Full wwPDB X-ray Structure Validation Report ⓘ

Oct 27, 2024 – 06:26 PM EDT

PDB ID	:	9B9T
Title	:	Crystal structure of the ternary complex of DCAF1 and WDR5 with PROTAC, OICR-40407
Authors	:	Mabanglo, M.F.; Wilson, B.J.; Krausser, C.; Hoffer, L.; Al-awar, R.; Vedadi, M.
Deposited on	:	2024-04-03
Resolution	:	2.05 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:

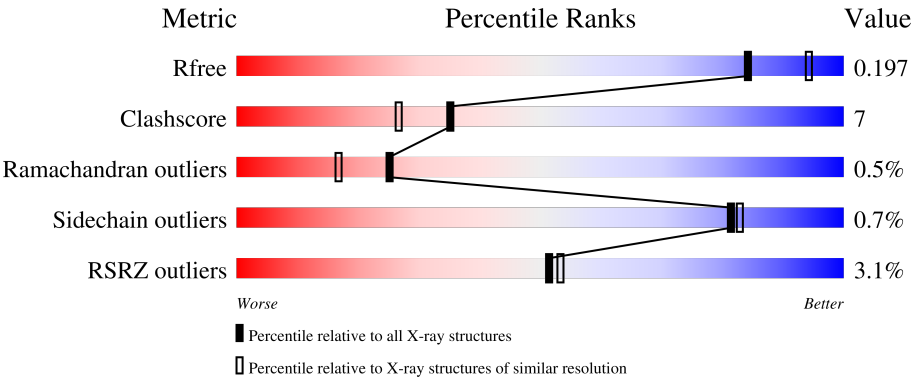
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 2.05 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}	164625	2096 (2.04-2.04)
Clashscore	180529	2229 (2.04-2.04)
Ramachandran outliers	177936	2217 (2.04-2.04)
Sidechain outliers	177891	2217 (2.04-2.04)
RSRZ outliers	164620	2096 (2.04-2.04)

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	329	2% 76% 16% • 7%
2	B	338	4% 76% 12% • 10%

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 5418 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 WD repeat-containing protein 5.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	305	Total	C	N	O	S	0	1	0
			2369	1513	394	452	10			

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	6	MET	-	initiating methionine	UNP P61964
A	7	HIS	-	expression tag	UNP P61964
A	8	HIS	-	expression tag	UNP P61964
A	9	HIS	-	expression tag	UNP P61964
A	10	HIS	-	expression tag	UNP P61964
A	11	HIS	-	expression tag	UNP P61964
A	12	HIS	-	expression tag	UNP P61964
A	13	SER	-	expression tag	UNP P61964
A	14	SER	-	expression tag	UNP P61964
A	15	GLY	-	expression tag	UNP P61964
A	16	ARG	-	expression tag	UNP P61964
A	17	GLU	-	expression tag	UNP P61964
A	18	ASN	-	expression tag	UNP P61964
A	19	LEU	-	expression tag	UNP P61964
A	20	TYR	-	expression tag	UNP P61964
A	21	PHE	-	expression tag	UNP P61964
A	22	GLN	-	expression tag	UNP P61964
A	23	GLY	-	expression tag	UNP P61964

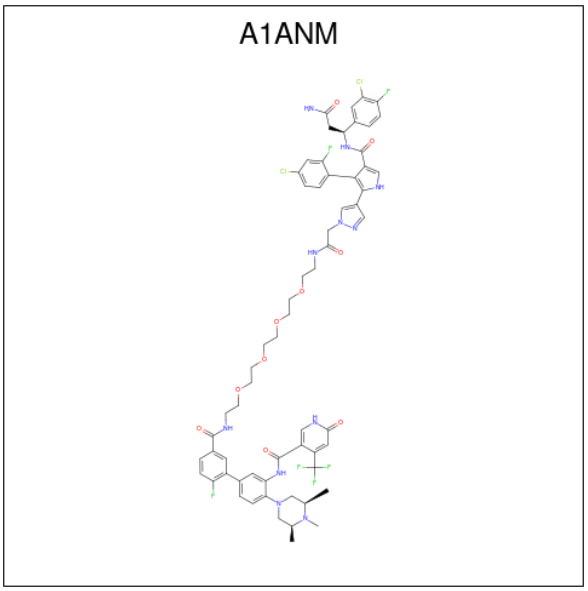
- Molecule 2 is a protein called DDB1- and CUL4-associated factor 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	303	Total	C	N	O	S	0	1	0
			2418	1528	413	459	18			

