Full wwPDB X-ray Structure Validation Report ⓘ

Sep 9, 2023 – 07:32 PM EDT

PDB ID	:	4IHL
Title	:	Human 14-3-3 isoform zeta in complex with a diphoyphorylated C-RAF peptide and Cotylenin A
Authors	:	Molzan, M.; Ottmann, C.
Deposited on	:	2012-12-19
Resolution	:	2.20 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:

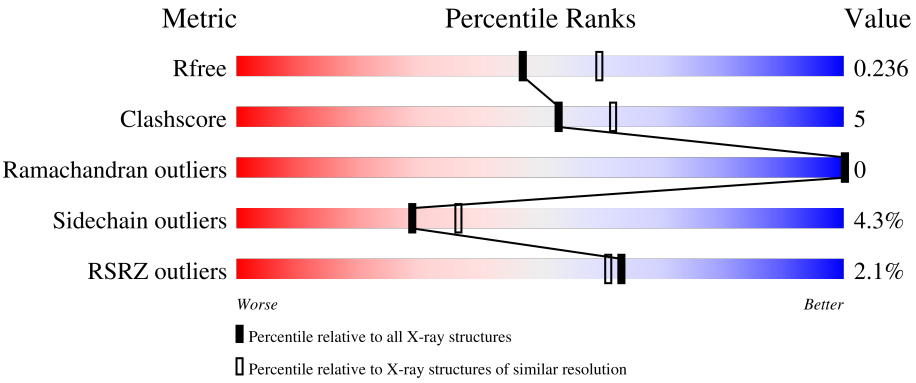
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.35.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.35.1

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 2.20 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	4898 (2.20-2.20)
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)
RSRZ outliers	127900	4800 (2.20-2.20)

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	235	2% 89% 8%
1	B	235	2% 85% 11%
2	P	36	3% 22% 19% 6% 53%

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 4287 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 14-3-3 protein zeta/delta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	230	Total	C	N	O	S	1	11	0
			1894	1191	313	380	10			
1	B	227	Total	C	N	O	S	0	10	0
			1862	1171	315	367	9			

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-4	GLY	-	expression tag	UNP P63104
A	-3	ALA	-	expression tag	UNP P63104
A	-2	MET	-	expression tag	UNP P63104
A	-1	GLY	-	expression tag	UNP P63104
A	0	SER	-	expression tag	UNP P63104
B	-4	GLY	-	expression tag	UNP P63104
B	-3	ALA	-	expression tag	UNP P63104
B	-2	MET	-	expression tag	UNP P63104
B	-1	GLY	-	expression tag	UNP P63104
B	0	SER	-	expression tag	UNP P63104

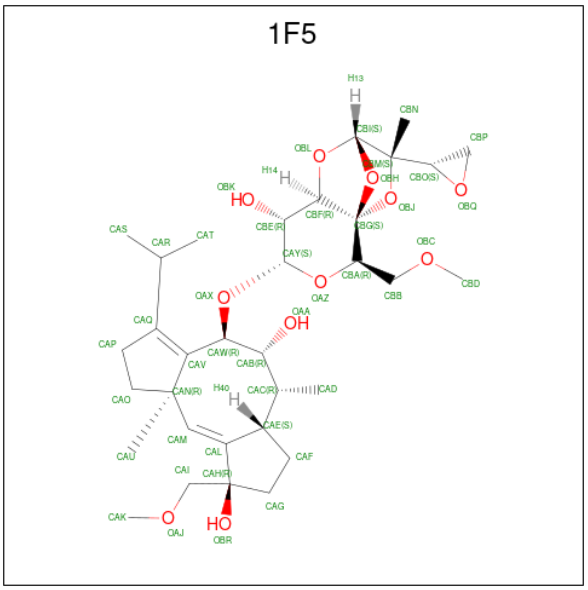
- Molecule 2 is a protein called RAF proto-oncogene serine/threonine-protein kinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	P	17	Total	C	N	O	P	0	2	0
			147	85	26	34	2			

- Molecule 3 is POTASSIUM ION (three-letter code: K) (formula: K).

