WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report ⓘ

Jul 29, 2024 – 03:13 PM EDT

PDB ID	:	8VON
Title	:	Double phenylalanine Apex domain mutant of bacteriophage P2 central spike protein, membrane-piercing module
Authors	:	Leiman, P.G.; Miller, J.M.
Deposited on	:	2024-01-15
Resolution	:	1.15 Å(reported)

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

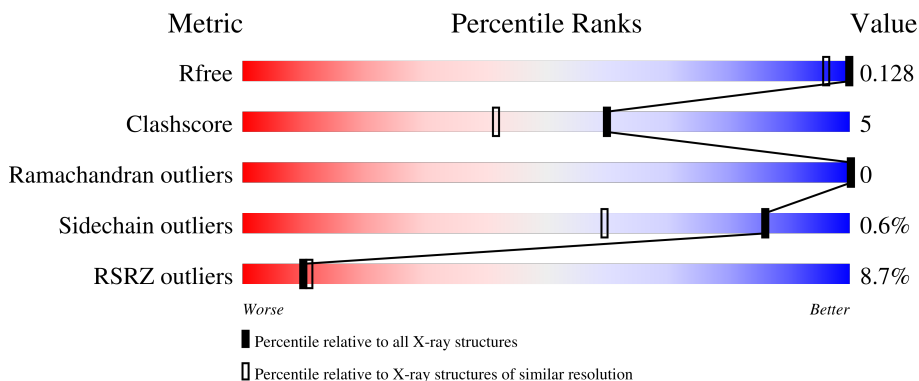|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.37.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

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 1.15 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.
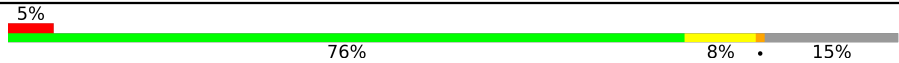
Metric	Percentile Ranks	Value
Rfree		0.128
Clashscore		5
Ramachandran outliers		0
Sidechain outliers		0.6%
RSRZ outliers		8.7%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	130704	1492 (1.18-1.10)
Clashscore	141614	1537 (1.18-1.10)
Ramachandran outliers	138981	1483 (1.18-1.10)
Sidechain outliers	138945	1480 (1.18-1.10)
RSRZ outliers	127900	1464 (1.18-1.10)

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	118	8% / 77% / 9% / 14%
1	B	118	10% / 77% / 7% / 16%
1	C	118	3% / 77% / 5% · / 17%
1	D	118	9% / 80% / 8% / 13%
1	E	118	8% / 77% / 6% · / 16%

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Mol	Chain	Length	Quality of chain
1	F	118	

5%

76% 8% • 15%

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 10441 atoms, of which 4882 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 Spike protein.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	102	Total	C	H	N	O	S	0	5	0
			1592	486	815	136	152	3			
1	B	99	Total	C	H	N	O	S	0	6	0
			1525	461	781	129	151	3			
1	C	98	Total	C	H	N	O	S	0	7	0
			1521	461	781	125	150	4			
1	D	103	Total	C	H	N	O	S	0	5	0
			1606	490	822	137	154	3			
1	E	99	Total	C	H	N	O	S	0	8	0
			1544	469	789	129	154	3			
1	F	100	Total	C	H	N	O	S	0	8	0
			1582	478	815	133	153	3			

There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	94	GLY	-	expression tag	UNP P31340
A	95	SER	-	expression tag	UNP P31340
A	96	GLY	-	expression tag	UNP P31340
A	97	SER	-	expression tag	UNP P31340
A	197	PHE	HIS	engineered mutation	UNP P31340
A	199	PHE	HIS	engineered mutation	UNP P31340
B	94	GLY	-	expression tag	UNP P31340
B	95	SER	-	expression tag	UNP P31340
B	96	GLY	-	expression tag	UNP P31340
B	97	SER	-	expression tag	UNP P31340
B	197	PHE	HIS	engineered mutation	UNP P31340
B	199	PHE	HIS	engineered mutation	UNP P31340
C	94	GLY	-	expression tag	UNP P31340
C	95	SER	-	expression tag	UNP P31340
C	96	GLY	-	expression tag	UNP P31340
C	97	SER	-	expression tag	UNP P31340
C	197	PHE	HIS	engineered mutation	UNP P31340

