



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 10, 2026 – 04:22 AM UTC

PDB ID : 2HIZ / pdb_00002hiz
Title : Crystal Structure of human beta-secretase (BACE) in the presence of an inhibitor
Authors : Benson, T.E.; Prince, D.B.; Tomasselli, A.G.; Emmons, T.L.; Paddock, D.J.
Deposited on : 2006-06-29
Resolution : 2.50 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

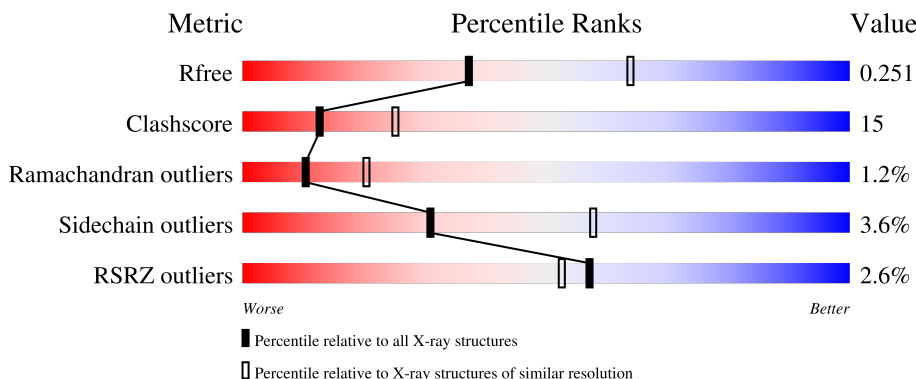
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.50 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	5829 (2.50-2.50)
Clashscore	190562	6492 (2.50-2.50)
Ramachandran outliers	187476	6378 (2.50-2.50)
Sidechain outliers	187428	6380 (2.50-2.50)
RSRZ outliers	180081	5833 (2.50-2.50)

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	455	
1	B	455	
1	C	455	

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 9176 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 Beta-secretase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	371	Total	C	N	O	S	0	0	0
			2924	1874	487	549	14			
1	B	372	Total	C	N	O	S	0	0	0
			2929	1879	487	549	14			
1	C	373	Total	C	N	O	S	0	0	0
			2937	1883	488	552	14			

There are 45 discrepancies between the modelled and reference sequences:

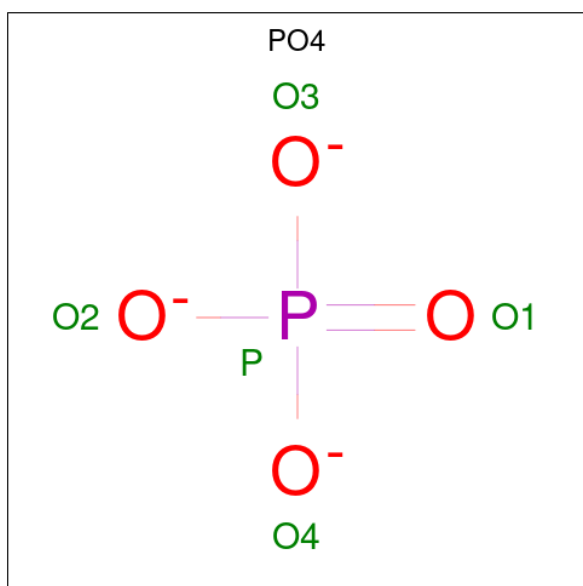
Chain	Residue	Modelled	Actual	Comment	Reference
A	1P	MET	-	cloning artifact	UNP P56817
A	2P	ALA	-	cloning artifact	UNP P56817
A	3P	SER	-	cloning artifact	UNP P56817
A	4P	MET	-	cloning artifact	UNP P56817
A	5P	THR	-	cloning artifact	UNP P56817
A	6P	GLY	-	cloning artifact	UNP P56817
A	7P	GLY	-	cloning artifact	UNP P56817
A	8P	GLN	-	cloning artifact	UNP P56817
A	9P	GLN	-	cloning artifact	UNP P56817
A	10P	MET	-	cloning artifact	UNP P56817
A	11P	GLY	-	cloning artifact	UNP P56817
A	12P	ARG	-	cloning artifact	UNP P56817
A	13P	GLY	-	cloning artifact	UNP P56817
A	14P	SER	-	cloning artifact	UNP P56817
A	15P	MET	-	cloning artifact	UNP P56817
B	1P	MET	-	cloning artifact	UNP P56817
B	2P	ALA	-	cloning artifact	UNP P56817
B	3P	SER	-	cloning artifact	UNP P56817
B	4P	MET	-	cloning artifact	UNP P56817
B	5P	THR	-	cloning artifact	UNP P56817
B	6P	GLY	-	cloning artifact	UNP P56817
B	7P	GLY	-	cloning artifact	UNP P56817
B	8P	GLN	-	cloning artifact	UNP P56817

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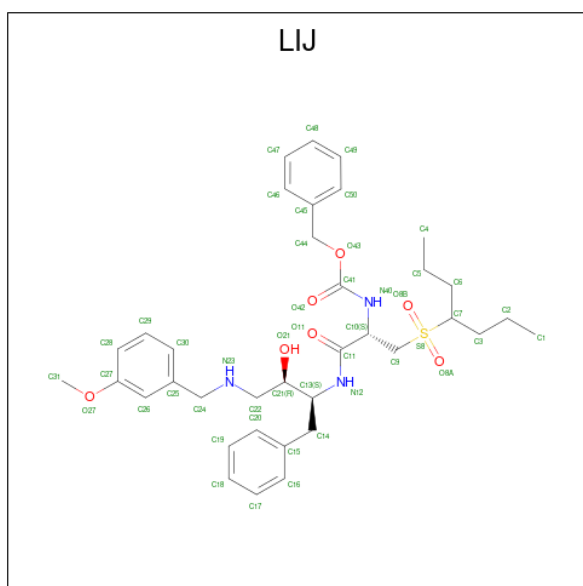
Chain	Residue	Modelled	Actual	Comment	Reference
B	9P	GLN	-	cloning artifact	UNP P56817
B	10P	MET	-	cloning artifact	UNP P56817
B	11P	GLY	-	cloning artifact	UNP P56817
B	12P	ARG	-	cloning artifact	UNP P56817
B	13P	GLY	-	cloning artifact	UNP P56817
B	14P	SER	-	cloning artifact	UNP P56817
B	15P	MET	-	cloning artifact	UNP P56817
C	1P	MET	-	cloning artifact	UNP P56817
C	2P	ALA	-	cloning artifact	UNP P56817
C	3P	SER	-	cloning artifact	UNP P56817
C	4P	MET	-	cloning artifact	UNP P56817
C	5P	THR	-	cloning artifact	UNP P56817
C	6P	GLY	-	cloning artifact	UNP P56817
C	7P	GLY	-	cloning artifact	UNP P56817
C	8P	GLN	-	cloning artifact	UNP P56817
C	9P	GLN	-	cloning artifact	UNP P56817
C	10P	MET	-	cloning artifact	UNP P56817
C	11P	GLY	-	cloning artifact	UNP P56817
C	12P	ARG	-	cloning artifact	UNP P56817
C	13P	GLY	-	cloning artifact	UNP P56817
C	14P	SER	-	cloning artifact	UNP P56817
C	15P	MET	-	cloning artifact	UNP P56817

- Molecule 2 is PHOSPHATE ION (CCD ID: PO4) (formula: O₄P).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total O P 5 4 1	0	0
2	A	1	Total O P 5 4 1	0	0
2	C	1	Total O P 5 4 1	0	0

- Molecule 3 is BENZYL [(1S)-2-({(1S,2R)-1-BENZYL-2-HYDROXY-3-[(3-METHOXYBENZYL)AMINO]PROPYL}AMINO)-2-OXO-1-[(1-PROPYLBUTYL)SULFONYL]METHYL}ETHYL]CARBAMATE (CCD ID: LIJ) (formula: C₃₆H₄₉N₃O₇S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total C N O S 47 36 3 7 1	0	0
3	B	1	Total C N O S 47 36 3 7 1	0	0
3	C	1	Total C N O S 47 36 3 7 1	0	0

