



# Full wwPDB X-ray Structure Validation Report ⓘ

Nov 22, 2023 – 01:20 PM JST

PDB ID : 7X7E  
Title : SARS-CoV-2 RBD and Nb22  
Authors : Wang, Y.; Ye, S.  
Deposited on : 2022-03-09  
Resolution : 2.67 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.36  
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) : 2.36

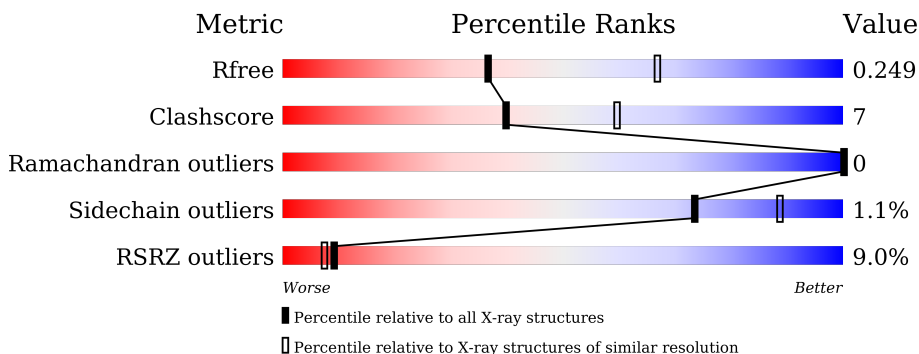
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.67 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	3863 (2.70-2.66)
Clashscore	141614	4210 (2.70-2.66)
Ramachandran outliers	138981	4141 (2.70-2.66)
Sidechain outliers	138945	4141 (2.70-2.66)
RSRZ outliers	127900	3780 (2.70-2.66)

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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	C	194	
1	D	194	
1	F	194	
2	A	130	
2	B	130	
2	E	130	

## 2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 7726 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.

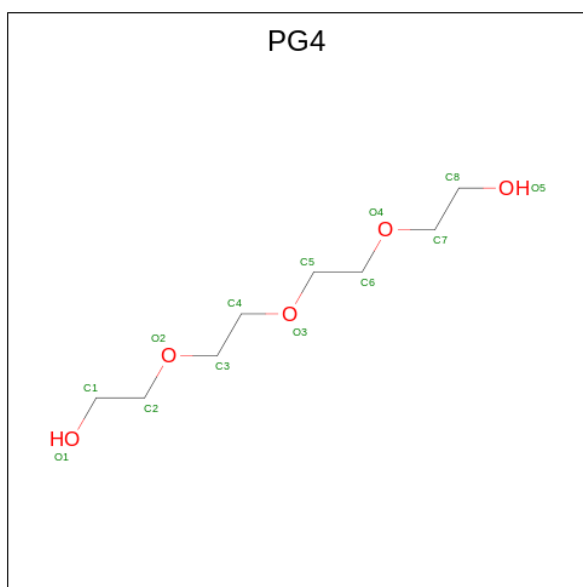
- Molecule 1 is a protein called Spike protein S1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	C	194	1542	988	257	289	8	0	1	0
1	D	194	1542	988	257	289	8	6	1	0
1	F	194	1542	988	257	289	8	0	1	0

- Molecule 2 is a protein called Nb22.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	A	130	972	603	175	189	5	0	0	0
2	E	130	972	603	175	189	5	0	0	0
2	B	130	972	603	175	189	5	0	0	0

- Molecule 3 is TETRAETHYLENE GLYCOL (three-letter code: PG4) (formula: C<sub>8</sub>H<sub>18</sub>O<sub>5</sub>) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	C	1	Total C O 13 8 5	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	C	54	Total O 54 54	0	0
4	D	34	Total O 34 34	0	0
4	A	31	Total O 31 31	0	0
4	E	18	Total O 18 18	0	0
4	F	12	Total O 12 12	0	0
4	B	22	Total O 22 22	0	0

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

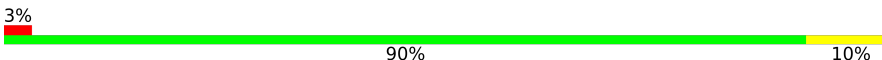
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Spike protein S1

