WORLDWIDE PDB
PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Jun 24, 2024 – 07:02 PM EDT

PDB ID	:	6Z36
Title	:	Crystal structure of the ACVR1 (ALK2) kinase in complex with the compound M4K2118
Authors	:	Adamson, R.J.; Williams, E.P.; Smil, D.; Burgess-Brown, N.; von Delft, F.; Arrowsmith, C.H.; Edwards, A.M.; Bountra, C.; Bullock, A.N.
Deposited on	:	2020-05-19
Resolution	:	1.37 Å(reported)

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

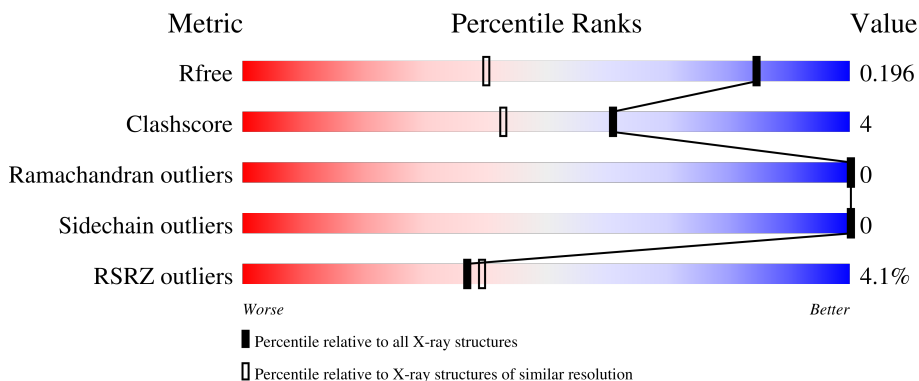|		
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	2.37.1
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

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 1.37 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		0.196
Clashscore		4
Ramachandran outliers		0
Sidechain outliers		0
RSRZ outliers		4.1%

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}	130704	2907 (1.40-1.36)
Clashscore	141614	3037 (1.40-1.36)
Ramachandran outliers	138981	2970 (1.40-1.36)
Sidechain outliers	138945	2969 (1.40-1.36)
RSRZ outliers	127900	2846 (1.40-1.36)

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	301	4% / 86% / 9% / 5%
1	B	301	4% / 92% / 5% ·

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
2	SO4	B	607	-	-	X	-

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 10032 atoms, of which 4559 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.
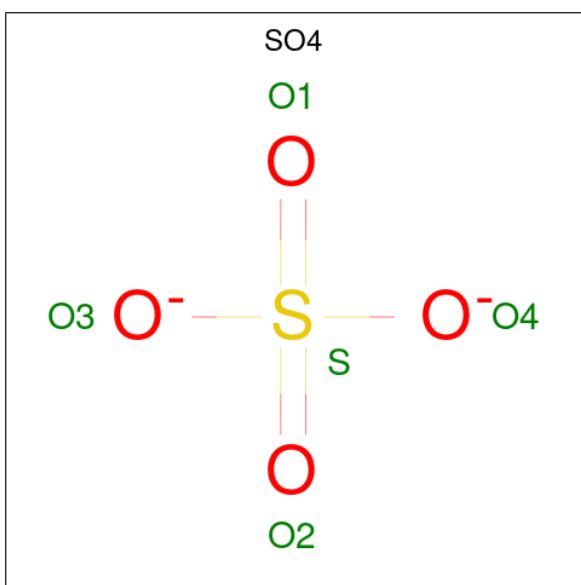
- Molecule 1 is a protein called Activin receptor type I.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	286	Total	C	H	N	O	S	0	13	0
			4593	1490	2255	406	427	15			
1	B	293	Total	C	H	N	O	S	0	8	0
			4536	1504	2172	415	430	15			

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	199	SER	-	expression tag	UNP Q04771
A	200	MET	-	expression tag	UNP Q04771
A	207	ASP	GLN	engineered mutation	UNP Q04771
B	199	SER	-	expression tag	UNP Q04771
B	200	MET	-	expression tag	UNP Q04771
B	207	ASP	GLN	engineered mutation	UNP Q04771

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O_4S).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total 5	O 4	S 1	0	0
2	A	1	Total 5	O 4	S 1	0	0
2	A	1	Total 5	O 4	S 1	0	0
2	B	1	Total 5	O 4	S 1	0	0
2	B	1	Total 5	O 4	S 1	0	0
2	B	1	Total 5	O 4	S 1	0	0
2	B	1	Total 5	O 4	S 1	0	0

- Molecule 3 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).
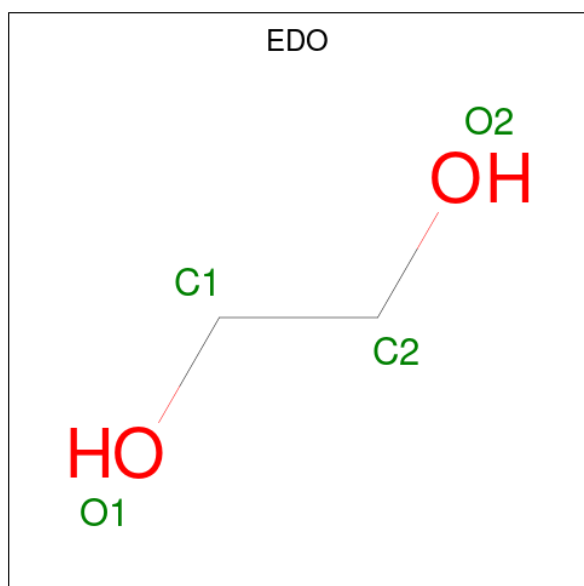
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total 10	C 2	H 6	O 2	0	0
3	B	1	Total 10	C 2	H 6	O 2	0	0

