Full wwPDB X-ray Structure Validation Report ⓘ

Jul 26, 2023 – 05:19 AM EDT

PDB ID	:	1A4K
Title	:	DIELS ALDER CATALYTIC ANTIBODY WITH TRANSITION STATE ANALOGUE
Authors	:	Spiller, B.W.; Romesburg, F.E.; Schultz, P.G.; Stevens, R.C.
Deposited on	:	1998-01-30
Resolution	:	2.40 Å(reported)

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

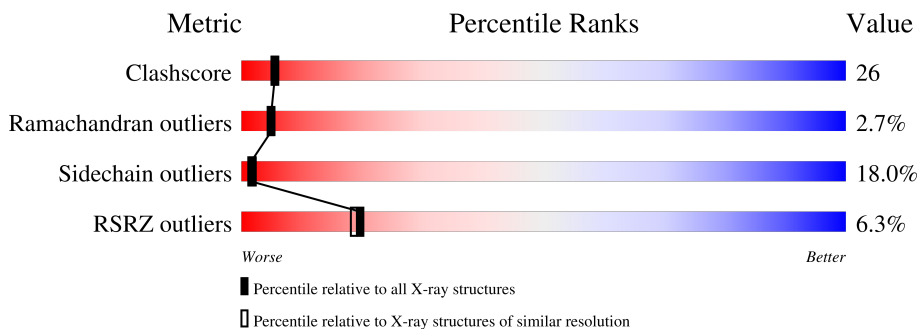|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.34
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.34

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 2.40 Å.

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

Metric	Percentile Ranks	Value
Clashscore		26
Ramachandran outliers		2.7%
Sidechain outliers		18.0%
RSRZ outliers		6.3%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	4398 (2.40-2.40)
Ramachandran outliers	138981	4318 (2.40-2.40)
Sidechain outliers	138945	4319 (2.40-2.40)
RSRZ outliers	127900	3811 (2.40-2.40)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	217	2% 59% 34% 6%
1	L	217	3% 51% 43% 5% •
2	B	219	9% 41% 45% 14%
2	H	219	11% 50% 40% 9% •

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 6921 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 ANTIBODY FAB.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	L	217	Total 1670	C 1049	N 284	O 332	S 5	0	0	0
1	A	216	Total 1665	C 1047	N 283	O 330	S 5	0	0	0

- Molecule 2 is a protein called ANTIBODY FAB.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	H	217	Total 1645	C 1046	N 271	O 322	S 6	0	0	0
2	B	219	Total 1662	C 1056	N 273	O 327	S 6	0	0	0

- Molecule 3 is CADMIUM ION (three-letter code: CD) (formula: Cd).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	L	2	Total 2	Cd 2	0	0
3	A	2	Total 2	Cd 2	0	0

- Molecule 4 is [4-(4-ACETYLAMINO-PHENYL)-3,5-DIOXO-4-AZA-TRICYCLO[5.2.2.0 2 ,6]UNDEC-1-YLCARBAMOYLOXY]-ACETIC ACID (three-letter code: FRA) (formula: $C_{21}H_{23}N_3O_7$).
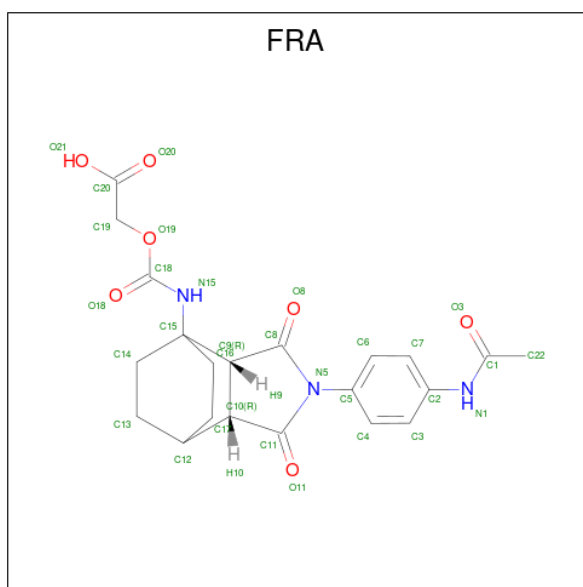
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	H	1	Total	C	N	O	0	0
			31	21	3	7		
4	B	1	Total	C	N	O	0	0
			31	21	3	7		

• Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	L	50	Total	O	0	0
			50	50		
5	H	51	Total	O	0	0
			51	51		
5	A	69	Total	O	0	0
			69	69		
5	B	43	Total	O	0	0
			43	43		

3 Residue-property plots ⓘ

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

• Molecule 1: ANTIBODY FAB
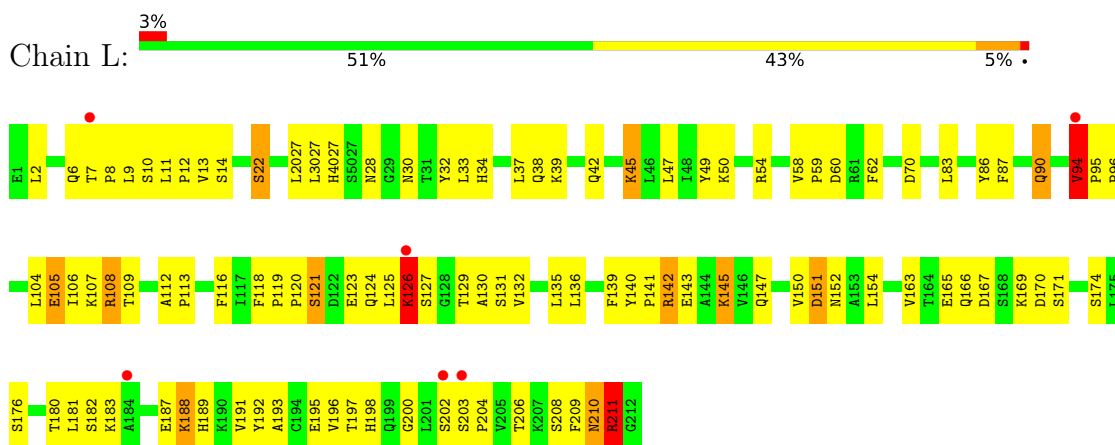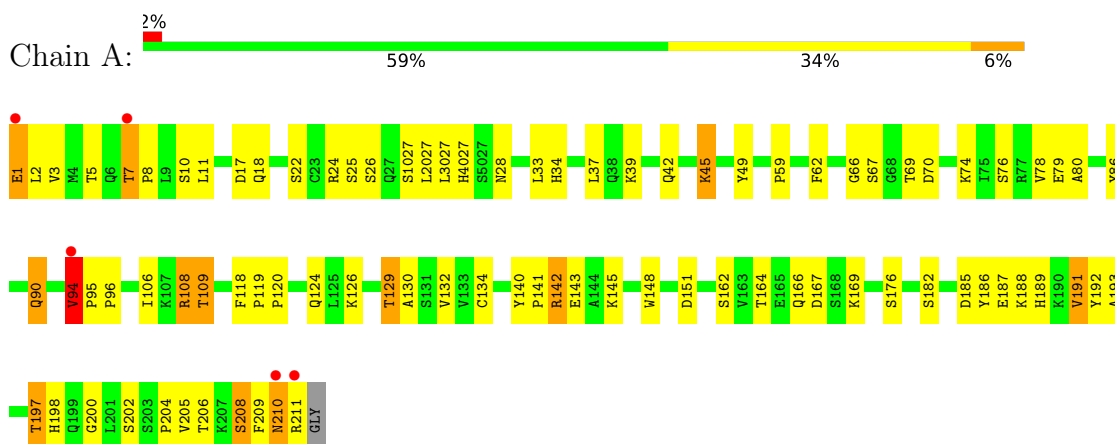
• Molecule 1: ANTIBODY FAB

• Molecule 2: ANTIBODY FAB

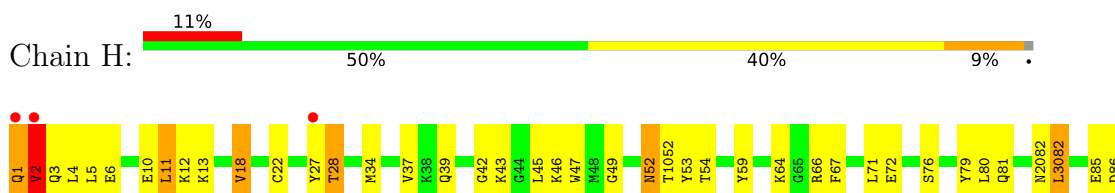V93 Q94 A95 E96 R97 L98 R99 R100 T1100 F2100 D101 Y102 S112 S113 A114 S115 T116 K117 G118 P119 F122 P123 L124 A125 P126 S127 S128 K129 S130 T131 S132 G133 G134 T135 A136 A137 L138 G139 C140 L141 V142 K143 D144 Y145 F146 P147 E148 P149 V150 W154 N155 S156 G157 A158 L159 T160

