



# Full wwPDB X-ray Structure Validation Report ⓘ

May 12, 2021 – 04:20 PM EDT

PDB ID : 4FFW  
Title : Crystal Structure of Dipeptidyl Peptidase IV (DPP4, DPP-IV, CD26) in Complex with Fab + sitagliptin  
Authors : Wang, Z.; Sudom, A.; Walker, N.P.; Min, X.  
Deposited on : 2012-06-01  
Resolution : 2.90 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](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.

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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)  
Xtrriage (Phenix) : 1.13  
EDS : 2.18  
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) : 2.18

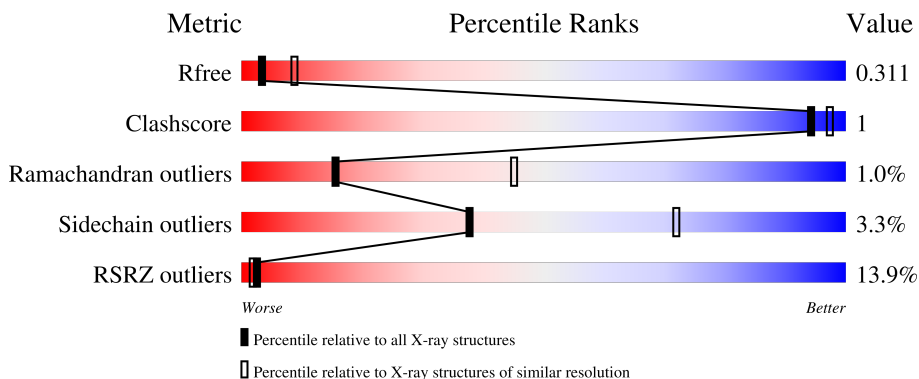
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

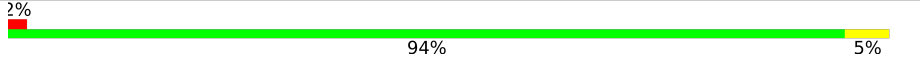
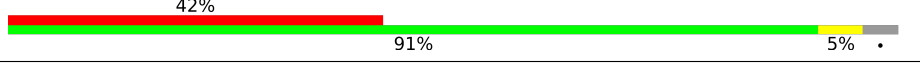
The reported resolution of this entry is 2.90 Å.

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	1957 (2.90-2.90)
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (2.90-2.90)
RSRZ outliers	127900	1906 (2.90-2.90)

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 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	A	730	
1	B	730	
2	C	210	
2	L	210	
3	D	217	

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Mol	Chain	Length	Quality of chain
3	H	217	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into three segments: a red segment on the left labeled '23%', a large green segment in the middle labeled '87%', and a small yellow segment on the right labeled '8%'. The yellow segment is followed by two small grey dots.</p>

## 2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 18266 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 Dipeptidyl peptidase 4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	727	Total	C	N	O	S	0	0	0
			5921	3792	980	1123	26			
1	B	729	Total	C	N	O	S	0	0	0
			5940	3804	985	1125	26			

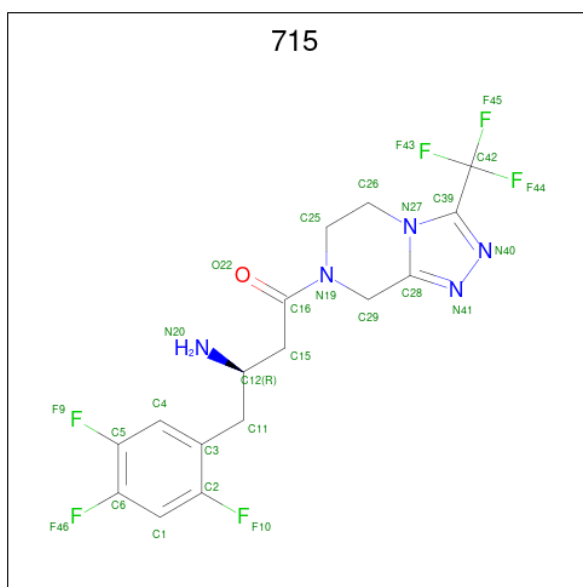
- Molecule 2 is a protein called Fab light chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	207	Total	C	N	O	S	0	0	0
			1588	987	272	322	7			
2	L	202	Total	C	N	O	S	0	0	0
			1535	956	260	312	7			

- Molecule 3 is a protein called Fab heavy chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	D	209	Total	C	N	O	S	0	0	0
			1597	1019	259	314	5			
3	H	208	Total	C	N	O	S	0	0	0
			1590	1014	258	313	5			

- Molecule 4 is (2R)-4-OXO-4-[3-(TRIFLUOROMETHYL)-5,6-DIHYDRO[1,2,4]TRIAZOLO[4,3-A]PYRAZIN-7(8H)-YL]-1-(2,4,5-TRIFLUOROPHENYL)BUTAN-2-A MINE (three-letter code: 715) (formula: C<sub>16</sub>H<sub>15</sub>F<sub>6</sub>N<sub>5</sub>O).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	F	N	O			
4	A	1	Total	28	16	6	5	1	0	0
4	B	1	Total	28	16	6	5	1	0	0

- Molecule 5 is water.

