wwPDB X-ray Structure Validation Summary Report (i)

Nov 18, 2024 – 04:07 PM EST

PDB ID	:	9DJX
Title	:	Ternary complex structure of Cereblon-DDB1 bound to WIZ(ZF7) and the molecular glue WIZ-6
Authors	:	Partridge, J.R.; Ma, X.; Ornelas, E.
Deposited on	:	2024-09-07
Resolution	:	3.35 Å(reported)

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

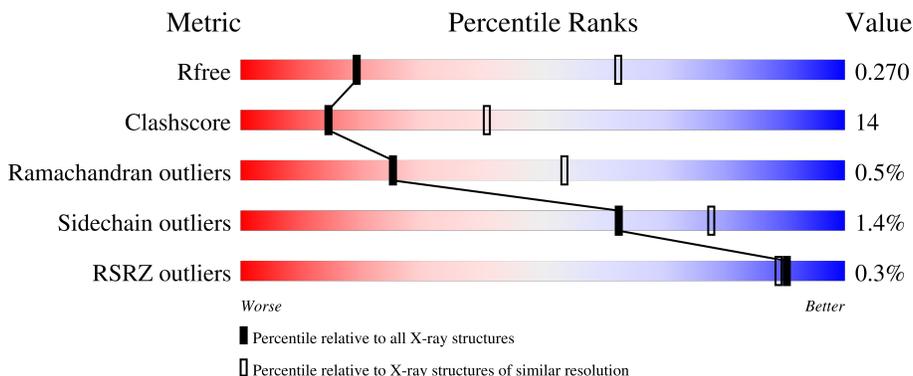|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 3.35 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.

Metric	Percentile Ranks	Value
Rfree		0.270
Clashscore		14
Ramachandran outliers		0.5%
Sidechain outliers		1.4%
RSRZ outliers		0.3%

Worse — *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R$_{free}$	164625	1012 (3.40-3.32)
Clashscore	180529	1035 (3.40-3.32)
Ramachandran outliers	177936	1037 (3.40-3.32)
Sidechain outliers	177891	1037 (3.40-3.32)
RSRZ outliers	164620	1012 (3.40-3.32)

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	373	68% / 24% / 8%
1	D	373	66% / 24% / 9%
2	B	836	66% / 29% / 5%
2	E	836	66% / 29% / 5%
3	C	30	77% / 10% / 13%

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Mol	Chain	Length	Quality of chain
3	F	30	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	SO4	E	1201	-	-	X	-

2 Entry composition ⓘ

There are 7 unique types of molecules in this entry. The entry contains 17640 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 Protein cereblon.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	344	Total	C	N	O	S	0	0	0
			2652	1709	440	480	23			
1	D	338	Total	C	N	O	S	0	0	0
			2558	1649	419	468	22			

- Molecule 2 is a protein called DNA damage-binding protein 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	794	Total	C	N	O	S	0	0	0
			5981	3806	995	1147	33			
2	E	795	Total	C	N	O	S	0	0	0
			5989	3815	992	1149	33			

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	700	GLY	-	linker	UNP Q16531
B	701	ASN	-	linker	UNP Q16531
B	702	GLY	-	linker	UNP Q16531
B	703	ASN	-	linker	UNP Q16531
B	704	SER	-	linker	UNP Q16531
B	705	GLY	-	linker	UNP Q16531
E	700	GLY	-	linker	UNP Q16531
E	701	ASN	-	linker	UNP Q16531
E	702	GLY	-	linker	UNP Q16531
E	703	ASN	-	linker	UNP Q16531
E	704	SER	-	linker	UNP Q16531
E	705	GLY	-	linker	UNP Q16531

- Molecule 3 is a protein called Protein Wiz.

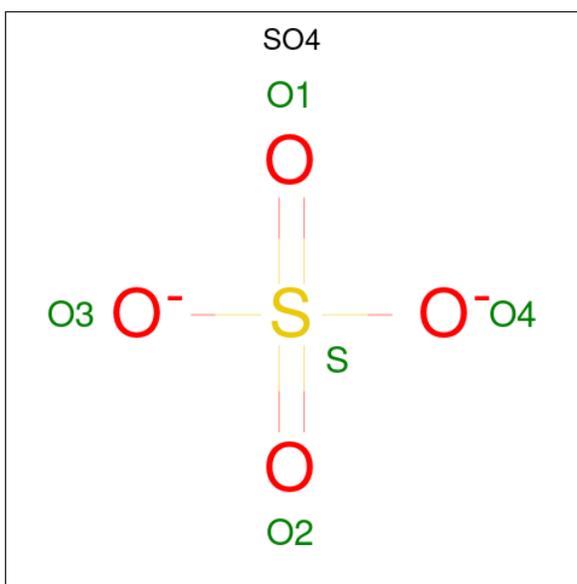| Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	26	Total	C	N	O	S	0	0	0
			176	106	30	37	3			
3	F	27	Total	C	N	O	S	0	0	0
			187	112	34	38	3			

