



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 20, 2026 – 05:14 AM UTC

PDB ID : 8U5M / pdb_00008u5m
Title : Structure of Sts-1 HP domain with rebamipide
Authors : Azia, F.; Dey, R.; French, J.B.
Deposited on : 2023-09-12
Resolution : 2.46 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 : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

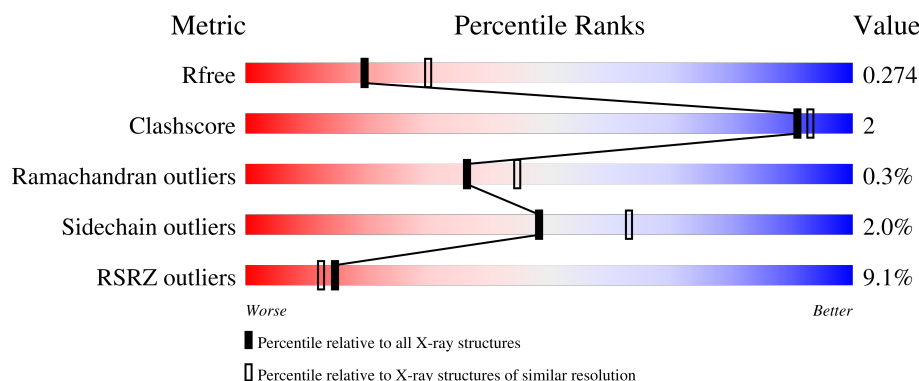
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.46 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}	180053	1190 (2.46-2.46)
Clashscore	190562	1229 (2.46-2.46)
Ramachandran outliers	187476	1218 (2.46-2.46)
Sidechain outliers	187428	1218 (2.46-2.46)
RSRZ outliers	180081	1190 (2.46-2.46)

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	287	<div> <div>3%</div> <div>84%</div> <div>6%</div> <div>10%</div> </div>
1	B	287	<div> <div>3%</div> <div>84%</div> <div>5%</div> <div>10%</div> </div>
1	C	287	<div> <div>4%</div> <div>85%</div> <div>5%</div> <div>10%</div> </div>
1	D	287	<div> <div>6%</div> <div>85%</div> <div>5%</div> <div>10%</div> </div>
1	E	287	<div> <div>17%</div> <div>82%</div> <div>7%</div> <div>10%</div> </div>

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Mol	Chain	Length	Quality of chain
1	F	287	<div><div></div><div>16%</div><div>85%</div><div>5%</div><div>11%</div></div>

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 11736 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 Ubiquitin-associated and SH3 domain-containing protein B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	257	Total	C	N	O	S	0	0	0
			1941	1235	334	357	15			
1	B	257	Total	C	N	O	S	0	0	0
			1949	1241	336	357	15			
1	C	257	Total	C	N	O	S	0	0	0
			1959	1247	339	358	15			
1	D	257	Total	C	N	O	S	0	0	0
			1924	1228	330	352	14			
1	E	257	Total	C	N	O	S	0	0	0
			1864	1184	322	344	14			
1	F	256	Total	C	N	O	S	0	0	0
			1840	1173	311	342	14			

There are 102 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	352	GLN	-	expression tag	UNP Q8TF42
A	353	GLY	-	expression tag	UNP Q8TF42
A	354	HIS	-	expression tag	UNP Q8TF42
A	355	MET	-	expression tag	UNP Q8TF42
A	356	ALA	-	expression tag	UNP Q8TF42
A	357	SER	-	expression tag	UNP Q8TF42
A	358	MET	-	expression tag	UNP Q8TF42
A	359	THR	-	expression tag	UNP Q8TF42
A	360	GLY	-	expression tag	UNP Q8TF42
A	361	GLY	-	expression tag	UNP Q8TF42
A	362	GLN	-	expression tag	UNP Q8TF42
A	363	GLN	-	expression tag	UNP Q8TF42
A	364	MET	-	expression tag	UNP Q8TF42
A	365	GLY	-	expression tag	UNP Q8TF42
A	366	ARG	-	expression tag	UNP Q8TF42
A	367	GLY	-	expression tag	UNP Q8TF42
A	368	SER	-	expression tag	UNP Q8TF42

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Chain	Residue	Modelled	Actual	Comment	Reference
B	352	GLN	-	expression tag	UNP Q8TF42
B	353	GLY	-	expression tag	UNP Q8TF42
B	354	HIS	-	expression tag	UNP Q8TF42
B	355	MET	-	expression tag	UNP Q8TF42
B	356	ALA	-	expression tag	UNP Q8TF42
B	357	SER	-	expression tag	UNP Q8TF42
B	358	MET	-	expression tag	UNP Q8TF42
B	359	THR	-	expression tag	UNP Q8TF42
B	360	GLY	-	expression tag	UNP Q8TF42
B	361	GLY	-	expression tag	UNP Q8TF42
B	362	GLN	-	expression tag	UNP Q8TF42
B	363	GLN	-	expression tag	UNP Q8TF42
B	364	MET	-	expression tag	UNP Q8TF42
B	365	GLY	-	expression tag	UNP Q8TF42
B	366	ARG	-	expression tag	UNP Q8TF42
B	367	GLY	-	expression tag	UNP Q8TF42
B	368	SER	-	expression tag	UNP Q8TF42
C	352	GLN	-	expression tag	UNP Q8TF42
C	353	GLY	-	expression tag	UNP Q8TF42
C	354	HIS	-	expression tag	UNP Q8TF42
C	355	MET	-	expression tag	UNP Q8TF42
C	356	ALA	-	expression tag	UNP Q8TF42
C	357	SER	-	expression tag	UNP Q8TF42
C	358	MET	-	expression tag	UNP Q8TF42
C	359	THR	-	expression tag	UNP Q8TF42
C	360	GLY	-	expression tag	UNP Q8TF42
C	361	GLY	-	expression tag	UNP Q8TF42
C	362	GLN	-	expression tag	UNP Q8TF42
C	363	GLN	-	expression tag	UNP Q8TF42
C	364	MET	-	expression tag	UNP Q8TF42
C	365	GLY	-	expression tag	UNP Q8TF42
C	366	ARG	-	expression tag	UNP Q8TF42
C	367	GLY	-	expression tag	UNP Q8TF42
C	368	SER	-	expression tag	UNP Q8TF42
D	352	GLN	-	expression tag	UNP Q8TF42
D	353	GLY	-	expression tag	UNP Q8TF42
D	354	HIS	-	expression tag	UNP Q8TF42
D	355	MET	-	expression tag	UNP Q8TF42
D	356	ALA	-	expression tag	UNP Q8TF42
D	357	SER	-	expression tag	UNP Q8TF42
D	358	MET	-	expression tag	UNP Q8TF42
D	359	THR	-	expression tag	UNP Q8TF42