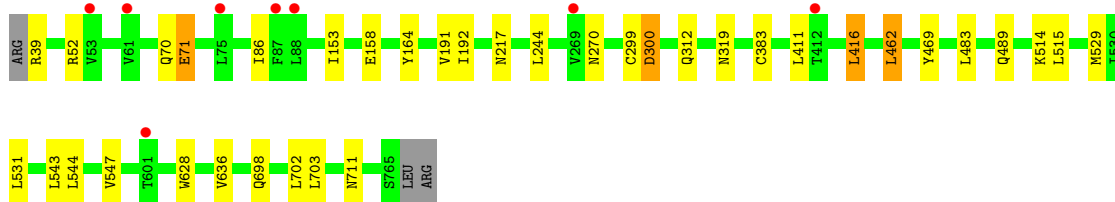
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	O		
5	A	27	Total	27	0	0
5	B	11	Total	11	0	0
5	C	1	Total	1	0	0

### 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.

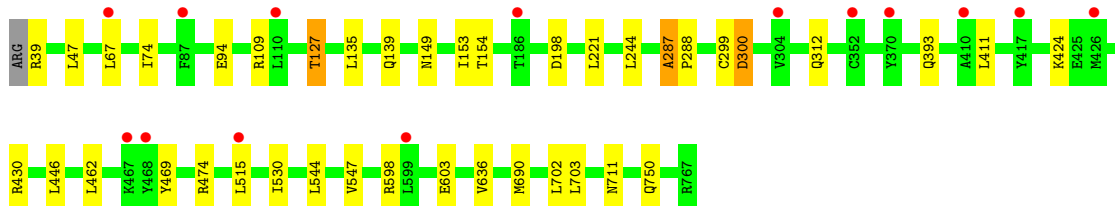
- Molecule 1: Dipeptidyl peptidase 4

Chain A: 

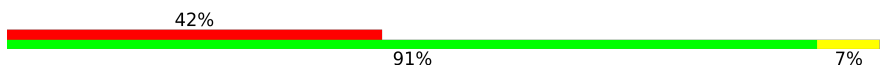


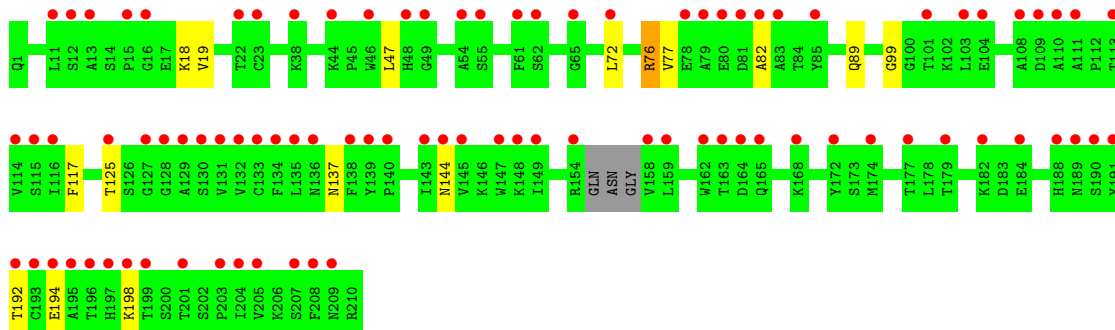
- Molecule 1: Dipeptidyl peptidase 4

Chain B: 

