



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 6, 2026 – 09:17 PM UTC

PDB ID : 2WRM / pdb_00002wrn
Title : Identification of Novel Allosteric Inhibitors of Hepatitis C Virus NS5B Polymerase Thumb Domain (Site II) by Structure-Based Design
Authors : Di Marco, S.
Deposited on : 2009-09-01
Resolution : 1.95 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

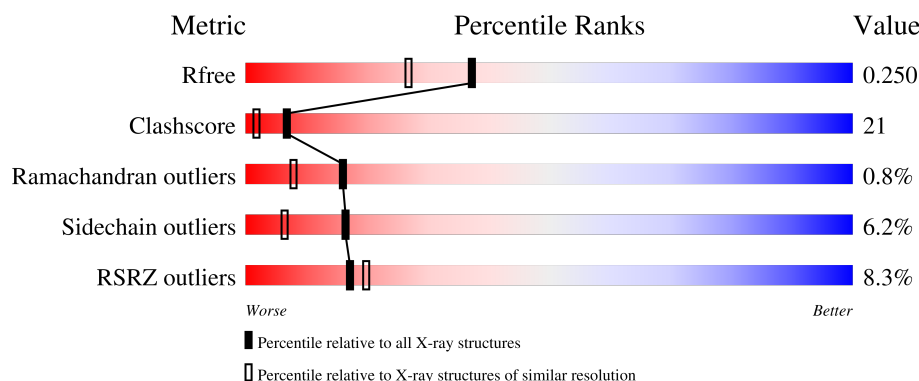
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.95 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	3494 (1.96-1.96)
Clashscore	190562	3612 (1.96-1.96)
Ramachandran outliers	187476	3587 (1.96-1.96)
Sidechain outliers	187428	3587 (1.96-1.96)
RSRZ outliers	180081	3495 (1.96-1.96)

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	536	8% 79% 12% • • •

2 Entry composition [i](#)

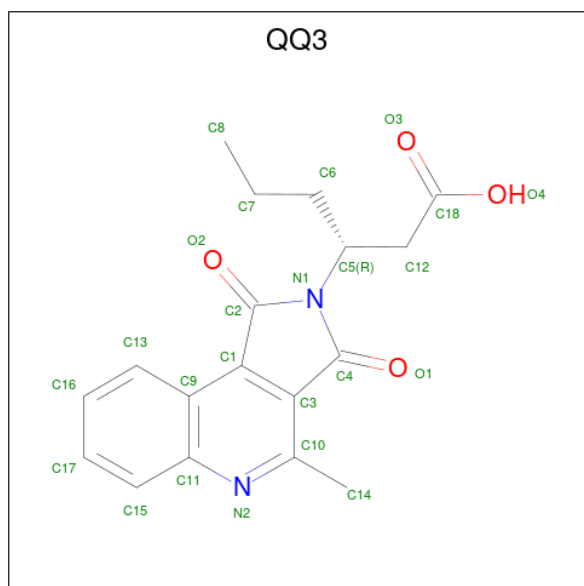
There are 3 unique types of molecules in this entry. The entry contains 4835 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 RNA-DIRECTED RNA POLYMERASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	531	Total	C	N	O	S	130	2	0
			4137	2605	733	768	31			

- Molecule 2 is (3R)-3-(4-METHYL-1,3-DIOXO-1,3-DIHYDRO-2H-PYRROLO[3,4-C]QUINOLIN-2-YL)HEXANOIC ACID (CCD ID: QQ3) (formula: C₁₈H₁₈N₂O₄).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	N	O	0	0
			24	18	2	4		
2	A	1	Total	C	N	O	0	0
			24	18	2	4		
2	A	1	Total	C	N	O	0	0
			21	17	2	2		

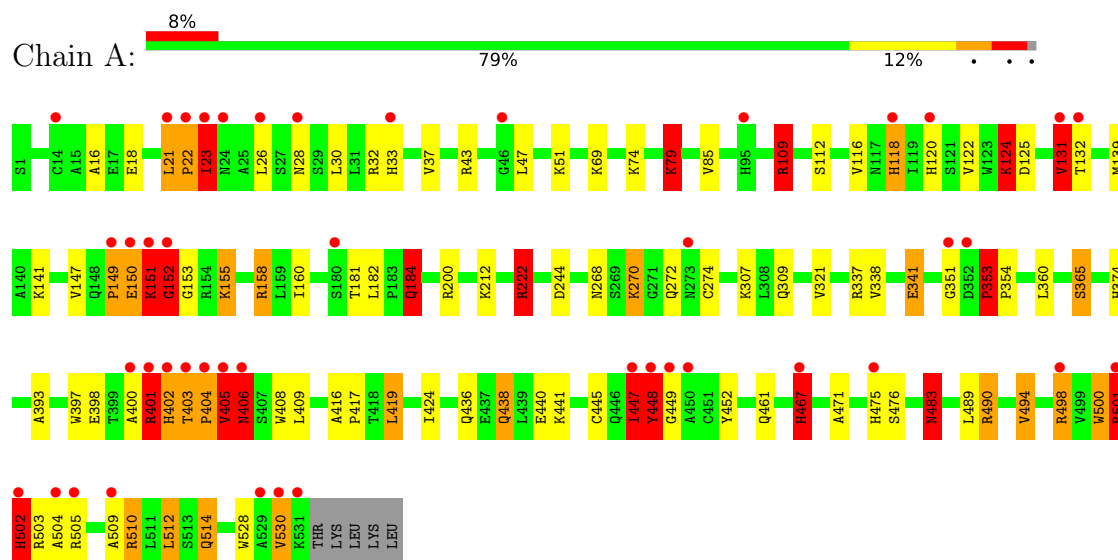
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	629	Total 629	O 629	0	0

3 Residue-property plots [i](#)

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

• Molecule 1: RNA-DIRECTED RNA POLYMERASE



4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	66.76Å 96.17Å 95.68Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	20.00 – 1.95 20.00 – 1.95	Depositor EDS
% Data completeness (in resolution range)	99.5 (20.00-1.95) 99.4 (20.00-1.95)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	5.01 (at 1.94Å)	Xtriage
Refinement program	REFMAC 5.1.24	Depositor
R, R_{free}	0.189 , 0.244 0.199 , 0.250	Depositor DCC
R_{free} test set	1840 reflections (4.05%)	wwPDB-VP
Wilson B-factor (Å ²)	19.0	Xtriage
Anisotropy	0.494	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.35 , 55.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.33$	Xtriage
Estimated twinning fraction	0.013 for -h,l,k	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	4835	wwPDB-VP
Average B, all atoms (Å ²)	24.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.12% 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: QQ3

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	19.07	85/4231 (2.0%)	4.20	131/5740 (2.3%)