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	866	SER	-	expression tag	UNP O95785
F	866	SER	-	expression tag	UNP O95785

- Molecule 4 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Zn	0	0
			1	1		
4	C	1	Total	Zn	0	0
			1	1		
4	D	1	Total	Zn	0	0
			1	1		
4	F	1	Total	Zn	0	0
			1	1		

- Molecule 5 is SULFATE ION (three-letter code: SO4) (formula: O_4S).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total 5	O 4	S 1	0	0
5	D	1	Total 5	O 4	S 1	0	0
5	E	1	Total 5	O 4	S 1	0	0

- Molecule 6 is (3S)-3-(5-{[(3R,6S)-1-ethyl-6-methylpiperidin-3-yl]oxy}-1-oxo-1,3-dihydro-2H-isoindol-2-yl)piperidine-2,6-dione (three-letter code: A1A5I) (formula: $C_{21}H_{27}N_3O_4$) (labeled as "Ligand of Interest" by depositor).

A1A5I
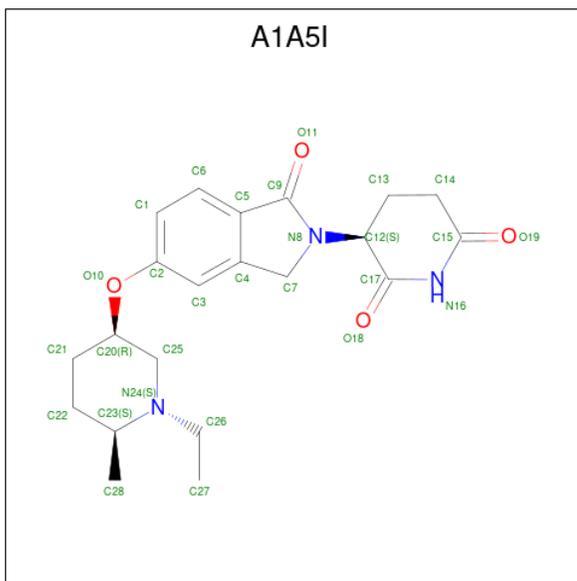
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
6	A	1	Total 28	C 21	N 3	O 4	0	0
6	D	1	Total 28	C 21	N 3	O 4	0	0

- Molecule 7 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	4	Total 4	O 4	0	0
7	B	5	Total 5	O 5	0	0
7	C	3	Total 3	O 3	0	0
7	D	4	Total 4	O 4	0	0

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	E	6	Total O 6 6		0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot abo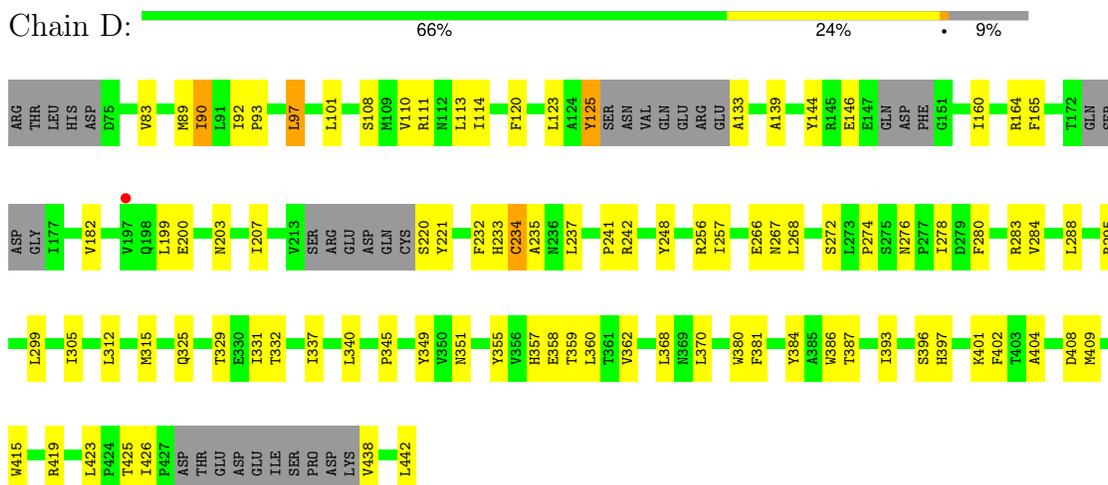ve a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.
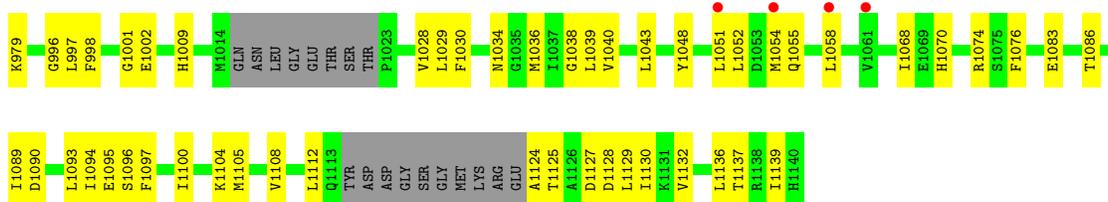
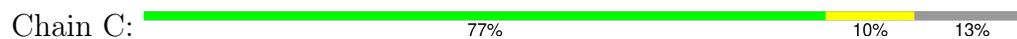- Molecule 1: Protein cereblon