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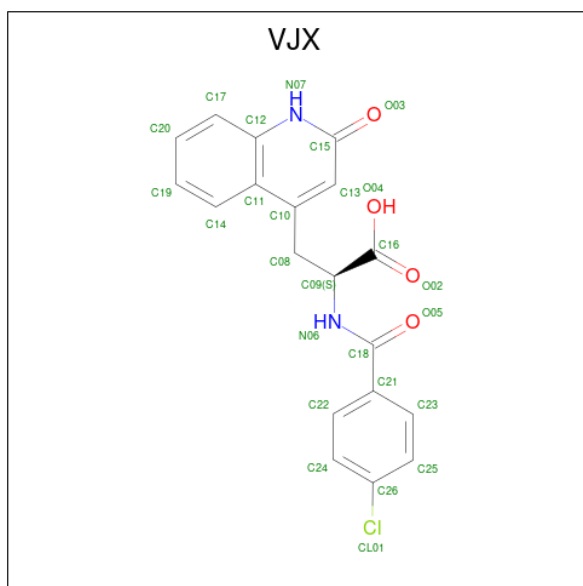
Chain	Residue	Modelled	Actual	Comment	Reference
D	360	GLY	-	expression tag	UNP Q8TF42
D	361	GLY	-	expression tag	UNP Q8TF42
D	362	GLN	-	expression tag	UNP Q8TF42
D	363	GLN	-	expression tag	UNP Q8TF42
D	364	MET	-	expression tag	UNP Q8TF42
D	365	GLY	-	expression tag	UNP Q8TF42
D	366	ARG	-	expression tag	UNP Q8TF42
D	367	GLY	-	expression tag	UNP Q8TF42
D	368	SER	-	expression tag	UNP Q8TF42
E	352	GLN	-	expression tag	UNP Q8TF42
E	353	GLY	-	expression tag	UNP Q8TF42
E	354	HIS	-	expression tag	UNP Q8TF42
E	355	MET	-	expression tag	UNP Q8TF42
E	356	ALA	-	expression tag	UNP Q8TF42
E	357	SER	-	expression tag	UNP Q8TF42
E	358	MET	-	expression tag	UNP Q8TF42
E	359	THR	-	expression tag	UNP Q8TF42
E	360	GLY	-	expression tag	UNP Q8TF42
E	361	GLY	-	expression tag	UNP Q8TF42
E	362	GLN	-	expression tag	UNP Q8TF42
E	363	GLN	-	expression tag	UNP Q8TF42
E	364	MET	-	expression tag	UNP Q8TF42
E	365	GLY	-	expression tag	UNP Q8TF42
E	366	ARG	-	expression tag	UNP Q8TF42
E	367	GLY	-	expression tag	UNP Q8TF42
E	368	SER	-	expression tag	UNP Q8TF42
F	352	GLN	-	expression tag	UNP Q8TF42
F	353	GLY	-	expression tag	UNP Q8TF42
F	354	HIS	-	expression tag	UNP Q8TF42
F	355	MET	-	expression tag	UNP Q8TF42
F	356	ALA	-	expression tag	UNP Q8TF42
F	357	SER	-	expression tag	UNP Q8TF42
F	358	MET	-	expression tag	UNP Q8TF42
F	359	THR	-	expression tag	UNP Q8TF42
F	360	GLY	-	expression tag	UNP Q8TF42
F	361	GLY	-	expression tag	UNP Q8TF42
F	362	GLN	-	expression tag	UNP Q8TF42
F	363	GLN	-	expression tag	UNP Q8TF42
F	364	MET	-	expression tag	UNP Q8TF42
F	365	GLY	-	expression tag	UNP Q8TF42
F	366	ARG	-	expression tag	UNP Q8TF42
F	367	GLY	-	expression tag	UNP Q8TF42

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Chain	Residue	Modelled	Actual	Comment	Reference
F	368	SER	-	expression tag	UNP Q8TF42

- Molecule 2 is Rebamipide (CCD ID: VJX) (formula: $C_{19}H_{15}ClN_2O_4$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total 26	C 19	Cl 1	N 2	O 4	0	0
2	C	1	Total 26	C 19	Cl 1	N 2	O 4	0	0
2	D	1	Total 26	C 19	Cl 1	N 2	O 4	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	45	Total	O	0	0
			45	45		
3	B	39	Total	O	0	0
			39	39		
3	C	41	Total	O	0	0
			41	41		
3	D	26	Total	O	0	0
			26	26		
3	E	14	Total	O	0	0
			14	14		

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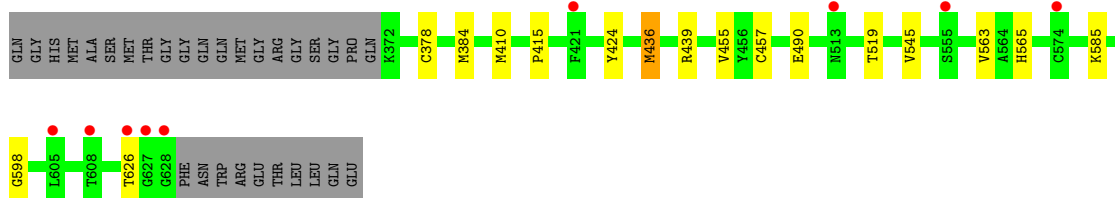
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	F	16	Total	O	0	0
			16	16		

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.

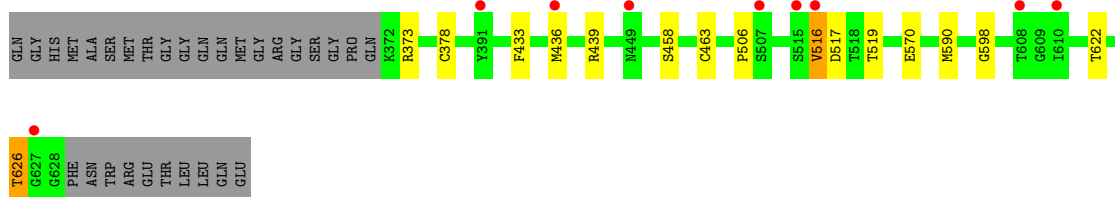
- Molecule 1: Ubiquitin-associated and SH3 domain-containing protein B

Chain A: 




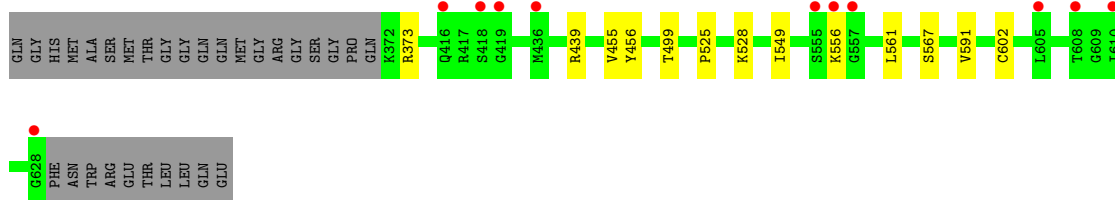
- Molecule 1: Ubiquitin-associated and SH3 domain-containing protein B

Chain B: 