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Chain	Residue	Modelled	Actual	Comment	Reference
C	199	PHE	HIS	engineered mutation	UNP P31340
D	94	GLY	-	expression tag	UNP P31340
D	95	SER	-	expression tag	UNP P31340
D	96	GLY	-	expression tag	UNP P31340
D	97	SER	-	expression tag	UNP P31340
D	197	PHE	HIS	engineered mutation	UNP P31340
D	199	PHE	HIS	engineered mutation	UNP P31340
E	94	GLY	-	expression tag	UNP P31340
E	95	SER	-	expression tag	UNP P31340
E	96	GLY	-	expression tag	UNP P31340
E	97	SER	-	expression tag	UNP P31340
E	197	PHE	HIS	engineered mutation	UNP P31340
E	199	PHE	HIS	engineered mutation	UNP P31340
F	94	GLY	-	expression tag	UNP P31340
F	95	SER	-	expression tag	UNP P31340
F	96	GLY	-	expression tag	UNP P31340
F	97	SER	-	expression tag	UNP P31340
F	197	PHE	HIS	engineered mutation	UNP P31340
F	199	PHE	HIS	engineered mutation	UNP P31340

- Molecule 2 is PHOSPHATIDYLETHANOLAMINE (three-letter code: PTY) (formula: $C_{40}H_{80}NO_8P$).
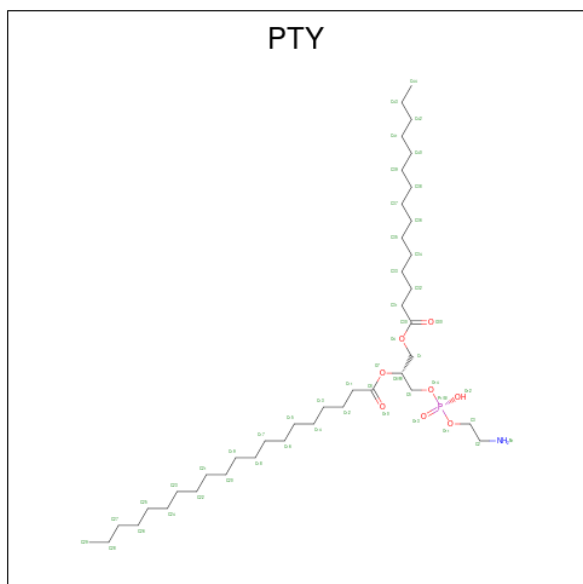
Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
			Total	C	H	N	O	P		
2	E	1	129	40	79	1	8	1	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	170	Total 170	O 170	0	0
3	B	155	Total 155	O 155	0	0
3	C	167	Total 167	O 167	0	0
3	D	155	Total 155	O 155	0	0
3	E	149	Total 149	O 149	0	0
3	F	146	Total 146	O 146	0	0