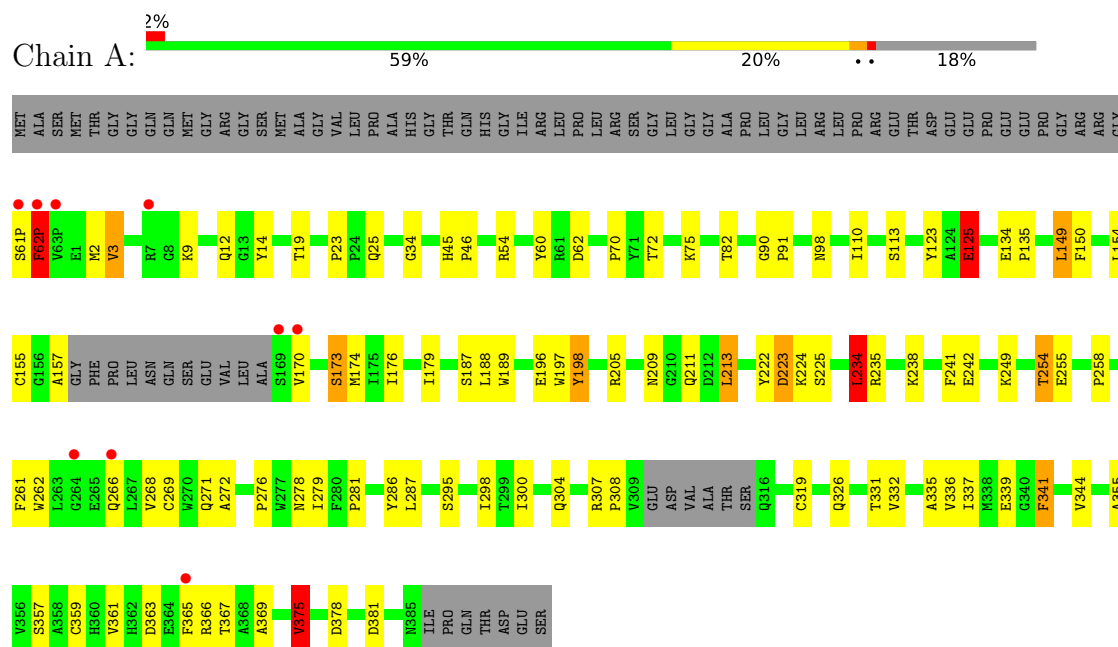
- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	86	Total O 86 86	0	0
4	B	75	Total O 75 75	0	0
4	C	69	Total O 69 69	0	0

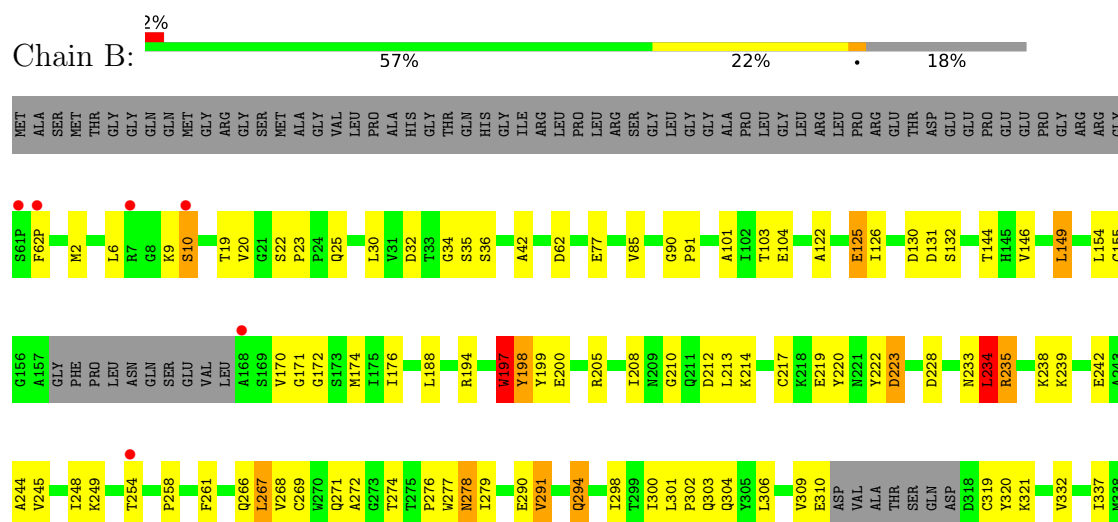
3 Residue-property plots [i](#)

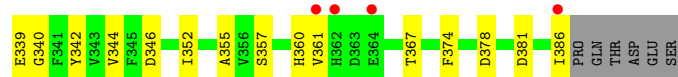
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. 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: Beta-secretase 1

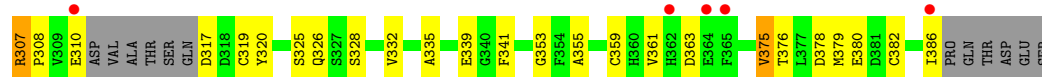
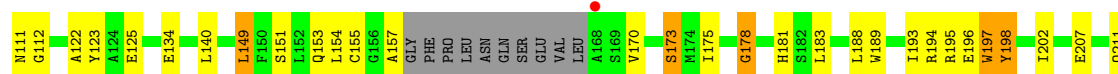
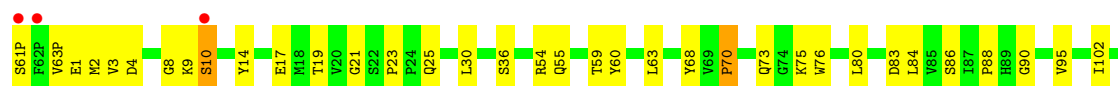


• Molecule 1: Beta-secretase 1





● Molecule 1: Beta-secretase 1



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	82.24Å 104.09Å 100.95Å 90.00° 103.46° 90.00°	Depositor
Resolution (Å)	20.00 – 2.50 20.00 – 2.50	Depositor EDS
% Data completeness (in resolution range)	86.5 (20.00-2.50) 86.7 (20.00-2.50)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.14 (at 2.51Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.214 , 0.253 0.213 , 0.251	Depositor DCC
R_{free} test set	5247 reflections (10.10%)	wwPDB-VP
Wilson B-factor (Å ²)	39.9	Xtriage
Anisotropy	0.317	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 41.4	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	9176	wwPDB-VP
Average B, all atoms (Å ²)	41.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.11% 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: PO4, LIJ

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	0.40	0/2998	1.00	9/4072 (0.2%)
1	B	0.40	0/3003	0.98	6/4079 (0.1%)
1	C	0.43	0/3011	1.01	21/4090 (0.5%)
All	All	0.41	0/9012	1.00	36/12241 (0.3%)

There are no bond length outliers.

All (36) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	198	TYR	N-CA-C	-8.85	97.76	110.59
1	B	198	TYR	N-CA-C	-8.76	96.78	110.36
1	A	234	LEU	N-CA-C	-7.97	96.29	108.96
1	C	233	ASN	N-CA-C	7.71	119.89	110.41
1	A	198	TYR	N-CA-C	-7.70	98.43	110.36
1	A	3	VAL	N-CA-C	7.65	118.19	110.23
1	A	375	VAL	CB-CA-C	-7.23	101.31	111.21
1	A	341	PHE	N-CA-C	7.20	119.40	109.18
1	B	234	LEU	N-CA-C	-6.96	97.20	108.41
1	C	307	ARG	CA-C-N	6.56	126.32	119.76
1	C	307	ARG	C-N-CA	6.56	126.32	119.76
1	C	363	ASP	N-CA-C	-6.22	100.37	110.20
1	B	342	TYR	N-CA-C	-6.20	98.62	108.73
1	B	233	ASN	N-CA-C	6.07	118.55	110.53
1	C	216	ASP	N-CA-C	-5.95	101.09	109.96
1	A	23	PRO	CA-C-N	5.71	126.04	119.93
1	A	23	PRO	C-N-CA	5.71	126.04	119.93
1	C	23	PRO	CA-C-N	5.66	125.99	119.93
1	C	23	PRO	C-N-CA	5.66	125.99	119.93
1	C	234	LEU	N-CA-C	-5.65	100.08	109.46
1	C	341	PHE	N-CA-C	5.62	118.40	109.81

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	295	SER	N-CA-C	-5.49	103.66	110.41
1	B	197	TRP	N-CA-C	-5.42	99.25	110.80
1	C	181	HIS	N-CA-C	5.41	117.93	111.71
1	C	178	GLY	N-CA-C	5.40	119.02	111.19
1	C	134	GLU	CA-C-N	5.39	125.69	119.92
1	C	134	GLU	C-N-CA	5.39	125.69	119.92
1	C	193	ILE	N-CA-C	-5.27	99.50	107.73
1	C	280	PHE	CA-C-N	5.26	126.00	120.11
1	C	280	PHE	C-N-CA	5.26	126.00	120.11
1	A	123	TYR	N-CA-C	5.25	117.64	110.55
1	C	196	GLU	N-CA-C	5.21	117.67	109.39
1	B	278	ASN	N-CA-C	5.14	119.02	112.34
1	A	196	GLU	N-CA-C	5.10	117.43	108.56
1	C	328	SER	N-CA-C	-5.04	105.83	112.94
1	C	123	TYR	N-CA-C	5.01	117.32	110.55

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	2924	0	2844	79	0
1	B	2929	0	2854	84	0
1	C	2937	0	2858	106	0
2	A	10	0	0	0	0
2	C	5	0	0	0	0
3	A	47	0	49	2	0
3	B	47	0	49	0	0
3	C	47	0	49	2	0
4	A	86	0	0	2	0
4	B	75	0	0	1	0
4	C	69	0	0	1	0
All	All	9176	0	8703	260	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 15.

