



Full wwPDB X-ray Structure Validation Report ⓘ

Dec 7, 2023 – 05:21 am GMT

PDB ID : 1UWA
Title : L290F mutant rubisco from chlamydomonas
Authors : Karkehabadi, S.; Taylor, T.C.; Spreitzer, R.J.; Andersson, I.
Deposited on : 2004-02-03
Resolution : 2.30 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 : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36
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) : 2.36

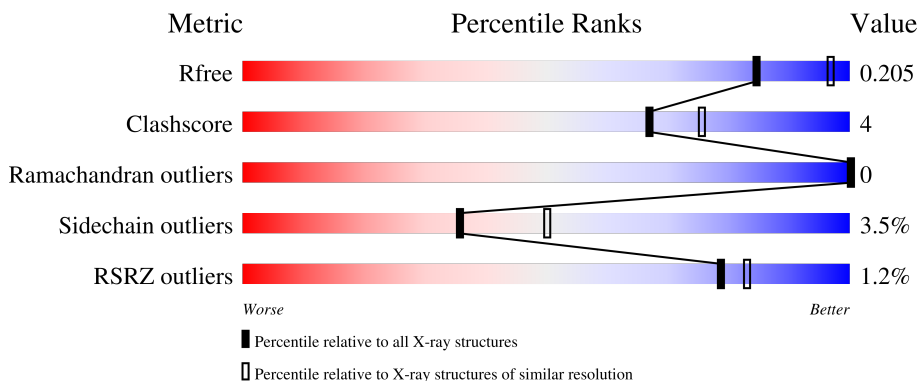
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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}	130704	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

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	475	88% 9% ..
1	B	475	85% 12% ..
1	E	475	87% 10% ..
1	H	475	86% 12% ..
1	K	475	87% 11% ..

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Mol	Chain	Length	Quality of chain	
1	O	475		87% 11% ..
1	R	475		86% 11% ..
1	V	475		87% 11% ..
2	C	140		86% 13% .
2	F	140		89% 11% .
2	I	140		89% 11% .
2	J	140		90% 10%
2	M	140		86% 14% .
2	P	140		91% 9% .
2	T	140		89% 10% .
2	W	140		86% 13% .

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
5	EDO	V	507	-	-	-	X

2 Entry composition i

There are 6 unique types of molecules in this entry. The entry contains 41073 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 RIBULOSE BISPHOSPHATE CARBOXYLASE LARGE CHAIN.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	465	3640	2302	641	673	24	0	2	0
1	B	465	3643	2303	641	675	24	0	3	0
1	E	469	3671	2319	646	682	24	0	4	0
1	H	469	3674	2321	649	680	24	0	4	0
1	K	469	3669	2319	646	680	24	0	3	0
1	O	469	3672	2320	646	682	24	0	4	0
1	R	465	3639	2302	641	672	24	0	2	0
1	V	465	3635	2300	640	671	24	0	1	0

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	46	PRO	LEU	conflict	UNP P00877
B	46	PRO	LEU	conflict	UNP P00877
E	46	PRO	LEU	conflict	UNP P00877
H	46	PRO	LEU	conflict	UNP P00877
K	46	PRO	LEU	conflict	UNP P00877
O	46	PRO	LEU	conflict	UNP P00877
R	46	PRO	LEU	conflict	UNP P00877
V	46	PRO	LEU	conflict	UNP P00877
A	290	PHE	LEU	engineered mutation	UNP P00877
B	290	PHE	LEU	engineered mutation	UNP P00877
E	290	PHE	LEU	engineered mutation	UNP P00877
H	290	PHE	LEU	engineered mutation	UNP P00877

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Chain	Residue	Modelled	Actual	Comment	Reference
K	290	PHE	LEU	engineered mutation	UNP P00877
O	290	PHE	LEU	engineered mutation	UNP P00877
R	290	PHE	LEU	engineered mutation	UNP P00877
V	290	PHE	LEU	engineered mutation	UNP P00877

- Molecule 2 is a protein called RIBULOSE BISPHOSPHATE CARBOXYLASE SMALL CHAIN 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	140	1142	737	192	202	11	0	1	0
2	F	140	1138	736	187	203	12	0	1	0
2	I	140	1133	732	188	202	11	0	1	0
2	J	140	1142	737	190	203	12	0	1	0
2	M	140	1140	736	189	203	12	0	1	0
2	P	140	1138	734	189	203	12	0	1	0
2	T	140	1134	733	186	203	12	0	1	0
2	W	140	1141	737	189	203	12	0	1	0

There are 16 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
I	128	SER	THR	conflict	UNP P00873
I	132	TRP	PHE	conflict	UNP P00873
C	128	SER	THR	conflict	UNP P00873
C	132	TRP	PHE	conflict	UNP P00873
F	128	SER	THR	conflict	UNP P00873
F	132	TRP	PHE	conflict	UNP P00873
J	128	SER	THR	conflict	UNP P00873
J	132	TRP	PHE	conflict	UNP P00873
P	128	SER	THR	conflict	UNP P00873
P	132	TRP	PHE	conflict	UNP P00873
T	128	SER	THR	conflict	UNP P00873
T	132	TRP	PHE	conflict	UNP P00873
M	128	SER	THR	conflict	UNP P00873
M	132	TRP	PHE	conflict	UNP P00873

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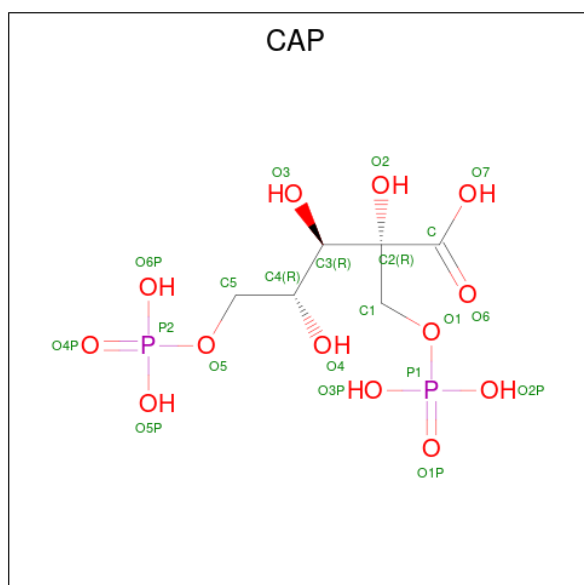
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Chain	Residue	Modelled	Actual	Comment	Reference
W	128	SER	THR	conflict	UNP P00873
W	132	TRP	PHE	conflict	UNP P00873

- Molecule 3 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

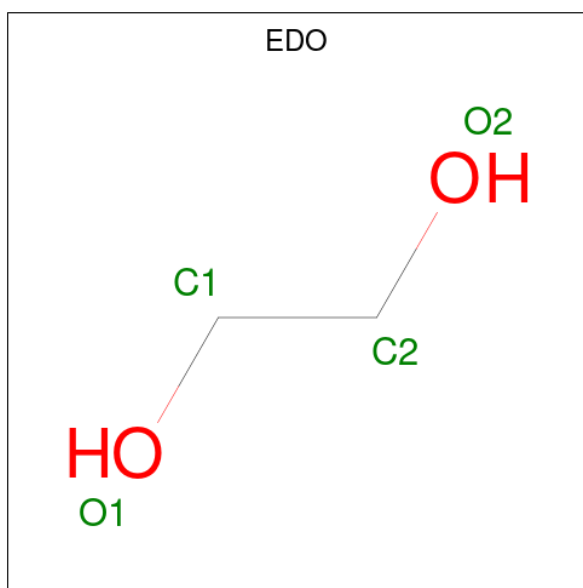
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total Mg 1 1	0	0
3	B	1	Total Mg 1 1	0	0
3	E	1	Total Mg 1 1	0	0
3	H	1	Total Mg 1 1	0	0
3	K	1	Total Mg 1 1	0	0
3	O	1	Total Mg 1 1	0	0
3	R	1	Total Mg 1 1	0	0
3	V	1	Total Mg 1 1	0	0

- Molecule 4 is 2-CARBOXYARABINITOL-1,5-DIPHOSPHATE (three-letter code: CAP) (formula: C₆H₁₄O₁₃P₂).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	A	1	Total	C	O	P	0	0
			21	6	13	2		
4	B	1	Total	C	O	P	0	0
			21	6	13	2		
4	E	1	Total	C	O	P	0	0
			21	6	13	2		
4	H	1	Total	C	O	P	0	0
			21	6	13	2		
4	K	1	Total	C	O	P	0	0
			21	6	13	2		
4	O	1	Total	C	O	P	0	0
			21	6	13	2		
4	R	1	Total	C	O	P	0	0
			21	6	13	2		
4	V	1	Total	C	O	P	0	0
			21	6	13	2		

- Molecule 5 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: C₂H₆O₂).



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

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total 4	C 2	O 2	0	0
5	A	1	Total 4	C 2	O 2	0	0
5	A	1	Total 4	C 2	O 2	0	0
5	B	1	Total 4	C 2	O 2	0	0
5	B	1	Total 4	C 2	O 2	0	0
5	B	1	Total 4	C 2	O 2	0	0
5	B	1	Total 4	C 2	O 2	0	0
5	B	1	Total 4	C 2	O 2	0	0
5	B	1	Total 4	C 2	O 2	0	0
5	B	1	Total 4	C 2	O 2	0	0
5	B	1	Total 4	C 2	O 2	0	0
5	C	1	Total 4	C 2	O 2	0	0
5	C	1	Total 4	C 2	O 2	0	0
5	E	1	Total 4	C 2	O 2	0	0
5	E	1	Total 4	C 2	O 2	0	0
5	E	1	Total 4	C 2	O 2	0	0
5	E	1	Total 4	C 2	O 2	0	0
5	E	1	Total 4	C 2	O 2	0	0
5	F	1	Total 4	C 2	O 2	0	0
5	F	1	Total 4	C 2	O 2	0	0
5	H	1	Total 4	C 2	O 2	0	0
5	H	1	Total 4	C 2	O 2	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	H	1	Total C O 4 2 2	0	0
5	H	1	Total C O 4 2 2	0	0
5	H	1	Total C O 4 2 2	0	0
5	H	1	Total C O 4 2 2	0	0
5	I	1	Total C O 4 2 2	0	0
5	I	1	Total C O 4 2 2	0	0
5	J	1	Total C O 4 2 2	0	0
5	J	1	Total C O 4 2 2	0	0
5	K	1	Total C O 4 2 2	0	0
5	K	1	Total C O 4 2 2	0	0
5	K	1	Total C O 4 2 2	0	0
5	K	1	Total C O 4 2 2	0	0
5	K	1	Total C O 4 2 2	0	0
5	K	1	Total C O 4 2 2	0	0
5	M	1	Total C O 4 2 2	0	0
5	O	1	Total C O 4 2 2	0	0
5	O	1	Total C O 4 2 2	0	0
5	O	1	Total C O 4 2 2	0	0
5	O	1	Total C O 4 2 2	0	0
5	O	1	Total C O 4 2 2	0	0
5	P	1	Total C O 4 2 2	0	0
5	P	1	Total C O 4 2 2	0	0

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Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	R	1	Total C O 4 2 2	0	0
5	R	1	Total C O 4 2 2	0	0
5	R	1	Total C O 4 2 2	0	0
5	R	1	Total C O 4 2 2	0	0
5	R	1	Total C O 4 2 2	0	0
5	R	1	Total C O 4 2 2	0	0
5	T	1	Total C O 4 2 2	0	0
5	T	1	Total C O 4 2 2	0	0
5	V	1	Total C O 4 2 2	0	0
5	V	1	Total C O 4 2 2	0	0
5	V	1	Total C O 4 2 2	0	0
5	V	1	Total C O 4 2 2	0	0
5	V	1	Total C O 4 2 2	0	0

- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	253	Total O 253 253	0	0
6	B	252	Total O 252 252	0	0
6	C	47	Total O 47 47	0	0
6	E	253	Total O 253 253	0	0
6	F	49	Total O 49 49	0	0
6	H	195	Total O 195 195	0	0

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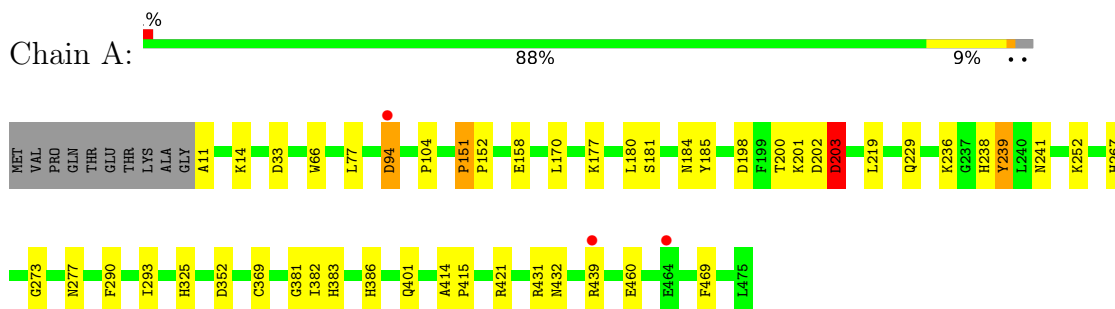
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	I	57	Total 57	O 57	0	0
6	J	45	Total 45	O 45	0	0
6	K	245	Total 245	O 245	0	0
6	M	63	Total 63	O 63	0	0
6	O	229	Total 229	O 229	0	0
6	P	60	Total 60	O 60	0	0
6	R	221	Total 221	O 221	0	0
6	T	52	Total 52	O 52	0	0
6	V	219	Total 219	O 219	0	0
6	W	70	Total 70	O 70	0	0

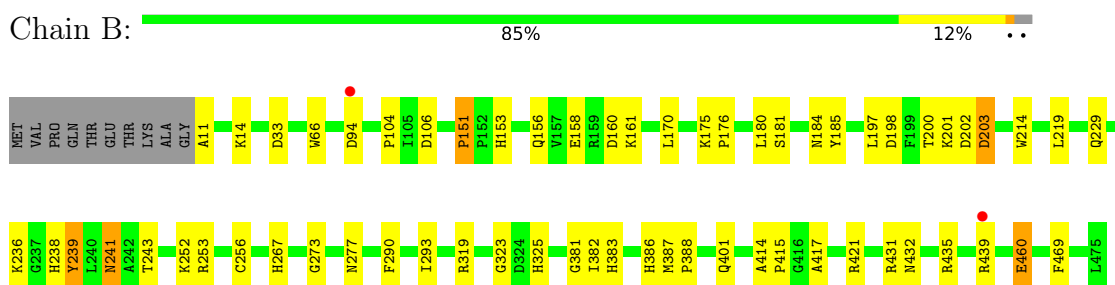
3 Residue-property plots [i](#)

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.

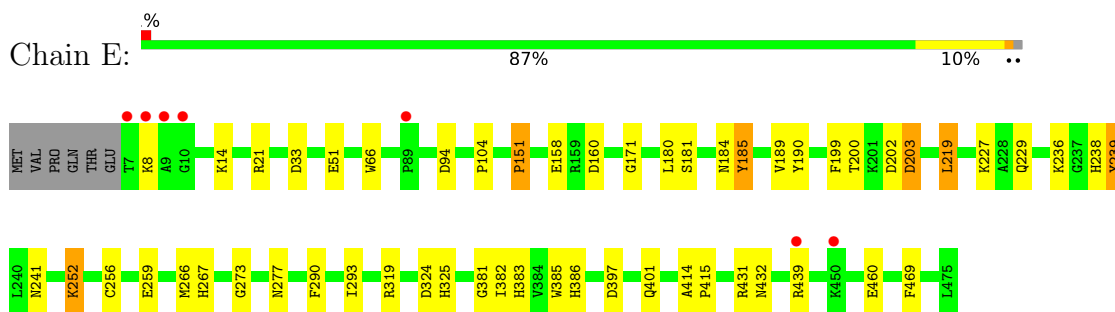
- Molecule 1: RIBULOSE BISPHOSPHATE CARBOXYLASE LARGE CHAIN



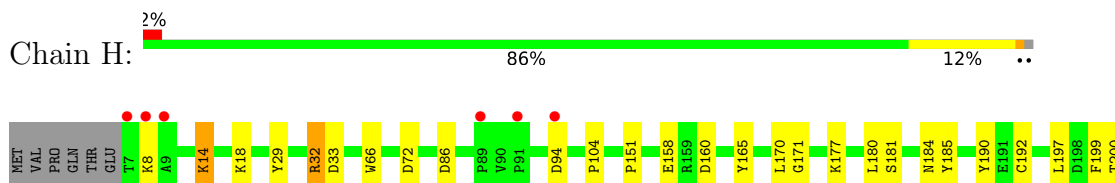
- Molecule 1: RIBULOSE BISPHOSPHATE CARBOXYLASE LARGE CHAIN

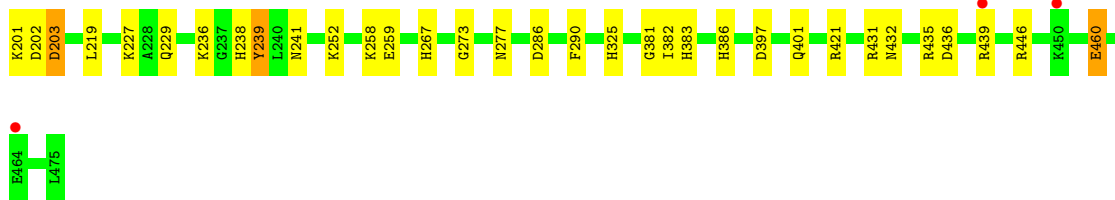


- Molecule 1: RIBULOSE BISPHOSPHATE CARBOXYLASE LARGE CHAIN

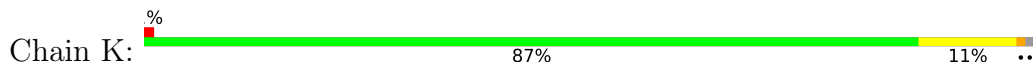


- Molecule 1: RIBULOSE BISPHOSPHATE CARBOXYLASE LARGE CHAIN

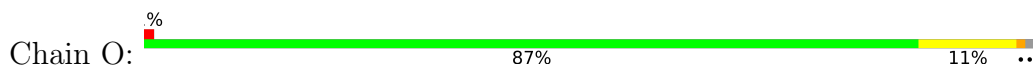




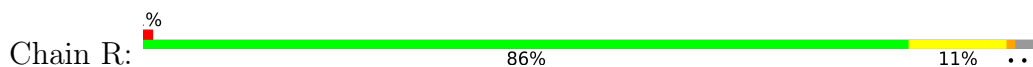
● Molecule 1: RIBULOSE BISPHOSPHATE CARBOXYLASE LARGE CHAIN