S161 F166 V169 L170 Q171 L175 L178 S179 S180 V181 V182 T183 V184 P185 S186 S187 S188 L189 G190 T191 Q192 I195 C196 N197 V198 N199 H200 K201 P202 S203 N204 T205 K206 V207 D208 K209 K210 V211 GLU PRO

● Molecule 2: ANTIBODY FAB

9%

Chain B:

41% 45% 14%

Q1 V2 Q3 L4 L5 E6 E10 L11 K12 K13 E16 T17 V18 C22 K23 A24 S25 G26 Y27 T28 F29 G33 M34 N35 W36 V37 K38 Q39 A40 P41 G42 K43 G44 L45 K46 W47 M48 G49 W50 I51 N52 T1052 Y53 T54 G55 E56 D61 K64 G65 R66 L71 E72

A75 S76 Y79 L80 Q81 I82 N1082 N2082 L3082 K83 N84 E85 D86 T87 A88 T89 Y90 F91 C92 V93 R97 L98 R99 R100 T1100 F2100 D101 Y102 T108 V109 T110 V111 S112 S113 A114 S115 T116 K117 G118 P119 F122 P123 L124 A125 P126 S127 S128 K129 S130 T131 S132 G133 G134 T135 A136 A137

L138 G139 C140 L141 V142 K143 D144 Y145 F146 P147 E148 P149 V150 T151 W154 N155 S156 G157 A158 L159 S161 H164 T165 F166 P167 A168 V169 L175 L178 S179 V182 T183 V184 P185 S186 S187 S188 L189 G190 T191 Y194 I195 C196 N197 V198 N199 H200 K201 P202 S203 N204 T205 K206

V207 D208 K209 K210 V211 E212 P213

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	69.32Å　　96.82Å　　172.73Å 90.00°　　90.00°　　90.00°	Depositor
Resolution (Å)	20.00　–　2.40 19.94　–　2.40	Depositor EDS
% Data completeness (in resolution range)	99.6 (20.00-2.40) 98.2 (19.94-2.40)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.05	Depositor
$< I/\sigma(I) >$ [1]	9.72 (at 2.41Å)	Xtriage
Refinement program	X-PLOR 3.851	Depositor
R, R_{free}	0.211　,　　　0.291 0.222　,　(Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å^2)	36.4	Xtriage
Anisotropy	0.245	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 63.9	EDS
L-test for twinning[2]	$< |L| > = 0.49, < L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	6921	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 16.42% of the height of the origin peak. No significant pseudotranslation is detected.*

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

5   Model quality ⓘ

5.1   Standard geometry ⓘ

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

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	0.38	0/1702	0.65	0/2310
1	L	0.38	0/1707	0.63	0/2315
2	B	0.39	0/1705	0.65	1/2322 (0.0%)
2	H	0.40	0/1687	0.64	0/2298
All	All	0.39	0/6801	0.64	1/9245 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	33	GLY	N-CA-C	-5.23	100.03	113.10

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	1665	0	1638	74	0
1	L	1670	0	1641	91	0
2	B	1662	0	1628	109	0
2	H	1645	0	1615	92	0
3	A	2	0	0	0	0
3	L	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	31	0	21	2	0
4	H	31	0	22	1	0
5	A	69	0	0	4	0
5	B	43	0	0	2	0
5	H	51	0	0	4	0
5	L	50	0	0	2	0
All	All	6921	0	6565	347	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 26.

All (347) 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:L:94:VAL:HB	1:L:95:PRO:HD3	1.30	1.10
1:L:94:VAL:HB	1:L:95:PRO:CD	1.91	1.00
2:H:18:VAL:HG22	2:H:3082:LEU:HD21	1.43	0.99
1:L:193:ALA:HB2	1:L:208:SER:HB3	1.50	0.93
1:A:7:THR:HB	1:A:8:PRO:HD3	1.49	0.92
1:L:197:THR:HG22	1:L:204:PRO:HB3	1.50	0.92
1:A:94:VAL:HB	1:A:95:PRO:HD3	1.52	0.90
2:B:52:ASN:HD22	2:B:53:TYR:H	1.19	0.90
2:B:18:VAL:HG22	2:B:3082:LEU:HD21	1.54	0.90
1:L:118:PHE:CZ	2:H:137:ALA:HB1	2.09	0.88
1:L:7:THR:HB	1:L:8:PRO:HD3	1.60	0.83
2:H:156:SER:H	2:H:197:ASN:HD21	1.27	0.82
2:B:52:ASN:ND2	2:B:53:TYR:H	1.78	0.81
1:L:193:ALA:CB	1:L:208:SER:HB3	2.11	0.80
2:B:52:ASN:ND2	2:B:54:THR:H	1.79	0.80
1:A:210:ASN:HD21	1:A:211:ARG:HE	1.29	0.80
2:B:127:SER:HB3	2:B:130:SER:HB3	1.63	0.80
1:L:123:GLU:HA	1:L:126:LYS:HD2	1.65	0.79
1:L:145:LYS:HD3	1:L:147:GLN:HG3	1.65	0.78
2:H:143:LYS:HE3	2:H:171:GLN:HE22	1.46	0.78
1:A:124:GLN:HG3	2:B:122:PHE:CE2	2.19	0.77
1:L:142:ARG:NH1	1:L:163:VAL:HG11	2.00	0.76
1:L:2027:LEU:HD22	1:L:90:GLN:HG3	1.68	0.76
2:B:156:SER:H	2:B:197:ASN:HD21	1.33	0.76
1:A:120:PRO:HG3	1:A:130:ALA:HB1	1.67	0.76
2:B:52:ASN:HD21	2:B:53:TYR:HB3	1.49	0.75
2:H:52:ASN:ND2	2:H:54:THR:H	1.84	0.75