There are 27 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	1053	MET	-	initiating methionine	UNP Q9Y4B6
B	1054	GLY	-	expression tag	UNP Q9Y4B6
B	1055	SER	-	expression tag	UNP Q9Y4B6
B	1056	SER	-	expression tag	UNP Q9Y4B6
B	1057	HIS	-	expression tag	UNP Q9Y4B6
B	1058	HIS	-	expression tag	UNP Q9Y4B6
B	1059	HIS	-	expression tag	UNP Q9Y4B6
B	1060	HIS	-	expression tag	UNP Q9Y4B6
B	1061	HIS	-	expression tag	UNP Q9Y4B6
B	1062	HIS	-	expression tag	UNP Q9Y4B6
B	1063	SER	-	expression tag	UNP Q9Y4B6
B	1064	SER	-	expression tag	UNP Q9Y4B6
B	1065	GLY	-	expression tag	UNP Q9Y4B6
B	1066	ARG	-	expression tag	UNP Q9Y4B6
B	1067	GLU	-	expression tag	UNP Q9Y4B6
B	1068	ASN	-	expression tag	UNP Q9Y4B6
B	1069	LEU	-	expression tag	UNP Q9Y4B6
B	1070	TYR	-	expression tag	UNP Q9Y4B6
B	1071	PHE	-	expression tag	UNP Q9Y4B6
B	1072	GLN	-	expression tag	UNP Q9Y4B6
B	1073	GLY	-	expression tag	UNP Q9Y4B6
B	1074	SER	-	expression tag	UNP Q9Y4B6
B	1075	SER	-	expression tag	UNP Q9Y4B6
B	1076	ARG	-	expression tag	UNP Q9Y4B6
B	1077	ALA	-	expression tag	UNP Q9Y4B6
B	1078	SER	-	expression tag	UNP Q9Y4B6
B	1079	ALA	-	expression tag	UNP Q9Y4B6

- Molecule 3 is N-{(1P)-5'-[(17-{(4P)-4-[(2P)-4-{[(1R)-3-amino-1-(3-chloro-4-fluorophenyl)-3-oxopropyl]carbamoyl}-3-(4-chloro-2-fluorophenyl)-1H-pyrrol-2-yl]-1H-pyrazol-1-yl}-16-oxo-3,6,9,12-tetraoxa-15-azaheptadecan-1-yl)carbamoyl]-2'-fluoro-4-[(3R,5S)-3,4,5-trimethylpiperazin-1-yl][1,1'-biphenyl]-3-yl}-6-oxo-4-(trifluoromethyl)-1,6-dihydropyridine-3-carboxamide (three-letter code: A1ANM) (formula: $C_{62}H_{65}Cl_2F_6N_{11}O_{10}$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
3	A	1	Total	C	Cl	F	N	O	0	0
			91	62	2	6	11	10		

