



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 02:58 PM UTC

PDB ID : 3ABW / pdb_00003abw
Title : Crystal structure of pharaonis halorhodopsin in complex with azide ion
Authors : Kouyama, T.; Kanada, S.
Deposited on : 2009-12-24
Resolution : 1.90 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

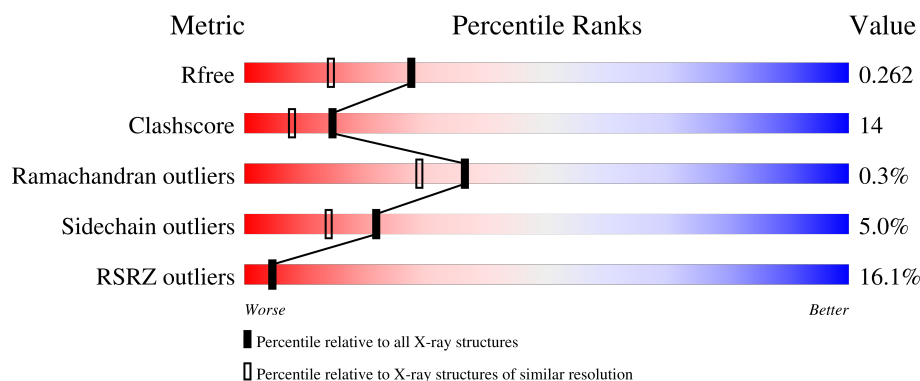
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.90 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	7789 (1.90-1.90)
Clashscore	190562	8410 (1.90-1.90)
Ramachandran outliers	187476	8333 (1.90-1.90)
Sidechain outliers	187428	8333 (1.90-1.90)
RSRZ outliers	180081	7790 (1.90-1.90)

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	291	9% 69% 19% • 11%
1	B	291	13% 62% 24% • 11%
1	D	291	21% 60% 26% • 11%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
4	L3P	B	311	-	-	-	X
4	L3P	D	312	-	-	-	X
5	AZI	A	401	-	X	-	-
5	AZI	B	401	-	X	-	-
5	AZI	D	401	-	X	-	-

2 Entry composition [i](#)

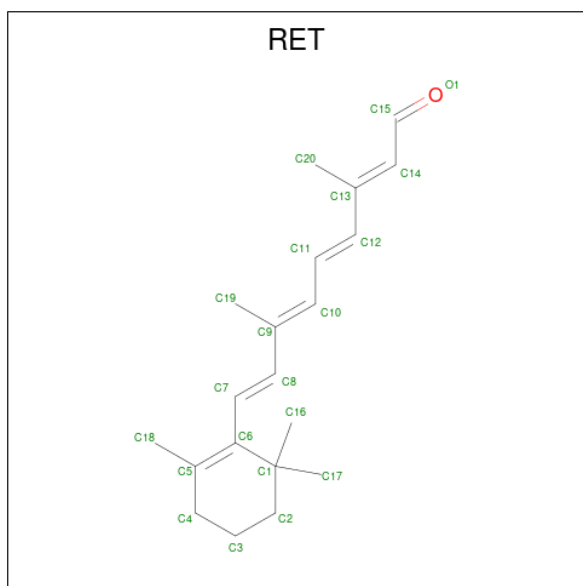
There are 6 unique types of molecules in this entry. The entry contains 6320 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Halorhodopsin.

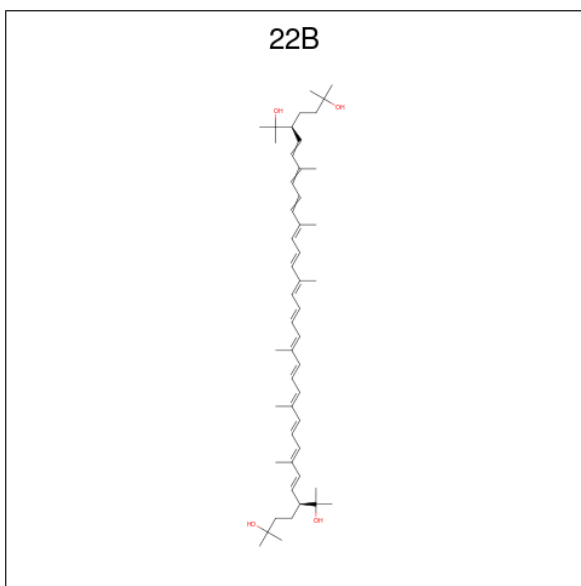
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	260	Total	C	N	O	S	0	0	0
			1967	1304	299	353	11			
1	B	259	Total	C	N	O	S	0	0	0
			1961	1301	298	351	11			
1	D	259	Total	C	N	O	S	0	0	0
			1961	1301	298	351	11			

- Molecule 2 is RETINAL (CCD ID: RET) (formula: $C_{20}H_{28}O$).



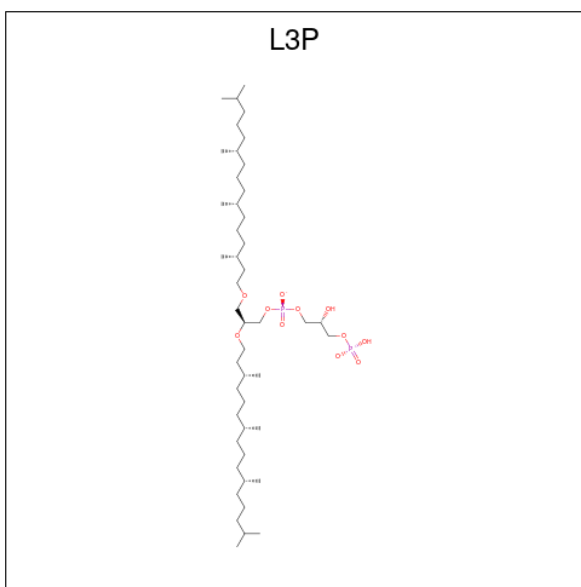
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	C	0	0
			20	20		
2	B	1	Total	C	0	0
			20	20		
2	D	1	Total	C	0	0
			20	20		

- Molecule 3 is BACTERIORUBERIN (CCD ID: 22B) (formula: $C_{50}H_{76}O_4$).



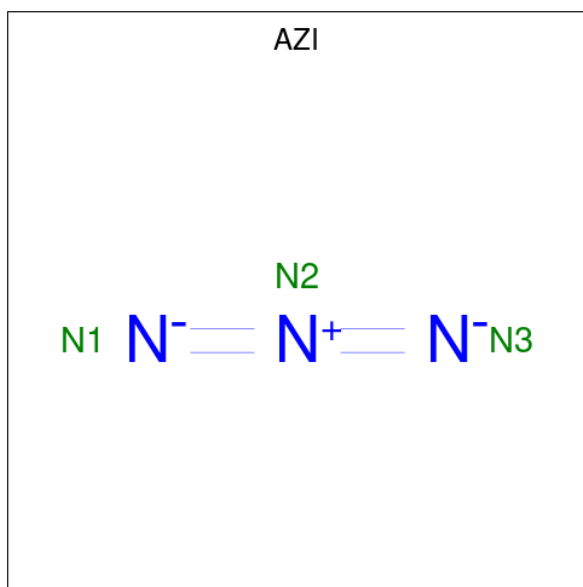
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			27	25	2		
3	B	1	Total	C	O	0	0
			27	25	2		

- Molecule 4 is 2,3-DI-O-PHYTANLY-3-SN-GLYCERO-1-PHOSPHORYL-3'-SN-GLYCEROL-1'-PHOSPHATE (CCD ID: L3P) (formula: $C_{46}H_{94}O_{11}P_2$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total C 20 20	0	0
4	A	1	Total C 20 20	0	0
4	A	1	Total C 20 20	0	0
4	B	1	Total C 20 20	0	0
4	B	1	Total C 20 20	0	0
4	B	1	Total C 20 20	0	0
4	D	1	Total C 20 20	0	0
4	D	1	Total C 20 20	0	0
4	D	1	Total C 20 20	0	0

- Molecule 5 is AZIDE ION (CCD ID: AZI) (formula: N₃).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total N 3 3	0	0
5	B	1	Total N 3 3	0	0
5	D	1	Total N 3 3	0	0

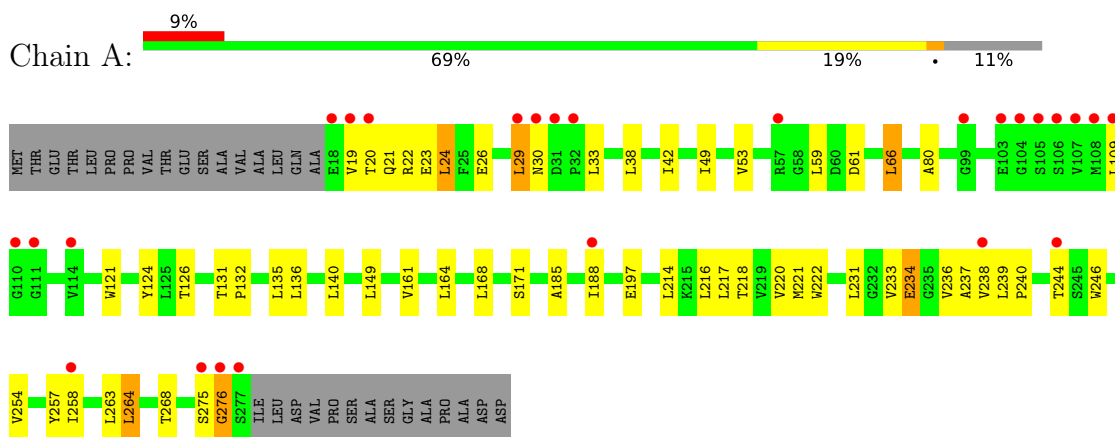
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	49	Total 49	O 49	0	0
6	B	48	Total 48	O 48	0	0
6	D	31	Total 31	O 31	0	0