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:106:ILE:H	1:L:166:GLN:HE22	1.31	0.75
2:H:28:THR:HG23	2:H:94:GLN:HE22	1.52	0.74
2:H:156:SER:N	2:H:197:ASN:HD21	1.85	0.74
2:H:85:GLU:H	2:H:85:GLU:CD	1.91	0.73
2:H:1:GLN:HG2	2:H:3:GLN:HB3	1.68	0.73
2:H:100:ARG:HG2	4:H:3083:FRA:H161	1.69	0.73
1:L:83:LEU:HD21	1:L:106:ILE:HG12	1.70	0.72
1:A:4027:HIS:HD2	1:A:28:ASN:H	1.36	0.72
1:A:94:VAL:HB	1:A:95:PRO:CD	2.19	0.72
2:B:119:PRO:HB3	2:B:145:TYR:HB3	1.71	0.72
1:A:185:ASP:HA	1:A:188:LYS:HG2	1.71	0.72
2:B:3:GLN:HA	2:B:25:SER:HB3	1.72	0.72
2:B:210:LYS:HD3	2:B:212:GLU:HG2	1.72	0.72
1:A:2027:LEU:HD22	1:A:90:GLN:HG3	1.73	0.70
2:H:116:THR:HG21	2:H:202:PRO:O	1.93	0.69
2:B:93:VAL:HG11	2:B:2100:PHE:HB3	1.74	0.69
2:H:18:VAL:CG2	2:H:3082:LEU:HD21	2.21	0.69
1:L:34:HIS:CD2	1:L:50:LYS:H	2.09	0.69
2:H:52:ASN:HD22	2:H:53:TYR:H	1.40	0.68
1:A:198:HIS:CD2	1:A:200:GLY:H	2.12	0.68
2:B:123:PRO:HD3	2:B:209:LYS:HE2	1.76	0.67
1:A:188:LYS:HG3	1:A:189:HIS:CD2	2.30	0.67
2:B:4:LEU:HD22	2:B:22:CYS:SG	2.35	0.67
2:B:66:ARG:NH2	2:B:86:ASP:OD2	2.26	0.66
2:H:127:SER:HB3	2:H:130:SER:HB3	1.77	0.66
2:H:42:GLY:O	2:H:43:LYS:HD3	1.96	0.66
1:L:96:PRO:HD2	2:H:47:TRP:CE3	2.31	0.66
2:B:119:PRO:HD2	2:B:205:THR:HG21	1.78	0.66
1:A:185:ASP:HB3	1:A:188:LYS:HE3	1.77	0.65
2:B:40:ALA:HB3	2:B:43:LYS:HB2	1.78	0.65
1:L:39:LYS:H	1:L:45:LYS:NZ	1.94	0.65
2:H:66:ARG:NH2	2:H:86:ASP:OD2	2.29	0.65
2:H:178:LEU:HD12	2:H:179:SER:N	2.11	0.65
1:L:39:LYS:HB2	1:L:42:GLN:HE21	1.62	0.65
1:A:118:PHE:CZ	2:B:137:ALA:HB1	2.31	0.65
1:L:34:HIS:HD2	1:L:50:LYS:H	1.43	0.65
1:L:113:PRO:HB3	1:L:139:PHE:HB3	1.80	0.64
1:A:49:TYR:CE1	2:B:99:ARG:HD2	2.33	0.63
2:B:39:GLN:HB2	2:B:45:LEU:HD23	1.79	0.63
1:A:210:ASN:CG	1:A:211:ARG:H	1.99	0.63
1:L:39:LYS:HB2	1:L:42:GLN:NE2	2.14	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:37:LEU:HD13	1:A:86:TYR:CZ	2.34	0.63
1:L:108:ARG:HG2	1:L:171:SER:HB2	1.80	0.62
1:L:211:ARG:NH1	1:L:211:ARG:HG2	2.13	0.62
2:H:47:TRP:CH2	2:H:49:GLY:HA2	2.35	0.62
1:L:106:ILE:H	1:L:166:GLN:NE2	1.96	0.62
1:A:2:LEU:HD21	1:A:25:SER:HB2	1.82	0.62
1:A:151:ASP:CG	1:A:189:HIS:HD1	2.02	0.62
1:L:94:VAL:CB	1:L:95:PRO:HD3	2.20	0.62
2:H:127:SER:HB2	2:H:130:SER:O	2.00	0.62
2:B:61:ASP:HA	2:B:64:LYS:HD2	1.81	0.62
2:H:28:THR:CG2	2:H:94:GLN:HE22	2.13	0.61
2:H:52:ASN:ND2	2:H:53:TYR:H	1.98	0.61
1:L:112:ALA:HB2	1:L:200:GLY:O	2.00	0.61
2:B:117:LYS:HD3	2:B:144:ASP:O	2.00	0.61
1:L:151:ASP:CG	1:L:189:HIS:HD1	2.03	0.61
2:H:116:THR:HG22	2:H:203:SER:HB3	1.83	0.61
2:H:28:THR:HG23	2:H:94:GLN:NE2	2.16	0.60
2:H:126:PRO:HA	2:H:137:ALA:HB3	1.82	0.60
2:H:1052:THR:HA	2:H:71:LEU:HD11	1.82	0.60
2:B:4:LEU:HB2	2:B:102:TYR:HE2	1.66	0.60
2:H:1:GLN:C	2:H:2:VAL:HG23	2.22	0.60
2:B:72:GLU:HB2	2:B:79:TYR:HE2	1.66	0.60
2:B:1052:THR:HA	2:B:71:LEU:HD11	1.82	0.59
1:L:197:THR:HG22	1:L:204:PRO:CB	2.29	0.59
1:L:94:VAL:CB	1:L:95:PRO:CD	2.77	0.59
2:B:203:SER:OG	2:B:205:THR:OG1	2.20	0.59
2:H:11:LEU:C	2:H:12:LYS:HG2	2.23	0.58
1:A:7:THR:CB	1:A:8:PRO:HD3	2.28	0.58
1:A:141:PRO:O	1:A:198:HIS:HE1	1.85	0.58
1:L:151:ASP:OD2	1:L:189:HIS:ND1	2.35	0.58
2:H:85:GLU:CD	2:H:85:GLU:N	2.57	0.58
1:A:198:HIS:HD2	1:A:200:GLY:H	1.49	0.58
2:B:1082:ASN:O	2:B:2082:ASN:HB2	2.04	0.58
2:B:156:SER:N	2:B:197:ASN:HD21	1.99	0.58
1:L:12:PRO:HB3	1:L:105:GLU:HG2	1.85	0.58
2:B:1:GLN:NE2	2:B:25:SER:HB2	2.19	0.58
1:L:37:LEU:HD13	1:L:86:TYR:CZ	2.38	0.58
2:H:52:ASN:HD21	2:H:53:TYR:HB3	1.67	0.58
1:A:118:PHE:CE2	2:B:137:ALA:HB1	2.39	0.58
2:B:159:LEU:CD1	2:B:182:VAL:HG11	2.34	0.58
2:B:116:THR:HG22	2:B:117:LYS:H	1.68	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:155:ASN:HB3	2:B:158:ALA:HB3	1.86	0.58
2:H:144:ASP:HA	2:H:175:LEU:HB3	1.86	0.57
2:H:156:SER:CA	2:H:197:ASN:HD21	2.17	0.57
1:A:162:SER:OG	2:B:167:PRO:HD2	2.04	0.57
2:B:23:LYS:HD2	2:B:75:ALA:O	2.04	0.57
2:H:207:VAL:HG23	2:H:208:ASP:N	2.19	0.57
2:B:164:HIS:HD2	5:B:3113:HOH:O	1.86	0.57
1:L:211:ARG:HG2	1:L:211:ARG:HH11	1.68	0.57
1:A:2027:LEU:CD2	1:A:90:GLN:HG3	2.35	0.57
1:L:167:ASP:HB3	1:L:170:ASP:OD1	2.04	0.57
2:H:11:LEU:O	2:H:12:LYS:HG2	2.03	0.57
1:A:192:TYR:O	1:A:208:SER:HB2	2.04	0.57
2:B:27:TYR:O	2:B:29:PHE:N	2.38	0.56
1:L:211:ARG:HH11	1:L:211:ARG:CG	2.19	0.56
2:B:116:THR:HG21	2:B:202:PRO:O	2.05	0.56
1:L:188:LYS:HG3	1:L:189:HIS:CD2	2.40	0.56
1:A:210:ASN:CG	1:A:211:ARG:N	2.59	0.56
2:B:159:LEU:HD13	2:B:182:VAL:HG11	1.86	0.56
2:H:119:PRO:HB2	2:H:142:VAL:HG23	1.88	0.56
2:H:156:SER:HA	2:H:197:ASN:ND2	2.21	0.56
2:H:197:ASN:N	2:H:197:ASN:OD1	2.37	0.56
1:A:4027:HIS:CD2	1:A:28:ASN:H	2.20	0.56
2:B:126:PRO:HA	2:B:137:ALA:HB3	1.88	0.56
1:L:198:HIS:CD2	1:L:200:GLY:H	2.23	0.56
1:A:3:VAL:HG13	5:A:5035:HOH:O	2.06	0.56
1:L:96:PRO:HD2	2:H:47:TRP:CD2	2.41	0.56