Chain A:

- Molecule 1: Protein cereblon

Chain D:

- Molecule 2: DNA damage-binding protein 1

Chain B:

MET S2 V6 V7 Q10 K11 A14 V15 T20 F23 T24 S25 L29 N30 L31 L32 I33 N36 T37 R38 L39 V43 V52 M57 Y58 G59 K60 V63 M64 P69 E72 L77 F78 I79 L80 N85 A86 C87 E90 Q93 S94 G95 E96

S97 I98 D99 I100 I101 T102 R103 A104 V108 T118 G119 I120 I124 D125 P126 R129 M130 I131 L135 K141 V142 I143 P144 L145 D146 F155 N156 I157 I165 K168 F169 L170 Y171 G172 C173 Q174 A175 V181 D184 V190 K191 Y192 S196 E199 N211

V212 E213 A214 M218 V219 P223 G227 I232 I237 T238 Y239 L246 A247 P250 P251 I252 I253 I258 H261 N262 R263 V264 D265 P266 N267 G268 Y271 L272 L273 M276 L280 F281 M282 E289 Q290 T294 L305 T308 S309 I310 T315 Y316 L317

D318 V321 R327 Q332 L333 L336 S345 Y346 V347 P358 I359 V360 D361 M362 C363 D366 L367 E368 R369 Q374 L375 C378 S379 G380 L387 N392 GLY ILE GLY GLY ASN GLY ASN SER GLY GLU ILE GLN LYS L710 L717 Y718 L736 R739 I740 E741

V742 Q743 T749 T750 A751 L752 R753 S757 S768 K769 L770 F771 S772 S773 SER THR ALA PRO HIS GLU T780 S781 F782 G783 E784 N790 H805 Q806 F807 L808 E811 Y812 L816 L821 N826 F829 I830 V831 A834 E839 E842 P843 F851 Q852 L858

E865 A869 M873 L880 R889 L890 Y891 T894 E898 H905 M910 A911 L912 Y913 L914 D925 L926 M927 R928 S929 A934 P937 F942 I945 N950 P951 N952 W953 M954 D963 N970 A971 F972 N973 L974 F975 D980 SER ALA ALA THR T985

D986 L997 F998 E1002 H1009 G1010 S1011 L1012 V1013 M1014 GLN ASN LEU GLY GLU THR SER THR P1023 T1024 V1028 L1029 T1032 I1037 G1038 L1039 V1040 Y1048 N1049 L1050 L1051 L1058 F1072 W1073 R1074 S1075 F1076 H1077 T1078 E1079 R1080 E1083 I1089 F1097 L1098 S1101 R1102

P1103 K1104 M1105 V1108 V1109 L1112 GLN TYR ASP ASP GLY SER GLY MET LYS ARG E1123 A1126 D1127 D1128 L1129 I1130 V1133 T1137 H1140