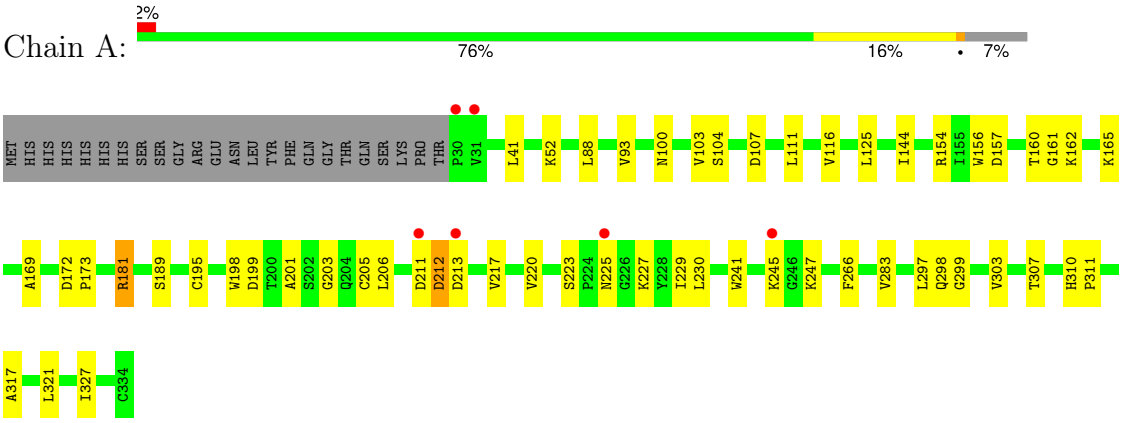
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	252	Total	O	0	0
			252	252		
4	B	288	Total	O	0	0
			288	288		

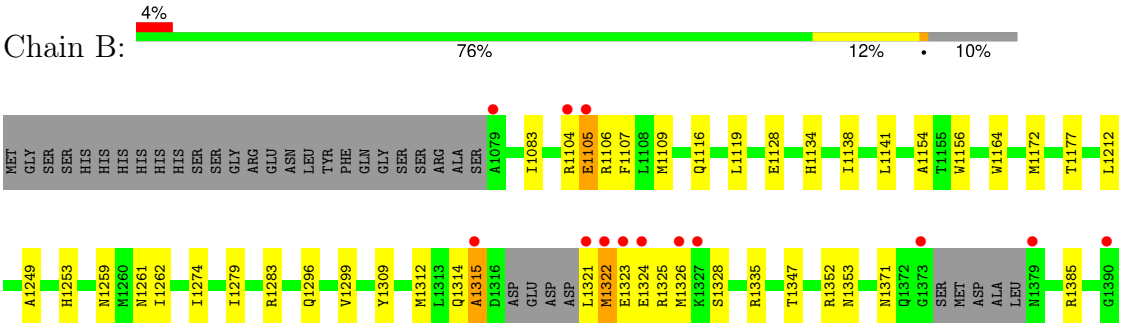
3 Residue-property plots (i)

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: WD repeat-containing protein 5



• Molecule 2: DDB1- and CUL4-associated factor 1



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	79.86Å 83.71Å 130.13Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	43.21 – 2.05 43.21 – 2.05	Depositor EDS
% Data completeness (in resolution range)	99.1 (43.21-2.05) 99.3 (43.21-2.05)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.20 (at 2.05Å)	Xtriage
Refinement program	PHENIX 1.21_5207	Depositor
R, R_{free}	0.186 , 0.196 0.186 , 0.197	Depositor DCC
R_{free} test set	2657 reflections (4.82%)	wwPDB-VP
Wilson B-factor (Å^2)	31.1	Xtriage
Anisotropy	0.088	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.36 , 36.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.48$, $< L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.020 for k,h,-l	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	5418	wwPDB-VP
Average B, all atoms (Å^2)	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.80% 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: A1ANM

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	0.45	0/2429	0.60	0/3294
2	B	0.43	0/2475	0.72	3/3350 (0.1%)
All	All	0.44	0/4904	0.66	3/6644 (0.0%)

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	A	0	1
2	B	0	2
All	All	0	3

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	1105	GLU	N-CA-C	15.61	153.14	111.00
2	B	1106	ARG	N-CA-CB	-8.71	94.92	110.60
2	B	1105	GLU	CB-CA-C	-7.35	95.70	110.40

There are no chirality outliers.