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

- Molecule 4 is (1R,3aS,4R,5R,6R,9aR,10E)-6-({(1S,2R,4S,5R,6R,8S,9S)-5-hydroxy-2-(methoxymethyl)-9-methyl-9-[(2S)-oxiran-2-yl]-3,7,10,1 1-tetraoxatricyclo[6.2.1.0 1,6]undec-4-yl}oxy)-1-(methoxymethyl)-4,9a-dimethyl-7-(propan-2-yl)-1,2,3,3a,4,5,6,8,9,9a-de cahydrodicyclopenta[a,d][8]annulene-1,5-diol (three-letter code: 1F5) (formula: $C_{33}H_{50}O_{11}$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C O 44 33 11	0	0
4	B	1	Total C O 44 33 11	0	0

- Molecule 5 is water.

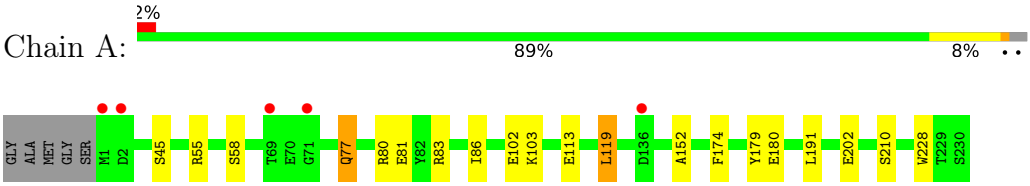
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	157	Total O 157 157	0	0
5	B	118	Total O 118 118	0	0
5	P	19	Total O 19 19	0	0

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.

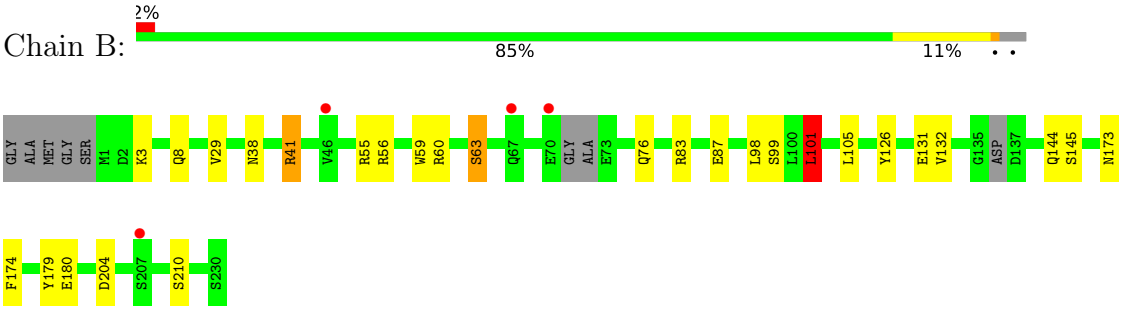
• Molecule 1: 14-3-3 protein zeta/delta

Chain A:



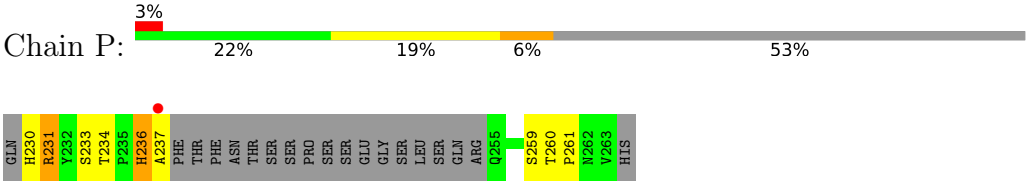
• Molecule 1: 14-3-3 protein zeta/delta

Chain B:



• Molecule 2: RAF proto-oncogene serine/threonine-protein kinase

Chain P:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	72.28Å 103.40Å 112.58Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.40 – 2.20 49.44 – 2.20	Depositor EDS
% Data completeness (in resolution range)	98.3 (49.40-2.20) 98.4 (49.44-2.20)	Depositor EDS
R_{merge}	0.04	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	4.19 (at 2.20Å)	Xtriage
Refinement program	REFMAC	Depositor
R, R_{free}	0.200 , 0.243 0.196 , 0.236	Depositor DCC
R_{free} test set	2142 reflections (5.00%)	wwPDB-VP
Wilson B-factor (Å^2)	46.3	Xtriage
Anisotropy	0.093	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 45.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	4287	wwPDB-VP
Average B, all atoms (Å^2)	50.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.77% 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: 1F5, K, SEP

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	0.84	1/1949 (0.1%)	0.72	0/2621
1	B	0.75	0/1915	0.76	1/2574 (0.0%)
2	P	0.61	0/134	0.85	0/182
All	All	0.79	1/3998 (0.0%)	0.74	1/5377 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	113	GLU	CD-OE2	-16.47	1.07	1.25

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	101	LEU	CA-CB-CG	5.07	126.96	115.30

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	1894	0	1877	10	0
1	B	1862	0	1854	27	0
2	P	147	0	127	8	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	A	44	0	50	0	0
4	B	44	0	50	0	0
5	A	157	0	0	2	0
5	B	118	0	0	1	0
5	P	19	0	0	2	0
All	All	4287	0	3958	43	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 5.