- Molecule 4 is D(-)-TARTARIC ACID (three-letter code: TAR) (formula: $C_4H_6O_6$).
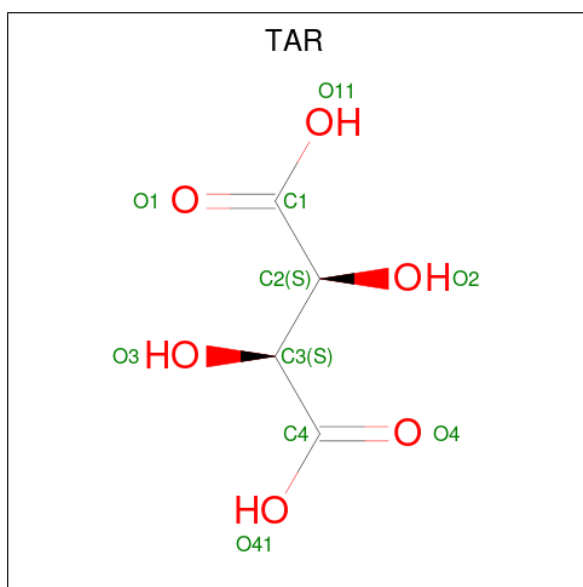
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	H	O	0	0
			14	4	4	6		

- Molecule 5 is 4-methyl-3-(4-piperidin-4-ylphenyl)-5-(3,4,5-trimethoxyphenyl)pyridine (three-letter code: Q5Z) (formula: $C_{26}H_{30}N_2O_3$) (labeled as "Ligand of Interest" by depositor).
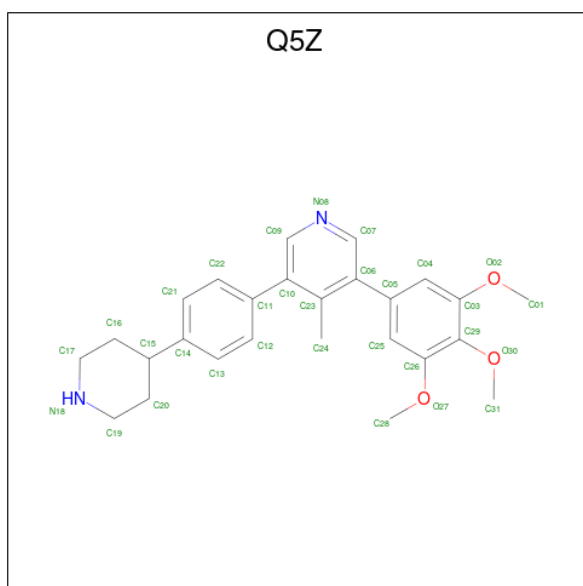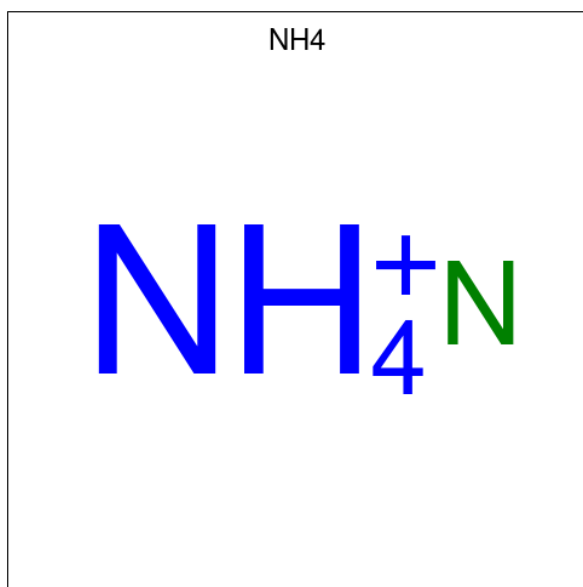

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total	C	H	N	O	0	0
			59	26	28	2	3		
5	A	1	Total	C	H	N	O	0	0
			59	26	28	2	3		

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
5	A	1	Total 59	C 26	H 28	N 2	O 3	0	0
5	B	1	Total 59	C 26	H 28	N 2	O 3	0	0

- Molecule 6 is AMMONIUM ION (three-letter code: NH4) (formula: H_4N).

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	B	1	Total 5	H 4	N 1	0	0

- Molecule 7 is water.

| Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	292	Total 292	O 292	0	0
7	B	301	Total 301	O 301	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 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: Activin receptor type I

Chain A:

• Molecule 1: Activin receptor type I

Chain B:
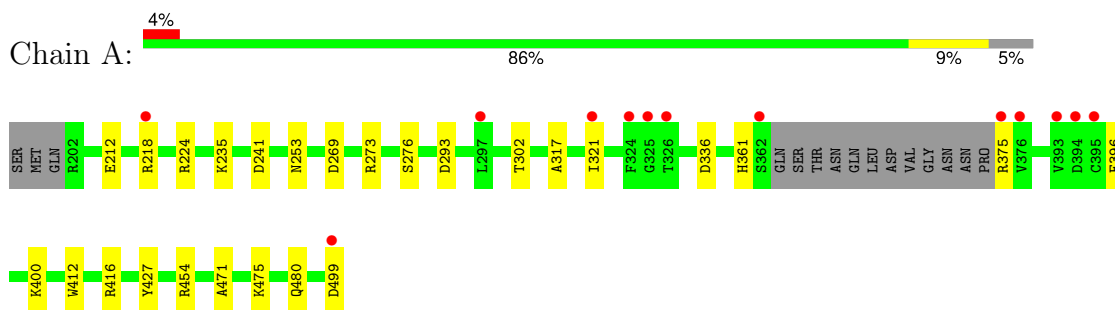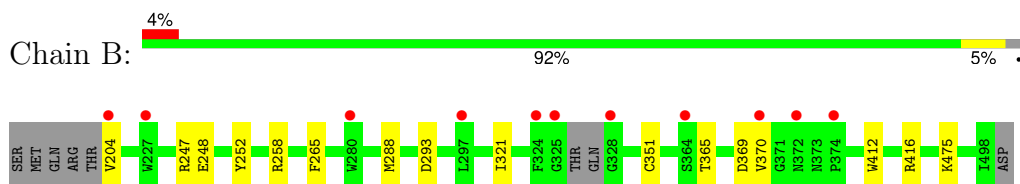
4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	127.43Å 84.61Å 88.38Å 90.00° 131.01° 90.00°	Depositor
Resolution (Å)	66.69 – 1.37 66.69 – 1.37	Depositor EDS
% Data completeness (in resolution range)	74.0 (66.69-1.37) 74.0 (66.69-1.37)	Depositor EDS
R_{merge}	0.23	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.76 (at 1.37Å)	Xtriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, R_{free}	0.149 , 0.191 0.158 , 0.196	Depositor DCC
R_{free} test set	5617 reflections (5.09%)	wwPDB-VP
Wilson B-factor (Å^2)	14.7	Xtriage
Anisotropy	0.008	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.42 , 48.1	EDS
L-test for twinning[2]	$< |L| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.017 for -h-2*l,-k,l	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	10032	wwPDB-VP
Average B, all atoms (Å^2)	23.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.57% 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 ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: TAR, EDO, Q5Z, SO4, NH4