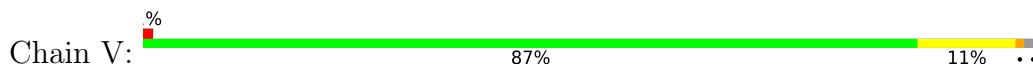
● Molecule 1: RIBULOSE BISPHOSPHATE CARBOXYLASE LARGE CHAIN



● Molecule 1: RIBULOSE BISPHOSPHATE CARBOXYLASE LARGE CHAIN

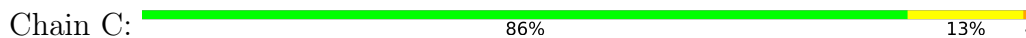


● Molecule 1: RIBULOSE BISPHOSPHATE CARBOXYLASE LARGE CHAIN

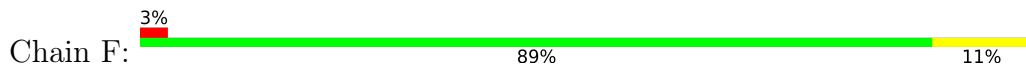




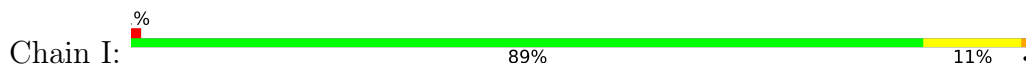
- Molecule 2: RIBULOSE BISPHOSPHATE CARBOXYLASE SMALL CHAIN 1



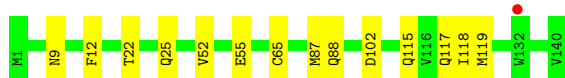
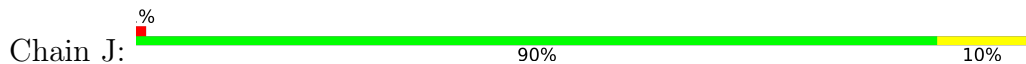
- Molecule 2: RIBULOSE BISPHOSPHATE CARBOXYLASE SMALL CHAIN 1



- Molecule 2: RIBULOSE BISPHOSPHATE CARBOXYLASE SMALL CHAIN 1



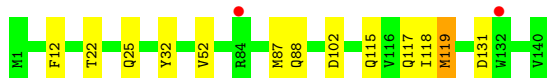
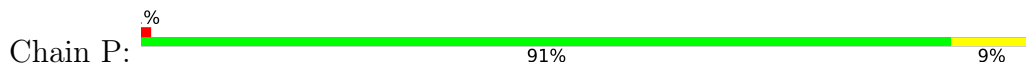
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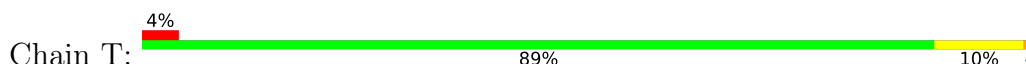
- Molecule 2: RIBULOSE BISPHOSPHATE CARBOXYLASE SMALL CHAIN 1



- Molecule 2: RIBULOSE BISPHOSPHATE CARBOXYLASE SMALL CHAIN 1



- Molecule 2: RIBULOSE BISPHOSPHATE CARBOXYLASE SMALL CHAIN 1





- Molecule 2: RIBULOSE BISPHOSPHATE CARBOXYLASE SMALL CHAIN 1

Chain W: 86% 13% .



4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	120.98Å 177.71Å 122.66Å 90.00° 117.70° 90.00°	Depositor
Resolution (Å)	30.00 – 2.30 29.97 – 2.10	Depositor EDS
% Data completeness (in resolution range)	98.2 (30.00-2.30) 95.7 (29.97-2.10)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.53 (at 2.10Å)	Xtriage
Refinement program	REFMAC 5.1.24	Depositor
R, R_{free}	0.171 , 0.205 0.170 , 0.205	Depositor DCC
R_{free} test set	12964 reflections (5.07%)	wwPDB-VP
Wilson B-factor (Å ²)	32.4	Xtriage
Anisotropy	0.252	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 38.3	EDS
L-test for twinning ²	$\langle L \rangle = 0.52$, $\langle L^2 \rangle = 0.36$	Xtriage
Estimated twinning fraction	0.000 for -h-l,k,h 0.000 for l,k,-h-l 0.000 for h,-k,-h-l 0.000 for -h-l,-k,l 0.158 for l,-k,h	Xtriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	41073	wwPDB-VP
Average B, all atoms (Å ²)	34.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.65% 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 i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: HYP, CAP, KCX, SMC, MG, EDO

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	0.56	0/3690	0.75	5/4986 (0.1%)
1	B	0.55	0/3699	0.74	5/4998 (0.1%)
1	E	0.54	0/3733	0.73	5/5043 (0.1%)
1	H	0.57	0/3735	0.74	7/5045 (0.1%)
1	K	0.65	1/3722 (0.0%)	0.74	7/5025 (0.1%)
1	O	0.54	0/3733	0.73	8/5043 (0.2%)
1	R	0.55	0/3690	0.74	6/4986 (0.1%)
1	V	0.55	0/3680	0.74	4/4974 (0.1%)
2	C	0.56	0/1181	1.06	6/1605 (0.4%)
2	F	0.57	0/1177	0.69	3/1600 (0.2%)
2	I	0.58	0/1172	0.71	3/1595 (0.2%)
2	J	0.54	0/1181	0.68	1/1605 (0.1%)
2	M	0.55	0/1179	0.72	3/1603 (0.2%)
2	P	0.55	0/1177	0.71	2/1601 (0.1%)
2	T	0.57	0/1173	0.69	1/1596 (0.1%)
2	W	0.55	0/1180	0.72	4/1604 (0.2%)
All	All	0.56	1/39102 (0.0%)	0.74	70/52909 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	K	359	SER	C-N	21.06	1.82	1.34

All (70) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	138	ARG	NE-CZ-NH1	-21.02	109.79	120.30
2	C	138	ARG	NE-CZ-NH2	20.39	130.50	120.30
2	C	138	ARG	CD-NE-CZ	9.92	137.49	123.60
1	O	203	ASP	CB-CG-OD2	7.07	124.66	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	E	203	ASP	CB-CG-OD2	6.68	124.32	118.30
1	H	203	ASP	CB-CG-OD2	6.68	124.31	118.30
1	R	33	ASP	CB-CG-OD2	6.43	124.09	118.30
2	W	131	ASP	CB-CG-OD2	6.34	124.01	118.30
1	V	33	ASP	CB-CG-OD2	6.33	124.00	118.30
1	B	160	ASP	CB-CG-OD2	6.32	123.99	118.30
1	B	33	ASP	CB-CG-OD2	6.10	123.79	118.30
1	R	352	ASP	CB-CG-OD2	6.08	123.77	118.30
1	H	397	ASP	CB-CG-OD2	6.06	123.76	118.30
2	M	131	ASP	CB-CG-OD2	6.05	123.74	118.30
1	V	203	ASP	CB-CG-OD2	6.04	123.74	118.30
1	R	397	ASP	CB-CG-OD2	5.90	123.61	118.30
1	O	357	ASP	CB-CG-OD2	5.87	123.58	118.30
1	H	436	ASP	CB-CG-OD2	5.84	123.56	118.30
2	W	102	ASP	CB-CG-OD2	5.84	123.56	118.30
2	J	102	ASP	CB-CG-OD2	5.83	123.55	118.30
1	A	33	ASP	CB-CG-OD2	5.80	123.52	118.30
2	P	131	ASP	CB-CG-OD2	5.78	123.50	118.30
2	P	102	ASP	CB-CG-OD2	5.74	123.47	118.30
1	K	359	SER	O-C-N	-5.70	113.59	122.70
2	C	131	ASP	CB-CG-OD2	5.67	123.41	118.30
1	E	160	ASP	CB-CG-OD2	5.64	123.38	118.30
2	M	102	ASP	CB-CG-OD2	5.58	123.33	118.30
1	E	33	ASP	CB-CG-OD2	5.57	123.31	118.30
1	K	203	ASP	CB-CG-OD2	5.56	123.31	118.30
2	C	23	ASP	CB-CG-OD2	5.53	123.27	118.30
1	O	198	ASP	CB-CG-OD2	5.52	123.27	118.30
1	A	203	ASP	CB-CG-OD2	5.46	123.21	118.30
1	K	137	ASP	CB-CG-OD2	5.40	123.16	118.30
1	O	94	ASP	CB-CG-OD2	5.39	123.15	118.30
1	V	347	ASP	CB-CG-OD2	5.38	123.14	118.30
1	O	160	ASP	CB-CG-OD2	5.37	123.14	118.30
1	A	198	ASP	CB-CG-OD2	5.37	123.13	118.30
1	K	160	ASP	CB-CG-OD2	5.36	123.13	118.30
1	B	203	ASP	CB-CG-OD2	5.36	123.13	118.30
1	B	198	ASP	CB-CG-OD2	5.35	123.12	118.30
1	K	33	ASP	CB-CG-OD2	5.34	123.11	118.30
2	I	69	ASP	CB-CG-OD2	5.33	123.09	118.30
1	O	33	ASP	CB-CG-OD2	5.32	123.09	118.30
2	T	102	ASP	CB-CG-OD2	5.30	123.07	118.30
1	A	94	ASP	CB-CG-OD2	5.28	123.05	118.30
1	B	106	ASP	CB-CG-OD2	5.27	123.04	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	K	86	ASP	CB-CG-OD2	5.26	123.04	118.30
2	I	23	ASP	CB-CG-OD2	5.26	123.03	118.30
1	H	286	ASP	CB-CG-OD2	5.25	123.02	118.30
1	H	160	ASP	CB-CG-OD2	5.25	123.02	118.30
1	H	33	ASP	CB-CG-OD2	5.24	123.02	118.30
2	W	69	ASP	CB-CG-OD2	5.22	123.00	118.30
2	M	69	ASP	CB-CG-OD2	5.17	122.95	118.30
2	C	69	ASP	CB-CG-OD2	5.16	122.94	118.30
1	O	324	ASP	CB-CG-OD2	5.16	122.94	118.30
1	E	324	ASP	CB-CG-OD2	5.15	122.94	118.30
2	F	23	ASP	CB-CG-OD2	5.12	122.91	118.30
1	K	397	ASP	CB-CG-OD2	5.12	122.91	118.30
2	F	131	ASP	CB-CG-OD2	5.11	122.90	118.30
1	R	203	ASP	CB-CG-OD2	5.10	122.89	118.30
2	W	23	ASP	CB-CG-OD2	5.09	122.88	118.30
1	A	352	ASP	CB-CG-OD2	5.09	122.88	118.30
2	F	102	ASP	CB-CG-OD2	5.09	122.88	118.30
1	R	160	ASP	CB-CG-OD2	5.08	122.87	118.30
1	V	106	ASP	CB-CG-OD2	5.07	122.87	118.30
2	I	131	ASP	CB-CG-OD2	5.06	122.85	118.30
1	E	397	ASP	CB-CG-OD2	5.02	122.82	118.30
1	H	86	ASP	CB-CG-OD2	5.01	122.81	118.30
1	O	286	ASP	CB-CG-OD2	5.00	122.80	118.30
1	R	86	ASP	CB-CG-OD2	5.00	122.80	118.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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	3640	0	3542	28	0
1	B	3643	0	3540	37	0
1	E	3671	0	3566	33	1
1	H	3674	0	3577	34	1
1	K	3669	0	3571	36	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	O	3672	0	3570	30	0
1	R	3639	0	3540	33	1
1	V	3635	0	3538	33	0
2	C	1142	0	1110	10	0
2	F	1138	0	1103	8	0
2	I	1133	0	1090	8	0
2	J	1142	0	1110	8	0
2	M	1140	0	1103	12	0
2	P	1138	0	1099	7	0
2	T	1134	0	1092	9	0
2	W	1141	0	1105	12	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	E	1	0	0	0	0
3	H	1	0	0	0	0
3	K	1	0	0	0	0
3	O	1	0	0	0	0
3	R	1	0	0	0	0
3	V	1	0	0	0	0
4	A	21	0	7	0	0
4	B	21	0	7	0	0
4	E	21	0	7	0	0
4	H	21	0	7	0	0
4	K	21	0	7	0	0
4	O	21	0	7	0	0
4	R	21	0	7	0	0
4	V	21	0	7	0	0
5	A	28	0	42	4	0
5	B	28	0	42	4	0
5	C	8	0	12	0	0
5	E	20	0	30	2	0
5	F	8	0	12	0	0
5	H	24	0	36	2	0
5	I	8	0	12	0	0
5	J	8	0	12	1	0
5	K	20	0	30	0	0
5	M	4	0	6	0	0
5	O	20	0	30	0	0
5	P	8	0	12	0	0
5	R	24	0	36	1	0
5	T	8	0	12	0	0
5	V	20	0	30	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
6	A	253	0	0	2	0
6	B	252	0	0	4	0
6	C	47	0	0	1	0
6	E	253	0	0	2	0
6	F	49	0	0	1	0
6	H	195	0	0	5	0
6	I	57	0	0	0	0
6	J	45	0	0	1	0
6	K	245	0	0	4	0
6	M	63	0	0	2	0
6	O	229	0	0	3	0
6	P	60	0	0	1	0
6	R	221	0	0	7	0
6	T	52	0	0	1	0
6	V	219	0	0	6	0
6	W	70	0	0	3	0
All	All	41073	0	37666	299	2

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 4.