All (260) 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:375:VAL:HG22	1:C:375:VAL:HG13	1.45	0.98
1:A:174:MET:HE3	1:A:176:ILE:HD11	1.51	0.93
1:B:269:CYS:HG	1:B:319:CYS:HG	0.96	0.88
1:C:4:ASP:H	1:C:173:SER:HB3	1.40	0.86
1:A:375:VAL:CG2	1:C:375:VAL:HG13	2.11	0.81
1:C:288:MET:HE1	1:C:378:ASP:C	2.10	0.77
1:B:276:PRO:O	1:B:279:ILE:HG12	1.86	0.75
1:C:155:CYS:HG	1:C:359:CYS:HG	0.78	0.75
1:C:288:MET:HE1	1:C:379:MET:N	2.01	0.75
1:B:20:VAL:HG12	1:B:85:VAL:HG22	1.70	0.74
1:A:149:LEU:HD23	1:A:150:PHE:N	2.02	0.73
1:A:155:CYS:HG	1:A:359:CYS:HG	0.87	0.72
1:A:375:VAL:HG22	1:C:375:VAL:CG1	2.19	0.72
1:C:269:CYS:HG	1:C:319:CYS:HG	0.73	0.72
1:C:217:CYS:HG	1:C:382:CYS:HG	0.75	0.72
1:A:258:PRO:HG3	1:A:266:GLN:NE2	2.06	0.70
1:C:271:GLN:H	1:C:271:GLN:CD	1.99	0.70
1:B:258:PRO:HG3	1:B:266:GLN:NE2	2.07	0.69
1:C:202:ILE:CD1	1:C:379:MET:HG3	2.23	0.69
1:A:2:MET:HG2	1:A:90:GLY:HA2	1.74	0.68
1:C:188:LEU:HD23	1:C:355:ALA:HB2	1.75	0.68
1:C:235:ARG:HB2	1:C:332:VAL:HB	1.76	0.68
1:A:258:PRO:HG3	1:A:266:GLN:HE21	1.60	0.67
1:A:61(P):SER:O	1:A:62(P):PHE:HB2	1.95	0.67
1:C:235:ARG:HG3	1:C:332:VAL:HB	1.77	0.67
1:B:170:VAL:HG12	1:B:171:GLY:N	2.10	0.67
1:B:155:CYS:O	1:B:170:VAL:HG13	1.96	0.66
1:B:234:LEU:HG	1:B:337:ILE:HD11	1.76	0.66
1:C:73:GLN:HB2	3:C:803:LIJ:H50	1.77	0.65
1:A:61(P):SER:HB2	4:A:997:HOH:O	1.96	0.64
1:B:261:PHE:CD1	1:B:268:VAL:HG23	2.33	0.64
1:A:235:ARG:HG3	1:A:332:VAL:HB	1.79	0.64
1:B:155:CYS:O	1:B:170:VAL:CG1	2.46	0.64
1:A:276:PRO:O	1:A:279:ILE:HG12	1.97	0.64
1:C:4:ASP:N	1:C:173:SER:HB3	2.12	0.63
1:C:276:PRO:O	1:C:279:ILE:HG12	1.99	0.63
1:C:271:GLN:CD	1:C:271:GLN:N	2.56	0.62
1:B:235:ARG:HG3	1:B:332:VAL:HB	1.81	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:174:MET:HE3	1:B:176:ILE:HD11	1.80	0.62
1:C:2:MET:HG2	1:C:90:GLY:HA2	1.82	0.62
1:B:244:ALA:O	1:B:248:ILE:HG13	1.99	0.62
1:B:378:ASP:HB3	1:B:381:ASP:OD2	1.99	0.62
1:A:300:ILE:N	1:A:300:ILE:HD12	2.16	0.61
1:A:367:THR:H	1:C:211:GLN:HE22	1.49	0.61
1:C:235:ARG:CG	1:C:332:VAL:HB	2.30	0.61
1:B:2:MET:HG2	1:B:90:GLY:HA2	1.82	0.61
1:A:72:THR:HG22	3:A:801:LIJ:H46	1.82	0.61
1:A:155:CYS:O	1:A:170:VAL:CG1	2.49	0.61
1:B:309:VAL:HG21	1:B:321:LYS:HG3	1.83	0.60
1:B:188:LEU:HD23	1:B:355:ALA:HB2	1.83	0.60
1:C:61(P):SER:N	1:C:175:ILE:CG2	2.64	0.60
1:C:149:LEU:HD21	1:C:178:GLY:HA2	1.84	0.60
1:B:103:THR:O	1:B:104:GLU:HG3	2.02	0.59
1:C:149:LEU:HD23	1:C:149:LEU:O	2.02	0.59
1:B:303:GLN:HB2	1:B:361:VAL:CG1	2.33	0.59
1:A:269:CYS:HG	1:A:319:CYS:HG	0.74	0.59
1:A:19:THR:HA	1:A:25:GLN:O	2.03	0.59
1:C:197:TRP:CG	1:C:198:TYR:H	2.20	0.59
1:A:125:GLU:O	1:A:125:GLU:HG3	2.02	0.59
1:B:290:GLU:HG2	4:B:908:HOH:O	2.03	0.58
1:C:61(P):SER:N	1:C:175:ILE:HG23	2.19	0.58
1:A:197:TRP:CG	1:A:198:TYR:H	2.22	0.58
1:A:149:LEU:HD23	1:A:149:LEU:C	2.29	0.58
1:A:261:PHE:CD1	1:A:268:VAL:HG23	2.39	0.57
1:B:245:VAL:HG12	1:B:249:LYS:HE3	1.86	0.57
1:C:288:MET:CE	1:C:378:ASP:HA	2.33	0.57
1:A:197:TRP:CD1	1:A:198:TYR:H	2.22	0.57
1:B:149:LEU:C	1:B:149:LEU:HD23	2.30	0.57
1:B:271:GLN:HB2	1:B:274:THR:HG21	1.87	0.57
1:C:238:LYS:HE2	1:C:242:GLU:OE2	2.05	0.57
1:C:63:LEU:HB2	1:C:80:LEU:O	2.05	0.57
1:C:155:CYS:HG	1:C:359:CYS:CB	2.16	0.57
1:C:9:LYS:HE2	1:C:112:GLY:O	2.05	0.57
1:A:363:ASP:HB3	1:A:366:ARG:O	2.05	0.56
1:B:197:TRP:CG	1:B:198:TYR:H	2.23	0.56
1:A:9:LYS:HD2	1:A:12:GLN:OE1	2.04	0.56
1:B:303:GLN:HB2	1:B:361:VAL:HG11	1.87	0.56
1:A:62(P):PHE:CB	1:A:2:MET:HE2	2.35	0.56
1:C:235:ARG:CB	1:C:332:VAL:HB	2.36	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:254:THR:HG22	1:A:255:GLU:HG3	1.87	0.55
1:C:310:GLU:O	1:C:310:GLU:HG3	2.06	0.55
1:C:194:ARG:HE	1:C:379:MET:HE3	1.70	0.55
1:A:157:ALA:HB2	1:A:170:VAL:HG22	1.88	0.55
1:B:245:VAL:CG1	1:B:249:LYS:HE3	2.36	0.55
1:C:238:LYS:HG3	1:C:326:GLN:OE1	2.07	0.55
1:B:170:VAL:CG1	1:B:171:GLY:N	2.70	0.55
1:B:291:VAL:O	1:B:294:GLN:HG3	2.06	0.54
1:B:238:LYS:HE3	1:B:242:GLU:OE2	2.08	0.54
1:A:3:VAL:O	1:A:173:SER:OG	2.15	0.54
1:A:62(P):PHE:HB2	1:A:2:MET:HE2	1.89	0.54
1:C:73:GLN:HB2	3:C:803:LIJ:C50	2.38	0.54
1:C:157:ALA:HB2	1:C:170:VAL:HG12	1.90	0.54
1:C:63(P):VAL:O	1:C:63(P):VAL:HG22	2.08	0.53
1:A:155:CYS:HG	1:A:359:CYS:CB	2.20	0.53
1:A:335:ALA:O	1:A:339:GLU:HG3	2.08	0.53
1:B:271:GLN:CD	1:B:271:GLN:H	2.16	0.53
1:A:378:ASP:HB3	1:A:381:ASP:OD2	2.09	0.53
1:C:301:LEU:HB3	1:C:302:PRO:HD2	1.91	0.53
1:C:198:TYR:CE2	1:C:224:LYS:HE3	2.44	0.52
1:C:241:PHE:CD2	1:C:326:GLN:HB3	2.43	0.52
1:C:335:ALA:O	1:C:339:GLU:HG3	2.10	0.52
1:A:235:ARG:CG	1:A:332:VAL:HB	2.39	0.52
1:C:3:VAL:O	1:C:4:ASP:HB3	2.08	0.52
1:C:151:SER:OG	1:C:175:ILE:HB	2.10	0.52
1:A:91:PRO:HD3	1:A:176:ILE:HB	1.91	0.51
1:C:36:SER:OG	1:C:122:ALA:HB3	2.10	0.51
1:B:194:ARG:HB3	1:B:200:GLU:HG2	1.92	0.51
1:C:270:TRP:O	1:C:317:ASP:HB3	2.10	0.51
1:C:189:TRP:O	1:C:353:GLY:HA2	2.10	0.51
1:C:125:GLU:CD	1:C:195:ARG:HH11	2.19	0.51
1:B:222:TYR:O	1:B:223:ASP:CB	2.59	0.50
1:C:288:MET:HE1	1:C:378:ASP:HA	1.94	0.50
1:C:222:TYR:O	1:C:223:ASP:CB	2.59	0.50
1:A:222:TYR:O	1:A:223:ASP:CB	2.59	0.50
1:A:365:PHE:CD1	1:A:366:ARG:HG3	2.46	0.50
1:C:63(P):VAL:O	1:C:63(P):VAL:CG2	2.60	0.50
1:B:126:ILE:HG23	1:B:197:TRP:HB2	1.94	0.49
1:A:209:ASN:ND2	1:A:281:PRO:HB3	2.27	0.49
1:A:271:GLN:O	1:A:272:ALA:C	2.55	0.49
1:A:278:ASN:OD1	1:C:254:THR:HG23	2.12	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:19:THR:HA	1:C:25:GLN:O	2.12	0.49
1:B:357:SER:O	1:B:360:HIS:HB3	2.12	0.49
1:C:61(P):SER:HB3	1:C:178:GLY:HA3	1.94	0.49
1:C:376:THR:HB	4:C:950:HOH:O	2.11	0.49
1:B:303:GLN:OE1	1:B:303:GLN:N	2.36	0.49
1:C:149:LEU:HD23	1:C:149:LEU:C	2.38	0.49
1:A:125:GLU:HG2	1:A:197:TRP:HB3	1.94	0.49
1:B:22:SER:HA	1:B:23:PRO:C	2.37	0.49
1:C:4:ASP:H	1:C:173:SER:CB	2.20	0.49
1:A:375:VAL:HG22	1:C:375:VAL:HG22	1.95	0.48
1:C:302:PRO:O	1:C:306:LEU:HB2	2.13	0.48
1:B:77:GLU:HG2	1:B:104:GLU:HB2	1.95	0.48