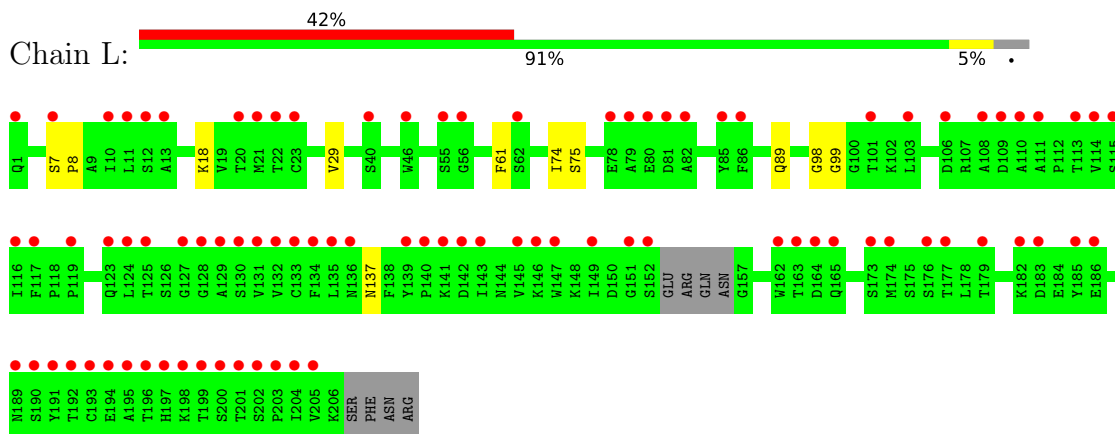


- Molecule 2: Fab light chain

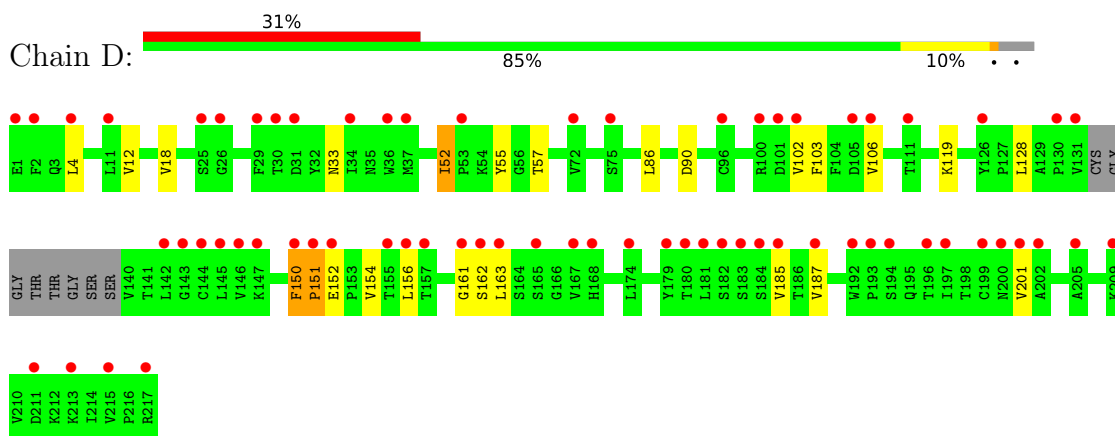
Chain C: 



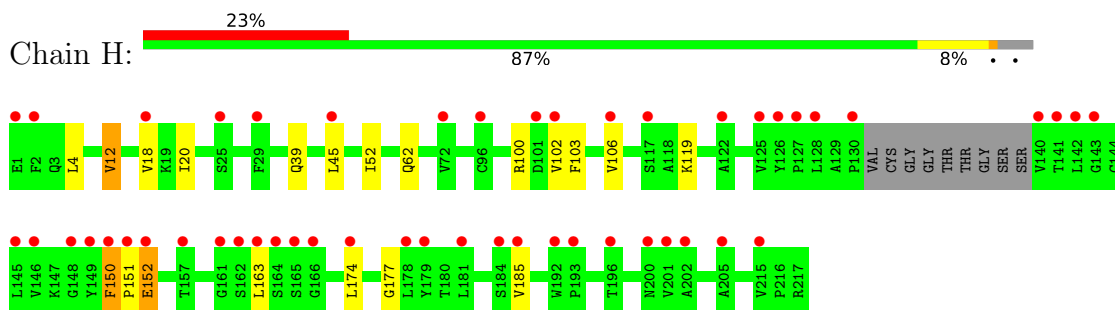
- Molecule 2: Fab light chain



- Molecule 3: Fab heavy chain



- Molecule 3: Fab heavy chain



## 4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	97.77Å 200.86Å 97.93Å 90.00° 93.64° 90.00°	Depositor
Resolution (Å)	29.99 – 2.90 29.99 – 2.90	Depositor EDS
% Data completeness (in resolution range)	99.1 (29.99-2.90) 98.7 (29.99-2.90)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	0.08	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.58 (at 2.90Å)	Xtrriage
Refinement program	REFMAC	Depositor
R, $R_{free}$	0.287 , 0.311 0.286 , 0.311	Depositor DCC
$R_{free}$ test set	4123 reflections (4.99%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	68.8	Xtrriage
Anisotropy	0.172	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.30 , 32.3	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.50$ , $\langle L^2 \rangle = 0.33$	Xtrriage
Estimated twinning fraction	0.450 for l,-k,h	Xtrriage
$F_o, F_c$ correlation	0.89	EDS
Total number of atoms	18266	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	94.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.27% 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: 715

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	0.26	0/6090	0.44	0/8280
1	B	0.26	0/6109	0.44	0/8305
2	C	0.27	0/1628	0.41	0/2213
2	L	0.26	0/1574	0.42	0/2143
3	D	0.27	0/1637	0.43	0/2236
3	H	0.27	0/1630	0.43	0/2226
All	All	0.26	0/18668	0.43	0/25403

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	A	5921	0	5658	10	0
1	B	5940	0	5682	12	0
2	C	1588	0	1515	4	0
2	L	1535	0	1466	2	0
3	D	1597	0	1575	11	0
3	H	1590	0	1566	9	0
4	A	28	0	15	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	28	0	15	0	0
5	A	27	0	0	0	0
5	B	11	0	0	0	0
5	C	1	0	0	0	0
All	All	18266	0	17492	45	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 1.