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	23

All (85) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	502	HIS	CE1-NE2	652.34	7.84	1.32
1	A	502	HIS	ND1-CE1	574.32	7.06	1.32
1	A	222	ARG	CD-NE	435.78	7.56	1.46
1	A	405	VAL	CB-CG1	400.09	14.72	1.52
1	A	222	ARG	NE-CZ	367.56	5.37	1.33
1	A	150	GLU	CA-C	285.50	5.49	1.52
1	A	401	ARG	CZ-NH1	260.84	4.97	1.32
1	A	152	GLY	N-CA	188.11	4.18	1.45
1	A	124	LYS	CE-NZ	109.57	4.78	1.49
1	A	184	GLN	CD-OE1	91.76	2.97	1.23
1	A	502	HIS	CD2-NE2	86.90	2.33	1.37
1	A	109	ARG	NE-CZ	84.09	2.25	1.33
1	A	448	TYR	CZ-OH	78.58	3.03	1.38
1	A	22	PRO	CA-C	77.23	2.62	1.52
1	A	402	HIS	CE1-NE2	74.46	2.07	1.32
1	A	404	PRO	N-CD	70.94	2.47	1.47
1	A	448	TYR	CD1-CE1	69.51	3.47	1.38
1	A	448	TYR	CD2-CE2	68.78	3.44	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	184	GLN	CD-NE2	67.72	2.75	1.33
1	A	152	GLY	CA-C	66.74	2.46	1.51
1	A	222	ARG	CZ-NH1	62.69	2.20	1.32
1	A	404	PRO	CA-CB	62.48	2.43	1.53
1	A	405	VAL	CA-CB	-57.42	0.76	1.54
1	A	32	ARG	NE-CZ	52.52	1.90	1.33
1	A	109	ARG	CG-CD	48.90	2.99	1.52
1	A	402	HIS	ND1-CE1	43.15	1.75	1.32
1	A	23	ILE	CA-C	38.44	2.01	1.52
1	A	483	ASN	CG-ND2	36.76	2.10	1.33
1	A	32	ARG	CD-NE	-36.26	0.95	1.46
1	A	402	HIS	CD2-NE2	-34.30	1.00	1.37
1	A	28	ASN	CB-CG	32.00	2.32	1.52
1	A	149	PRO	C-N	-31.73	0.85	1.33
1	A	502	HIS	CG-ND1	31.56	1.73	1.38
1	A	155	LYS	CD-CE	31.19	2.46	1.52
1	A	490	ARG	CD-NE	28.72	1.86	1.46
1	A	43	ARG	CG-CD	23.74	2.23	1.52
1	A	151	LYS	CG-CD	21.23	2.16	1.52
1	A	69	LYS	CE-NZ	-21.07	0.86	1.49
1	A	448	TYR	CG-CD2	18.73	1.78	1.39
1	A	402	HIS	CG-ND1	16.61	1.56	1.38
1	A	147	VAL	CB-CG1	-16.50	0.98	1.52
1	A	272	GLN	CD-NE2	16.29	1.67	1.33
1	A	18	GLU	CG-CD	16.04	1.92	1.52
1	A	490	ARG	CZ-NH2	14.87	1.52	1.33
1	A	51	LYS	CE-NZ	14.79	1.93	1.49
1	A	32	ARG	CZ-NH1	14.55	1.53	1.32
1	A	270	LYS	CG-CD	-14.50	1.08	1.52
1	A	438	GLN	CD-OE1	14.23	1.50	1.23
1	A	307	LYS	CE-NZ	-12.94	1.10	1.49
1	A	51	LYS	CG-CD	-12.86	1.13	1.52
1	A	16	ALA	CA-CB	-12.83	1.31	1.53
1	A	149	PRO	N-CD	-12.59	1.30	1.47
1	A	440	GLU	CD-OE1	-12.38	1.01	1.25
1	A	74	LYS	CE-NZ	12.10	1.85	1.49
1	A	212	LYS	CE-NZ	11.80	1.84	1.49
1	A	512	LEU	CG-CD1	-10.80	1.17	1.52
1	A	467	HIS	CG-CD2	-10.48	1.24	1.35
1	A	79	LYS	CD-CE	-9.87	1.22	1.52
1	A	149	PRO	CB-CG	-9.74	1.00	1.49
1	A	365	SER	CB-OG	-9.66	1.22	1.42

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	109	ARG	CZ-NH2	-9.47	1.21	1.33
1	A	440	GLU	CD-OE2	9.31	1.43	1.25
1	A	79	LYS	CG-CD	8.96	1.79	1.52
1	A	353	PRO	CB-CG	-8.78	1.05	1.49
1	A	502	HIS	CA-CB	8.62	1.68	1.53
1	A	467	HIS	CG-ND1	-8.38	1.29	1.38
1	A	158	ARG	NE-CZ	8.33	1.42	1.33
1	A	436	GLN	CD-NE2	-8.25	1.16	1.33
1	A	494	VAL	CB-CG2	7.96	1.78	1.52
1	A	467	HIS	CE1-NE2	7.72	1.40	1.32
1	A	514	GLN	CD-OE1	7.49	1.37	1.23
1	A	419	LEU	CG-CD1	7.48	1.77	1.52
1	A	447	ILE	CB-CG2	7.41	1.76	1.52
1	A	502	HIS	CA-C	7.38	1.62	1.52
1	A	270	LYS	CD-CE	7.01	1.73	1.52
1	A	26	LEU	CG-CD1	-6.73	1.30	1.52
1	A	402	HIS	CA-CB	6.58	1.64	1.53
1	A	441	LYS	CG-CD	6.57	1.72	1.52
1	A	490	ARG	NE-CZ	-6.55	1.25	1.33
1	A	467	HIS	CD2-NE2	-6.53	1.30	1.37
1	A	155	LYS	CG-CD	-6.26	1.33	1.52
1	A	530	VAL	CB-CG2	-6.23	1.31	1.52
1	A	502	HIS	N-CA	6.10	1.54	1.46
1	A	47	LEU	CB-CG	5.57	1.64	1.53
1	A	158	ARG	CZ-NH1	5.06	1.39	1.32

All (131) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	401	ARG	NE-CZ-NH1	-89.35	32.15	121.50
1	A	502	HIS	ND1-CE1-NE2	-87.84	20.56	108.40
1	A	222	ARG	CD-NE-CZ	-82.51	8.89	124.40
1	A	184	GLN	OE1-CD-NE2	-76.31	46.29	122.60
1	A	448	TYR	CG-CD2-CE2	-74.97	8.75	121.20
1	A	109	ARG	CD-NE-CZ	-71.65	24.09	124.40
1	A	23	ILE	CA-C-O	-66.80	37.28	120.78
1	A	222	ARG	NE-CZ-NH2	-63.23	62.30	119.20
1	A	222	ARG	NE-CZ-NH1	-55.87	65.63	121.50
1	A	448	TYR	CD1-CE1-CZ	-53.67	22.99	119.60
1	A	222	ARG	NH1-CZ-NH2	-51.60	52.22	119.30
1	A	405	VAL	O-C-N	-48.87	61.49	122.57
1	A	419	LEU	CD1-CG-CD2	-43.70	14.67	110.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	404	PRO	N-CA-CB	-43.60	54.60	103.44
1	A	402	HIS	CA-CB-CG	-42.45	71.35	113.80
1	A	152	GLY	CA-C-O	-40.34	50.38	120.57
1	A	149	PRO	O-C-N	-40.14	67.71	122.30
1	A	28	ASN	CB-CG-ND2	-39.65	56.92	116.40
1	A	467	HIS	CG-CD2-NE2	-35.26	71.94	107.20
1	A	402	HIS	N-CA-CB	-31.87	64.79	110.36
1	A	502	HIS	CE1-NE2-CD2	-30.46	78.54	109.00
1	A	448	TYR	CZ-CE2-CD2	29.36	172.45	119.60
1	A	467	HIS	CG-ND1-CE1	-29.06	59.89	109.30
1	A	402	HIS	CE1-NE2-CD2	-27.15	81.85	109.00
1	A	151	LYS	CG-CD-CE	-27.04	49.11	111.30
1	A	404	PRO	CA-N-CD	26.96	149.75	112.00
1	A	502	HIS	CG-ND1-CE1	-26.55	64.16	109.30
1	A	28	ASN	CB-CG-OD1	-26.51	67.78	120.80
1	A	405	VAL	CA-CB-CG1	26.48	155.41	110.40
1	A	353	PRO	N-CA-CB	-25.90	77.96	103.08
1	A	222	ARG	CG-CD-NE	25.17	167.38	112.00
1	A	23	ILE	N-CA-C	24.68	160.66	109.34
1	A	124	LYS	CD-CE-NZ	-22.89	38.66	111.90
1	A	109	ARG	CG-CD-NE	-22.86	61.72	112.00
1	A	447	ILE	CG1-CB-CG2	-22.07	44.48	110.70
1	A	353	PRO	CA-CB-CG	21.98	146.26	104.50
1	A	158	ARG	NE-CZ-NH1	-21.04	100.47	121.50
1	A	502	HIS	N-CA-CB	-20.79	75.36	110.49
1	A	502	HIS	CG-CD2-NE2	-19.40	87.80	107.20
1	A	405	VAL	CG1-CB-CG2	-19.03	68.94	110.80
1	A	272	GLN	OE1-CD-NE2	-18.53	104.07	122.60
1	A	405	VAL	CB-CA-C	18.50	141.63	111.29
1	A	150	GLU	CA-C-O	-18.18	98.59	118.77
1	A	467	HIS	CB-CG-CD2	-18.13	107.63	131.20
1	A	447	ILE	CA-CB-CG2	-17.84	80.18	110.50
1	A	184	GLN	CG-CD-OE1	-17.36	86.07	120.80
1	A	270	LYS	CB-CG-CD	16.90	150.18	111.30
1	A	490	ARG	CD-NE-CZ	-16.81	100.86	124.40
1	A	402	HIS	CG-ND1-CE1	-16.72	80.88	109.30
1	A	530	VAL	CA-CB-CG1	-16.38	82.56	110.40
1	A	23	ILE	CB-CA-C	-16.21	84.70	111.29
1	A	22	PRO	CB-CA-C	15.94	137.86	111.56
1	A	448	TYR	CG-CD1-CE1	-15.87	97.40	121.20
1	A	150	GLU	CB-CA-C	-15.80	82.47	109.02
1	A	79	LYS	CD-CE-NZ	15.67	162.03	111.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	483	ASN	CB-CG-ND2	-14.97	93.95	116.40
1	A	184	GLN	CG-CD-NE2	-14.97	93.95	116.40
1	A	402	HIS	CG-CD2-NE2	14.85	122.05	107.20
1	A	131	VAL	CG1-CB-CG2	14.57	142.86	110.80
1	A	405	VAL	CA-CB-CG2	14.51	135.07	110.40
1	A	155	LYS	CD-CE-NZ	-14.41	65.78	111.90
1	A	438	GLN	OE1-CD-NE2	-14.41	108.19	122.60
1	A	404	PRO	N-CD-CG	-14.40	81.60	103.20
1	A	109	ARG	CB-CG-CD	-14.19	78.67	111.30
1	A	79	LYS	CG-CD-CE	14.16	143.86	111.30
1	A	467	HIS	CB-CG-ND1	-14.13	101.50	122.70
1	A	514	GLN	CG-CD-OE1	-14.01	92.78	120.80
1	A	530	VAL	CA-CB-CG2	-13.77	87.00	110.40
1	A	502	HIS	CA-CB-CG	-13.55	100.25	113.80
1	A	272	GLN	CG-CD-NE2	13.44	136.55	116.40
1	A	404	PRO	CA-CB-CG	13.38	129.92	104.50
1	A	18	GLU	CG-CD-OE1	12.96	148.20	118.40
1	A	149	PRO	CA-C-N	12.86	142.43	122.24
1	A	149	PRO	C-N-CA	12.86	142.43	122.24
1	A	436	GLN	OE1-CD-NE2	-12.58	110.02	122.60
1	A	147	VAL	CA-CB-CG1	12.25	131.22	110.40
1	A	16	ALA	CB-CA-C	12.09	129.78	109.72
1	A	158	ARG	NE-CZ-NH2	11.90	129.91	119.20
1	A	182	LEU	CD1-CG-CD2	-11.80	84.83	110.80
1	A	530	VAL	CG1-CB-CG2	11.75	136.66	110.80
1	A	151	LYS	CA-C-N	11.57	144.10	121.41
1	A	151	LYS	C-N-CA	11.57	144.10	121.41
1	A	109	ARG	NE-CZ-NH2	11.47	129.52	119.20
1	A	51	LYS	CB-CG-CD	11.10	136.82	111.30
1	A	212	LYS	CD-CE-NZ	-11.04	76.57	111.90
1	A	405	VAL	N-CA-CB	-10.74	93.51	111.23
1	A	448	TYR	CA-CB-CG	10.64	133.05	113.90
1	A	494	VAL	CA-CB-CG2	-10.62	92.35	110.40
1	A	404	PRO	CB-CA-C	9.69	127.08	112.55
1	A	151	LYS	CB-CG-CD	-9.52	89.40	111.30
1	A	401	ARG	CA-CB-CG	9.43	132.96	114.10
1	A	467	HIS	CE1-NE2-CD2	-9.24	99.76	109.00
1	A	155	LYS	CB-CG-CD	9.05	132.11	111.30
1	A	490	ARG	NE-CZ-NH2	-8.95	111.15	119.20
1	A	436	GLN	CG-CD-NE2	8.95	129.82	116.40
1	A	403	THR	C-N-CD	-8.93	88.40	125.00
1	A	402	HIS	CB-CG-ND1	-8.93	109.31	122.70