All (43) 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:38:ASN:ND2	1:B:41[C]:ARG:HH12	1.28	1.29
1:B:38:ASN:HD22	1:B:41[C]:ARG:NH1	1.31	1.25
1:B:38:ASN:ND2	1:B:41[C]:ARG:NH1	1.85	1.22
1:B:60[B]:ARG:NH1	1:B:131[B]:GLU:OE2	1.83	1.10
1:B:60[B]:ARG:NH1	1:B:131[B]:GLU:CD	2.22	0.92
1:B:56:ARG:O	1:B:60[B]:ARG:HD3	1.68	0.91
1:B:38:ASN:HD21	1:B:41[C]:ARG:HH12	1.21	0.86
1:B:59:TRP:HE3	1:B:60[B]:ARG:HD2	1.43	0.82
1:A:102:GLU:HG2	5:A:492:HOH:O	1.85	0.76
1:B:210:SER:HA	5:B:424:HOH:O	1.90	0.70
1:B:126:TYR:CZ	1:B:144:GLN:HG2	2.26	0.70
1:B:60[B]:ARG:HH12	1:B:131[B]:GLU:CD	1.90	0.66
1:B:60[B]:ARG:HH11	1:B:131[B]:GLU:CD	2.00	0.65
2:P:236:HIS:O	2:P:237:ALA:HB2	1.97	0.65
1:B:83:ARG:HG2	1:B:83:ARG:HH11	1.63	0.63
1:B:180[A]:GLU:OE2	2:P:231:ARG:HD2	1.98	0.62
1:A:180:GLU:HG3	5:P:317:HOH:O	1.99	0.62
2:P:231:ARG:O	2:P:231:ARG:NE	2.29	0.62
1:B:59:TRP:CE3	1:B:60[B]:ARG:HD2	2.30	0.60
1:A:119:LEU:HB3	1:A:152:ALA:HB2	1.84	0.59
1:B:126:TYR:CE2	1:B:144:GLN:HG2	2.39	0.58
1:B:87:GLU:HG2	1:B:132:VAL:HG13	1.86	0.57
2:P:236:HIS:O	2:P:237:ALA:CB	2.51	0.57
1:A:210:SER:HA	5:A:530:HOH:O	2.04	0.57
1:A:77:GLN:O	1:A:81:GLU:HG3	2.11	0.51
1:B:101:LEU:HD13	1:B:105:LEU:HD12	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:55:ARG:N	1:A:55:ARG:HD2	2.28	0.48
2:P:260[B]:THR:HG22	2:P:261:PRO:HD2	1.95	0.47
1:A:80[A]:ARG:HG3	1:A:83:ARG:NH2	2.30	0.46
1:B:59:TRP:O	1:B:63:SER:HB3	2.16	0.46
1:B:87:GLU:HG2	1:B:132:VAL:CG1	2.47	0.44
1:B:3:LYS:HG3	1:B:29:VAL:HG13	2.01	0.43
2:P:260[B]:THR:CG2	2:P:261:PRO:HD2	2.50	0.42
1:B:98:LEU:HD22	1:B:126:TYR:CE2	2.54	0.42
1:A:58:SER:HB3	1:A:86:ILE:HD13	2.02	0.41
1:B:173:ASN:OD1	2:P:234[A]:THR:HG23	2.20	0.41
1:A:179:TYR:CE1	1:A:228:TRP:CD1	3.08	0.41
1:B:179:TYR:HD2	1:B:180[B]:GLU:HG2	1.86	0.41
2:P:234[B]:THR:HG23	5:P:313:HOH:O	2.20	0.40
1:B:55:ARG:HD2	1:B:55:ARG:N	2.36	0.40
1:A:80[A]:ARG:HG3	1:A:83:ARG:HH21	1.87	0.40
1:B:126:TYR:CB	1:B:145:SER:HB2	2.52	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	239/235 (102%)	236 (99%)	3 (1%)	0	100	100
1	B	231/235 (98%)	228 (99%)	3 (1%)	0	100	100
2	P	13/36 (36%)	13 (100%)	0	0	100	100
All	All	483/506 (96%)	477 (99%)	6 (1%)	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	A	204/202 (101%)	197 (97%)	7 (3%)	37 47
1	B	201/202 (100%)	193 (96%)	8 (4%)	31 40
2	P	15/32 (47%)	12 (80%)	3 (20%)	1 1
All	All	420/436 (96%)	402 (96%)	18 (4%)	29 36