3 Residue-property plots ⓘ

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.
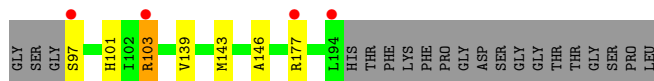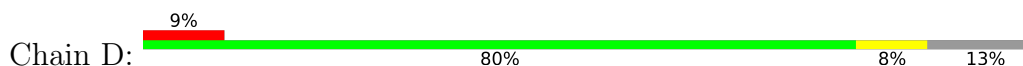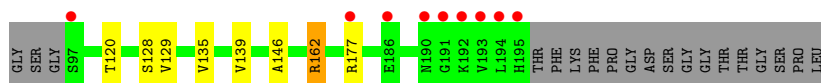
- Molecule 1: Spike protein
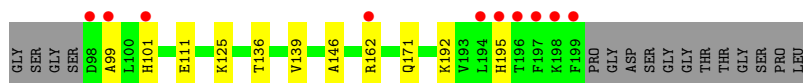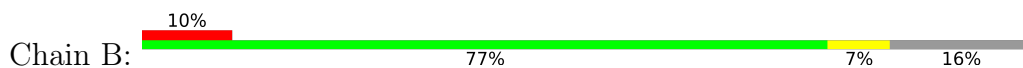
Chain A:

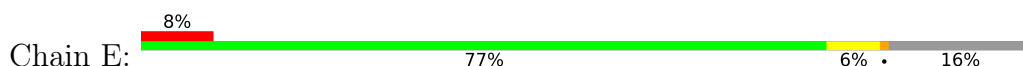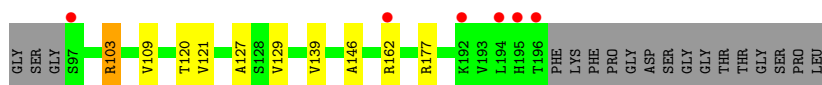- Molecule 1: Spike protein

Chain B:

- Molecule 1: Spike protein

Chain C:

- Molecule 1: Spike protein

Chain D:

- Molecule 1: Spike protein

Chain E:

- Molecule 1: Spike protein

Chain F:

GLY SER GLY S97 R103 V109 T120 V121 A127 S128 V129 V139 A146 R162 R177 K192 V193 L194 H195 T196 PHE LYS PHE PRO GLY ASP SER GLY THR THR GLY SER PRO LEU

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	45.57Å 49.51Å 89.54Å 106.49° 89.74° 112.34°	Depositor
Resolution (Å)	34.77 – 1.15 44.75 – 1.15	Depositor EDS
% Data completeness (in resolution range)	98.8 (34.77-1.15) 99.3 (44.75-1.15)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	4.42 (at 1.15Å)	Xtriage
Refinement program	PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.114 , 0.128 0.115 , 0.128	Depositor DCC
R_{free} test set	3690 reflections (1.50%)	wwPDB-VP
Wilson B-factor (Å^2)	10.7	Xtriage
Anisotropy	0.077	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.43 , 63.6	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.98	EDS
Total number of atoms	10441	wwPDB-VP
Average B, all atoms (Å^2)	18.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 9.64% of the height of the origin peak. No significant pseudotranslation is detected.*

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[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: PTY

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	0.54	1/802 (0.1%)	0.74	0/1087
1	B	0.48	0/769	0.75	0/1045
1	C	0.51	0/768	0.75	0/1044
1	D	0.49	0/809	0.75	0/1097
1	E	0.58	0/788	0.76	0/1073
1	F	0.49	0/799	0.76	0/1086
All	All	0.52	1/4735 (0.0%)	0.75	0/6432

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	3
1	C	0	2
1	D	0	2
1	E	0	2
1	F	0	4
All	All	0	13

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	111	GLU	CD-OE1	6.60	1.32	1.25

There are no bond angle outliers.

There are no chirality outliers.

All (13) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	149	ARG	Sidechain
1	B	162[A]	ARG	Sidechain
1	B	162[B]	ARG	Sidechain
1	C	103[A]	ARG	Sidechain
1	C	103[B]	ARG	Sidechain
1	D	162[A]	ARG	Sidechain
1	D	162[B]	ARG	Sidechain
1	E	162[A]	ARG	Sidechain
1	E	162[B]	ARG	Sidechain
1	F	103[A]	ARG	Sidechain
1	F	103[B]	ARG	Sidechain
1	F	162[A]	ARG	Sidechain
1	F	162[B]	ARG	Sidechain

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	777	815	812	7	3
1	B	744	781	779	7	0
1	C	740	781	779	7	0
1	D	784	822	819	8	3
1	E	755	789	778	17	0
1	F	767	815	812	9	0
2	E	50	79	79	6	0
3	A	170	0	0	4	2
3	B	155	0	0	3	1
3	C	167	0	0	3	1
3	D	155	0	0	1	2
3	E	149	0	0	5	3
3	F	146	0	0	3	1
All	All	5559	4882	4858	44	8

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 5.