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	0.47	0/2413	0.63	0/3274
1	B	0.54	1/2436 (0.0%)	0.62	1/3306 (0.0%)
All	All	0.51	1/4849 (0.0%)	0.63	1/6580 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	351	CYS	CB-SG	-15.53	1.55	1.82

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	351	CYS	CA-CB-SG	5.33	123.59	114.00

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	2338	2255	2267	24	0
1	B	2364	2172	2307	16	0
2	A	15	0	0	0	0
2	B	20	0	0	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	4	6	6	0	0
3	B	4	6	6	0	0
4	A	10	4	4	3	0
5	A	93	84	0	1	0
5	B	31	28	0	0	0
6	B	1	4	0	0	0
7	A	292	0	0	10	1
7	B	301	0	0	8	2
All	All	5473	4559	4590	43	3

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 4.

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:A:212:GLU:OE1	7:A:901:HOH:O	1.86	0.93
1:A:293[A]:ASP:OD1	7:A:902:HOH:O	1.90	0.88
2:B:607:SO4:O2	7:B:701:HOH:O	1.94	0.85
1:B:365:THR:O	7:B:702:HOH:O	1.98	0.80
1:A:317:ALA:O	1:A:321[A]:ILE:HD13	1.83	0.78
1:A:454:ARG:NH2	1:A:480[B]:GLN:OE1	2.21	0.73
1:A:218:ARG:H	4:A:803:TAR:H2	1.59	0.68
1:B:248:GLU:OE1	7:B:703:HOH:O	2.12	0.67
1:A:253:ASN:O	7:A:903:HOH:O	2.14	0.65
1:B:293:ASP:OD1	7:B:704:HOH:O	2.14	0.65
1:B:258[B]:ARG:HH22	1:B:265:PHE:HB3	1.62	0.65
1:A:375:ARG:NH2	7:A:905:HOH:O	2.31	0.62
1:B:204:VAL:N	7:B:708:HOH:O	2.33	0.61
1:A:269:ASP:OD2	7:A:904:HOH:O	2.17	0.57
1:A:273:ARG:NE	1:A:276:SER:OG	2.40	0.54
1:A:454:ARG:HH22	1:A:480[B]:GLN:CD	2.12	0.52
1:A:412:TRP:CZ2	1:A:416:ARG:HD2	2.45	0.52
1:B:321[B]:ILE:HD12	1:B:321[B]:ILE:O	2.12	0.50
1:B:288:MET:O	7:B:705:HOH:O	2.20	0.49
1:B:258[B]:ARG:HH22	1:B:265:PHE:H	1.61	0.49
1:A:336:ASP:OD2	7:A:905:HOH:O	2.20	0.48
1:B:252:TYR:CD1	1:B:265:PHE:HB2	2.50	0.46
1:A:471:ALA:O	1:A:475[B]:LYS:HG2	2.16	0.45
1:A:475[B]:LYS:HA	1:A:475[B]:LYS:HD2	1.79	0.45
1:A:302:THR:HG21	1:A:499:ASP:OD2	2.16	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:370:VAL:CG1	1:B:370:VAL:O	2.66	0.43
1:A:427:TYR:CD2	1:A:427:TYR:C	2.92	0.43
1:B:412:TRP:CZ2	1:B:416:ARG:HD2	2.54	0.43
1:B:247:ARG:NH2	1:B:369:ASP:O	2.52	0.43
5:A:804:Q5Z:C24	5:A:804:Q5Z:C22	2.97	0.42
1:A:224:ARG:NE	7:A:901:HOH:O	2.32	0.42
1:A:475[B]:LYS:HE2	7:A:1014:HOH:O	2.19	0.42
2:B:607:SO4:S	7:B:701:HOH:O	2.61	0.42
1:B:365:THR:HB	7:B:702:HOH:O	2.19	0.42
1:B:370:VAL:O	1:B:370:VAL:HG12	2.20	0.41
1:A:241:ASP:OD1	7:A:906:HOH:O	2.21	0.41
1:A:218:ARG:CZ	4:A:803:TAR:O2	2.68	0.41
1:A:396:PHE:CE2	1:A:400[B]:LYS:HE3	2.56	0.41
1:A:235:LYS:NZ	7:A:911:HOH:O	2.40	0.41
1:A:361:HIS:HB2	1:A:396:PHE:CD1	2.55	0.41
1:A:218:ARG:HB2	4:A:803:TAR:O41	2.22	0.40
1:B:258[B]:ARG:NH2	1:B:265:PHE:H	2.18	0.40

All (3) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
7:B:702:HOH:O	7:B:722:HOH:O[4_444]	1.89	0.31
7:B:705:HOH:O	7:B:771:HOH:O[4_454]	2.00	0.20
7:A:1135:HOH:O	7:A:1162:HOH:O[4_455]	2.18	0.02

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	295/301 (98%)	292 (99%)	3 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	B	297/301 (99%)	293 (99%)	4 (1%)	0	100 | 100
All	All	592/602 (98%)	585 (99%)	7 (1%)	0	100 | 100

There are no Ramachandran outliers to report.

