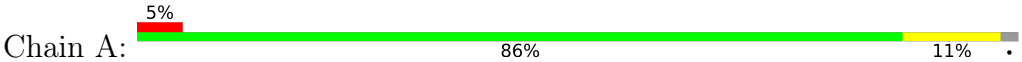
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
8	A	127	Total O 128 128	0	1
8	B	122	Total O 122 122	0	0

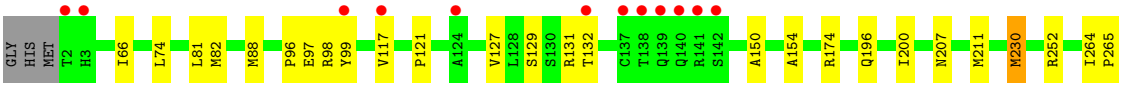
3 Residue-property plots (i)

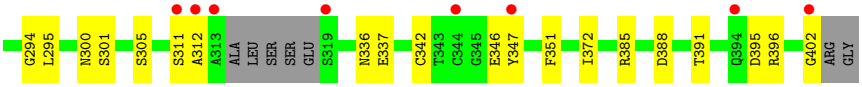
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: NpsA Adenylation Domain

Chain A:

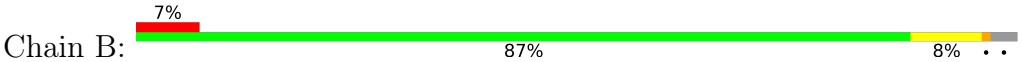


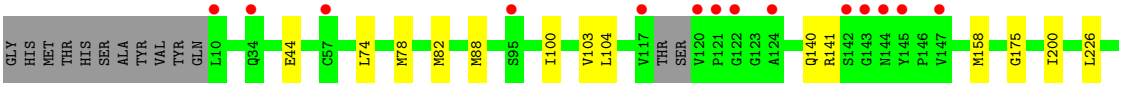




• Molecule 1: NpsA Adenylation Domain

Chain B:





4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	77.44Å 60.28Å 80.25Å 90.00° 101.01° 90.00°	Depositor
Resolution (Å)	78.78 – 1.83 78.78 – 1.83	Depositor EDS
% Data completeness (in resolution range)	95.2 (78.78-1.83) 88.0 (78.78-1.83)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.10	Depositor
$< I/\sigma(I) >$ [1]	0.80 (at 1.83Å)	Xtriage
Refinement program	PHENIX 1.15_3459	Depositor
R, R_{free}	0.201 , 0.231 (Not available) , 0.228	Depositor DCC
R_{free} test set	2889 reflections (4.52%)	wwPDB-VP
Wilson B-factor (Å^2)	27.8	Xtriage
Anisotropy	0.226	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 49.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.025 for l,-k,h	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	6265	wwPDB-VP
Average B, all atoms (Å^2)	41.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.68% 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: EPE, R2V, PGE, BR, CL, PEG

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	0.30	0/3051	0.55	0/4162
1	B	0.40	0/2971	0.62	0/4054
All	All	0.35	0/6022	0.58	0/8216

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2991	0	2973	41	0
1	B	2915	0	2899	31	0
2	A	32	0	0	2	0
2	B	32	0	0	0	0
3	A	10	0	14	3	0
4	A	15	0	18	0	0
5	A	7	0	10	0	0
5	B	6	0	6	0	0
6	A	1	0	0	0	0
6	B	2	0	0	1	0
7	A	3	0	0	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	B	1	0	0	0	0
8	A	128	0	0	4	0
8	B	122	0	0	5	0
All	All	6265	0	5920	68	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 6.