2:H:201:LYS:NZ	2:H:201:LYS:H	2.04	0.56
1:A:124:GLN:HG3	2:B:122:PHE:CD2	2.41	0.56
1:L:2027:LEU:CD2	1:L:90:GLN:HG3	2.36	0.55
2:B:27:TYR:C	2:B:29:PHE:H	2.09	0.55
1:A:18:GLN:NE2	1:A:74:LYS:HD3	2.21	0.55
2:H:199:ASN:ND2	2:H:201:LYS:HE3	2.22	0.55
1:A:94:VAL:CB	1:A:95:PRO:HD3	2.33	0.55
2:B:10:GLU:OE1	2:B:12:LYS:HE3	2.07	0.55
1:L:106:ILE:N	1:L:166:GLN:HE22	2.04	0.55
2:H:4:LEU:HD22	2:H:22:CYS:SG	2.47	0.55
1:A:94:VAL:CB	1:A:95:PRO:CD	2.85	0.54
1:A:210:ASN:ND2	1:A:211:ARG:HE	2.01	0.54
1:L:7:THR:HB	1:L:8:PRO:CD	2.35	0.54
1:L:32:TYR:CE1	2:H:100:ARG:HD2	2.43	0.54
2:H:2:VAL:HG11	2:H:102:TYR:HB2	1.90	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:2:VAL:HG12	2:H:94:GLN:OE1	2.08	0.54
1:A:2027:LEU:HD22	1:A:90:GLN:CG	2.38	0.54
2:B:119:PRO:HB2	2:B:142:VAL:HG23	1.90	0.54
1:L:39:LYS:H	1:L:45:LYS:HZ1	1.54	0.54
1:L:54:ARG:NE	1:L:60:ASP:HA	2.23	0.54
2:H:195:ILE:HG12	2:H:210:LYS:HA	1.89	0.53
1:A:1:GLU:CG	1:A:2:LEU:N	2.72	0.53
1:A:106:ILE:H	1:A:166:GLN:HE22	1.54	0.53
2:H:119:PRO:HD2	2:H:205:THR:HG21	1.89	0.53
2:H:149:PRO:HA	5:H:3128:HOH:O	2.08	0.53
2:B:116:THR:HG22	2:B:117:LYS:N	2.23	0.53
1:L:124:GLN:HE22	1:L:131:SER:CB	2.22	0.53
1:L:143:GLU:CD	1:L:143:GLU:H	2.10	0.53
2:B:52:ASN:HD22	2:B:53:TYR:N	2.00	0.53
2:H:93:VAL:HG11	2:H:2100:PHE:HB3	1.90	0.53
1:A:96:PRO:HD2	2:B:47:TRP:CE3	2.43	0.53
1:A:108:ARG:HD3	1:A:109:THR:O	2.08	0.53
1:A:1027:SER:HA	1:A:69:THR:HG22	1.91	0.53
2:B:212:GLU:OE1	2:B:212:GLU:HA	2.08	0.52
1:A:188:LYS:NZ	1:A:189:HIS:NE2	2.41	0.52
1:L:37:LEU:HD13	1:L:86:TYR:CE1	2.45	0.52
2:H:59:TYR:HB2	2:H:64:LYS:HD3	1.92	0.52
1:A:1:GLU:HG2	1:A:2:LEU:N	2.23	0.52
2:B:207:VAL:HG23	2:B:208:ASP:N	2.24	0.52
2:H:135:THR:HA	2:H:185:PRO:HA	1.92	0.52
2:B:154:TRP:CH2	2:B:196:CYS:HB3	2.45	0.52
1:L:192:TYR:HB2	1:L:209:PHE:CE1	2.45	0.52
1:A:17:ASP:O	1:A:78:VAL:HG23	2.10	0.52
1:A:70:ASP:HB2	5:A:5054:HOH:O	2.08	0.52
2:B:83:LYS:HD3	2:B:85:GLU:OE1	2.08	0.52
1:A:33:LEU:C	1:A:33:LEU:HD13	2.30	0.52
1:A:119:PRO:HB3	1:A:209:PHE:CZ	2.44	0.52
1:L:150:VAL:C	1:L:152:ASN:H	2.12	0.52
2:H:66:ARG:HH22	2:H:86:ASP:CG	2.12	0.51
2:H:2082:ASN:ND2	5:H:3091:HOH:O	2.43	0.51
1:A:143:GLU:H	1:A:143:GLU:CD	2.14	0.51
1:L:129:THR:HG23	1:L:181:LEU:O	2.11	0.51
1:A:7:THR:HB	1:A:8:PRO:CD	2.31	0.51
2:H:156:SER:H	2:H:197:ASN:ND2	2.04	0.51
2:B:72:GLU:HB2	2:B:79:TYR:CE2	2.46	0.51
2:B:138:LEU:HD11	2:B:194:TYR:CD2	2.46	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:203:SER:HG	2:B:205:THR:HG1	1.51	0.51
2:H:155:ASN:ND2	2:H:195:ILE:H	2.09	0.51
1:L:140:TYR:CG	1:L:141:PRO:HA	2.46	0.51
2:H:159:LEU:HD13	2:H:182:VAL:HG11	1.93	0.50
2:B:11:LEU:HG	2:B:147:PRO:HG3	1.94	0.50
2:B:97:ARG:HB2	4:B:3083:FRA:C2	2.41	0.50
2:B:40:ALA:HB3	2:B:43:LYS:CB	2.41	0.50
1:A:79:GLU:O	1:A:80:ALA:HB3	2.12	0.50
1:L:37:LEU:O	1:L:45:LYS:HD2	2.11	0.50
1:L:2:LEU:C	1:L:2:LEU:HD23	2.32	0.50
1:L:150:VAL:C	1:L:152:ASN:N	2.61	0.50
2:H:81:GLN:HG2	5:H:3104:HOH:O	2.12	0.49
2:H:116:THR:HA	2:H:146:PHE:O	2.12	0.49
1:L:6:GLN:HA	1:L:22:SER:O	2.12	0.49
1:A:124:GLN:NE2	1:A:129:THR:HG22	2.27	0.49
1:L:150:VAL:HA	1:L:191:VAL:O	2.13	0.49
1:L:6:GLN:OE1	1:L:87:PHE:HA	2.13	0.49
2:H:154:TRP:CH2	2:H:196:CYS:HB3	2.48	0.49
1:A:39:LYS:HB2	1:A:42:GLN:HE21	1.77	0.49
2:B:186:SER:O	2:B:189:LEU:HB2	2.12	0.49
2:H:3082:LEU:HD12	2:H:86:ASP:OD2	2.12	0.48
2:H:124:LEU:HB2	2:H:139:GLY:C	2.33	0.48
2:H:144:ASP:HB3	2:H:175:LEU:HD23	1.95	0.48
2:B:2:VAL:HG13	2:B:102:TYR:OH	2.13	0.48
2:B:199:ASN:HB2	2:B:206:LYS:HE2	1.95	0.48
1:L:34:HIS:HD2	1:L:49:TYR:HA	1.77	0.48
2:B:80:LEU:HD22	2:B:81:GLN:N	2.29	0.48
2:H:116:THR:HG21	2:H:202:PRO:C	2.34	0.48
2:B:93:VAL:CG1	2:B:2100:PHE:HB3	2.43	0.48
1:L:38:GLN:HA	1:L:45:LYS:HZ3	1.78	0.48
2:H:10:GLU:OE1	2:H:12:LYS:HE3	2.12	0.48
2:H:156:SER:HA	2:H:197:ASN:HD21	1.79	0.48
2:B:155:ASN:CB	2:B:158:ALA:HB3	2.44	0.48
1:A:39:LYS:HG3	1:A:45:LYS:HE3	1.96	0.47
1:A:119:PRO:HB3	1:A:209:PHE:CE1	2.49	0.47
1:L:12:PRO:CB	1:L:105:GLU:HG2	2.44	0.47
1:L:28:ASN:OD1	1:L:30:ASN:HB2	2.14	0.47
1:L:151:ASP:O	1:L:152:ASN:HB3	2.14	0.47
2:B:131:THR:HG23	2:B:189:LEU:HD12	1.96	0.47
1:L:4027:HIS:HE1	5:L:5062:HOH:O	1.98	0.47
1:L:125:LEU:C	1:L:127:SER:H	2.18	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:11:LEU:HG	2:H:147:PRO:HG3	1.95	0.47
1:L:120:PRO:HD3	1:L:132:VAL:HG22	1.96	0.47
2:H:119:PRO:HB3	2:H:145:TYR:HB3	1.97	0.47
2:B:207:VAL:CG2	2:B:208:ASP:N	2.77	0.47
2:H:186:SER:HA	2:H:189:LEU:HG	1.96	0.47
1:L:182:SER:O	1:L:183:LYS:C	2.52	0.47
1:A:5:THR:HG21	1:A:24:ARG:NH2	2.29	0.47
2:B:2:VAL:HG12	2:B:4:LEU:H	1.80	0.47
2:B:201:LYS:N	2:B:202:PRO:CD	2.77	0.47
2:H:116:THR:CG2	2:H:203:SER:HB3	2.43	0.46
2:H:201:LYS:N	2:H:202:PRO:CD	2.78	0.46
1:A:120:PRO:HD3	1:A:132:VAL:HG22	1.96	0.46