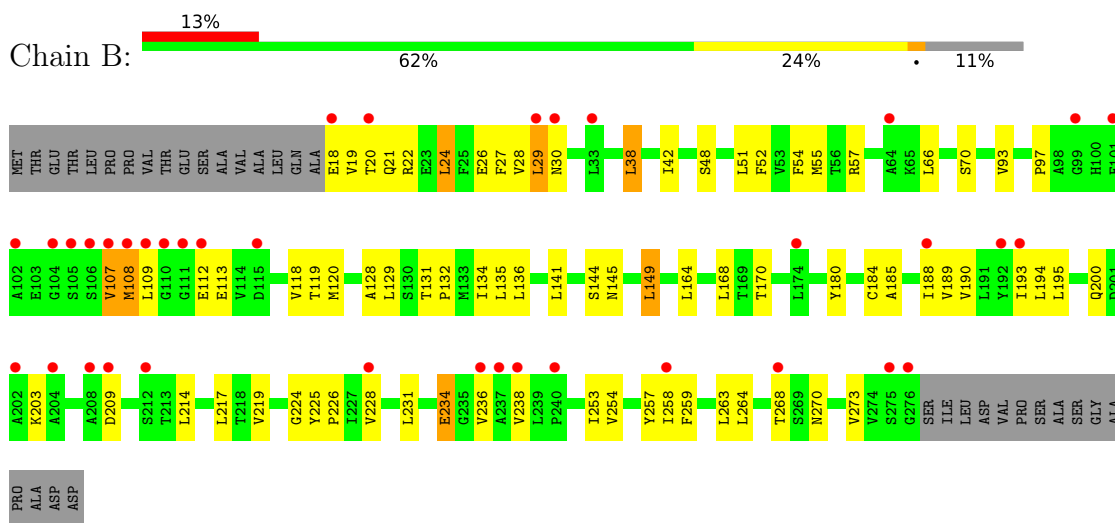
3 Residue-property plots

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

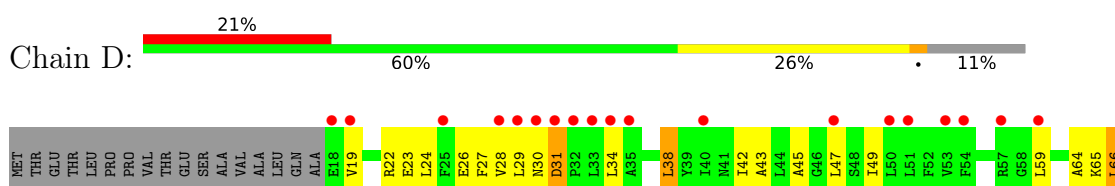
• Molecule 1: Halorhodopsin

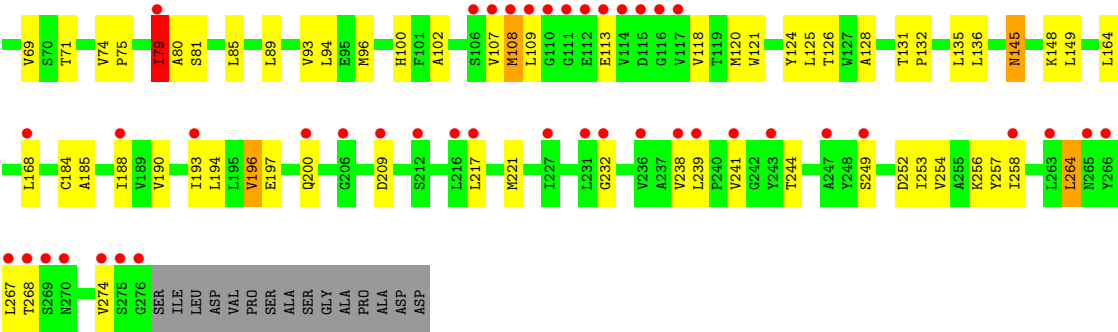


• Molecule 1: Halorhodopsin



• Molecule 1: Halorhodopsin





4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	152.09Å 98.79Å 100.14Å 90.00° 127.85° 90.00°	Depositor
Resolution (Å)	15.00 – 1.90 15.00 – 1.90	Depositor EDS
% Data completeness (in resolution range)	87.9 (15.00-1.90) 87.7 (15.00-1.90)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.87 (at 1.89Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.242 , 0.263 0.242 , 0.262	Depositor DCC
R_{free} test set	4064 reflections (5.03%)	wwPDB-VP
Wilson B-factor (Å ²)	25.1	Xtriage
Anisotropy	0.169	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.44 , 68.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	6320	wwPDB-VP
Average B, all atoms (Å ²)	32.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.28% 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: L3P, AZI, RET, 22B

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	0.45	0/2013	0.91	5/2756 (0.2%)
1	B	0.40	0/2007	0.87	3/2748 (0.1%)
1	D	0.39	0/2007	0.88	7/2748 (0.3%)
All	All	0.42	0/6027	0.88	15/8252 (0.2%)

There are no bond length outliers.

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	29	LEU	N-CA-C	-7.94	100.09	110.33
1	B	42	ILE	N-CA-C	-6.75	103.91	110.72
1	D	196	VAL	N-CA-C	6.52	117.17	111.56
1	A	42	ILE	N-CA-C	-6.32	104.17	110.62
1	D	79	ILE	CB-CA-C	-6.14	103.85	112.14
1	A	29	LEU	N-CA-C	-6.03	102.58	110.53
1	D	42	ILE	N-CA-C	-5.86	104.81	110.72
1	A	237	ALA	N-CA-C	5.77	119.39	111.54
1	D	31	ASP	CA-C-N	5.68	126.94	119.84
1	D	31	ASP	C-N-CA	5.68	126.94	119.84
1	D	66	LEU	N-CA-C	-5.67	105.18	111.36
1	A	257	TYR	N-CA-C	5.58	117.17	111.14
1	B	107	VAL	N-CA-C	5.56	116.01	111.62
1	A	197	GLU	N-CA-C	5.37	116.99	111.03
1	D	197	GLU	N-CA-C	5.07	117.78	111.24

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	1967	0	2018	42	0
1	B	1961	0	2013	69	0
1	D	1961	0	2013	65	0
2	A	20	0	27	0	0
2	B	20	0	27	2	0
2	D	20	0	27	1	0
3	A	27	0	37	0	0
3	B	27	0	37	0	0
4	A	60	0	117	3	0
4	B	60	0	117	4	0
4	D	60	0	117	6	0
5	A	3	0	0	0	0
5	B	3	0	0	0	0
5	D	3	0	0	0	0
6	A	49	0	0	1	1
6	B	48	0	0	1	0
6	D	31	0	0	0	0
All	All	6320	0	6550	178	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 14.

All (178) 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:238:VAL:HG23	1:A:239:LEU:HD13	1.49	0.93
1:D:185:ALA:O	1:D:188:ILE:HG12	1.74	0.87
1:B:254:VAL:HG13	1:B:258:ILE:HD11	1.57	0.85
1:B:254:VAL:HA	1:B:258:ILE:HG12	1.63	0.81
1:D:43:ALA:O	1:D:47:LEU:HD13	1.83	0.78
1:D:145:ASN:C	1:D:145:ASN:HD22	1.93	0.77
1:B:20:THR:HG22	1:B:22:ARG:H	1.48	0.76
1:A:220:VAL:HG12	1:A:221:MET:HE2	1.67	0.75
1:D:238:VAL:HG23	1:D:239:LEU:HD13	1.67	0.75
1:D:100:HIS:HD2	1:D:102:ALA:H	1.34	0.75

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:108:MET:HE3	1:D:113:GLU:HB2	1.69	0.75
1:B:190:VAL:O	1:B:193:ILE:HG13	1.87	0.74
1:B:200:GLN:HA	1:B:203:LYS:HE2	1.68	0.74
1:D:254:VAL:HA	1:D:258:ILE:HG22	1.70	0.73
1:D:190:VAL:O	1:D:193:ILE:HG13	1.87	0.73
1:B:193:ILE:HD12	1:B:194:LEU:N	2.06	0.71
1:D:108:MET:HA	1:D:113:GLU:HA	1.70	0.70
1:B:270:ASN:O	1:B:273:VAL:HG12	1.92	0.70
1:B:164:LEU:HD21	4:B:315:L3P:H243	1.74	0.70
1:B:185:ALA:O	1:B:188:ILE:HG12	1.92	0.69
1:B:164:LEU:O	1:B:168:LEU:HD13	1.93	0.68
1:D:38:LEU:HD21	1:D:120:MET:HE1	1.72	0.68
1:A:185:ALA:O	1:A:188:ILE:HG13	1.94	0.68
1:B:119:THR:HG23	1:B:234:GLU:OE1	1.95	0.67
1:A:238:VAL:HG23	1:A:239:LEU:CD1	2.24	0.66
1:D:193:ILE:HD12	1:D:194:LEU:N	2.11	0.65
1:A:214:LEU:CD1	1:A:263:LEU:HD13	2.26	0.65
1:D:65:LYS:O	1:D:69:VAL:HG23	1.97	0.65
1:B:29:LEU:O	1:B:30:ASN:HB2	1.97	0.64
1:A:80:ALA:HB1	4:A:317:L3P:H292	1.78	0.64
1:B:19:VAL:HG21	1:B:93:VAL:HG11	1.79	0.64
1:A:264:LEU:O	1:A:268:THR:HG22	1.98	0.64
1:D:232:GLY:HA3	1:D:244:THR:HG21	1.80	0.64
1:A:20:THR:HG22	1:A:22:ARG:H	1.62	0.63
1:B:108:MET:HA	1:B:113:GLU:HA	1.81	0.63
1:D:100:HIS:CD2	1:D:102:ALA:H	2.16	0.63
1:D:19:VAL:HG21	1:D:93:VAL:HG11	1.80	0.63
1:B:141:LEU:HD22	1:B:263:LEU:CD1	2.31	0.61
1:D:164:LEU:O	1:D:168:LEU:HD23	2.00	0.61
1:A:236:VAL:HG13	1:A:238:VAL:HG13	1.82	0.60
1:A:254:VAL:O	1:A:258:ILE:HG13	2.02	0.60
1:B:254:VAL:HG13	1:B:258:ILE:CD1	2.31	0.59
1:A:217:LEU:HD21	1:A:258:ILE:HD11	1.83	0.59
1:D:238:VAL:HG23	1:D:239:LEU:CD1	2.33	0.59
1:A:275:SER:O	1:A:276:GLY:C	2.44	0.58
1:D:22:ARG:O	1:D:26:GLU:HG2	2.04	0.57
1:D:254:VAL:O	1:D:258:ILE:HG22	2.04	0.57
1:A:29:LEU:O	1:A:30:ASN:HB2	2.03	0.57
1:B:48:SER:HB3	1:B:52:PHE:CE2	2.39	0.57
1:B:224:GLY:O	1:B:228:VAL:HG23	2.04	0.57
1:D:131:THR:OG1	1:D:132:PRO:HD3	2.05	0.56