All (68) 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:131:ARG:HD2	8:A:703:HOH:O	1.68	0.93
1:A:252:ARG:HH22	1:B:273:ASP:HB3	1.45	0.81
1:B:361:TYR:HB3	8:B:605:HOH:O	1.85	0.77
1:A:117:VAL:HG13	1:A:127:VAL:HG11	1.67	0.76
1:B:372:ILE:HD11	1:B:374:ILE:HD11	1.68	0.76
1:B:315:LEU:H	1:B:315:LEU:HD12	1.51	0.72
1:B:315:LEU:HD12	1:B:315:LEU:N	2.03	0.72
1:A:230:MET:HE3	1:B:226:LEU:HG	1.72	0.70
1:A:385:ARG:HH12	3:A:502:PGE:H52	1.56	0.69
1:B:44:GLU:HB3	1:B:141:ARG:NH2	2.05	0.69
1:A:351:PHE:HE2	1:A:372:ILE:HD11	1.60	0.67
1:A:98:ARG:HD3	7:A:506:CL:CL	2.32	0.67
1:B:278:ARG:HB3	1:B:278:ARG:NH2	2.10	0.67
1:B:82:MET:HG3	1:B:88:MET:HE3	1.77	0.65
1:B:252:ARG:NH1	6:B:503:BR:BR	2.83	0.65
1:B:300:ASN:O	1:B:301:SER:HB2	1.98	0.63
1:A:150:ALA:HB1	1:A:174:ARG:HB3	1.83	0.60
1:A:295:LEU:HB3	1:A:305:SER:OG	2.03	0.58
1:A:402:GLY:N	8:A:602:HOH:O	2.34	0.58
1:A:97:GLU:HG2	1:A:121:PRO:HB3	1.87	0.57
1:B:285:GLN:HG3	1:B:312:ALA:HB2	1.85	0.57
1:A:300:ASN:O	1:A:301:SER:HB2	2.05	0.57
1:A:252:ARG:NH2	8:B:604:HOH:O	2.40	0.54
1:B:362:SER:N	8:B:605:HOH:O	2.37	0.54
1:A:252:ARG:NH2	1:B:273:ASP:HB3	2.17	0.53
1:B:276:ASN:HB2	8:B:664:HOH:O	2.08	0.53
1:A:337:GLU:HA	3:A:502:PGE:H3	1.91	0.53
1:A:117:VAL:HG12	1:A:117:VAL:O	2.08	0.52
1:A:351:PHE:CE2	1:A:385:ARG:HG2	2.45	0.52
1:B:78:MET:HA	1:B:88:MET:HE1	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:230:MET:CE	1:B:226:LEU:HG	2.41	0.51
1:A:395:ASP:O	1:A:396:ARG:HB2	2.11	0.50
1:B:278:ARG:HB3	1:B:278:ARG:CZ	2.41	0.48
1:B:305:SER:HB3	1:B:332:MET:SD	2.54	0.48
1:A:129:SER:OG	1:A:132:THR:HG23	2.14	0.48
1:A:336:ASN:C	3:A:502:PGE:H12	2.40	0.47
1:A:388:ASP:OD2	2:A:501:R2V:O31	2.32	0.47
1:B:78:MET:O	1:B:88:MET:HE1	2.15	0.46
1:A:117:VAL:HG13	1:A:127:VAL:CG1	2.41	0.46
1:A:294:GLY:O	2:A:501:R2V:N01	2.49	0.45
1:B:253:LEU:O	1:B:257:VAL:HG22	2.16	0.45
1:B:103:VAL:HG13	1:B:158:MET:HE3	1.97	0.45
1:B:88:MET:HE2	1:B:88:MET:HB3	1.66	0.45
1:B:381:MET:HB3	1:B:383:PHE:CE2	2.52	0.45
1:A:66:ILE:HD11	1:A:81:LEU:HD12	1.98	0.44
1:A:336:ASN:HB3	1:A:342:CYS:SG	2.58	0.44
1:A:402:GLY:CA	8:A:602:HOH:O	2.66	0.44
1:A:82:MET:HA	1:A:82:MET:HE2	2.00	0.43
1:A:347:TYR:N	1:A:347:TYR:HD2	2.16	0.43
1:A:347:TYR:N	1:A:347:TYR:CD2	2.86	0.43
1:A:74:LEU:HD21	1:A:200:ILE:HG21	1.99	0.43
1:B:372:ILE:O	1:B:372:ILE:HG13	2.18	0.43
1:A:396:ARG:HA	1:A:396:ARG:HD2	1.60	0.43
1:B:332:MET:HE2	1:B:398:ILE:HD12	2.00	0.43
1:B:74:LEU:HD21	1:B:200:ILE:HG21	2.00	0.42
1:A:264:ILE:HB	1:A:265:PRO:HD3	2.00	0.42
1:B:100:ILE:O	1:B:104:LEU:HG	2.19	0.42
1:A:402:GLY:HA2	8:A:602:HOH:O	2.20	0.42
1:A:82:MET:HE1	1:A:154:ALA:O	2.20	0.42
1:B:175:GLY:HA2	1:B:356:GLY:HA2	2.02	0.42
1:A:311:SER:OG	1:A:312:ALA:N	2.53	0.41
1:A:207:ASN:O	1:A:211:MET:HB2	2.20	0.41
1:B:252:ARG:NH1	1:B:279:LEU:HD11	2.35	0.41
1:A:346:GLU:O	1:A:391:THR:OG1	2.34	0.41
1:B:362:SER:HB2	8:B:678:HOH:O	2.20	0.41
1:A:96:PRO:HG2	1:A:99[B]:TYR:CD1	2.57	0.40
1:A:82:MET:HE3	1:A:88:MET:HG3	2.04	0.40
1:A:300:ASN:O	1:A:301:SER:CB	2.67	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	395/406 (97%)	382 (97%)	13 (3%)	0	100 100
1	B	279/406 (69%)	270 (97%)	8 (3%)	1 (0%)	30 18
All	All	674/812 (83%)	652 (97%)	21 (3%)	1 (0%)	48 38