All (299) 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:B:267:HIS:HD2	1:B:277:ASN:HD22	1.09	0.97
1:R:267:HIS:HD2	1:R:277:ASN:HD22	1.06	0.97
1:V:267:HIS:HD2	1:V:277:ASN:HD22	1.07	0.96
2:J:87:MET:HE3	6:J:315:HOH:O	1.64	0.96
1:K:267:HIS:HD2	1:K:277:ASN:HD22	1.12	0.95
1:H:267:HIS:HD2	1:H:277:ASN:HD22	1.10	0.94
1:A:267:HIS:HD2	1:A:277:ASN:HD22	1.07	0.92
1:O:267:HIS:HD2	1:O:277:ASN:HD22	1.09	0.92
1:E:267:HIS:HD2	1:E:277:ASN:HD22	1.08	0.92
5:V:507:EDO:H11	6:V:804:HOH:O	1.69	0.91
1:B:11:ALA:N	5:B:509:EDO:HO2	1.70	0.89
1:O:21:ARG:CZ	1:O:51[B]:GLU:HG3	2.03	0.89
1:A:11:ALA:N	5:A:508:EDO:HO2	1.75	0.85
1:B:267:HIS:CD2	1:B:277:ASN:HD22	1.93	0.84
2:M:115:GLN:HE21	1:O:184:ASN:HD22	1.26	0.83
1:H:267:HIS:CD2	1:H:277:ASN:HD22	1.98	0.82
1:A:267:HIS:CD2	1:A:277:ASN:HD22	1.95	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:P:115:GLN:HE21	1:V:184:ASN:HD22	1.27	0.82
1:E:267:HIS:CD2	1:E:277:ASN:HD22	1.95	0.82
1:K:32:ARG:HD2	6:K:830:HOH:O	1.81	0.80
1:R:267:HIS:CD2	1:R:277:ASN:HD22	1.96	0.80
2:C:115:GLN:HE21	1:H:184:ASN:HD22	1.29	0.80
1:E:184:ASN:HD22	2:W:115:GLN:HE21	1.29	0.80
1:K:431:ARG:HH21	1:K:432:ASN:HD21	1.30	0.79
1:R:431:ARG:HH21	1:R:432:ASN:HD21	1.27	0.79
1:O:267:HIS:CD2	1:O:277:ASN:HD22	1.99	0.78
1:H:431:ARG:HH21	1:H:432:ASN:HD21	1.31	0.78
1:O:383:HIS:H	1:O:386:HIS:HD2	1.32	0.78
1:V:267:HIS:CD2	1:V:277:ASN:HD22	1.96	0.77
1:V:431:ARG:HH21	1:V:432:ASN:HD21	1.31	0.77
2:C:22:THR:H	2:C:25:GLN:HE21	1.33	0.76
2:J:115:GLN:HE21	1:R:184:ASN:HD22	1.32	0.76
2:F:98:LYS:HE2	6:F:346:HOH:O	1.86	0.76
1:K:267:HIS:CD2	1:K:277:ASN:HD22	2.00	0.75
2:I:22:THR:H	2:I:25:GLN:HE21	1.35	0.75
1:H:383:HIS:H	1:H:386:HIS:HD2	1.35	0.74
1:K:383:HIS:H	1:K:386:HIS:HD2	1.34	0.74
5:B:509:EDO:H11	6:B:837:HOH:O	1.88	0.74
2:I:115:GLN:HE21	1:K:184:ASN:HD22	1.33	0.74
1:A:431:ARG:HH21	1:A:432:ASN:HD21	1.34	0.73
1:E:431:ARG:HH21	1:E:432:ASN:HD21	1.34	0.73
2:W:22:THR:H	2:W:25:GLN:HE21	1.37	0.72
2:M:87:MET:HG2	6:M:314:HOH:O	1.89	0.72
1:B:431:ARG:HH21	1:B:432:ASN:HD21	1.38	0.71
1:A:383:HIS:H	1:A:386:HIS:HD2	1.36	0.71
1:B:184:ASN:HD22	2:T:115:GLN:HE21	1.38	0.71
2:T:22:THR:H	2:T:25:GLN:HE21	1.37	0.71
1:E:383:HIS:H	1:E:386:HIS:HD2	1.36	0.71
1:O:431:ARG:HH21	1:O:432:ASN:HD21	1.37	0.71
2:P:22:THR:H	2:P:25:GLN:HE21	1.38	0.70
2:M:22:THR:H	2:M:25:GLN:HE21	1.39	0.70
1:B:383:HIS:H	1:B:386:HIS:HD2	1.41	0.68
1:V:383:HIS:H	1:V:386:HIS:HD2	1.42	0.68
2:F:22:THR:H	2:F:25:GLN:HE21	1.38	0.68
1:O:21:ARG:NH2	1:O:51[B]:GLU:HG3	2.09	0.68
1:R:383:HIS:H	1:R:386:HIS:HD2	1.40	0.68
2:P:87:MET:HE1	6:P:360:HOH:O	1.94	0.67
1:A:184:ASN:HD22	2:F:115:GLN:HE21	1.42	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:J:22:THR:H	2:J:25:GLN:HE21	1.43	0.66
1:E:21:ARG:CZ	1:E:51[B]:GLU:HG3	2.26	0.66
1:B:180:LEU:HA	2:T:115:GLN:HE22	1.61	0.66
1:A:180:LEU:HA	2:F:115:GLN:HE22	1.60	0.65
1:O:229:GLN:HE21	1:O:236:LYS:H	1.44	0.65
1:R:446:ARG:HD3	6:R:622:HOH:O	1.96	0.65
1:B:200:THR:OG1	1:B:238:HIS:HD2	1.80	0.65
1:O:192:CYS:HB3	1:O:197:LEU:HD12	1.79	0.64
1:V:450:LYS:HG3	6:V:653:HOH:O	1.96	0.64
1:B:229:GLN:HE21	1:B:236:LYS:H	1.45	0.64
1:O:156[B]:GLN:NE2	6:O:601:HOH:O	2.29	0.64
1:E:229:GLN:HE21	1:E:236:LYS:H	1.46	0.64
2:M:24:GLU:HB2	6:M:356:HOH:O	1.98	0.63
1:R:360[B]:ARG:NH2	6:R:601:HOH:O	2.31	0.63
1:V:468:GLU:H	5:V:506:EDO:C1	2.11	0.63
1:K:229:GLN:HE21	1:K:236:LYS:H	1.46	0.63
1:A:229:GLN:HE21	1:A:236:LYS:H	1.48	0.62
1:A:202:ASP:OD1	1:A:238:HIS:HE1	1.82	0.62
1:H:229:GLN:HE21	1:H:236:LYS:H	1.47	0.62
2:M:115:GLN:HE22	1:O:180:LEU:HA	1.65	0.61
1:R:239:TYR:HE2	1:R:401:GLN:HE22	1.47	0.61
1:K:239:TYR:HE2	1:K:401:GLN:HE22	1.48	0.61
1:A:200:THR:OG1	1:A:238:HIS:HD2	1.83	0.61
1:V:202:ASP:OD1	1:V:238:HIS:HE1	1.83	0.61
1:R:202:ASP:OD1	1:R:238:HIS:HE1	1.84	0.60
1:V:229:GLN:HE21	1:V:236:LYS:H	1.47	0.60
1:R:200:THR:OG1	1:R:238:HIS:HD2	1.85	0.60
1:H:239:TYR:HE2	1:H:401:GLN:HE22	1.50	0.59
1:R:229:GLN:HE21	1:R:236:LYS:H	1.49	0.59
2:C:115:GLN:HE22	1:H:180:LEU:HA	1.66	0.59
1:K:32:ARG:CZ	6:K:601:HOH:O	2.51	0.59
1:B:202:ASP:OD1	1:B:238:HIS:HE1	1.86	0.58
1:E:202:ASP:OD1	1:E:238:HIS:HE1	1.84	0.58
1:E:219:LEU:HD23	6:W:243:HOH:O	2.03	0.58
1:V:200:THR:OG1	1:V:238:HIS:HD2	1.85	0.58
1:V:239:TYR:HE2	1:V:401:GLN:HE22	1.50	0.58
1:E:180:LEU:HA	2:W:115:GLN:HE22	1.69	0.58
1:K:200:THR:OG1	1:K:238:HIS:HD2	1.87	0.58
1:B:239:TYR:HE2	1:B:401:GLN:HE22	1.52	0.57
1:E:239:TYR:HE2	1:E:401:GLN:HE22	1.51	0.57
2:I:115:GLN:HE22	1:K:180:LEU:HA	1.69	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:200:THR:OG1	1:H:238:HIS:HD2	1.87	0.57
1:V:473:ASP:OD2	5:V:507:EDO:H22	2.04	0.57
1:V:337:GLY:HA2	5:V:507:EDO:H12	1.86	0.57
1:E:21:ARG:NH1	1:E:51[B]:GLU:HG3	2.19	0.57
1:R:469:PHE:CE2	5:R:506:EDO:H12	2.39	0.57
1:O:202:ASP:OD1	1:O:238:HIS:HE1	1.88	0.56
2:C:138:ARG:HD3	6:C:305:HOH:O	2.04	0.56
1:H:18:LYS:HG2	5:H:504:EDO:H12	1.87	0.56
1:K:202:ASP:OD1	1:K:238:HIS:HE1	1.88	0.56
1:H:446:ARG:HD3	6:H:682:HOH:O	2.05	0.56
1:O:200:THR:OG1	1:O:238:HIS:HD2	1.87	0.56
2:W:87:MET:HG2	6:W:204:HOH:O	2.06	0.56
2:C:22:THR:H	2:C:25:GLN:NE2	2.02	0.55
1:H:202:ASP:OD1	1:H:238:HIS:HE1	1.90	0.55
1:A:267:HIS:HE1	6:O:772:HOH:O	1.89	0.55
1:O:239:TYR:HE2	1:O:401:GLN:HE22	1.53	0.55
1:B:383:HIS:H	1:B:386:HIS:CD2	2.25	0.55
1:A:239:TYR:HE2	1:A:401:GLN:HE22	1.54	0.54
1:E:200:THR:OG1	1:E:238:HIS:HD2	1.90	0.54
1:H:29:TYR:OH	1:H:32[B]:ARG:HD2	2.08	0.54
2:P:22:THR:H	2:P:25:GLN:NE2	2.06	0.54
1:A:383:HIS:H	1:A:386:HIS:CD2	2.23	0.53
1:O:21:ARG:NH1	1:O:51[B]:GLU:HG3	2.22	0.53
5:A:509:EDO:H12	6:A:748:HOH:O	2.08	0.53
1:B:267:HIS:HE1	6:B:790:HOH:O	1.90	0.53
1:V:468:GLU:O	5:V:506:EDO:H11	2.09	0.53
1:E:383:HIS:H	1:E:386:HIS:CD2	2.23	0.52
1:K:32:ARG:CD	6:K:791:HOH:O	2.56	0.52
1:V:32:ARG:HD2	6:V:759:HOH:O	2.09	0.52
1:V:383:HIS:H	1:V:386:HIS:CD2	2.27	0.52
2:P:115:GLN:HE22	1:V:180:LEU:HA	1.75	0.51
1:B:469:PHE:CZ	5:B:506:EDO:H21	2.46	0.51
2:J:22:THR:H	2:J:25:GLN:NE2	2.07	0.51
1:E:185:TYR:O	1:E:189:VAL:HG23	2.10	0.51
1:A:414:ALA:HB3	1:A:415:PRO:HD3	1.92	0.51
1:O:158:GLU:CD	1:O:325:HIS:HE2	2.14	0.51
1:R:414:ALA:HB3	1:R:415:PRO:HD3	1.93	0.51
1:A:381:GLY:HA2	1:O:66:TRP:CD1	2.46	0.51
2:C:115:GLN:NE2	1:H:181:SER:H	2.09	0.50
2:T:22:THR:H	2:T:25:GLN:NE2	2.07	0.50
1:H:383:HIS:H	1:H:386:HIS:CD2	2.22	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:W:22:THR:H	2:W:25:GLN:NE2	2.07	0.50
6:A:787:HOH:O	1:O:267:HIS:HE1	1.94	0.50
1:E:259[B]:GLU:OE1	2:W:61:GLY:HA3	2.11	0.50
1:K:32:ARG:NH2	6:K:601:HOH:O	2.45	0.50
2:M:22:THR:H	2:M:25:GLN:NE2	2.07	0.50
1:H:32[B]:ARG:HD3	6:H:715:HOH:O	2.11	0.50
1:V:192:CYS:HB3	1:V:197:LEU:HD12	1.94	0.50
1:V:277:ASN:HD21	1:V:293:ILE:HD12	1.77	0.50
1:B:267:HIS:HD2	1:B:277:ASN:ND2	1.93	0.49
1:B:460:GLU:HG2	6:B:833:HOH:O	2.12	0.49
1:R:158:GLU:CD	1:R:325:HIS:HE2	2.16	0.49
1:O:383:HIS:H	1:O:386:HIS:CD2	2.21	0.49
1:R:463:LYS:NZ	6:R:603:HOH:O	2.42	0.49
1:H:32[B]:ARG:CD	6:H:715:HOH:O	2.60	0.49
1:K:381:GLY:HA2	1:R:66:TRP:CD1	2.48	0.49
1:K:66:TRP:CD1	1:R:381:GLY:HA2	2.48	0.48
2:M:115:GLN:NE2	1:O:181:SER:H	2.11	0.48
1:R:277:ASN:HD21	1:R:293:ILE:HD12	1.78	0.48
1:A:273:GLY:HA3	1:O:273:GLY:HA3	1.95	0.48
1:R:383:HIS:H	1:R:386:HIS:CD2	2.27	0.48
2:J:115:GLN:HE22	1:R:180:LEU:HA	1.78	0.48
1:K:273:GLY:HA3	1:R:273:GLY:HA3	1.96	0.48
2:F:22:THR:H	2:F:25:GLN:NE2	2.09	0.48
1:K:383:HIS:N	1:K:386:HIS:HD2	2.07	0.48
1:B:11:ALA:N	5:B:509:EDO:O2	2.41	0.48
2:I:32:TYR:HD2	2:I:119:MET:HE1	1.77	0.48
1:A:77:LEU:HD21	5:A:503:EDO:H21	1.96	0.48
1:K:383:HIS:H	1:K:386:HIS:CD2	2.23	0.48
1:V:158:GLU:CD	1:V:325:HIS:HE2	2.16	0.48
1:K:277:ASN:HD21	1:K:293:ILE:HD12	1.78	0.47
1:E:158:GLU:CD	1:E:325:HIS:HE2	2.15	0.47
1:H:267:HIS:HE1	6:V:691:HOH:O	1.96	0.47
1:E:151:HYP:HD23	1:E:319:ARG:O	2.15	0.47
1:H:158:GLU:CD	1:H:325:HIS:HE2	2.17	0.47
1:B:382:ILE:HA	1:B:386:HIS:CD2	2.49	0.47
5:E:506:EDO:H12	6:E:753:HOH:O	2.14	0.47
1:H:273:GLY:HA3	1:V:273:GLY:HA3	1.96	0.47
1:K:165:TYR:CD1	2:P:117:GLN:HB3	2.50	0.47
1:E:277:ASN:HD21	1:E:293:ILE:HD12	1.79	0.47
1:H:383:HIS:N	1:H:386:HIS:HD2	2.09	0.47
1:B:161:LYS:HE2	6:H:780:HOH:O	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:H:192:CYS:HB3	1:H:197:LEU:HD12	1.97	0.46
1:R:158:GLU:HA	1:R:290:PHE:CZ	2.50	0.46
1:R:267:HIS:HE1	6:R:770:HOH:O	1.97	0.46
1:E:181:SER:H	2:W:115:GLN:NE2	2.14	0.46
1:B:414:ALA:HB3	1:B:415:PRO:HD3	1.97	0.46
1:E:267:HIS:HE1	6:E:780:HOH:O	1.98	0.46
1:B:273:GLY:HA3	1:E:273:GLY:HA3	1.97	0.46
2:M:58:ILE:HD11	2:T:58:ILE:HB	1.98	0.46
6:V:694:HOH:O	2:W:66:LEU:HB2	2.16	0.46
1:B:158:GLU:CD	1:B:325:HIS:HE2	2.17	0.45
1:K:158:GLU:CD	1:K:325:HIS:HE2	2.17	0.45
1:O:151:HYP:HD23	1:O:319:ARG:O	2.16	0.45
1:K:158:GLU:HA	1:K:290:PHE:CZ	2.51	0.45
1:V:382:ILE:HA	1:V:386:HIS:CD2	2.51	0.45
1:K:192:CYS:HB3	1:K:197:LEU:HD12	1.98	0.45
2:I:115:GLN:NE2	1:K:181:SER:H	2.13	0.45
2:W:32:TYR:HD2	2:W:119:MET:HE1	1.81	0.45
2:C:32:TYR:HD2	2:C:119:MET:HE1	1.82	0.45
1:R:175:LYS:HA	1:R:176:PRO:C	2.37	0.45
1:A:158:GLU:CD	1:A:325:HIS:HE2	2.17	0.44
1:B:158:GLU:HA	1:B:290:PHE:CZ	2.51	0.44
2:W:24:GLU:HB2	6:W:249:HOH:O	2.17	0.44
1:V:190:TYR:CZ	1:V:227:LYS:HE3	2.52	0.44
1:B:277:ASN:HD21	1:B:293:ILE:HD12	1.81	0.44
1:O:151:HYP:HA	1:O:152:PRO:HD3	1.89	0.44
1:V:175:LYS:HA	1:V:176:PRO:C	2.37	0.44
1:A:277:ASN:HD21	1:A:293:ILE:HD12	1.83	0.44
1:B:151:HYP:HB2	1:B:323:GLY:O	2.18	0.44
2:I:22:THR:H	2:I:25:GLN:NE2	2.07	0.44
1:R:463:LYS:CE	6:R:603:HOH:O	2.65	0.44
1:V:158:GLU:HA	1:V:290:PHE:CZ	2.52	0.44
1:B:170:LEU:HD11	1:B:421:ARG:HA	2.00	0.43
1:R:151:HYP:HB2	1:R:323:GLY:O	2.18	0.43
1:A:382:ILE:HA	1:A:386:HIS:CD2	2.53	0.43
1:K:267:HIS:HE1	6:R:727:HOH:O	2.00	0.43
1:A:151:HYP:HA	1:A:152:PRO:HD3	1.90	0.43
1:B:153:HIS:HE1	6:B:717:HOH:O	2.01	0.43
2:F:134:PRO:HG2	2:F:137:LYS:HB2	2.00	0.43
1:A:158:GLU:HA	1:A:290:PHE:CZ	2.53	0.43
1:K:177:LYS:HB2	1:R:62:SER:O	2.17	0.43
1:E:158:GLU:HA	1:E:290:PHE:CZ	2.54	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:T:2[A]:MET:HE3	6:T:352:HOH:O	2.18	0.43
1:H:165:TYR:CD1	2:J:117:GLN:HB3	2.53	0.43
1:B:381:GLY:HA2	1:E:66:TRP:CD1	2.53	0.43
1:O:383:HIS:N	1:O:386:HIS:HD2	2.09	0.43
1:E:252:LYS:HE2	6:V:611:HOH:O	2.19	0.43
2:F:32:TYR:HD2	2:F:119:MET:HE1	1.84	0.43
1:B:156[B]:GLN:HG3	2:C:116:VAL:HB	1.99	0.42
2:C:67:TYR:CD2	2:C:67:TYR:C	2.93	0.42
1:H:72:ASP:OD2	5:H:508:EDO:H21	2.18	0.42
1:H:381:GLY:HA2	1:V:66:TRP:CD1	2.54	0.42
2:M:134:PRO:HG2	2:M:137:LYS:HB2	2.01	0.42
1:V:151:HYP:HA	1:V:152:PRO:HD3	1.87	0.42
1:B:66:TRP:CD1	1:E:381:GLY:HA2	2.55	0.42
1:B:181:SER:H	2:T:115:GLN:NE2	2.17	0.42
1:H:158:GLU:HA	1:H:290:PHE:CZ	2.54	0.42
2:I:39:ILE:O	2:I:109:ALA:HA	2.19	0.42
2:P:32:TYR:HD2	2:P:119:MET:HE1	1.85	0.42
1:E:414:ALA:HB3	1:E:415:PRO:HD3	2.01	0.42
1:R:156[B]:GLN:CD	6:R:606:HOH:O	2.58	0.42
1:R:190:TYR:CZ	1:R:227:LYS:HE3	2.55	0.42
1:B:151:HYP:HD23	1:B:319:ARG:O	2.20	0.42
1:H:460:GLU:HG2	6:H:790:HOH:O	2.19	0.42
1:A:66:TRP:CD1	1:O:381:GLY:HA2	2.55	0.42
1:H:66:TRP:CD1	1:V:381:GLY:HA2	2.55	0.42
1:V:383:HIS:N	1:V:386:HIS:HD2	2.14	0.42
1:A:181:SER:H	2:F:115:GLN:NE2	2.18	0.41
1:A:170:LEU:HD11	1:A:421:ARG:HA	2.02	0.41
1:B:241:ASN:ND2	1:B:243:THR:H	2.18	0.41
1:H:258:LYS:HA	2:J:65:CYS:SG	2.60	0.41
2:W:67:TYR:CD2	2:W:67:TYR:C	2.94	0.41
1:E:382:ILE:HA	1:E:386:HIS:CD2	2.55	0.41
1:E:469:PHE:CE2	5:E:505:EDO:H12	2.55	0.41
1:R:382:ILE:HA	1:R:386:HIS:CD2	2.56	0.41
1:E:190:TYR:CZ	1:E:227:LYS:HE3	2.55	0.41
1:E:239:TYR:HB3	1:E:266:MET:HB3	2.02	0.41
1:K:151:HYP:HA	1:K:152:PRO:HD3	1.89	0.41
1:E:171:GLY:HA2	1:E:199:PHE:O	2.21	0.41
1:E:383:HIS:CE1	1:E:385:TRP:HB2	2.56	0.41
1:V:468:GLU:H	5:V:506:EDO:H12	1.84	0.41
1:B:175:LYS:HA	1:B:176:PRO:C	2.40	0.41
1:O:277:ASN:HD21	1:O:293:ILE:HD12	1.86	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:197:LEU:HG	1:B:417:ALA:HB1	2.02	0.41
1:H:170:LEU:HD11	1:H:421:ARG:HA	2.02	0.41
2:I:67:TYR:CD2	2:I:67:TYR:C	2.93	0.41
2:C:39:ILE:O	2:C:109:ALA:HA	2.20	0.41
1:H:190:TYR:CZ	1:H:227:LYS:HE3	2.56	0.41
1:H:382:ILE:HA	1:H:386:HIS:CD2	2.56	0.41
1:R:302:ASP:OD2	1:R:311:PHE:HB2	2.21	0.41
2:W:119:MET:HG3	2:W:120:GLY:N	2.35	0.41
1:B:214:TRP:CE3	1:B:253:ARG:HG2	2.56	0.41
1:K:175:LYS:HA	1:K:176:PRO:C	2.41	0.41
2:M:32:TYR:HD2	2:M:119:MET:HE1	1.86	0.41
1:O:21:ARG:CD	6:O:708:HOH:O	2.68	0.41
1:O:158:GLU:HA	1:O:290:PHE:CZ	2.56	0.41
1:A:77:LEU:HD12	1:A:77:LEU:HA	1.97	0.41
1:H:171:GLY:HA2	1:H:199:PHE:O	2.21	0.41
1:K:151:HYP:HD23	1:K:319:ARG:O	2.21	0.41
1:A:177:LYS:HG2	1:A:203:ASP:OD2	2.22	0.40
1:K:452:SER:HA	1:K:453:PRO:HD3	1.96	0.40
1:V:171:GLY:HA2	1:V:199:PHE:O	2.21	0.40
1:A:469:PHE:CZ	5:A:509:EDO:H21	2.55	0.40
2:J:55:GLU:OE1	5:J:202:EDO:H11	2.21	0.40
1:V:151:HYP:HD23	1:V:319:ARG:O	2.21	0.40
2:M:67:TYR:CD2	2:M:67:TYR:C	2.95	0.40
1:H:177:LYS:HB2	1:V:62:SER:O	2.21	0.40
1:K:151:HYP:HB2	1:K:323:GLY:O	2.21	0.40
1:O:170:LEU:HD11	1:O:421:ARG:HA	2.03	0.40
1:O:190:TYR:CZ	1:O:227:LYS:HE3	2.56	0.40
2:T:119:MET:HG3	2:T:120:GLY:N	2.36	0.40
1:B:387:MET:HB3	1:B:388:PRO:HD3	2.03	0.40
2:M:117:GLN:HB3	1:R:165:TYR:CD1	2.57	0.40
1:R:170:LEU:HD11	1:R:421:ARG:HA	2.03	0.40
2:T:42:LEU:HD21	2:T:93:ILE:HG12	2.04	0.40