All (18) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	45	SER
1	A	77	GLN
1	A	103	LYS
1	A	119	LEU
1	A	174	PHE
1	A	191	LEU
1	A	202	GLU
1	B	41[B]	ARG
1	B	41[C]	ARG
1	B	63	SER
1	B	76	GLN
1	B	99	SER
1	B	101	LEU
1	B	174	PHE
1	B	204	ASP
2	P	230	HIS
2	P	231	ARG
2	P	236	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	50	ASN
1	A	77	GLN
1	A	147	GLN

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Mol	Chain	Res	Type
1	B	38	ASN
1	B	77	GLN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

2 non-standard protein/DNA/RNA residues are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
2	SEP	P	233	2	8,9,10	1.40	1 (12%)	8,12,14	1.86	2 (25%)
2	SEP	P	259	2	8,9,10	1.77	1 (12%)	8,12,14	0.92	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	SEP	P	233	2	-	0/5/8/10	-
2	SEP	P	259	2	-	0/5/8/10	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	P	259	SEP	P-O1P	4.21	1.64	1.50
2	P	233	SEP	P-O1P	2.59	1.58	1.50

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	P	233	SEP	OG-P-O1P	3.72	116.92	106.47
2	P	233	SEP	P-OG-CB	-3.24	109.37	118.30

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 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	1F5	B	302	-	47,50,50	2.59	13 (27%)	46,82,82	2.24	15 (32%)
4	1F5	A	302	-	47,50,50	2.41	15 (31%)	46,82,82	1.93	12 (26%)

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	1F5	B	302	-	-	2/15/121/121	0/8/7/7
4	1F5	A	302	-	-	1/15/121/121	0/8/7/7

All (28) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	302	1F5	CAE-CAC	10.08	1.63	1.56
4	B	302	1F5	CAH-CAL	-7.36	1.45	1.54
4	A	302	1F5	CAH-CAL	-6.80	1.45	1.54
4	A	302	1F5	CAM-CAL	5.98	1.38	1.33
4	B	302	1F5	CAE-CAL	-5.41	1.43	1.52
4	A	302	1F5	CAP-CAQ	-5.19	1.42	1.51
4	A	302	1F5	CAW-CAV	-4.52	1.44	1.50
4	A	302	1F5	CAE-CAC	4.47	1.59	1.56
4	B	302	1F5	CAP-CAQ	-4.47	1.43	1.51
4	B	302	1F5	CAW-CAV	-4.08	1.44	1.50
4	A	302	1F5	CAR-CAQ	3.93	1.56	1.51
4	B	302	1F5	OBL-CBI	3.91	1.48	1.41
4	A	302	1F5	CAE-CAL	-3.60	1.46	1.52
4	A	302	1F5	OBJ-CBG	3.52	1.48	1.42
4	A	302	1F5	CBP-CBO	3.52	1.51	1.45
4	B	302	1F5	OAZ-CBA	3.32	1.48	1.44
4	A	302	1F5	CAO-CAN	-3.28	1.50	1.55
4	B	302	1F5	CAR-CAQ	3.19	1.55	1.51
4	A	302	1F5	OBL-CBF	2.90	1.47	1.44
4	B	302	1F5	CBP-CBO	2.81	1.50	1.45
4	A	302	1F5	OBL-CBI	2.58	1.46	1.41
4	B	302	1F5	CAM-CAL	2.54	1.35	1.33
4	A	302	1F5	OBH-CBI	2.42	1.45	1.41
4	B	302	1F5	OBL-CBF	2.20	1.46	1.44
4	A	302	1F5	OAX-CAY	2.19	1.47	1.41
4	A	302	1F5	CBG-CBF	-2.19	1.51	1.54
4	B	302	1F5	OAX-CAY	2.05	1.47	1.41
4	B	302	1F5	CAQ-CAV	2.04	1.36	1.33