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	301	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	319/336 (95%)	317 (99%)	2 (1%)	78 72
1	B	308/336 (92%)	304 (99%)	4 (1%)	61 47
All	All	627/672 (93%)	621 (99%)	6 (1%)	68 58

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	196	GLN
1	A	230	MET
1	B	140	GLN
1	B	278	ARG
1	B	315	LEU

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Mol	Chain	Res	Type
1	B	319	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	285	GLN
1	A	300	ASN
1	A	397	ASN
1	B	54	GLN
1	B	126	HIS
1	B	135	GLN
1	B	300	ASN
1	B	365	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 13 ligands modelled in this entry, 7 are monoatomic - leaving 6 for Mogul analysis.

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	EPE	A	503	-	15,15,15	1.23	3 (20%)	19,20,20	1.50	4 (21%)
3	PGE	A	502	-	9,9,9	0.53	0	8,8,8	0.51	0
5	PEG	A	504	-	6,6,6	0.26	0	5,5,5	0.46	0
2	R2V	A	501	-	35,35,35	2.47	9 (25%)	48,52,52	1.48	9 (18%)
5	PEG	B	502	-	5,5,6	1.28	0	4,4,5	0.59	0
2	R2V	B	501	-	35,35,35	1.87	13 (37%)	48,52,52	1.33	7 (14%)

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	EPE	A	503	-	-	1/9/19/19	0/1/1/1
3	PGE	A	502	-	-	6/7/7/7	-
5	PEG	A	504	-	-	0/4/4/4	-
2	R2V	A	501	-	-	3/19/35/35	0/4/4/4
5	PEG	B	502	-	-	0/3/3/4	-
2	R2V	B	501	-	-	2/19/35/35	0/4/4/4

All (25) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	R2V	C20-N19	8.10	1.48	1.39
2	A	501	R2V	S16-N15	6.01	1.68	1.61
2	A	501	R2V	S16-N19	5.29	1.73	1.63
2	A	501	R2V	C09-N10	4.37	1.45	1.37
2	B	501	R2V	C09-N10	3.93	1.44	1.37
2	B	501	R2V	S16-N15	3.72	1.65	1.61
2	B	501	R2V	C07-C06	3.57	1.45	1.39
2	B	501	R2V	C06-N05	3.06	1.40	1.34
4	A	503	EPE	C10-S	2.94	1.81	1.77
2	A	501	R2V	C22-C20	2.84	1.56	1.50
2	B	501	R2V	C25-C26	2.66	1.44	1.39
2	A	501	R2V	O21-C20	-2.63	1.17	1.23
2	B	501	R2V	C02-N03	2.60	1.43	1.35
2	B	501	R2V	C02-N01	2.36	1.40	1.34
4	A	503	EPE	O1S-S	2.25	1.51	1.45
2	B	501	R2V	C14-N15	-2.25	1.43	1.47
2	A	501	R2V	C06-N05	2.25	1.38	1.34
2	B	501	R2V	O21-C20	-2.24	1.18	1.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	503	EPE	O2S-S	2.21	1.51	1.45
2	B	501	R2V	C23-C22	2.17	1.42	1.39
2	A	501	R2V	C02-N01	2.17	1.39	1.34
2	B	501	R2V	C32-C11	2.15	1.60	1.53
2	A	501	R2V	C07-C06	2.11	1.42	1.39
2	B	501	R2V	C09-N08	2.08	1.35	1.31
2	B	501	R2V	O12-C11	-2.04	1.37	1.42