All (44) 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:99:ALA:HB1	3:A:397:HOH:O	1.87	0.73
1:A:162[A]:ARG:HG3	3:A:364:HOH:O	1.91	0.71
1:B:115:GLU:OE2	3:B:301:HOH:O	2.09	0.69
1:A:171:GLN:OE1	3:A:301:HOH:O	2.11	0.69
1:A:136:THR:HG23	1:C:143[A]:MET:HG3	1.76	0.67
1:C:103[A]:ARG:NH1	3:C:301:HOH:O	2.28	0.65
1:D:171:GLN:OE1	3:D:301:HOH:O	2.15	0.64
1:D:101:HIS:CD2	1:D:111:GLU:OE2	2.52	0.63
1:E:120[B]:THR:HG22	3:E:440:HOH:O	2.00	0.62
1:E:129[B]:VAL:HG23	2:E:301:PTY:H262	1.82	0.61
1:D:101:HIS:HD2	1:D:111:GLU:OE2	1.83	0.60
1:E:129[B]:VAL:HG22	1:F:121:VAL:HB	1.85	0.59
1:B:111[B]:GLU:HG3	1:B:120[B]:THR:OG1	2.04	0.57
3:E:405:HOH:O	1:F:120[B]:THR:HG22	2.06	0.55
1:B:146:ALA:HA	1:C:139:VAL:O	2.07	0.55
1:E:129[A]:VAL:HG12	2:E:301:PTY:H241	1.89	0.55
1:E:146:ALA:HA	1:F:139:VAL:O	2.08	0.53
1:F:120[A]:THR:HG22	3:F:377:HOH:O	2.09	0.52
1:B:111[B]:GLU:CG	1:B:120[B]:THR:OG1	2.58	0.51
1:A:139:VAL:O	1:C:146:ALA:HA	2.12	0.50
1:E:120[A]:THR:HG23	3:E:440:HOH:O	2.11	0.49
1:E:135[B]:VAL:HG12	2:E:301:PTY:H402	1.94	0.49
1:E:135[B]:VAL:HG13	1:F:127:ALA:HB3	1.94	0.48
1:C:101:HIS:HE1	1:C:103[A]:ARG:HD3	1.78	0.48
1:E:120[A]:THR:HG22	3:E:480:HOH:O	2.14	0.47
1:E:162[B]:ARG:HB3	1:E:162[B]:ARG:NH1	2.30	0.47
1:D:146:ALA:HA	1:E:139:VAL:O	2.16	0.46
1:E:177:ARG:HG3	3:F:364:HOH:O	2.16	0.45
1:E:129[A]:VAL:HG12	2:E:301:PTY:C24	2.47	0.45
1:A:146:ALA:HA	1:B:139:VAL:O	2.16	0.45
1:B:129[A]:VAL:HG23	3:B:414:HOH:O	2.15	0.45
1:D:139:VAL:O	1:F:146:ALA:HA	2.17	0.45
1:C:177:ARG:NH1	3:C:305:HOH:O	2.50	0.44
1:C:177:ARG:HG3	3:C:305:HOH:O	2.18	0.44
1:E:177:ARG:NH2	3:E:401:HOH:O	2.50	0.43
1:D:101:HIS:HD2	1:D:111:GLU:CD	2.23	0.42
1:F:103[A]:ARG:HG2	1:F:109:VAL:HG22	2.01	0.42
1:E:135[B]:VAL:CG1	2:E:301:PTY:H382	2.49	0.42
1:B:120[A]:THR:HG22	3:B:341:HOH:O	2.19	0.41
1:F:177:ARG:HG3	3:F:360:HOH:O	2.19	0.41
1:D:136:THR:O	1:E:128:SER:HA	2.21	0.41
1:A:125[B]:LYS:HD2	3:A:312:HOH:O	2.20	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:121:VAL:HB	1:F:129[B]:VAL:HG12	2.03	0.40
1:E:129[B]:VAL:CG2	2:E:301:PTY:H262	2.50	0.40