- Molecule 1: Ubiquitin-associated and SH3 domain-containing protein B

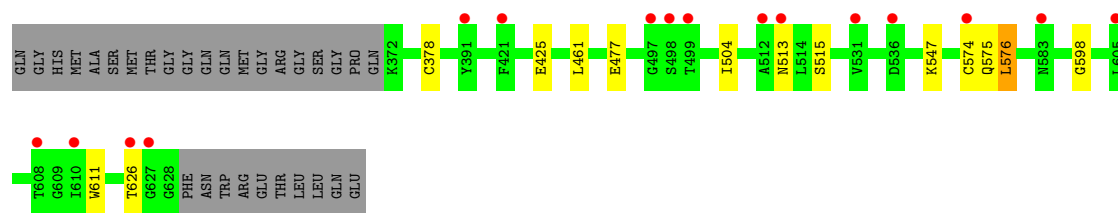
Chain C: 



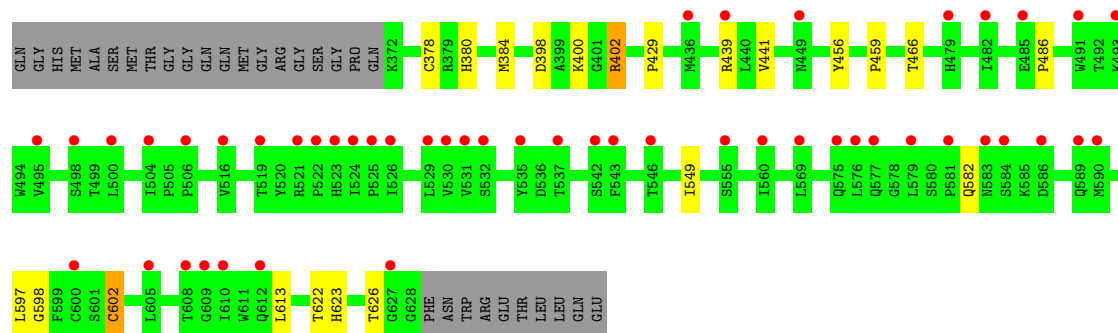
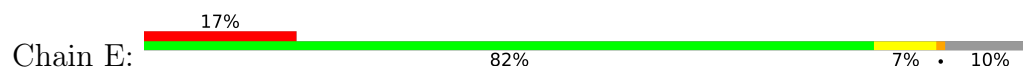
- Molecule 1: Ubiquitin-associated and SH3 domain-containing protein B

Chain D: 

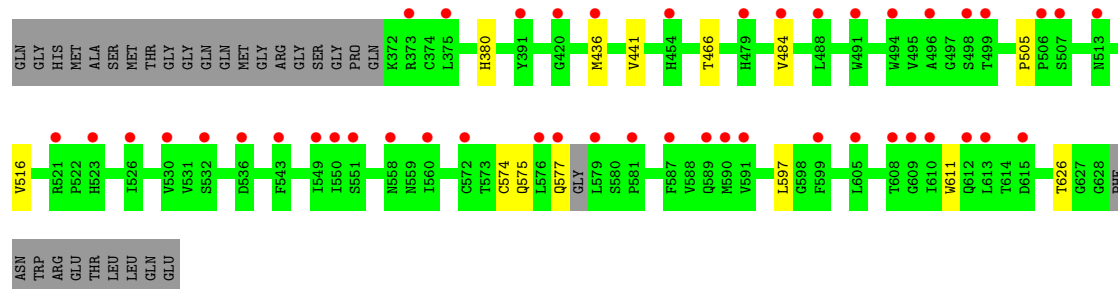
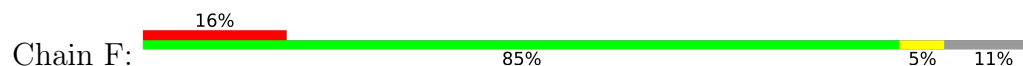




● Molecule 1: Ubiquitin-associated and SH3 domain-containing protein B



● Molecule 1: Ubiquitin-associated and SH3 domain-containing protein B



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	82.65Å 122.27Å 99.59Å 90.00° 112.41° 90.00°	Depositor
Resolution (Å)	73.55 – 2.46 73.55 – 2.46	Depositor EDS
% Data completeness (in resolution range)	98.1 (73.55-2.46) 98.1 (73.55-2.46)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.74 (at 2.45Å)	Xtriage
Refinement program	REFMAC 5.8.0258	Depositor
R, R_{free}	0.229 , 0.274 0.231 , 0.274	Depositor DCC
R_{free} test set	3230 reflections (4.95%)	wwPDB-VP
Wilson B-factor (Å ²)	55.9	Xtriage
Anisotropy	0.282	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 59.0	EDS
L-test for twinning ²	$\langle L \rangle = 0.50$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.006 for h,-k,-h-l	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	11736	wwPDB-VP
Average B, all atoms (Å ²)	63.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.97% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: VJX

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	1.02	0/1989	1.42	0/2715
1	B	1.02	0/1997	1.43	0/2723
1	C	1.02	0/2008	1.42	0/2736
1	D	1.04	0/1974	1.44	0/2699
1	E	1.08	0/1912	1.48	0/2621
1	F	1.07	0/1885	1.50	1/2585 (0.0%)
All	All	1.04	0/11765	1.45	1/16079 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	F	505	PRO	N-CA-CB	5.23	106.12	103.19

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	1941	0	1849	6	0
1	B	1949	0	1871	8	0
1	C	1959	0	1890	4	0
1	D	1924	0	1809	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	1864	0	1695	12	0
1	F	1840	0	1658	6	0
2	A	26	0	0	0	0
2	C	26	0	0	0	0
2	D	26	0	0	0	0
3	A	45	0	0	0	0
3	B	39	0	0	0	0
3	C	41	0	0	0	0
3	D	26	0	0	0	0
3	E	14	0	0	0	0
3	F	16	0	0	0	0
All	All	11736	0	10772	37	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 2.