All (20) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	A	503	EPE	O3S-S-O2S	-3.81	101.86	111.40
2	A	501	R2V	C13-C14-N15	3.73	119.65	112.53
2	A	501	R2V	C22-C20-N19	3.05	119.71	116.08
2	A	501	R2V	C07-C06-N10	2.72	108.78	105.81
2	B	501	R2V	C07-C06-N10	2.66	108.71	105.81
2	B	501	R2V	O21-C20-N19	-2.56	118.02	121.16
2	A	501	R2V	C22-C28-C26	2.54	122.00	119.70
4	A	503	EPE	O3S-S-C10	2.52	110.94	106.00
2	B	501	R2V	O33-C32-C11	-2.48	101.55	110.10
2	B	501	R2V	C06-C07-N08	-2.48	107.75	110.58
2	A	501	R2V	O21-C20-N19	-2.42	118.19	121.16
4	A	503	EPE	O2S-S-C10	2.41	110.37	106.73
4	A	503	EPE	O1S-S-C10	2.39	110.34	106.73
2	B	501	R2V	O18-S16-O17	-2.26	117.01	120.34
2	A	501	R2V	C32-C11-N10	-2.19	107.87	113.30
2	A	501	R2V	C23-C22-C28	-2.18	116.73	119.25
2	B	501	R2V	O31-C30-C13	-2.16	104.88	111.08
2	A	501	R2V	C06-N10-C11	2.13	131.62	126.63
2	A	501	R2V	O12-C13-C30	-2.12	100.94	105.15
2	B	501	R2V	C30-C32-C11	-2.09	97.51	101.46

There are no chirality outliers.

All (12) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	R2V	C30-C13-C14-N15
2	A	501	R2V	O12-C13-C14-N15
4	A	503	EPE	C8-C7-N4-C3
3	A	502	PGE	O1-C1-C2-O2
3	A	502	PGE	C3-C4-O3-C5
3	A	502	PGE	C4-C3-O2-C2

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Mol	Chain	Res	Type	Atoms
2	B	501	R2V	C30-C13-C14-N15
2	B	501	R2V	O12-C13-C14-N15
3	A	502	PGE	O2-C3-C4-O3
3	A	502	PGE	C6-C5-O3-C4
3	A	502	PGE	C1-C2-O2-C3
2	A	501	R2V	C14-N15-S16-O17

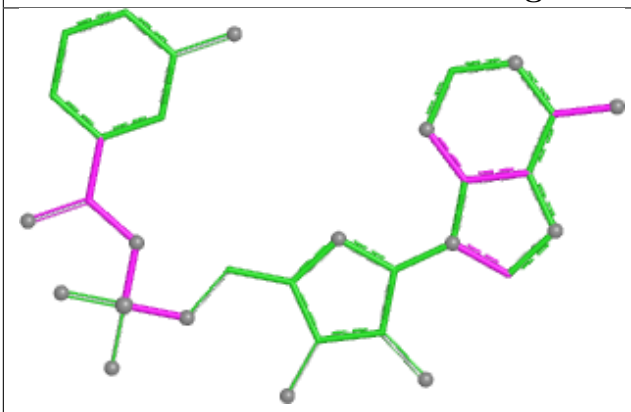
There are no ring outliers.