All (27) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	302	1F5	OBH-CBI-CBM	-6.46	100.36	104.41
4	A	302	1F5	CAG-CAH-CAL	5.82	109.35	103.65
4	B	302	1F5	CAG-CAH-CAL	4.78	108.33	103.65
4	B	302	1F5	CAE-CAC-CAB	-4.59	107.55	112.39
4	A	302	1F5	CAF-CAE-CAL	4.56	109.25	103.02
4	B	302	1F5	CAR-CAQ-CAV	-4.26	123.99	129.59
4	A	302	1F5	OBJ-CBM-CBO	3.95	113.69	105.53
4	B	302	1F5	OBJ-CBM-CBO	3.88	113.56	105.53
4	B	302	1F5	CBP-OBQ-CBO	3.80	63.15	60.68
4	A	302	1F5	OBL-CBI-OBH	-3.57	101.46	105.85
4	B	302	1F5	CAP-CAQ-CAV	3.40	113.95	110.63

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	302	1F5	CBG-CBF-CBE	-3.39	110.11	114.33
4	A	302	1F5	CBP-OBQ-CBO	3.32	62.84	60.68
4	B	302	1F5	OBL-CBI-OBH	-3.19	101.92	105.85
4	B	302	1F5	OBL-CBF-CBG	-3.07	99.37	103.70
4	A	302	1F5	CAH-CAL-CAE	-2.79	106.80	108.97
4	A	302	1F5	CBG-CBF-CBE	-2.71	110.95	114.33
4	A	302	1F5	CAF-CAE-CAC	-2.50	105.08	110.81
4	A	302	1F5	OBK-CBE-CBF	-2.48	103.76	109.51
4	B	302	1F5	CAF-CAG-CAH	-2.44	101.38	104.03
4	A	302	1F5	CAE-CAC-CAB	-2.39	109.87	112.39
4	B	302	1F5	CAF-CAE-CAL	2.35	106.23	103.02
4	B	302	1F5	OBJ-CBG-OBH	-2.25	102.55	105.43
4	A	302	1F5	OBH-CBI-CBM	-2.25	103.00	104.41
4	B	302	1F5	OBQ-CBP-CBO	-2.09	57.84	59.78
4	B	302	1F5	CAK-OAJ-CAI	-2.07	107.59	112.16
4	A	302	1F5	CBN-CBM-CBO	-2.01	108.79	112.36

There are no chirality outliers.

All (3) torsion outliers are listed below:

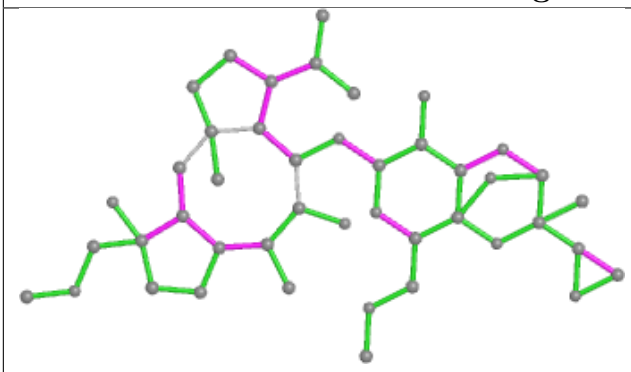
Mol	Chain	Res	Type	Atoms
4	B	302	1F5	OAZ-CBA-CBB-OBC
4	A	302	1F5	OAZ-CBA-CBB-OBC
4	B	302	1F5	CBG-CBA-CBB-OBC

There are no ring outliers.

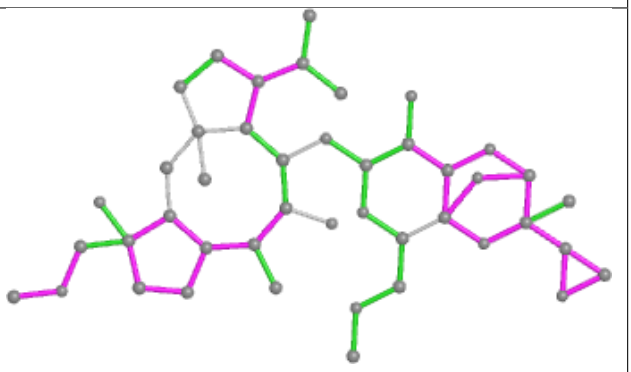
No monomer is involved in short contacts.

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 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.