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	149	PRO	CA-N-CD	-8.57	100.00	112.00
1	A	448	TYR	OH-CZ-CE2	-8.46	94.53	119.90
1	A	32	ARG	CD-NE-CZ	-8.33	112.73	124.40
1	A	448	TYR	CE1-CZ-OH	8.28	144.75	119.90
1	A	490	ARG	CG-CD-NE	8.14	129.91	112.00
1	A	69	LYS	CB-CG-CD	8.05	129.83	111.30
1	A	490	ARG	NE-CZ-NH1	-8.03	113.47	121.50
1	A	18	GLU	CB-CG-CD	-7.99	99.01	112.60
1	A	22	PRO	N-CA-C	-7.89	96.22	112.47
1	A	353	PRO	CB-CG-CD	-7.80	81.14	106.10
1	A	353	PRO	CB-CA-C	7.53	120.11	110.92
1	A	69	LYS	CD-CE-NZ	-7.36	88.34	111.90
1	A	32	ARG	NE-CZ-NH2	7.31	125.78	119.20
1	A	18	GLU	CG-CD-OE2	-7.16	101.94	118.40
1	A	28	ASN	CA-CB-CG	7.16	119.76	112.60
1	A	109	ARG	NH1-CZ-NH2	-7.05	110.13	119.30
1	A	69	LYS	CG-CD-CE	6.79	126.92	111.30
1	A	150	GLU	N-CA-C	6.69	122.94	114.31
1	A	502	HIS	N-CA-C	6.67	125.00	110.80
1	A	155	LYS	CG-CD-CE	-6.26	96.91	111.30
1	A	149	PRO	CA-CB-CG	6.17	116.22	104.50
1	A	441	LYS	CB-CG-CD	6.12	125.39	111.30
1	A	448	TYR	N-CA-C	-6.08	106.22	113.21
1	A	419	LEU	CB-CG-CD1	-6.00	92.69	110.70
1	A	32	ARG	NE-CZ-NH1	-5.95	115.55	121.50
1	A	26	LEU	CD1-CG-CD2	5.80	123.57	110.80
1	A	18	GLU	OE1-CD-OE2	-5.67	109.31	122.90
1	A	402	HIS	ND1-CE1-NE2	-5.51	102.89	108.40
1	A	43	ARG	CG-CD-NE	-5.47	99.95	112.00
1	A	514	GLN	OE1-CD-NE2	5.42	128.02	122.60
1	A	500	TRP	N-CA-C	5.41	117.26	111.36
1	A	402	HIS	ND1-CG-CD2	5.23	111.33	106.10
1	A	406	ASN	N-CA-CB	5.03	117.60	110.46
1	A	401	ARG	CD-NE-CZ	-5.01	117.39	124.40

There are no chirality outliers.

All (23) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	109	ARG	Sidechain
1	A	149	PRO	Mainchain
1	A	150	GLU	Mainchain,Peptide

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Mol	Chain	Res	Type	Group
1	A	151	LYS	Peptide
1	A	152	GLY	Mainchain,Peptide
1	A	158	ARG	Sidechain
1	A	184	GLN	Sidechain
1	A	222	ARG	Sidechain
1	A	23	ILE	Mainchain,Peptide
1	A	401	ARG	Sidechain
1	A	402	HIS	Sidechain
1	A	405	VAL	Mainchain
1	A	438	GLN	Sidechain
1	A	448	TYR	Sidechain
1	A	467	HIS	Sidechain
1	A	483	ASN	Sidechain
1	A	490	ARG	Sidechain
1	A	501	ARG	Peptide
1	A	502	HIS	Sidechain
1	A	514	GLN	Sidechain

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	4137	0	4148	172	0
2	A	69	0	49	3	0
3	A	629	0	0	51	1
All	All	4835	0	4197	172	1

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 21.