1:B:154:LEU:O	1:B:339:GLU:HA	2.13	0.48
1:B:301:LEU:HD11	1:B:367:THR:HA	1.95	0.48
1:C:30:LEU:HD23	1:C:30:LEU:C	2.38	0.48
1:A:234:LEU:HG	1:A:337:ILE:HD11	1.95	0.48
1:C:258:PRO:HB2	1:C:266:GLN:OE1	2.13	0.48
1:B:238:LYS:O	1:B:242:GLU:HG3	2.14	0.48
1:B:300:ILE:O	1:B:300:ILE:HG13	2.14	0.48
1:A:225:SER:OG	1:A:331:THR:HB	2.14	0.48
1:B:301:LEU:HB3	1:B:302:PRO:HD2	1.96	0.48
1:B:42:ALA:CB	1:B:101:ALA:HB1	2.44	0.48
1:C:307:ARG:HA	1:C:308:PRO:HD3	1.68	0.47
1:C:380:GLU:CD	1:C:380:GLU:H	2.21	0.47
1:B:302:PRO:O	1:B:306:LEU:HB2	2.15	0.47
1:A:45:HIS:ND1	1:A:46:PRO:HD2	2.29	0.47
1:C:63(P):VAL:HA	1:C:3:VAL:HG23	1.97	0.47
1:A:110:ILE:HB	1:A:113:SER:HB3	1.97	0.47
1:B:144:THR:OG1	1:B:146:VAL:HG23	2.14	0.47
1:B:268:VAL:HG12	1:B:269:CYS:N	2.30	0.47
1:C:8:GLY:O	1:C:170:VAL:HG22	2.15	0.47
1:C:95:VAL:HG11	1:C:140:LEU:HD12	1.95	0.47
1:C:288:MET:HE1	1:C:378:ASP:CA	2.44	0.47
1:A:300:ILE:HG12	1:A:337:ILE:HD12	1.96	0.47
1:B:302:PRO:HG2	1:B:303:GLN:OE1	2.15	0.47
1:B:205:ARG:NH1	1:B:212:ASP:OD2	2.48	0.46
1:B:212:ASP:O	1:B:214:LYS:HG3	2.15	0.46
1:C:59:THR:HG21	1:C:84:LEU:CD1	2.46	0.46
1:B:19:THR:HA	1:B:25:GLN:O	2.14	0.46
1:B:374:PHE:HD2	1:C:292:THR:HG22	1.80	0.46
1:A:54:ARG:HB3	1:A:60:TYR:CD2	2.50	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:207:GLU:HA	1:C:211:GLN:O	2.15	0.46
1:C:300:ILE:O	1:C:300:ILE:HG13	2.13	0.46
1:C:241:PHE:CG	1:C:326:GLN:HB3	2.50	0.46
1:B:32:ASP:OD2	1:B:35:SER:OG	2.29	0.46
1:B:271:GLN:O	1:B:272:ALA:C	2.57	0.46
1:A:269:CYS:CB	1:A:319:CYS:HG	2.25	0.45
1:A:238:LYS:O	1:A:242:GLU:HG3	2.16	0.45
1:B:9:LYS:O	1:B:10:SER:C	2.59	0.45
1:B:301:LEU:O	1:B:304:GLN:HB2	2.17	0.45
1:A:82:THR:HG22	1:A:98:ASN:HD22	1.80	0.45
1:C:202:ILE:HD12	1:C:379:MET:HG3	1.97	0.45
1:C:213:LEU:HD12	1:C:213:LEU:HA	1.85	0.45
1:B:222:TYR:O	1:B:223:ASP:HB3	2.17	0.45
1:A:205:ARG:HB3	1:A:286:TYR:HB2	1.98	0.45
1:A:241:PHE:CG	1:A:326:GLN:HB3	2.51	0.45
1:C:68:TYR:OH	1:C:70:PRO:HB3	2.17	0.45
1:C:76:TRP:HB2	1:C:102:ILE:HG23	1.99	0.45
1:C:253:SER:C	1:C:255:GLU:H	2.23	0.45
1:B:125:GLU:O	1:B:125:GLU:HG3	2.17	0.45
1:C:197:TRP:CD1	1:C:198:TYR:H	2.35	0.44
1:A:198:TYR:CE2	1:A:224:LYS:HE3	2.52	0.44
1:A:341:PHE:C	1:A:357:SER:HB2	2.42	0.44
1:A:14:TYR:CG	1:A:154:LEU:HD22	2.53	0.44
1:B:271:GLN:O	1:B:274:THR:HG23	2.17	0.44
1:A:61(P):SER:O	1:A:62(P):PHE:CB	2.65	0.44
1:C:21:GLY:HA2	1:C:83:ASP:OD1	2.17	0.44
1:C:278:ASN:HD22	1:C:278:ASN:H	1.65	0.44
1:A:249:LYS:HE2	1:A:262:TRP:CD1	2.53	0.44
1:B:302:PRO:C	1:B:304:GLN:N	2.73	0.44
1:A:3:VAL:O	1:A:173:SER:CB	2.65	0.44
1:A:304:GLN:O	1:A:336:VAL:HB	2.18	0.44
1:A:70:PRO:HA	1:A:75:LYS:HB3	2.00	0.43
1:B:6:LEU:HB2	1:B:172:GLY:C	2.43	0.43
1:B:30:LEU:C	1:B:30:LEU:HD23	2.43	0.43
1:B:217:CYS:HA	1:B:220:TYR:CD1	2.53	0.43
1:C:19:THR:OG1	1:C:86:SER:HB2	2.17	0.43
1:A:189:TRP:CZ3	1:B:291:VAL:CG1	3.02	0.43
1:A:197:TRP:CG	1:A:198:TYR:N	2.86	0.43
1:C:197:TRP:CG	1:C:198:TYR:N	2.86	0.43
1:C:155:CYS:SG	1:C:359:CYS:CB	3.06	0.43
1:C:261:PHE:CD1	1:C:268:VAL:HG23	2.53	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:125:GLU:HG2	1:A:197:TRP:CB	2.48	0.43
1:B:309:VAL:O	1:B:310:GLU:C	2.61	0.43
1:A:375:VAL:CG2	1:C:375:VAL:HG22	2.48	0.43
1:C:54:ARG:HD2	1:C:60:TYR:CZ	2.54	0.43
1:A:179:ILE:HD11	1:A:344:VAL:HG11	1.99	0.43
1:C:293:ASN:CB	1:C:375:VAL:HG12	2.49	0.43
1:C:9:LYS:O	1:C:10:SER:C	2.60	0.43
1:C:14:TYR:CG	1:C:154:LEU:HD22	2.54	0.42
1:C:153:GLN:OE1	1:C:183:LEU:HD22	2.20	0.42
1:C:293:ASN:HA	1:C:375:VAL:HG12	2.01	0.42
1:A:9:LYS:HG3	1:A:12:GLN:HG3	2.01	0.42
1:A:241:PHE:CD2	1:A:326:GLN:HB3	2.55	0.42
1:B:199:TYR:HB3	1:B:352:ILE:HD11	2.01	0.42
1:B:149:LEU:HD12	1:B:346:ASP:HA	2.02	0.42
1:B:304:GLN:CG	1:B:361:VAL:HG21	2.50	0.42
1:C:293:ASN:HA	1:C:375:VAL:HA	2.01	0.42
1:A:45:HIS:CE1	1:A:46:PRO:HD2	2.54	0.42
1:A:213:LEU:HA	1:A:213:LEU:HD12	1.78	0.42
4:A:901:HOH:O	1:C:375:VAL:HG22	2.19	0.42
1:B:91:PRO:HD3	1:B:176:ILE:HB	2.02	0.42
1:B:267:LEU:HD23	1:B:309:VAL:HG21	2.01	0.42
1:B:276:PRO:O	1:B:277:TRP:C	2.63	0.42
1:B:309:VAL:HG22	1:B:320:TYR:HA	2.00	0.42
1:A:298:ILE:HA	1:A:369:ALA:O	2.20	0.41
1:C:271:GLN:O	1:C:273:GLY:N	2.53	0.41
1:C:231:THR:HG21	1:C:332:VAL:HG11	2.02	0.41
1:C:286:TYR:CD2	1:C:297:ARG:HB3	2.54	0.41
1:B:344:VAL:O	1:B:352:ILE:HA	2.19	0.41
1:B:34:GLY:HA3	1:B:228:ASP:OD1	2.20	0.41
1:B:36:SER:OG	1:B:122:ALA:HB3	2.20	0.41
1:C:111:ASN:HD22	1:C:112:GLY:N	2.17	0.41
1:C:319:CYS:C	1:C:320:TYR:CD1	2.99	0.41
1:A:287:LEU:O	1:A:295:SER:HB2	2.21	0.41
1:B:271:GLN:HB2	1:B:274:THR:CG2	2.49	0.41
1:B:298:ILE:O	1:B:298:ILE:HG13	2.20	0.41
1:C:189:TRP:HB3	1:C:296:PHE:CD2	2.56	0.41
1:B:219:GLU:OE2	1:B:239:LYS:HD3	2.21	0.41
1:C:68:TYR:OH	1:C:75:LYS:HD3	2.20	0.41
1:A:34:GLY:O	3:A:801:LIJ:H26	2.21	0.41
1:A:45:HIS:CG	1:A:46:PRO:HD2	2.56	0.41
1:B:309:VAL:O	1:B:319:CYS:HB2	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:3:VAL:O	1:C:4:ASP:CB	2.67	0.41
1:B:197:TRP:CG	1:B:198:TYR:N	2.89	0.41
1:B:267:LEU:HD23	1:B:309:VAL:CG2	2.51	0.41
1:A:188:LEU:HD23	1:A:355:ALA:HB2	2.03	0.40
1:B:130:ASP:C	1:B:132:SER:H	2.29	0.40
1:C:149:LEU:HD21	1:C:178:GLY:CA	2.49	0.40
1:A:62(P):PHE:HD1	1:A:62(P):PHE:HA	1.81	0.40
1:A:134:GLU:HA	1:A:135:PRO:HD3	1.89	0.40
1:C:268:VAL:O	1:C:319:CYS:HA	2.22	0.40
1:B:208:ILE:C	1:B:210:GLY:N	2.77	0.40
1:B:269:CYS:HG	1:B:319:CYS:CB	2.32	0.40
1:B:304:GLN:NE2	1:B:340:GLY:HA3	2.35	0.40
1:B:386:ILE:H	1:B:386:ILE:HG13	1.56	0.40
1:C:222:TYR:O	1:C:223:ASP:HB2	2.21	0.40
1:C:17:GLU:HG2	1:C:88:PRO:HG2	2.03	0.40
1:C:253:SER:C	1:C:255:GLU:N	2.80	0.40
1:A:307:ARG:HA	1:A:308:PRO:HD3	1.79	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	365/455 (80%)	341 (93%)	21 (6%)	3 (1%)	16	31
1	B	366/455 (80%)	337 (92%)	24 (7%)	5 (1%)	9	17
1	C	367/455 (81%)	344 (94%)	18 (5%)	5 (1%)	9	17
All	All	1098/1365 (80%)	1022 (93%)	63 (6%)	13 (1%)	10	20