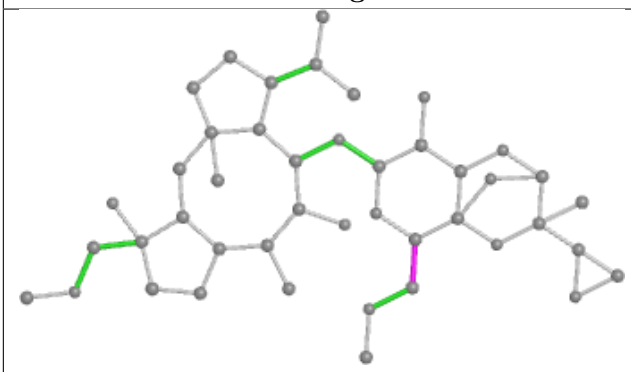
Ligand 1F5 B 302



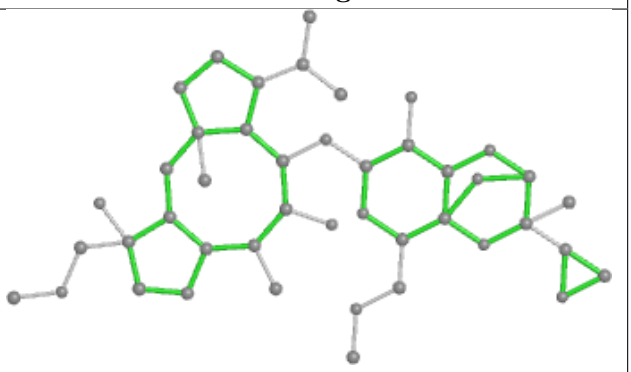
Bond lengths



Bond angles

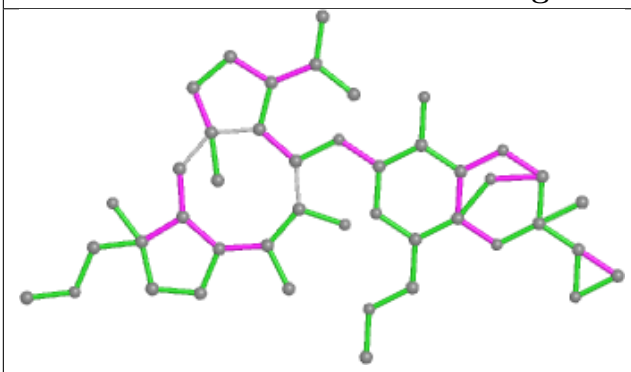


Torsions

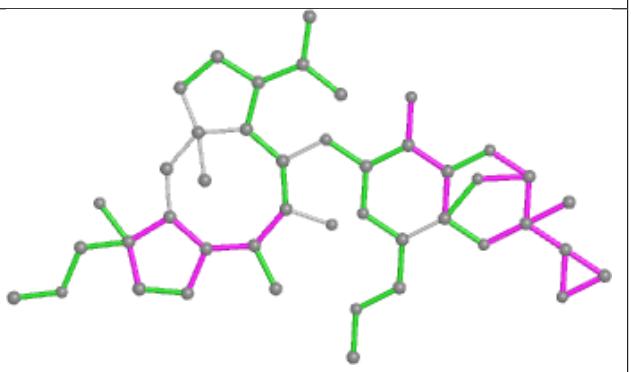


Rings

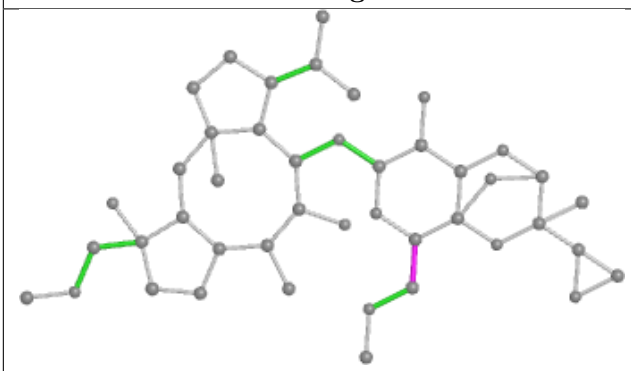
Ligand 1F5 A 302



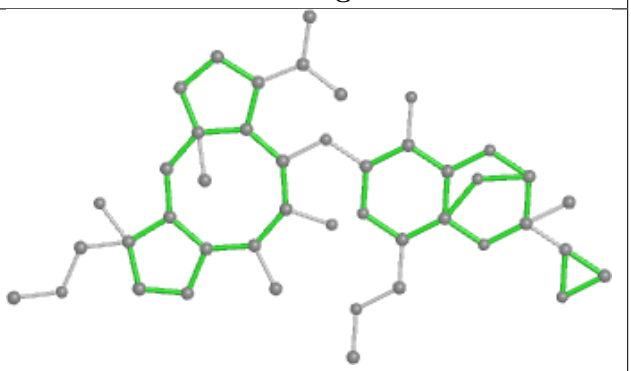
Bond lengths



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	230/235 (97%)	-0.06	5 (2%)	62	59	31, 44, 73, 105	2 (0%)
1	B	227/235 (96%)	-0.03	4 (1%)	68	66	30, 47, 79, 103	0
2	P	15/36 (41%)	0.43	1 (6%)	17	16	39, 68, 99, 99	1 (6%)
All	All	472/506 (93%)	-0.03	10 (2%)	63	61	30, 46, 81, 105	3 (0%)

All (10) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	70	GLU	3.3
1	A	71	GLY	3.1