All (8) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:192:LYS:NZ	1:D:181:GLU:OE1[1_666]	1.90	0.30
3:A:455:HOH:O	3:E:522:HOH:O[1_565]	1.97	0.23
3:D:455:HOH:O	3:E:494:HOH:O[1_554]	1.99	0.21
3:B:386:HOH:O	3:D:446:HOH:O[1_665]	2.02	0.18
3:C:458:HOH:O	3:E:515:HOH:O[1_665]	2.12	0.08
1:A:192:LYS:HZ2	1:D:181:GLU:OE1[1_666]	1.56	0.04
3:A:446:HOH:O	3:F:376:HOH:O[1_665]	2.17	0.03
1:A:192:LYS:HZ3	1:D:181:GLU:OE1[1_666]	1.59	0.01

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	105/118 (89%)	100 (95%)	5 (5%)	0	100	100
1	B	103/118 (87%)	99 (96%)	4 (4%)	0	100	100
1	C	103/118 (87%)	98 (95%)	5 (5%)	0	100	100
1	D	106/118 (90%)	102 (96%)	4 (4%)	0	100	100
1	E	105/118 (89%)	100 (95%)	5 (5%)	0	100	100
1	F	106/118 (90%)	99 (93%)	7 (7%)	0	100	100
All	All	628/708 (89%)	598 (95%)	30 (5%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	90/95 (95%)	88 (98%)	2 (2%)	52	12
1	B	87/95 (92%)	87 (100%)	0	100	100
1	C	88/95 (93%)	87 (99%)	1 (1%)	73	38
1	D	91/95 (96%)	91 (100%)	0	100	100
1	E	90/95 (95%)	90 (100%)	0	100	100
1	F	91/95 (96%)	91 (100%)	0	100	100
All	All	537/570 (94%)	534 (99%)	3 (1%)	86	59

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	101	HIS
1	A	195	HIS
1	C	97	SER

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

Mol	Chain	Res	Type
1	D	101	HIS
1	E	101	HIS

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 (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

1 ligand is 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	$\#|Z| > 2$
2	PTY	E	301	-	49,49,49	0.28	0	52,54,54	0.48	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
2	PTY	E	301	-	-	9/53/53/53	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (9) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	E	301	PTY	C3-O11-P1-O14
2	E	301	PTY	C23-C24-C25-C26
2	E	301	PTY	C24-C25-C26-C27
2	E	301	PTY	C26-C27-C28-C29
2	E	301	PTY	C38-C39-C40-C41
2	E	301	PTY	C3-O11-P1-O13
2	E	301	PTY	C40-C41-C42-C43
2	E	301	PTY	C20-C21-C22-C23
2	E	301	PTY	C19-C20-C21-C22

There are no ring outliers.