All (2) 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)
1:E:51[A]:GLU:OE2	1:K:439:ARG:NH2[1_554]	1.95	0.25
1:H:14:LYS:CE	1:R:460:GLU:OE1[2_547]	2.00	0.20

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	460/475 (97%)	446 (97%)	14 (3%)	0	100	100
1	B	461/475 (97%)	448 (97%)	13 (3%)	0	100	100
1	E	466/475 (98%)	452 (97%)	14 (3%)	0	100	100
1	H	466/475 (98%)	452 (97%)	14 (3%)	0	100	100
1	K	462/475 (97%)	449 (97%)	13 (3%)	0	100	100
1	O	466/475 (98%)	452 (97%)	14 (3%)	0	100	100
1	R	460/475 (97%)	446 (97%)	14 (3%)	0	100	100
1	V	459/475 (97%)	445 (97%)	14 (3%)	0	100	100
2	C	139/140 (99%)	132 (95%)	7 (5%)	0	100	100
2	F	139/140 (99%)	133 (96%)	6 (4%)	0	100	100
2	I	139/140 (99%)	133 (96%)	6 (4%)	0	100	100
2	J	139/140 (99%)	132 (95%)	7 (5%)	0	100	100
2	M	139/140 (99%)	134 (96%)	5 (4%)	0	100	100
2	P	139/140 (99%)	134 (96%)	5 (4%)	0	100	100
2	T	139/140 (99%)	132 (95%)	7 (5%)	0	100	100
2	W	139/140 (99%)	132 (95%)	7 (5%)	0	100	100
All	All	4812/4920 (98%)	4652 (97%)	160 (3%)	0	100	100

There are no Ramachandran outliers to report.

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	370/376 (98%)	360 (97%)	10 (3%)	44	61
1	B	371/376 (99%)	360 (97%)	11 (3%)	41	57
1	E	374/376 (100%)	363 (97%)	11 (3%)	42	58
1	H	374/376 (100%)	358 (96%)	16 (4%)	29	40
1	K	373/376 (99%)	361 (97%)	12 (3%)	39	54
1	O	374/376 (100%)	361 (96%)	13 (4%)	36	50
1	R	370/376 (98%)	359 (97%)	11 (3%)	41	57
1	V	369/376 (98%)	359 (97%)	10 (3%)	44	61
2	C	122/123 (99%)	114 (93%)	8 (7%)	16	22
2	F	122/123 (99%)	116 (95%)	6 (5%)	25	35
2	I	120/123 (98%)	114 (95%)	6 (5%)	24	34
2	J	123/123 (100%)	117 (95%)	6 (5%)	25	35
2	M	122/123 (99%)	116 (95%)	6 (5%)	25	35
2	P	122/123 (99%)	117 (96%)	5 (4%)	30	43
2	T	121/123 (98%)	115 (95%)	6 (5%)	24	34
2	W	122/123 (99%)	117 (96%)	5 (4%)	30	43
All	All	3949/3992 (99%)	3807 (96%)	142 (4%)	36	49

All (142) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	14	LYS
1	A	94	ASP
1	A	185	TYR
1	A	203	ASP
1	A	219	LEU
1	A	239	TYR
1	A	241	ASN
1	A	252	LYS
1	A	439	ARG
1	A	460	GLU
1	B	14	LYS
1	B	94	ASP
1	B	185	TYR
1	B	203	ASP
1	B	219	LEU
1	B	239	TYR

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Mol	Chain	Res	Type
1	B	241	ASN
1	B	252	LYS
1	B	435	ARG
1	B	439	ARG
1	B	460	GLU
2	C	9	ASN
2	C	12	PHE
2	C	52	VAL
2	C	88	GLN
2	C	118	ILE
2	C	119	MET
2	C	127	LYS
2	C	130	ARG
1	E	8	LYS
1	E	14	LYS
1	E	94	ASP
1	E	185	TYR
1	E	203	ASP
1	E	219	LEU
1	E	239	TYR
1	E	241	ASN
1	E	252	LYS
1	E	439	ARG
1	E	460	GLU
2	F	12	PHE
2	F	52	VAL
2	F	88	GLN
2	F	118	ILE
2	F	119	MET
2	F	127	LYS
1	H	8	LYS
1	H	14	LYS
1	H	32[A]	ARG
1	H	32[B]	ARG
1	H	94	ASP
1	H	185	TYR
1	H	203	ASP
1	H	219	LEU
1	H	239	TYR
1	H	241	ASN
1	H	252	LYS
1	H	259[A]	GLU

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Mol	Chain	Res	Type
1	H	259[B]	GLU
1	H	435	ARG
1	H	439	ARG
1	H	460	GLU
2	I	9	ASN
2	I	12	PHE
2	I	52	VAL
2	I	88	GLN
2	I	118	ILE
2	I	119	MET
2	J	9	ASN
2	J	12	PHE
2	J	52	VAL
2	J	88	GLN
2	J	118	ILE
2	J	119	MET
1	K	8	LYS
1	K	14	LYS
1	K	94	ASP
1	K	172	CYS
1	K	185	TYR
1	K	203	ASP
1	K	219	LEU
1	K	239	TYR
1	K	241	ASN
1	K	252	LYS
1	K	439	ARG
1	K	460	GLU
2	M	12	PHE
2	M	52	VAL
2	M	88	GLN
2	M	118	ILE
2	M	119	MET
2	M	130	ARG
1	O	7	THR
1	O	14	LYS
1	O	94	ASP
1	O	185	TYR
1	O	203	ASP
1	O	219	LEU
1	O	239	TYR
1	O	241	ASN

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Mol	Chain	Res	Type
1	O	252	LYS
1	O	259[A]	GLU
1	O	259[B]	GLU
1	O	439	ARG
1	O	460	GLU
2	P	12	PHE
2	P	52	VAL
2	P	88	GLN
2	P	118	ILE
2	P	119	MET
1	R	14	LYS
1	R	94	ASP
1	R	96	GLN
1	R	185	TYR
1	R	203	ASP
1	R	219	LEU
1	R	239	TYR
1	R	241	ASN
1	R	252	LYS
1	R	439	ARG
1	R	460	GLU
2	T	9	ASN
2	T	12	PHE
2	T	52	VAL
2	T	88	GLN
2	T	118	ILE
2	T	119	MET
1	V	14	LYS
1	V	94	ASP
1	V	185	TYR
1	V	203	ASP
1	V	219	LEU
1	V	239	TYR
1	V	241	ASN
1	V	252	LYS
1	V	439	ARG
1	V	460	GLU
2	W	12	PHE
2	W	52	VAL
2	W	88	GLN
2	W	118	ILE
2	W	119	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (111) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	153	HIS
1	A	229	GLN
1	A	238	HIS
1	A	241	ASN
1	A	267	HIS
1	A	277	ASN
1	A	304	GLN
1	A	386	HIS
1	A	432	ASN
1	B	153	HIS
1	B	229	GLN
1	B	238	HIS
1	B	241	ASN
1	B	267	HIS
1	B	277	ASN
1	B	304	GLN
1	B	386	HIS
1	B	432	ASN
2	C	8	ASN
2	C	9	ASN
2	C	25	GLN
2	C	29	GLN
2	C	115	GLN
1	E	153	HIS
1	E	163	ASN
1	E	229	GLN
1	E	238	HIS
1	E	241	ASN
1	E	267	HIS
1	E	277	ASN
1	E	304	GLN
1	E	386	HIS
1	E	401	GLN
1	E	432	ASN
2	F	9	ASN
2	F	25	GLN
2	F	29	GLN
2	F	115	GLN
1	H	153	HIS
1	H	229	GLN
1	H	238	HIS

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Mol	Chain	Res	Type
1	H	241	ASN
1	H	267	HIS
1	H	277	ASN
1	H	304	GLN
1	H	386	HIS
1	H	432	ASN
2	I	9	ASN
2	I	25	GLN
2	I	29	GLN
2	I	115	GLN
2	J	9	ASN
2	J	25	GLN
2	J	29	GLN
2	J	115	GLN
1	K	153	HIS
1	K	229	GLN
1	K	238	HIS
1	K	241	ASN
1	K	267	HIS
1	K	277	ASN
1	K	304	GLN
1	K	386	HIS
1	K	401	GLN
1	K	432	ASN
2	M	9	ASN
2	M	25	GLN
2	M	29	GLN
2	M	115	GLN
1	O	153	HIS
1	O	229	GLN
1	O	238	HIS
1	O	241	ASN
1	O	267	HIS
1	O	277	ASN
1	O	304	GLN
1	O	386	HIS
1	O	432	ASN
2	P	9	ASN
2	P	25	GLN
2	P	29	GLN
2	P	115	GLN
1	R	153	HIS

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Mol	Chain	Res	Type
1	R	229	GLN
1	R	238	HIS
1	R	241	ASN
1	R	267	HIS
1	R	277	ASN
1	R	304	GLN
1	R	386	HIS
1	R	432	ASN
2	T	9	ASN
2	T	25	GLN
2	T	29	GLN
2	T	115	GLN
1	V	153	HIS
1	V	156	GLN
1	V	207	ASN
1	V	229	GLN
1	V	238	HIS
1	V	241	ASN
1	V	267	HIS
1	V	277	ASN
1	V	304	GLN
1	V	386	HIS
1	V	401	GLN
1	V	432	ASN
2	W	9	ASN
2	W	25	GLN
2	W	29	GLN
2	W	115	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

40 non-standard protein/DNA/RNA residues 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$
1	SMC	H	369	1	5,6,7	0.68	0	2,6,8	0.66	0
1	HYP	H	151	1	6,8,9	0.74	0	5,10,12	4.13	4 (80%)
1	SMC	K	369	1	5,6,7	1.16	1 (20%)	2,6,8	0.36	0
1	SMC	A	369	1	5,6,7	1.06	1 (20%)	2,6,8	0.74	0
1	SMC	B	256	1	5,6,7	1.37	1 (20%)	2,6,8	1.03	0
1	SMC	R	256	1	5,6,7	0.54	0	2,6,8	1.08	0
1	KCX	R	201	1,3	9,11,12	0.78	0	5,12,14	0.98	0
1	HYP	O	151	1	6,8,9	0.94	0	5,10,12	3.97	3 (60%)
1	KCX	A	201	1,3	9,11,12	1.31	2 (22%)	5,12,14	0.85	0
1	HYP	B	151	1	6,8,9	0.80	0	5,10,12	3.91	3 (60%)
1	KCX	H	201	1,3	9,11,12	0.85	0	5,12,14	1.50	1 (20%)
1	KCX	V	201	1,3	9,11,12	0.65	0	5,12,14	0.89	0
1	SMC	O	369	1	5,6,7	0.78	0	2,6,8	1.55	1 (50%)
1	SMC	V	256	1	5,6,7	0.63	0	2,6,8	0.57	0
1	HYP	E	151	1	6,8,9	0.70	0	5,10,12	3.70	4 (80%)
1	SMC	H	256	1	5,6,7	0.66	0	2,6,8	0.87	0
1	SMC	K	256	1	5,6,7	1.38	1 (20%)	2,6,8	0.59	0
1	HYP	E	104	1	6,8,9	0.72	0	5,10,12	3.29	3 (60%)
1	HYP	K	104	1	6,8,9	0.66	0	5,10,12	3.34	3 (60%)
1	HYP	V	151	1	6,8,9	0.79	0	5,10,12	3.20	3 (60%)
1	HYP	K	151	1	6,8,9	0.90	0	5,10,12	3.55	3 (60%)
1	KCX	B	201	1,3	9,11,12	1.19	1 (11%)	5,12,14	0.67	0
1	SMC	V	369	1	5,6,7	0.96	0	2,6,8	0.86	0
1	SMC	O	256	1	5,6,7	0.76	0	2,6,8	0.33	0
1	HYP	B	104	1	6,8,9	0.85	0	5,10,12	3.28	3 (60%)
1	SMC	E	369	1	5,6,7	0.87	0	2,6,8	0.72	0
1	SMC	A	256	1	5,6,7	0.98	0	2,6,8	0.26	0
1	KCX	O	201	1,3	9,11,12	1.09	0	5,12,14	1.08	1 (20%)
1	HYP	A	151	1	6,8,9	0.68	0	5,10,12	4.12	4 (80%)
1	HYP	R	151	1	6,8,9	0.51	0	5,10,12	3.37	3 (60%)
1	SMC	B	369	1	5,6,7	0.70	0	2,6,8	1.17	0
1	SMC	R	369	1	5,6,7	0.70	0	2,6,8	1.55	0
1	HYP	O	104	1	6,8,9	0.69	0	5,10,12	3.22	3 (60%)
1	HYP	A	104	1	6,8,9	0.61	0	5,10,12	3.23	3 (60%)
1	SMC	E	256	1	5,6,7	1.06	1 (20%)	2,6,8	0.72	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
1	KCX	K	201	1,3	9,11,12	0.90	0	5,12,14	1.27	1 (20%)
1	HYP	R	104	1	5,7,9	0.49	0	7,8,12	1.37	2 (28%)
1	KCX	E	201	1,3	9,11,12	1.00	0	5,12,14	0.79	0
1	HYP	V	104	1	6,8,9	0.60	0	5,10,12	3.19	3 (60%)
1	HYP	H	104	1	6,8,9	0.62	0	5,10,12	3.66	3 (60%)

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
1	SMC	H	369	1	-	1/3/5/7	-
1	HYP	H	151	1	-	0/0/11/13	0/1/1/1
1	SMC	K	369	1	-	1/3/5/7	-
1	SMC	A	369	1	-	1/3/5/7	-
1	SMC	B	256	1	-	0/3/5/7	-
1	SMC	R	256	1	-	0/3/5/7	-
1	KCX	R	201	1,3	-	0/9/10/12	-
1	HYP	O	151	1	-	0/0/11/13	0/1/1/1
1	KCX	A	201	1,3	-	0/9/10/12	-
1	HYP	B	151	1	-	0/0/11/13	0/1/1/1
1	KCX	H	201	1,3	-	0/9/10/12	-
1	KCX	V	201	1,3	-	0/9/10/12	-
1	SMC	O	369	1	-	1/3/5/7	-
1	SMC	V	256	1	-	0/3/5/7	-
1	HYP	E	151	1	-	0/0/11/13	0/1/1/1
1	SMC	H	256	1	-	0/3/5/7	-
1	SMC	K	256	1	-	0/3/5/7	-
1	HYP	E	104	1	-	0/0/11/13	0/1/1/1
1	HYP	K	104	1	-	0/0/11/13	0/1/1/1
1	HYP	V	151	1	-	0/0/11/13	0/1/1/1
1	HYP	K	151	1	-	0/0/11/13	0/1/1/1
1	KCX	B	201	1,3	-	0/9/10/12	-
1	SMC	V	369	1	-	1/3/5/7	-
1	SMC	O	256	1	-	0/3/5/7	-
1	HYP	B	104	1	-	0/0/11/13	0/1/1/1
1	SMC	E	369	1	-	1/3/5/7	-
1	SMC	A	256	1	-	0/3/5/7	-
1	KCX	O	201	1,3	-	0/9/10/12	-
1	HYP	A	151	1	-	0/0/11/13	0/1/1/1
1	HYP	R	151	1	-	0/0/11/13	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
1	SMC	B	369	1	-	1/3/5/7	-
1	SMC	R	369	1	-	1/3/5/7	-
1	HYP	O	104	1	-	0/0/11/13	0/1/1/1
1	HYP	A	104	1	-	0/0/11/13	0/1/1/1
1	SMC	E	256	1	-	0/3/5/7	-
1	KCX	K	201	1,3	-	0/9/10/12	-
1	HYP	R	104	1	-	0/0/9/13	0/1/1/1
1	KCX	E	201	1,3	-	0/9/10/12	-
1	HYP	V	104	1	-	0/0/11/13	0/1/1/1
1	HYP	H	104	1	-	0/0/11/13	0/1/1/1

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	K	256	SMC	CB-SG	-2.99	1.76	1.80
1	B	256	SMC	CB-SG	-2.94	1.76	1.80
1	B	201	KCX	OQ1-CX	2.54	1.26	1.21
1	A	201	KCX	OQ1-CX	2.40	1.26	1.21
1	K	369	SMC	CB-SG	-2.17	1.77	1.80
1	A	201	KCX	CD-CE	2.15	1.60	1.51
1	E	256	SMC	CB-SG	-2.14	1.77	1.80
1	A	369	SMC	CB-SG	-2.08	1.77	1.80

All (54) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	151	HYP	CB-CG-CD	6.00	110.63	103.27
1	H	104	HYP	CB-CG-CD	5.76	110.32	103.27
1	H	151	HYP	OD1-CG-CD	-5.74	97.79	110.35
1	O	151	HYP	CB-CG-CD	5.70	110.25	103.27
1	B	151	HYP	CB-CG-CD	5.32	109.78	103.27
1	O	151	HYP	OD1-CG-CD	-5.31	98.74	110.35
1	V	104	HYP	CB-CG-CD	5.29	109.75	103.27
1	K	104	HYP	CB-CG-CD	5.20	109.64	103.27
1	E	151	HYP	CB-CG-CD	5.14	109.56	103.27
1	A	104	HYP	CB-CG-CD	5.08	109.50	103.27
1	H	151	HYP	CB-CG-CD	5.07	109.48	103.27
1	B	151	HYP	OD1-CG-CD	-5.03	99.35	110.35
1	E	104	HYP	CB-CG-CD	5.01	109.40	103.27
1	A	151	HYP	OD1-CG-CD	-4.85	99.74	110.35
1	B	104	HYP	CB-CG-CD	4.83	109.19	103.27
1	E	151	HYP	OD1-CG-CB	-4.79	98.19	110.03