All (172) 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:448:TYR:CD2	1:A:448:TYR:CG	1.78	1.66
1:A:502:HIS:ND1	1:A:502:HIS:CG	1.73	1.57
1:A:374:HIS:HB2	1:A:475:HIS:CE1	1.38	1.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:502:HIS:NE2	1:A:503:ARG:HB2	1.30	1.40
1:A:374:HIS:CB	1:A:475:HIS:CE1	2.08	1.33
1:A:374:HIS:CB	1:A:475:HIS:HE1	1.38	1.31
1:A:500:TRP:O	1:A:502:HIS:ND1	1.61	1.30
1:A:116:VAL:O	1:A:120:HIS:ND1	1.63	1.30
1:A:120:HIS:CD2	3:A:2213:HOH:O	1.73	1.28
1:A:467:HIS:CD2	3:A:2577:HOH:O	1.84	1.25
1:A:118:HIS:CD2	3:A:2209:HOH:O	1.93	1.17
1:A:118:HIS:HE1	1:A:122:VAL:CG2	1.59	1.16
1:A:500:TRP:C	1:A:502:HIS:ND1	2.05	1.14
1:A:501:ARG:C	1:A:502:HIS:ND1	2.07	1.12
1:A:118:HIS:CE1	1:A:122:VAL:HG23	1.85	1.10
1:A:116:VAL:HG13	1:A:120:HIS:CE1	1.85	1.10
1:A:120:HIS:CD2	3:A:2212:HOH:O	2.02	1.09
1:A:118:HIS:NE2	3:A:2209:HOH:O	1.84	1.08
1:A:500:TRP:HA	1:A:502:HIS:NE2	1.70	1.06
1:A:118:HIS:ND1	1:A:118:HIS:C	2.16	1.02
1:A:494:VAL:CB	3:A:2597:HOH:O	2.08	1.01
1:A:502:HIS:NE2	1:A:503:ARG:CB	2.22	1.01
1:A:467:HIS:CD2	3:A:2576:HOH:O	2.12	1.00
1:A:501:ARG:N	1:A:502:HIS:CD2	2.22	1.00
1:A:181:THR:HB	3:A:2298:HOH:O	1.62	0.99
1:A:118:HIS:CE1	1:A:122:VAL:CG2	2.44	0.98
1:A:445:CYS:HB2	3:A:2555:HOH:O	1.61	0.98
1:A:509:ALA:O	3:A:2607:HOH:O	1.82	0.97
1:A:141:LYS:HG3	1:A:405:VAL:CG1	1.94	0.96
1:A:21:LEU:HB3	3:A:2031:HOH:O	1.67	0.95
1:A:118:HIS:HE1	1:A:122:VAL:HG23	1.23	0.94
1:A:502:HIS:ND1	1:A:503:ARG:N	2.17	0.93
1:A:116:VAL:HG13	1:A:120:HIS:HE1	1.29	0.93
1:A:21:LEU:HD21	1:A:37:VAL:HG12	1.47	0.93
1:A:120:HIS:HD2	3:A:2213:HOH:O	1.18	0.92
1:A:502:HIS:CG	1:A:503:ARG:H	1.89	0.90
1:A:502:HIS:ND1	1:A:502:HIS:CD2	2.39	0.90
1:A:374:HIS:HB3	1:A:475:HIS:HE1	1.38	0.88
1:A:118:HIS:HE1	1:A:122:VAL:HG21	1.37	0.88
1:A:467:HIS:CE1	1:A:471:ALA:HB2	2.08	0.88
1:A:118:HIS:ND1	1:A:118:HIS:O	2.08	0.86
1:A:120:HIS:HD2	3:A:2212:HOH:O	1.46	0.86
1:A:419:LEU:HB2	3:A:2626:HOH:O	1.74	0.86
1:A:417:PRO:HG3	1:A:467:HIS:ND1	1.90	0.86

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:374:HIS:HB2	1:A:475:HIS:NE2	1.92	0.85
1:A:309:GLN:NE2	3:A:2430:HOH:O	2.10	0.84
1:A:21:LEU:HD22	1:A:397:TRP:CZ3	2.15	0.82
1:A:116:VAL:CG1	1:A:120:HIS:CE1	2.61	0.82
1:A:374:HIS:O	1:A:475:HIS:ND1	2.13	0.80
1:A:400:ALA:HB2	3:A:2040:HOH:O	1.81	0.80
1:A:321:VAL:HG21	1:A:365:SER:HB3	1.61	0.80
1:A:500:TRP:CA	1:A:502:HIS:NE2	2.42	0.80
1:A:141:LYS:CG	1:A:405:VAL:CG1	2.59	0.79
1:A:498:ARG:O	1:A:502:HIS:HB3	1.83	0.79
1:A:21:LEU:CG	3:A:2031:HOH:O	2.32	0.78
1:A:374:HIS:C	1:A:475:HIS:CE1	2.62	0.78
1:A:374:HIS:CA	1:A:475:HIS:HE1	1.96	0.77
1:A:406:ASN:HB2	3:A:2533:HOH:O	1.84	0.76
1:A:22:PRO:CA	3:A:2032:HOH:O	2.34	0.76
1:A:374:HIS:HB3	1:A:475:HIS:CE1	2.17	0.75
1:A:21:LEU:HD21	1:A:37:VAL:CG1	2.17	0.74
1:A:374:HIS:CA	1:A:475:HIS:CE1	2.71	0.73
1:A:85:VAL:HG11	1:A:120:HIS:CE1	2.25	0.72
1:A:502:HIS:CG	1:A:503:ARG:N	2.55	0.71
1:A:498:ARG:O	1:A:502:HIS:CB	2.37	0.71
1:A:184:GLN:CB	3:A:2311:HOH:O	2.38	0.71
1:A:21:LEU:CD2	1:A:37:VAL:HG12	2.21	0.71
1:A:483:ASN:CG	3:A:2591:HOH:O	2.35	0.69
1:A:160:ILE:N	1:A:405:VAL:HG11	2.08	0.69
1:A:401:ARG:CB	3:A:2528:HOH:O	2.13	0.69
1:A:21:LEU:HD22	1:A:397:TRP:CE3	2.27	0.69
1:A:501:ARG:N	1:A:502:HIS:CG	2.61	0.68
1:A:184:GLN:HB2	3:A:2311:HOH:O	1.93	0.68
1:A:401:ARG:NH1	3:A:2528:HOH:O	2.27	0.68
1:A:21:LEU:CB	3:A:2031:HOH:O	2.30	0.67
1:A:447:ILE:HG13	3:A:2557:HOH:O	1.96	0.66
1:A:502:HIS:ND1	1:A:502:HIS:N	2.42	0.66
1:A:79:LYS:HG3	1:A:244:ASP:HB3	1.79	0.65
1:A:22:PRO:HB2	1:A:400:ALA:HB1	1.79	0.65
1:A:501:ARG:N	1:A:502:HIS:ND1	2.45	0.65
1:A:510:ARG:NH2	3:A:2609:HOH:O	2.31	0.63
1:A:337:ARG:O	1:A:341:GLU:HG2	1.99	0.63
1:A:467:HIS:HD2	3:A:2577:HOH:O	1.48	0.63
1:A:141:LYS:N	1:A:405:VAL:HG12	2.14	0.63
1:A:409:LEU:HD23	3:A:2555:HOH:O	1.99	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:374:HIS:C	1:A:475:HIS:HE1	2.04	0.62
1:A:502:HIS:ND1	1:A:502:HIS:C	2.57	0.62
1:A:118:HIS:CE1	1:A:122:VAL:HG21	2.25	0.62
1:A:509:ALA:HA	3:A:2607:HOH:O	1.98	0.62
1:A:397:TRP:CD1	1:A:401:ARG:NH1	2.67	0.62
1:A:448:TYR:C	3:A:2559:HOH:O	2.42	0.61
1:A:116:VAL:O	1:A:120:HIS:CE1	2.49	0.61
1:A:397:TRP:CD1	1:A:401:ARG:HH12	2.19	0.61
1:A:417:PRO:CG	1:A:467:HIS:ND1	2.64	0.61
1:A:400:ALA:HB3	1:A:401:ARG:HH11	1.66	0.60
1:A:21:LEU:CD2	1:A:397:TRP:CE3	2.86	0.59
1:A:512:LEU:HB2	3:A:2607:HOH:O	2.02	0.59
1:A:116:VAL:C	1:A:120:HIS:ND1	2.54	0.58
1:A:21:LEU:HD12	3:A:2031:HOH:O	2.02	0.58
1:A:502:HIS:ND1	1:A:502:HIS:CA	2.66	0.58
1:A:406:ASN:CB	3:A:2533:HOH:O	2.47	0.58
1:A:501:ARG:O	1:A:505:ARG:HG3	2.04	0.58
1:A:467:HIS:HE1	1:A:471:ALA:HB2	1.66	0.57
1:A:502:HIS:NE2	1:A:503:ARG:HD2	2.19	0.57
1:A:406:ASN:HB3	1:A:408:TRP:CD1	2.40	0.57
1:A:501:ARG:O	1:A:502:HIS:ND1	2.36	0.57
1:A:321:VAL:CG2	1:A:365:SER:HB3	2.34	0.56
1:A:475:HIS:CD2	1:A:476:SER:OG	2.58	0.56
1:A:160:ILE:HG22	1:A:405:VAL:HG11	1.86	0.56
1:A:501:ARG:CA	1:A:502:HIS:ND1	2.69	0.56
1:A:21:LEU:HG	3:A:2031:HOH:O	2.02	0.55
1:A:124:LYS:HG2	1:A:125:ASP:N	2.22	0.55
1:A:502:HIS:CG	1:A:502:HIS:NE2	2.65	0.55
1:A:374:HIS:O	1:A:475:HIS:CE1	2.59	0.55
1:A:139[B]:MET:CE	1:A:139[B]:MET:CG	2.84	0.54
1:A:21:LEU:CD1	3:A:2031:HOH:O	2.56	0.54
1:A:120:HIS:NE2	3:A:2213:HOH:O	2.14	0.54
1:A:502:HIS:HD1	1:A:504:ALA:H	1.56	0.54
1:A:79:LYS:CG	1:A:79:LYS:CE	2.87	0.53
1:A:21:LEU:HD22	1:A:397:TRP:HZ3	1.72	0.52
1:A:21:LEU:CD2	1:A:37:VAL:CG1	2.84	0.52
1:A:120:HIS:CG	3:A:2212:HOH:O	2.49	0.52
1:A:501:ARG:HG2	1:A:502:HIS:H	1.73	0.52
1:A:501:ARG:CG	1:A:502:HIS:N	2.72	0.52
1:A:30:LEU:O	1:A:494:VAL:HG13	2.10	0.52
1:A:200:ARG:HH21	1:A:365:SER:CB	2.22	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:109:ARG:NE	3:A:2196:HOH:O	2.43	0.52
1:A:447:ILE:HB	1:A:452:TYR:HE1	1.73	0.52
1:A:160:ILE:CB	1:A:405:VAL:HG11	2.40	0.51
1:A:21:LEU:HD23	1:A:37:VAL:O	2.10	0.51
1:A:184:GLN:CG	3:A:2311:HOH:O	2.57	0.50
1:A:449:GLY:N	3:A:2559:HOH:O	2.44	0.49
1:A:124:LYS:HD2	3:A:2221:HOH:O	2.13	0.49
1:A:500:TRP:C	1:A:502:HIS:CG	2.55	0.49
1:A:528:TRP:HB2	2:A:1532:QQ3:C6	2.43	0.49
1:A:33:HIS:HB2	3:A:2057:HOH:O	2.13	0.48
1:A:33:HIS:ND1	3:A:2057:HOH:O	2.34	0.48
1:A:447:ILE:CG1	3:A:2557:HOH:O	2.55	0.48
1:A:21:LEU:CD2	1:A:397:TRP:HE3	2.27	0.48
1:A:424:ILE:HD11	1:A:489:LEU:HD21	1.94	0.48
1:A:467:HIS:CE1	1:A:471:ALA:CB	2.90	0.48
1:A:131:VAL:CB	3:A:2243:HOH:O	2.62	0.47
1:A:528:TRP:HB2	2:A:1532:QQ3:H62C	1.96	0.47
1:A:338:VAL:HA	1:A:341:GLU:CG	2.43	0.47
1:A:501:ARG:HA	1:A:528:TRP:CZ3	2.49	0.47
1:A:398:GLU:CD	1:A:406:ASN:HA	2.39	0.47
1:A:397:TRP:CG	1:A:401:ARG:HH12	2.33	0.46
1:A:160:ILE:CG2	1:A:405:VAL:HG11	2.46	0.46
1:A:155:LYS:CE	1:A:155:LYS:CG	2.93	0.46
1:A:501:ARG:C	1:A:502:HIS:CG	2.91	0.46
1:A:502:HIS:NE2	1:A:503:ARG:CG	2.78	0.45
1:A:405:VAL:HA	3:A:2532:HOH:O	2.16	0.45
1:A:498:ARG:O	1:A:502:HIS:CD2	2.69	0.45
1:A:509:ALA:C	3:A:2607:HOH:O	2.46	0.45
1:A:400:ALA:CB	3:A:2040:HOH:O	2.54	0.44
1:A:152:GLY:O	2:A:1534:QQ3:H71C	2.16	0.44
1:A:448:TYR:CD2	1:A:448:TYR:CB	2.82	0.44
1:A:141:LYS:CD	1:A:405:VAL:CG1	2.96	0.44
1:A:37:VAL:HG13	1:A:393:ALA:HB1	1.99	0.43
1:A:501:ARG:HG2	1:A:502:HIS:N	2.33	0.43
1:A:21:LEU:HD23	1:A:37:VAL:C	2.43	0.43
1:A:353:PRO:HA	1:A:354:PRO:HD2	1.89	0.42
1:A:501:ARG:HA	1:A:528:TRP:HZ3	1.85	0.42
1:A:141:LYS:H	1:A:405:VAL:HG12	1.84	0.42
1:A:120:HIS:CB	3:A:2212:HOH:O	2.66	0.41
1:A:268:ASN:HB3	1:A:274:CYS:SG	2.61	0.41
1:A:268:ASN:CG	3:A:2405:HOH:O	2.64	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:160:ILE:HB	1:A:405:VAL:HG11	2.02	0.41
1:A:416:ALA:N	1:A:417:PRO:CD	2.84	0.41
1:A:475:HIS:HD1	1:A:475:HIS:H	1.70	0.40
1:A:116:VAL:C	1:A:120:HIS:CE1	2.99	0.40
1:A:416:ALA:HB3	1:A:467:HIS:CD2	2.57	0.40