All (13) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	62(P)	PHE
1	A	223	ASP
1	B	10	SER
1	B	223	ASP
1	C	223	ASP
1	C	272	ALA
1	C	10	SER
1	A	125	GLU
1	B	131	ASP
1	B	254	THR
1	B	278	ASN
1	C	70	PRO
1	C	253	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	317/381 (83%)	305 (96%)	12 (4%)	29	56
1	B	317/381 (83%)	306 (96%)	11 (4%)	32	58
1	C	318/381 (84%)	307 (96%)	11 (4%)	32	58
All	All	952/1143 (83%)	918 (96%)	34 (4%)	31	58

All (34) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	62(P)	PHE
1	A	62	ASP
1	A	125	GLU
1	A	149	LEU
1	A	173	SER
1	A	187	SER
1	A	211	GLN
1	A	213	LEU
1	A	234	LEU
1	A	254	THR

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Mol	Chain	Res	Type
1	A	361	VAL
1	A	375	VAL
1	B	62(P)	PHE
1	B	62	ASP
1	B	125	GLU
1	B	149	LEU
1	B	197	TRP
1	B	213	LEU
1	B	234	LEU
1	B	235	ARG
1	B	267	LEU
1	B	291	VAL
1	B	294	GLN
1	C	1	GLU
1	C	55	GLN
1	C	149	LEU
1	C	173	SER
1	C	197	TRP
1	C	292	THR
1	C	300	ILE
1	C	325	SER
1	C	361	VAL
1	C	375	VAL
1	C	386	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (22) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	55	GLN
1	A	73	GLN
1	A	98	ASN
1	A	111	ASN
1	A	211	GLN
1	A	266	GLN
1	A	271	GLN
1	A	385	ASN
1	B	98	ASN
1	B	111	ASN
1	B	181	HIS
1	B	209	ASN
1	B	266	GLN
1	B	278	ASN

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Mol	Chain	Res	Type
1	C	53	GLN
1	C	73	GLN
1	C	89	HIS
1	C	111	ASN
1	C	211	GLN
1	C	278	ASN
1	C	294	GLN
1	C	385	ASN

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](#)

6 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	PO4	A	703	-	4,4,4	1.63	0	6,6,6	0.46	0
3	LIJ	B	802	-	48,49,49	3.76	24 (50%)	56,64,64	1.50	11 (19%)
2	PO4	A	702	-	4,4,4	1.60	0	6,6,6	0.47	0
3	LIJ	A	801	-	48,49,49	3.20	23 (47%)	56,64,64	1.37	10 (17%)
3	LIJ	C	803	-	48,49,49	3.42	25 (52%)	56,64,64	1.55	12 (21%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	PO4	C	701	-	4,4,4	1.61	0	6,6,6	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
3	LIJ	B	802	-	-	11/50/50/50	0/3/3/3
3	LIJ	C	803	-	-	13/50/50/50	0/3/3/3
3	LIJ	A	801	-	-	14/50/50/50	0/3/3/3

All (72) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	802	LIJ	C9-S8	15.86	1.86	1.77
3	C	803	LIJ	C9-S8	10.99	1.83	1.77
3	A	801	LIJ	C9-S8	8.62	1.82	1.77
3	A	801	LIJ	C28-C27	5.83	1.49	1.38
3	C	803	LIJ	C28-C27	5.70	1.49	1.38
3	C	803	LIJ	C26-C27	5.67	1.48	1.39
3	B	802	LIJ	C28-C27	5.65	1.49	1.38
3	C	803	LIJ	C26-C25	5.63	1.48	1.39
3	B	802	LIJ	C26-C25	5.42	1.48	1.39
3	C	803	LIJ	C29-C30	5.38	1.48	1.38
3	A	801	LIJ	C26-C25	5.35	1.48	1.39
3	A	801	LIJ	C26-C27	5.24	1.47	1.39
3	B	802	LIJ	C20-C15	5.20	1.49	1.38
3	C	803	LIJ	C29-C28	5.14	1.47	1.38
3	A	801	LIJ	C17-C16	5.13	1.47	1.38
3	B	802	LIJ	C29-C30	5.13	1.47	1.38
3	B	802	LIJ	C26-C27	5.12	1.47	1.39
3	A	801	LIJ	C20-C15	5.10	1.49	1.38
3	B	802	LIJ	C17-C16	5.05	1.47	1.38
3	A	801	LIJ	C29-C30	5.04	1.47	1.38
3	A	801	LIJ	C29-C28	4.97	1.47	1.38
3	B	802	LIJ	C29-C28	4.89	1.47	1.38
3	C	803	LIJ	C20-C15	4.86	1.48	1.38
3	A	801	LIJ	C16-C15	4.76	1.48	1.38
3	C	803	LIJ	C17-C16	4.74	1.47	1.38
3	B	802	LIJ	C16-C15	4.63	1.48	1.38
3	C	803	LIJ	C30-C25	4.61	1.48	1.38