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	O	104	HYP	CB-CG-CD	4.72	109.06	103.27
1	H	151	HYP	OD1-CG-CB	-4.72	98.37	110.03
1	K	151	HYP	OD1-CG-CD	-4.62	100.25	110.35
1	A	151	HYP	OD1-CG-CB	-4.56	98.76	110.03
1	K	151	HYP	CB-CG-CD	4.45	108.72	103.27
1	H	104	HYP	OD1-CG-CB	-4.44	99.05	110.03
1	R	151	HYP	OD1-CG-CB	-4.40	99.16	110.03
1	B	151	HYP	OD1-CG-CB	-4.36	99.24	110.03
1	R	151	HYP	OD1-CG-CD	-4.25	101.04	110.35
1	E	104	HYP	OD1-CG-CB	-4.22	99.59	110.03
1	V	151	HYP	OD1-CG-CB	-4.21	99.61	110.03
1	K	151	HYP	OD1-CG-CB	-4.20	99.65	110.03
1	O	104	HYP	OD1-CG-CD	-4.01	101.58	110.35
1	B	104	HYP	OD1-CG-CB	-3.94	100.30	110.03
1	A	104	HYP	OD1-CG-CB	-3.94	100.30	110.03
1	O	151	HYP	OD1-CG-CB	-3.93	100.30	110.03
1	V	151	HYP	CB-CG-CD	3.92	108.07	103.27
1	R	151	HYP	CB-CG-CD	3.91	108.06	103.27
1	E	151	HYP	OD1-CG-CD	-3.79	102.07	110.35
1	V	151	HYP	OD1-CG-CD	-3.74	102.17	110.35
1	V	104	HYP	OD1-CG-CB	-3.66	100.99	110.03
1	K	104	HYP	OD1-CG-CB	-3.55	101.25	110.03
1	K	104	HYP	OD1-CG-CD	-3.47	102.77	110.35
1	H	104	HYP	OD1-CG-CD	-3.36	103.00	110.35
1	O	104	HYP	OD1-CG-CB	-3.15	102.23	110.03
1	B	104	HYP	OD1-CG-CD	-3.12	103.52	110.35
1	H	201	KCX	OQ1-CX-NZ	-2.96	120.37	124.96
1	E	104	HYP	OD1-CG-CD	-2.92	103.97	110.35
1	A	104	HYP	OD1-CG-CD	-2.80	104.23	110.35
1	K	201	KCX	OQ1-CX-NZ	-2.71	120.76	124.96
1	V	104	HYP	OD1-CG-CD	-2.58	104.70	110.35
1	R	104	HYP	CB-CA-C	2.35	115.93	112.70
1	O	201	KCX	OQ1-CX-NZ	-2.19	121.56	124.96
1	O	369	SMC	CA-CB-SG	-2.19	110.50	114.04
1	E	151	HYP	O-C-CA	-2.10	119.26	124.78
1	H	151	HYP	O-C-CA	-2.06	119.39	124.78
1	R	104	HYP	CD-N-CA	2.05	112.60	107.08
1	A	151	HYP	O-C-CA	-2.01	119.51	124.78

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	369	SMC	N-CA-CB-SG
1	B	369	SMC	N-CA-CB-SG
1	E	369	SMC	N-CA-CB-SG
1	H	369	SMC	N-CA-CB-SG
1	K	369	SMC	N-CA-CB-SG
1	O	369	SMC	N-CA-CB-SG
1	V	369	SMC	N-CA-CB-SG
1	R	369	SMC	N-CA-CB-SG

There are no ring outliers.

7 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	O	151	HYP	2	0
1	B	151	HYP	2	0
1	E	151	HYP	1	0
1	V	151	HYP	2	0
1	K	151	HYP	3	0
1	A	151	HYP	1	0
1	R	151	HYP	1	0

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 75 ligands modelled in this entry, 8 are monoatomic - leaving 67 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	$\# Z > 2$
5	EDO	R	504	-	3,3,3	0.33	0	2,2,2	0.03	0
5	EDO	A	508	-	3,3,3	0.33	0	2,2,2	0.13	0
5	EDO	A	509	-	3,3,3	0.37	0	2,2,2	0.23	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	CAP	E	502	3	17,20,20	1.23	2 (11%)	22,31,31	1.13	1 (4%)
5	EDO	E	503	-	3,3,3	0.28	0	2,2,2	0.21	0
5	EDO	H	504	-	3,3,3	0.30	0	2,2,2	0.42	0
5	EDO	O	503	-	3,3,3	0.35	0	2,2,2	0.22	0
5	EDO	H	508	-	3,3,3	0.42	0	2,2,2	0.10	0
5	EDO	M	201	-	3,3,3	0.28	0	2,2,2	0.27	0
5	EDO	A	506	-	3,3,3	0.37	0	2,2,2	0.18	0
5	EDO	O	506	-	3,3,3	0.40	0	2,2,2	0.23	0
5	EDO	B	508	-	3,3,3	0.48	0	2,2,2	0.27	0
5	EDO	R	506	-	3,3,3	0.36	0	2,2,2	0.08	0
5	EDO	V	506	-	3,3,3	0.30	0	2,2,2	0.24	0
5	EDO	T	201	-	3,3,3	0.33	0	2,2,2	0.11	0
5	EDO	J	202	-	3,3,3	0.35	0	2,2,2	0.04	0
5	EDO	I	202	-	3,3,3	0.26	0	2,2,2	0.40	0
5	EDO	R	507	-	3,3,3	0.50	0	2,2,2	0.10	0
4	CAP	O	502	3	17,20,20	1.21	2 (11%)	22,31,31	1.00	0
5	EDO	B	503	-	3,3,3	0.48	0	2,2,2	0.07	0
5	EDO	E	506	-	3,3,3	0.35	0	2,2,2	0.26	0
5	EDO	P	202	-	3,3,3	0.31	0	2,2,2	0.10	0
5	EDO	C	202	-	3,3,3	0.29	0	2,2,2	0.39	0
4	CAP	R	502	3	17,20,20	1.15	2 (11%)	22,31,31	1.03	1 (4%)
5	EDO	P	201	-	3,3,3	0.24	0	2,2,2	0.59	0
5	EDO	J	201	-	3,3,3	0.35	0	2,2,2	0.19	0
5	EDO	C	201	-	3,3,3	0.28	0	2,2,2	0.16	0
5	EDO	E	507	-	3,3,3	0.29	0	2,2,2	0.28	0
4	CAP	A	502	3	17,20,20	1.15	2 (11%)	22,31,31	0.88	0
5	EDO	O	505	-	3,3,3	0.29	0	2,2,2	0.52	0
5	EDO	B	509	-	3,3,3	0.25	0	2,2,2	0.48	0
5	EDO	B	507	-	3,3,3	0.45	0	2,2,2	0.17	0
5	EDO	F	202	-	3,3,3	0.25	0	2,2,2	0.43	0
4	CAP	H	502	3	17,20,20	1.09	2 (11%)	22,31,31	0.94	1 (4%)
5	EDO	V	505	-	3,3,3	0.34	0	2,2,2	0.22	0
4	CAP	V	502	3	17,20,20	1.18	2 (11%)	22,31,31	0.95	1 (4%)
5	EDO	V	503	-	3,3,3	0.45	0	2,2,2	0.19	0
4	CAP	K	502	3	17,20,20	1.29	3 (17%)	22,31,31	0.91	1 (4%)
5	EDO	A	505	-	3,3,3	0.35	0	2,2,2	0.13	0
5	EDO	I	201	-	3,3,3	0.33	0	2,2,2	0.05	0
5	EDO	K	504	-	3,3,3	0.32	0	2,2,2	0.53	0
5	EDO	A	503	-	3,3,3	0.35	0	2,2,2	0.12	0
5	EDO	V	504	-	3,3,3	0.28	0	2,2,2	0.42	0
5	EDO	T	202	-	3,3,3	0.26	0	2,2,2	0.70	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	EDO	K	503	-	3,3,3	0.41	0	2,2,2	0.13	0
5	EDO	O	507	-	3,3,3	0.37	0	2,2,2	0.09	0
5	EDO	H	503	-	3,3,3	0.23	0	2,2,2	0.43	0
5	EDO	E	505	-	3,3,3	0.34	0	2,2,2	0.35	0
4	CAP	B	502	3	17,20,20	1.20	2 (11%)	22,31,31	0.83	0
5	EDO	K	505	-	3,3,3	0.29	0	2,2,2	0.29	0
5	EDO	B	504	-	3,3,3	0.32	0	2,2,2	0.23	0
5	EDO	F	201	-	3,3,3	0.30	0	2,2,2	0.12	0
5	EDO	V	507	-	3,3,3	0.36	0	2,2,2	0.11	0
5	EDO	K	507	-	3,3,3	0.36	0	2,2,2	0.21	0
5	EDO	R	508	-	3,3,3	0.35	0	2,2,2	0.03	0
5	EDO	A	507	-	3,3,3	0.37	0	2,2,2	0.16	0
5	EDO	H	506	-	3,3,3	0.37	0	2,2,2	0.17	0
5	EDO	B	505	-	3,3,3	0.31	0	2,2,2	0.20	0
5	EDO	H	505	-	3,3,3	0.35	0	2,2,2	0.12	0
5	EDO	K	506	-	3,3,3	0.43	0	2,2,2	0.21	0
5	EDO	O	504	-	3,3,3	0.20	0	2,2,2	0.10	0
5	EDO	E	504	-	3,3,3	0.36	0	2,2,2	0.24	0
5	EDO	H	507	-	3,3,3	0.32	0	2,2,2	0.08	0
5	EDO	B	506	-	3,3,3	0.40	0	2,2,2	0.21	0
5	EDO	R	505	-	3,3,3	0.32	0	2,2,2	0.31	0
5	EDO	A	504	-	3,3,3	0.32	0	2,2,2	0.06	0
5	EDO	R	503	-	3,3,3	0.40	0	2,2,2	0.13	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
5	EDO	R	504	-	-	1/1/1/1	-
5	EDO	A	508	-	-	1/1/1/1	-
5	EDO	A	509	-	-	1/1/1/1	-
4	CAP	E	502	3	-	7/29/29/29	-
5	EDO	E	503	-	-	0/1/1/1	-
5	EDO	H	504	-	-	0/1/1/1	-
5	EDO	O	503	-	-	0/1/1/1	-
5	EDO	H	508	-	-	0/1/1/1	-
5	EDO	M	201	-	-	1/1/1/1	-
5	EDO	A	506	-	-	1/1/1/1	-
5	EDO	O	506	-	-	0/1/1/1	-
5	EDO	B	508	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	EDO	R	506	-	-	1/1/1/1	-
5	EDO	V	506	-	-	1/1/1/1	-
5	EDO	T	201	-	-	1/1/1/1	-
5	EDO	J	202	-	-	1/1/1/1	-
5	EDO	I	202	-	-	0/1/1/1	-
5	EDO	R	507	-	-	0/1/1/1	-
4	CAP	O	502	3	-	7/29/29/29	-
5	EDO	B	503	-	-	0/1/1/1	-
5	EDO	E	506	-	-	1/1/1/1	-
5	EDO	P	202	-	-	0/1/1/1	-
5	EDO	C	202	-	-	1/1/1/1	-
4	CAP	R	502	3	-	7/29/29/29	-
5	EDO	P	201	-	-	0/1/1/1	-
5	EDO	J	201	-	-	0/1/1/1	-
5	EDO	C	201	-	-	0/1/1/1	-
5	EDO	E	507	-	-	0/1/1/1	-
4	CAP	A	502	3	-	7/29/29/29	-
5	EDO	O	505	-	-	0/1/1/1	-
5	EDO	B	509	-	-	1/1/1/1	-
5	EDO	B	507	-	-	1/1/1/1	-
5	EDO	F	202	-	-	0/1/1/1	-
4	CAP	H	502	3	-	7/29/29/29	-
5	EDO	V	505	-	-	0/1/1/1	-
4	CAP	V	502	3	-	7/29/29/29	-
5	EDO	V	503	-	-	0/1/1/1	-
4	CAP	K	502	3	-	6/29/29/29	-
5	EDO	A	505	-	-	0/1/1/1	-
5	EDO	I	201	-	-	1/1/1/1	-
5	EDO	K	504	-	-	1/1/1/1	-
5	EDO	A	503	-	-	0/1/1/1	-
5	EDO	V	504	-	-	1/1/1/1	-
5	EDO	T	202	-	-	0/1/1/1	-
5	EDO	K	503	-	-	0/1/1/1	-
5	EDO	O	507	-	-	1/1/1/1	-
5	EDO	H	503	-	-	0/1/1/1	-
5	EDO	E	505	-	-	1/1/1/1	-
4	CAP	B	502	3	-	6/29/29/29	-
5	EDO	K	505	-	-	0/1/1/1	-
5	EDO	B	504	-	-	1/1/1/1	-
5	EDO	F	201	-	-	0/1/1/1	-
5	EDO	V	507	-	-	0/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	EDO	K	507	-	-	1/1/1/1	-
5	EDO	R	508	-	-	1/1/1/1	-
5	EDO	A	507	-	-	1/1/1/1	-
5	EDO	H	506	-	-	0/1/1/1	-
5	EDO	B	505	-	-	1/1/1/1	-
5	EDO	H	505	-	-	0/1/1/1	-
5	EDO	K	506	-	-	0/1/1/1	-
5	EDO	O	504	-	-	1/1/1/1	-
5	EDO	E	504	-	-	1/1/1/1	-
5	EDO	H	507	-	-	1/1/1/1	-
5	EDO	B	506	-	-	0/1/1/1	-
5	EDO	R	505	-	-	0/1/1/1	-
5	EDO	A	504	-	-	0/1/1/1	-
5	EDO	R	503	-	-	1/1/1/1	-

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	O	502	CAP	O6-C	3.29	1.32	1.22
4	V	502	CAP	O6-C	3.07	1.32	1.22
4	E	502	CAP	O6-C	3.05	1.32	1.22
4	K	502	CAP	O6-C	2.99	1.31	1.22
4	V	502	CAP	O7-C	2.99	1.41	1.30
4	B	502	CAP	O6-C	2.94	1.31	1.22
4	E	502	CAP	O7-C	2.94	1.41	1.30
4	R	502	CAP	O6-C	2.91	1.31	1.22
4	A	502	CAP	O6-C	2.87	1.31	1.22
4	B	502	CAP	O7-C	2.86	1.41	1.30
4	R	502	CAP	O7-C	2.81	1.40	1.30
4	O	502	CAP	O7-C	2.81	1.40	1.30
4	H	502	CAP	O6-C	2.80	1.31	1.22
4	H	502	CAP	O7-C	2.76	1.40	1.30
4	A	502	CAP	O7-C	2.73	1.40	1.30
4	K	502	CAP	O7-C	2.64	1.40	1.30
4	K	502	CAP	O2-C2	2.28	1.47	1.42

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	E	502	CAP	O2-C2-C	-3.52	102.55	108.97
4	R	502	CAP	O2-C2-C	-3.34	102.87	108.97
4	V	502	CAP	O2-C2-C	-2.42	104.54	108.97

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	H	502	CAP	O2-C2-C	-2.25	104.86	108.97
4	K	502	CAP	O2-C2-C	-2.07	105.19	108.97

There are no chirality outliers.