• Molecule 2: DNA damage-binding protein 1

Chain E: %   66%   29%   • 5%

MET S2 Y5 V6 K11 P12 T13 A14 H22 F23 T24 L29 N30 L31 N36 T37 R38 I41 Y42 V43 L49 V52 K53 E54 M57 Y58 V63 R68 P69 E72 S73 K74 D75 L76 L77 L80 N85 L89 E90 Y91 S94 I98

V108 R111 T118 D125 C128 R129 M130 I131 R134 L139 F140 K141 V142 I143 P144 L145 D148 N149 K153 A154 F155 N156 L159 E160 E161 I165 L170 Y171 Q174 A175 D184 P185 H189 E194 V195 S196 L197 K200 E201 F202 W207 E210

E215 A216 S217 P223 I232 G233 Q234 I237 T238 G242 L246 A247 I252 T257 I258 R263 V264 D265 P266 N267 G268 S269 R270 Y271 L272 L273 L280 L284 L285 E288 E289 Q290 M291 D292 G293 T294 V295 D299 L300 L304 L305 T315 Y316 L317

F323 R327 V334 K335 L336 N337 V348 A349 N355 L356 G357 P358 I359 M362 L367 Q374 C378 S379 G380 L387 R391 N392 GLY ILE GLY GLY ASN GLY ASN SER GLY GLU ILE GLN LYS L710 R713 T714 V715 P716 L717 Y718 E719 I724 V735 R739

I740 E741 V742 Q743 ASP T745 T749 L752 S755 A756 S762 S763 F771 SER SER SER THR ALA PRO HIS GLU T780 E787 V788 D795 T798 V801 L802 H803 F807 Y812 V831 R847 I848 V849 Y853 S854 D855 E863 V866 A869 V870

M873 V874 E875 F876 K879 L880 S883 I884 R889 L890 T901 N904 M910 A911 L912 T916 K917 G918 L922 D925 L926 M927 R928 S929 V930 L931 L932 L933 A934 F942 I945 N952 L960 D963 N964 F965 N970 A971 F972 F975 V976 C977 Q978

K979 G996 L997 F998 G1001 E1002 H1009 M1014 GLN ASN LEU GLY GLU THR SER THR P1023 V1028 L1029 F1030 N1034 G1035 M1036 I1037 G1038 L1039 V1040 L1043 Y1048 L1051 L1052 D1053 M1054 Q1055 L1058 V1061 I1068 E1069 H1070 R1074 S1075 F1076 E1083 T1086

I1089 D1090 L1093 I1094 E1095 S1096 F1097 I1100 K1104 M1105 V1108 L1112 Q1113 TYR ASP ASP GLY SER GLY MET LYS ARG GLU A1124 T1125 A1126 D1127 D1128 L1129 I1130 K1131 V1132 L1136 T1137 R1138 I1139 H1140

• Molecule 3: Protein Wiz

Chain C:

77%   10%   13%

SER GLN S868 F879 L885 H888 L893 ARG GLN

• Molecule 3: Protein Wiz

Chain F:

60%   30%   10%

SER GLN S868 T871 C872 E873 V874 C878 F879 E880 T881 G884 H888 R894 GLN

4   Data and refinement statistics   ⓘ

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	109.11Å 145.03Å 191.90Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	46.88 – 3.35 46.88 – 3.35	Depositor EDS
% Data completeness (in resolution range)	98.7 (46.88-3.35) 98.7 (46.88-3.35)	Depositor EDS
R_{merge}	0.28	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.63 (at 3.33Å)	Xtriage
Refinement program	PHENIX (1.21_5207: ???)	Depositor
R, R_{free}	0.202 , 0.271 0.210 , 0.270	Depositor DCC
R_{free} test set	2237 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å^2)	104.7	Xtriage
Anisotropy	0.176	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 90.2	EDS
L-test for twinning[2]	$< |L| > = 0.46, < L^2 > = 0.29$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	17640	wwPDB-VP
Average B, all atoms (Å^2)	108.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 17.07% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, SO4, A1A5I

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	0.48	0/2715	0.66	0/3705
1	D	0.52	0/2616	0.72	3/3579 (0.1%)
2	B	0.46	0/6090	0.70	4/8289 (0.0%)
2	E	0.45	0/6098	0.69	2/8297 (0.0%)
3	C	0.51	0/178	0.84	1/241 (0.4%)
3	F	0.41	0/189	0.64	0/255
All	All	0.47	0/17886	0.70	10/24366 (0.0%)

There are no bond length outliers.