1	A	2	ASP	2.9
1	B	67	GLN	2.7
1	A	136	ASP	2.6
1	B	207	SER	2.5
1	A	1	MET	2.2
1	A	69	THR	2.2
2	P	237	ALA	2.2
1	B	46	VAL	2.1

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

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	SEP	P	259	10/11	0.98	0.12	31,37,40,42	0
2	SEP	P	233	10/11	0.99	0.12	34,40,45,48	0

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

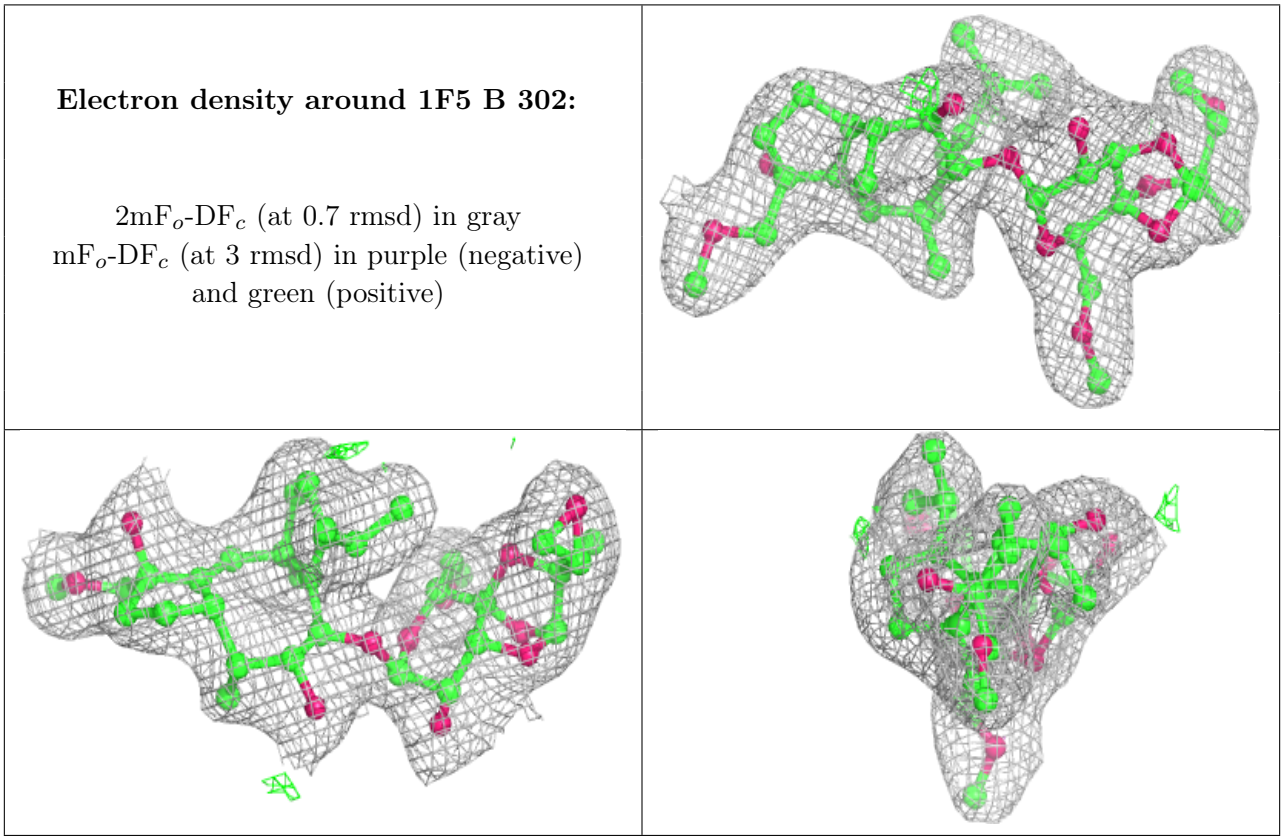
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' 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
3	K	A	301	1/1	0.84	0.20	76,76,76,76	0
3	K	B	301	1/1	0.94	0.23	69,69,69,69	0
4	1F5	B	302	44/44	0.95	0.13	28,40,55,64	0
4	1F5	A	302	44/44	0.97	0.10	32,39,49,62	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.