All (3) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	181	ARG	Sidechain
2	B	1104	ARG	Sidechain
2	B	1283	ARG	Sidechain

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	2369	0	2358	39	0
2	B	2418	0	2327	33	0
3	A	91	0	0	1	0
4	A	252	0	0	2	0
4	B	288	0	0	5	0
All	All	5418	0	4685	70	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 7.

All (70) 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:B:1259:ASN:HD21	2:B:1262:ILE:H	1.13	0.91
1:A:199:ASP:HB2	1:A:206:LEU:HD11	1.63	0.80
2:B:1324:GLU:O	4:B:1401:HOH:O	2.05	0.71
1:A:100:ASN:O	1:A:116:VAL:HG12	1.89	0.71
2:B:1259:ASN:HD22	2:B:1296:GLN:HE22	1.36	0.71
1:A:229:ILE:HG13	1:A:241:TRP:HB2	1.71	0.71
2:B:1352:ARG:NH2	2:B:1385:ARG:HD2	2.06	0.71
1:A:310:HIS:CG	1:A:311:PRO:HD2	2.36	0.61
2:B:1352:ARG:HH21	2:B:1385:ARG:HD2	1.65	0.61
1:A:103:VAL:HG21	1:A:144:ILE:HD13	1.83	0.61
2:B:1352:ARG:HB3	2:B:1371:ASN:O	2.01	0.60
2:B:1156:TRP:HB3	2:B:1322:MET:SD	2.43	0.58
1:A:125:LEU:HB3	1:A:156:TRP:CE3	2.40	0.56
1:A:154:ARG:HD3	1:A:156:TRP:CZ2	2.40	0.56
1:A:160:THR:HB	1:A:162:LYS:HE2	1.87	0.56
2:B:1259:ASN:ND2	2:B:1261:ASN:H	2.04	0.56
2:B:1259:ASN:ND2	2:B:1296:GLN:HE22	2.04	0.55
2:B:1321:LEU:O	2:B:1323:GLU:N	2.40	0.55
2:B:1253:HIS:HE1	4:B:1623:HOH:O	1.91	0.54
4:A:1706:HOH:O	2:B:1326:MET:HE2	2.06	0.54
2:B:1109:MET:HG2	2:B:1119:LEU:HD21	1.89	0.53
1:A:107:ASP:OD2	3:A:1401:A1ANM:N86	2.42	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:41:LEU:HB2	1:A:327:ILE:HB	1.90	0.52
1:A:157:ASP:HB3	1:A:160:THR:OG1	2.10	0.52
2:B:1315:ALA:HB2	4:B:1446:HOH:O	2.10	0.52
1:A:223:SER:HA	1:A:266:PHE:CE1	2.45	0.51
4:A:1688:HOH:O	2:B:1322:MET:HG3	2.11	0.51
1:A:225:ASN:ND2	1:A:227:LYS:HD2	2.26	0.51
2:B:1314:GLN:O	2:B:1315:ALA:HB3	2.12	0.49
1:A:212:ASP:O	1:A:213:ASP:OD1	2.31	0.49
2:B:1322:MET:O	4:B:1401:HOH:O	2.20	0.49
2:B:1134:HIS:CG	2:B:1154:ALA:HB2	2.48	0.48