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	253/270 (94%)	253 (100%)	0	100 | 100
1	B	259/270 (96%)	259 (100%)	0	100 | 100
All	All	512/540 (95%)	512 (100%)	0	100 | 100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	363	GLN
1	B	452	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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 15 ligands modelled in this entry, 1 is modelled with single atom - leaving 14 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	Q5Z	B	603	-	34,34,34	2.12	9 (26%)	43,47,47	0.98	3 (6%)
5	Q5Z	A	805	-	34,34,34	2.19	9 (26%)	43,47,47	1.57	12 (27%)
2	SO4	B	604	-	4,4,4	0.19	0	6,6,6	0.17	0
2	SO4	A	808	-	4,4,4	0.24	0	6,6,6	0.12	0
2	SO4	B	605	-	4,4,4	0.20	0	6,6,6	0.28	0
2	SO4	A	807	-	4,4,4	0.25	0	6,6,6	0.05	0
2	SO4	A	801	-	4,4,4	0.34	0	6,6,6	0.21	0
2	SO4	B	606	-	4,4,4	0.23	0	6,6,6	0.12	0
3	EDO	A	802	-	3,3,3	0.51	0	2,2,2	0.25	0
5	Q5Z	A	806	-	34,34,34	2.13	7 (20%)	43,47,47	1.48	7 (16%)
5	Q5Z	A	804	-	34,34,34	1.98	7 (20%)	43,47,47	1.00	2 (4%)
2	SO4	B	607	-	4,4,4	0.39	0	6,6,6	0.41	0
4	TAR	A	803	-	9,9,9	1.18	0	12,12,12	1.70	4 (33%)
3	EDO	B	601	-	3,3,3	0.37	0	2,2,2	0.46	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
5	Q5Z	B	603	-	-	1/18/26/26	0/4/4/4
5	Q5Z	A	805	-	-	0/18/26/26	0/4/4/4
5	Q5Z	A	806	-	-	4/18/26/26	0/4/4/4
3	EDO	A	802	-	-	0/1/1/1	-
5	Q5Z	A	804	-	-	2/18/26/26	0/4/4/4
4	TAR	A	803	-	-	8/12/12/12	-
3	EDO	B	601	-	-	1/1/1/1	-

All (32) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	A	806	Q5Z	C20-C15	-5.46	1.39	1.53
5	A	805	Q5Z	C20-C15	-5.45	1.39	1.53
5	A	804	Q5Z	C20-C15	-5.21	1.39	1.53
5	B	603	Q5Z	C20-C15	-5.18	1.39	1.53
5	A	805	Q5Z	C10-C11	-5.02	1.40	1.49
5	B	603	Q5Z	C20-C19	4.91	1.65	1.52
5	A	805	Q5Z	C20-C19	4.78	1.65	1.52
5	A	806	Q5Z	C20-C19	4.75	1.65	1.52
5	A	804	Q5Z	C20-C19	4.41	1.64	1.52
5	A	805	Q5Z	C19-N18	-4.28	1.31	1.47
5	A	804	Q5Z	C19-N18	-4.27	1.31	1.47
5	B	603	Q5Z	C19-N18	-4.22	1.31	1.47
5	A	805	Q5Z	C06-C05	-4.20	1.41	1.49
5	B	603	Q5Z	C10-C11	-4.20	1.41	1.49
5	A	806	Q5Z	C19-N18	-4.18	1.31	1.47
5	A	806	Q5Z	C10-C11	-4.04	1.42	1.49
5	A	806	Q5Z	C06-C05	-3.98	1.42	1.49
5	A	805	Q5Z	C17-N18	3.96	1.61	1.47
5	B	603	Q5Z	C06-C05	-3.84	1.42	1.49
5	A	804	Q5Z	C17-N18	3.79	1.60	1.47
5	B	603	Q5Z	C17-N18	3.76	1.60	1.47
5	A	806	Q5Z	C17-N18	3.65	1.60	1.47
5	A	804	Q5Z	C10-C11	-3.63	1.42	1.49
5	A	804	Q5Z	C06-C05	-3.46	1.43	1.49
5	A	805	Q5Z	C16-C17	-3.27	1.43	1.52
5	A	806	Q5Z	C16-C17	-3.19	1.44	1.52
5	B	603	Q5Z	C16-C17	-3.08	1.44	1.52
5	A	804	Q5Z	C16-C17	-3.05	1.44	1.52
5	A	805	Q5Z	O27-C26	2.62	1.41	1.37
5	B	603	Q5Z	O27-C26	2.48	1.41	1.37
5	B	603	Q5Z	O02-C03	2.40	1.41	1.37
5	A	805	Q5Z	O02-C03	2.22	1.40	1.37

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	A	806	Q5Z	C16-C15-C14	4.20	122.61	112.67
5	A	805	Q5Z	C20-C15-C14	3.66	121.35	112.67
5	A	806	Q5Z	C07-C06-C05	3.55	124.68	119.56
5	A	805	Q5Z	C16-C15-C14	3.46	120.86	112.67
5	A	806	Q5Z	C20-C15-C14	3.37	120.64	112.67
5	A	805	Q5Z	C04-C05-C06	-2.91	115.72	120.61