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	801	LIJ	C30-C25	4.53	1.47	1.38
3	B	802	LIJ	C50-C45	4.52	1.47	1.38
3	C	803	LIJ	C16-C15	4.50	1.47	1.38
3	C	803	LIJ	C50-C45	4.44	1.47	1.38
3	A	801	LIJ	C50-C45	4.41	1.47	1.38
3	A	801	LIJ	C19-C20	4.37	1.46	1.38
3	A	801	LIJ	C18-C17	4.17	1.47	1.38
3	B	802	LIJ	C19-C20	4.15	1.46	1.38
3	A	801	LIJ	C6-C7	4.15	1.61	1.52
3	C	803	LIJ	C6-C7	4.06	1.60	1.52
3	B	802	LIJ	C49-C50	4.04	1.45	1.38
3	C	803	LIJ	C49-C50	4.02	1.45	1.38
3	B	802	LIJ	C30-C25	3.97	1.46	1.38
3	B	802	LIJ	C18-C17	3.96	1.47	1.38
3	C	803	LIJ	C18-C17	3.95	1.46	1.38
3	C	803	LIJ	C19-C20	3.89	1.45	1.38
3	C	803	LIJ	C47-C46	3.88	1.45	1.38
3	B	802	LIJ	C6-C7	3.80	1.60	1.52
3	B	802	LIJ	C47-C46	3.78	1.45	1.38
3	B	802	LIJ	C19-C18	3.72	1.46	1.38
3	A	801	LIJ	C49-C50	3.72	1.45	1.38
3	B	802	LIJ	C46-C45	3.71	1.46	1.38
3	A	801	LIJ	C48-C47	3.60	1.46	1.38
3	A	801	LIJ	C19-C18	3.59	1.46	1.38
3	C	803	LIJ	C46-C45	3.56	1.46	1.38
3	B	802	LIJ	C48-C47	3.51	1.46	1.38
3	C	803	LIJ	C19-C18	3.49	1.45	1.38
3	C	803	LIJ	C48-C47	3.49	1.45	1.38
3	A	801	LIJ	C47-C46	3.42	1.44	1.38
3	C	803	LIJ	C49-C48	3.39	1.45	1.38
3	A	801	LIJ	C46-C45	3.30	1.45	1.38
3	B	802	LIJ	C49-C48	3.30	1.45	1.38
3	A	801	LIJ	C49-C48	3.22	1.45	1.38
3	C	803	LIJ	C24-C25	3.06	1.58	1.51
3	B	802	LIJ	C24-C25	2.75	1.57	1.51
3	C	803	LIJ	O43-C41	2.47	1.40	1.35
3	B	802	LIJ	C10-N40	-2.34	1.41	1.45
3	C	803	LIJ	C41-N40	2.31	1.40	1.34
3	A	801	LIJ	C41-N40	2.25	1.40	1.34
3	B	802	LIJ	C41-N40	2.21	1.40	1.34
3	C	803	LIJ	C22-C21	-2.21	1.49	1.52
3	B	802	LIJ	C22-N23	2.20	1.50	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	803	LIJ	C22-N23	2.18	1.50	1.47
3	A	801	LIJ	C22-N23	2.14	1.50	1.47
3	A	801	LIJ	C24-C25	2.06	1.56	1.51

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	802	LIJ	C14-C13-N12	-4.08	104.28	110.08
3	C	803	LIJ	C13-N12-C11	4.07	130.32	123.25
3	C	803	LIJ	O8A-S8-O8B	-4.03	113.56	118.13
3	B	802	LIJ	C13-N12-C11	3.96	130.14	123.25
3	A	801	LIJ	O8A-S8-O8B	-3.94	113.67	118.13
3	B	802	LIJ	O8A-S8-O8B	-3.89	113.72	118.13
3	C	803	LIJ	C14-C13-N12	-3.88	104.57	110.08
3	C	803	LIJ	C44-O43-C41	3.68	124.22	115.93
3	A	801	LIJ	C31-O27-C27	3.36	124.69	117.50
3	A	801	LIJ	C14-C13-N12	-3.33	105.35	110.08
3	B	802	LIJ	C27-C26-C25	3.27	123.33	119.76
3	C	803	LIJ	C31-O27-C27	3.12	124.18	117.50
3	B	802	LIJ	C31-O27-C27	3.00	123.93	117.50
3	B	802	LIJ	C44-O43-C41	2.91	122.47	115.93
3	C	803	LIJ	C27-C26-C25	2.88	122.91	119.76
3	A	801	LIJ	C27-C26-C25	2.78	122.80	119.76
3	A	801	LIJ	O11-C11-C10	-2.72	114.77	120.48
3	C	803	LIJ	O11-C11-C10	-2.65	114.92	120.48
3	A	801	LIJ	C25-C24-N23	-2.63	104.53	112.79
3	B	802	LIJ	O21-C21-C22	-2.53	104.70	109.67
3	A	801	LIJ	C44-O43-C41	2.49	121.54	115.93
3	A	801	LIJ	C13-N12-C11	2.44	127.48	123.25
3	C	803	LIJ	C10-N40-C41	2.44	126.99	120.93
3	C	803	LIJ	O21-C21-C22	-2.39	104.96	109.67
3	C	803	LIJ	C25-C24-N23	-2.31	105.51	112.79
3	A	801	LIJ	C10-N40-C41	2.25	126.53	120.93
3	B	802	LIJ	C25-C24-N23	-2.24	105.74	112.79
3	B	802	LIJ	O11-C11-C10	-2.24	115.79	120.48
3	B	802	LIJ	C28-C27-C26	-2.18	117.58	120.50
3	A	801	LIJ	C28-C27-C26	-2.17	117.59	120.50
3	B	802	LIJ	C11-C10-N40	2.16	116.94	111.11
3	C	803	LIJ	C28-C27-C26	-2.14	117.63	120.50
3	C	803	LIJ	O8A-S8-C7	-2.02	105.71	108.94

There are no chirality outliers.

All (38) torsion outliers are listed below:

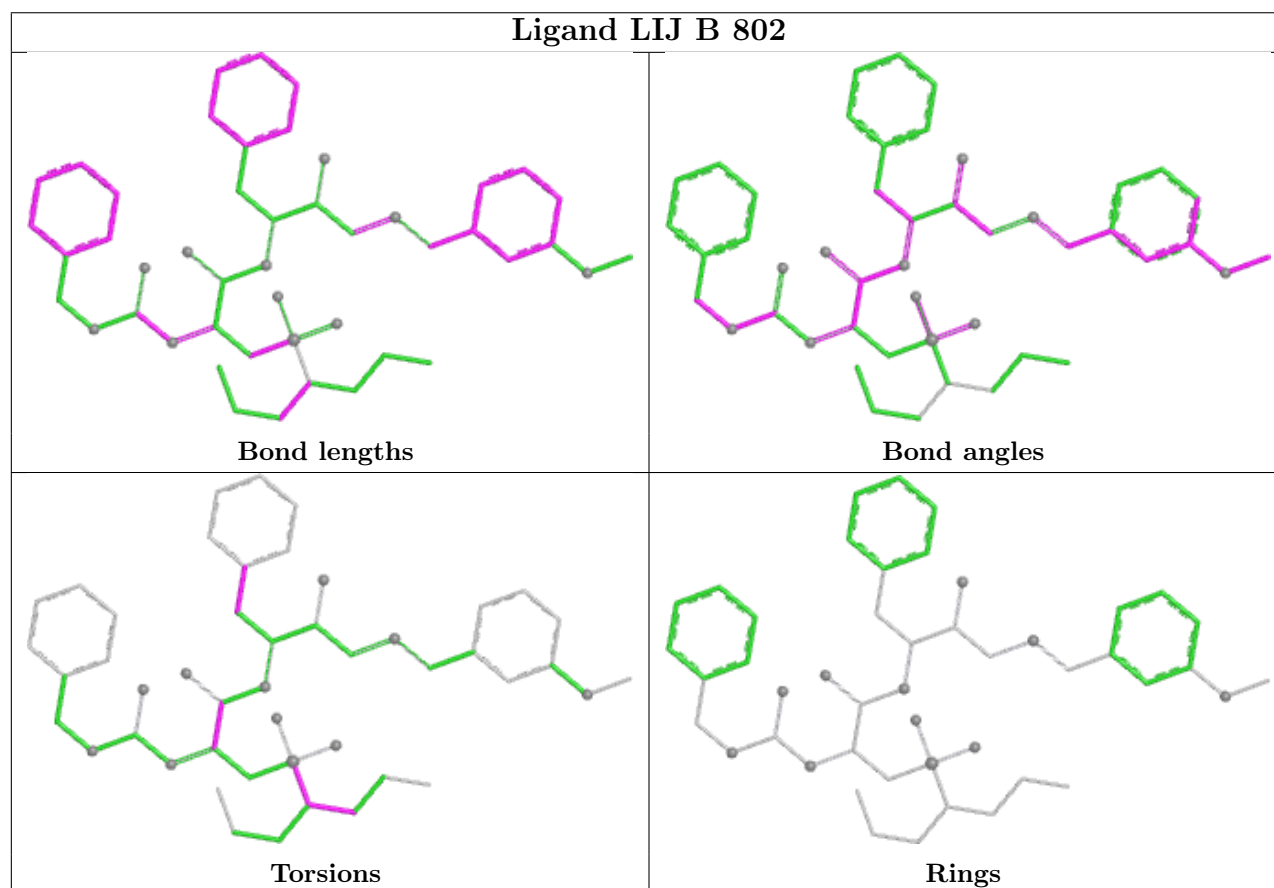
Mol	Chain	Res	Type	Atoms
3	A	801	LIJ	C6-C7-S8-C9
3	A	801	LIJ	C3-C7-S8-O8B
3	A	801	LIJ	C3-C7-S8-O8A
3	A	801	LIJ	C3-C7-S8-C9
3	B	802	LIJ	C6-C7-S8-O8B
3	B	802	LIJ	C6-C7-S8-O8A
3	B	802	LIJ	C6-C7-S8-C9
3	B	802	LIJ	C3-C7-S8-O8B
3	B	802	LIJ	C3-C7-S8-O8A
3	B	802	LIJ	C3-C7-S8-C9
3	C	803	LIJ	C6-C7-S8-O8B
3	C	803	LIJ	C6-C7-S8-O8A
3	C	803	LIJ	C6-C7-S8-C9
3	C	803	LIJ	C3-C7-S8-O8A
3	C	803	LIJ	C3-C7-S8-C9
3	A	801	LIJ	C28-C27-O27-C31
3	A	801	LIJ	C26-C27-O27-C31
3	C	803	LIJ	C28-C27-O27-C31
3	C	803	LIJ	C26-C27-O27-C31
3	B	802	LIJ	N40-C10-C11-O11
3	A	801	LIJ	N40-C10-C11-O11
3	C	803	LIJ	N40-C10-C11-O11
3	B	802	LIJ	N40-C10-C11-N12
3	C	803	LIJ	C13-C14-C15-C20
3	C	803	LIJ	C13-C14-C15-C16
3	A	801	LIJ	N40-C10-C11-N12
3	C	803	LIJ	N40-C10-C11-N12
3	B	802	LIJ	C13-C14-C15-C20
3	A	801	LIJ	C13-C14-C15-C20
3	B	802	LIJ	C13-C14-C15-C16
3	A	801	LIJ	C13-C14-C15-C16
3	A	801	LIJ	C5-C6-C7-S8
3	A	801	LIJ	C6-C7-S8-O8B
3	A	801	LIJ	C6-C7-S8-O8A
3	C	803	LIJ	C3-C7-S8-O8B
3	A	801	LIJ	C2-C3-C7-C6
3	B	802	LIJ	C2-C3-C7-C6
3	C	803	LIJ	C2-C3-C7-C6