All (37) 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:E:398:ASP:OD2	1:E:402:ARG:HD3	1.89	0.73
1:A:384:MET:HE1	1:A:410:MET:HG2	1.81	0.61
1:B:626:THR:HG21	1:E:622:THR:HA	1.88	0.56
1:E:378:CYS:HA	1:E:598:GLY:O	2.10	0.52
1:D:574:CYS:SG	1:D:575:GLN:N	2.84	0.50
1:D:378:CYS:HA	1:D:598:GLY:O	2.12	0.50
1:E:384:MET:HG3	1:E:429:PRO:HG2	1.94	0.49
1:E:400:LYS:HB2	1:E:402:ARG:HD2	1.94	0.49
1:B:378:CYS:HA	1:B:598:GLY:O	2.12	0.48
1:A:415:PRO:O	1:A:424:TYR:OH	2.31	0.48
1:F:574:CYS:SG	1:F:575:GLN:N	2.86	0.48
1:C:567:SER:HA	1:C:591:VAL:HG22	1.96	0.47
1:E:380:HIS:HA	1:E:466:THR:HG21	1.97	0.47
1:B:506:PRO:HA	1:B:516:VAL:HG11	1.96	0.47
1:D:513:ASN:O	1:D:513:ASN:CG	2.59	0.46
1:A:457:CYS:HA	1:A:563:VAL:O	2.15	0.46
1:E:602:CYS:SG	1:E:613:LEU:HD23	2.55	0.46
1:F:484:VAL:HG23	1:F:516:VAL:HG13	1.97	0.45
1:A:436:MET:HG3	1:F:436:MET:SD	2.56	0.45
1:B:622:THR:HA	1:E:626:THR:HG21	2.00	0.44
1:E:459:PRO:HD3	1:E:486:PRO:HA	2.00	0.43
1:F:441:VAL:HG21	1:F:597:LEU:HD12	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:441:VAL:HG21	1:E:597:LEU:HD12	1.99	0.43
1:A:378:CYS:HA	1:A:598:GLY:O	2.19	0.42
1:C:456:TYR:CE1	1:C:549:ILE:HG23	2.54	0.42
1:B:433:PHE:CE2	1:E:623:HIS:CD2	3.08	0.42
1:D:576:LEU:HD22	1:D:611:TRP:CD1	2.55	0.42
1:E:456:TYR:CE1	1:E:549:ILE:HG23	2.55	0.42
1:B:570:GLU:CD	1:B:590:MET:HE1	2.45	0.42
1:A:490:GLU:HB3	1:A:565:HIS:CG	2.55	0.41
1:D:461:LEU:HD13	1:D:504:ILE:HD12	2.03	0.41
1:F:577:GLN:HA	1:F:611:TRP:O	2.21	0.41
1:C:525:PRO:HD2	1:C:528:LYS:HG3	2.03	0.41
1:B:517:ASP:OD1	1:B:519:THR:HB	2.21	0.41
1:C:455:VAL:HA	1:C:561:LEU:O	2.21	0.40
1:B:458:SER:HB3	1:B:463:CYS:SG	2.62	0.40
1:F:380:HIS:HA	1:F:466:THR:HG21	2.03	0.40

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	255/287 (89%)	246 (96%)	9 (4%)	0	100	100
1	B	255/287 (89%)	241 (94%)	12 (5%)	2 (1%)	16	20
1	C	255/287 (89%)	245 (96%)	9 (4%)	1 (0%)	30	37
1	D	255/287 (89%)	242 (95%)	12 (5%)	1 (0%)	30	37
1	E	255/287 (89%)	242 (95%)	13 (5%)	0	100	100
1	F	252/287 (88%)	233 (92%)	19 (8%)	0	100	100
All	All	1527/1722 (89%)	1449 (95%)	74 (5%)	4 (0%)	36	45

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	516	VAL
1	C	556	LYS
1	B	373	ARG
1	D	515	SER

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	203/249 (82%)	196 (97%)	7 (3%)	32	47
1	B	205/249 (82%)	202 (98%)	3 (2%)	57	70
1	C	208/249 (84%)	204 (98%)	4 (2%)	50	64
1	D	197/249 (79%)	192 (98%)	5 (2%)	42	56
1	E	182/249 (73%)	178 (98%)	4 (2%)	45	60
1	F	177/249 (71%)	176 (99%)	1 (1%)	78	86
All	All	1172/1494 (78%)	1148 (98%)	24 (2%)	48	63

All (24) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	436	MET
1	A	439	ARG
1	A	455	VAL
1	A	519	THR
1	A	545	VAL
1	A	585	LYS
1	A	626	THR
1	B	436	MET
1	B	439	ARG
1	B	626	THR
1	C	373	ARG
1	C	439	ARG
1	C	499	THR
1	C	602	CYS
1	D	425	GLU

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Mol	Chain	Res	Type
1	D	477	GLU
1	D	547	LYS
1	D	576	LEU
1	D	626	THR
1	E	402	ARG
1	E	439	ARG
1	E	582	GLN
1	E	602	CYS
1	F	626	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	478	ASN
1	B	468	HIS
1	C	476	GLN
1	D	449	ASN
1	D	469	ASN
1	E	558	ASN
1	F	468	HIS
1	F	476	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](#)

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](#)

3 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	VJX	D	701	-	28,28,28	2.50	11 (39%)	37,39,39	2.00	12 (32%)
2	VJX	C	701	-	28,28,28	2.62	13 (46%)	37,39,39	1.96	12 (32%)
2	VJX	A	701	-	28,28,28	2.26	10 (35%)	37,39,39	1.97	11 (29%)

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	VJX	D	701	-	-	4/16/16/16	0/3/3/3
2	VJX	C	701	-	-	2/16/16/16	0/3/3/3
2	VJX	A	701	-	-	2/16/16/16	0/3/3/3

All (34) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	701	VJX	C15-N07	7.10	1.46	1.37
2	C	701	VJX	C15-N07	6.81	1.45	1.37
2	A	701	VJX	C15-N07	6.45	1.45	1.37
2	C	701	VJX	C09-C16	4.80	1.64	1.52
2	C	701	VJX	C21-C18	4.25	1.59	1.50
2	D	701	VJX	C09-C16	4.04	1.62	1.52
2	A	701	VJX	C09-C16	3.98	1.62	1.52
2	A	701	VJX	C13-C15	3.80	1.50	1.42
2	D	701	VJX	C21-C18	3.78	1.58	1.50
2	D	701	VJX	C09-N06	3.33	1.52	1.45
2	C	701	VJX	C08-C09	3.20	1.60	1.53
2	A	701	VJX	C21-C18	3.14	1.57	1.50
2	C	701	VJX	C11-C10	3.10	1.52	1.46
2	C	701	VJX	C18-N06	3.02	1.41	1.34
2	D	701	VJX	C13-C15	2.98	1.48	1.42
2	A	701	VJX	C26-CL01	2.89	1.81	1.74

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	701	VJX	O03-C15	-2.88	1.18	1.24
2	D	701	VJX	C18-N06	2.87	1.40	1.34
2	C	701	VJX	C13-C15	2.86	1.48	1.42
2	C	701	VJX	C26-CL01	2.85	1.81	1.74
2	D	701	VJX	C26-CL01	2.82	1.81	1.74
2	C	701	VJX	C09-N06	2.69	1.51	1.45
2	A	701	VJX	C08-C10	2.64	1.55	1.50
2	D	701	VJX	O03-C15	-2.57	1.19	1.24
2	C	701	VJX	C08-C10	2.56	1.55	1.50
2	D	701	VJX	C11-C10	2.56	1.51	1.46
2	C	701	VJX	C25-C23	2.28	1.42	1.38
2	D	701	VJX	C24-C22	2.24	1.42	1.38
2	A	701	VJX	O03-C15	-2.24	1.20	1.24
2	D	701	VJX	C08-C09	2.13	1.58	1.53
2	C	701	VJX	C24-C22	2.09	1.42	1.38
2	A	701	VJX	C18-N06	2.07	1.39	1.34
2	A	701	VJX	C09-N06	2.07	1.50	1.45
2	A	701	VJX	C11-C10	2.03	1.50	1.46