The worst 5 of 10 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	268	LEU	N-CA-CB	-6.75	96.91	110.40
2	B	345	SER	CB-CA-C	5.89	121.30	110.10
2	E	972	PHE	N-CA-CB	-5.88	100.02	110.60
2	E	292	ASP	CB-CA-C	5.76	121.93	110.40
1	D	267	ASN	N-CA-CB	5.37	120.26	110.60

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	2652	0	2564	71	0
1	D	2558	0	2444	60	0
2	B	5981	0	5720	169	0
2	E	5989	0	5750	180	0
3	C	176	0	152	1	0
3	F	187	0	165	8	0
4	A	1	0	0	0	0
4	C	1	0	0	0	0
4	D	1	0	0	0	0
4	F	1	0	0	0	0
5	A	5	0	0	1	0
5	D	5	0	0	1	0
5	E	5	0	0	2	0
6	A	28	0	0	0	0
6	D	28	0	0	0	0
7	A	4	0	0	0	0
7	B	5	0	0	0	0
7	C	3	0	0	0	0
7	D	4	0	0	0	0
7	E	6	0	0	0	0
All	All	17640	0	16795	474	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 14.

The worst 5 of 474 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:1109:VAL:HA	2:B:1112:LEU:HD11	1.20	1.08
2:E:159:LEU:HD22	2:E:161:GLU:O	1.56	1.05
2:E:11:LYS:CB	2:E:38:ARG:HE	1.70	1.04
2:B:265:ASP:OD1	2:B:266:PRO:HD2	1.62	1.00
2:B:912:LEU:HD13	2:B:926:LEU:CD1	1.92	0.99

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	336/373 (90%)	311 (93%)	22 (6%)	3 (1%)	14	41
1	D	326/373 (87%)	297 (91%)	28 (9%)	1 (0%)	37	65
2	B	782/836 (94%)	704 (90%)	74 (10%)	4 (0%)	25	53
2	E	783/836 (94%)	706 (90%)	74 (10%)	3 (0%)	30	59
3	C	24/30 (80%)	22 (92%)	2 (8%)	0	100	100
3	F	25/30 (83%)	25 (100%)	0	0	100	100
All	All	2276/2478 (92%)	2065 (91%)	200 (9%)	11 (0%)	25	53

5 of 11 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	E	854	SER
1	A	270	ASP
1	A	345	PRO
2	B	95	GLY
2	E	855	ASP

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	282/340 (83%)	278 (99%)	4 (1%)	62	78
1	D	269/340 (79%)	264 (98%)	5 (2%)	52	72
2	B	631/727 (87%)	621 (98%)	10 (2%)	58	75

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	E	633/727 (87%)	626 (99%)	7 (1%)	70	82
3	C	19/26 (73%)	19 (100%)	0	100	100
3	F	20/26 (77%)	20 (100%)	0	100	100
All	All	1854/2186 (85%)	1828 (99%)	26 (1%)	62	78

5 of 26 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	90	ILE
1	D	125	TYR
2	E	880	LEU
1	D	108	SER
1	D	234	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 9 such sidechains are listed below:

Mol	Chain	Res	Type
2	E	803	HIS
2	E	1055	GLN
1	D	236	ASN
1	D	267	ASN
2	E	290	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 9 ligands modelled in this entry, 4 are monoatomic - leaving 5 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	#$|Z| > 2$
5	SO4	A	502	-	4,4,4	0.90	0	6,6,6	0.26	0
6	A1A5I	A	503	-	31,31,31	0.24	0	40,45,45	0.45	0
6	A1A5I	D	503	-	31,31,31	0.24	0	40,45,45	0.44	0
5	SO4	D	502	-	4,4,4	0.93	0	6,6,6	0.32	0
5	SO4	E	1201	-	4,4,4	0.82	0	6,6,6	0.21	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
6	A1A5I	A	503	-	-	4/10/48/48	0/4/4/4
6	A1A5I	D	503	-	-	5/10/48/48	0/4/4/4

There are no bond length outliers.

There are no bond angle outliers.