There are no ring outliers.

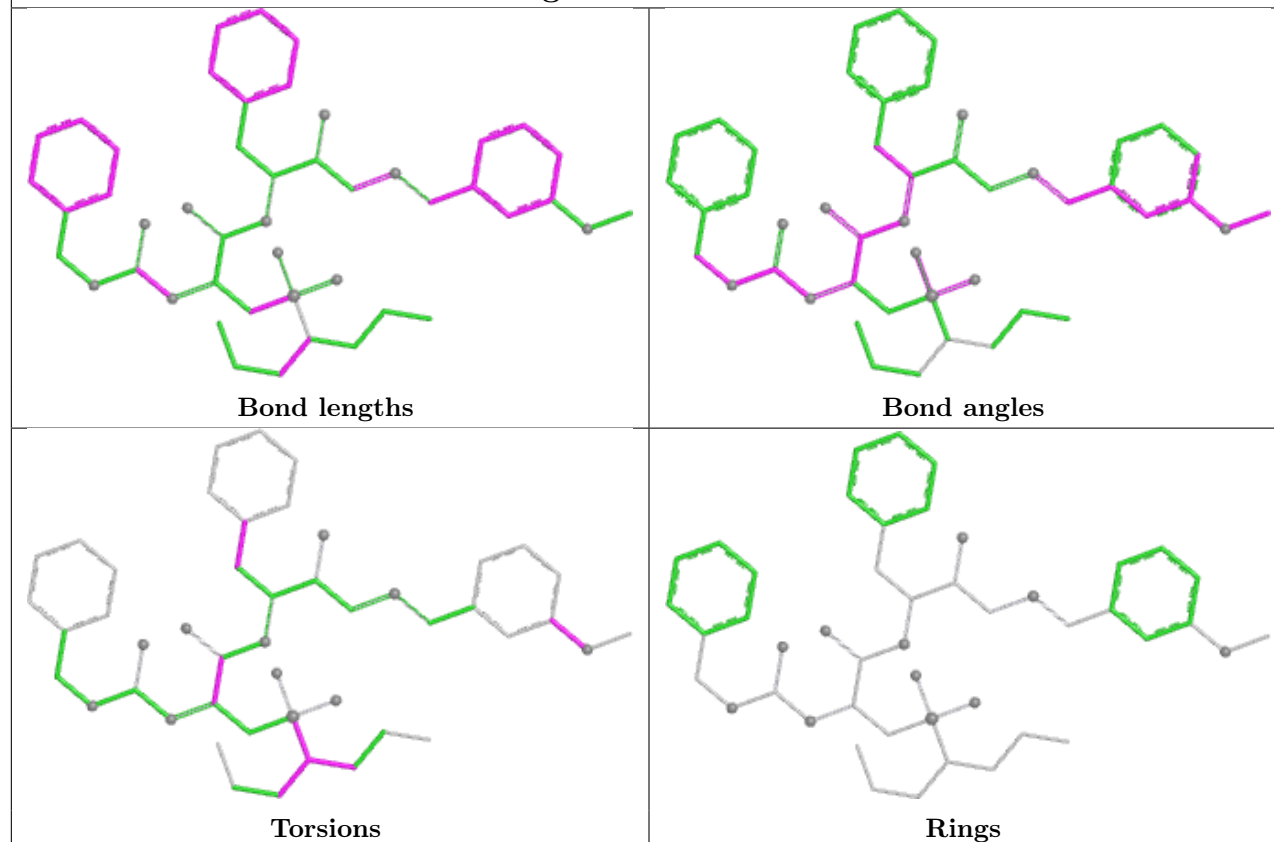
2 monomers are involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	801	LIJ	2	0
3	C	803	LIJ	2	0

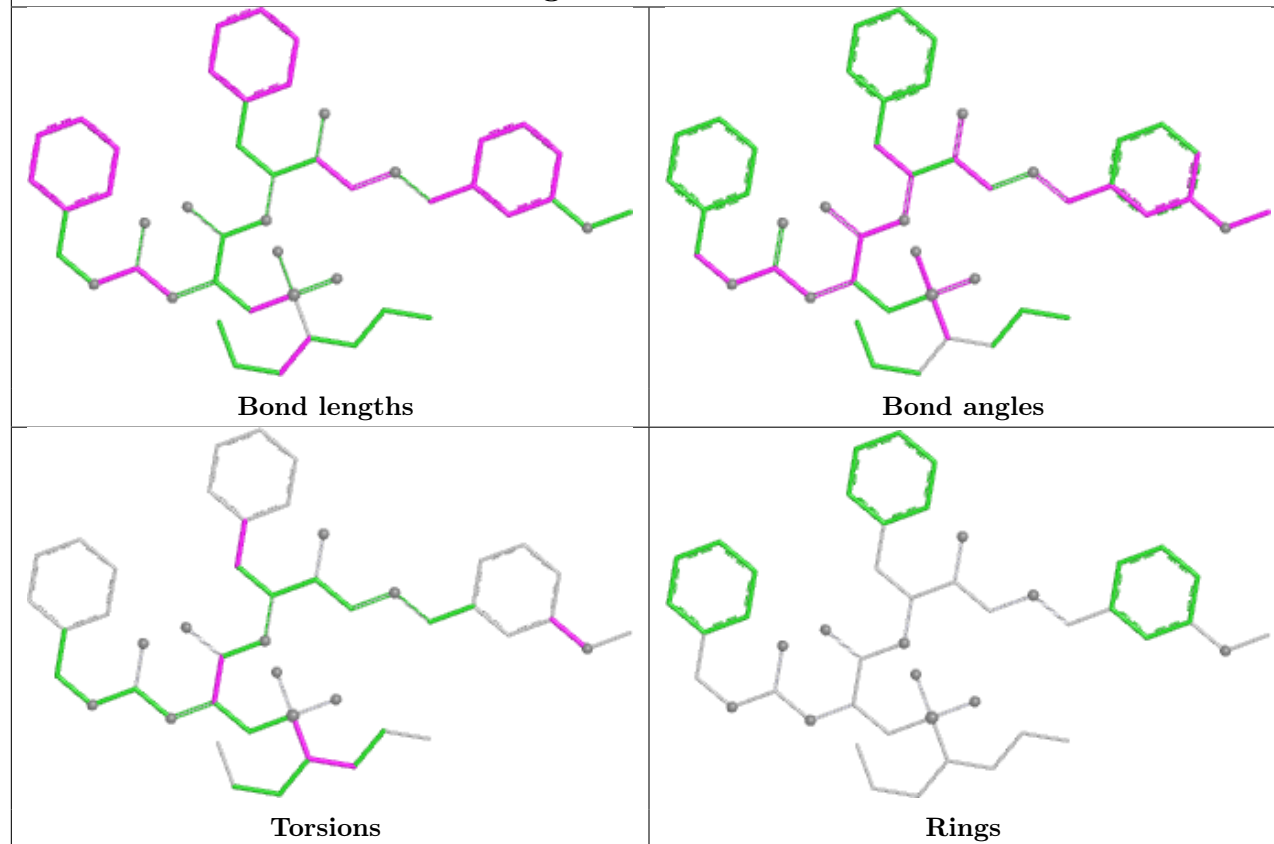
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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.