2 monomers are involved in 5 short contacts:

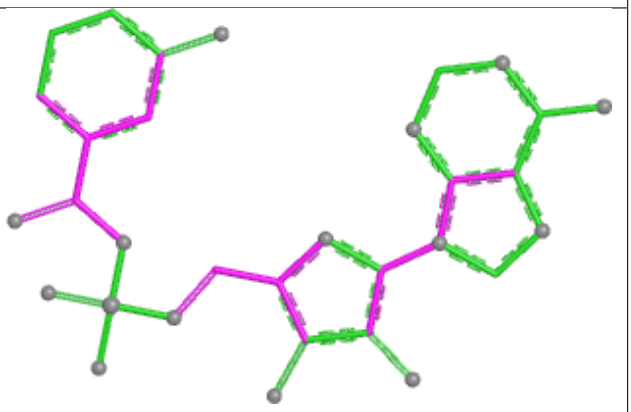
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	502	PGE	3	0
2	A	501	R2V	2	0

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

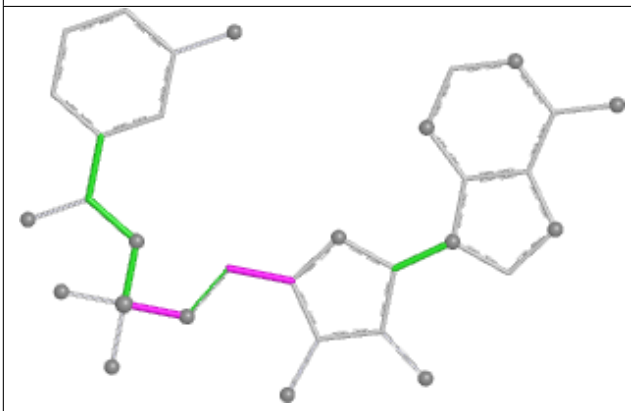
Ligand R2V A 501



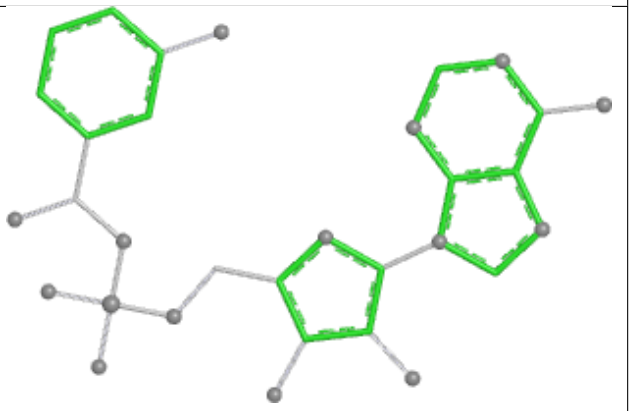
Bond lengths



Bond angles

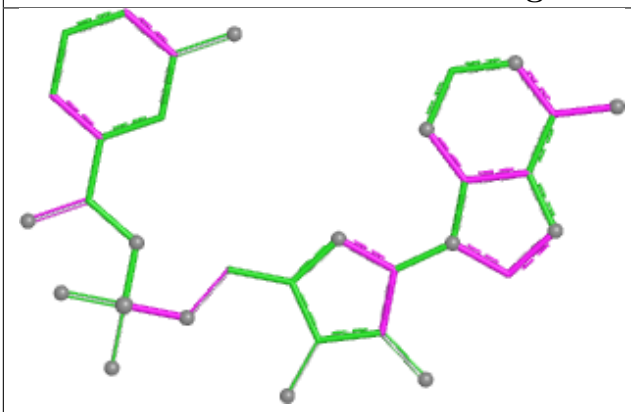


Torsions

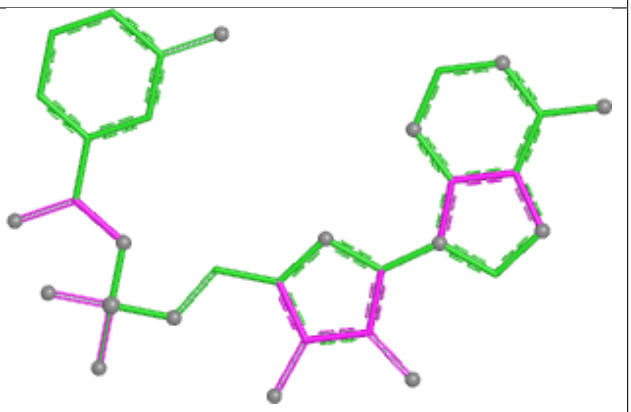


Rings

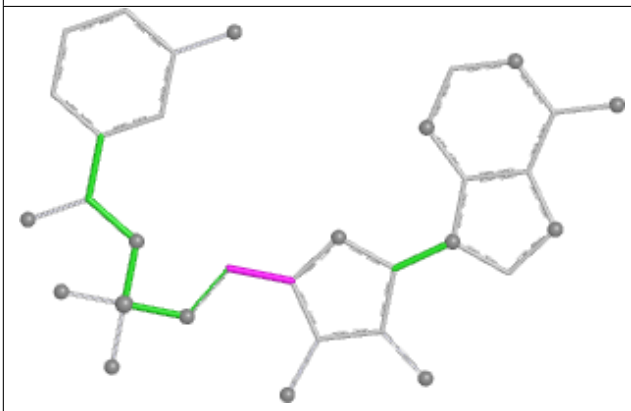
Ligand R2V B 501



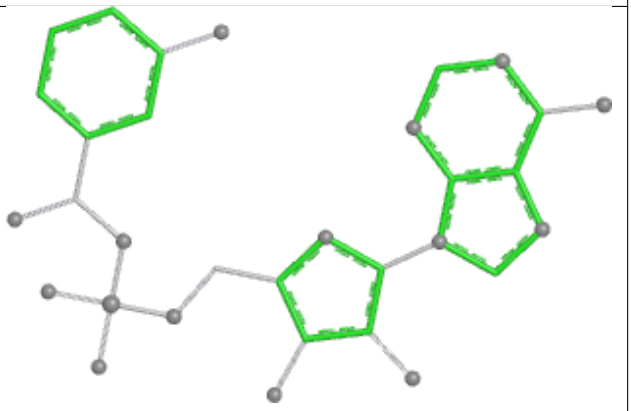
Bond lengths



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

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	396/406 (97%)	0.37	20 (5%)	33	35	13, 34, 66, 114	3 (0%)
1	B	392/406 (96%)	0.76	29 (7%)	20	21	23, 41, 73, 130	1 (0%)
All	All	788/812 (97%)	0.56	49 (6%)	26	28	13, 38, 72, 130	4 (0%)

All (49) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	315	LEU	5.0
1	A	347	TYR	4.7
1	B	316	SER	4.7