All (45) 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:B:287:ALA:HB1	1:B:288:PRO:HA	1.66	0.76
1:B:67:LEU:HB3	1:B:74:ILE:HD11	1.83	0.59
1:B:287:ALA:HB1	1:B:288:PRO:CA	2.31	0.58
3:H:12:VAL:HG11	3:H:18:VAL:HG13	1.86	0.57
1:A:547:VAL:HG21	1:A:636:VAL:HG11	1.88	0.56
3:D:163:LEU:HD23	3:D:185:VAL:HG21	1.87	0.56
3:H:150:PHE:HB3	3:H:151:PRO:HD3	1.88	0.54
3:H:163:LEU:HD23	3:H:185:VAL:HG21	1.90	0.53
1:B:547:VAL:HG21	1:B:636:VAL:HG11	1.92	0.52
1:A:191:VAL:HG12	1:A:192:ILE:HD12	1.91	0.51
1:B:299:CYS:O	1:B:300:ASP:HB2	2.10	0.51
1:B:462:LEU:HD23	1:B:469:TYR:HB3	1.92	0.50
1:B:299:CYS:O	1:B:300:ASP:CB	2.61	0.49
1:B:127:THR:HG23	1:B:149:ASN:HA	1.94	0.49
1:A:153:ILE:HG22	1:A:164:TYR:HB3	1.94	0.49
1:A:299:CYS:O	1:A:300:ASP:CB	2.60	0.48
1:B:139:GLN:HA	3:D:57:THR:HG23	1.96	0.48
3:D:150:PHE:HB3	3:D:151:PRO:HD3	1.95	0.48
1:A:462:LEU:HD23	1:A:469:TYR:HB3	1.95	0.47
3:D:52:ILE:HD11	3:D:55:TYR:CD1	2.50	0.46
1:A:529:MET:HE2	1:A:531:LEU:HD21	1.97	0.46
3:H:151:PRO:O	3:H:152:GLU:HB2	2.17	0.45
3:H:151:PRO:O	3:H:152:GLU:CB	2.65	0.45
3:H:4:LEU:HD13	3:H:106:VAL:HG11	1.99	0.45
3:D:154:VAL:HG13	3:D:154:VAL:O	2.17	0.45
1:A:411:LEU:HD13	1:A:416:LEU:CD2	2.48	0.44
2:C:19:VAL:HG21	2:C:77:VAL:HG21	2.00	0.44
1:A:70:GLN:O	1:A:71:GLU:HB2	2.18	0.44
1:B:94:GLU:OE1	3:D:33:ASN:ND2	2.51	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:161:GLY:O	3:D:163:LEU:N	2.52	0.43
3:D:4:LEU:HD13	3:D:106:VAL:HG11	2.01	0.42
3:H:39:GLN:HB2	3:H:45:LEU:HD23	2.02	0.42
3:H:150:PHE:O	3:H:151:PRO:C	2.57	0.42
2:L:61:PHE:CE1	2:L:74:ILE:HG23	2.55	0.42
1:B:47:LEU:HD22	1:B:750:GLN:HA	2.02	0.41
2:L:7:SER:HA	2:L:8:PRO:HA	1.95	0.41
3:H:174:LEU:HD11	3:H:177:GLY:HA2	2.03	0.41
1:A:70:GLN:O	1:A:71:GLU:CB	2.68	0.41
2:C:47:LEU:HD12	2:C:72:LEU:CD1	2.50	0.41
2:C:117:PHE:CD2	3:D:128:LEU:HB3	2.55	0.40
2:C:192:THR:HG22	2:C:194:GLU:HG3	2.02	0.40
3:D:18:VAL:HG22	3:D:86:LEU:HD11	2.02	0.40
3:D:156:LEU:HD13	3:D:201:VAL:HG22	2.02	0.40
1:A:411:LEU:HD13	1:A:416:LEU:HD23	2.03	0.40
1:B:530:ILE:N	1:B:530:ILE:HD12	2.37	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	725/730 (99%)	680 (94%)	43 (6%)	2 (0%)	41 71
1	B	727/730 (100%)	683 (94%)	40 (6%)	4 (1%)	25 58
2	C	203/210 (97%)	177 (87%)	22 (11%)	4 (2%)	7 27
2	L	198/210 (94%)	173 (87%)	21 (11%)	4 (2%)	7 27
3	D	205/217 (94%)	179 (87%)	20 (10%)	6 (3%)	4 18
3	H	204/217 (94%)	186 (91%)	15 (7%)	3 (2%)	10 34
All	All	2262/2314 (98%)	2078 (92%)	161 (7%)	23 (1%)	15 45

All (23) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	300	ASP
1	B	300	ASP
3	D	152	GLU
3	D	162	SER
3	H	152	GLU
1	A	71	GLU
3	D	150	PHE
3	H	150	PHE
2	L	75	SER
1	B	198	ASP
1	B	393	GLN
2	C	82	ALA
1	B	287	ALA
2	C	137	ASN
2	C	76	ARG
2	L	137	ASN
2	C	99	GLY
2	L	98	GLY
3	D	102	VAL
2	L	99	GLY
3	D	151	PRO
3	D	187	VAL
3	H	102	VAL

### 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	648/651 (100%)	625 (96%)	23 (4%)	36	70
1	B	650/651 (100%)	628 (97%)	22 (3%)	37	71
2	C	183/185 (99%)	177 (97%)	6 (3%)	38	72
2	L	177/185 (96%)	174 (98%)	3 (2%)	60	86
3	D	184/189 (97%)	179 (97%)	5 (3%)	44	77
3	H	183/189 (97%)	176 (96%)	7 (4%)	33	67

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	2025/2050 (99%)	1959 (97%)	66 (3%)	38 72

All (66) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	39	ARG
1	A	52	ARG
1	A	86	ILE
1	A	158	GLU
1	A	217	ASN
1	A	244	LEU
1	A	270	ASN
1	A	312	GLN
1	A	319	ASN
1	A	383	CYS
1	A	416	LEU
1	A	462	LEU
1	A	483	LEU
1	A	489	GLN
1	A	514	LYS
1	A	515	LEU
1	A	543	LEU
1	A	544	LEU
1	A	628	TRP
1	A	698	GLN
1	A	702	LEU
1	A	703	LEU
1	A	711	ASN
1	B	39	ARG
1	B	109	ARG
1	B	127	THR
1	B	135	LEU
1	B	153	ILE
1	B	154	THR
1	B	221	LEU
1	B	244	LEU
1	B	312	GLN
1	B	411	LEU
1	B	424	LYS
1	B	430	ARG
1	B	446	LEU
1	B	474	ARG