All (82) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	502	CAP	O6-C-C2-C1
4	A	502	CAP	O7-C-C2-C1
4	A	502	CAP	O6-C-C2-O2
4	A	502	CAP	O7-C-C2-O2
4	A	502	CAP	O3-C3-C4-O4
4	B	502	CAP	O6-C-C2-C1
4	B	502	CAP	O7-C-C2-C1
4	B	502	CAP	O6-C-C2-O2
4	B	502	CAP	O7-C-C2-O2
4	B	502	CAP	O3-C3-C4-O4
4	E	502	CAP	O6-C-C2-C1
4	E	502	CAP	O7-C-C2-C1
4	E	502	CAP	O6-C-C2-O2
4	E	502	CAP	O7-C-C2-O2
4	E	502	CAP	O3-C3-C4-O4
4	H	502	CAP	O6-C-C2-C1
4	H	502	CAP	O7-C-C2-C1
4	H	502	CAP	O6-C-C2-O2
4	H	502	CAP	O7-C-C2-O2
4	H	502	CAP	C2-C3-C4-O4
4	H	502	CAP	O3-C3-C4-O4
4	K	502	CAP	O6-C-C2-C1
4	K	502	CAP	O7-C-C2-C1
4	K	502	CAP	O6-C-C2-O2
4	K	502	CAP	O7-C-C2-O2
4	K	502	CAP	O3-C3-C4-O4
4	O	502	CAP	O6-C-C2-C1
4	O	502	CAP	O7-C-C2-C1
4	O	502	CAP	O6-C-C2-O2
4	O	502	CAP	O7-C-C2-O2
4	O	502	CAP	O3-C3-C4-O4
4	R	502	CAP	O6-C-C2-C1
4	R	502	CAP	O6-C-C2-O2
4	R	502	CAP	O7-C-C2-O2
4	R	502	CAP	C2-C3-C4-O4

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Mol	Chain	Res	Type	Atoms
4	R	502	CAP	O3-C3-C4-O4
4	V	502	CAP	O6-C-C2-C1
4	V	502	CAP	O7-C-C2-C1
4	V	502	CAP	O6-C-C2-O2
4	V	502	CAP	O7-C-C2-O2
4	V	502	CAP	O3-C3-C4-O4
4	R	502	CAP	O7-C-C2-C1
5	B	508	EDO	O1-C1-C2-O2
5	K	504	EDO	O1-C1-C2-O2
5	R	508	EDO	O1-C1-C2-O2
4	A	502	CAP	O2-C2-C3-C4
4	B	502	CAP	O2-C2-C3-C4
4	E	502	CAP	O2-C2-C3-C4
4	H	502	CAP	O2-C2-C3-C4
4	K	502	CAP	O2-C2-C3-C4
4	O	502	CAP	O2-C2-C3-C4
4	R	502	CAP	O2-C2-C3-C4
4	V	502	CAP	O2-C2-C3-C4
4	E	502	CAP	C2-C3-C4-O4
4	O	502	CAP	C2-C3-C4-O4
5	C	202	EDO	O1-C1-C2-O2
5	M	201	EDO	O1-C1-C2-O2
5	O	507	EDO	O1-C1-C2-O2
5	R	504	EDO	O1-C1-C2-O2
5	A	506	EDO	O1-C1-C2-O2
5	B	504	EDO	O1-C1-C2-O2
5	B	507	EDO	O1-C1-C2-O2
5	E	504	EDO	O1-C1-C2-O2
5	E	505	EDO	O1-C1-C2-O2
5	E	506	EDO	O1-C1-C2-O2
5	O	504	EDO	O1-C1-C2-O2
5	V	504	EDO	O1-C1-C2-O2
5	V	506	EDO	O1-C1-C2-O2
5	B	509	EDO	O1-C1-C2-O2
5	K	507	EDO	O1-C1-C2-O2
4	A	502	CAP	C2-C3-C4-O4
4	V	502	CAP	C2-C3-C4-O4
5	A	508	EDO	O1-C1-C2-O2
5	I	201	EDO	O1-C1-C2-O2
5	A	509	EDO	O1-C1-C2-O2
5	B	505	EDO	O1-C1-C2-O2
5	H	507	EDO	O1-C1-C2-O2

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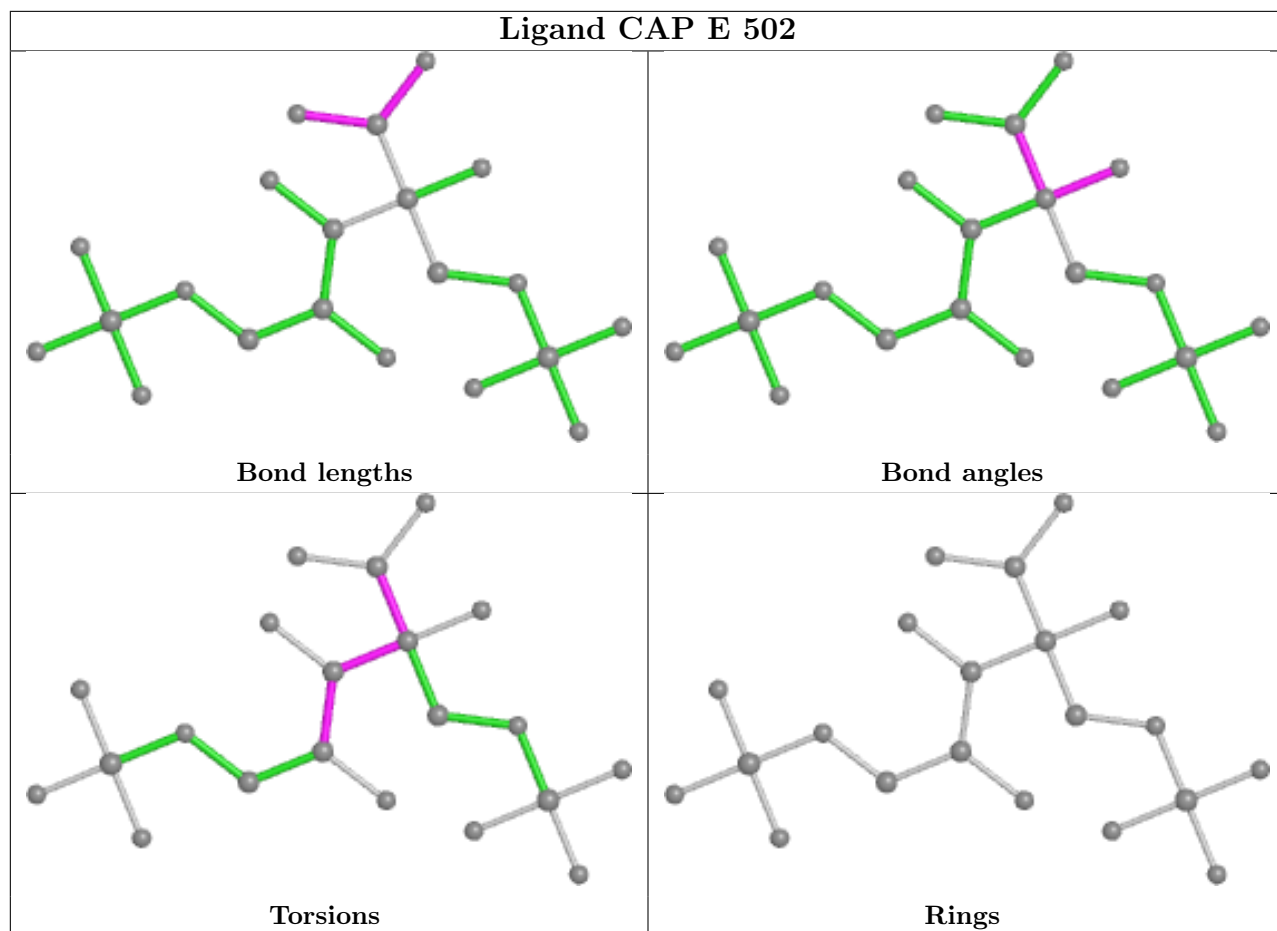
Mol	Chain	Res	Type	Atoms
5	A	507	EDO	O1-C1-C2-O2
5	J	202	EDO	O1-C1-C2-O2
5	R	503	EDO	O1-C1-C2-O2
5	R	506	EDO	O1-C1-C2-O2
5	T	201	EDO	O1-C1-C2-O2

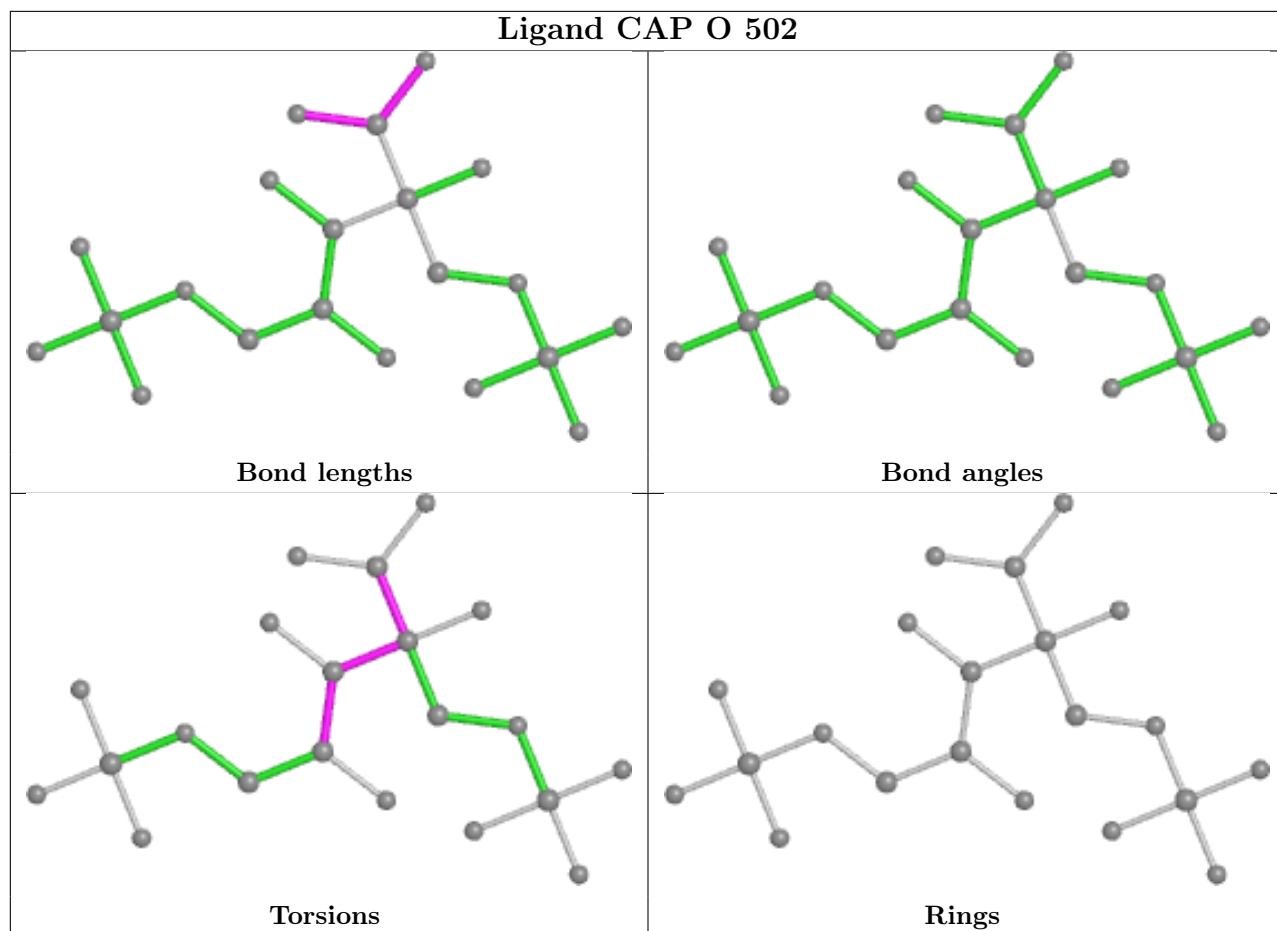
There are no ring outliers.

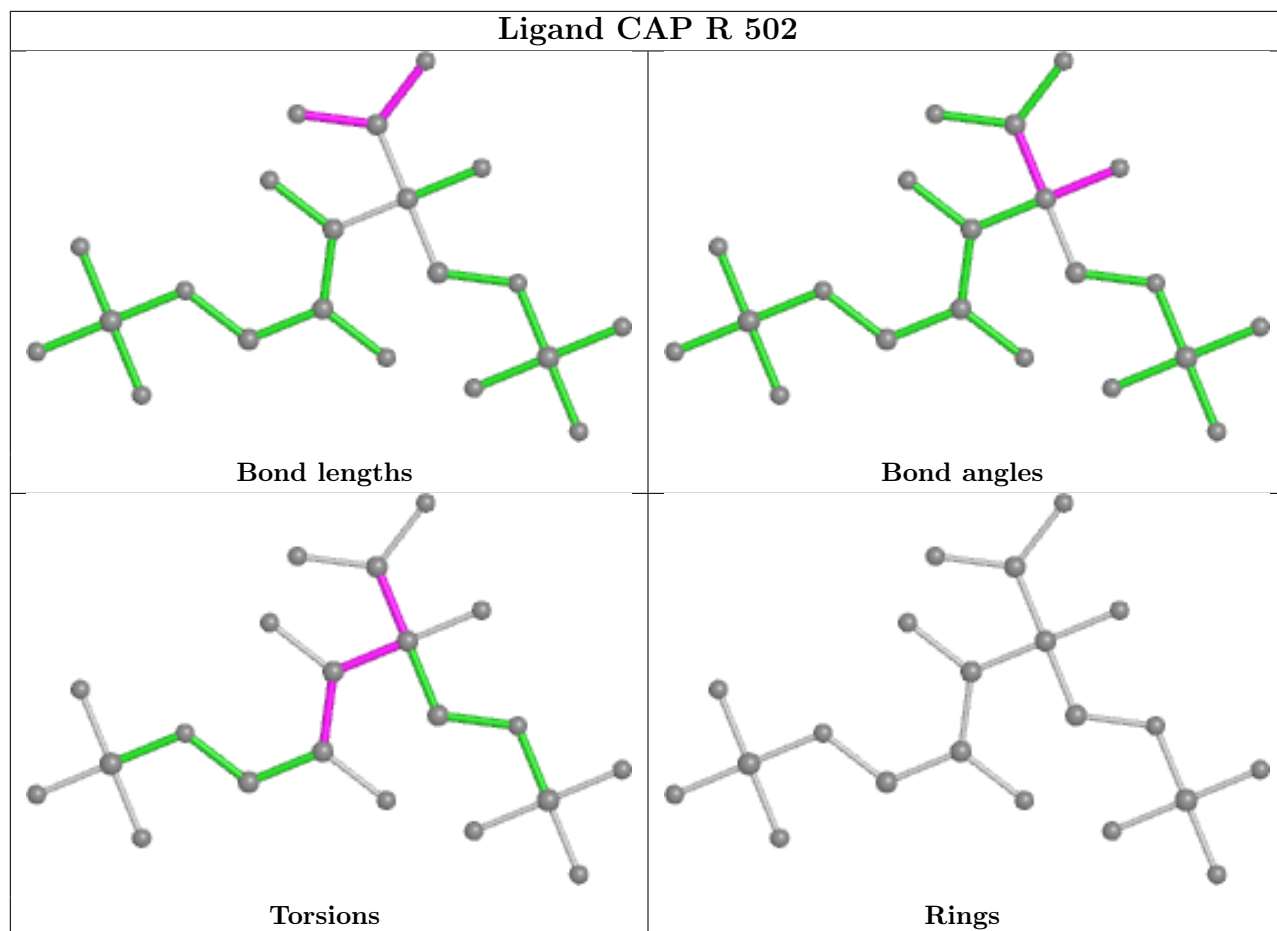
13 monomers are involved in 20 short contacts:

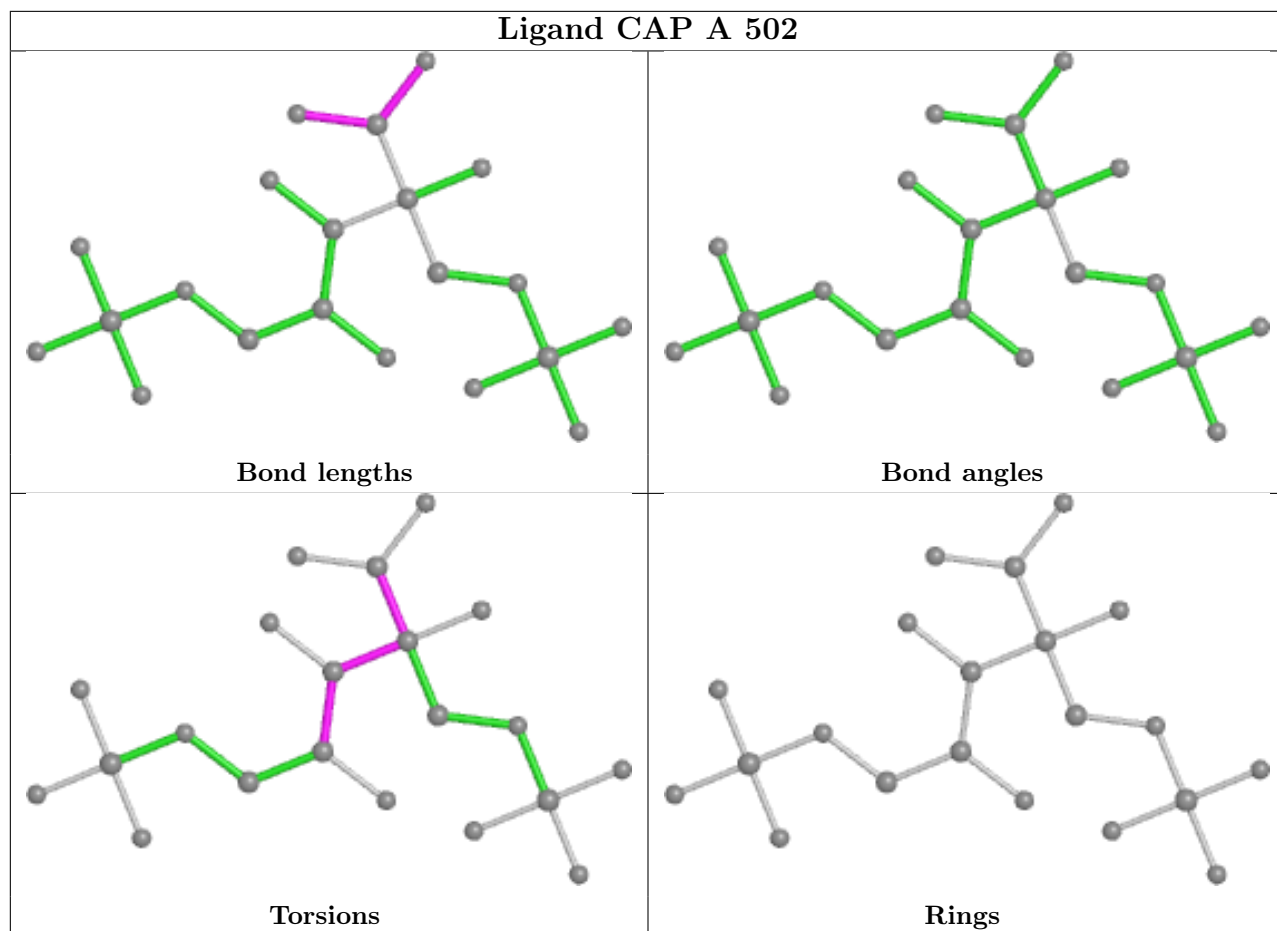
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	508	EDO	1	0
5	A	509	EDO	2	0
5	H	504	EDO	1	0
5	H	508	EDO	1	0
5	R	506	EDO	1	0
5	V	506	EDO	3	0
5	J	202	EDO	1	0
5	E	506	EDO	1	0
5	B	509	EDO	3	0
5	A	503	EDO	1	0
5	E	505	EDO	1	0
5	V	507	EDO	3	0
5	B	506	EDO	1	0