All (35) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	701	VJX	C15-C13-C10	6.27	125.84	122.51
2	C	701	VJX	C15-C13-C10	6.15	125.78	122.51
2	D	701	VJX	C15-C13-C10	6.15	125.78	122.51
2	A	701	VJX	O03-C15-N07	-4.26	116.80	120.61
2	C	701	VJX	O03-C15-N07	-4.09	116.95	120.61
2	D	701	VJX	O03-C15-N07	-3.83	117.18	120.61
2	C	701	VJX	C14-C11-C12	-3.73	114.60	118.81
2	D	701	VJX	C21-C18-N06	3.64	123.79	117.04
2	D	701	VJX	C14-C11-C12	-3.58	114.77	118.81
2	A	701	VJX	C14-C11-C12	-3.15	115.26	118.81
2	D	701	VJX	O05-C18-C21	-2.98	115.00	120.90
2	C	701	VJX	C21-C18-N06	2.90	122.41	117.04
2	A	701	VJX	O03-C15-C13	2.85	129.39	125.46
2	A	701	VJX	C13-C15-N07	-2.60	113.81	115.89
2	C	701	VJX	O05-C18-C21	-2.58	115.79	120.90
2	A	701	VJX	C24-C22-C21	2.46	123.43	120.80
2	C	701	VJX	C23-C21-C22	-2.42	115.50	118.57
2	A	701	VJX	O04-C16-O02	2.38	129.49	124.08
2	D	701	VJX	C25-C23-C21	2.38	123.35	120.80
2	D	701	VJX	O03-C15-C13	2.36	128.71	125.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	701	VJX	C09-N06-C18	2.31	127.11	121.56
2	D	701	VJX	C23-C21-C22	-2.29	115.65	118.57
2	C	701	VJX	C17-C12-C11	2.25	122.31	119.37
2	D	701	VJX	C13-C15-N07	-2.23	114.11	115.89
2	C	701	VJX	C19-C14-C11	2.22	123.81	119.80
2	D	701	VJX	C17-C12-C11	2.21	122.26	119.37
2	C	701	VJX	O03-C15-C13	2.21	128.51	125.46
2	C	701	VJX	C24-C22-C21	2.18	123.13	120.80
2	A	701	VJX	C21-C18-N06	2.18	121.08	117.04
2	D	701	VJX	O04-C16-O02	2.14	128.93	124.08
2	C	701	VJX	O04-C16-O02	2.11	128.87	124.08
2	C	701	VJX	C25-C23-C21	2.11	123.05	120.80
2	D	701	VJX	C19-C14-C11	2.08	123.56	119.80
2	A	701	VJX	C17-C12-C11	2.06	122.07	119.37
2	A	701	VJX	C23-C21-C22	-2.04	115.97	118.57

There are no chirality outliers.

All (8) torsion outliers are listed below:

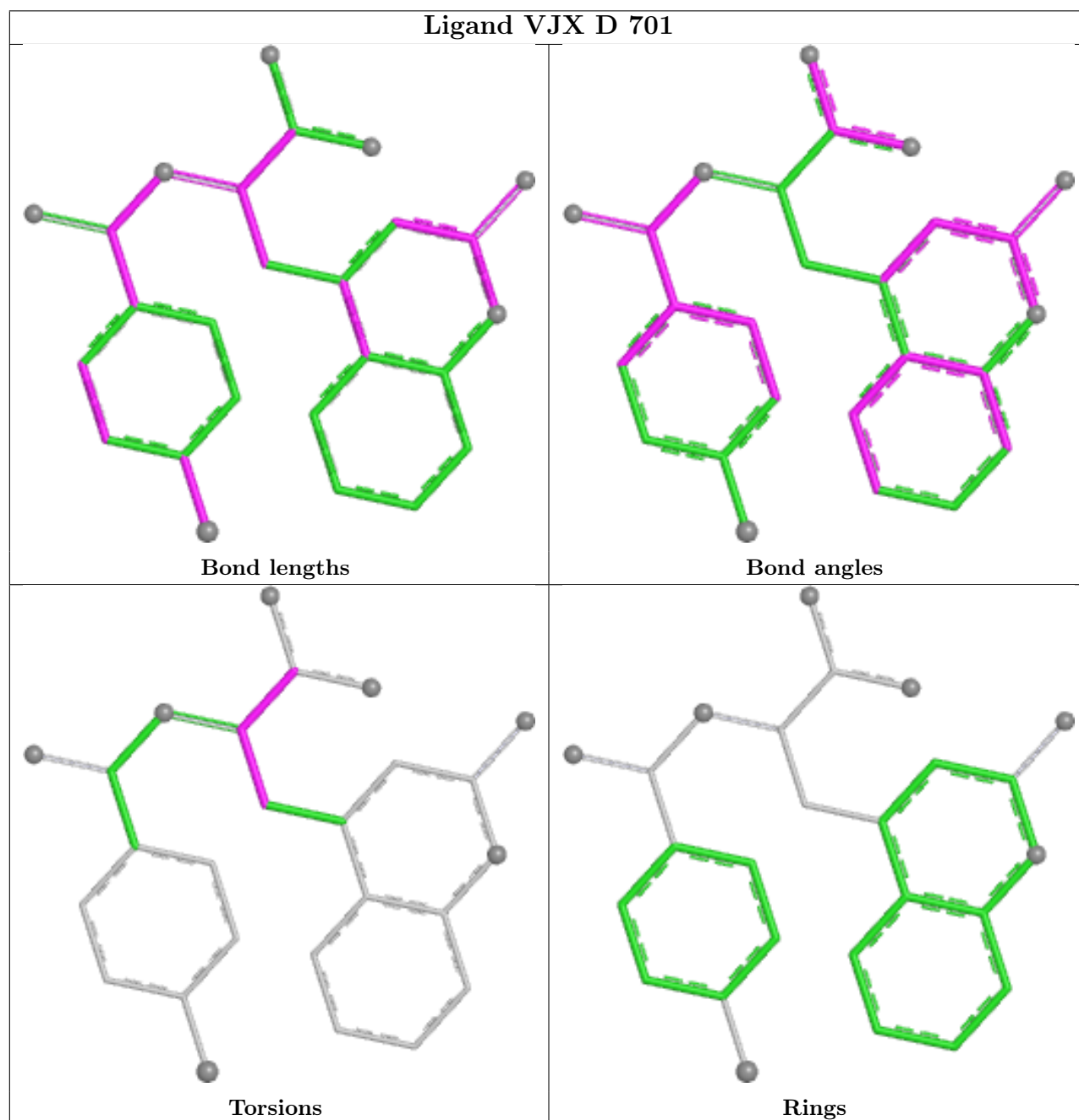
Mol	Chain	Res	Type	Atoms
2	D	701	VJX	C10-C08-C09-C16
2	D	701	VJX	C10-C08-C09-N06
2	C	701	VJX	C10-C08-C09-C16
2	D	701	VJX	C08-C09-C16-O02
2	C	701	VJX	C10-C08-C09-N06
2	A	701	VJX	C08-C09-C16-O02
2	A	701	VJX	C08-C09-C16-O04
2	D	701	VJX	C08-C09-C16-O04