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:121:TRP:HA	1:D:124:TYR:CD2	2.41	0.56
1:B:136:LEU:HD13	1:B:136:LEU:C	2.30	0.55
1:B:144:SER:OG	1:B:149:LEU:HD22	2.06	0.55
1:A:164:LEU:HD21	4:A:313:L3P:H241	1.89	0.55
1:B:20:THR:HG22	1:B:22:ARG:N	2.21	0.55
1:B:108:MET:HA	1:B:112:GLU:O	2.06	0.55
1:A:20:THR:O	1:A:24:LEU:HD22	2.07	0.54
1:D:145:ASN:ND2	1:D:148:LYS:H	2.05	0.54
1:D:45:ALA:O	1:D:49:ILE:HG13	2.08	0.54
1:B:21:GLN:HE21	4:B:311:L3P:H143	1.73	0.54
1:B:270:ASN:HB3	1:B:273:VAL:HG12	1.90	0.53
1:A:20:THR:CG2	1:A:22:ARG:HG2	2.38	0.53
1:D:254:VAL:HA	1:D:258:ILE:CG2	2.38	0.53
1:B:70:SER:OG	1:B:136:LEU:HD12	2.08	0.53
1:D:108:MET:HB2	1:D:113:GLU:HG3	1.90	0.53
1:A:20:THR:HG21	1:A:22:ARG:NH1	2.22	0.53
1:D:217:LEU:HD11	1:D:254:VAL:CG1	2.39	0.53
1:D:145:ASN:HD21	1:D:148:LYS:HG3	1.74	0.53
1:A:20:THR:HG21	1:A:22:ARG:HG2	1.92	0.52
1:D:267:LEU:HD11	1:D:274:VAL:HG21	1.91	0.52
1:B:193:ILE:HD12	1:B:193:ILE:C	2.35	0.52
1:D:252:ASP:O	1:D:256:LYS:HB2	2.10	0.51
1:B:109:LEU:HD22	1:B:109:LEU:N	2.25	0.51
1:D:28:VAL:HG13	1:D:34:LEU:CD1	2.41	0.51
1:D:71:THR:HG21	1:D:264:LEU:HD13	1.92	0.51
1:D:145:ASN:HD21	1:D:148:LYS:H	1.59	0.50
1:B:231:LEU:HA	1:B:236:VAL:HG12	1.94	0.50
1:D:126:THR:HG22	4:D:314:L3P:H291	1.93	0.50
1:B:108:MET:HG2	1:B:113:GLU:HA	1.93	0.50
1:D:29:LEU:C	1:D:31:ASP:H	2.19	0.50
1:A:254:VAL:HA	1:A:258:ILE:HG12	1.93	0.50
1:D:125:LEU:HD13	4:D:316:L3P:H262	1.94	0.50
1:D:193:ILE:HD12	1:D:193:ILE:C	2.36	0.49
1:D:196:VAL:O	1:D:200:GLN:HG2	2.11	0.49
1:D:253:ILE:HA	1:D:257:TYR:CD2	2.48	0.49
4:D:316:L3P:H152	4:D:316:L3P:H191	1.95	0.48
1:A:20:THR:HG22	1:A:21:GLN:N	2.26	0.48
1:B:168:LEU:HD22	4:D:314:L3P:H242	1.94	0.48
1:D:80:ALA:HB1	4:D:314:L3P:H303	1.95	0.48
1:D:145:ASN:C	1:D:145:ASN:ND2	2.65	0.48
1:B:141:LEU:HD22	1:B:263:LEU:HD11	1.96	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:28:VAL:HG13	1:D:34:LEU:HD12	1.94	0.48
1:A:254:VAL:HA	1:A:258:ILE:CG1	2.44	0.48
1:A:234:GLU:HG3	6:A:511:HOH:O	2.13	0.48
1:B:20:THR:HG22	1:B:21:GLN:N	2.28	0.48
1:D:254:VAL:CA	1:D:258:ILE:HG22	2.42	0.48
1:B:70:SER:CB	1:B:136:LEU:HD12	2.44	0.48
1:D:221:MET:HA	1:D:221:MET:HE2	1.95	0.47
1:B:26:GLU:O	1:B:29:LEU:O	2.32	0.47
1:A:218:THR:HG23	1:A:222:TRP:NE1	2.30	0.47
1:B:268:THR:HG23	6:B:516:HOH:O	2.14	0.47
1:A:22:ARG:HG3	1:A:23:GLU:N	2.29	0.47
1:B:97:PRO:HB3	1:B:170:THR:O	2.16	0.46
1:B:19:VAL:CG2	1:B:93:VAL:HG11	2.46	0.46
1:D:184:CYS:O	1:D:188:ILE:HG23	2.16	0.46
1:A:233:VAL:HG23	1:A:234:GLU:OE1	2.16	0.46
1:A:33:LEU:HD22	1:A:246:TRP:CD1	2.50	0.46
1:B:93:VAL:HG13	1:B:93:VAL:O	2.15	0.46
1:B:236:VAL:HG13	1:B:238:VAL:HG13	1.98	0.46
1:A:19:VAL:HG12	1:A:109:LEU:HD23	1.97	0.46
1:B:54:PHE:O	1:B:57:ARG:HG2	2.16	0.46
1:B:258:ILE:HG13	1:B:259:PHE:N	2.31	0.46
1:B:270:ASN:HB3	1:B:273:VAL:CG1	2.45	0.46
1:B:141:LEU:HD22	1:B:263:LEU:HD13	1.97	0.46
1:B:195:LEU:HD21	1:B:219:VAL:HG21	1.98	0.45
1:B:129:LEU:C	1:B:132:PRO:HD2	2.42	0.45
1:D:94:LEU:HD11	1:D:168:LEU:HD13	1.97	0.45
1:D:23:GLU:HB3	1:D:109:LEU:HB3	1.98	0.45
1:D:85:LEU:HD22	1:D:120:MET:HE2	1.99	0.45
1:A:49:ILE:O	1:A:53:VAL:HG23	2.16	0.45
1:B:38:LEU:HD11	1:B:120:MET:HE1	1.98	0.45
1:B:107:VAL:O	1:B:108:MET:HB2	2.16	0.45
1:D:89:LEU:HD21	4:D:314:L3P:H23	1.99	0.45
1:D:29:LEU:O	1:D:30:ASN:HB2	2.17	0.45
1:B:259:PHE:CD1	1:B:259:PHE:C	2.94	0.44
1:D:232:GLY:CA	1:D:244:THR:HG21	2.47	0.44
1:D:38:LEU:HD21	1:D:120:MET:CE	2.45	0.44
1:B:188:ILE:HG13	1:B:189:VAL:N	2.33	0.44
1:B:134:ILE:HG23	1:B:259:PHE:CZ	2.52	0.44
1:A:26:GLU:O	1:A:29:LEU:O	2.36	0.44
1:A:131:THR:N	1:A:132:PRO:CD	2.81	0.43
1:B:184:CYS:O	1:B:188:ILE:HG23	2.18	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:59:LEU:HD21	1:D:268:THR:HG22	2.00	0.43
1:A:66:LEU:HD13	1:A:140:LEU:HD11	2.00	0.43
1:B:214:LEU:CD1	1:B:263:LEU:HD13	2.48	0.43
1:D:249:SER:O	1:D:253:ILE:HG13	2.18	0.43
1:B:20:THR:CG2	1:B:21:GLN:N	2.82	0.43
1:B:180:TYR:CD2	2:B:292:RET:H32	2.53	0.43
1:A:240:PRO:O	1:A:244:THR:HG23	2.18	0.43
1:B:236:VAL:HG22	1:B:236:VAL:O	2.18	0.43
1:B:149:LEU:HB3	4:B:318:L3P:H271	2.01	0.43
1:B:51:LEU:O	1:B:55:MET:HG3	2.20	0.42
1:B:253:ILE:HA	1:B:257:TYR:CD2	2.54	0.42
1:A:19:VAL:O	1:A:19:VAL:HG23	2.19	0.42
1:D:74:VAL:HB	1:D:75:PRO:CD	2.49	0.42
2:D:292:RET:H7	2:D:292:RET:H181	1.84	0.42
1:A:220:VAL:CG1	1:A:221:MET:HE2	2.44	0.42
1:D:107:VAL:O	1:D:108:MET:HB3	2.19	0.42
1:D:75:PRO:O	1:D:79:ILE:HG13	2.20	0.42
1:D:128:ALA:O	1:D:132:PRO:HG2	2.20	0.42
2:B:292:RET:H7	2:B:292:RET:H181	1.81	0.41
1:A:20:THR:CG2	1:A:21:GLN:N	2.83	0.41
1:A:161:VAL:HG12	4:B:311:L3P:H291	2.02	0.41
1:B:217:LEU:C	1:B:217:LEU:HD23	2.45	0.41
1:D:168:LEU:HD22	1:D:168:LEU:N	2.36	0.41
1:B:24:LEU:HD12	1:B:24:LEU:HA	1.86	0.41
1:B:27:PHE:CE1	1:B:118:VAL:HG21	2.55	0.41
1:B:128:ALA:O	1:B:132:PRO:HG2	2.20	0.41
1:B:225:TYR:N	1:B:226:PRO:HD2	2.36	0.41
1:D:81:SER:CB	1:D:126:THR:HG21	2.51	0.41
1:A:33:LEU:HD22	1:A:246:TRP:HD1	1.85	0.41
1:B:108:MET:HG2	1:B:113:GLU:CA	2.51	0.41
1:A:61:ASP:OD2	1:A:275:SER:HA	2.20	0.41
1:B:28:VAL:C	1:B:29:LEU:O	2.61	0.41
1:B:29:LEU:O	1:B:30:ASN:CB	2.62	0.41
1:B:131:THR:N	1:B:132:PRO:CD	2.84	0.41
1:B:145:ASN:O	1:B:149:LEU:HD23	2.20	0.41
1:D:27:PHE:CZ	1:D:118:VAL:HG21	2.55	0.41
1:D:241:VAL:HA	1:D:244:THR:OG1	2.21	0.40
1:D:64:ALA:O	1:D:267:LEU:HD21	2.21	0.40
1:A:121:TRP:HA	1:A:124:TYR:CD2	2.55	0.40
1:A:126:THR:HG22	4:A:317:L3P:H302	2.03	0.40
1:A:171:SER:HB2	1:B:22:ARG:HA	2.04	0.40

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:231:LEU:O	1:A:238:VAL:HG22	2.20	0.40
1:D:108:MET:HB2	1:D:113:GLU:CG	2.51	0.40
1:D:27:PHE:CE1	1:D:118:VAL:HG21	2.56	0.40
1:D:96:MET:HG3	1:D:102:ALA:HB3	2.04	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)
6:A:600:HOH:O	6:A:600:HOH:O[2_656]	1.79	0.41

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	258/291 (89%)	253 (98%)	4 (2%)	1 (0%)	30	22
1	B	257/291 (88%)	248 (96%)	9 (4%)	0	100	100
1	D	257/291 (88%)	250 (97%)	6 (2%)	1 (0%)	30	22
All	All	772/873 (88%)	751 (97%)	19 (2%)	2 (0%)	36	29

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	276	GLY
1	D	108	MET

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	209/233 (90%)	198 (95%)	11 (5%)	20	12
1	B	208/233 (89%)	198 (95%)	10 (5%)	23	15
1	D	208/233 (89%)	198 (95%)	10 (5%)	23	15
All	All	625/699 (89%)	594 (95%)	31 (5%)	22	14

All (31) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	24	LEU
1	A	38	LEU
1	A	59	LEU
1	A	66	LEU
1	A	135	LEU
1	A	136	LEU
1	A	149	LEU
1	A	168	LEU
1	A	216	LEU
1	A	234	GLU
1	A	264	LEU
1	B	18	GLU
1	B	24	LEU
1	B	38	LEU
1	B	66	LEU
1	B	108	MET
1	B	135	LEU
1	B	149	LEU
1	B	209	ASP
1	B	234	GLU
1	B	264	LEU
1	D	24	LEU
1	D	38	LEU
1	D	66	LEU
1	D	79	ILE
1	D	135	LEU
1	D	136	LEU
1	D	145	ASN
1	D	149	LEU
1	D	209	ASP

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	D	264	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	41	ASN
1	B	41	ASN
1	B	265	ASN
1	D	100	HIS
1	D	145	ASN
1	D	270	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](#)

17 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	RET	B	292	1	20,20,21	2.29	6 (30%)	27,27,28	1.79	9 (33%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	22B	B	300	-	26,26,53	3.01	11 (42%)	31,35,72	1.93	9 (29%)
4	L3P	B	318	-	19,19,58	2.04	8 (42%)	22,22,73	1.29	3 (13%)
5	AZI	B	401	-	2,2,2	4.88	2 (100%)	0,1,1	-	-
2	RET	D	292	1	20,20,21	2.25	6 (30%)	27,27,28	1.72	8 (29%)
4	L3P	B	315	-	19,19,58	2.00	8 (42%)	22,22,73	1.13	1 (4%)
4	L3P	D	314	-	19,19,58	2.00	8 (42%)	22,22,73	1.19	2 (9%)
2	RET	A	292	1	20,20,21	2.21	6 (30%)	27,27,28	1.72	8 (29%)
4	L3P	B	311	-	19,19,58	2.01	8 (42%)	22,22,73	1.13	2 (9%)
5	AZI	D	401	-	2,2,2	4.99	2 (100%)	0,1,1	-	-
4	L3P	A	310	-	19,19,58	2.06	8 (42%)	22,22,73	1.34	3 (13%)
4	L3P	D	312	-	19,19,58	2.02	8 (42%)	22,22,73	1.20	2 (9%)
3	22B	A	300	-	26,26,53	3.00	11 (42%)	31,35,72	1.90	8 (25%)
5	AZI	A	401	-	2,2,2	4.75	2 (100%)	0,1,1	-	-
4	L3P	A	313	-	19,19,58	2.00	8 (42%)	22,22,73	1.10	1 (4%)
4	L3P	D	316	-	19,19,58	2.08	8 (42%)	22,22,73	1.30	3 (13%)
4	L3P	A	317	-	19,19,58	2.05	8 (42%)	22,22,73	1.34	2 (9%)

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	RET	B	292	1	-	0/13/30/31	0/1/1/1
3	22B	B	300	-	-	8/31/31/65	-
4	L3P	B	318	-	-	5/20/20/67	-
2	RET	D	292	1	-	0/13/30/31	0/1/1/1
4	L3P	B	315	-	-	6/20/20/67	-
4	L3P	D	314	-	-	7/20/20/67	-
2	RET	A	292	1	-	0/13/30/31	0/1/1/1
4	L3P	B	311	-	-	4/20/20/67	-
4	L3P	A	310	-	-	9/20/20/67	-
4	L3P	D	312	-	-	6/20/20/67	-
3	22B	A	300	-	-	8/31/31/65	-
4	L3P	A	313	-	-	4/20/20/67	-
4	L3P	D	316	-	-	8/20/20/67	-

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	L3P	A	317	-	-	6/20/20/67	-

All (118) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	300	22B	C2-C3	8.82	1.63	1.49
3	B	300	22B	C2-C3	8.78	1.63	1.49
2	B	292	RET	C1-C6	6.49	1.62	1.53
2	D	292	RET	C1-C6	6.41	1.62	1.53
2	A	292	RET	C1-C6	6.39	1.62	1.53
3	B	300	22B	C1-C2	5.69	1.61	1.55
3	A	300	22B	C1-C2	5.33	1.61	1.55
5	B	401	AZI	N1-N2	-5.22	1.12	1.23
5	D	401	AZI	N1-N2	-5.02	1.12	1.23
5	D	401	AZI	N3-N2	-4.95	1.13	1.23
5	A	401	AZI	N3-N2	-4.82	1.13	1.23
3	B	300	22B	C21-C2	4.71	1.59	1.53
3	A	300	22B	C21-C2	4.70	1.59	1.53
5	A	401	AZI	N1-N2	-4.69	1.13	1.23
5	B	401	AZI	N3-N2	-4.52	1.13	1.23
2	A	292	RET	C5-C6	4.33	1.41	1.34
2	D	292	RET	C5-C6	4.26	1.41	1.34
3	B	300	22B	O27-C23	4.12	1.54	1.44
3	A	300	22B	O27-C23	4.04	1.54	1.44
2	B	292	RET	C5-C6	4.04	1.41	1.34
3	A	300	22B	C16-C1	3.98	1.59	1.52
3	B	300	22B	C16-C1	3.96	1.59	1.52
3	B	300	22B	C19-C9	3.81	1.58	1.50
3	A	300	22B	C19-C9	3.78	1.58	1.50
2	B	292	RET	C14-C13	3.67	1.36	1.33
2	D	292	RET	C14-C13	3.61	1.36	1.33
3	A	300	22B	C17-C1	3.26	1.57	1.52
4	A	310	L3P	C15-C13	3.20	1.68	1.52
3	B	300	22B	C17-C1	3.15	1.57	1.52
4	D	314	L3P	C15-C13	3.14	1.68	1.52
4	A	317	L3P	C15-C13	3.13	1.67	1.52
4	B	315	L3P	C15-C13	3.13	1.67	1.52
4	D	312	L3P	C15-C13	3.13	1.67	1.52
3	B	300	22B	C22-C21	3.10	1.61	1.53
4	D	316	L3P	C15-C13	3.09	1.67	1.52
4	B	311	L3P	C15-C13	3.09	1.67	1.52
4	A	313	L3P	C15-C13	3.08	1.67	1.52