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Mol	Chain	Res	Type
1	B	515	LEU
1	B	544	LEU
1	B	598	ARG
1	B	603	GLU
1	B	690	MET
1	B	702	LEU
1	B	703	LEU
1	B	711	ASN
2	C	18	LYS
2	C	76	ARG
2	C	89	GLN
2	C	125	THR
2	C	144	ASN
2	C	198	LYS
3	D	12	VAL
3	D	52	ILE
3	D	90	ASP
3	D	103	PHE
3	D	119	LYS
3	H	12	VAL
3	H	20	ILE
3	H	52	ILE
3	H	62	GLN
3	H	100	ARG
3	H	103	PHE
3	H	119	LYS
2	L	18	LYS
2	L	29	VAL
2	L	89	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	139	GLN
1	A	149	ASN
1	A	217	ASN
1	A	227	ASN
1	A	261	ASN
1	A	270	ASN
1	A	319	ASN
1	A	436	GLN
1	A	440	HIS

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Mol	Chain	Res	Type
1	A	442	ASN
1	A	456	GLN
1	A	484	HIS
1	A	489	GLN
1	A	711	ASN
1	B	124	HIS
1	B	261	ASN
1	B	341	GLN
1	B	440	HIS
1	B	711	ASN
2	C	6	GLN
2	C	36	GLN
3	H	62	GLN
3	H	84	ASN
2	L	136	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 [i](#)

2 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	715	A	801	-	27,30,30	0.79	0	32,45,45	1.33	4 (12%)
4	715	B	801	-	27,30,30	0.80	0	32,45,45	1.31	4 (12%)

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	715	A	801	-	-	2/18/27/27	0/2/3/3
4	715	B	801	-	-	0/18/27/27	0/2/3/3

There are no bond length outliers.

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	801	715	C1-C2-C3	-3.20	119.78	123.98
4	A	801	715	C1-C2-C3	-3.13	119.88	123.98
4	B	801	715	C4-C3-C2	2.91	119.96	116.58
4	A	801	715	C4-C3-C2	2.68	119.70	116.58
4	B	801	715	C26-N27-C39	2.62	130.69	125.38
4	A	801	715	C26-N27-C39	2.52	130.49	125.38
4	B	801	715	F43-C42-C39	-2.31	108.84	111.32
4	A	801	715	C28-C29-N19	-2.15	106.70	111.49

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	801	715	C15-C16-N19-C29
4	A	801	715	O22-C16-N19-C29

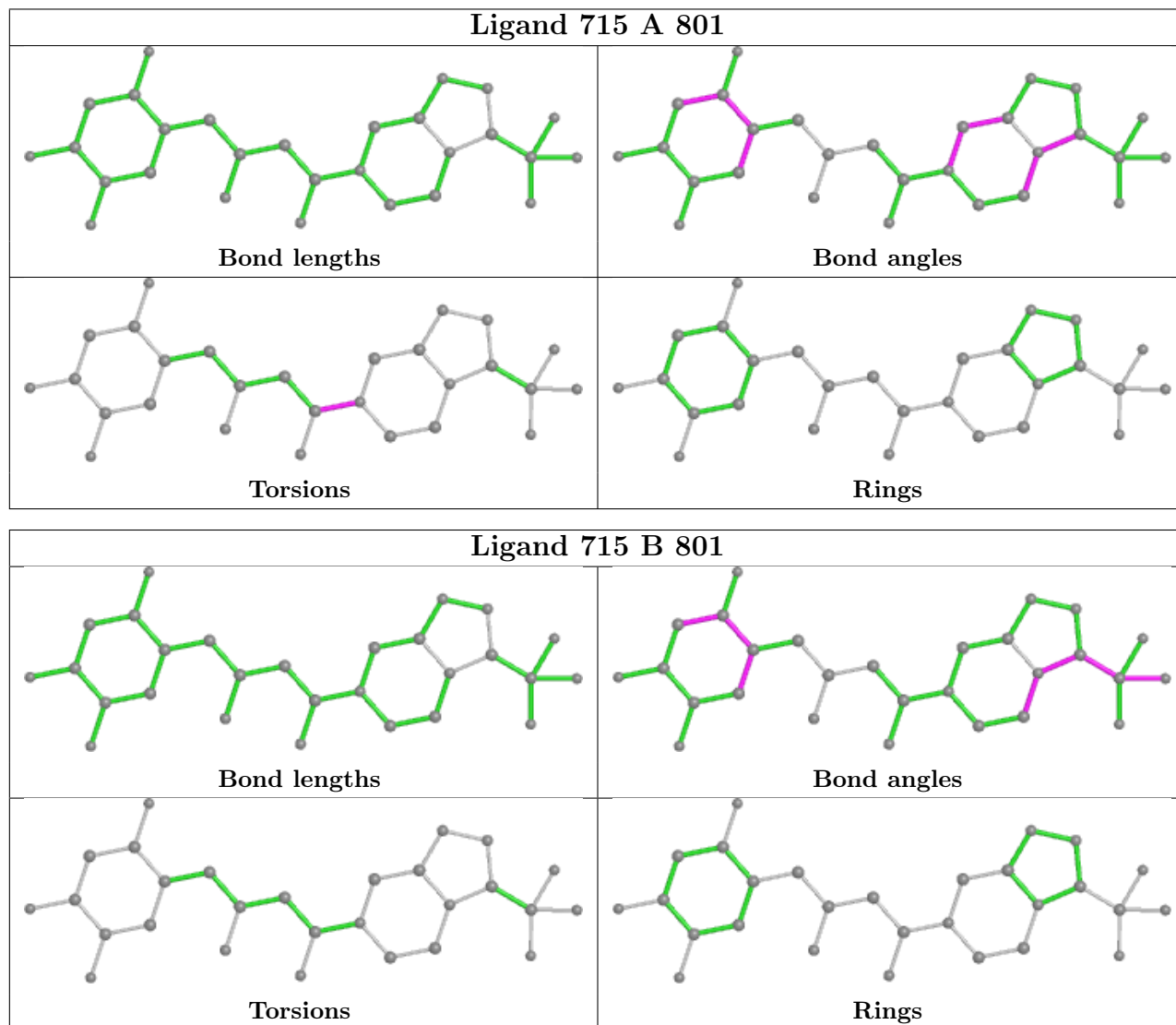
There are no ring outliers.