1:L:12:PRO:HA	1:L:105:GLU:HG2	1.98	0.46
1:L:13:VAL:HG11	1:L:104:LEU:HD11	1.98	0.46
1:L:94:VAL:HG22	5:L:5039:HOH:O	2.16	0.46
2:H:127:SER:CB	2:H:130:SER:HB3	2.45	0.46
1:L:108:ARG:HD3	1:L:109:THR:O	2.16	0.46
2:B:51:ILE:CD1	2:B:71:LEU:HG	2.46	0.46
1:A:108:ARG:HD2	1:A:140:TYR:CB	2.46	0.46
1:A:59:PRO:HG2	1:A:62:PHE:CD2	2.51	0.45
2:B:149:PRO:HA	5:B:3106:HOH:O	2.16	0.45
2:H:1:GLN:O	2:H:2:VAL:HG23	2.16	0.45
2:B:54:THR:CG2	2:B:56:GLU:HG2	2.47	0.45
2:B:127:SER:CB	2:B:130:SER:HB3	2.41	0.45
2:B:147:PRO:HD2	2:B:202:PRO:CB	2.47	0.45
1:A:167:ASP:OD2	1:A:169:LYS:HB2	2.16	0.45
1:L:34:HIS:HD2	1:L:50:LYS:N	2.13	0.45
1:L:121:SER:OG	2:H:122:PHE:HB3	2.17	0.45
1:L:197:THR:CG2	1:L:204:PRO:HB3	2.36	0.45
2:B:126:PRO:O	2:B:127:SER:O	2.35	0.45
1:L:150:VAL:HG22	1:L:192:TYR:CD2	2.52	0.45
1:A:188:LYS:HD2	1:A:189:HIS:NE2	2.32	0.45
2:B:205:THR:HG22	2:B:207:VAL:HG12	1.99	0.45
1:L:54:ARG:NH1	1:L:62:PHE:O	2.50	0.44
2:H:150:VAL:HG12	2:H:178:LEU:HD21	1.98	0.44
2:B:12:LYS:O	2:B:111:VAL:HA	2.16	0.44
1:A:39:LYS:HD3	5:A:5042:HOH:O	2.17	0.44
1:L:32:TYR:CD1	2:H:100:ARG:HD2	2.52	0.44
1:L:129:THR:HG22	1:L:130:ALA:N	2.31	0.44
2:H:134:GLY:O	2:H:185:PRO:HA	2.17	0.44
1:A:120:PRO:HG2	1:A:186:TYR:CZ	2.52	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:96:PRO:HG2	2:H:47:TRP:CG	2.52	0.44
1:L:116:PHE:CD1	1:L:116:PHE:N	2.85	0.44
2:H:72:GLU:HB2	2:H:79:TYR:HE2	1.82	0.43
1:A:108:ARG:HD2	1:A:140:TYR:CG	2.54	0.43
1:A:210:ASN:O	1:A:211:ARG:C	2.57	0.43
1:L:58:VAL:HA	1:L:59:PRO:HD2	1.91	0.43
2:B:97:ARG:H	4:B:3083:FRA:H221	1.83	0.43
1:L:147:GLN:HB3	1:L:154:LEU:CD1	2.47	0.43
2:B:38:LYS:HD2	2:B:90:TYR:CE1	2.54	0.43
1:L:135:LEU:HD22	2:H:181:VAL:HG11	1.99	0.43
1:A:182:SER:OG	1:A:185:ASP:OD1	2.36	0.43
1:A:197:THR:HG22	1:A:204:PRO:HB3	2.01	0.43
1:A:134:CYS:HB2	1:A:148:TRP:CH2	2.54	0.43
2:B:27:TYR:C	2:B:29:PHE:N	2.72	0.43
2:B:138:LEU:C	2:B:138:LEU:HD23	2.39	0.43
2:H:39:GLN:HB2	2:H:45:LEU:HD23	1.99	0.42
2:H:146:PHE:HA	2:H:147:PRO:HA	1.76	0.42
1:A:96:PRO:HD2	2:B:47:TRP:CD2	2.54	0.42
1:A:164:THR:HG23	2:B:166:PHE:CD2	2.54	0.42
2:B:156:SER:HA	2:B:197:ASN:ND2	2.34	0.42
2:B:11:LEU:C	2:B:12:LYS:HG2	2.40	0.42
2:B:52:ASN:ND2	2:B:53:TYR:N	2.58	0.42
2:B:127:SER:HB2	2:B:130:SER:O	2.19	0.42
2:H:199:ASN:HD21	2:H:201:LYS:HG3	1.84	0.42
2:B:13:LYS:HG3	2:B:16:GLU:OE1	2.19	0.42
1:L:6:GLN:HE21	1:L:6:GLN:HB3	1.66	0.42
2:H:10:GLU:OE2	5:H:3111:HOH:O	2.21	0.42
2:H:72:GLU:HB2	2:H:79:TYR:CE2	2.55	0.42
2:B:13:LYS:O	2:B:16:GLU:HG3	2.20	0.42
2:B:16:GLU:O	2:B:3082:LEU:HD22	2.19	0.42
1:A:7:THR:CB	1:A:8:PRO:CD	2.94	0.42
2:B:3:GLN:HA	2:B:25:SER:CB	2.47	0.42
1:L:2027:LEU:CD1	1:L:33:LEU:HD23	2.50	0.42
1:L:151:ASP:O	1:L:152:ASN:CB	2.67	0.42
2:B:27:TYR:CD1	2:B:27:TYR:N	2.85	0.42
2:B:151:THR:OG1	2:B:199:ASN:HB3	2.19	0.42
1:A:4027:HIS:HD2	1:A:28:ASN:N	2.13	0.42
2:B:87:THR:O	2:B:88:ALA:HB2	2.20	0.42
1:L:191:VAL:O	1:L:191:VAL:CG2	2.68	0.42
2:H:119:PRO:HB2	2:H:142:VAL:CG2	2.48	0.42
2:H:188:SER:HB2	2:H:192:GLN:OE1	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:117:LYS:HD2	2:B:175:LEU:HD21	2.02	0.42
1:L:145:LYS:HE3	1:L:147:GLN:OE1	2.20	0.42
2:B:35:ASN:HD22	2:B:35:ASN:N	2.18	0.42
1:L:37:LEU:HB2	1:L:47:LEU:HD11	2.01	0.41
2:H:155:ASN:HD22	2:H:155:ASN:HA	1.67	0.41
2:B:187:SER:O	2:B:189:LEU:N	2.53	0.41
1:L:118:PHE:HA	1:L:119:PRO:HD3	1.94	0.41
1:A:142:ARG:HH11	1:A:142:ARG:CG	2.33	0.41
5:A:5071:HOH:O	2:B:183:THR:HG21	2.20	0.41
2:B:98:LEU:HD12	2:B:98:LEU:HA	1.92	0.41
1:L:34:HIS:CD2	1:L:49:TYR:HA	2.55	0.41
2:H:154:TRP:CZ3	2:H:196:CYS:HB3	2.54	0.41
2:B:71:LEU:HD23	2:B:71:LEU:HA	1.90	0.41
2:H:47:TRP:CZ2	2:H:49:GLY:HA2	2.54	0.41
2:H:96:GLU:OE1	2:H:99:ARG:HG3	2.20	0.41
2:B:47:TRP:CH2	2:B:49:GLY:HA2	2.56	0.41
2:B:61:ASP:HA	2:B:64:LYS:CD	2.49	0.41
2:B:178:LEU:C	2:B:178:LEU:HD12	2.41	0.41
2:B:11:LEU:O	2:B:12:LYS:HG2	2.21	0.41
2:H:189:LEU:N	2:H:189:LEU:HD23	2.36	0.41
2:H:67:PHE:HA	2:H:81:GLN:O	2.21	0.41
1:L:136:LEU:HD21	1:L:196:VAL:HG13	2.03	0.41
1:A:66:GLY:O	1:A:67:SER:HB3	2.21	0.41
2:B:132:SER:HA	2:B:186:SER:HB3	2.03	0.41
1:A:34:HIS:CD2	2:B:1100:THR:HG22	2.55	0.41
1:A:191:VAL:O	1:A:191:VAL:CG2	2.69	0.41
1:L:174:SER:O	2:H:166:PHE:HE1	2.05	0.40
2:B:18:VAL:CG2	2:B:3082:LEU:HD11	2.51	0.40
2:B:135:THR:HA	2:B:184:VAL:O	2.22	0.40
1:A:193:ALA:HB2	1:A:208:SER:HB2	2.03	0.40
2:B:4:LEU:HD12	2:B:102:TYR:HD2	1.87	0.40
2:B:6:GLU:OE2	2:B:92:CYS:HB3	2.21	0.40
2:B:17:THR:HG22	2:B:18:VAL:N	2.36	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	214/217 (99%)	199 (93%)	12 (6%)	3 (1%)	11	15
1	L	215/217 (99%)	192 (89%)	18 (8%)	5 (2%)	6	7
2	B	217/219 (99%)	186 (86%)	21 (10%)	10 (5%)	2	1
2	H	215/219 (98%)	189 (88%)	21 (10%)	5 (2%)	6	7
All	All	861/872 (99%)	766 (89%)	72 (8%)	23 (3%)	5	5