1:A:283:VAL:HB	1:A:297:LEU:HB2	1.96	0.47
2:B:1141:LEU:HD12	2:B:1141:LEU:C	2.34	0.47
1:A:103:VAL:CG2	1:A:144:ILE:HD13	2.45	0.47
2:B:1312:MET:HE2	4:B:1584:HOH:O	2.14	0.46
2:B:1352:ARG:NH2	2:B:1385:ARG:CD	2.77	0.46
2:B:1109:MET:HG2	2:B:1119:LEU:CD2	2.45	0.46
1:A:125:LEU:HD13	1:A:156:TRP:CG	2.51	0.46
2:B:1335:ARG:HG2	2:B:1347:THR:HG23	1.97	0.45
1:A:169:ALA:HA	1:A:198:TRP:CH2	2.51	0.45
2:B:1107:PHE:CE1	2:B:1128:GLU:HG3	2.52	0.45
1:A:88:LEU:HB3	2:B:1321:LEU:HD22	1.99	0.45
2:B:1164:TRP:CZ3	2:B:1172:MET:HB2	2.51	0.45
1:A:157:ASP:O	1:A:161:GLY:N	2.45	0.44
1:A:211:ASP:HB3	1:A:241:TRP:CZ2	2.53	0.44
1:A:303:VAL:HB	1:A:321:LEU:HD12	1.99	0.44
2:B:1274:ILE:HG12	2:B:1279:ILE:HD12	2.01	0.43
1:A:160:THR:HB	1:A:162:LYS:CE	2.48	0.43
1:A:165:LYS:HE3	1:A:203:GLY:HA3	2.00	0.43
2:B:1299:VAL:HA	2:B:1309:TYR:O	2.18	0.43
1:A:189:SER:HB2	1:A:217:VAL:HG12	2.01	0.43
1:A:107:ASP:HB3	2:B:1321:LEU:HD11	2.01	0.43
2:B:1212:LEU:HD21	2:B:1249:ALA:HB2	2.00	0.43
1:A:198:TRP:CZ3	1:A:205:CYS:HB2	2.55	0.42
1:A:195:CYS:SG	1:A:217:VAL:HG11	2.58	0.42
1:A:172:ASP:HB3	1:A:173:PRO:HD2	2.01	0.42
1:A:229:ILE:CG1	1:A:241:TRP:HB2	2.47	0.42
2:B:1328:SER:OG	2:B:1353:ASN:HB3	2.20	0.41
2:B:1083:ILE:HD13	2:B:1083:ILE:HA	1.86	0.41
1:A:52:LYS:HG3	1:A:93:VAL:O	2.20	0.41
1:A:245:LYS:HB3	1:A:247:LYS:HG3	2.02	0.41
1:A:225:ASN:HD21	1:A:227:LYS:HD2	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:310:HIS:CD2	1:A:311:PRO:HD2	2.56	0.41
1:A:307:THR:HA	1:A:317:ALA:O	2.21	0.41
1:A:165:LYS:NZ	1:A:201:ALA:O	2.43	0.40
1:A:104:SER:O	1:A:111:LEU:HA	2.22	0.40
1:A:220:VAL:HA	1:A:230:LEU:O	2.22	0.40
1:A:298:GLN:HG2	1:A:299:GLY:N	2.36	0.40
2:B:1116:GLN:O	2:B:1138[A]:ILE:HD12	2.21	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	304/329 (92%)	289 (95%)	15 (5%)	0	100 100
2	B	298/338 (88%)	287 (96%)	8 (3%)	3 (1%)	13 6
All	All	602/667 (90%)	576 (96%)	23 (4%)	3 (0%)	25 17