Ligand LIJ A 801



Ligand LIJ C 803



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	371/455 (81%)	-0.06	9 (2%) 59 55	23, 37, 62, 76	0
1	B	372/455 (81%)	0.03	10 (2%) 56 51	19, 40, 71, 85	0
1	C	373/455 (81%)	-0.06	10 (2%) 56 51	22, 38, 64, 83	0
All	All	1116/1365 (81%)	-0.03	29 (2%) 57 52	19, 38, 66, 85	0

All (29) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	61(P)	SER	5.8
1	C	61(P)	SER	5.2
1	A	62(P)	PHE	5.1
1	C	62(P)	PHE	5.0
1	B	361	VAL	4.8
1	B	168	ALA	4.6
1	A	365	PHE	3.8
1	C	168	ALA	3.6
1	C	362	HIS	3.5
1	A	61(P)	SER	3.5
1	A	170	VAL	3.4
1	B	62(P)	PHE	3.3
1	A	63(P)	VAL	3.2
1	B	362	HIS	3.2
1	C	386	ILE	3.1
1	C	10	SER	3.0
1	C	365	PHE	2.9
1	C	272	ALA	2.6
1	B	10	SER	2.5
1	B	364	GLU	2.5
1	C	364	GLU	2.4
1	A	266	GLN	2.3
1	B	386	ILE	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	7	ARG	2.2
1	A	169	SER	2.2
1	C	310	GLU	2.2
1	A	264	GLY	2.1
1	A	7	ARG	2.1
1	B	254	THR	2.1

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](#)

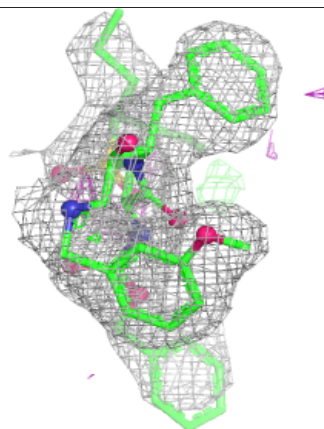
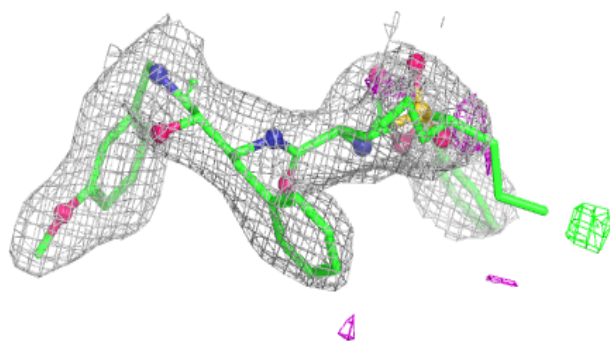
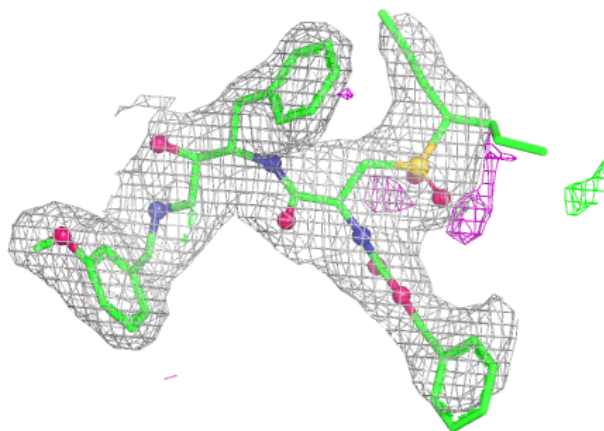
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	PO4	A	703	5/5	0.59	0.34	99,99,99,99	0
2	PO4	A	702	5/5	0.69	0.16	98,98,99,99	0
2	PO4	C	701	5/5	0.86	0.14	99,99,99,99	0
3	LIJ	B	802	47/47	0.91	0.12	31,48,62,64	0
3	LIJ	A	801	47/47	0.93	0.11	30,37,58,59	0
3	LIJ	C	803	47/47	0.94	0.11	23,40,64,66	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.

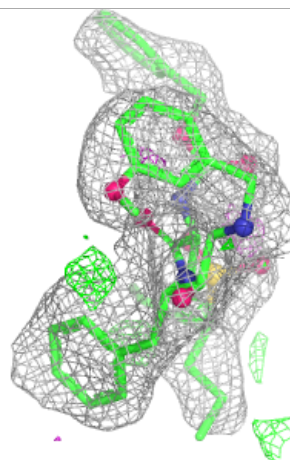
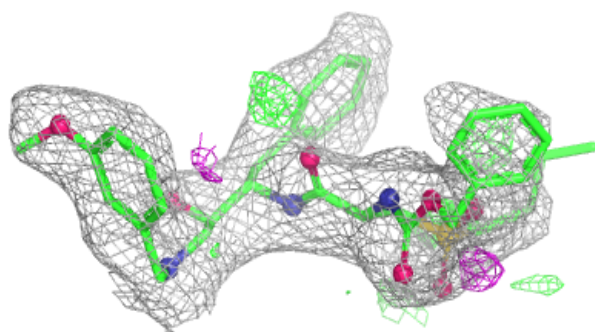
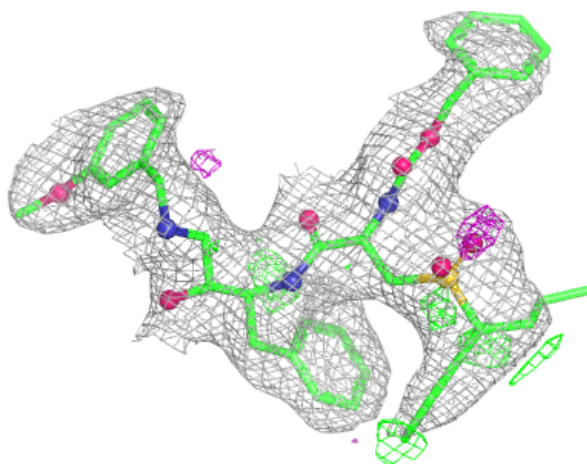
Electron density around LIJ B 802:

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



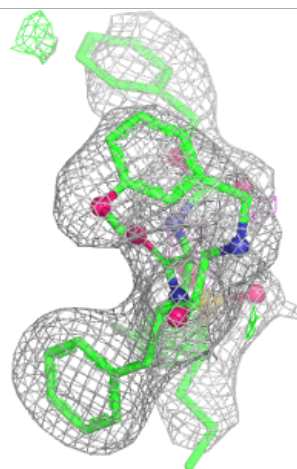
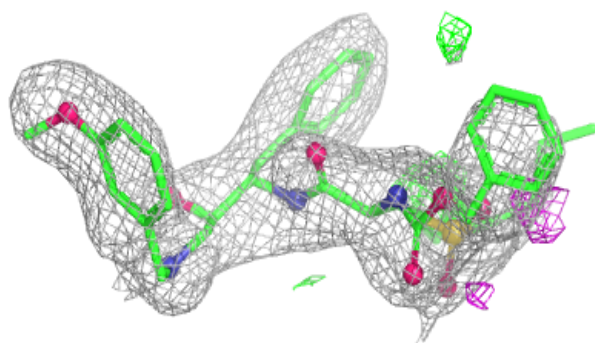
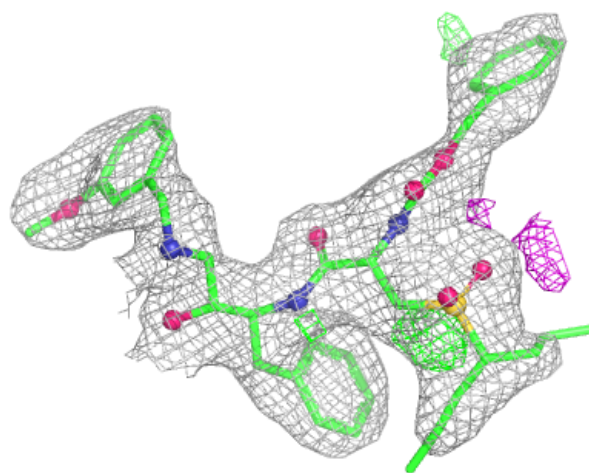
Electron density around LIJ A 801:

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



Electron density around LIJ C 803:

$2mF_o-DF_c$ (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.