Chain C:  91% 9%




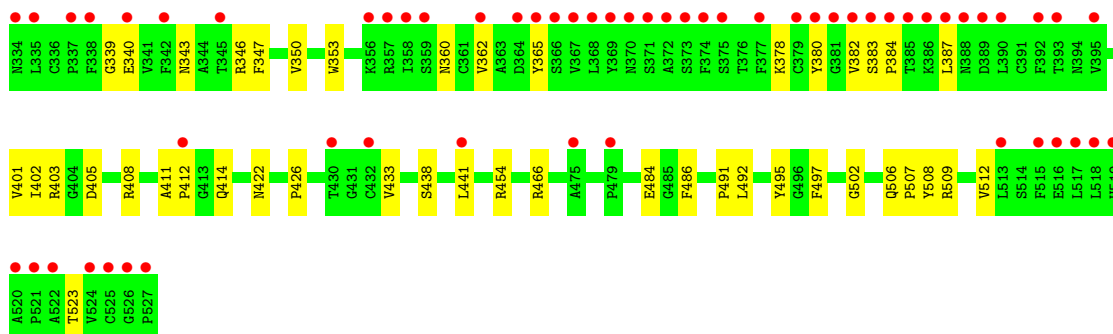
- Molecule 1: Spike protein S1

Chain D:  3% 90% 10%




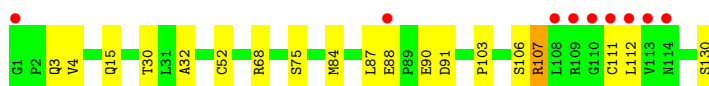
- Molecule 1: Spike protein S1

Chain F:  30% 77% 23%

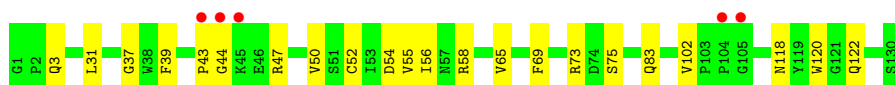
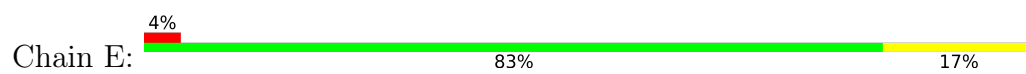


- Molecule 2: Nb22

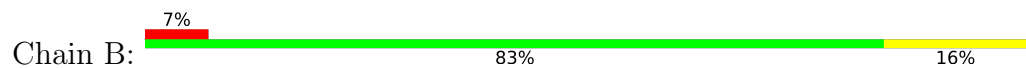
Chain A:  7% 85% 14%



- Molecule 2: Nb22



- Molecule 2: Nb22



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	73.79Å 88.68Å 172.47Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	37.23 – 2.67 37.23 – 2.67	Depositor EDS
% Data completeness (in resolution range)	98.5 (37.23-2.67) 98.5 (37.23-2.67)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.55 (at 2.68Å)	Xtrriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, $R_{free}$	0.204 , 0.249 0.204 , 0.249	Depositor DCC
$R_{free}$ test set	1724 reflections (5.30%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	45.1	Xtrriage
Anisotropy	0.351	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 43.5	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	7726	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	58.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.67% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: PG4

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	C	0.26	0/1586	0.44	0/2159
1	D	0.27	0/1586	0.44	0/2159
1	F	0.25	0/1586	0.44	0/2159
2	A	0.28	0/991	0.46	0/1345
2	B	0.26	0/991	0.46	0/1345
2	E	0.31	0/991	0.48	0/1345
All	All	0.27	0/7731	0.45	0/10512

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 [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	C	1542	0	1457	14	0
1	D	1542	0	1457	18	0
1	F	1542	0	1457	36	1
2	A	972	0	944	17	0
2	B	972	0	944	13	0
2	E	972	0	942	17	1
3	C	13	0	18	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	A	31	0	0	9	0
4	B	22	0	0	3	0
4	C	54	0	0	5	0
4	D	34	0	0	10	0
4	E	18	0	0	1	0
4	F	12	0	0	4	0
All	All	7726	0	7219	108	1

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 7.