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	318	L3P	C15-C13	3.08	1.67	1.52
3	A	300	22B	C22-C21	3.07	1.61	1.53
2	B	292	RET	C7-C6	3.06	1.55	1.45
3	B	300	22B	C20-C13	3.04	1.57	1.50
3	A	300	22B	C20-C13	2.95	1.56	1.50
2	D	292	RET	C7-C6	2.93	1.55	1.45
4	A	317	L3P	C17-C18	2.92	1.66	1.52
4	D	316	L3P	C17-C18	2.91	1.66	1.52
4	A	317	L3P	C25-C23	2.89	1.66	1.52
4	D	316	L3P	C25-C23	2.89	1.66	1.52
2	A	292	RET	C7-C6	2.88	1.54	1.45
4	A	310	L3P	C25-C23	2.87	1.66	1.52
4	B	311	L3P	C26-C27	2.86	1.64	1.52
4	B	318	L3P	C17-C18	2.85	1.66	1.52
4	D	312	L3P	C25-C23	2.82	1.66	1.52
4	B	318	L3P	C25-C23	2.81	1.66	1.52
4	D	314	L3P	C25-C23	2.80	1.66	1.52
4	B	311	L3P	C25-C23	2.79	1.66	1.52
4	B	315	L3P	C25-C23	2.77	1.66	1.52
4	A	310	L3P	C26-C27	2.77	1.63	1.52
4	A	313	L3P	C25-C23	2.76	1.66	1.52
3	B	300	22B	C18-C5	2.75	1.56	1.50
4	D	316	L3P	C26-C27	2.74	1.63	1.52
4	D	314	L3P	C26-C27	2.73	1.63	1.52
3	A	300	22B	C18-C5	2.73	1.56	1.50
4	A	317	L3P	C26-C27	2.70	1.63	1.52
4	D	312	L3P	C26-C27	2.69	1.63	1.52
4	A	310	L3P	C19-C18	2.69	1.61	1.52
4	D	312	L3P	C17-C18	2.68	1.65	1.52
4	D	316	L3P	C19-C18	2.68	1.61	1.52
2	B	292	RET	C2-C3	-2.68	1.46	1.52
4	A	310	L3P	C17-C18	2.67	1.65	1.52
4	B	318	L3P	C26-C27	2.66	1.63	1.52
4	B	318	L3P	C19-C18	2.66	1.61	1.52
4	A	310	L3P	C14-C13	2.63	1.61	1.52
4	A	313	L3P	C14-C13	2.63	1.61	1.52
4	B	315	L3P	C17-C18	2.62	1.65	1.52
4	B	311	L3P	C17-C18	2.62	1.65	1.52
4	D	314	L3P	C17-C18	2.62	1.65	1.52
4	A	313	L3P	C17-C18	2.61	1.65	1.52
4	B	315	L3P	C19-C18	2.61	1.61	1.52
4	D	316	L3P	C14-C13	2.61	1.61	1.52

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	312	L3P	C14-C13	2.61	1.61	1.52
4	B	315	L3P	C26-C27	2.60	1.63	1.52
4	D	312	L3P	C19-C18	2.59	1.61	1.52
4	A	313	L3P	C26-C27	2.59	1.63	1.52
4	B	318	L3P	C14-C13	2.57	1.60	1.52
4	A	317	L3P	C14-C13	2.57	1.60	1.52
4	B	315	L3P	C14-C13	2.57	1.60	1.52
2	A	292	RET	C2-C3	-2.57	1.46	1.52
4	B	311	L3P	C19-C18	2.56	1.60	1.52
4	A	317	L3P	C19-C18	2.55	1.60	1.52
4	D	314	L3P	C14-C13	2.55	1.60	1.52
4	A	313	L3P	C19-C18	2.54	1.60	1.52
4	D	316	L3P	C26-C25	2.51	1.62	1.52
4	B	311	L3P	C14-C13	2.51	1.60	1.52
4	A	313	L3P	C26-C25	2.50	1.62	1.52
4	D	314	L3P	C19-C18	2.49	1.60	1.52
4	A	317	L3P	C26-C25	2.49	1.62	1.52
2	D	292	RET	C2-C3	-2.48	1.46	1.52
4	D	312	L3P	C26-C25	2.45	1.62	1.52
4	B	318	L3P	C26-C25	2.43	1.62	1.52
4	A	310	L3P	C26-C25	2.43	1.62	1.52
4	D	314	L3P	C26-C25	2.43	1.62	1.52
4	B	311	L3P	C26-C25	2.43	1.62	1.52
4	B	315	L3P	C26-C25	2.43	1.62	1.52
2	A	292	RET	C14-C13	2.33	1.35	1.33
3	A	300	22B	C4-C3	2.25	1.37	1.32
4	D	316	L3P	C16-C15	2.23	1.61	1.52
4	B	318	L3P	C16-C15	2.19	1.61	1.52
4	A	317	L3P	C16-C15	2.18	1.61	1.52
4	B	315	L3P	C16-C15	2.17	1.61	1.52
4	A	313	L3P	C16-C15	2.17	1.61	1.52
2	D	292	RET	C2-C1	2.16	1.59	1.54
4	D	314	L3P	C16-C15	2.14	1.61	1.52
4	B	311	L3P	C16-C15	2.12	1.61	1.52
4	D	312	L3P	C16-C15	2.12	1.61	1.52
3	B	300	22B	C4-C3	2.11	1.37	1.32
4	A	310	L3P	C16-C15	2.11	1.61	1.52
2	B	292	RET	C18-C5	2.10	1.54	1.50
2	A	292	RET	C2-C1	2.07	1.58	1.54

All (61) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	300	22B	C20-C13-C12	4.35	124.73	118.09
3	B	300	22B	C21-C22-C23	4.20	124.08	116.24
3	A	300	22B	C21-C22-C23	3.95	123.61	116.24
3	B	300	22B	C20-C13-C12	3.94	124.10	118.09
3	B	300	22B	C16-C1-C2	3.71	116.69	111.71
4	A	310	L3P	C26-C25-C23	3.60	127.92	115.97
4	A	317	L3P	C26-C25-C23	3.57	127.83	115.97
4	D	312	L3P	C26-C25-C23	3.47	127.50	115.97
2	D	292	RET	C1-C6-C7	3.42	124.92	115.65
4	D	316	L3P	C26-C25-C23	3.40	127.27	115.97
4	D	314	L3P	C26-C25-C23	3.40	127.26	115.97
2	A	292	RET	C20-C13-C12	3.39	123.27	118.09
4	B	318	L3P	C26-C25-C23	3.36	127.12	115.97
2	B	292	RET	C1-C6-C7	3.34	124.71	115.65
3	A	300	22B	C16-C1-C2	3.30	116.14	111.71
3	B	300	22B	C17-C1-C16	-3.20	105.84	110.52
3	A	300	22B	C17-C1-C16	-3.20	105.85	110.52
3	B	300	22B	C4-C5-C6	-3.20	113.98	119.01
3	B	300	22B	C18-C5-C4	3.18	122.95	118.09
4	B	311	L3P	C26-C25-C23	3.13	126.38	115.97
3	A	300	22B	C18-C5-C4	3.09	122.81	118.09
2	D	292	RET	C1-C6-C5	-3.08	118.43	122.64
3	A	300	22B	C4-C5-C6	-3.00	114.29	119.01
2	B	292	RET	C20-C13-C12	3.00	122.67	118.09
4	A	317	L3P	C16-C17-C18	2.98	125.86	115.97
2	A	292	RET	C12-C13-C14	-2.89	110.88	118.55
4	D	316	L3P	C16-C17-C18	2.88	125.55	115.97
4	B	318	L3P	C16-C17-C18	2.87	125.49	115.97
2	A	292	RET	C1-C6-C7	2.86	123.41	115.65
3	A	300	22B	C12-C13-C14	-2.84	111.00	118.55
2	D	292	RET	C2-C1-C6	2.84	114.56	110.44
4	B	315	L3P	C26-C25-C23	2.79	125.24	115.97
2	B	292	RET	C2-C1-C6	2.78	114.47	110.44
4	A	310	L3P	C21-C20-C18	2.75	125.11	115.97
2	A	292	RET	C1-C6-C5	-2.75	118.88	122.64
2	B	292	RET	C17-C1-C6	2.72	114.51	110.24
2	B	292	RET	C1-C6-C5	-2.66	119.00	122.64
2	A	292	RET	C2-C1-C6	2.65	114.29	110.44
4	A	310	L3P	C16-C17-C18	2.52	124.33	115.97
2	D	292	RET	C20-C13-C12	2.50	121.91	118.09
3	B	300	22B	C12-C13-C14	-2.45	112.04	118.55
4	A	313	L3P	C26-C25-C23	2.45	124.10	115.97
2	A	292	RET	C8-C9-C10	-2.44	115.17	119.01

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	292	RET	C2-C3-C4	2.43	116.63	111.28
2	B	292	RET	C8-C9-C10	-2.41	115.22	119.01
2	B	292	RET	C19-C9-C8	2.35	121.68	118.09
2	D	292	RET	C8-C9-C10	-2.30	115.39	119.01
2	A	292	RET	C17-C1-C6	2.29	113.83	110.24
2	B	292	RET	C7-C6-C5	-2.29	116.29	121.56
2	D	292	RET	C19-C9-C8	2.28	121.56	118.09
3	B	300	22B	C24-C23-C22	2.28	118.26	111.51
2	A	292	RET	C19-C9-C8	2.27	121.55	118.09
3	A	300	22B	C24-C23-C22	2.26	118.20	111.51
2	D	292	RET	C17-C1-C6	2.22	113.73	110.24
2	D	292	RET	C7-C6-C5	-2.13	116.64	121.56
4	D	314	L3P	C16-C17-C18	2.12	123.00	115.97
4	D	312	L3P	C16-C17-C18	2.11	122.98	115.97
4	B	311	L3P	C16-C17-C18	2.04	122.76	115.97
4	B	318	L3P	C17-C16-C15	2.03	122.36	113.28
4	D	316	L3P	C17-C16-C15	2.02	122.35	113.28
3	B	300	22B	O26-C1-C2	2.02	110.75	107.55

There are no chirality outliers.

All (71) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	300	22B	C1-C2-C3-C4
3	A	300	22B	C2-C3-C4-C5
3	A	300	22B	C7-C8-C9-C10
3	A	300	22B	C7-C8-C9-C19
3	A	300	22B	C21-C22-C23-C24
3	A	300	22B	C21-C22-C23-O27
3	B	300	22B	C1-C2-C3-C4
3	B	300	22B	C2-C3-C4-C5
3	B	300	22B	C7-C8-C9-C10
3	B	300	22B	C21-C22-C23-C24
3	B	300	22B	C21-C22-C23-O27
4	B	315	L3P	C15-C16-C17-C18
4	D	314	L3P	C15-C16-C17-C18
4	A	310	L3P	C15-C16-C17-C18
4	A	313	L3P	C15-C16-C17-C18
4	A	317	L3P	C15-C16-C17-C18
4	B	311	L3P	C15-C16-C17-C18
4	B	318	L3P	C15-C16-C17-C18
4	D	312	L3P	C15-C16-C17-C18

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
4	D	316	L3P	C15-C16-C17-C18
4	A	310	L3P	C19-C18-C20-C21
3	B	300	22B	C7-C8-C9-C19
4	D	316	L3P	C18-C20-C21-C22
3	A	300	22B	C21-C22-C23-C25
3	B	300	22B	C21-C22-C23-C25
4	A	313	L3P	C25-C26-C27-C28
4	B	318	L3P	C25-C26-C27-C28
4	A	310	L3P	C18-C20-C21-C22
4	B	315	L3P	C26-C27-C28-C29
4	B	318	L3P	C26-C27-C28-C29
4	A	317	L3P	C26-C27-C28-C29
4	A	317	L3P	C26-C27-C28-C30
4	D	312	L3P	C25-C26-C27-C28
4	B	315	L3P	C26-C27-C28-C30
4	B	318	L3P	C26-C27-C28-C30
4	D	312	L3P	C26-C27-C28-C30
4	A	310	L3P	C22-C23-C25-C26
4	A	310	L3P	C26-C27-C28-C29
4	A	310	L3P	C26-C27-C28-C30
4	D	312	L3P	C26-C27-C28-C29
4	D	316	L3P	C26-C27-C28-C29
4	D	316	L3P	C26-C27-C28-C30
4	B	318	L3P	C13-C15-C16-C17
4	A	313	L3P	C26-C27-C28-C29
4	A	313	L3P	C26-C27-C28-C30
3	A	300	22B	C21-C2-C3-C4
3	B	300	22B	C21-C2-C3-C4
4	A	317	L3P	C13-C15-C16-C17
4	A	317	L3P	C17-C18-C20-C21
4	D	314	L3P	C17-C18-C20-C21
4	D	314	L3P	C22-C23-C25-C26
4	A	310	L3P	C24-C23-C25-C26
4	D	314	L3P	C24-C23-C25-C26
4	B	315	L3P	C25-C26-C27-C28
4	B	315	L3P	C13-C15-C16-C17
4	A	310	L3P	C25-C26-C27-C28
4	A	317	L3P	C19-C18-C20-C21
4	B	311	L3P	C16-C17-C18-C19
4	D	314	L3P	C19-C18-C20-C21
4	B	311	L3P	C16-C17-C18-C20
4	D	316	L3P	C13-C15-C16-C17

Continued on next page...