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	1105	GLU
2	B	1322	MET
2	B	1315	ALA

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	268/289 (93%)	266 (99%)	2 (1%)	81 83
2	B	268/297 (90%)	266 (99%)	2 (1%)	81 83
All	All	536/586 (92%)	532 (99%)	4 (1%)	81 83

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	181	ARG
1	A	212	ASP
2	B	1177	THR
2	B	1325	ARG

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	265	ASN
1	A	289	GLN
2	B	1253	HIS
2	B	1259	ASN
2	B	1289	HIS

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 oligosaccharides 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	$\#\|Z\| > 2$
3	A1ANM	A	1401	-	93,98,98	3.16	27 (29%)	123,138,138	1.87	30 (24%)

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	A1ANM	A	1401	-	-	11/66/89/89	0/8/8/8

All (27) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1401	A1ANM	C01-N02	-13.00	1.27	1.47
3	A	1401	A1ANM	C87-C77	11.32	1.52	1.36
3	A	1401	A1ANM	C61-C60	-8.93	1.39	1.50
3	A	1401	A1ANM	C39-C40	-8.77	1.39	1.49
3	A	1401	A1ANM	C84-N86	6.89	1.47	1.37
3	A	1401	A1ANM	C87-N86	6.80	1.47	1.36
3	A	1401	A1ANM	C83-C78	6.16	1.49	1.35
3	A	1401	A1ANM	C16-N18	5.68	1.46	1.33
3	A	1401	A1ANM	C10-C09	-5.59	1.39	1.49
3	A	1401	A1ANM	C83-C84	5.02	1.53	1.42
3	A	1401	A1ANM	C44-N46	4.93	1.45	1.34
3	A	1401	A1ANM	C34-N33	4.89	1.45	1.33
3	A	1401	A1ANM	C75-N74	4.69	1.45	1.35
3	A	1401	A1ANM	C03-N02	-4.27	1.37	1.48
3	A	1401	A1ANM	C89-N02	-4.03	1.38	1.48
3	A	1401	A1ANM	C49-N51	3.71	1.44	1.32
3	A	1401	A1ANM	O85-C84	-3.64	1.17	1.24
3	A	1401	A1ANM	O17-C16	-3.30	1.15	1.23
3	A	1401	A1ANM	O76-C75	-3.10	1.17	1.23
3	A	1401	A1ANM	C42-N41	-3.04	1.31	1.36
3	A	1401	A1ANM	C06-N05	2.61	1.47	1.41

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	1401	A1ANM	O45-C44	-2.55	1.17	1.23
3	A	1401	A1ANM	C43-C44	2.36	1.54	1.50
3	A	1401	A1ANM	O35-C34	-2.29	1.18	1.23
3	A	1401	A1ANM	C73-C06	-2.18	1.38	1.40
3	A	1401	A1ANM	C71-C15	-2.17	1.36	1.39
3	A	1401	A1ANM	C79-C78	2.14	1.53	1.49

All (30) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	1401	A1ANM	C87-N86-C84	-6.26	119.35	124.13
3	A	1401	A1ANM	C47-N46-C44	-4.91	116.50	122.34
3	A	1401	A1ANM	C71-C10-C11	4.44	121.24	115.98
3	A	1401	A1ANM	C71-C10-C09	-4.29	110.77	118.63
3	A	1401	A1ANM	C72-C09-C10	-4.05	113.81	120.61
3	A	1401	A1ANM	C20-C19-N18	3.97	121.28	111.82
3	A	1401	A1ANM	O17-C16-C15	-3.88	113.21	120.90
3	A	1401	A1ANM	C83-C84-N86	3.81	120.95	115.95
3	A	1401	A1ANM	C89-C88-N05	3.77	116.45	110.86
3	A	1401	A1ANM	C06-C73-N74	3.66	125.36	118.61
3	A	1401	A1ANM	C69-N70-N37	3.65	108.03	104.23
3	A	1401	A1ANM	C15-C16-N18	3.56	124.53	117.12
3	A	1401	A1ANM	C36-N37-C38	-3.53	125.00	129.38
3	A	1401	A1ANM	O85-C84-C83	-3.33	120.86	125.46
3	A	1401	A1ANM	C09-C10-C11	3.24	127.99	122.86
3	A	1401	A1ANM	C88-N05-C04	-3.15	105.20	113.38
3	A	1401	A1ANM	C13-C11-C10	-3.14	119.35	123.34
3	A	1401	A1ANM	C72-C73-N74	-2.72	114.82	121.95
3	A	1401	A1ANM	C64-C66-C67	2.70	119.82	117.54
3	A	1401	A1ANM	C19-N18-C16	2.66	128.13	122.11
3	A	1401	A1ANM	C88-C89-N02	2.59	113.70	108.07
3	A	1401	A1ANM	C79-C78-C77	-2.58	120.68	123.08
3	A	1401	A1ANM	C08-C09-C10	2.53	125.09	120.91
3	A	1401	A1ANM	C36-N37-N70	2.38	124.61	120.87
3	A	1401	A1ANM	C62-C61-C67	2.27	119.80	116.20
3	A	1401	A1ANM	C60-C40-C39	-2.20	126.27	130.38
3	A	1401	A1ANM	C66-C67-C61	-2.16	120.13	123.59
3	A	1401	A1ANM	F80-C79-C78	-2.02	108.79	112.68
3	A	1401	A1ANM	O76-C75-C77	2.01	124.55	121.04
3	A	1401	A1ANM	C08-C09-C72	2.00	120.98	118.23