All (108) 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:E:47:ARG:NH1	2:E:120:TRP:CZ3	2.03	1.25
1:D:394:ASN:HB2	4:D:601:HOH:O	1.52	1.09
2:A:112:LEU:N	4:A:202:HOH:O	1.85	1.00
2:B:28:GLY:O	4:B:201:HOH:O	1.81	0.97
2:A:130:SER:O	4:A:201:HOH:O	1.82	0.97
2:A:111:CYS:CA	4:A:202:HOH:O	2.12	0.95
1:D:371:SER:HB2	4:D:604:HOH:O	1.69	0.92
1:D:478:THR:O	4:D:602:HOH:O	1.89	0.90
1:F:360:ASN:H	1:F:523:THR:HG22	1.38	0.88
2:E:47:ARG:NH1	2:E:120:TRP:CH2	2.42	0.87
1:D:371:SER:CA	4:D:604:HOH:O	2.26	0.84
1:D:371:SER:N	4:D:604:HOH:O	2.12	0.83
1:D:371:SER:CB	4:D:604:HOH:O	2.26	0.82
2:E:47:ARG:CZ	2:E:120:TRP:CH2	2.62	0.82
1:D:394:ASN:ND2	4:D:601:HOH:O	1.85	0.82
2:A:107:ARG:NH1	4:A:203:HOH:O	2.12	0.81
2:A:111:CYS:HB3	4:A:202:HOH:O	1.82	0.79
2:A:111:CYS:CB	4:A:202:HOH:O	2.34	0.75
2:A:111:CYS:HA	4:A:202:HOH:O	1.78	0.74
2:A:103:PRO:HG2	2:A:106:SER:HB3	1.71	0.72
2:E:47:ARG:NH1	2:E:120:TRP:CE3	2.58	0.72
2:E:3:GLN:O	4:E:201:HOH:O	2.10	0.68
1:C:345:THR:OG1	4:C:701:HOH:O	2.11	0.68
1:F:340:GLU:OE2	4:F:601:HOH:O	2.11	0.67
1:C:373:SER:O	4:C:702:HOH:O	2.12	0.66
1:D:411:ALA:O	4:D:605:HOH:O	2.14	0.66
1:F:360:ASN:H	1:F:523:THR:CG2	2.11	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:527:PRO:O	4:C:703:HOH:O	2.15	0.62
2:E:47:ARG:CZ	2:E:120:TRP:CZ3	2.83	0.62
2:B:68:ARG:NH2	2:B:91:ASP:OD2	2.33	0.61
1:F:360:ASN:N	1:F:523:THR:HG22	2.13	0.60
1:F:382:VAL:HG11	1:F:387:LEU:HD21	1.85	0.59
1:F:382:VAL:HG12	1:F:383:SER:N	2.18	0.58
1:F:411:ALA:HB3	1:F:414:GLN:HG3	1.86	0.58
1:F:422:ASN:HD21	1:F:454:ARG:H	1.51	0.57
1:C:471:GLU:HB3	1:F:346:ARG:NH2	2.20	0.56
2:B:104:PRO:O	2:B:107:ARG:NE	2.39	0.56
1:F:441:LEU:HD12	1:F:509:ARG:HH12	1.71	0.55
2:B:30:THR:HG22	2:B:32:ALA:H	1.71	0.54
1:D:413:GLY:N	4:D:603:HOH:O	2.05	0.54
2:E:75:SER:N	1:F:484:GLU:OE2	2.35	0.54
1:F:362:VAL:HG13	1:F:362:VAL:O	2.08	0.53
1:F:350:VAL:HG13	1:F:422:ASN:HD22	1.74	0.53
2:A:84:MET:HB3	2:A:87:LEU:HD21	1.90	0.53
2:A:68:ARG:NH2	2:A:91:ASP:OD2	2.42	0.53
1:F:433:VAL:HG12	1:F:512:VAL:HG22	1.90	0.53
1:D:430:THR:HG22	1:D:515:PHE:HB2	1.92	0.52
1:F:347:PHE:CG	1:F:509:ARG:HD3	2.45	0.51
2:A:130:SER:C	4:A:201:HOH:O	2.35	0.51
2:E:47:ARG:NH2	2:E:120:TRP:CH2	2.78	0.51
1:F:365:TYR:CZ	1:F:387:LEU:HB3	2.46	0.51
1:D:379:CYS:HA	1:D:432:CYS:HA	1.93	0.50
1:C:350:VAL:HG22	1:C:422:ASN:HB3	1.92	0.50
1:F:339:GLY:O	1:F:343:ASN:HB2	2.12	0.49