1	A	312	ALA	4.6
1	A	99[A]	TYR	4.5
1	B	121	PRO	4.5
1	A	142	SER	4.4
1	B	317	SER	4.1
1	B	120	VAL	3.9
1	A	313	ALA	3.8
1	B	142	SER	3.6
1	A	117	VAL	3.6
1	B	117	VAL	3.5
1	B	314	ALA	3.4
1	A	2	THR	3.4
1	B	10	LEU	2.9
1	B	144	ASN	2.9
1	B	124	ALA	2.9
1	B	143	GLY	2.9
1	B	313	ALA	2.8
1	A	124	ALA	2.8
1	B	403	ARG	2.7
1	A	140	GLN	2.7
1	A	138	THR	2.7

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Mol	Chain	Res	Type	RSRZ
1	A	139	GLN	2.6
1	A	311	SER	2.6
1	B	145	TYR	2.6
1	A	137	CYS	2.6
1	A	344	CYS	2.5
1	B	57	CYS	2.5
1	B	376	TYR	2.5
1	A	3	HIS	2.5
1	A	141	ARG	2.5
1	B	147	VAL	2.5
1	A	319	SER	2.5
1	B	95	SER	2.4
1	B	379	THR	2.3
1	B	368	ALA	2.3
1	B	312	ALA	2.3
1	B	374	ILE	2.3
1	A	394	GLN	2.2
1	B	34	GLN	2.2
1	B	362	SER	2.2
1	A	402	GLY	2.2
1	B	318	GLU	2.1
1	B	401	VAL	2.1
1	A	132	THR	2.0
1	B	122	GLY	2.0
1	B	378	GLY	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (i)

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

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands (i)