All (23) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	L	94	VAL
1	L	210	ASN
1	L	211	ARG
2	H	137	ALA
1	A	94	VAL
1	A	210	ASN
2	B	27	TYR
2	B	137	ALA
2	H	2	VAL
2	B	127	SER
1	L	126	LYS
1	L	188	LYS
2	H	127	SER
2	H	133	GLY
2	B	28	THR
2	B	133	GLY
2	B	188	SER
2	H	186	SER
2	B	25	SER
2	B	138	LEU
1	A	7	THR
2	B	26	GLY
2	B	132	SER

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	193/193 (100%)	169 (88%)	24 (12%)	4	5
1	L	193/193 (100%)	164 (85%)	29 (15%)	3	3
2	B	185/185 (100%)	141 (76%)	44 (24%)	0	0
2	H	183/185 (99%)	144 (79%)	39 (21%)	1	1
All	All	754/756 (100%)	618 (82%)	136 (18%)	1	2

All (136) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	L	9	LEU
1	L	10	SER
1	L	11	LEU
1	L	14	SER
1	L	22	SER
1	L	3027	LEU
1	L	45	LYS
1	L	70	ASP
1	L	90	GLN
1	L	94	VAL
1	L	105	GLU
1	L	107	LYS
1	L	108	ARG
1	L	121	SER
1	L	126	LYS
1	L	142	ARG
1	L	145	LYS
1	L	151	ASP
1	L	165	GLU
1	L	169	LYS
1	L	176	SER
1	L	180	THR
1	L	187	GLU
1	L	195	GLU

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Mol	Chain	Res	Type
1	L	202	SER
1	L	203	SER
1	L	206	THR
1	L	210	ASN
1	L	211	ARG
2	H	1	GLN
2	H	2	VAL
2	H	5	LEU
2	H	6	GLU
2	H	11	LEU
2	H	13	LYS
2	H	18	VAL
2	H	27	TYR
2	H	28	THR
2	H	34	MET
2	H	37	VAL
2	H	46	LYS
2	H	52	ASN
2	H	76	SER
2	H	80	LEU
2	H	3082	LEU
2	H	98	LEU
2	H	112	SER
2	H	113	SER
2	H	115	SER
2	H	117	LYS
2	H	124	LEU
2	H	135	THR
2	H	140	CYS
2	H	150	VAL
2	H	159	LEU
2	H	161	SER
2	H	169	VAL
2	H	175	LEU
2	H	178	LEU
2	H	179	SER
2	H	183	THR
2	H	191	THR
2	H	197	ASN
2	H	201	LYS
2	H	204	ASN
2	H	206	LYS

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Mol	Chain	Res	Type
2	H	209	LYS
2	H	210	LYS
1	A	1	GLU
1	A	10	SER
1	A	11	LEU
1	A	22	SER
1	A	26	SER
1	A	3027	LEU
1	A	45	LYS
1	A	76	SER
1	A	90	GLN
1	A	94	VAL
1	A	108	ARG
1	A	109	THR
1	A	126	LYS
1	A	129	THR
1	A	142	ARG
1	A	145	LYS
1	A	176	SER
1	A	187	GLU
1	A	191	VAL
1	A	197	THR
1	A	202	SER
1	A	205	VAL
1	A	206	THR
1	A	208	SER
2	B	5	LEU
2	B	6	GLU
2	B	11	LEU
2	B	12	LYS
2	B	13	LYS
2	B	18	VAL
2	B	34	MET
2	B	37	VAL
2	B	46	LYS
2	B	52	ASN
2	B	56	GLU
2	B	66	ARG
2	B	72	GLU
2	B	76	SER
2	B	80	LEU
2	B	81	GLN

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Mol	Chain	Res	Type
2	B	1082	ASN
2	B	3082	LEU
2	B	98	LEU
2	B	108	THR
2	B	110	THR
2	B	113	SER
2	B	115	SER
2	B	124	LEU
2	B	127	SER
2	B	128	SER
2	B	140	CYS
2	B	142	VAL
2	B	150	VAL
2	B	159	LEU
2	B	160	THR
2	B	161	SER
2	B	169	VAL
2	B	175	LEU
2	B	179	SER
2	B	183	THR
2	B	186	SER
2	B	188	SER
2	B	197	ASN
2	B	201	LYS
2	B	204	ASN
2	B	206	LYS
2	B	207	VAL
2	B	209	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (34) such sidechains are listed below:

Mol	Chain	Res	Type
1	L	4027	HIS
1	L	34	HIS
1	L	42	GLN
1	L	124	GLN
1	L	152	ASN
1	L	166	GLN
1	L	198	HIS
1	L	210	ASN
2	H	1	GLN
2	H	3	GLN

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Mol	Chain	Res	Type
2	H	52	ASN
2	H	81	GLN
2	H	94	GLN
2	H	155	ASN
2	H	164	HIS
2	H	171	GLN
2	H	197	ASN
2	H	199	ASN
1	A	18	GLN
1	A	4027	HIS
1	A	38	GLN
1	A	42	GLN
1	A	147	GLN
1	A	152	ASN
1	A	166	GLN
1	A	198	HIS
1	A	210	ASN
2	B	3	GLN
2	B	52	ASN
2	B	81	GLN
2	B	155	ASN
2	B	171	GLN
2	B	192	GLN
2	B	197	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 6 ligands modelled in this entry, 4 are monoatomic - leaving 2 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
4	FRA	B	3083	-	34,34,34	2.68	12 (35%)	46,51,51	3.03	16 (34%)
4	FRA	H	3083	-	34,34,34	2.64	12 (35%)	46,51,51	2.85	19 (41%)

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
4	FRA	B	3083	-	-	9/18/60/60	0/5/4/4
4	FRA	H	3083	-	-	2/18/60/60	0/5/4/4

All (24) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	H	3083	FRA	C10-C12	6.29	1.64	1.54
4	B	3083	FRA	C10-C12	6.25	1.64	1.54
4	B	3083	FRA	C14-C13	-6.17	1.40	1.53
4	H	3083	FRA	C14-C13	-6.11	1.40	1.53
4	H	3083	FRA	C14-C15	5.95	1.63	1.54
4	B	3083	FRA	C14-C15	5.64	1.63	1.54
4	B	3083	FRA	C16-C15	4.77	1.61	1.54
4	B	3083	FRA	C5-N5	4.72	1.51	1.44
4	H	3083	FRA	C16-C15	4.54	1.61	1.54
4	H	3083	FRA	C16-C17	4.05	1.62	1.53
4	H	3083	FRA	C17-C12	3.83	1.62	1.53
4	B	3083	FRA	C17-C12	3.76	1.62	1.53
4	B	3083	FRA	C16-C17	3.56	1.61	1.53
4	H	3083	FRA	C5-N5	3.54	1.49	1.44
4	H	3083	FRA	C8-N5	-2.87	1.36	1.40
4	B	3083	FRA	C4-C5	2.72	1.44	1.39
4	B	3083	FRA	C8-N5	-2.61	1.36	1.40
4	H	3083	FRA	C4-C5	2.50	1.44	1.39
4	B	3083	FRA	C3-C2	2.42	1.43	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	H	3083	FRA	C9-C10	2.33	1.57	1.54
4	H	3083	FRA	C3-C2	2.15	1.42	1.39
4	B	3083	FRA	C6-C5	2.14	1.43	1.39
4	H	3083	FRA	O19-C18	2.09	1.39	1.35
4	B	3083	FRA	C9-C10	2.03	1.57	1.54