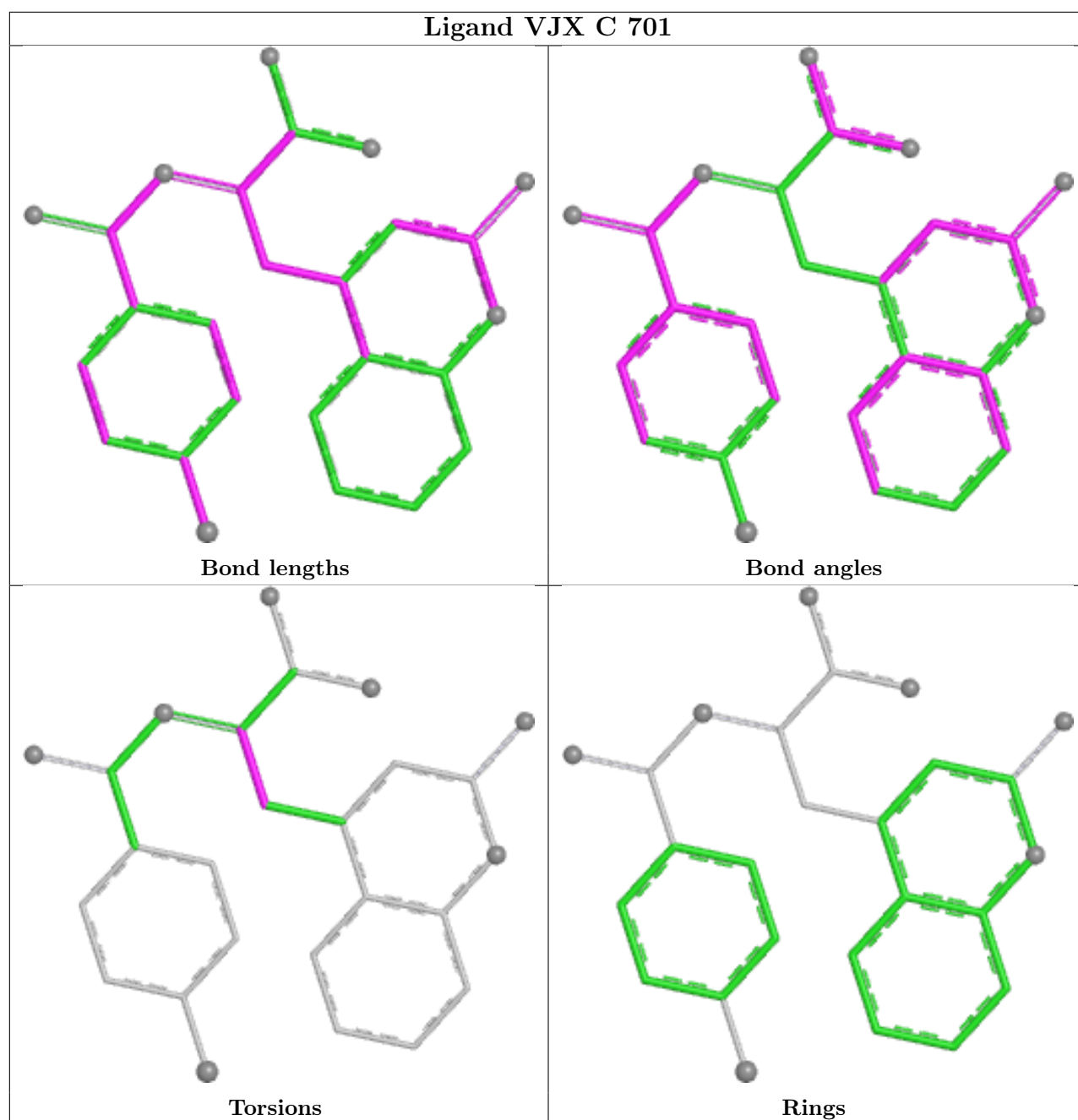
There are no ring outliers.

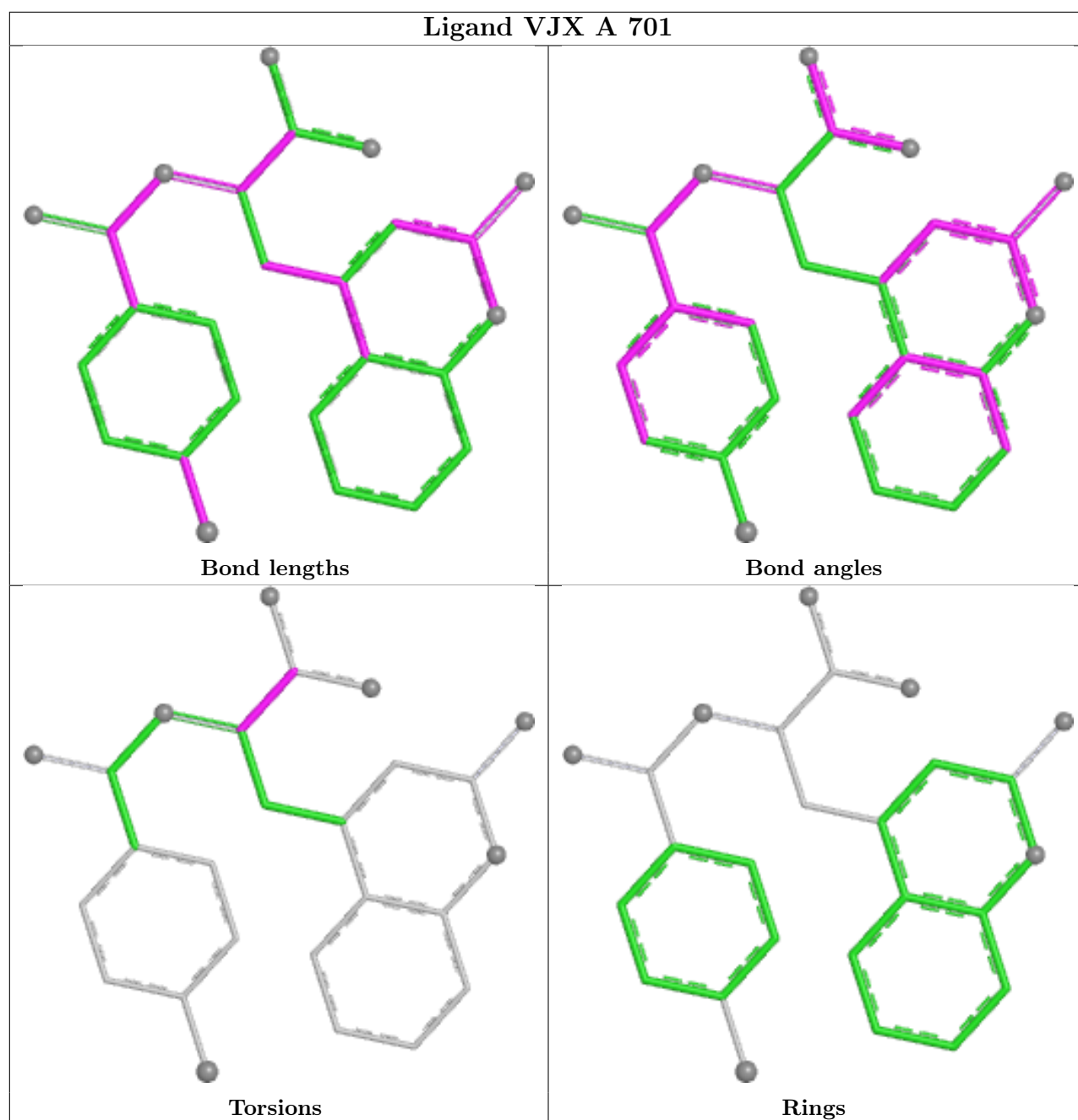
No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier.