All (1) 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)
3:A:2167:HOH:O	3:A:2468:HOH:O[3_556]	2.17	0.03

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	531/536 (99%)	509 (96%)	18 (3%)	4 (1%)	16 8

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	153	GLY
1	A	502	HIS
1	A	351	GLY
1	A	501	ARG

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	454/459 (99%)	426 (94%)	28 (6%)	16 6

All (28) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	21	LEU
1	A	23	ILE
1	A	79	LYS
1	A	112	SER
1	A	118	HIS
1	A	124	LYS
1	A	131	VAL
1	A	132	THR
1	A	151	LYS
1	A	184	GLN
1	A	222	ARG
1	A	270	LYS
1	A	341	GLU
1	A	353	PRO
1	A	360	LEU
1	A	403	THR
1	A	404	PRO
1	A	405	VAL
1	A	406	ASN
1	A	447	ILE
1	A	448	TYR
1	A	461	GLN
1	A	467	HIS
1	A	483	ASN
1	A	498	ARG
1	A	502	HIS
1	A	510	ARG
1	A	530	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (11) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	35	ASN
1	A	110	ASN

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Mol	Chain	Res	Type
1	A	309	GLN
1	A	330	GLN
1	A	374	HIS
1	A	406	ASN
1	A	461	GLN
1	A	467	HIS
1	A	475	HIS
1	A	502	HIS
1	A	514	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	QQ3	A	1532	-	26,26,26	2.53	5 (19%)	34,38,38	2.16	12 (35%)
2	QQ3	A	1533	-	26,26,26	2.63	6 (23%)	34,38,38	2.11	10 (29%)
2	QQ3	A	1534	-	23,23,26	2.65	7 (30%)	31,34,38	2.04	11 (35%)

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	QQ3	A	1532	-	-	5/11/27/27	0/3/3/3
2	QQ3	A	1533	-	-	6/11/27/27	0/3/3/3
2	QQ3	A	1534	-	-	3/7/23/27	0/3/3/3

All (18) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1533	QQ3	C1-C2	-7.12	1.39	1.49
2	A	1534	QQ3	C10-N2	7.07	1.40	1.32
2	A	1532	QQ3	C1-C2	-6.59	1.40	1.49
2	A	1534	QQ3	C1-C2	-6.48	1.40	1.49
2	A	1533	QQ3	C10-N2	6.36	1.40	1.32
2	A	1532	QQ3	C3-C4	-5.88	1.38	1.49
2	A	1532	QQ3	C10-N2	5.84	1.39	1.32
2	A	1533	QQ3	C3-C4	-5.61	1.39	1.49
2	A	1534	QQ3	C3-C4	-5.27	1.39	1.49
2	A	1533	QQ3	C4-N1	-4.16	1.31	1.40
2	A	1532	QQ3	C4-N1	-4.09	1.32	1.40
2	A	1532	QQ3	C2-N1	-3.01	1.34	1.40
2	A	1533	QQ3	C2-N1	-2.84	1.34	1.40
2	A	1534	QQ3	C2-N1	-2.78	1.34	1.40
2	A	1534	QQ3	C4-N1	-2.77	1.34	1.40
2	A	1533	QQ3	C14-C10	2.42	1.54	1.50
2	A	1534	QQ3	C14-C10	2.24	1.53	1.50
2	A	1534	QQ3	C1-C9	-2.14	1.40	1.43