2:B:84:MET:HB3	2:B:87:LEU:HD21	1.94	0.49
1:C:471:GLU:HB3	1:F:346:ARG:HH22	1.77	0.49
1:F:402:ILE:O	1:F:508:TYR:N	2.39	0.49
1:D:338:PHE:HE1	1:D:358:ILE:HD13	1.78	0.48
1:F:454:ARG:NH1	4:F:605:HOH:O	2.43	0.48
1:C:439:ASN:HD21	1:C:499:PRO:HA	1.79	0.47
1:F:384:PRO:N	4:F:604:HOH:O	2.47	0.47
2:A:52:CYS:SG	4:A:222:HOH:O	2.61	0.47
2:E:43:PRO:HG2	2:B:15:GLN:HE22	1.80	0.47
1:F:378:LYS:HD3	1:F:380:TYR:OH	2.14	0.47
1:F:382:VAL:CG1	1:F:383:SER:N	2.77	0.47
2:A:88:GLU:HG3	2:A:90:GLU:OE1	2.14	0.47
1:C:484:GLU:OE2	4:C:705:HOH:O	2.20	0.46
1:C:439:ASN:O	1:C:443:SER:HB2	2.16	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:54:ASP:HB2	2:E:58:ARG:H	1.80	0.46
1:F:412:PRO:HB3	1:F:426:PRO:O	2.16	0.46
2:B:111:CYS:HB2	2:B:113:VAL:HG22	1.98	0.46
1:F:384:PRO:CD	4:F:604:HOH:O	2.65	0.44
2:E:56:ILE:HD11	2:E:58:ARG:CZ	2.48	0.44
1:F:350:VAL:HG22	1:F:422:ASN:HB3	2.00	0.44
1:F:491:PRO:HG2	1:F:492:LEU:HD22	2.00	0.44
2:B:3:GLN:HG3	2:B:4:VAL:N	2.33	0.44
1:D:484:GLU:OE2	2:A:75:SER:N	2.42	0.43
2:B:100:HIS:NE2	2:B:109:ARG:HB3	2.33	0.43
2:A:3:GLN:HG3	2:A:4:VAL:N	2.34	0.43
1:C:453:TYR:CZ	1:C:493:GLN:HB3	2.53	0.43
1:F:403:ARG:HE	1:F:405:ASP:HB3	1.83	0.43
1:D:386:LYS:O	1:D:390:LEU:HG	2.20	0.42
1:D:413:GLY:CA	4:D:603:HOH:O	2.62	0.42
2:B:72:SER:OG	4:B:203:HOH:O	2.21	0.42
2:E:50:VAL:HG13	2:E:65:VAL:HG11	2.01	0.42
1:C:471:GLU:OE2	1:F:346:ARG:NH1	2.52	0.42
1:C:460:ASN:O	4:C:706:HOH:O	2.21	0.42
2:A:15:GLN:HG3	2:B:125:GLN:OE1	2.20	0.42
2:B:110:GLY:O	4:B:204:HOH:O	2.21	0.42
2:A:30:THR:HG22	2:A:32:ALA:H	1.85	0.41
1:C:379:CYS:HA	1:C:432:CYS:HA	2.02	0.41
1:F:438:SER:HB3	1:F:509:ARG:HG3	2.02	0.41
2:E:31:LEU:O	2:E:73:ARG:NH1	2.54	0.41
1:F:380:TYR:CZ	1:F:412:PRO:HD2	2.56	0.41
1:F:401:VAL:HG22	1:F:509:ARG:HG2	2.01	0.41
1:D:440:ASN:OD1	1:D:440:ASN:N	2.49	0.41
1:D:502:GLY:O	1:D:506:GLN:HG3	2.20	0.41
1:F:353:TRP:O	1:F:466:ARG:NH1	2.54	0.41
1:F:347:PHE:CD2	1:F:509:ARG:HD3	2.56	0.41
1:F:497:PHE:CD2	1:F:507:PRO:HB3	2.55	0.41
1:D:476:GLY:N	1:D:487:ASN:HB3	2.36	0.41
2:E:55:VAL:HG11	2:E:102:VAL:HB	2.02	0.41
2:E:37:GLY:HA2	2:E:52:CYS:HA	2.02	0.40
1:C:431:GLY:HA2	1:C:515:PHE:CD2	2.56	0.40
1:F:502:GLY:O	1:F:506:GLN:HG3	2.21	0.40
2:B:56:ILE:HD11	2:B:58:ARG:CZ	2.52	0.40
2:E:69:PHE:HA	2:E:83:GLN:O	2.22	0.40
2:E:39:PHE:CB	2:E:47:ARG:HD2	2.51	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the sym-