1 monomer is involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	301	PTY	6	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 PTY E 301

Bond lengths   Bond angles

Torsions   Rings
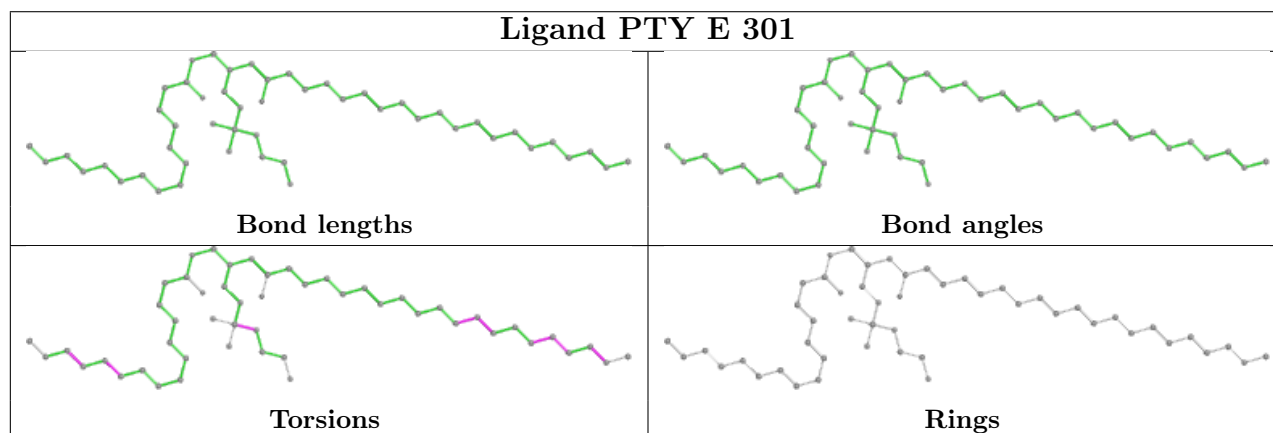
5.7 Other polymers (i)

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, 95th 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	102/118 (86%)	0.72	10 (9%)	7	8	8, 12, 33, 49	0
1	B	99/118 (83%)	0.69	12 (12%)	4	5	8, 11, 33, 47	0
1	C	98/118 (83%)	0.44	4 (4%)	37	35	8, 11, 27, 31	0
1	D	103/118 (87%)	0.67	11 (10%)	6	7	8, 11, 31, 46	0
1	E	99/118 (83%)	0.59	9 (9%)	9	10	8, 11, 32, 58	0
1	F	100/118 (84%)	0.58	6 (6%)	21	22	7, 12, 30, 58	0
All	All	601/708 (84%)	0.62	52 (8%)	10	11	7, 11, 32, 58	0

All (52) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	196	THR	8.5
1	F	195	HIS	8.4
1	A	197	PHE	8.0
1	A	198	LYS	7.9
1	B	193	VAL	7.8
1	E	193	VAL	7.8
1	D	197	PHE	7.2
1	D	199	PHE	7.2
1	D	198	LYS	7.2
1	E	195	HIS	6.4
1	A	199	PHE	6.3
1	A	195	HIS	6.1
1	C	194	LEU	5.8
1	D	195	HIS	5.5
1	E	194	LEU	5.3
1	F	194	LEU	5.3
1	A	196	THR	5.3
1	B	194	LEU	5.2
1	B	96	GLY	5.0

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Mol	Chain	Res	Type	RSRZ
1	E	192	LYS	4.9
1	D	196	THR	4.7
1	D	97	SER	4.4
1	F	97	SER	4.4
1	A	98	ASP	4.2
1	D	194	LEU	4.1
1	C	97	SER	3.7
1	A	99	ALA	3.6
1	E	191	GLY	3.6
1	B	192	LYS	3.3
1	E	97	SER	3.2
1	B	97	SER	3.0
1	B	101	HIS	3.0
1	B	177	ARG	2.8
1	B	191	GLY	2.8
1	D	101	HIS	2.8
1	E	177	ARG	2.7
1	D	162[A]	ARG	2.7
1	A	194	LEU	2.6
1	B	186	GLU	2.5
1	B	98	ASP	2.5
1	A	101	HIS	2.4
1	E	186	GLU	2.3
1	F	192	LYS	2.3
1	F	162[A]	ARG	2.3
1	D	177	ARG	2.3
1	C	103[A]	ARG	2.2
1	D	98	ASP	2.1
1	A	162[A]	ARG	2.1
1	B	162[A]	ARG	2.1
1	B	183	THR	2.0
1	C	177	ARG	2.0
1	E	190	ASN	2.0