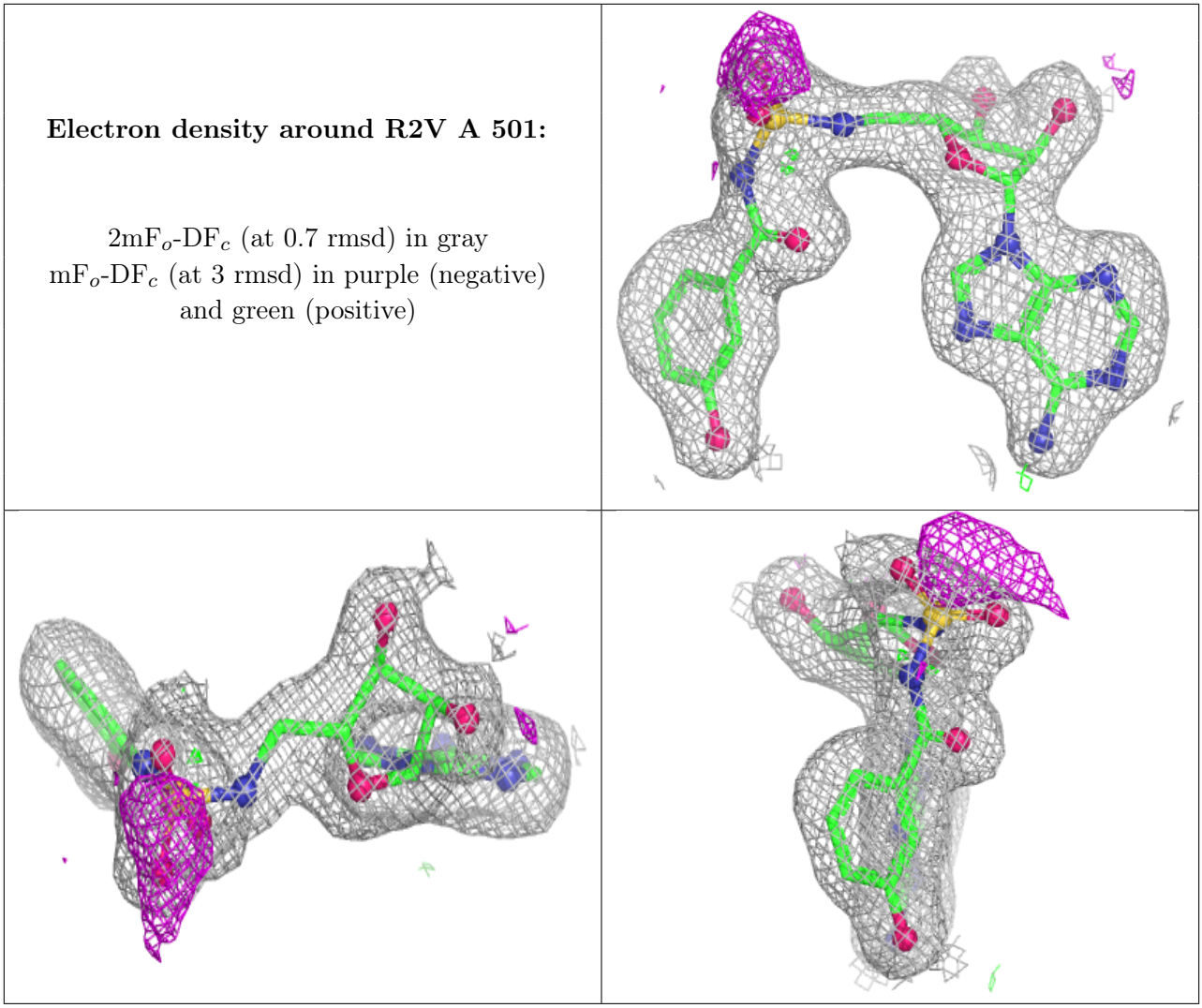
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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
5	PEG	A	504	7/7	0.80	0.17	65,67,67,68	0
5	PEG	B	502	6/7	0.80	0.17	65,67,67,67	0
3	PGE	A	502	10/10	0.86	0.13	59,60,61,61	0
4	EPE	A	503	15/15	0.90	0.13	44,52,63,66	0
2	R2V	A	501	32/32	0.93	0.08	24,29,34,37	0
6	BR	B	503	1/1	0.95	0.08	47,47,47,47	1
6	BR	B	504	1/1	0.95	0.08	47,47,47,47	1
2	R2V	B	501	32/32	0.96	0.07	27,33,35,36	0
6	BR	A	505	1/1	0.96	0.07	50,50,50,50	1
7	CL	B	505	1/1	0.96	0.07	42,42,42,42	0
7	CL	A	508	1/1	0.97	0.06	36,36,36,36	0
7	CL	A	507	1/1	0.97	0.06	40,40,40,40	0
7	CL	A	506	1/1	0.99	0.03	43,43,43,43	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.