metry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:E:44:GLY:O	1:F:383:SER:OG[3_545]	1.89	0.31

## 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	C	193/194 (100%)	186 (96%)	7 (4%)	0	100	100
1	D	193/194 (100%)	183 (95%)	10 (5%)	0	100	100
1	F	193/194 (100%)	180 (93%)	13 (7%)	0	100	100
2	A	128/130 (98%)	121 (94%)	7 (6%)	0	100	100
2	B	128/130 (98%)	121 (94%)	7 (6%)	0	100	100
2	E	128/130 (98%)	123 (96%)	5 (4%)	0	100	100
All	All	963/972 (99%)	914 (95%)	49 (5%)	0	100	100

There are no Ramachandran outliers to report.

### 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	C	168/167 (101%)	167 (99%)	1 (1%)	86	94
1	D	168/167 (101%)	168 (100%)	0	100	100
1	F	168/167 (101%)	165 (98%)	3 (2%)	59	81

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	A	104/104 (100%)	103 (99%)	1 (1%)	76	90
2	B	104/104 (100%)	102 (98%)	2 (2%)	57	80
2	E	104/104 (100%)	102 (98%)	2 (2%)	57	80
All	All	816/813 (100%)	807 (99%)	9 (1%)	73	89

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	377	PHE
2	A	107	ARG
2	E	118	ASN
2	E	122	GLN
1	F	408	ARG
1	F	486	PHE
1	F	495	TYR
2	B	3	GLN
2	B	115	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	F	422	ASN

### 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

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
3	PG4	C	601	-	12,12,12	0.12	0	11,11,11	0.15	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	PG4	C	601	-	-	2/10/10/10	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

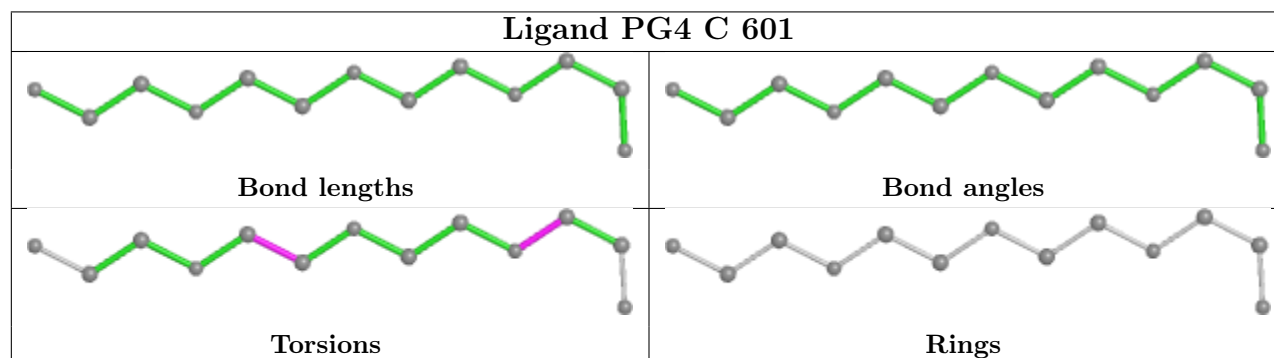
Mol	Chain	Res	Type	Atoms
3	C	601	PG4	C1-C2-O2-C3
3	C	601	PG4	O3-C5-C6-O4