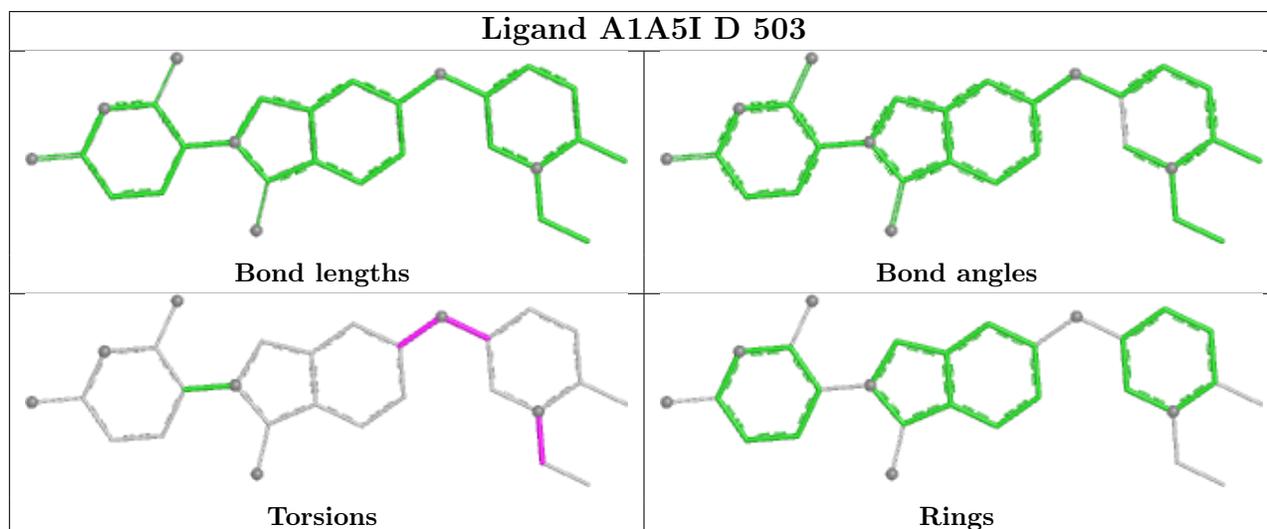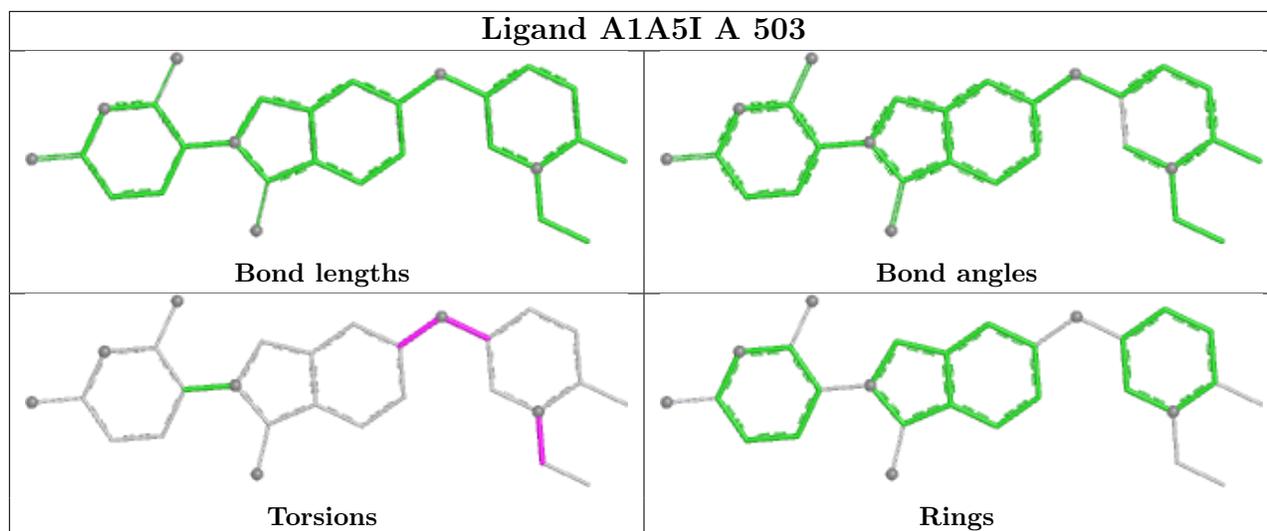There are no chirality outliers.

5 of 9 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	A	503	A1A5I	C27-C26-N24-C25
6	D	503	A1A5I	C27-C26-N24-C25
6	D	503	A1A5I	C1-C2-O10-C20
6	D	503	A1A5I	C3-C2-O10-C20
6	A	503	A1A5I	C1-C2-O10-C20

There are no ring outliers.