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

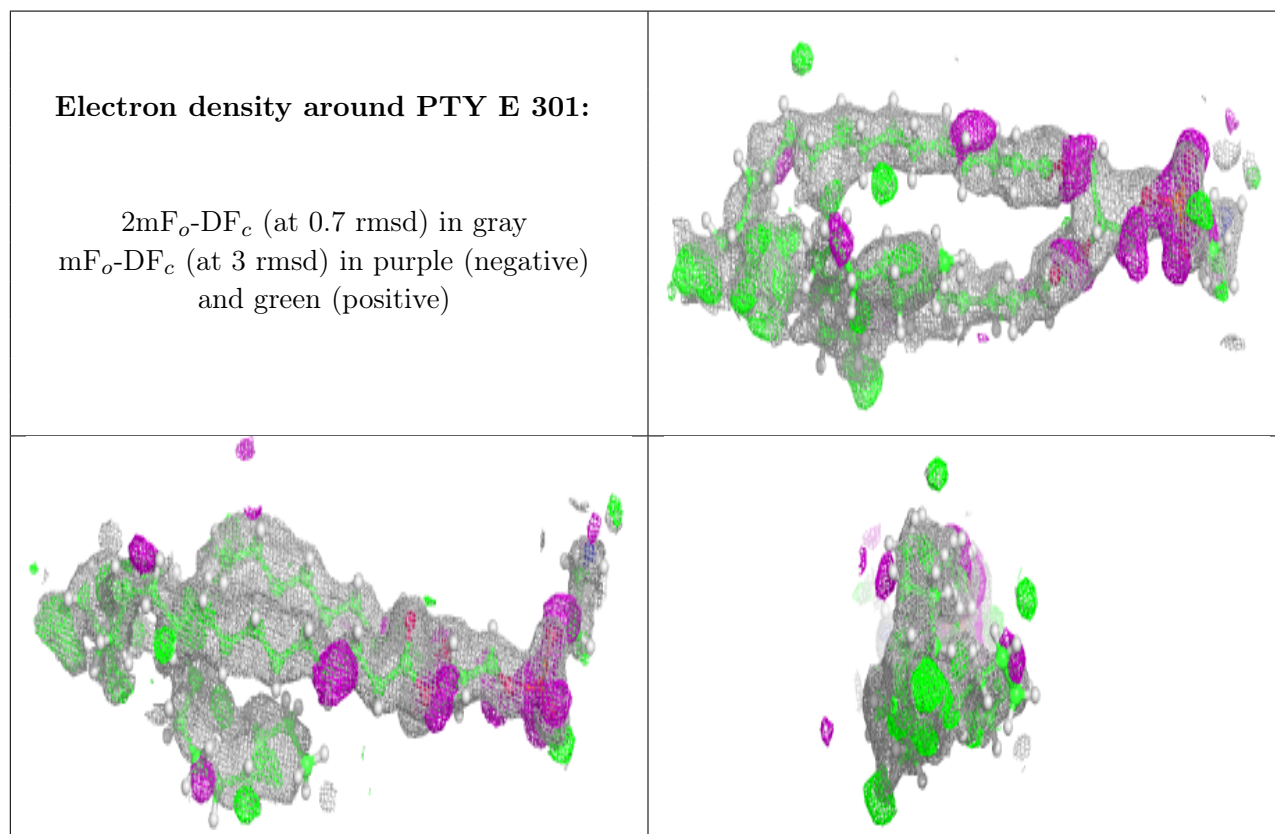There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates ⓘ

There are no monosaccharides 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, 95th 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
2	PTY	E	301	50/50	0.81	0.18	20,55,68,68	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 PTY E 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.