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 than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the

average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data

### 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<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	C	194/194 (100%)	-0.21	0 <b>100</b> <b>100</b>	19, 38, 58, 82	0
1	D	194/194 (100%)	-0.15	5 (2%) 56 55	26, 45, 75, 137	0
1	F	194/194 (100%)	1.58	59 (30%) <b>0</b> <b>0</b>	46, 98, 175, 253	0
2	A	130/130 (100%)	0.17	9 (6%) <b>16</b> <b>14</b>	26, 42, 94, 213	0
2	B	130/130 (100%)	0.33	9 (6%) <b>16</b> <b>14</b>	23, 42, 109, 235	0
2	E	130/130 (100%)	0.08	5 (3%) <b>40</b> <b>38</b>	24, 46, 85, 162	0
All	All	972/972 (100%)	0.32	87 (8%) <b>9</b> <b>7</b>	19, 47, 134, 253	0

All (87) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	A	113	VAL	9.8
1	F	372	ALA	9.2
1	F	366	SER	8.9
2	A	109	ARG	8.9
1	F	518	LEU	8.4
1	F	373	SER	8.3
1	F	382	VAL	8.2
1	F	370	ASN	7.4
1	F	371	SER	7.1
2	B	114	ASN	7.1
1	F	521	PRO	6.8
2	A	114	ASN	6.8
1	F	369	TYR	6.8
2	B	109	ARG	6.6
1	F	384	PRO	6.4
2	B	107	ARG	6.3
1	F	430	THR	6.3
2	B	113	VAL	5.9
1	F	381	GLY	5.8

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
2	E	44	GLY	5.7
1	F	359	SER	5.7
1	F	387	LEU	5.6
1	F	517	LEU	5.3
1	F	385	THR	4.8
1	F	379	CYS	4.8
1	D	370	ASN	4.7
2	A	111	CYS	4.6
1	F	515	PHE	4.4
1	F	340	GLU	4.3
1	F	335	LEU	4.2
2	A	110	GLY	4.2
1	F	364	ASP	4.2
1	F	383	SER	4.2
1	F	441	LEU	3.7
2	B	112	LEU	3.7
1	F	367	VAL	3.6
1	F	345	THR	3.6
1	F	377	PHE	3.5
1	F	432	CYS	3.5
1	F	338	PHE	3.4
2	B	108	LEU	3.4
1	F	389	ASP	3.4
1	F	337	PRO	3.4
1	F	368	LEU	3.4
2	A	108	LEU	3.3
2	B	1	GLY	3.2
1	F	380	TYR	3.1
1	F	392	PHE	3.1
2	A	112	LEU	3.1
1	D	372	ALA	3.0
1	F	519	HIS	3.0
1	F	526	GLY	3.0
1	F	358	ILE	2.9
1	F	527	PRO	2.9
1	F	475	ALA	2.9
1	F	520	ALA	2.9
1	D	371	SER	2.9
1	F	513	LEU	2.8
2	E	45	LYS	2.8
1	F	334	ASN	2.7
2	E	104	PRO	2.5

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Mol	Chain	Res	Type	RSRZ
1	F	374	PHE	2.5
1	F	522	ALA	2.4
1	F	395	VAL	2.4
1	F	412	PRO	2.4
1	F	357	ARG	2.4
2	B	111	CYS	2.4
2	B	46	GLU	2.4
1	D	373	SER	2.4
1	F	525	CYS	2.4
1	F	516	GLU	2.4
1	F	365	TYR	2.3
1	F	390	LEU	2.3
1	D	346	ARG	2.3
1	F	362	VAL	2.3
1	F	479	PRO	2.3
1	F	386	LYS	2.3
2	A	1	GLY	2.2
1	F	342	PHE	2.2
1	F	356	LYS	2.2
2	E	105	GLY	2.1
2	E	43	PRO	2.1
1	F	388	ASN	2.1
1	F	524	VAL	2.1
1	F	393	THR	2.1
2	A	88	GLU	2.0
1	F	375[A]	SER	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 [\(i\)](#)