3 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	502	SO4	1	0
5	D	502	SO4	1	0
5	E	1201	SO4	2	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 A1A5I A 503

Bond lengths   Bond angles

Torsions   Rings

Ligand A1A5I D 503

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, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	344/373 (92%)	-0.60	0	100	100	77, 100, 158, 198	0
1	D	338/373 (90%)	-0.53	1 (0%)	90	89	77, 101, 158, 190	0
2	B	794/836 (94%)	-0.63	2 (0%)	90	89	76, 101, 150, 202	0
2	E	795/836 (95%)	-0.68	5 (0%)	85	81	74, 107, 156, 202	0
3	C	26/30 (86%)	-0.58	0	100	100	91, 103, 121, 132	0
3	F	27/30 (90%)	-0.56	0	100	100	96, 108, 126, 160	0
All	All	2324/2478 (93%)	-0.63	8 (0%)	90	89	74, 104, 155, 202	0

The worst 5 of 8 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	E	1058	LEU	3.2
2	E	1051	LEU	2.6
1	D	197	VAL	2.5
2	E	970	ASN	2.5
2	B	970	ASN	2.3

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

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

6.3 Carbohydrates ⓘ
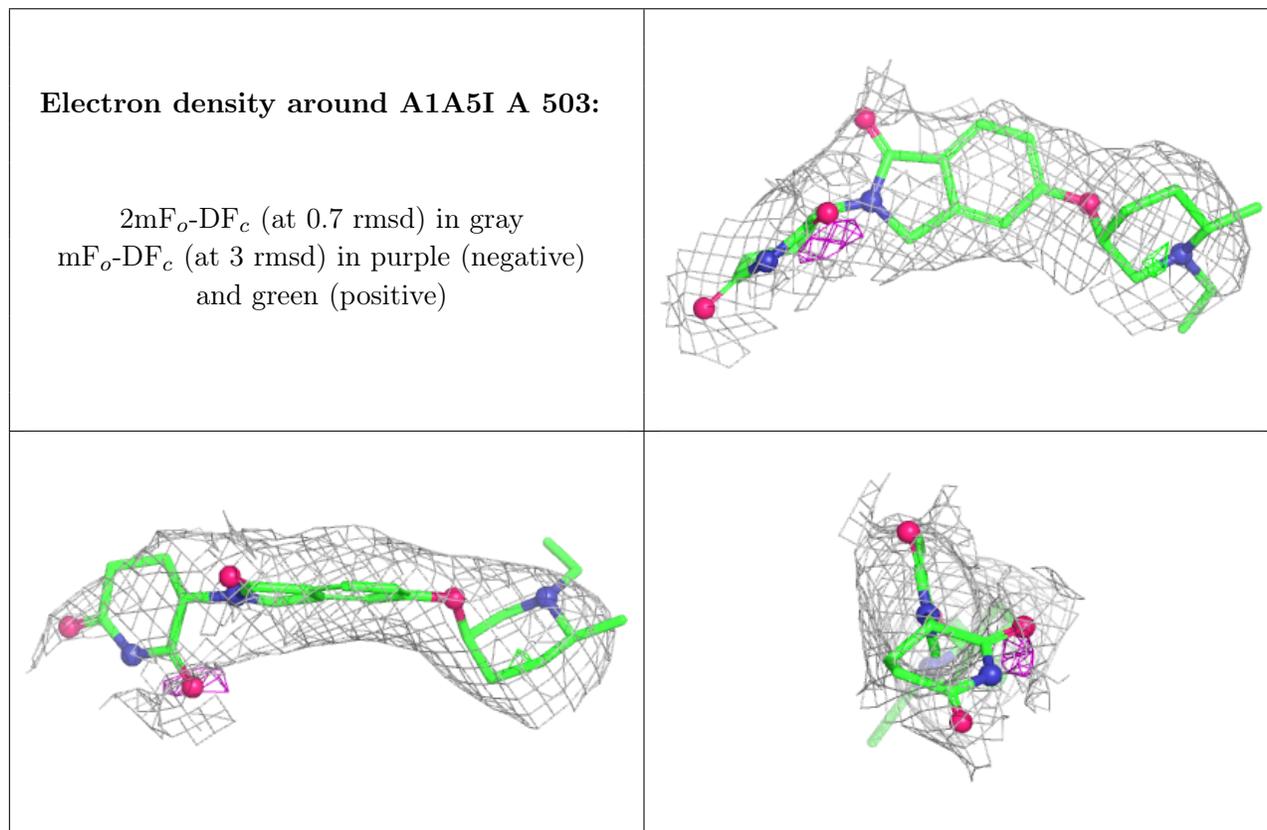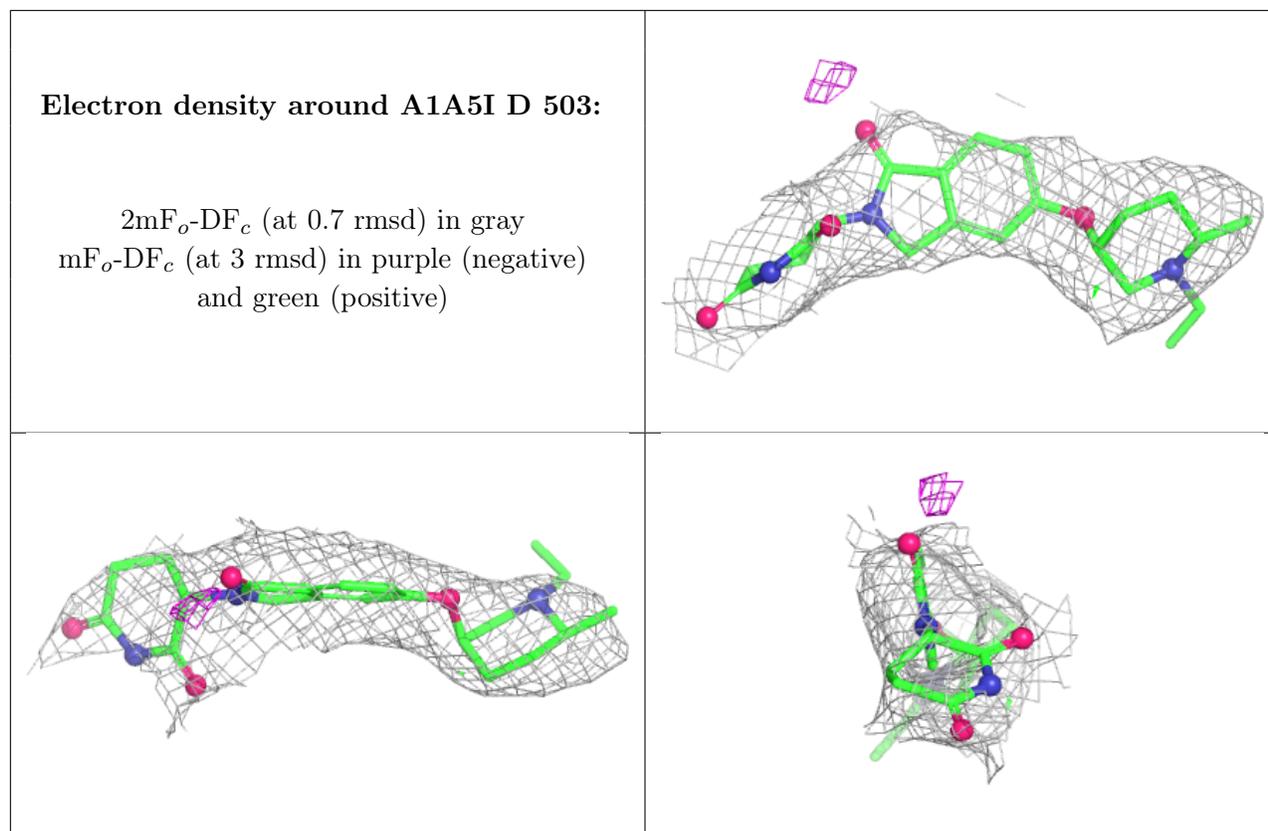
There are no monosaccharides in this entry.

6.4   Ligands (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, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	SO4	E	1201	5/5	0.85	0.07	130,133,137,145	0
6	A1A5I	A	503	28/28	0.85	0.11	92,102,115,120	0
5	SO4	A	502	5/5	0.88	0.05	106,111,121,131	0
6	A1A5I	D	503	28/28	0.88	0.09	99,105,119,125	0
5	SO4	D	502	5/5	0.90	0.06	146,147,157,160	0
4	ZN	C	900	1/1	0.99	0.02	86,86,86,86	0
4	ZN	F	900	1/1	1.00	0.01	90,90,90,90	0
4	ZN	A	501	1/1	1.00	0.02	88,88,88,88	0
4	ZN	D	501	1/1	1.00	0.05	89,89,89,89	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 A1A5I A 503:

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

Electron density around A1A5I D 503:

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

6.5 Other polymers (i)

There are no such residues in this entry.