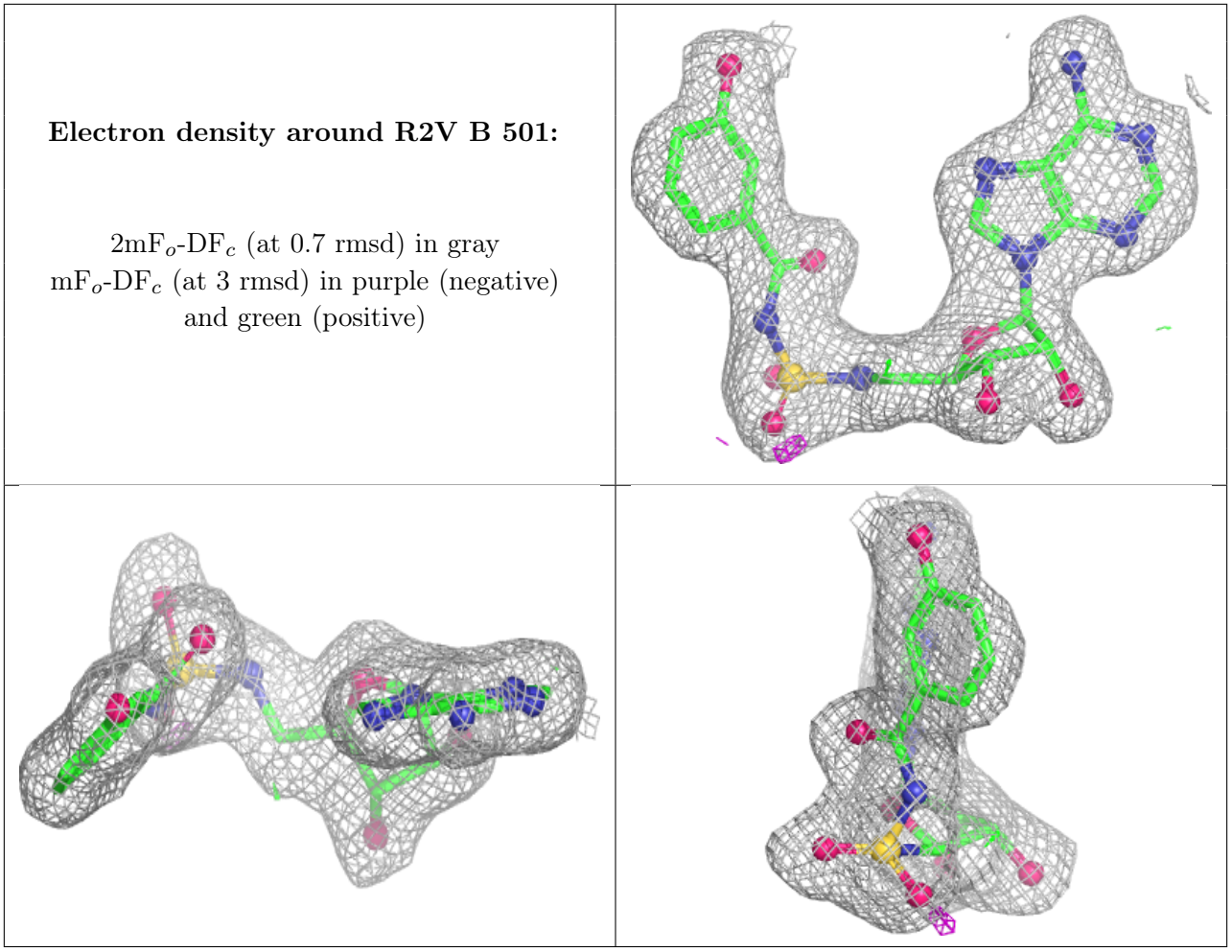
Electron density around R2V A 501:

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



Electron density around R2V B 501:

$2mF_o$-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.