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1533	QQ3	C3-C10-N2	-5.68	119.15	122.55
2	A	1534	QQ3	C3-C10-N2	-5.35	119.35	122.55
2	A	1532	QQ3	C3-C10-N2	-5.07	119.52	122.55
2	A	1532	QQ3	C5-N1-C2	4.36	133.27	124.19
2	A	1533	QQ3	C1-C2-N1	4.03	109.59	106.43
2	A	1534	QQ3	C1-C2-N1	3.87	109.47	106.43
2	A	1532	QQ3	O2-C2-C1	-3.77	124.57	129.21
2	A	1533	QQ3	O2-C2-C1	-3.70	124.66	129.21
2	A	1534	QQ3	O2-C2-C1	-3.67	124.70	129.21

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	1533	QQ3	C9-C1-C2	3.48	134.79	129.18
2	A	1532	QQ3	C9-C1-C2	3.36	134.59	129.18
2	A	1533	QQ3	C3-C1-C2	-3.30	105.07	108.07
2	A	1532	QQ3	C5-N1-C4	-3.29	117.33	124.19
2	A	1532	QQ3	C1-C2-N1	3.13	108.89	106.43
2	A	1532	QQ3	C5-C12-C18	2.97	117.15	112.50
2	A	1533	QQ3	C9-C11-N2	-2.83	119.81	122.80
2	A	1534	QQ3	O1-C4-C3	-2.82	124.86	129.15
2	A	1534	QQ3	C2-N1-C4	-2.81	108.36	111.55
2	A	1534	QQ3	C1-C3-C4	-2.80	106.09	108.30
2	A	1534	QQ3	C9-C11-N2	-2.78	119.85	122.80
2	A	1533	QQ3	C10-N2-C11	2.71	120.91	118.42
2	A	1532	QQ3	C1-C3-C4	-2.71	106.16	108.30
2	A	1533	QQ3	C5-N1-C2	2.68	129.76	124.19
2	A	1532	QQ3	C3-C1-C2	-2.59	105.71	108.07
2	A	1532	QQ3	C3-C4-N1	2.49	109.88	106.06
2	A	1534	QQ3	C9-C1-C2	2.47	133.16	129.18
2	A	1534	QQ3	C3-C4-N1	2.41	109.75	106.06
2	A	1532	QQ3	C9-C11-N2	-2.39	120.27	122.80
2	A	1532	QQ3	C10-N2-C11	2.34	120.58	118.42
2	A	1533	QQ3	C14-C10-N2	2.21	120.21	116.94
2	A	1534	QQ3	C10-N2-C11	2.19	120.43	118.42
2	A	1533	QQ3	C2-N1-C4	-2.13	109.13	111.55
2	A	1534	QQ3	C1-C9-C11	2.11	119.78	116.60

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1532	QQ3	C18-C12-C5-C6
2	A	1532	QQ3	C18-C12-C5-N1
2	A	1533	QQ3	C18-C12-C5-N1
2	A	1534	QQ3	C5-C6-C7-C8
2	A	1532	QQ3	C5-C12-C18-O4
2	A	1532	QQ3	C5-C12-C18-O3
2	A	1534	QQ3	N1-C5-C6-C7
2	A	1532	QQ3	C5-C6-C7-C8
2	A	1533	QQ3	C5-C12-C18-O3
2	A	1534	QQ3	C12-C5-C6-C7
2	A	1533	QQ3	C5-C12-C18-O4
2	A	1533	QQ3	N1-C5-C6-C7
2	A	1533	QQ3	C18-C12-C5-C6

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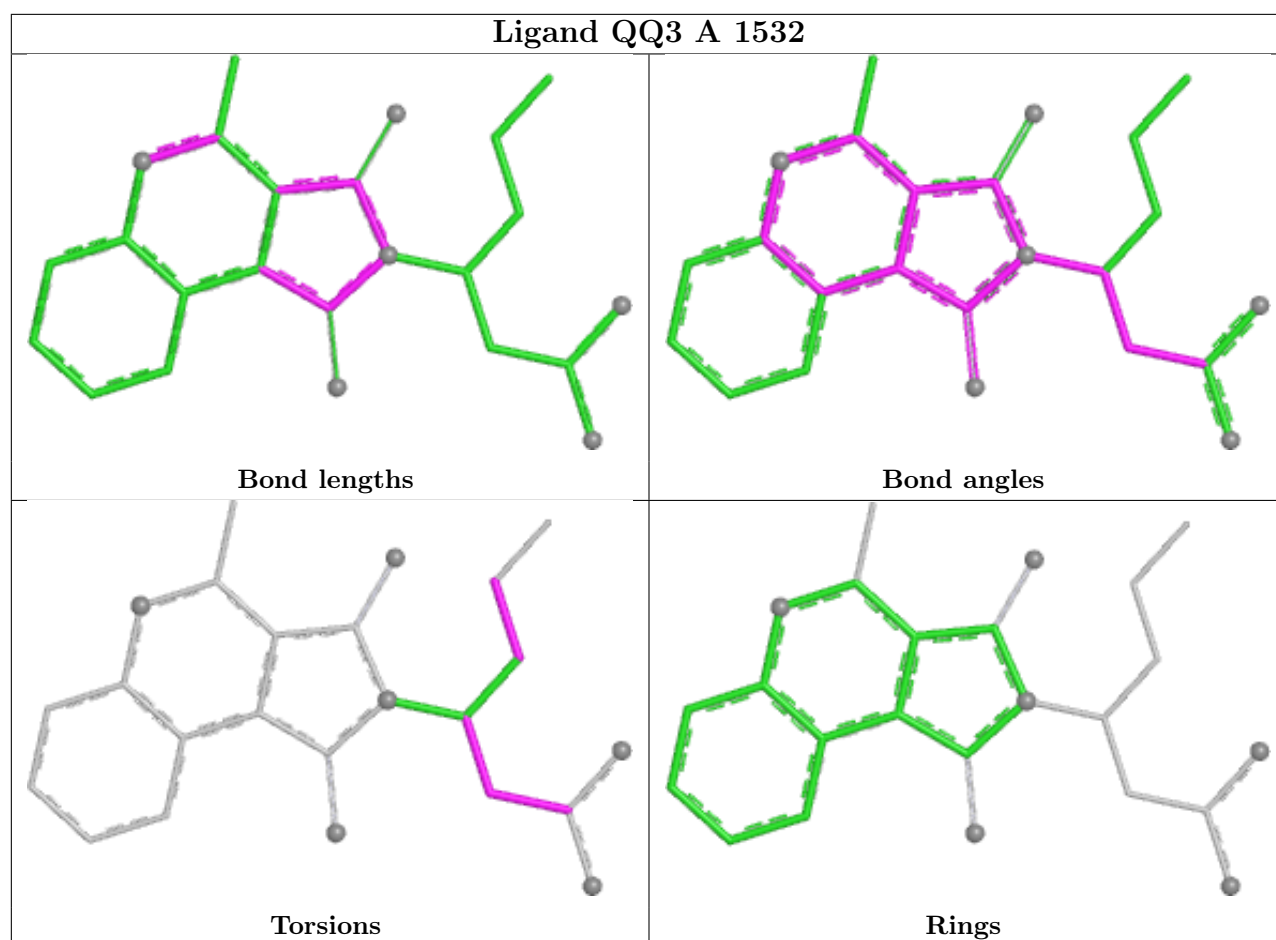
Mol	Chain	Res	Type	Atoms
2	A	1533	QQ3	C12-C5-C6-C7