Continued from previous page...

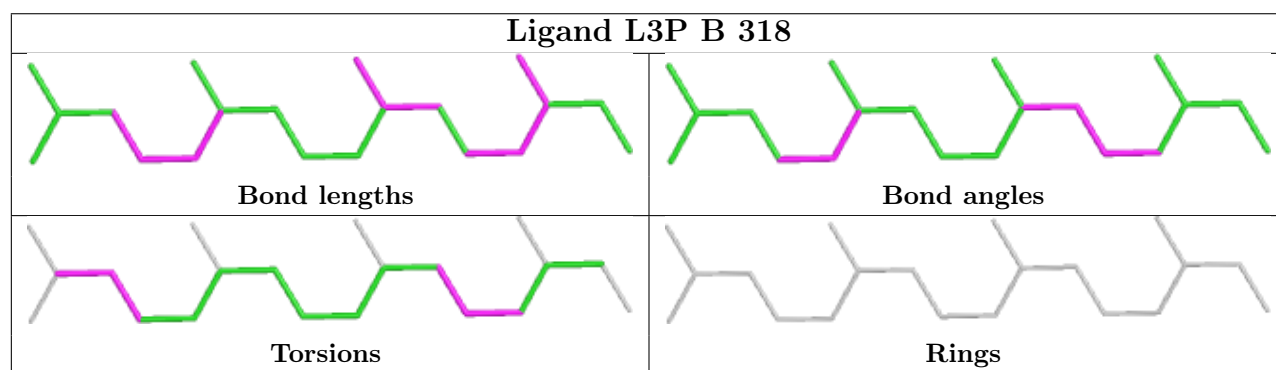
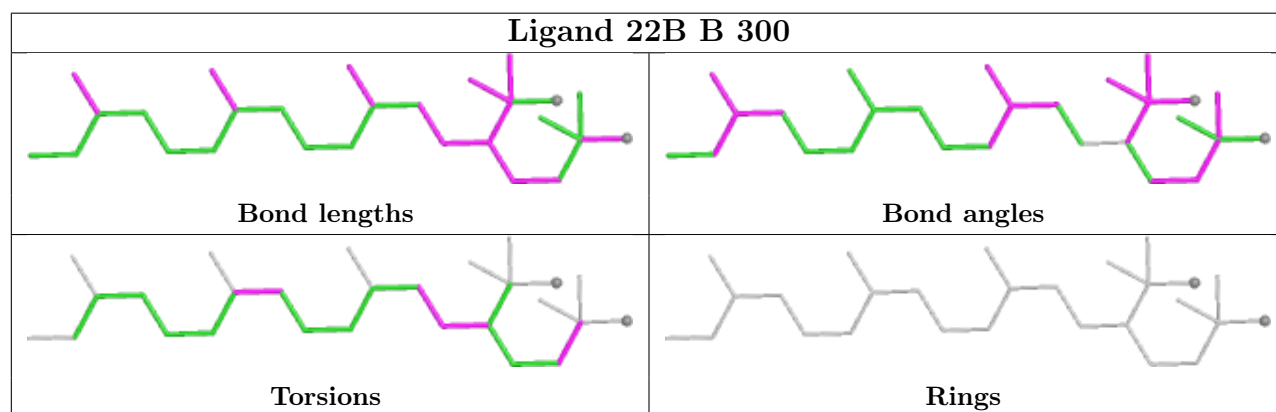
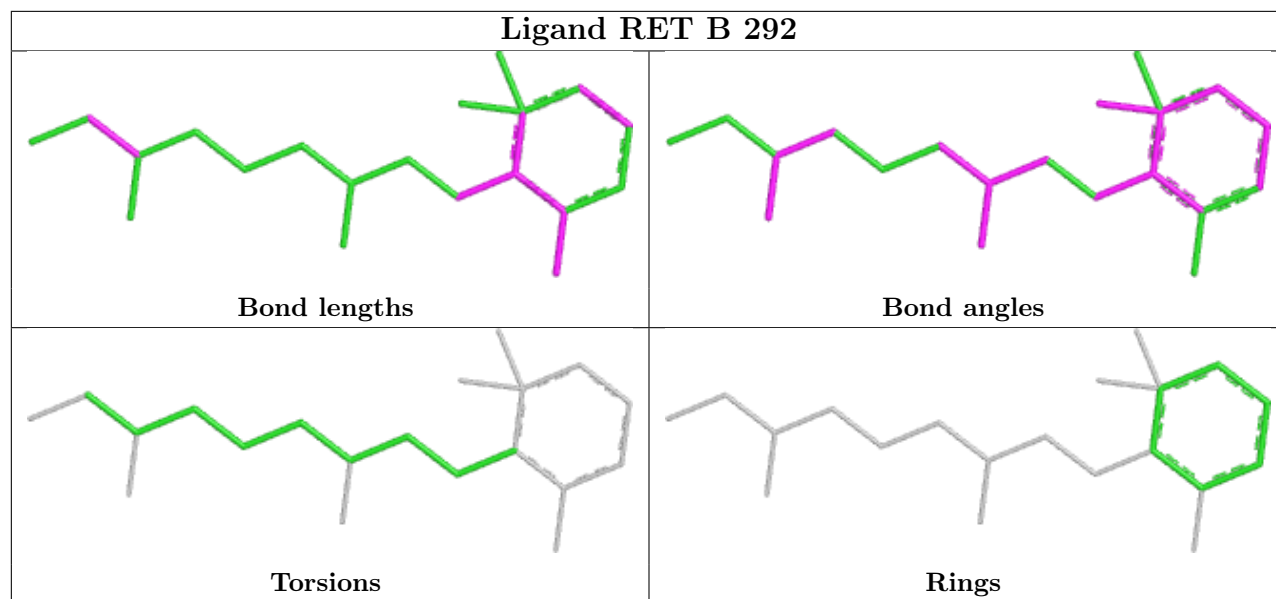
Mol	Chain	Res	Type	Atoms
4	A	310	L3P	C13-C15-C16-C17
4	D	314	L3P	C16-C17-C18-C20
4	D	312	L3P	C16-C17-C18-C20
4	D	314	L3P	C16-C17-C18-C19
4	D	316	L3P	C19-C18-C20-C21
4	D	312	L3P	C16-C17-C18-C19
4	B	311	L3P	C13-C15-C16-C17
4	D	316	L3P	C17-C18-C20-C21
4	B	315	L3P	C22-C23-C25-C26
4	D	316	L3P	C25-C26-C27-C28

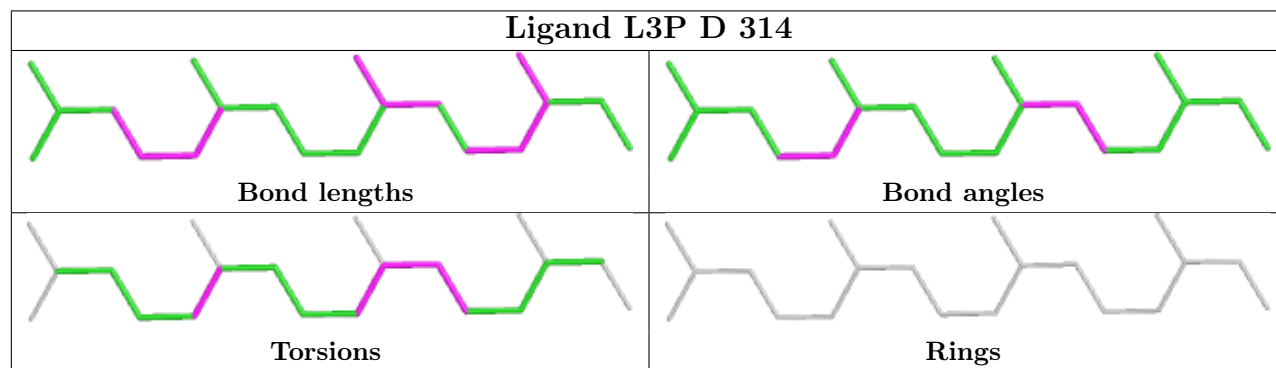
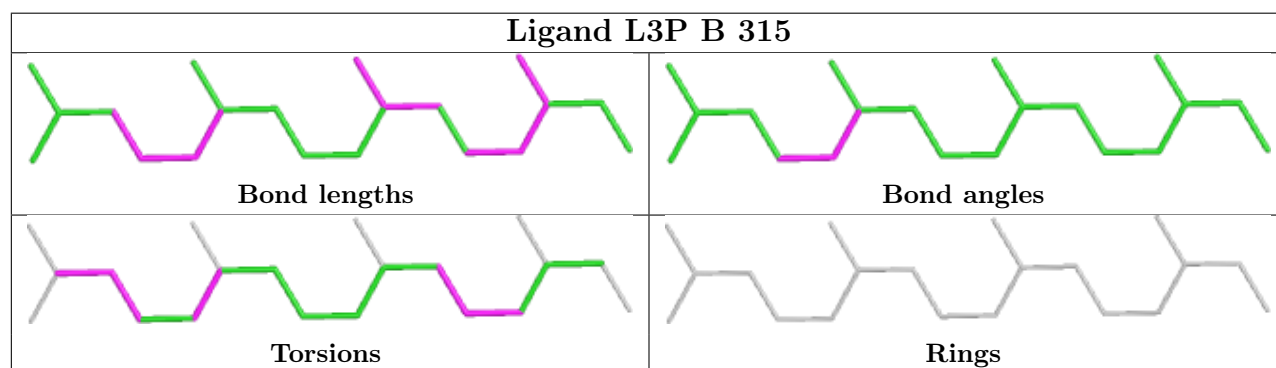
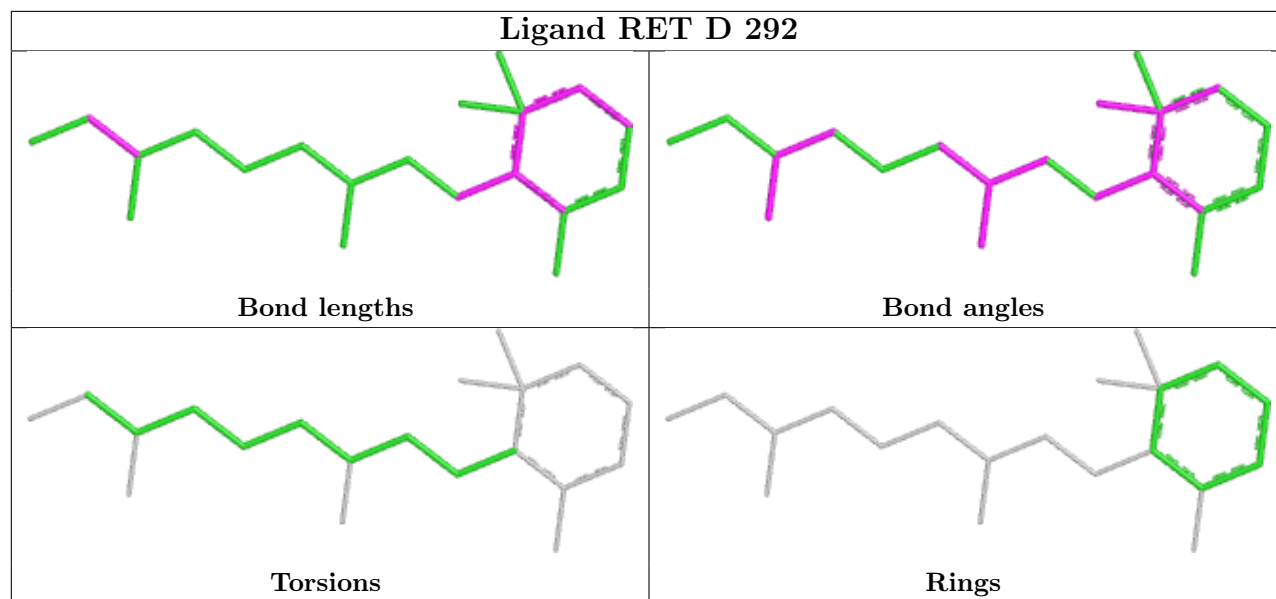
There are no ring outliers.