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	A	805	Q5Z	C22-C11-C10	-2.79	116.28	120.91
5	A	806	Q5Z	C09-N08-C07	2.74	121.24	117.51
5	A	804	Q5Z	C16-C15-C20	2.67	115.49	109.68
5	A	806	Q5Z	C16-C15-C20	2.67	115.48	109.68
4	A	803	TAR	C2-C3-C4	2.66	115.73	109.82
5	A	805	Q5Z	C12-C11-C10	2.66	125.31	120.91
5	A	805	Q5Z	C20-C19-N18	2.65	115.80	110.81
5	A	805	Q5Z	C25-C05-C06	2.63	125.02	120.61
5	A	805	Q5Z	C05-C06-C23	2.48	126.56	122.47
5	A	805	Q5Z	C16-C17-N18	2.48	115.48	110.81
4	A	803	TAR	O11-C1-C2	2.47	120.17	113.31
5	A	806	Q5Z	C20-C19-N18	2.46	115.45	110.81
5	A	806	Q5Z	C05-C06-C23	-2.44	118.45	122.47
4	A	803	TAR	O41-C4-C3	2.43	120.07	113.31
5	A	805	Q5Z	C10-C09-N08	-2.39	120.90	124.27
5	B	603	Q5Z	C20-C19-N18	2.35	115.25	110.81
5	A	805	Q5Z	C09-C10-C11	-2.29	116.25	119.56
5	A	804	Q5Z	C09-N08-C07	2.21	120.52	117.51
5	B	603	Q5Z	C16-C15-C20	2.21	114.48	109.68
5	B	603	Q5Z	C09-N08-C07	2.17	120.46	117.51
4	A	803	TAR	O11-C1-O1	-2.05	119.43	124.08
5	A	805	Q5Z	C07-C06-C05	-2.04	116.62	119.56

There are no chirality outliers.

All (16) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	803	TAR	O1-C1-C2-O2
4	A	803	TAR	O11-C1-C2-O2
4	A	803	TAR	O1-C1-C2-C3
4	A	803	TAR	O11-C1-C2-C3
3	B	601	EDO	O1-C1-C2-O2
4	A	803	TAR	O3-C3-C4-O41
4	A	803	TAR	C2-C3-C4-O41
4	A	803	TAR	C2-C3-C4-O4
5	A	804	Q5Z	C21-C14-C15-C20
4	A	803	TAR	O3-C3-C4-O4
5	A	804	Q5Z	C13-C14-C15-C20
5	A	806	Q5Z	C25-C05-C06-C07
5	A	806	Q5Z	C25-C05-C06-C23
5	A	806	Q5Z	C04-C05-C06-C07
5	B	603	Q5Z	C21-C14-C15-C20

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Mol	Chain	Res	Type	Atoms
5	A	806	Q5Z	C21-C14-C15-C20

There are no ring outliers.

3 monomers are involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	804	Q5Z	1	0
2	B	607	SO4	2	0
4	A	803	TAR	3	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 Q5Z B 603