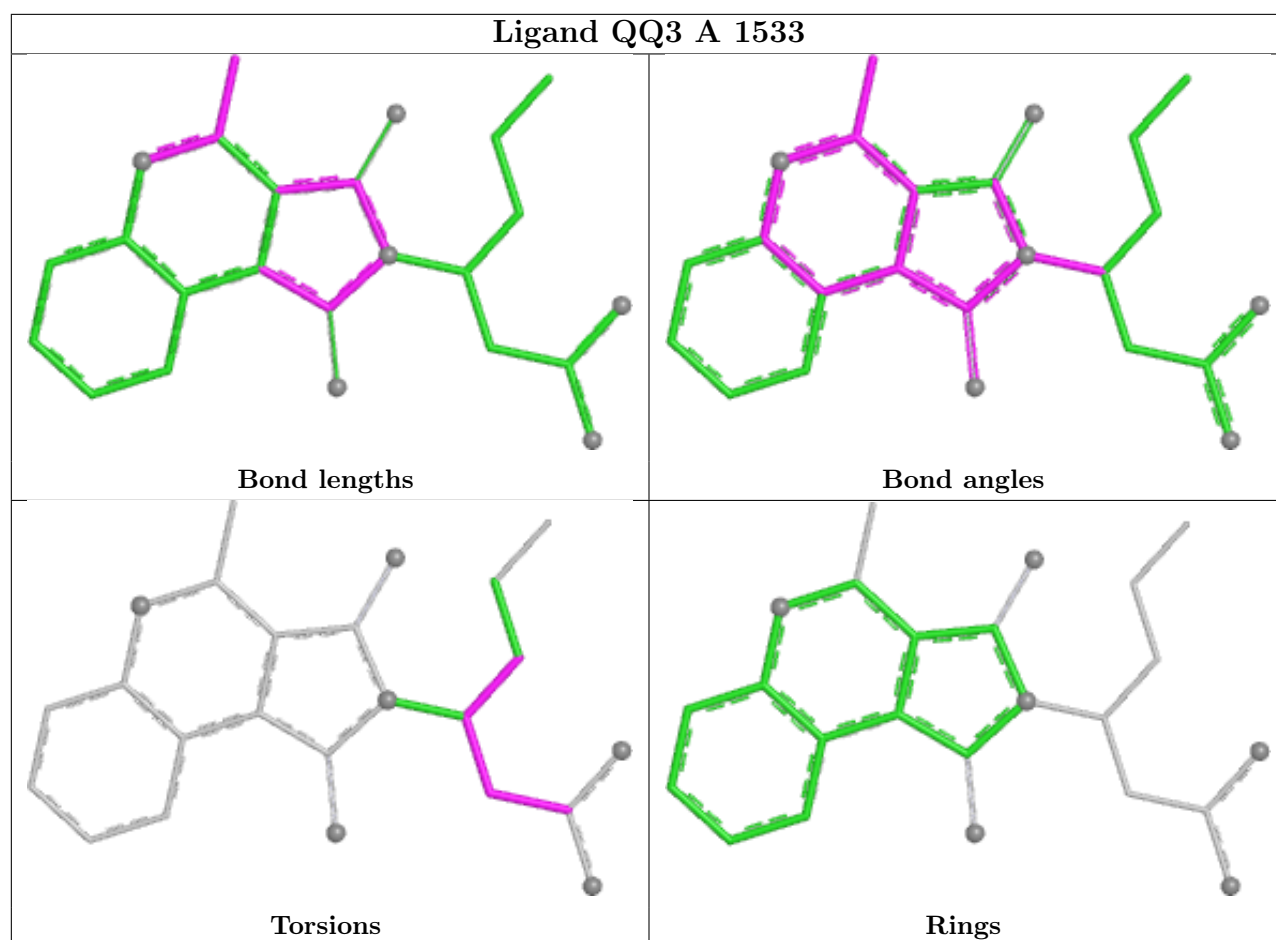
There are no ring outliers.

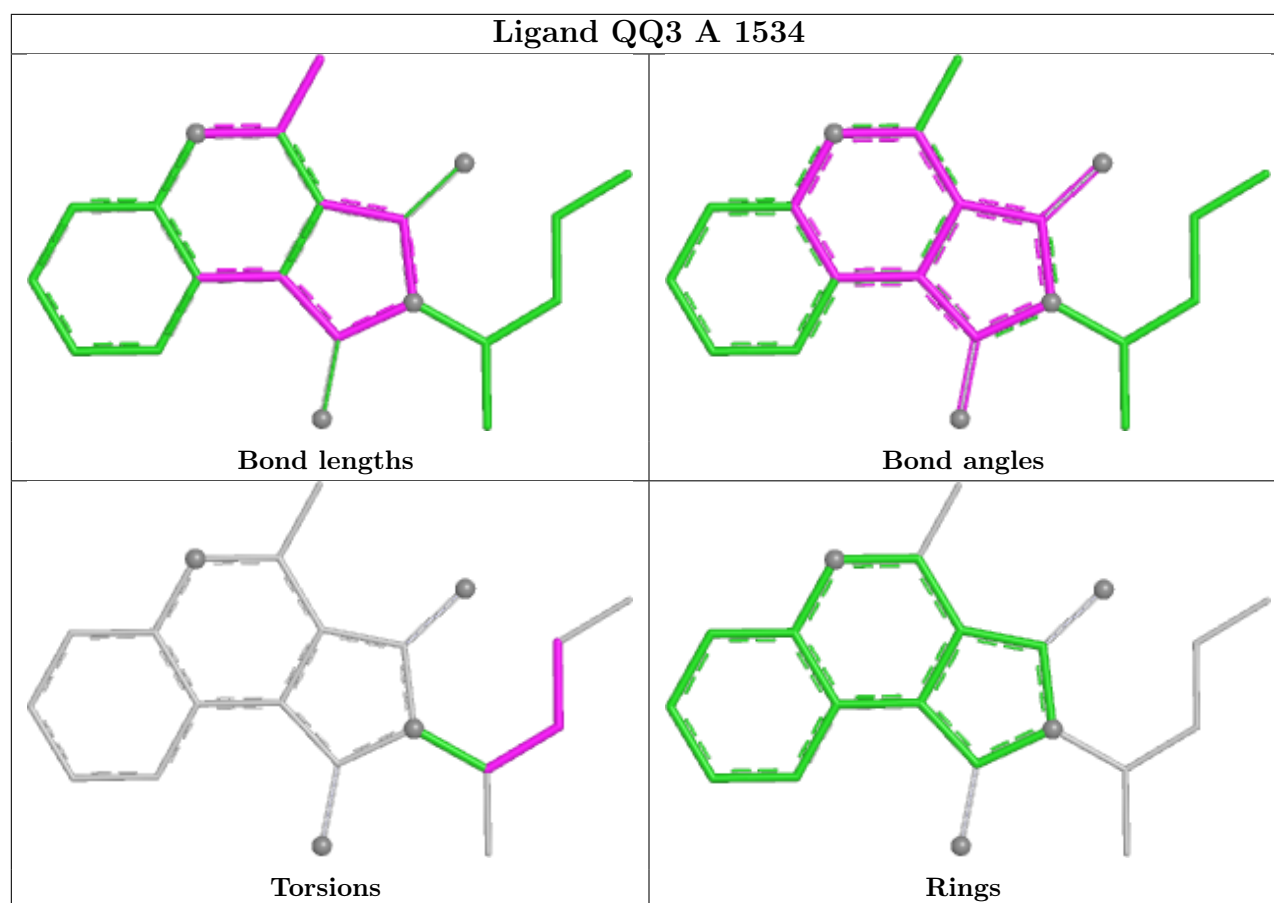
2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1532	QQ3	2	0
2	A	1534	QQ3	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 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](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	149:PRO	C	150:GLU	N	0.85

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	531/536 (99%)	0.31	44 (8%) 17 20	10, 20, 35, 53	60 (11%)

All (44) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	405	VAL	9.0
1	A	447	ILE	8.1
1	A	467	HIS	6.7
1	A	502	HIS	6.3
1	A	449	GLY	6.3
1	A	475	HIS	5.9
1	A	21	LEU	5.9
1	A	448	TYR	5.8
1	A	450	ALA	5.7
1	A	120	HIS	5.7
1	A	406	ASN	5.5
1	A	24	ASN	5.1
1	A	33	HIS	5.1
1	A	22	PRO	4.8
1	A	151	LYS	4.8
1	A	501	ARG	4.7
1	A	351	GLY	4.2
1	A	404	PRO	4.0
1	A	400	ALA	4.0
1	A	505	ARG	3.8
1	A	23	ILE	3.8
1	A	95	HIS	3.7
1	A	509	ALA	3.7
1	A	531	LYS	3.5
1	A	352	ASP	3.2
1	A	401	ARG	3.2
1	A	150	GLU	3.1

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Mol	Chain	Res	Type	RSRZ
1	A	152	GLY	3.0
1	A	46	GLY	3.0
1	A	118	HIS	2.9
1	A	131	VAL	2.9
1	A	403	THR	2.9
1	A	26	LEU	2.8
1	A	14	CYS	2.6
1	A	498	ARG	2.6
1	A	530	VAL	2.6
1	A	28	ASN	2.5
1	A	402	HIS	2.5
1	A	180	SER	2.4
1	A	149	PRO	2.4
1	A	529	ALA	2.3
1	A	132	THR	2.3
1	A	504	ALA	2.1
1	A	273	ASN	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