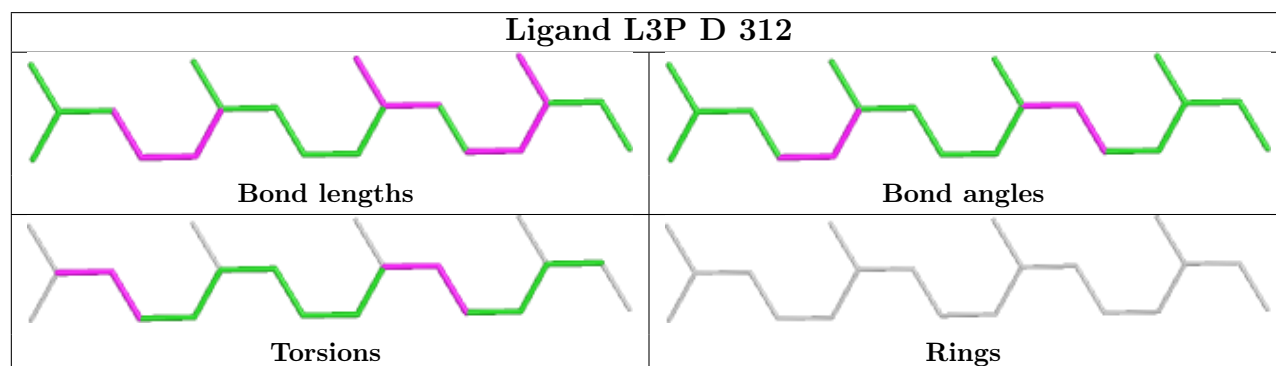
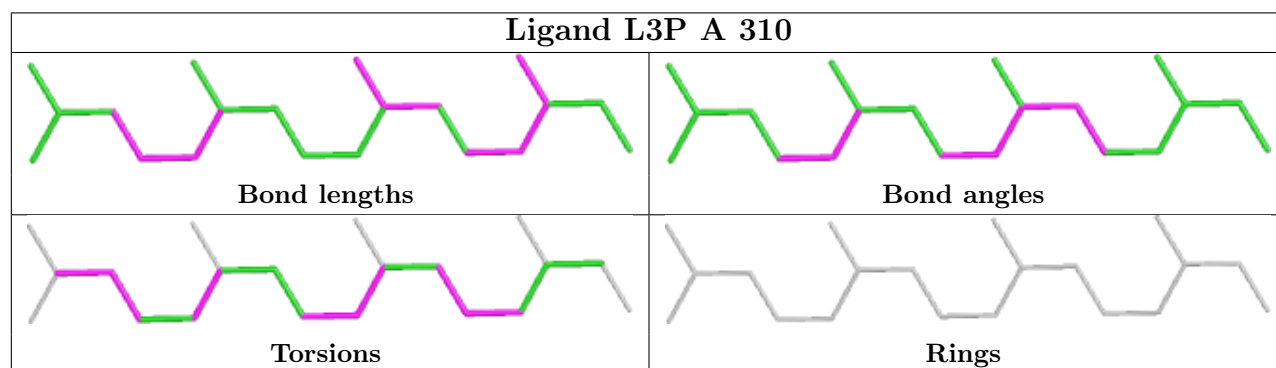
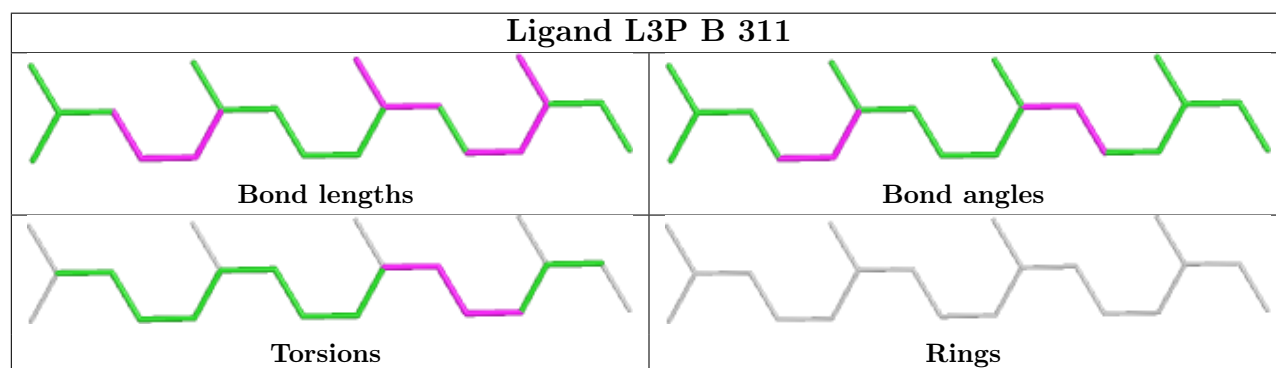
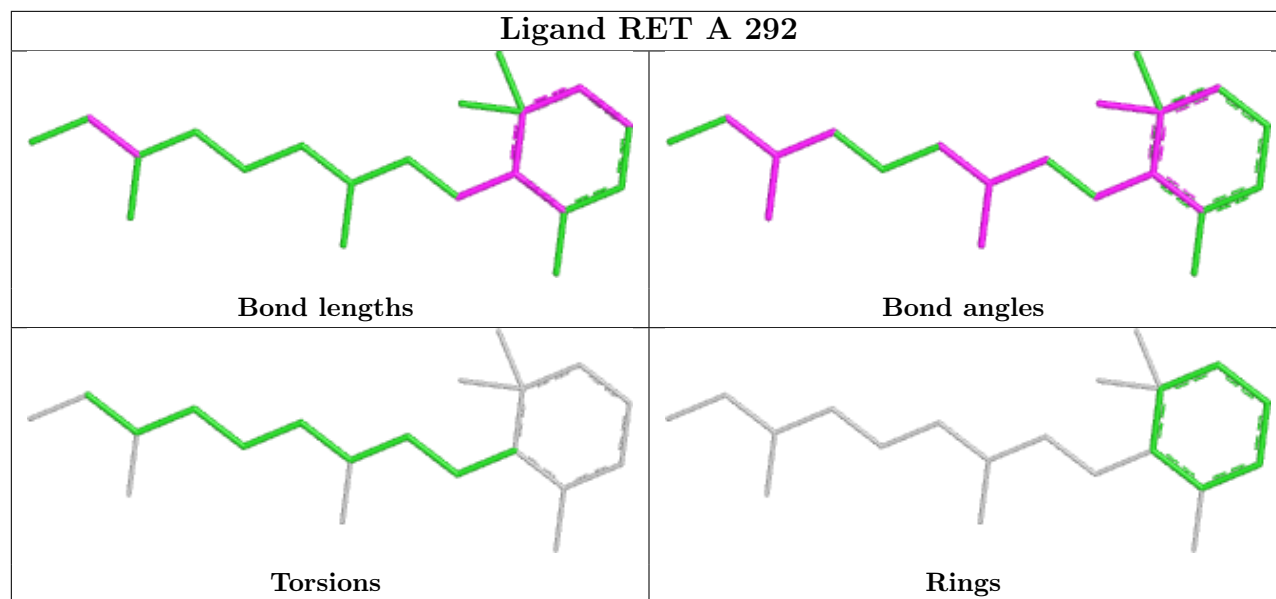
9 monomers are involved in 16 short contacts:

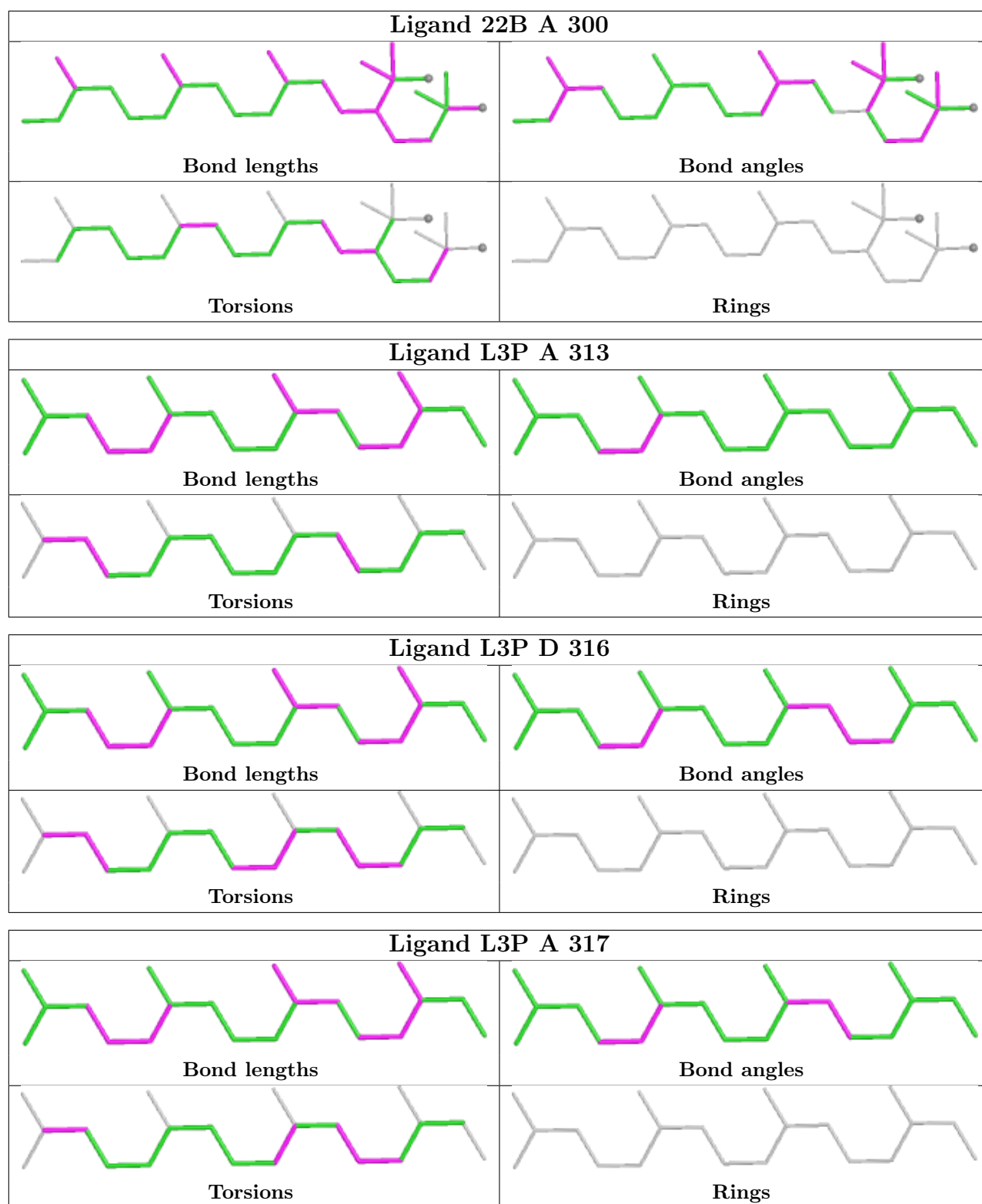
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	292	RET	2	0
4	B	318	L3P	1	0
2	D	292	RET	1	0
4	B	315	L3P	1	0
4	D	314	L3P	4	0
4	B	311	L3P	2	0
4	A	313	L3P	1	0
4	D	316	L3P	2	0
4	A	317	L3P	2	0

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.