Bond lengths

Bond angles

Torsions

Rings

Ligand Q5Z A 805

Bond lengths

Bond angles

Torsions

Rings

Ligand Q5Z A 806

Bond lengths

Bond angles

Torsions

Rings

Ligand Q5Z A 804

Bond lengths

Bond angles

Torsions

Rings
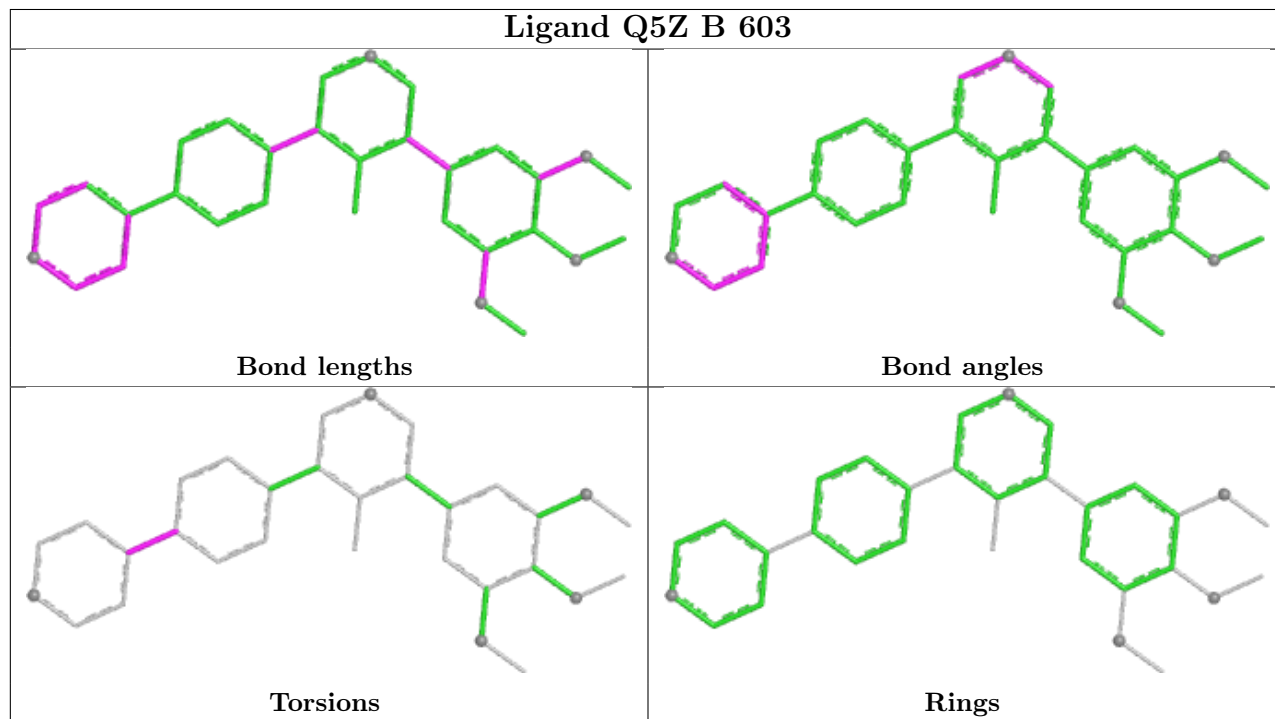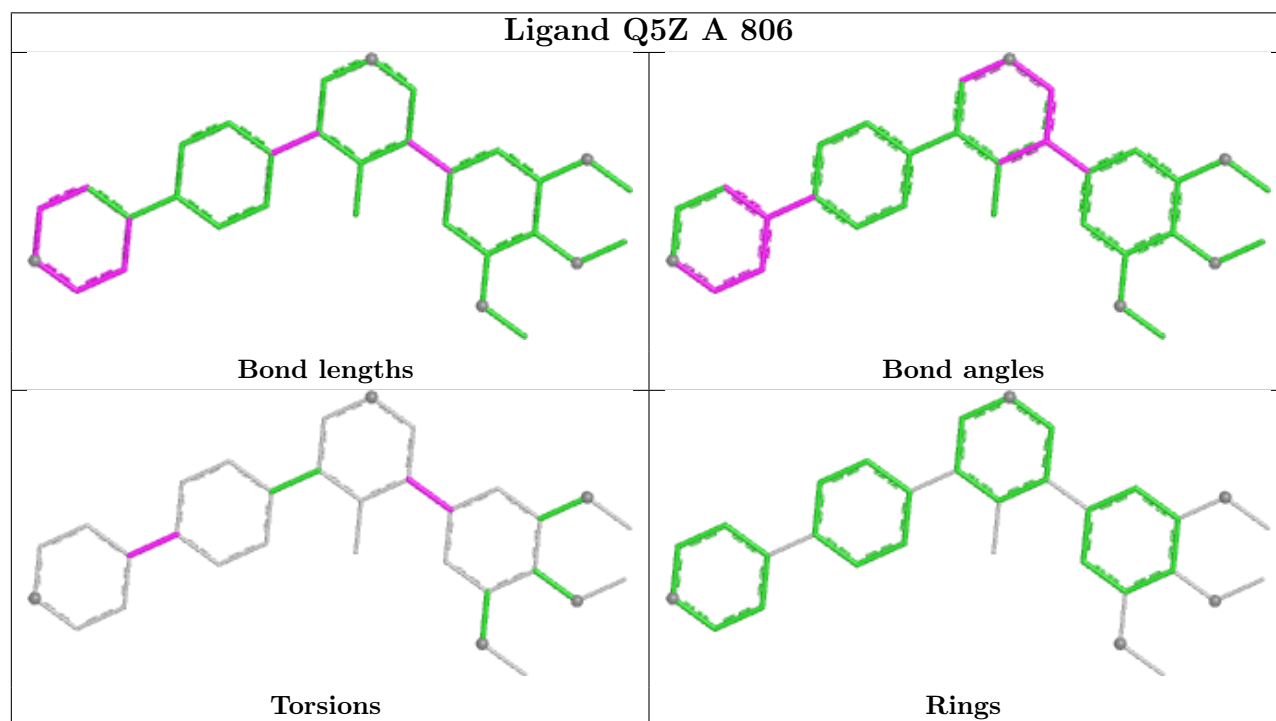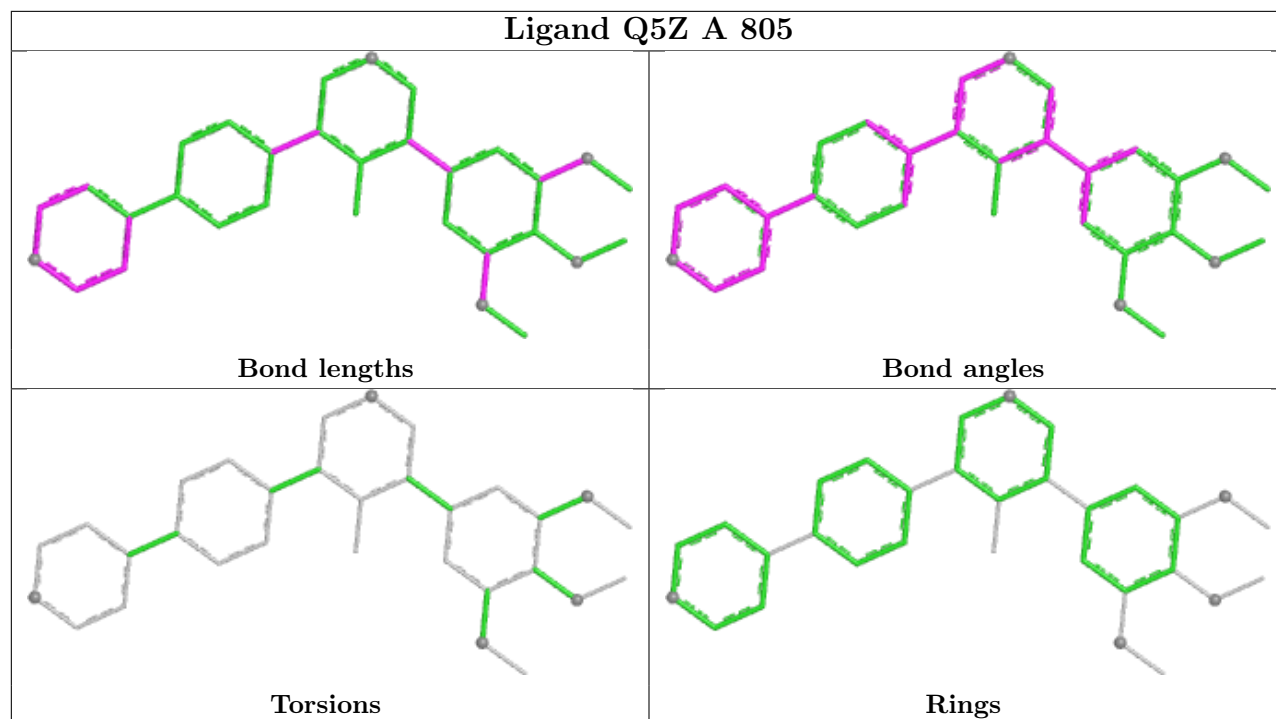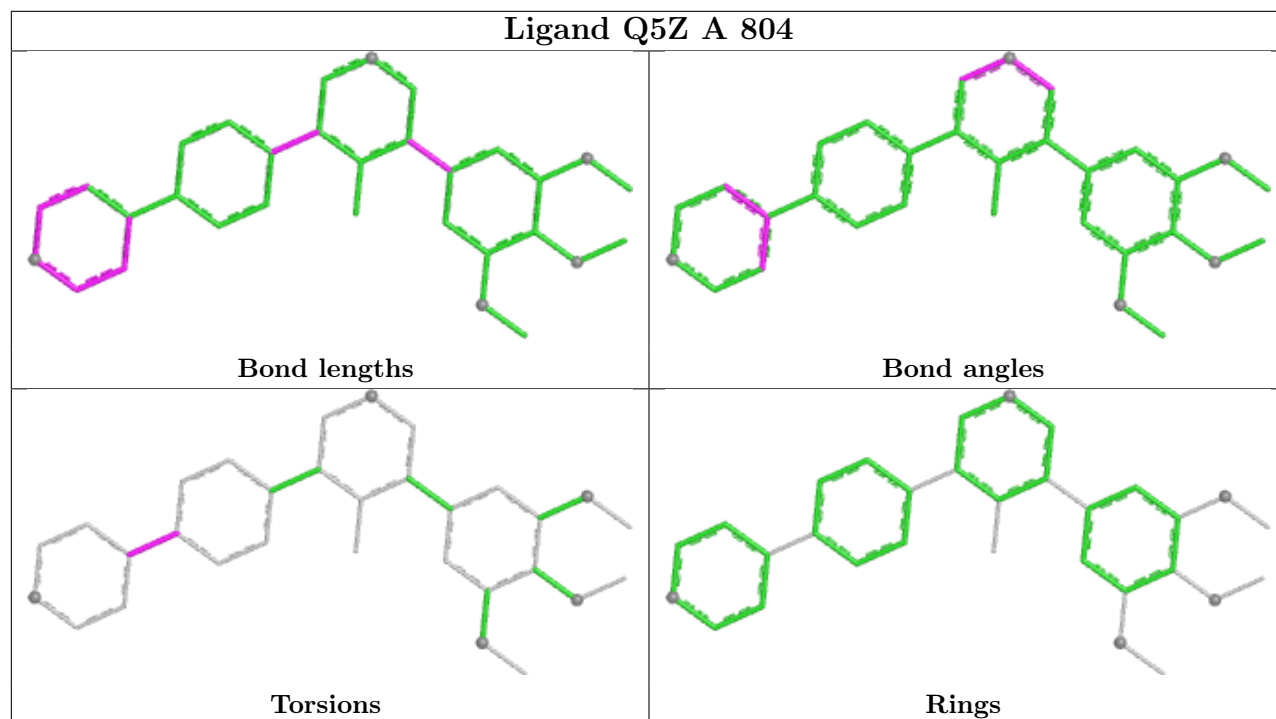
5.7 Other polymers ⓘ