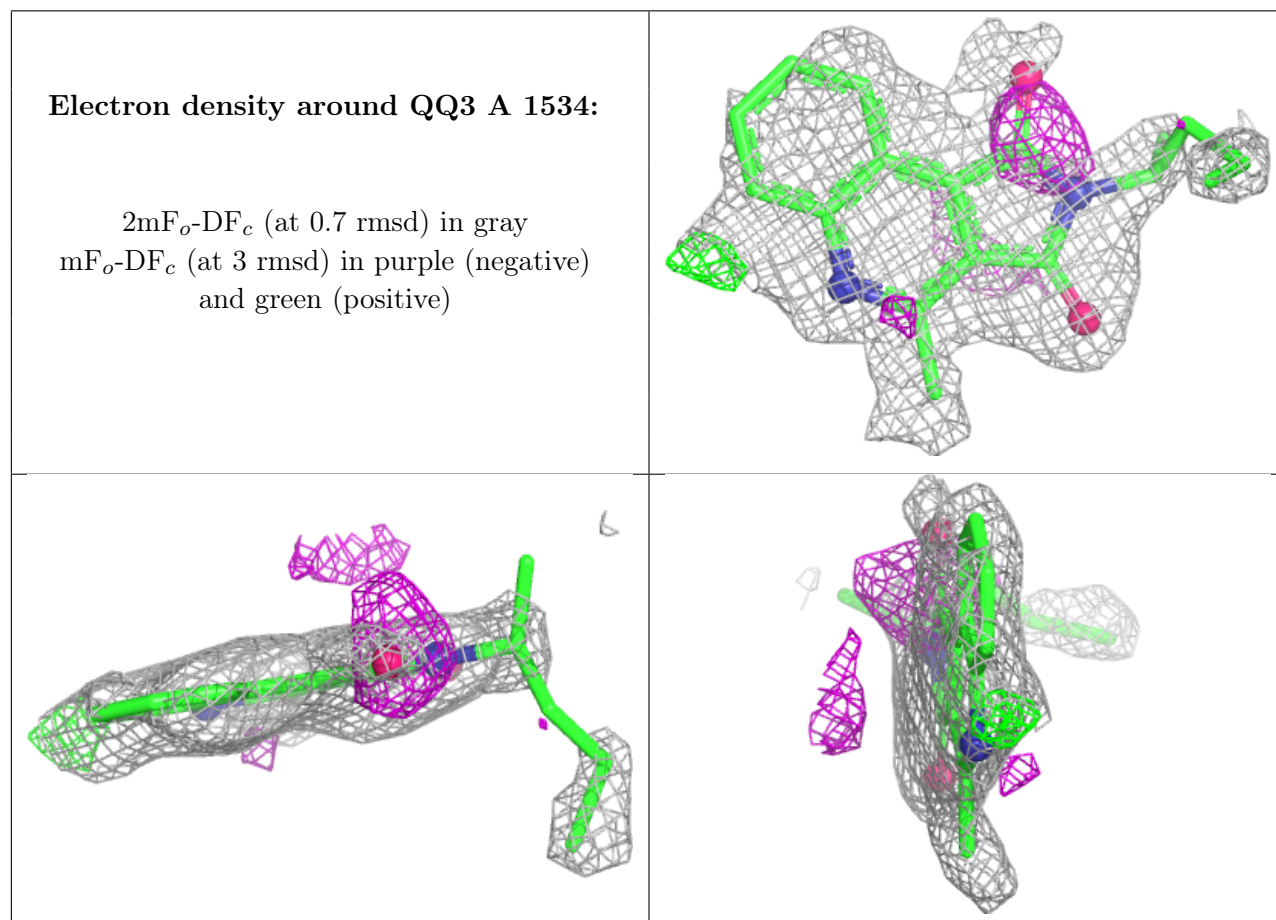
6.4 Ligands [i](#)

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($\text{\AA}^2$)	Q<0.9
2	QQ3	A	1534	21/24	0.62	0.16	42,43,45,45	0
2	QQ3	A	1532	24/24	0.86	0.09	27,29,32,33	0
2	QQ3	A	1533	24/24	0.93	0.08	24,26,32,35	0

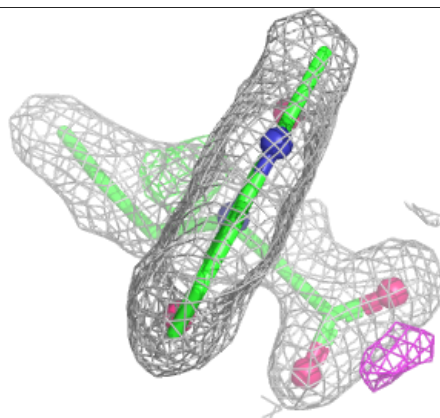
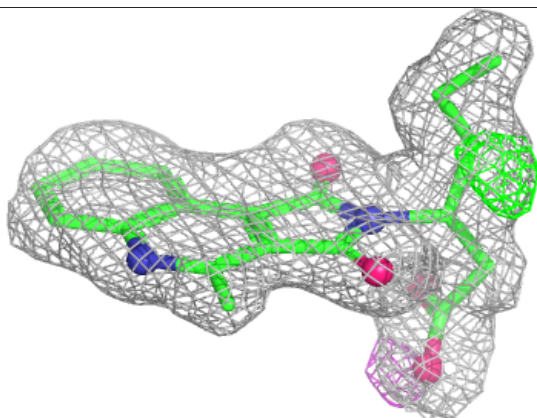
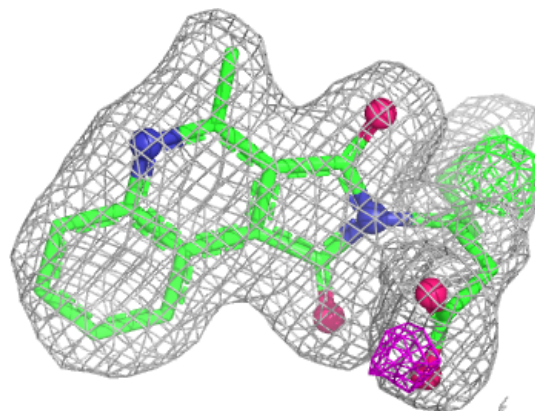
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers

as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

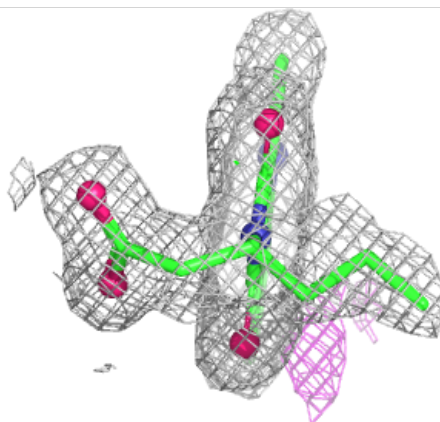
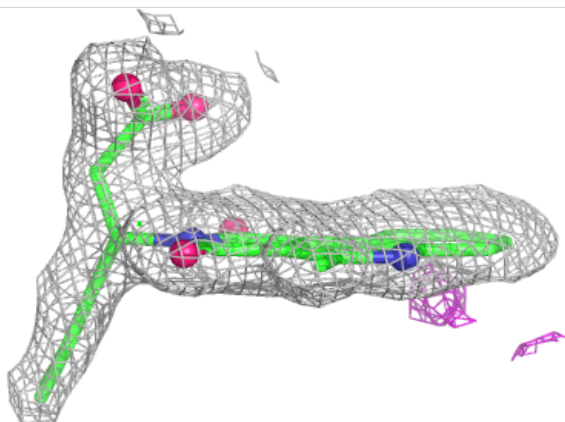
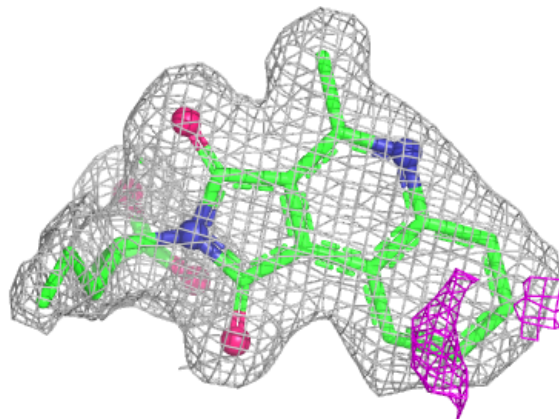


Electron density around QQ3 A 1532:

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

**Electron density around QQ3 A 1533:**

$2mF_o-DF_c$ (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.