There are no chirality outliers.

All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	1401	A1ANM	C20-C19-N18-C16
3	A	1401	A1ANM	O76-C75-C77-C78
3	A	1401	A1ANM	N74-C75-C77-C78
3	A	1401	A1ANM	O21-C22-C23-O24
3	A	1401	A1ANM	O76-C75-C77-C87
3	A	1401	A1ANM	N74-C75-C77-C87
3	A	1401	A1ANM	C23-C22-O21-C20
3	A	1401	A1ANM	C29-C28-O27-C26
3	A	1401	A1ANM	C72-C73-N74-C75
3	A	1401	A1ANM	C28-C29-O30-C31
3	A	1401	A1ANM	C40-C60-C61-C62

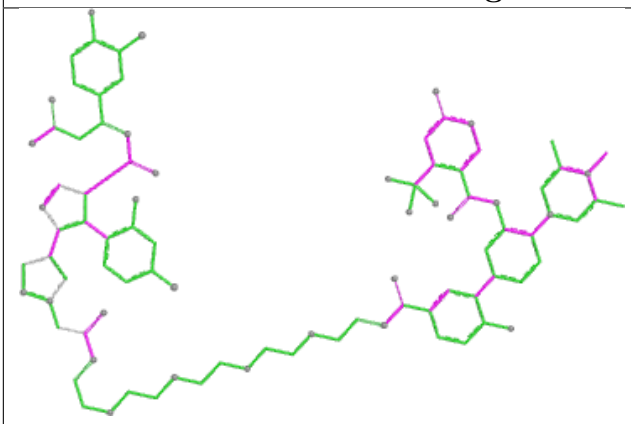
There are no ring outliers.

1 monomer is involved in 1 short contact:

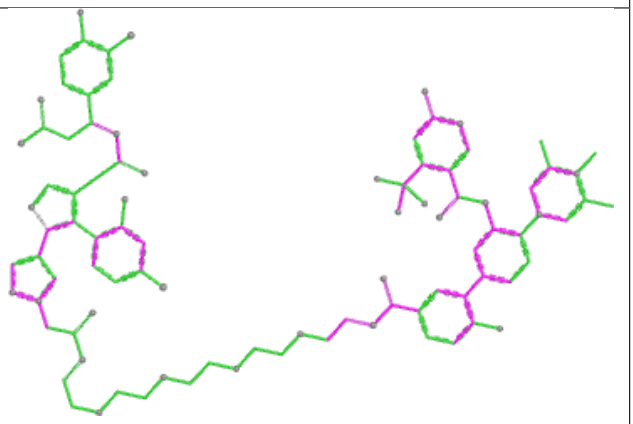
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1401	A1ANM	1	0

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.