5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2		OWAB(Å ²)	Q<0.9
1	A	260/291 (89%)	0.60	26 (10%)	12 13	16, 23, 47, 69	0
1	B	259/291 (89%)	0.97	37 (14%)	6 6	18, 29, 43, 58	0
1	D	259/291 (89%)	1.36	62 (23%)	2 1	20, 32, 56, 80	0
All	All	778/873 (89%)	0.98	125 (16%)	4 4	16, 28, 49, 80	0

All (125) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	111	GLY	8.4
1	A	110	GLY	8.0
1	A	277	SER	7.6
1	D	109	LEU	7.5
1	D	276	GLY	7.0
1	A	109	LEU	7.0
1	B	276	GLY	7.0
1	D	193	ILE	6.3
1	D	112	GLU	6.0
1	A	107	VAL	5.9
1	D	111	GLY	5.4
1	A	276	GLY	5.4
1	A	30	ASN	5.3
1	D	258	ILE	5.1
1	A	104	GLY	5.1
1	B	101	PHE	5.0
1	D	30	ASN	4.8
1	D	28	VAL	4.8
1	A	106	SER	4.7
1	B	18	GLU	4.6
1	D	108	MET	4.5
1	B	104	GLY	4.4
1	D	29	LEU	4.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	B	258	ILE	4.1
1	D	107	VAL	4.0
1	D	114	VAL	4.0
1	D	33	LEU	4.0
1	B	109	LEU	3.9
1	B	110	GLY	3.9
1	D	188	ILE	3.9
1	A	108	MET	3.9
1	A	19	VAL	3.8
1	B	188	ILE	3.7
1	B	112	GLU	3.7
1	B	20	THR	3.7
1	A	31	ASP	3.6
1	D	110	GLY	3.6
1	D	32	PRO	3.6
1	D	209	ASP	3.6
1	B	29	LEU	3.6
1	B	238	VAL	3.5
1	D	238	VAL	3.5
1	B	202	ALA	3.5
1	A	105	SER	3.4
1	D	275	SER	3.4
1	D	31	ASP	3.4
1	B	209	ASP	3.3
1	B	107	VAL	3.3
1	B	236	VAL	3.3
1	B	193	ILE	3.3
1	B	30	ASN	3.3
1	D	18	GLU	3.3
1	B	108	MET	3.2
1	A	188	ILE	3.2
1	D	113	GLU	3.2
1	D	116	GLY	3.2
1	B	174	LEU	3.2
1	B	208	ALA	3.1
1	A	275	SER	3.1
1	D	249	SER	3.1
1	A	238	VAL	3.0
1	A	29	LEU	3.0
1	D	200	GLN	3.0
1	D	274	VAL	2.9
1	D	243	TYR	2.9

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	D	232	GLY	2.9
1	D	269	SER	2.9
1	D	216	LEU	2.9
1	B	111	GLY	2.9
1	D	117	VAL	2.8
1	D	59	LEU	2.8
1	A	57	ARG	2.8
1	B	99	GLY	2.8
1	A	18	GLU	2.8
1	B	268	THR	2.8
1	B	228	VAL	2.8
1	D	34	LEU	2.7
1	D	239	LEU	2.7
1	D	212	SER	2.6
1	D	47	LEU	2.6
1	D	263	LEU	2.6
1	A	258	ILE	2.6
1	D	40	ILE	2.6
1	D	53	VAL	2.6
1	D	247	ALA	2.6
1	D	231	LEU	2.6
1	D	35	ALA	2.6
1	B	102	ALA	2.5
1	A	114	VAL	2.5
1	D	115	ASP	2.5
1	D	268	THR	2.4
1	B	240	PRO	2.4
1	D	19	VAL	2.4
1	D	50	LEU	2.4
1	D	51	LEU	2.3
1	B	204	ALA	2.3
1	A	103	GLU	2.3
1	D	267	LEU	2.3
1	A	244	THR	2.3
1	D	54	PHE	2.3
1	B	106	SER	2.3
1	D	25	PHE	2.3
1	A	32	PRO	2.3
1	D	227	ILE	2.3
1	B	212	SER	2.3
1	D	106	SER	2.3
1	D	57	ARG	2.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	A	20	THR	2.2
1	D	265	ASN	2.2
1	B	105	SER	2.2
1	B	275	SER	2.2
1	D	206	GLY	2.1
1	B	237	ALA	2.1
1	D	79	ILE	2.1
1	D	236	VAL	2.1
1	B	33	LEU	2.1
1	D	217	LEU	2.1
1	D	270	ASN	2.1
1	B	115	ASP	2.1
1	D	241	VAL	2.1
1	A	99	GLY	2.0
1	D	168	LEU	2.0
1	B	64	ALA	2.0
1	B	192	TYR	2.0
1	D	266	TYR	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(Å ²)	Q<0.9
4	L3P	A	313	20/59	0.52	0.34	94,95,96,96	0
4	L3P	D	316	20/59	0.54	0.29	95,96,96,96	0
4	L3P	A	310	20/59	0.60	0.34	79,85,90,90	0
4	L3P	A	317	20/59	0.61	0.31	86,87,94,94	0
3	22B	A	300	27/54	0.66	0.24	70,74,79,79	0

Continued on next page...

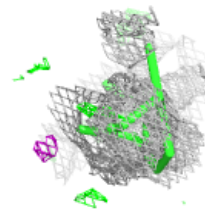
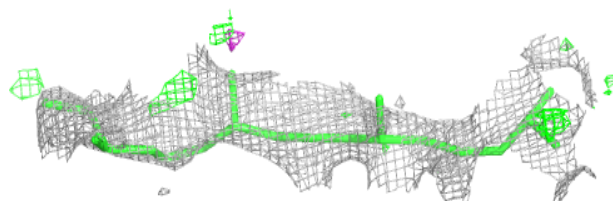
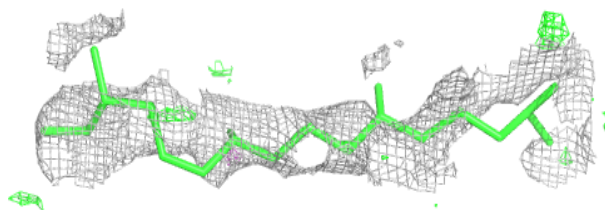
Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
4	L3P	D	312	20/59	0.67	0.42	108,110,111,111	0
4	L3P	B	318	20/59	0.68	0.32	90,94,95,95	0
4	L3P	B	315	20/59	0.69	0.38	114,115,117,117	0
4	L3P	B	311	20/59	0.71	0.41	113,114,116,116	0
4	L3P	D	314	20/59	0.72	0.27	83,86,92,93	0
3	22B	B	300	27/54	0.75	0.17	43,46,50,52	0
5	AZI	D	401	3/3	0.84	0.10	37,37,40,43	0
5	AZI	B	401	3/3	0.87	0.11	27,27,32,33	0
2	RET	D	292	20/21	0.87	0.11	24,26,30,30	0
5	AZI	A	401	3/3	0.90	0.09	24,24,28,30	0
2	RET	B	292	20/21	0.92	0.09	21,23,26,26	0
2	RET	A	292	20/21	0.92	0.08	15,19,23,23	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.

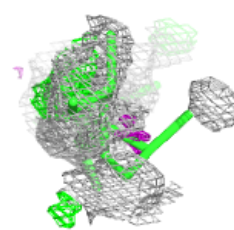
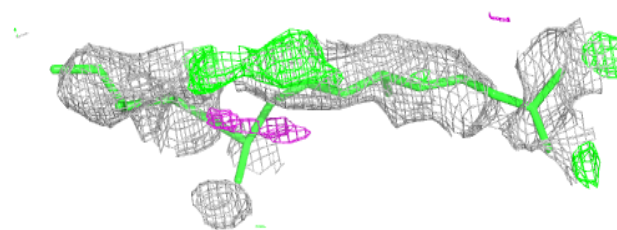
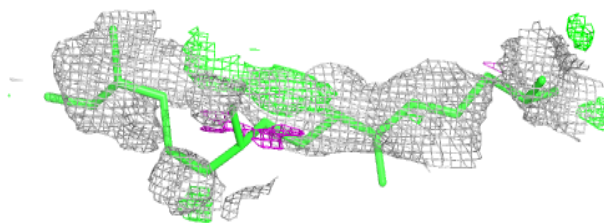
Electron density around L3P A 313:

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

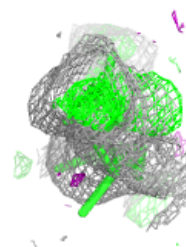
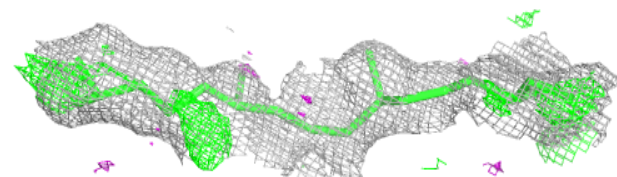
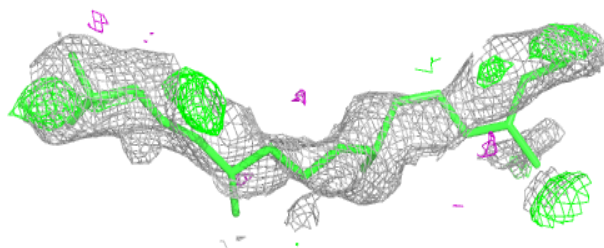


Electron density around L3P D 316:

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

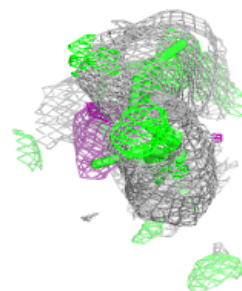
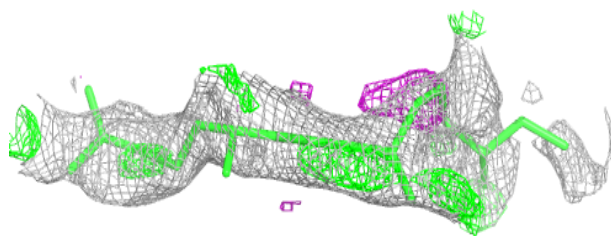
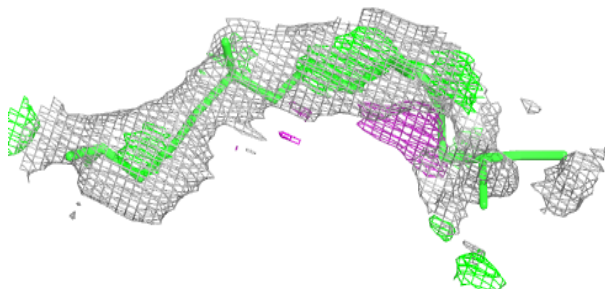
**Electron density around L3P A 310:**

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

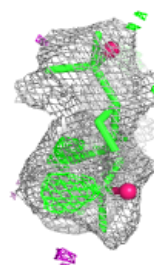
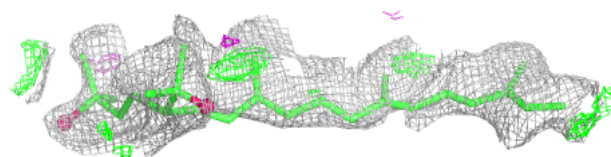
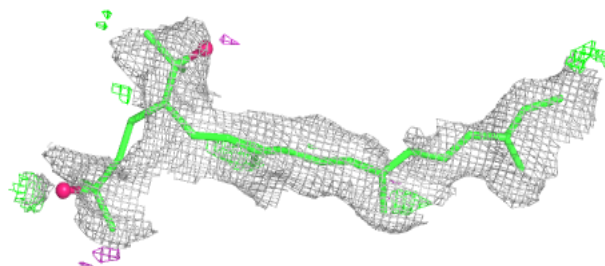


Electron density around L3P A 317:

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

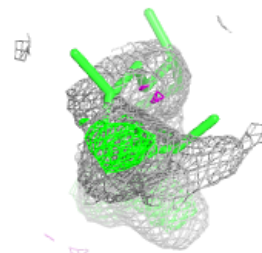
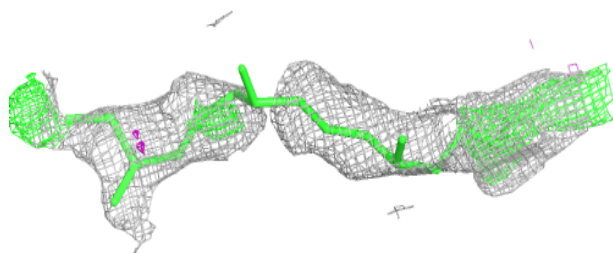
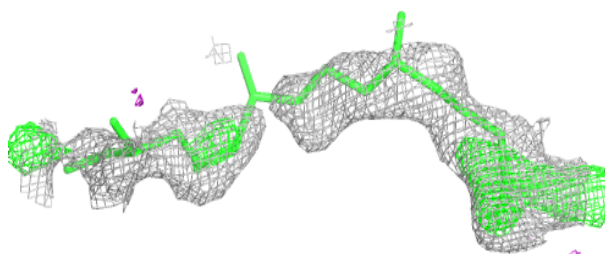
**Electron density around 22B A 300:**