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	A	727/730 (99%)	0.31	8 (1%) 80 80	36, 73, 104, 123	0
1	B	729/730 (99%)	0.31	14 (1%) 66 65	34, 74, 104, 123	0
2	C	207/210 (98%)	2.07	89 (42%) 0 0	89, 145, 190, 196	0
2	L	202/210 (96%)	2.05	89 (44%) 0 0	86, 138, 192, 200	0
3	D	209/217 (96%)	1.52	67 (32%) 0 0	83, 126, 163, 168	0
3	H	208/217 (95%)	1.29	50 (24%) 0 0	79, 124, 158, 167	0
All	All	2282/2314 (98%)	0.83	317 (13%) 2 2	34, 89, 169, 200	0

All (317) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	D	181	LEU	10.5
2	L	110	ALA	10.3
3	D	101	ASP	10.1
2	C	140	PRO	9.8
2	L	196	THR	8.5
2	C	115	SER	8.4
2	C	114	VAL	8.0
2	L	191	TYR	7.9
3	H	161	GLY	7.9
2	C	195	ALA	7.8
2	L	183	ASP	7.5
2	C	11	LEU	7.5
2	C	79	ALA	7.4
2	L	146	LYS	7.4
2	C	188	HIS	7.3
3	D	146	VAL	7.2
2	L	174	MET	7.2
3	H	2	PHE	7.0
2	L	203	PRO	7.0

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
2	C	23	CYS	6.9
2	L	195	ALA	6.9
2	L	145	VAL	6.8
2	C	81	ASP	6.7
2	L	131	VAL	6.7
3	D	162	SER	6.6
3	D	163	LEU	6.4
2	C	110	ALA	6.4
2	L	133	CYS	6.4
3	H	150	PHE	6.3
2	L	116	ILE	6.2
2	L	147	TRP	6.0
2	C	149	ILE	6.0
2	C	177	THR	5.9
2	L	140	PRO	5.8
2	C	189	ASN	5.8
3	D	157	THR	5.7
2	C	139	TYR	5.7
3	H	163	LEU	5.7
2	C	62	SER	5.5
3	H	192	TRP	5.5
2	C	165	GLN	5.5
2	L	22	THR	5.5
3	D	131	VAL	5.4
3	D	213	LYS	5.4
2	C	164	ASP	5.3
3	H	140	VAL	5.3
3	D	151	PRO	5.2
2	C	133	CYS	5.2
2	C	196	THR	5.0
2	C	13	ALA	5.0
2	C	184	GLU	5.0
2	C	201	THR	5.0
2	L	114	VAL	4.9
3	D	196	THR	4.9
2	L	108	ALA	4.9
2	L	11	LEU	4.9
2	C	145	VAL	4.8
2	L	55	SER	4.8
2	L	192	THR	4.7
2	C	109	ASP	4.7
2	C	12	SER	4.7

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
2	L	142	ASP	4.7
3	D	150	PHE	4.6
3	H	126	TYR	4.6
2	L	139	TYR	4.6
2	L	189	ASN	4.5
2	L	23	CYS	4.5
2	C	72	LEU	4.5
2	C	192	THR	4.4
2	L	165	GLN	4.4
2	C	191	TYR	4.4
2	C	179	THR	4.4
3	H	181	LEU	4.4
2	C	132	VAL	4.3
3	H	151	PRO	4.3
2	C	144	ASN	4.3
2	L	141	LYS	4.3
3	H	165	SER	4.2
2	C	158	VAL	4.2
2	L	62	SER	4.2
3	H	101	ASP	4.1
2	L	130	SER	4.1
2	L	13	ALA	4.1
3	H	142	LEU	4.1
3	D	185	VAL	4.1
2	L	202	SER	4.1
2	C	113	THR	4.1
2	L	176	SER	4.0
2	L	132	VAL	4.0
2	L	149	ILE	4.0
2	L	111	ALA	4.0
2	C	103	LEU	3.9
3	H	148	GLY	3.9
2	C	197	HIS	3.8
3	D	29	PHE	3.8
3	H	164	SER	3.7
2	C	209	ASN	3.7
2	L	199	THR	3.7
3	D	161	GLY	3.7
3	H	185	VAL	3.7
2	C	46	TRP	3.7
2	L	186	GLU	3.6
2	L	177	THR	3.6