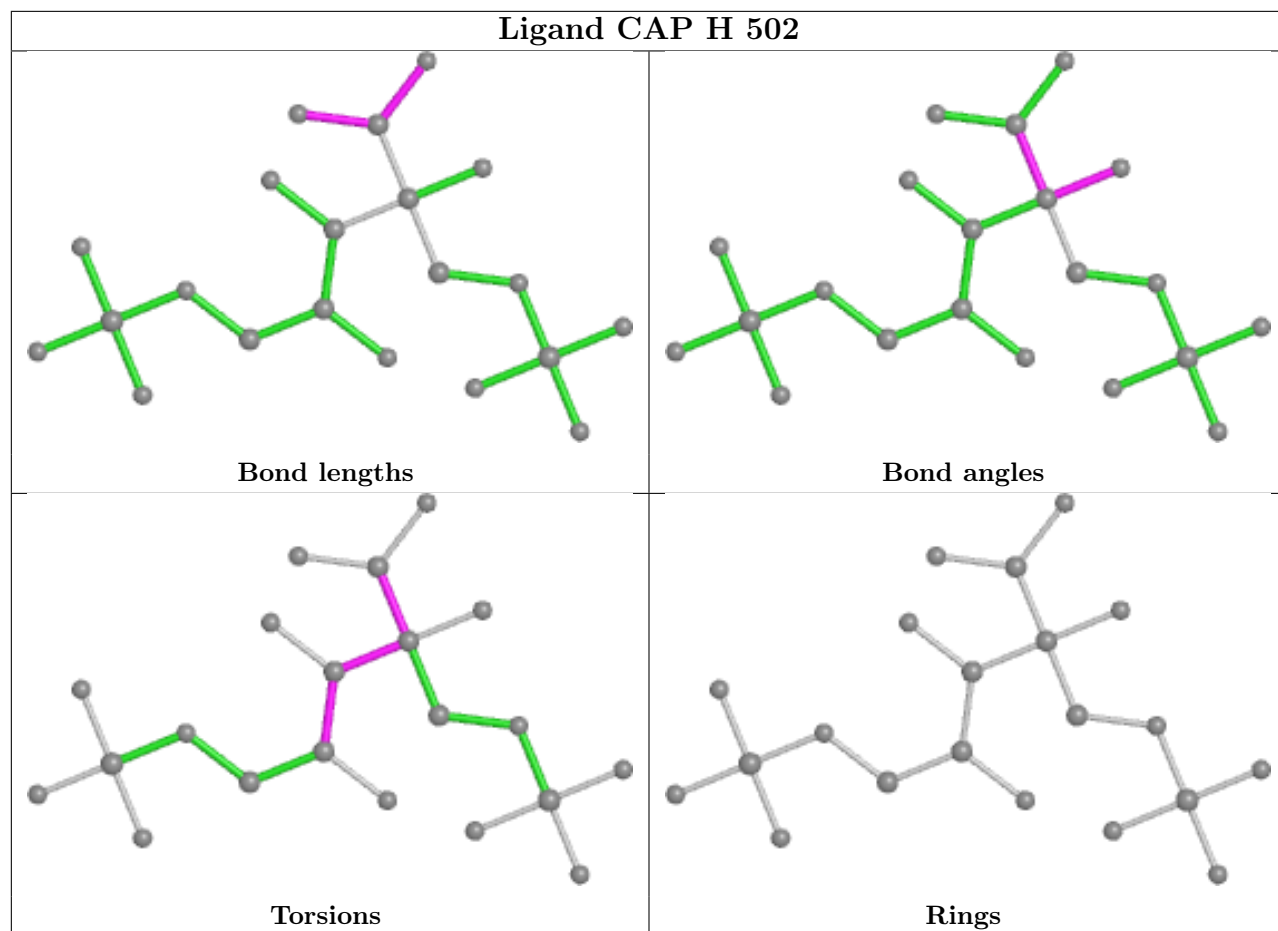
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

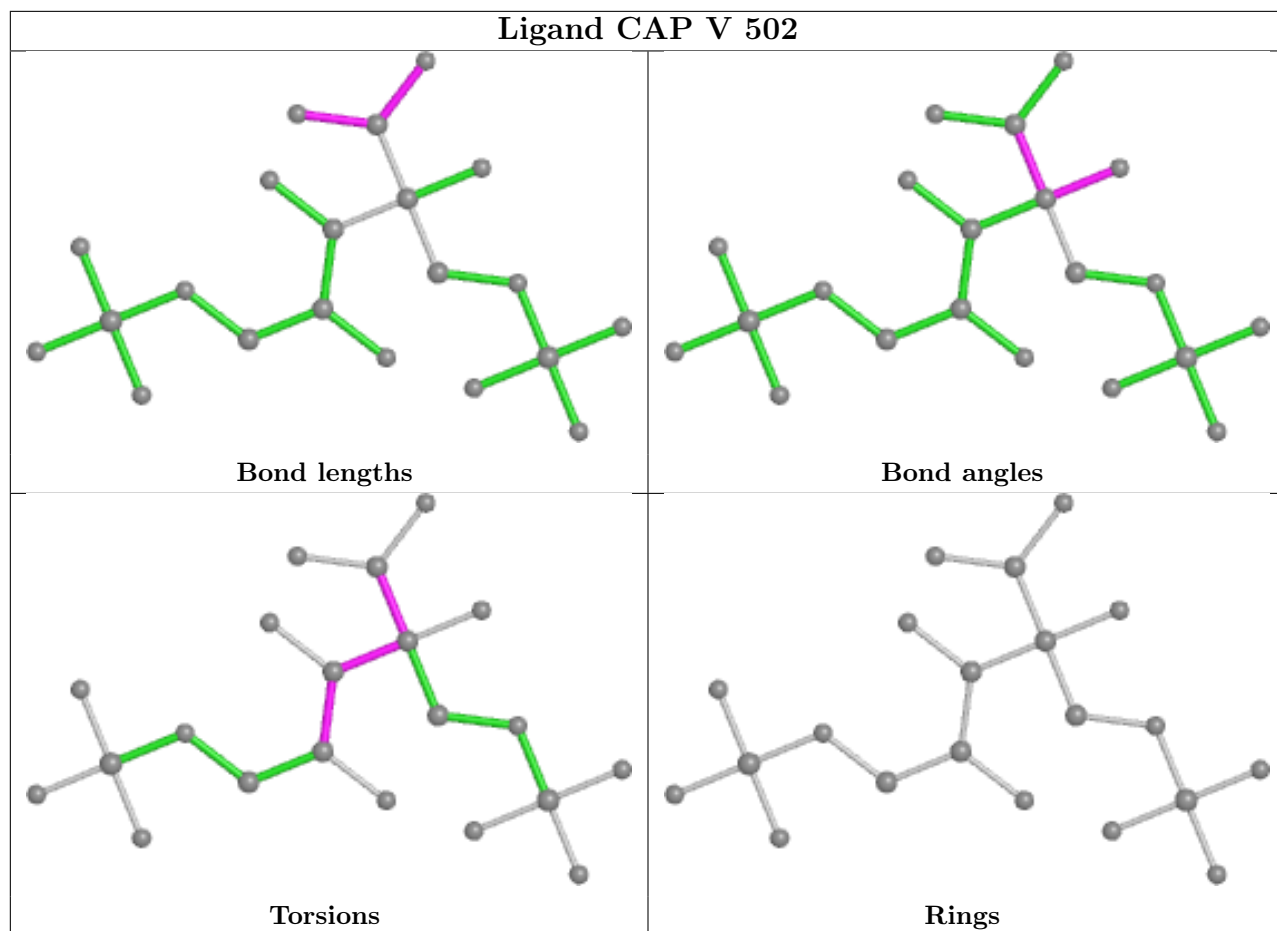


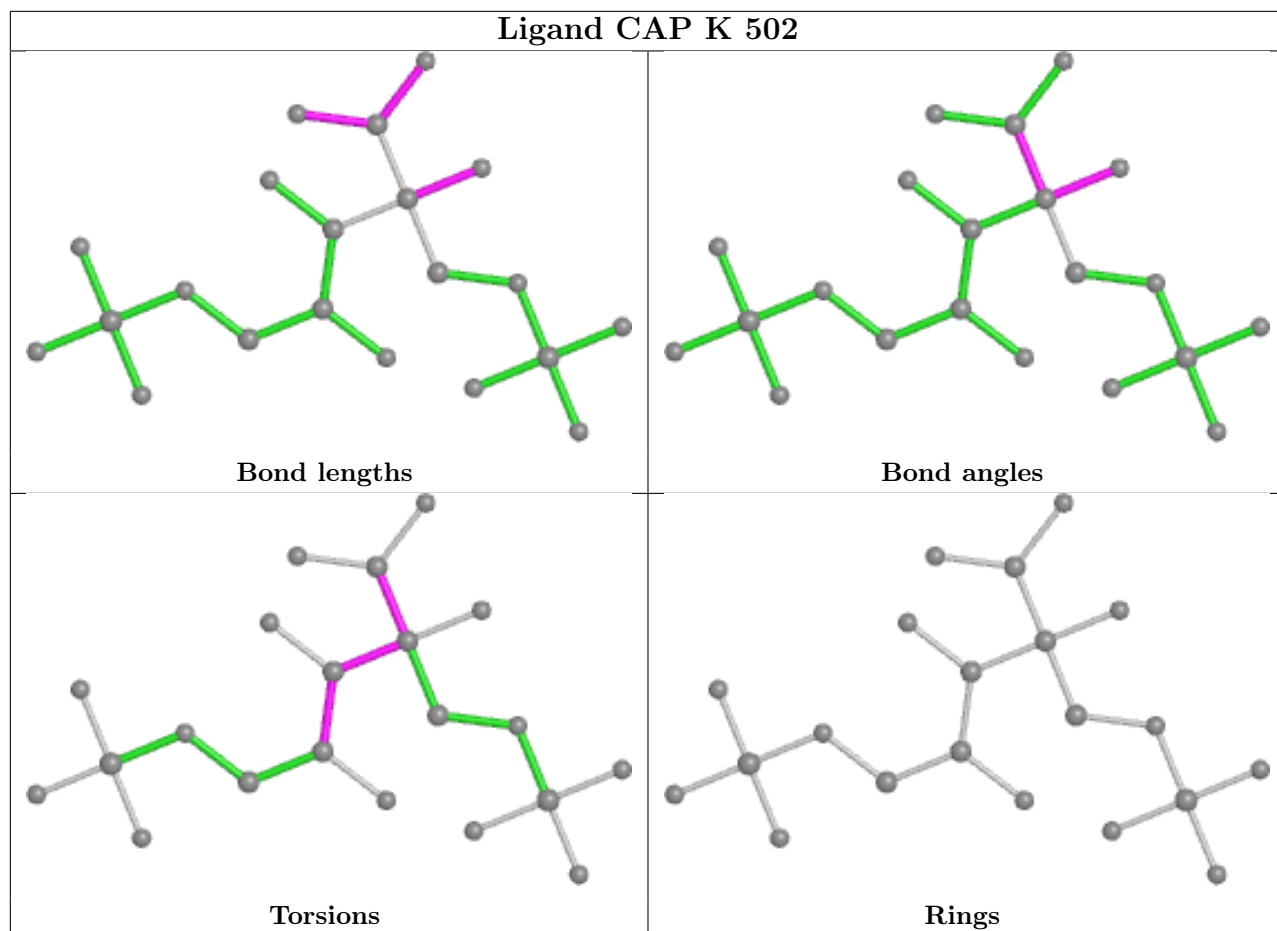


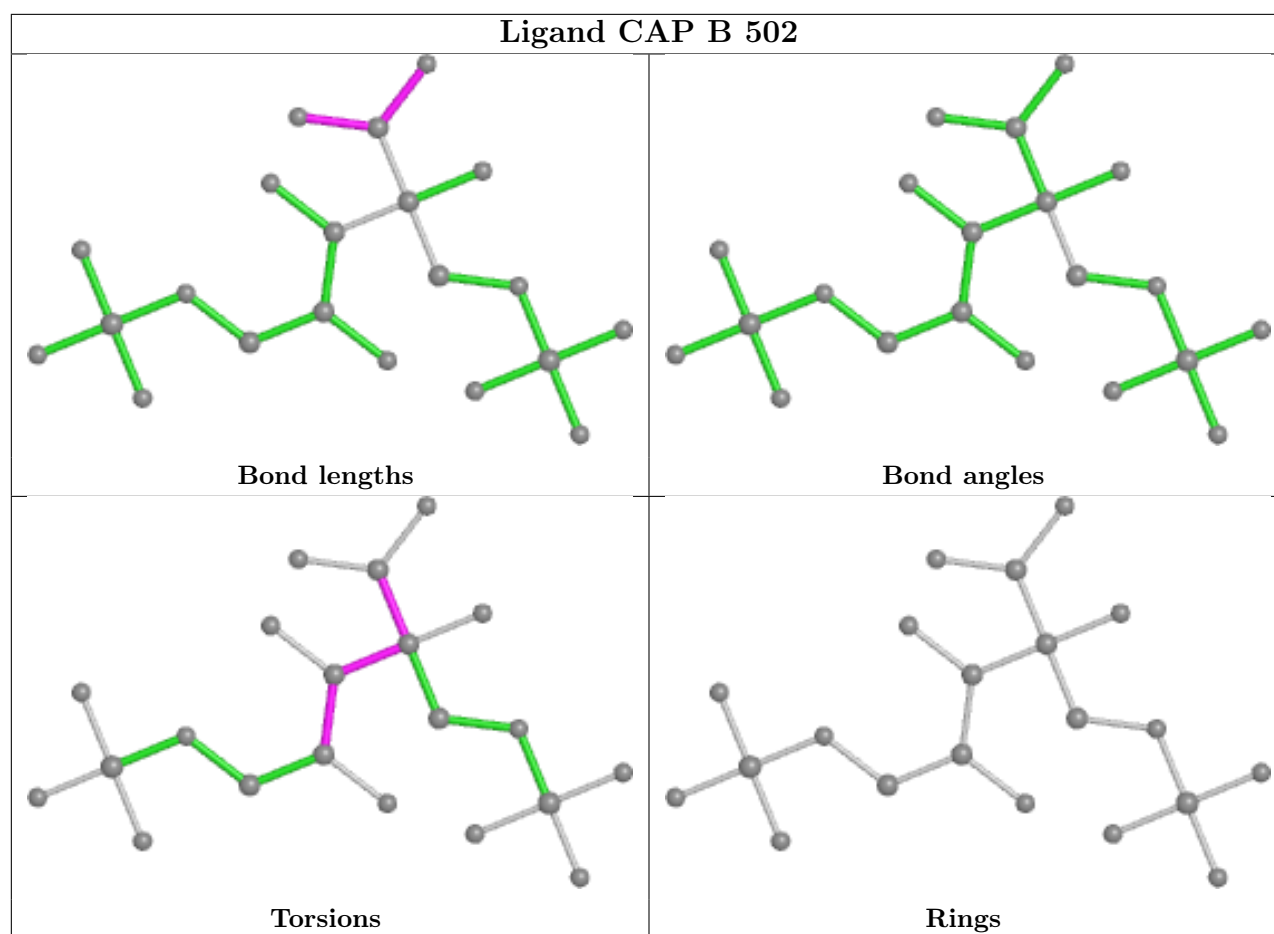












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	K	2

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	K	360:ARG	C	361:GLY	N	2.35
1	K	359:SER	C	360:ARG	N	1.82

6 Fit of model and data [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	460/475 (96%)	-0.64	3 (0%) 87 91	24, 31, 46, 63	0
1	B	460/475 (96%)	-0.67	2 (0%) 92 95	24, 31, 46, 63	0
1	E	464/475 (97%)	-0.58	7 (1%) 73 79	24, 31, 47, 92	0
1	H	464/475 (97%)	-0.58	9 (1%) 66 73	24, 31, 47, 95	0
1	K	464/475 (97%)	-0.55	6 (1%) 77 81	24, 31, 47, 90	0
1	O	464/475 (97%)	-0.58	7 (1%) 73 79	24, 31, 47, 87	0
1	R	460/475 (96%)	-0.62	5 (1%) 80 85	24, 31, 46, 63	0
1	V	460/475 (96%)	-0.64	4 (0%) 84 88	24, 31, 46, 63	0
2	C	140/140 (100%)	-0.28	0 100 100	30, 40, 52, 64	0
2	F	140/140 (100%)	-0.27	4 (2%) 51 58	30, 40, 52, 60	0
2	I	140/140 (100%)	-0.35	1 (0%) 87 91	30, 40, 52, 56	0
2	J	140/140 (100%)	-0.22	1 (0%) 87 91	30, 40, 52, 63	1 (0%)
2	M	140/140 (100%)	-0.46	0 100 100	30, 40, 52, 57	1 (0%)
2	P	140/140 (100%)	-0.36	2 (1%) 75 80	30, 40, 52, 60	0
2	T	140/140 (100%)	-0.16	6 (4%) 35 42	30, 40, 52, 57	0
2	W	140/140 (100%)	-0.51	0 100 100	30, 40, 52, 56	1 (0%)
All	All	4816/4920 (97%)	-0.54	57 (1%) 79 83	24, 32, 50, 95	3 (0%)

All (57) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	V	92	GLY	7.0
1	H	7	THR	5.2
1	E	8	LYS	4.9
1	K	8	LYS	4.5
1	K	7	THR	4.5

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Mol	Chain	Res	Type	RSRZ
2	F	127	LYS	4.4
1	O	8	LYS	4.2
1	H	8	LYS	3.9
1	K	439	ARG	3.8
1	V	94	ASP	3.8
1	E	7	THR	3.7
2	J	132	TRP	3.5
1	R	92	GLY	3.5
1	R	439	ARG	3.5
1	B	94	ASP	3.4
1	K	10	GLY	3.3
2	T	132	TRP	3.3
1	E	9	ALA	3.3
1	O	10	GLY	3.2
1	E	439	ARG	3.1
1	O	94	ASP	3.1
1	H	94	ASP	3.1
1	A	94	ASP	3.1
1	V	11	ALA	2.9
1	O	439	ARG	2.9
1	E	10	GLY	2.9
1	O	7	THR	2.9
2	T	130	ARG	2.8
2	I	137	LYS	2.8
2	T	102	ASP	2.7
1	K	9	ALA	2.7
2	F	132	TRP	2.6
1	H	439	ARG	2.6
2	T	136	ASN	2.6
1	O	9	ALA	2.6
1	H	91	PRO	2.5
1	R	443	ASP	2.5
2	T	129	ALA	2.5
1	H	464	GLU	2.5
1	H	9	ALA	2.5
1	K	94	ASP	2.4
2	T	128	SER	2.3
1	R	94	ASP	2.3
2	P	132	TRP	2.3
1	H	450	LYS	2.3
2	P	84	ARG	2.3
1	V	439	ARG	2.3