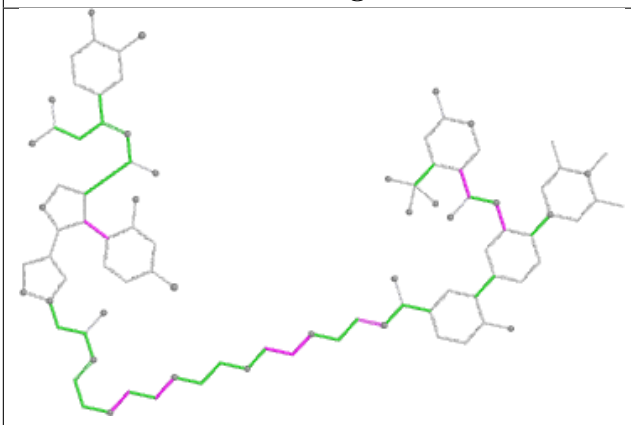
Ligand A1ANM A 1401



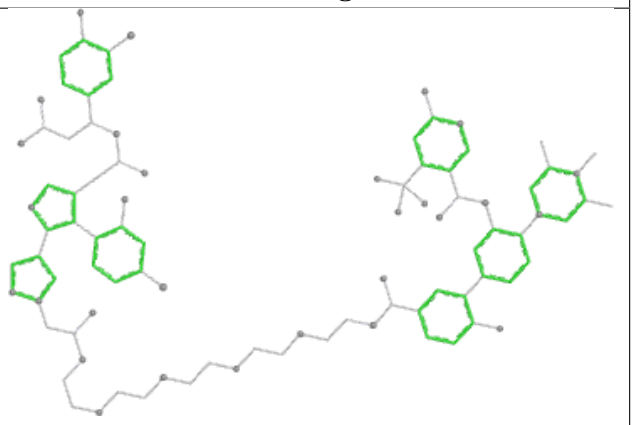
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

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	305/329 (92%)	-0.08	6 (1%) 64 68	18, 33, 50, 84	1 (0%)
2	B	303/338 (89%)	-0.11	13 (4%) 40 43	16, 32, 57, 89	1 (0%)
All	All	608/667 (91%)	-0.09	19 (3%) 51 53	16, 33, 54, 89	2 (0%)

All (19) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	30	PRO	5.0
2	B	1322	MET	4.4
2	B	1321	LEU	4.2
2	B	1324	GLU	3.9
2	B	1105	GLU	3.2
1	A	213	ASP	3.0
1	A	31	VAL	2.9
2	B	1373	GLY	2.7
2	B	1315	ALA	2.6
2	B	1390	GLY	2.5
2	B	1079	ALA	2.3
1	A	245	LYS	2.3
2	B	1379	ASN	2.3
1	A	211	ASP	2.1
2	B	1323	GLU	2.1
2	B	1104	ARG	2.0
2	B	1327	LYS	2.0
2	B	1326	MET	2.0
1	A	225	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 (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

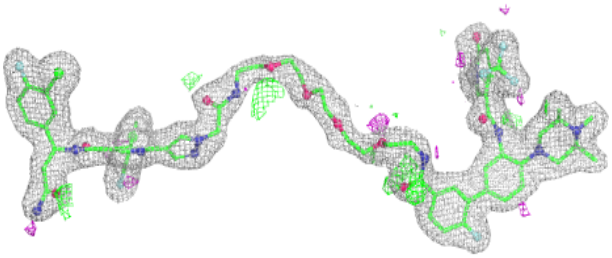
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

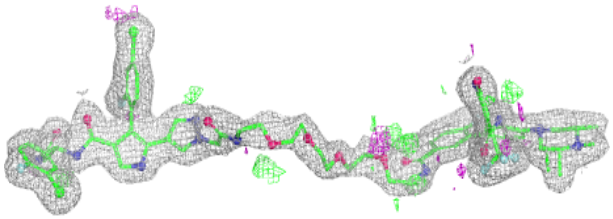
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	A1ANM	A	1401	91/91	0.95	0.09	21,28,66,69	0

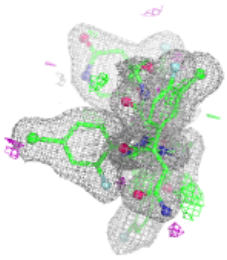
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around A1ANM A 1401:

$2mF_o$-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.