All (35) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	B	3083	FRA	C9-C8-N5	7.17	113.80	108.11
4	H	3083	FRA	C9-C8-N5	7.05	113.70	108.11
4	B	3083	FRA	C22-C1-N1	6.97	125.21	114.98
4	B	3083	FRA	O11-C11-C10	-6.68	119.94	127.52
4	H	3083	FRA	O8-C8-C9	-6.36	119.93	127.50
4	B	3083	FRA	O8-C8-C9	-6.29	120.01	127.50
4	H	3083	FRA	C22-C1-N1	6.09	123.91	114.98
4	B	3083	FRA	C10-C11-N5	5.94	113.22	108.26
4	B	3083	FRA	O3-C1-N1	-5.80	115.41	123.04
4	H	3083	FRA	O11-C11-C10	-5.66	121.09	127.52
4	B	3083	FRA	C2-N1-C1	5.61	138.20	127.99
4	B	3083	FRA	C8-N5-C11	-5.20	108.31	112.81
4	H	3083	FRA	O3-C1-N1	-5.16	116.25	123.04
4	H	3083	FRA	C10-C11-N5	4.88	112.34	108.26
4	H	3083	FRA	C2-N1-C1	4.83	136.77	127.99
4	H	3083	FRA	C8-N5-C11	-4.33	109.06	112.81
4	B	3083	FRA	C19-O19-C18	4.09	120.06	115.64
4	B	3083	FRA	C10-C9-C8	-3.97	101.34	104.53
4	H	3083	FRA	C14-C15-N15	3.97	121.32	110.29
4	H	3083	FRA	O19-C19-C20	-3.88	102.47	110.88
4	H	3083	FRA	C13-C14-C15	3.40	116.77	109.80
4	H	3083	FRA	C4-C5-N5	3.37	123.68	119.64
4	B	3083	FRA	C13-C14-C15	3.32	116.61	109.80
4	H	3083	FRA	C10-C9-C8	-3.22	101.94	104.53
4	H	3083	FRA	C19-O19-C18	3.09	118.99	115.64
4	B	3083	FRA	C14-C15-N15	3.01	118.67	110.29
4	B	3083	FRA	C4-C5-N5	3.00	123.24	119.64
4	H	3083	FRA	C5-N5-C11	2.64	126.58	123.61
4	B	3083	FRA	O11-C11-N5	2.60	126.84	124.30
4	H	3083	FRA	C9-C15-N15	-2.55	106.53	110.36
4	H	3083	FRA	C9-C10-C11	-2.40	102.95	104.80
4	H	3083	FRA	O11-C11-N5	2.32	126.57	124.30
4	B	3083	FRA	C9-C15-N15	-2.26	106.96	110.36

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	H	3083	FRA	O8-C8-N5	2.12	126.37	124.30
4	B	3083	FRA	C5-N5-C8	2.03	125.89	123.61

There are no chirality outliers.
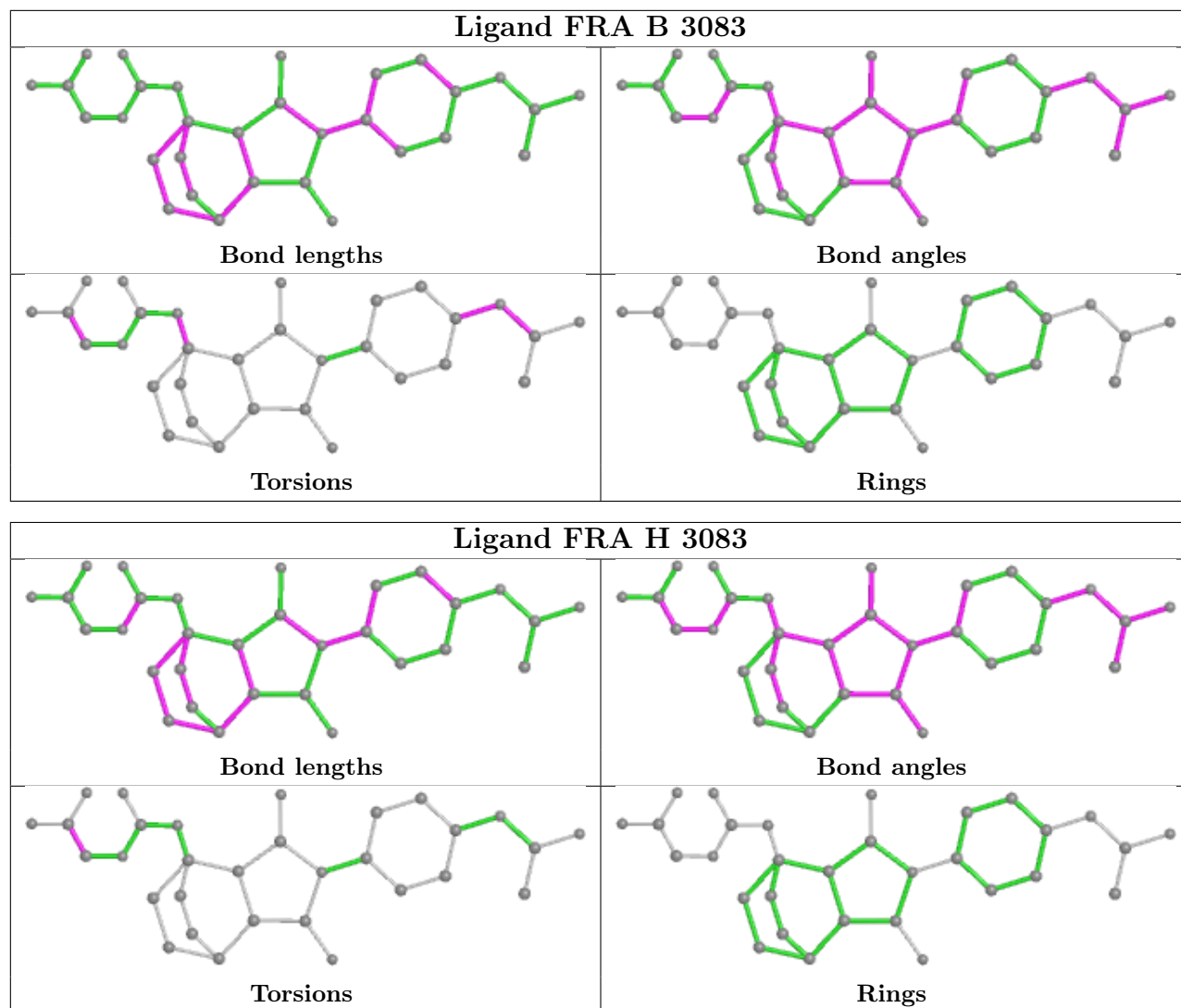
All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	H	3083	FRA	O19-C19-C20-O21
4	B	3083	FRA	O3-C1-N1-C2
4	B	3083	FRA	C22-C1-N1-C2
4	H	3083	FRA	O19-C19-C20-O20
4	B	3083	FRA	O19-C19-C20-O20
4	B	3083	FRA	C14-C15-N15-C18
4	B	3083	FRA	C3-C2-N1-C1
4	B	3083	FRA	O19-C19-C20-O21
4	B	3083	FRA	C9-C15-N15-C18
4	B	3083	FRA	C7-C2-N1-C1
4	B	3083	FRA	C16-C15-N15-C18

There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	3083	FRA	2	0
4	H	3083	FRA	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 then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand FRA B 3083

Bond lengths

Bond angles

Torsions

Rings

Ligand FRA H 3083

Bond lengths

Bond angles

Torsions

Rings

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6   Fit of model and data ⓘ

6.1   Protein, DNA and RNA chains ⓘ

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å²)	Q<0.9
1	A	216/217 (99%)	-0.11	5 (2%)	60	58	16, 33, 60, 79	0
1	L	217/217 (100%)	0.09	6 (2%)	53	51	17, 40, 68, 76	0
2	B	219/219 (100%)	0.46	19 (8%)	10	9	22, 41, 82, 100	0
2	H	217/219 (99%)	0.46	25 (11%)	4	4	15, 37, 92, 100	0
All	All	869/872 (99%)	0.23	55 (6%)	20	18	15, 38, 76, 100	0

All (55) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	B	128	SER	10.1
2	H	128	SER	9.6
2	H	132	SER	8.0
2	H	129	LYS	7.5
2	H	133	GLY	6.8
2	H	131	THR	6.6
2	B	133	GLY	6.6
2	B	131	THR	6.0
2	H	130	SER	5.7
2	H	158	ALA	5.3
2	B	2	VAL	5.2
2	B	130	SER	5.2
2	B	132	SER	5.1
2	B	129	LYS	4.9
2	H	27	TYR	4.5
2	H	127	SER	4.4
2	H	1	GLN	4.2
2	B	191	THR	3.9
2	H	190	GLY	3.9
1	A	94	VAL	3.9
2	H	135	THR	3.7