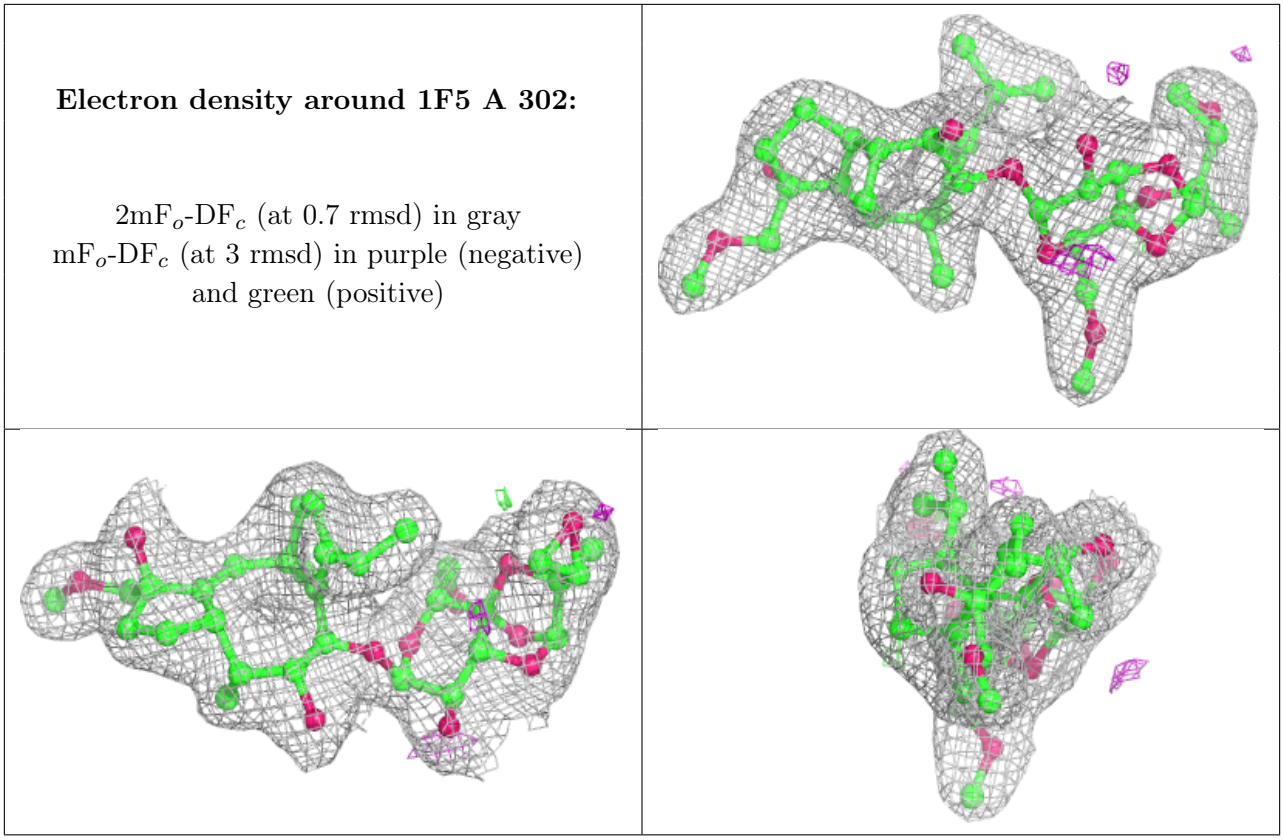
Electron density around 1F5 B 302:

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



Electron density around 1F5 A 302:

$2mF_o$-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.