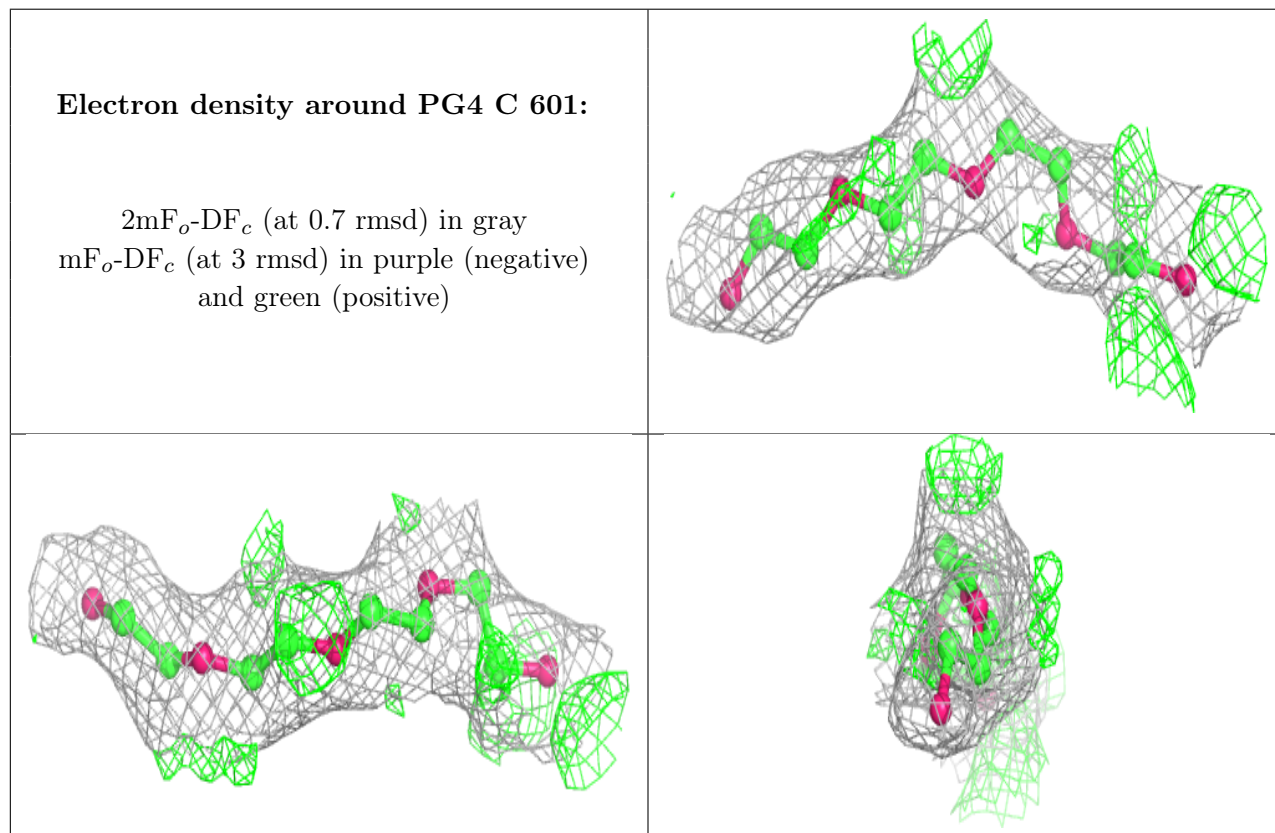
There are no monosaccharides in this entry.

## 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<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
3	PG4	C	601	13/13	0.84	0.24	33,52,62,70	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.



## 6.5 Other polymers [i](#)

There are no such residues in this entry.