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Mol	Chain	Res	Type	RSRZ
2	H	191	THR	3.6
2	B	43	LYS	3.3
1	L	203	SER	3.3
2	H	187	SER	3.3
2	H	2	VAL	3.3
1	L	7	THR	3.2
2	B	127	SER	3.1
2	B	1	GLN	3.0
2	B	34	MET	2.9
2	H	192	GLN	2.8
1	A	1	GLU	2.7
2	B	92	CYS	2.7
1	A	211	ARG	2.7
1	A	7	THR	2.6
2	B	27	TYR	2.6
2	H	157	GLY	2.6
2	H	185	PRO	2.6
1	L	126	LYS	2.5
2	B	204	ASN	2.4
2	H	134	GLY	2.4
2	B	42	GLY	2.3
2	H	93	VAL	2.3
2	H	186	SER	2.3
1	A	210	ASN	2.3
2	H	204	ASN	2.3
2	H	210	LYS	2.2
1	L	94	VAL	2.2
2	H	189	LEU	2.2
2	B	134	GLY	2.2
1	L	202	SER	2.2
1	L	184	ALA	2.2
2	B	26	GLY	2.1
2	H	137	ALA	2.1
2	B	137	ALA	2.1

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

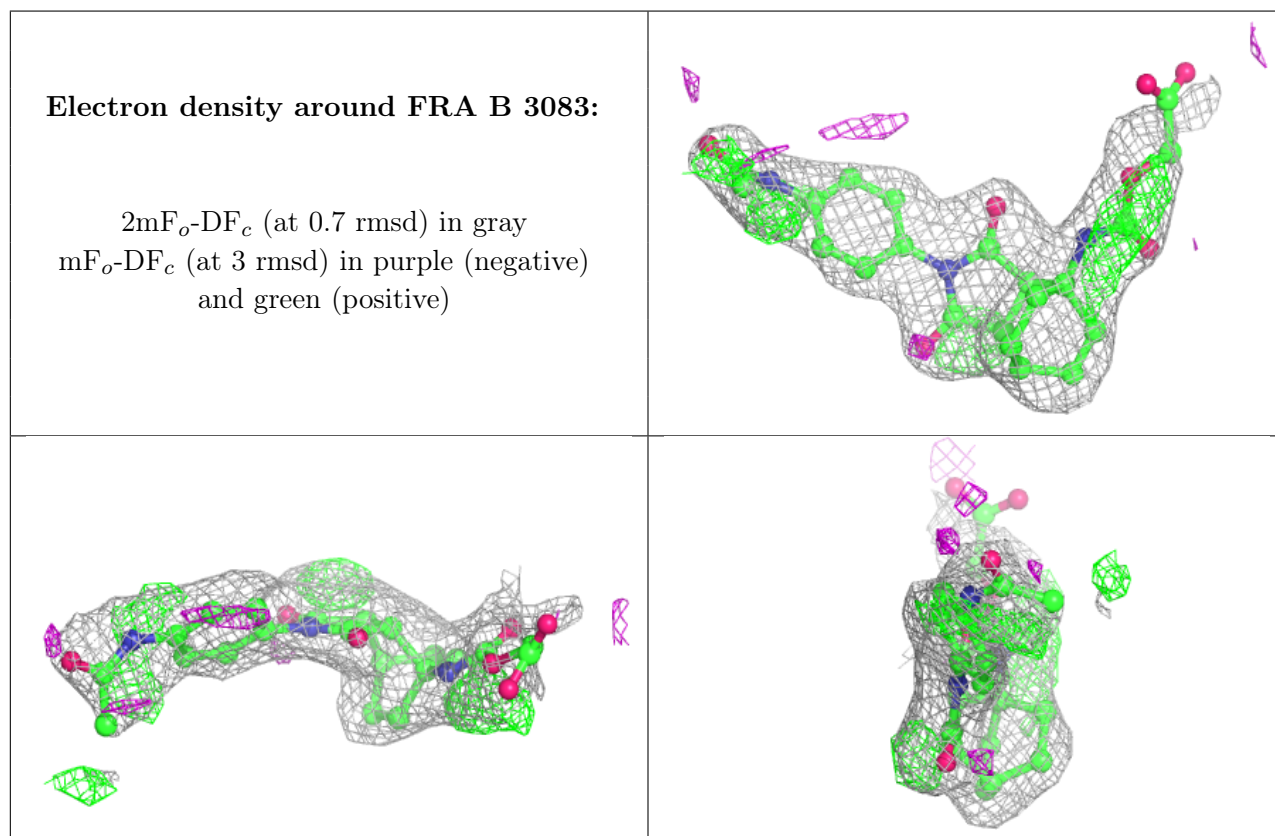There are no non-standard protein/DNA/RNA residues in this entry.

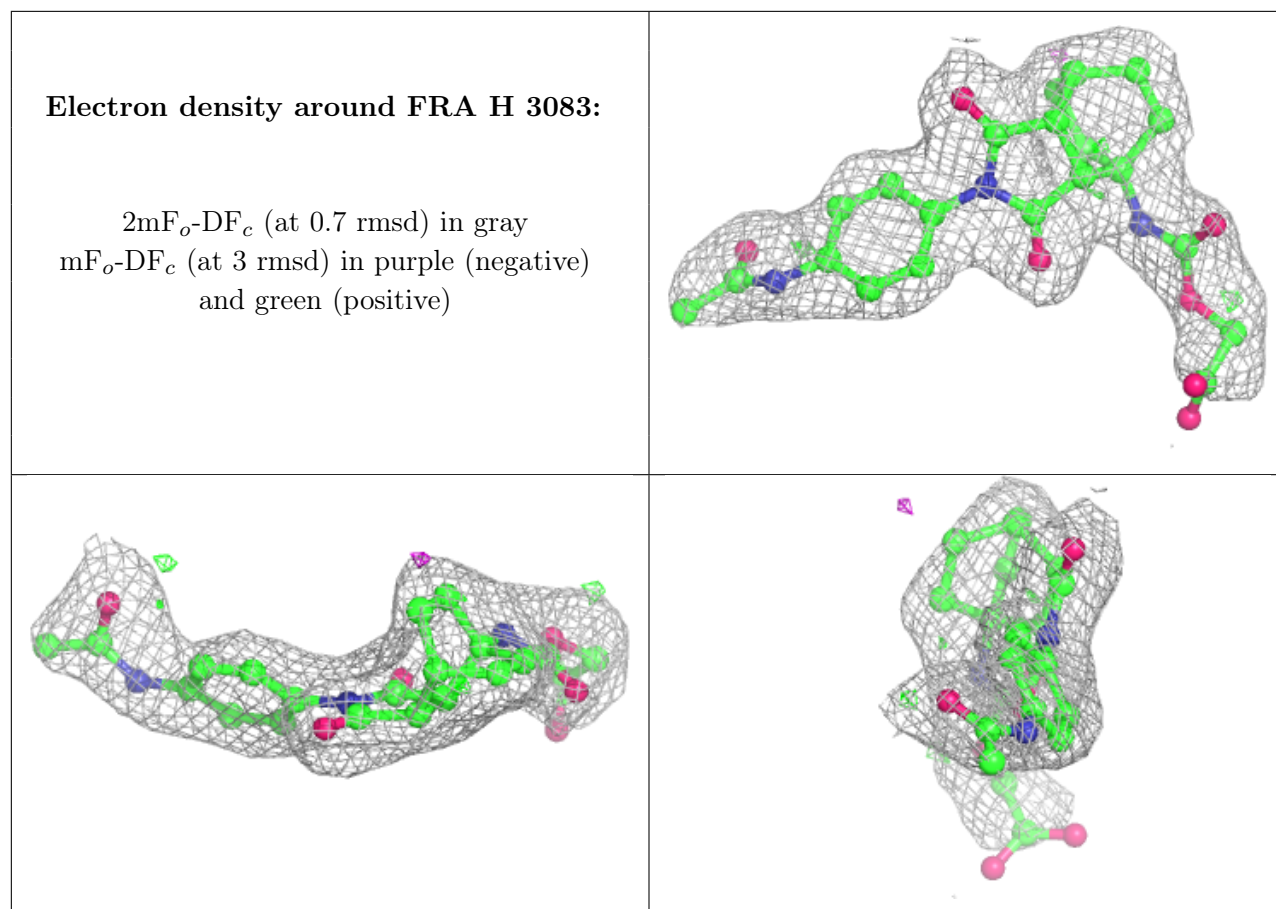## 6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
4	FRA	B	3083	31/31	0.85	0.23	29,39,90,95	0
4	FRA	H	3083	31/31	0.92	0.16	17,25,87,98	0
3	CD	L	5029	1/1	0.98	0.06	62,62,62,62	0
3	CD	L	5028	1/1	0.99	0.12	37,37,37,37	0
3	CD	A	5028	1/1	0.99	0.10	41,41,41,41	0
3	CD	A	5029	1/1	1.00	0.07	41,41,41,41	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 FRA B 3083:

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

Electron density around FRA H 3083:

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

6.5 Other polymers (i)

There are no such residues in this entry.