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	286/301 (95%)	0.28	13 (4%)	33	35	10, 17, 40, 65	0
1	B	293/301 (97%)	0.29	11 (3%)	40	42	11, 19, 40, 61	0
All	All	579/602 (96%)	0.28	24 (4%)	37	39	10, 18, 40, 65	0

All (24) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	204	VAL	7.3
1	A	499	ASP	4.4
1	B	372	ASN	4.4
1	A	325	GLY	3.6
1	B	297	LEU	3.5
1	A	324	PHE	3.4
1	A	375	ARG	3.2
1	B	328	GLY	3.2
1	B	227	TRP	3.2
1	A	326	THR	3.1
1	B	370	VAL	3.0
1	B	325	GLY	3.0
1	A	218	ARG	2.8
1	A	394	ASP	2.5
1	A	321[A]	ILE	2.5
1	A	395	CYS	2.5
1	B	374	PRO	2.5
1	B	364	SER	2.4
1	A	362	SER	2.3
1	A	376	VAL	2.3
1	A	393	VAL	2.2
1	A	297	LEU	2.1
1	B	280	TRP	2.1
1	B	324	PHE	2.1

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 ⓘ

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
2	SO4	B	607	5/5	0.87	0.22	25,56,104,138	0
2	SO4	A	807	5/5	0.88	0.16	81,86,87,88	0
3	EDO	B	601	4/4	0.89	0.10	32,42,49,50	0
6	NH4	B	602	1/1	0.89	0.23	38,46,46,46	0
4	TAR	A	803	10/10	0.93	0.17	37,70,153,184	0
3	EDO	A	802	4/4	0.93	0.11	29,35,39,39	0
2	SO4	B	606	5/5	0.94	0.19	44,85,132,135	0
5	Q5Z	A	806	31/31	0.96	0.09	14,19,38,41	0
5	Q5Z	A	805	31/31	0.96	0.09	14,21,38,39	0
5	Q5Z	B	603	31/31	0.97	0.10	13,21,56,59	0
2	SO4	A	801	5/5	0.97	0.09	19,20,22,26	0
2	SO4	A	808	5/5	0.98	0.06	18,20,24,25	0
5	Q5Z	A	804	31/31	0.98	0.08	10,16,44,46	0
2	SO4	B	604	5/5	0.99	0.06	25,25,28,28	0
2	SO4	B	605	5/5	0.99	0.09	17,21,28,28	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 Q5Z A 806:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
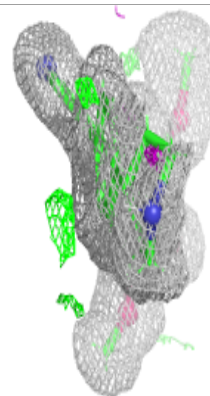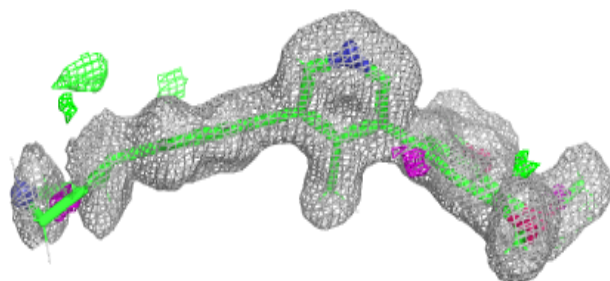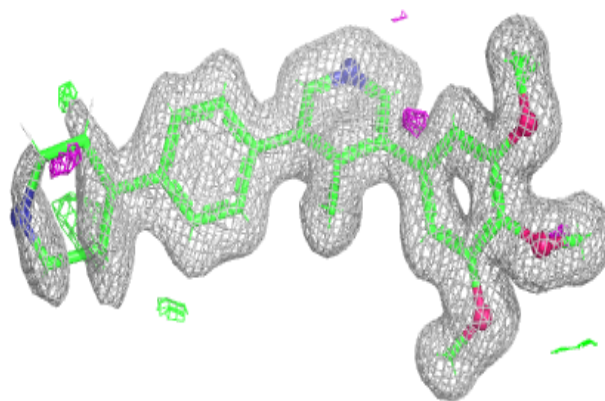and green (positive)
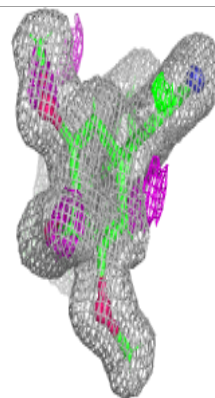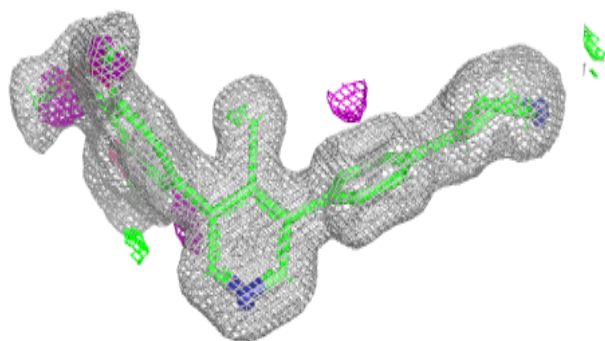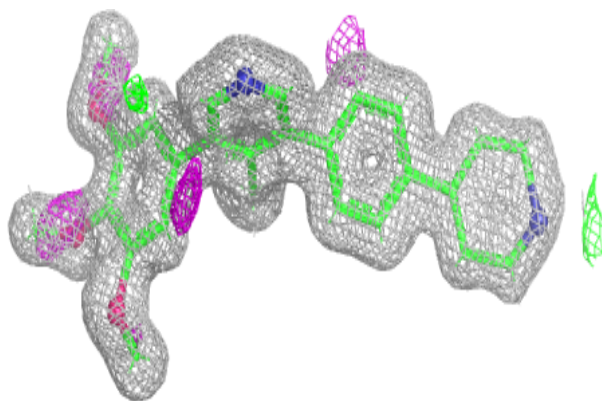
Electron density around Q5Z A 805:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
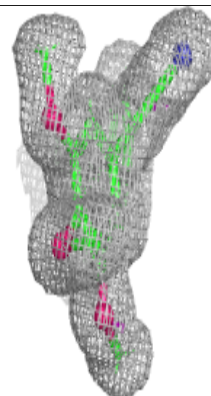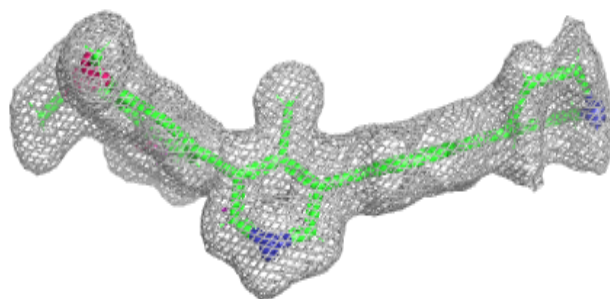mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
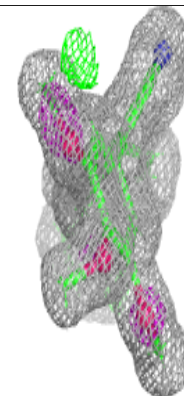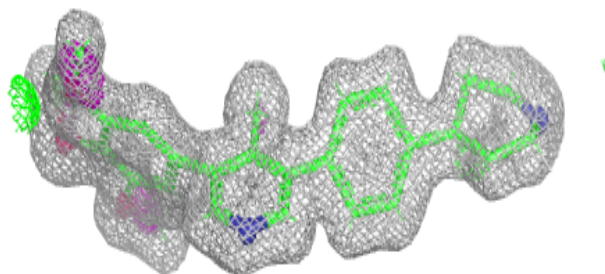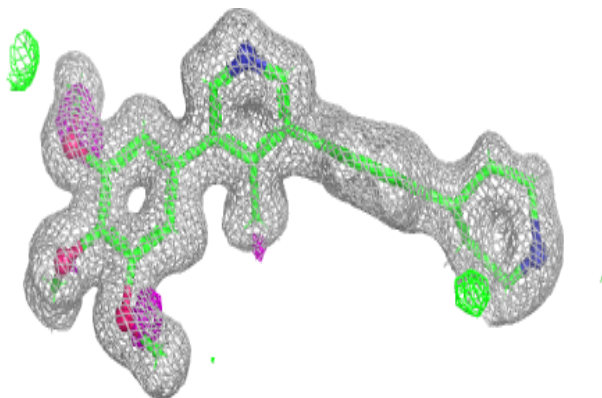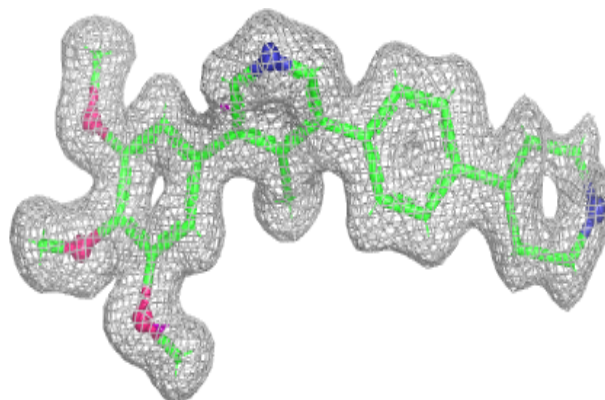
Electron density around Q5Z B 603:

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 Q5Z A 804:

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.