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

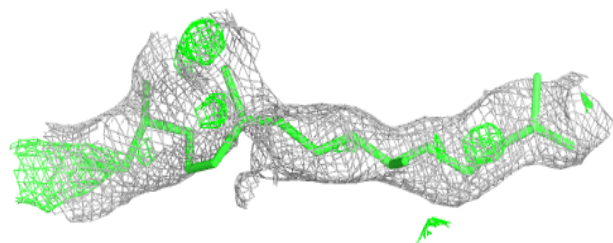
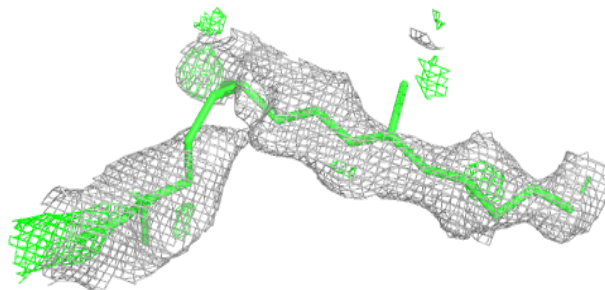


Electron density around L3P D 312:

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

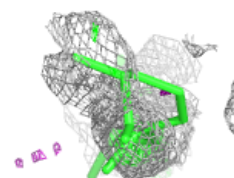
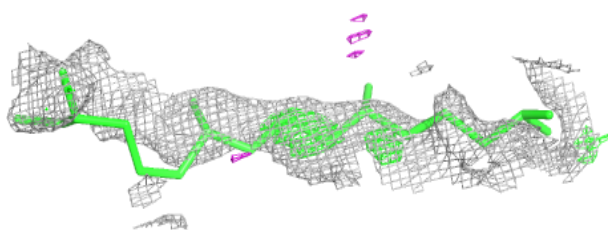
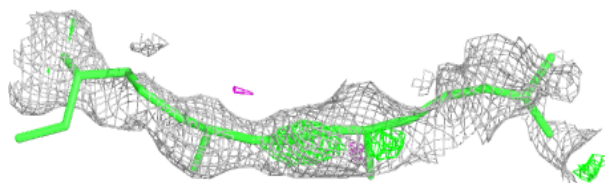
**Electron density around L3P B 318:**

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

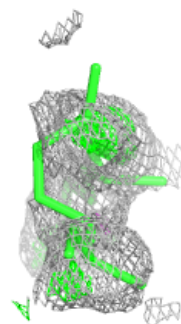
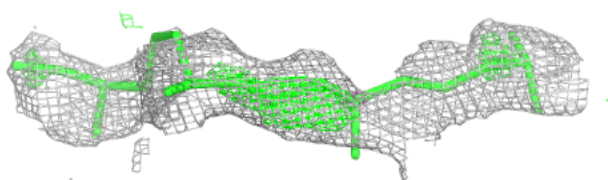
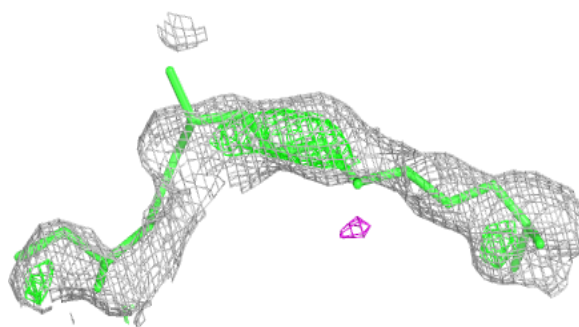


Electron density around L3P B 315:

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

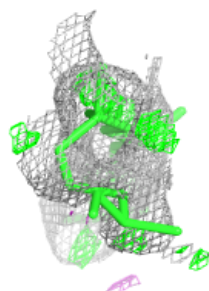
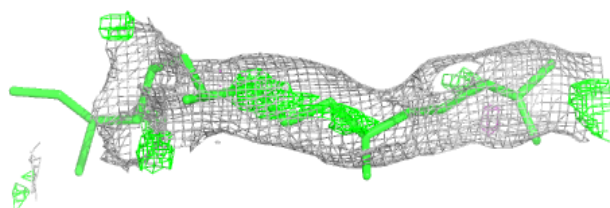
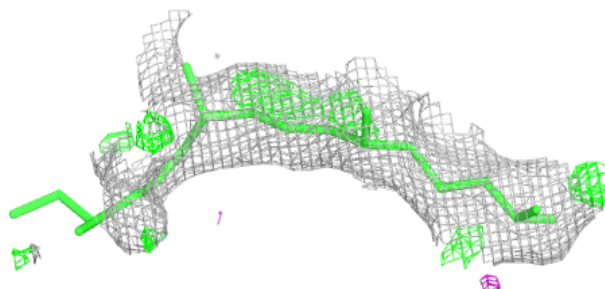
**Electron density around L3P B 311:**

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

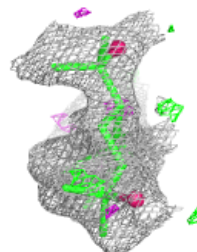
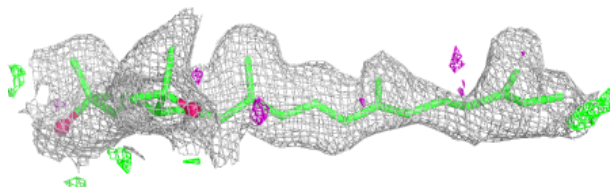
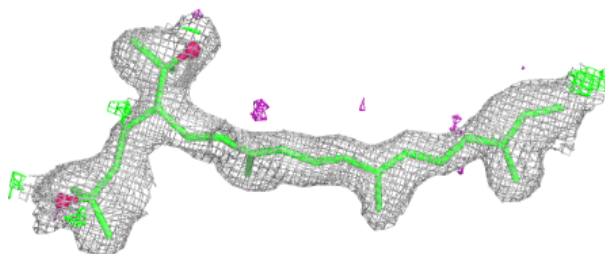


Electron density around L3P D 314:

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

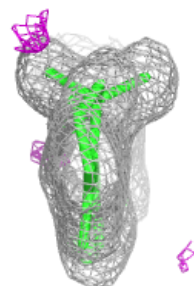
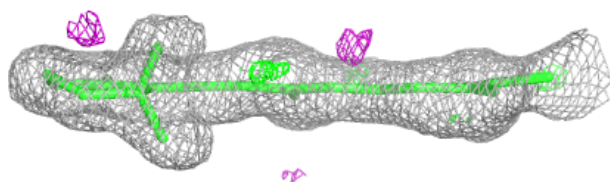
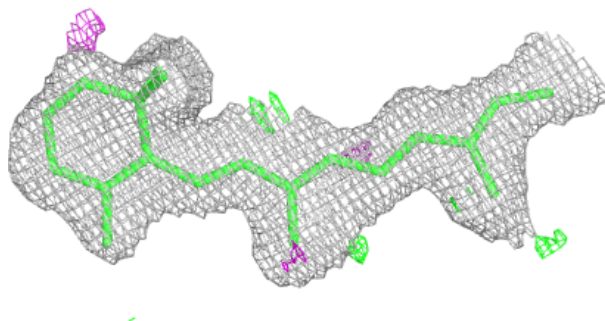
**Electron density around 22B B 300:**

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

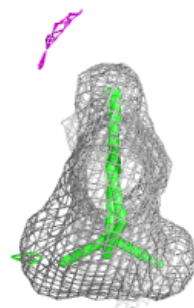
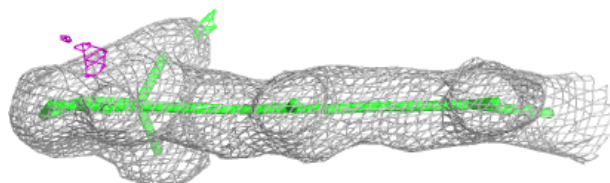
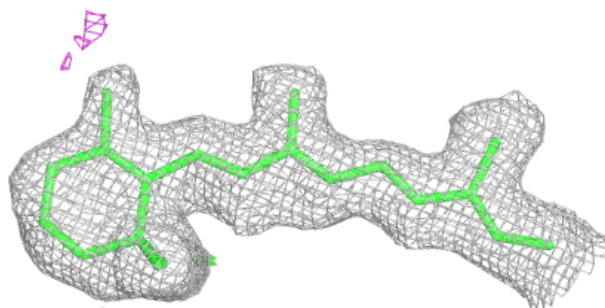


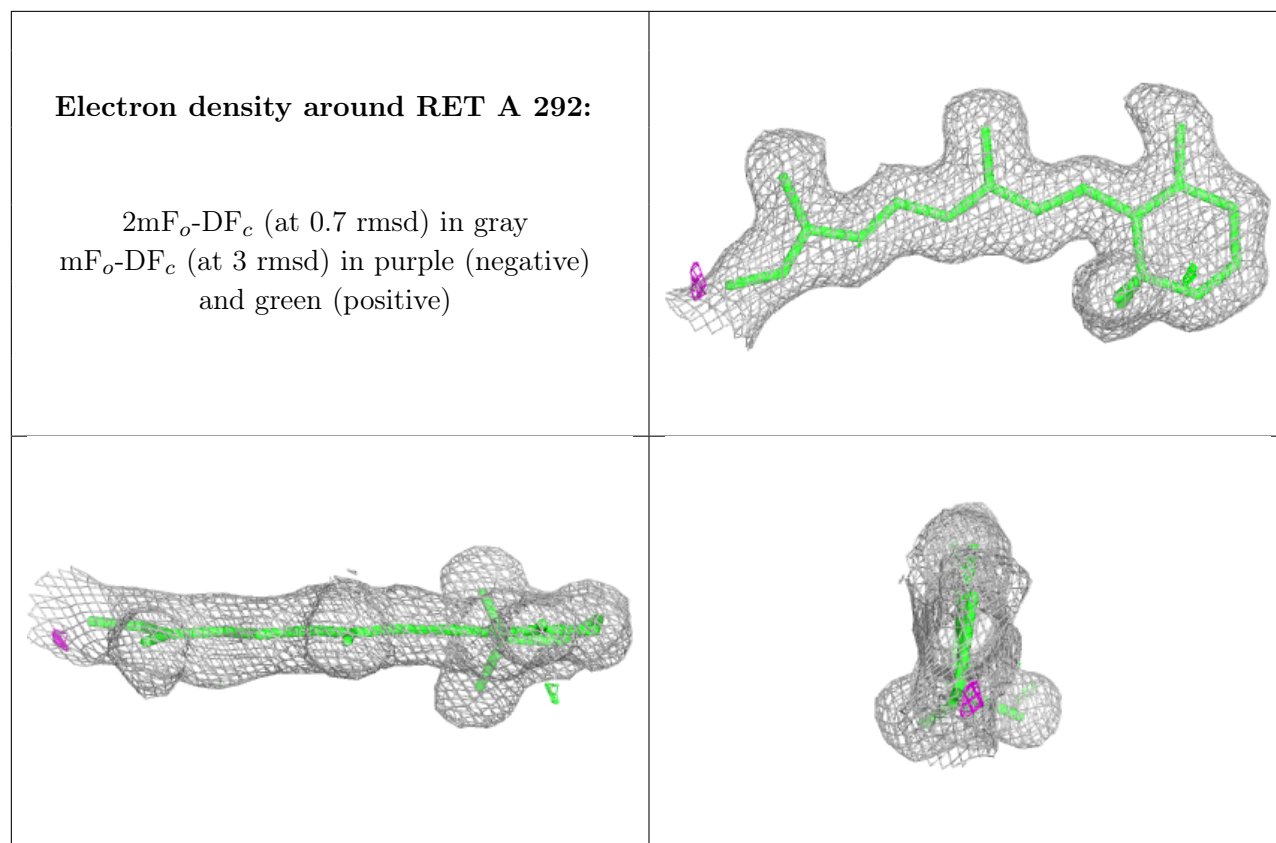
Electron density around RET D 292:

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

**Electron density around RET B 292:**

$2mF_o-DF_c$ (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.