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
2	C	138	PHE	3.6
2	L	115	SER	3.6
3	D	100	ARG	3.6
2	C	198	LYS	3.6
3	D	105	ASP	3.5
3	H	127	PRO	3.5
3	H	193	PRO	3.5
2	C	82	ALA	3.5
2	L	198	LYS	3.5
2	L	103	LEU	3.5
2	C	190	SER	3.5
3	H	72	VAL	3.5
2	C	80	GLU	3.5
2	C	128	GLY	3.5
3	D	106	VAL	3.5
2	C	101	THR	3.5
3	D	1	GLU	3.5
2	C	159	LEU	3.4
2	C	111	ALA	3.4
2	L	182	LYS	3.4
3	D	174	LEU	3.4
3	D	182	SER	3.4
3	D	217	ARG	3.4
3	H	202	ALA	3.4
3	H	200	ASN	3.4
3	H	178	LEU	3.3
2	L	12	SER	3.3
2	L	200	SER	3.3
2	C	204	ILE	3.3
2	L	194	GLU	3.3
2	L	197	HIS	3.3
3	H	1	GLU	3.3
3	D	144	CYS	3.3
2	L	143	ILE	3.2
3	D	34	ILE	3.2
2	L	109	ASP	3.2
3	H	128	LEU	3.2
2	C	194	GLU	3.2
2	C	130	SER	3.2
3	D	184	SER	3.2
2	L	190	SER	3.2
3	H	184	SER	3.2

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
3	D	156	LEU	3.2
3	D	30	THR	3.2
3	H	201	VAL	3.2
2	C	163	THR	3.2
2	C	205	VAL	3.2
3	H	106	VAL	3.2
2	L	201	THR	3.2
3	D	145	LEU	3.2
2	C	78	GLU	3.2
2	L	78	GLU	3.2
3	D	215	VAL	3.1
3	D	179	TYR	3.1
3	D	200	ASN	3.1
3	H	146	VAL	3.1
2	L	135	LEU	3.1
3	H	157	THR	3.1
2	C	83	ALA	3.1
3	D	25	SER	3.0
3	D	194	SER	3.0
2	L	164	ASP	3.0
3	H	145	LEU	3.0
2	C	127	GLY	3.0
2	L	21	MET	3.0
3	H	215	VAL	3.0
2	L	119	PRO	3.0
3	D	209	LYS	3.0
3	H	152	GLU	3.0
2	C	22	THR	2.9
2	C	174	MET	2.9
2	L	162	TRP	2.9
2	C	16	GLY	2.9
2	C	193	CYS	2.9
3	H	174	LEU	2.9
1	A	601	THR	2.9
2	L	46	TRP	2.9
3	D	2	PHE	2.9
2	C	129	ALA	2.9
3	D	187	VAL	2.9
2	L	101	THR	2.9
3	D	36	TRP	2.9
3	H	130	PRO	2.9
3	D	183	SER	2.9

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
2	L	1	GLN	2.9
2	C	148	LYS	2.8
1	A	53	VAL	2.8
3	H	25	SER	2.8
3	H	96	CYS	2.8
2	C	48	HIS	2.8
2	L	179	THR	2.8
3	D	126	TYR	2.8
2	C	168	LYS	2.8
2	L	152	SER	2.8
3	D	130	PRO	2.8
3	H	162	SER	2.8
2	C	134	PHE	2.7
2	L	204	ILE	2.7
3	D	37	MET	2.7
2	L	86	PHE	2.7
2	C	49	GLY	2.7
2	L	128	GLY	2.6
2	C	104	GLU	2.6
2	L	56	GLY	2.6
2	L	40	SER	2.6
3	H	18	VAL	2.6
3	D	53	PRO	2.6
2	L	151	GLY	2.6
2	C	199	THR	2.6
2	C	208	PHE	2.6
3	D	72	VAL	2.6
2	C	162	TRP	2.6
2	C	143	ILE	2.6
2	L	81	ASP	2.6
2	C	116	ILE	2.6
2	C	131	VAL	2.6
2	L	7	SER	2.6
3	H	141	THR	2.5
1	B	417	TYR	2.5
1	A	87	PHE	2.5
2	L	185	TYR	2.5
3	H	149	TYR	2.5
3	D	11	LEU	2.5
3	D	192	TRP	2.5
2	L	20	THR	2.5
2	L	163	THR	2.5

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
3	H	196	THR	2.5
2	L	80	GLU	2.5
2	L	117	PHE	2.5
3	H	205	ALA	2.5
3	H	102	VAL	2.5
2	L	125	THR	2.5
3	D	168	HIS	2.5
3	H	179	TYR	2.5
2	L	113	THR	2.5
3	H	166	GLY	2.5
2	C	55	SER	2.5
1	B	467	LYS	2.5
3	D	142	LEU	2.5
2	C	207	SER	2.4
3	D	102	VAL	2.4
1	B	87	PHE	2.4
3	D	201	VAL	2.4
3	D	199	CYS	2.4
3	D	152	GLU	2.4
2	L	85	TYR	2.4
3	H	117	SER	2.4
2	C	61	PHE	2.4
3	H	29	PHE	2.4
3	H	122	ALA	2.4
2	L	205	VAL	2.4
3	D	211	ASP	2.4
3	D	167	VAL	2.4
3	D	180	THR	2.4
2	L	79	ALA	2.4
3	D	75	SER	2.4
3	D	4	LEU	2.4
1	B	426	MET	2.4
2	L	136	ASN	2.4
3	D	26	GLY	2.3
2	C	44	LYS	2.3
3	D	193	PRO	2.3
2	C	135	LEU	2.3
2	L	173	SER	2.3
2	C	15	PRO	2.3
1	B	370	TYR	2.3
3	H	143	GLY	2.3
2	L	134	PHE	2.3