The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.







5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 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	257/287 (89%)	0.29	9 (3%) 47 47	35, 51, 72, 95	0
1	B	257/287 (89%)	0.34	9 (3%) 47 47	36, 53, 76, 88	0
1	C	257/287 (89%)	0.46	11 (4%) 40 39	37, 57, 84, 111	0
1	D	257/287 (89%)	0.62	16 (6%) 26 24	43, 62, 91, 107	0
1	E	257/287 (89%)	1.21	50 (19%) 3 2	30, 78, 117, 143	0
1	F	256/287 (89%)	1.24	46 (17%) 3 3	43, 79, 114, 127	0
All	All	1541/1722 (89%)	0.69	141 (9%) 15 12	30, 61, 102, 143	0

All (141) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	608	THR	4.7
1	F	579	LEU	4.0
1	E	581	PRO	3.9
1	B	515	SER	3.7
1	F	605	LEU	3.7
1	E	560	ILE	3.6
1	E	531	VAL	3.6
1	E	576	LEU	3.5
1	E	529	LEU	3.5
1	F	590	MET	3.4
1	F	549	ILE	3.4
1	E	609	GLY	3.4
1	F	491	TRP	3.3
1	F	577	GLN	3.3
1	E	491	TRP	3.3
1	F	613	LEU	3.2
1	E	526	ILE	3.2
1	F	479	HIS	3.2
1	A	608	THR	3.2

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Mol	Chain	Res	Type	RSRZ
1	F	608	THR	3.1
1	C	605	LEU	3.1
1	E	546	THR	3.0
1	E	482	ILE	2.9
1	E	485	GLU	2.9
1	F	612	GLN	2.9
1	E	569	LEU	2.9
1	E	605	LEU	2.9
1	E	543	PHE	2.9
1	E	521	ARG	2.9
1	E	532	SER	2.9
1	A	574	CYS	2.9
1	E	608	THR	2.9
1	E	577	GLN	2.8
1	F	532	SER	2.8
1	D	498	SER	2.8
1	F	513	ASN	2.8
1	F	558	ASN	2.7
1	B	516	VAL	2.7
1	F	576	LEU	2.7
1	F	494	TRP	2.7
1	F	572	CYS	2.7
1	F	526	ILE	2.7
1	F	499	THR	2.7
1	E	589	GLN	2.7
1	F	610	ILE	2.6
1	F	521	ARG	2.6
1	C	418	SER	2.6
1	A	628	GLY	2.6
1	F	560	ILE	2.6
1	F	587	PHE	2.6
1	F	498	SER	2.6
1	F	550	ILE	2.6
1	D	497	GLY	2.6
1	F	420	GLY	2.6
1	F	599	PHE	2.6
1	F	496	ALA	2.6
1	F	436	MET	2.5
1	F	523	HIS	2.5
1	A	605	LEU	2.5
1	A	513	ASN	2.5
1	E	519	THR	2.5

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Mol	Chain	Res	Type	RSRZ
1	E	535	TYR	2.5
1	E	586	ASP	2.5
1	F	551	SER	2.5
1	E	522	PRO	2.5
1	F	506	PRO	2.5
1	E	610	ILE	2.5
1	F	536	ASP	2.5
1	E	612	GLN	2.5
1	F	373	ARG	2.5
1	E	537	THR	2.5
1	E	542	SER	2.5
1	E	555	SER	2.5
1	E	479	HIS	2.4
1	F	591	VAL	2.4
1	E	498	SER	2.4
1	E	600	CYS	2.4
1	F	609	GLY	2.4
1	F	615	ASP	2.4
1	B	391	TYR	2.4
1	E	495	VAL	2.4
1	D	574	CYS	2.4
1	E	579	LEU	2.4
1	F	543	PHE	2.4
1	E	506	PRO	2.4
1	C	610	ILE	2.4
1	D	605	LEU	2.4
1	F	488	LEU	2.4
1	D	421	PHE	2.4
1	F	581	PRO	2.3
1	D	627	GLY	2.3
1	E	504	ILE	2.3
1	F	530	VAL	2.3
1	E	449	ASN	2.3
1	E	500	LEU	2.3
1	E	439	ARG	2.3
1	D	499	THR	2.3
1	C	628	GLY	2.3
1	C	436	MET	2.3
1	D	512	ALA	2.2
1	D	608	THR	2.2
1	A	627	GLY	2.2
1	F	507	SER	2.2

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Mol	Chain	Res	Type	RSRZ
1	E	516	VAL	2.2
1	B	610	ILE	2.2
1	E	584	SER	2.2
1	E	575	GLN	2.2
1	B	436	MET	2.2
1	B	627	GLY	2.2
1	E	436	MET	2.2
1	B	449	ASN	2.2
1	D	583	ASN	2.2
1	D	626	THR	2.2
1	F	375	LEU	2.2
1	C	555	SER	2.2
1	D	536	ASP	2.2
1	A	421	PHE	2.2
1	E	583	ASN	2.1
1	B	608	THR	2.1
1	C	557	GLY	2.1
1	E	524	ILE	2.1
1	F	391	TYR	2.1
1	D	513	ASN	2.1
1	C	419	GLY	2.1
1	C	416	GLN	2.1
1	F	484	VAL	2.1
1	F	589	GLN	2.1
1	A	626	THR	2.1
1	E	627	GLY	2.1
1	E	493	LYS	2.1
1	A	555	SER	2.1
1	E	525	PRO	2.1
1	D	531	VAL	2.1
1	D	610	ILE	2.1
1	E	590	MET	2.1
1	F	454	HIS	2.1
1	E	523	HIS	2.0
1	E	530	VAL	2.0
1	C	556	LYS	2.0
1	B	507	SER	2.0
1	D	391	TYR	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 oligosaccharides in this entry.

6.4 Ligands [i](#)

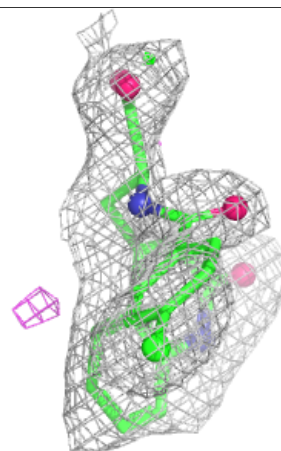
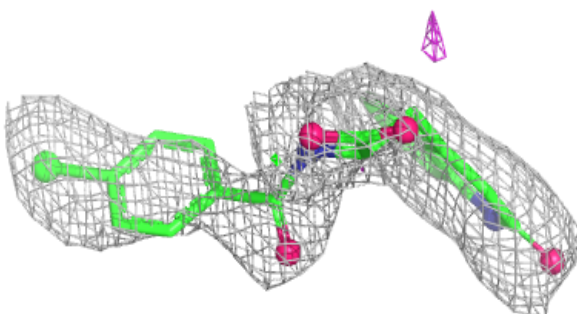
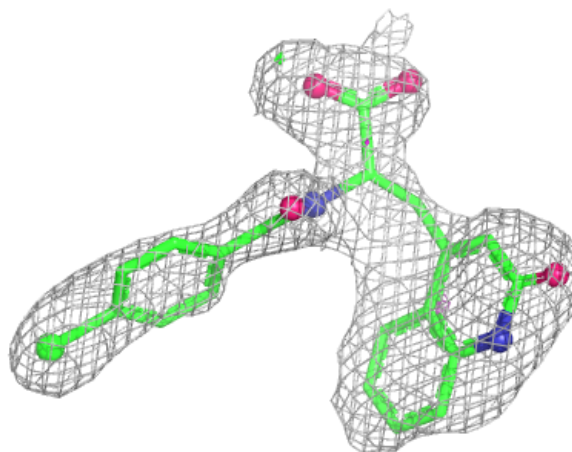
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q<0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	VJX	C	701	26/26	0.82	0.15	62,70,72,75	0
2	VJX	D	701	26/26	0.83	0.13	67,77,80,82	0
2	VJX	A	701	26/26	0.85	0.12	50,63,66,68	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.

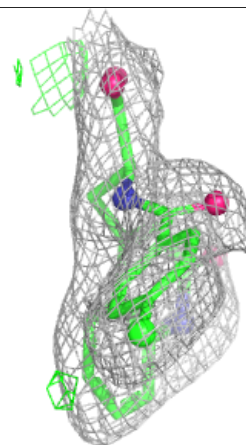
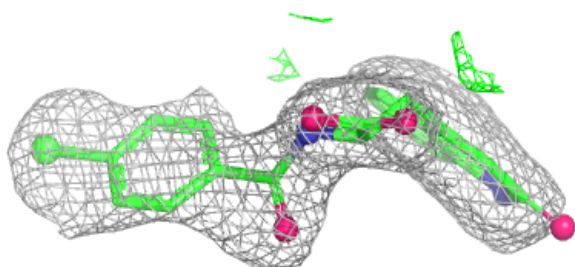
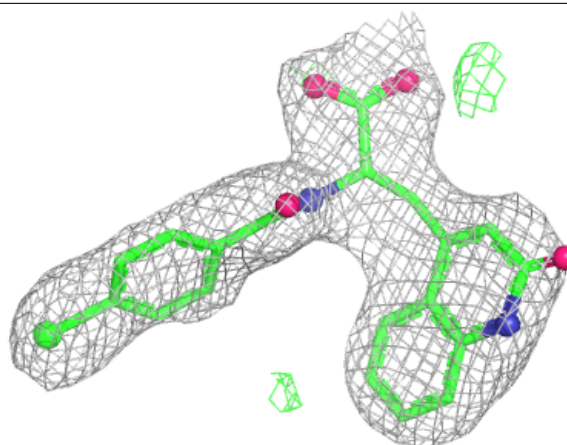
Electron density around VJX C 701:

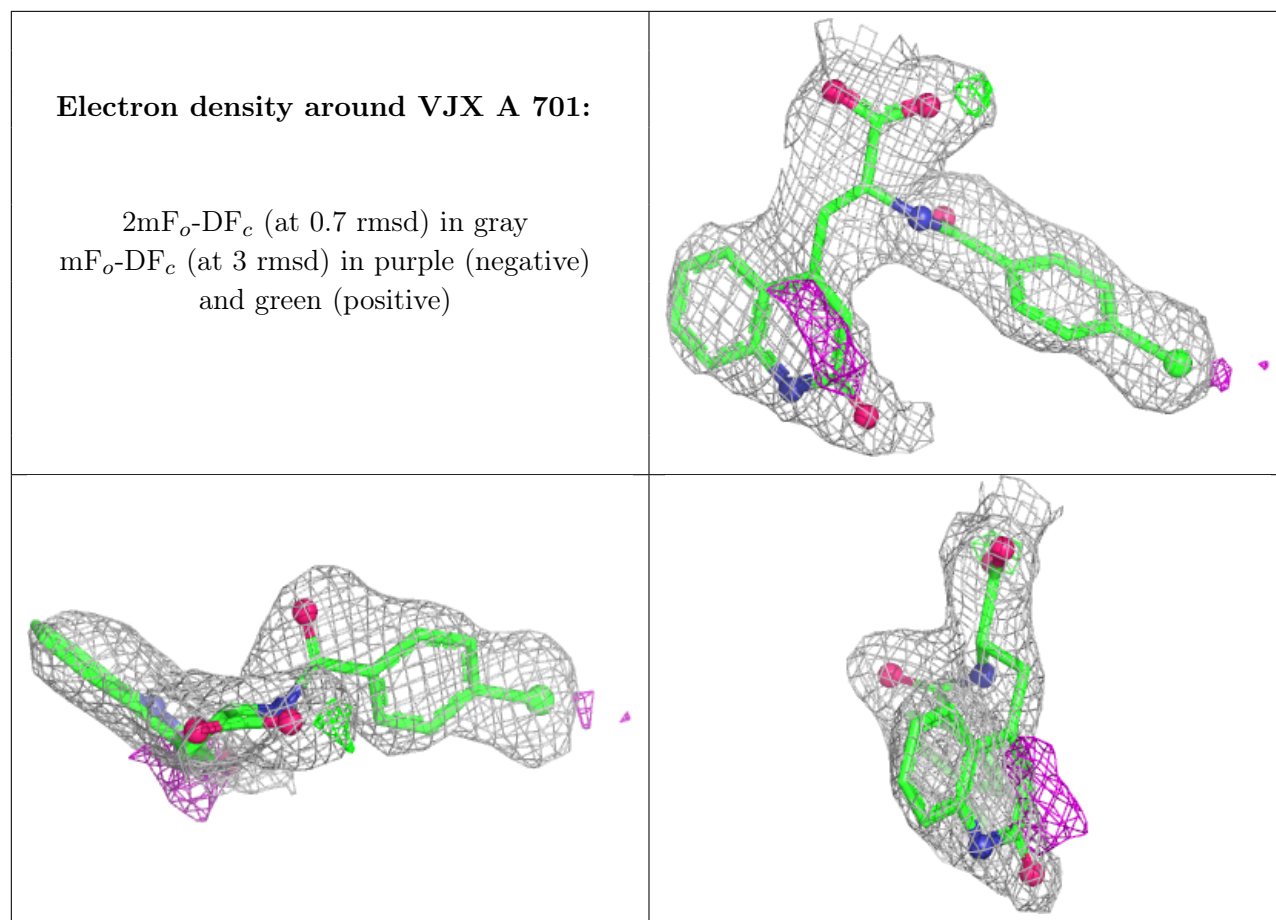
2mF_o-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around VJX D 701:

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





6.5 Other polymers ⓘ

There are no such residues in this entry.