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>	<b>RSRZ</b>
3	D	143	GLY	2.3
3	D	197	ILE	2.3
1	A	88	LEU	2.3
2	C	65	GLY	2.3
2	L	123	GLN	2.3
2	C	85	TYR	2.2
3	H	45	LEU	2.2
2	C	154	ARG	2.2
2	L	82	ALA	2.2
1	A	412	THR	2.2
2	C	125	THR	2.2
2	L	10	ILE	2.2
1	B	110	LEU	2.2
1	B	410	ALA	2.2
3	D	96	CYS	2.2
1	B	186	THR	2.2
3	D	155	THR	2.2
2	C	172	TYR	2.2
1	B	67	LEU	2.1
1	B	352	CYS	2.1
3	H	125	VAL	2.1
1	A	75	LEU	2.1
3	D	165	SER	2.1
1	A	269	VAL	2.1
1	B	468	TYR	2.1
2	C	54	ALA	2.1
2	C	108	ALA	2.1
3	D	202	ALA	2.1
2	C	147	TRP	2.1
2	L	124	LEU	2.1
2	C	38	LYS	2.1
2	L	106	ASP	2.1
3	D	31	ASP	2.1
2	L	129	ALA	2.1
3	D	205	ALA	2.1
1	B	304	VAL	2.1
2	L	127	GLY	2.0
1	A	61	VAL	2.0
2	C	203	PRO	2.0
1	B	599	LEU	2.0
2	L	193	CYS	2.0
1	B	515	LEU	2.0

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Mol	Chain	Res	Type	RSRZ
2	C	136	ASN	2.0
3	D	111	THR	2.0
2	C	182	LYS	2.0
3	D	147	LYS	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](#)

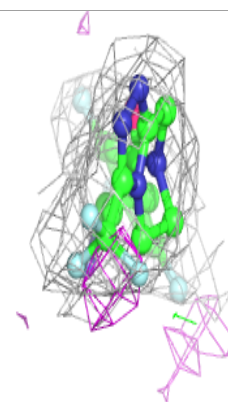
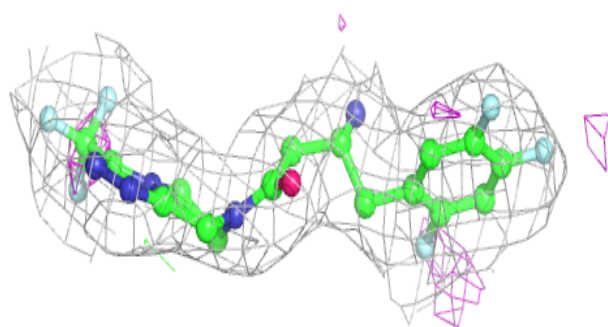
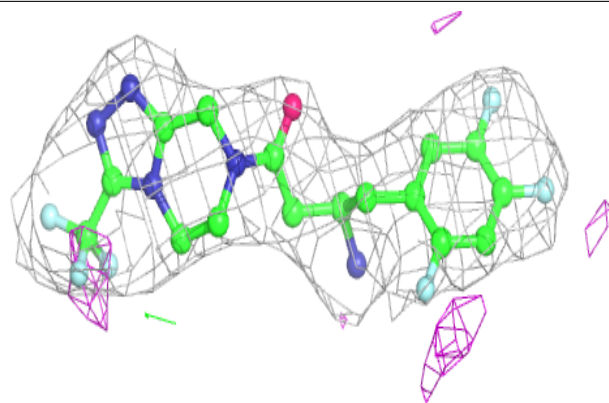
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
4	715	A	801	28/28	0.89	0.22	69,78,91,92	0
4	715	B	801	28/28	0.91	0.21	68,76,89,89	0

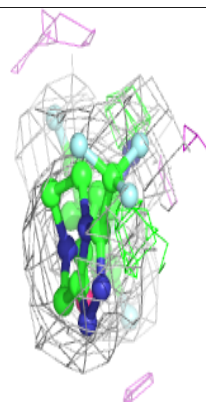
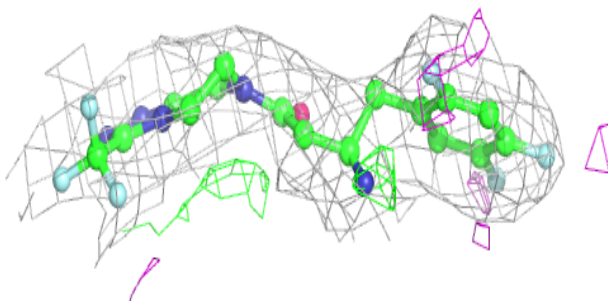
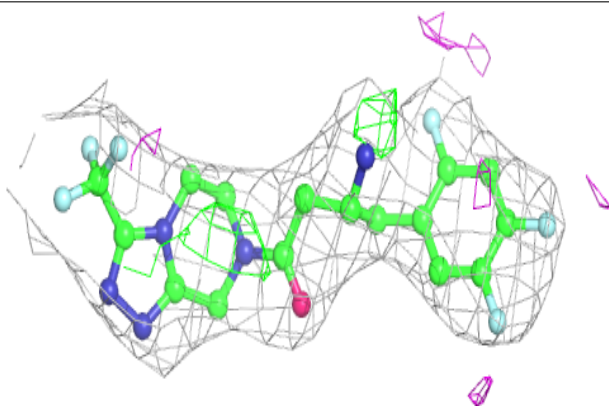
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

**Electron density around 715 A 801:**

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

**Electron density around 715 B 801:**

$2mF_o-DF_c$  (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.