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Mol	Chain	Res	Type	RSRZ
1	R	11	ALA	2.3
1	E	89	PRO	2.2
1	H	89	PRO	2.2
2	F	126	PRO	2.2
1	O	92	GLY	2.2
2	F	102	ASP	2.2
1	A	439	ARG	2.1
1	E	450	LYS	2.1
1	B	439	ARG	2.0
1	A	464	GLU	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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
1	HYP	B	151	8/9	0.92	0.10	24,27,29,30	0
1	HYP	E	104	8/9	0.92	0.10	26,28,30,30	0
1	HYP	V	151	8/9	0.93	0.10	24,28,29,30	0
1	HYP	B	104	8/9	0.94	0.09	26,28,30,30	0
1	HYP	H	104	8/9	0.94	0.09	26,29,30,30	0
1	HYP	O	151	8/9	0.94	0.09	24,28,29,30	0
1	HYP	R	104	7/9	0.94	0.08	26,28,30,30	0
1	HYP	A	151	8/9	0.94	0.08	24,28,29,30	0
1	HYP	R	151	8/9	0.95	0.09	24,28,29,30	0
1	HYP	V	104	8/9	0.95	0.07	26,28,30,30	0
1	HYP	O	104	8/9	0.95	0.07	26,28,30,30	0
1	HYP	K	104	8/9	0.96	0.08	26,29,30,30	0
1	HYP	K	151	8/9	0.96	0.07	24,28,29,30	0
1	KCX	A	201	12/13	0.96	0.12	23,26,28,29	0
1	KCX	B	201	12/13	0.96	0.11	23,26,28,29	0
1	SMC	O	256	7/8	0.96	0.08	27,29,30,30	0
1	SMC	A	256	7/8	0.96	0.09	27,29,29,31	0
1	HYP	A	104	8/9	0.96	0.08	26,28,30,30	0
1	HYP	H	151	8/9	0.96	0.06	24,28,29,30	0
1	SMC	H	369	7/8	0.96	0.07	28,31,32,37	0
1	SMC	E	369	7/8	0.97	0.06	28,30,32,37	0
1	KCX	O	201	12/13	0.97	0.13	23,26,28,29	0
1	SMC	B	256	7/8	0.97	0.07	27,28,29,30	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
1	SMC	O	369	7/8	0.97	0.07	28,30,32,36	0
1	HYP	E	151	8/9	0.97	0.06	24,28,29,30	0
1	KCX	K	201	12/13	0.97	0.12	23,26,28,29	0
1	KCX	R	201	12/13	0.97	0.12	23,26,28,29	0
1	SMC	R	256	7/8	0.97	0.07	27,29,29,31	0
1	SMC	K	369	7/8	0.97	0.08	28,30,32,37	0
1	KCX	H	201	12/13	0.97	0.10	23,26,28,29	0
1	KCX	V	201	12/13	0.97	0.12	23,26,28,29	0
1	SMC	V	369	7/8	0.97	0.07	28,30,32,37	0
1	SMC	K	256	7/8	0.98	0.07	27,29,29,31	0
1	SMC	R	369	7/8	0.98	0.07	28,30,32,37	0
1	SMC	A	369	7/8	0.98	0.06	28,30,32,37	0
1	SMC	B	369	7/8	0.98	0.06	28,30,32,36	0
1	KCX	E	201	12/13	0.98	0.12	23,26,28,29	0
1	SMC	V	256	7/8	0.98	0.06	27,29,30,31	0
1	SMC	E	256	7/8	0.98	0.07	27,29,29,31	0
1	SMC	H	256	7/8	0.99	0.05	27,29,29,30	0

6.3 Carbohydrates [i](#)

There are no monosaccharides 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
5	EDO	V	507	4/4	0.29	0.41	62,63,63,67	0
5	EDO	C	202	4/4	0.47	0.29	88,89,91,92	0
5	EDO	K	507	4/4	0.59	0.36	61,64,65,67	0
5	EDO	A	508	4/4	0.61	0.20	66,69,70,71	0
5	EDO	B	507	4/4	0.65	0.27	52,55,55,57	0
5	EDO	A	506	4/4	0.66	0.38	56,59,61,63	0
5	EDO	O	507	4/4	0.67	0.26	55,57,58,59	0
5	EDO	B	509	4/4	0.71	0.15	57,57,58,61	0
5	EDO	T	201	4/4	0.74	0.20	62,64,69,70	0
5	EDO	A	505	4/4	0.74	0.16	55,55,56,58	0
5	EDO	H	507	4/4	0.75	0.22	59,62,62,63	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
5	EDO	V	506	4/4	0.76	0.35	53,62,67,69	0
5	EDO	H	505	4/4	0.76	0.30	59,62,62,63	0
5	EDO	R	508	4/4	0.78	0.28	59,60,60,61	0
5	EDO	B	505	4/4	0.78	0.18	48,53,53,55	0
5	EDO	E	507	4/4	0.79	0.20	55,65,66,72	0
5	EDO	P	202	4/4	0.79	0.31	59,61,62,62	0
5	EDO	V	505	4/4	0.80	0.14	51,54,58,58	0
5	EDO	K	505	4/4	0.81	0.23	56,63,64,66	0
5	EDO	I	201	4/4	0.84	0.22	56,60,61,63	0
5	EDO	J	202	4/4	0.85	0.16	44,46,48,49	0
5	EDO	M	201	4/4	0.87	0.22	74,74,74,76	0
5	EDO	J	201	4/4	0.87	0.15	50,56,60,63	0
5	EDO	E	506	4/4	0.88	0.15	48,53,56,56	0
5	EDO	E	505	4/4	0.88	0.14	46,49,49,51	0
5	EDO	K	506	4/4	0.88	0.16	39,41,45,49	0
5	EDO	O	505	4/4	0.89	0.16	58,64,67,67	0
5	EDO	H	508	4/4	0.89	0.17	38,41,46,48	0
5	EDO	B	503	4/4	0.90	0.11	30,31,37,37	0
5	EDO	H	506	4/4	0.90	0.24	49,51,52,55	0
5	EDO	C	201	4/4	0.90	0.30	53,54,57,60	0
5	EDO	O	503	4/4	0.90	0.15	35,40,40,43	0
5	EDO	K	503	4/4	0.90	0.13	40,45,45,49	0
5	EDO	F	201	4/4	0.90	0.26	51,53,53,56	0
5	EDO	R	505	4/4	0.91	0.13	40,43,43,46	0
5	EDO	A	509	4/4	0.91	0.22	49,59,61,63	0
5	EDO	O	506	4/4	0.91	0.19	42,51,52,57	0
5	EDO	I	202	4/4	0.92	0.20	64,64,64,65	0
5	EDO	R	507	4/4	0.93	0.11	31,32,32,36	0
5	EDO	F	202	4/4	0.93	0.12	49,53,53,55	0
5	EDO	A	503	4/4	0.93	0.11	33,35,36,37	0
5	EDO	O	504	4/4	0.94	0.11	33,34,35,39	0
5	EDO	P	201	4/4	0.94	0.16	41,47,51,58	0
5	EDO	K	504	4/4	0.94	0.10	32,33,35,36	0
5	EDO	V	503	4/4	0.94	0.09	30,35,38,40	0
5	EDO	R	503	4/4	0.94	0.12	31,31,34,35	0
5	EDO	B	508	4/4	0.94	0.11	22,22,25,29	0
5	EDO	R	506	4/4	0.94	0.18	46,47,49,54	0
5	EDO	T	202	4/4	0.95	0.09	38,44,45,46	0
5	EDO	A	507	4/4	0.95	0.10	34,34,36,37	0
5	EDO	E	503	4/4	0.95	0.09	29,35,36,39	0
5	EDO	R	504	4/4	0.95	0.08	36,37,40,42	0
5	EDO	B	506	4/4	0.95	0.15	29,39,39,41	0

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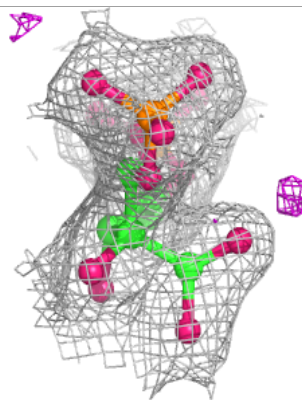
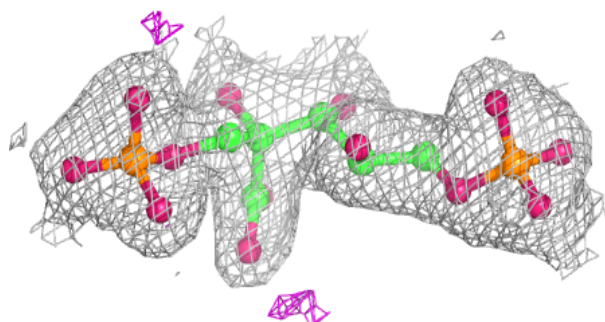
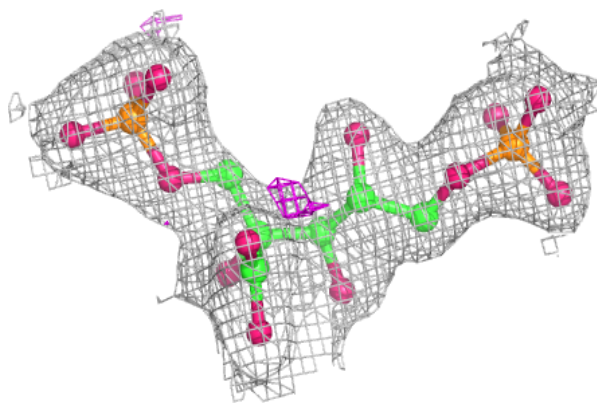
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
3	MG	K	501	1/1	0.96	0.08	27,27,27,27	0
5	EDO	H	504	4/4	0.96	0.10	39,40,42,43	0
5	EDO	V	504	4/4	0.96	0.09	39,41,41,46	0
5	EDO	E	504	4/4	0.97	0.09	28,33,34,35	0
3	MG	R	501	1/1	0.97	0.06	28,28,28,28	0
5	EDO	B	504	4/4	0.97	0.08	33,33,35,37	0
4	CAP	V	502	21/21	0.97	0.09	28,31,33,37	0
3	MG	B	501	1/1	0.97	0.09	27,27,27,27	0
3	MG	A	501	1/1	0.97	0.10	27,27,27,27	0
5	EDO	H	503	4/4	0.97	0.05	33,33,34,37	0
3	MG	O	501	1/1	0.98	0.09	27,27,27,27	0
4	CAP	A	502	21/21	0.98	0.12	27,31,32,37	0
5	EDO	A	504	4/4	0.98	0.09	33,34,41,42	0
4	CAP	B	502	21/21	0.98	0.11	28,31,32,37	0
4	CAP	E	502	21/21	0.98	0.11	28,31,33,37	0
4	CAP	R	502	21/21	0.98	0.10	27,31,33,37	0
3	MG	E	501	1/1	0.99	0.14	27,27,27,27	0
3	MG	V	501	1/1	0.99	0.07	27,27,27,27	0
4	CAP	H	502	21/21	0.99	0.09	28,32,33,37	0
4	CAP	K	502	21/21	0.99	0.13	27,31,33,37	0
4	CAP	O	502	21/21	0.99	0.10	27,31,33,37	0
3	MG	H	501	1/1	0.99	0.05	28,28,28,28	0

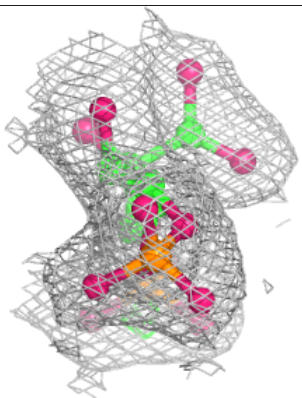
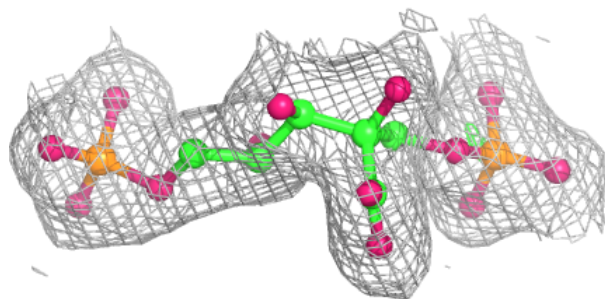
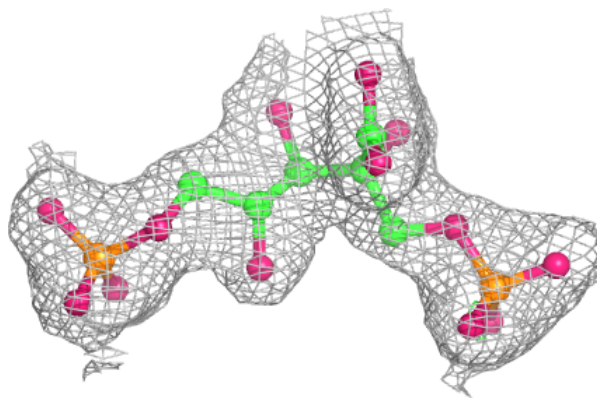
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around CAP V 502:

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

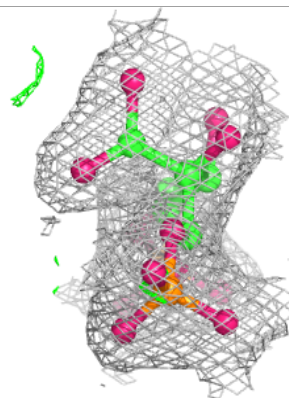
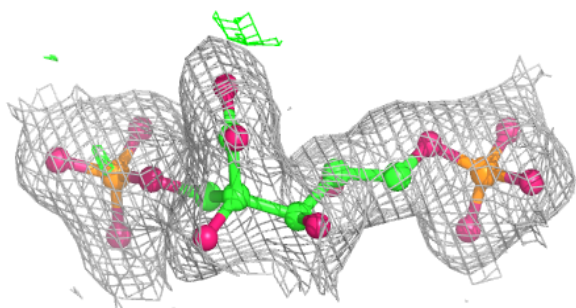
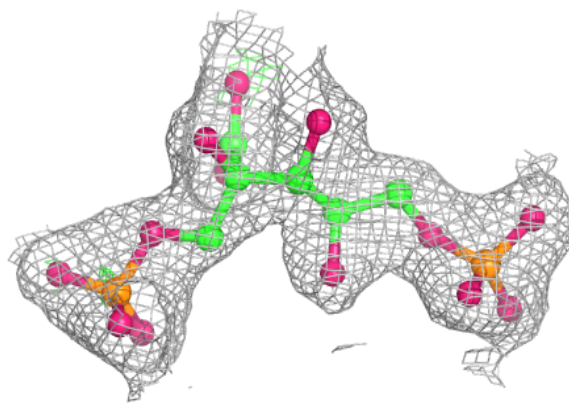
**Electron density around CAP A 502:**

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

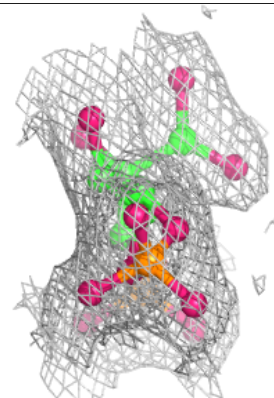
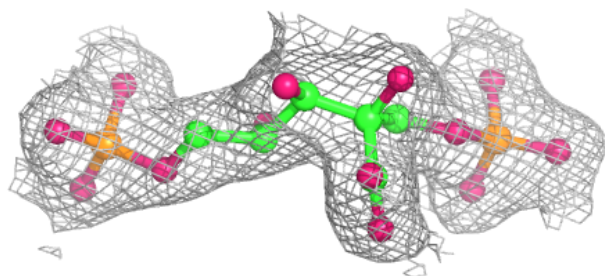
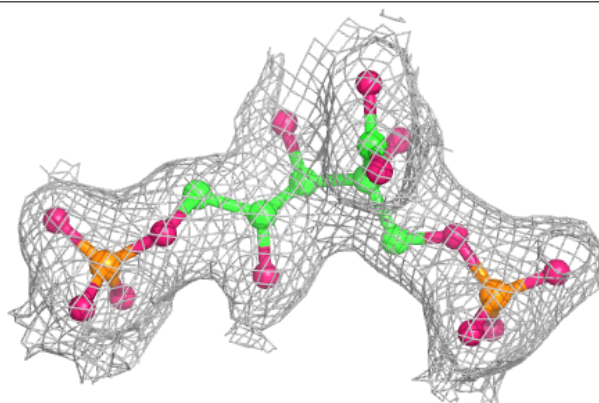


Electron density around CAP B 502:

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

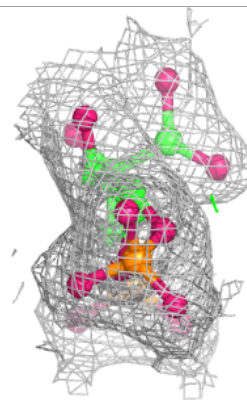
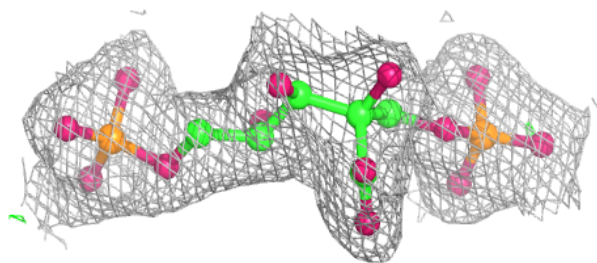
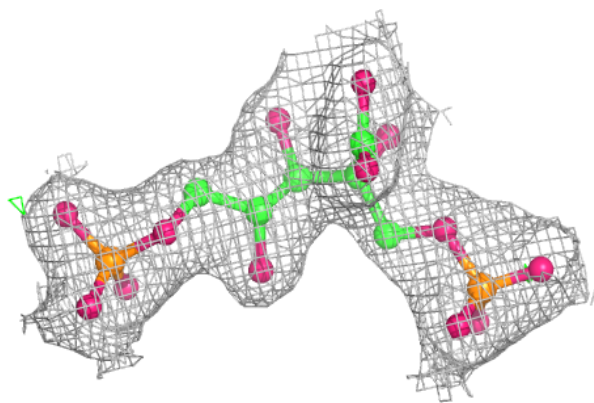
**Electron density around CAP E 502:**

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

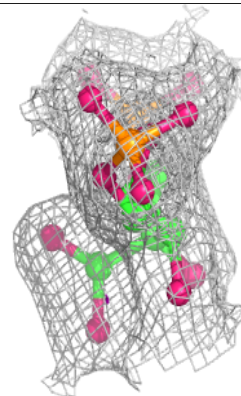
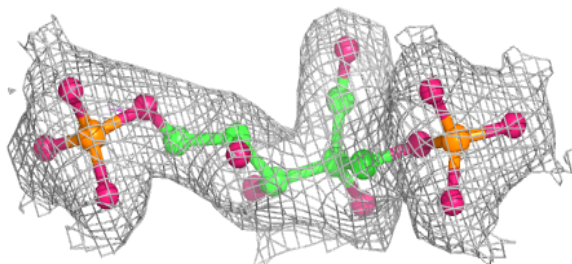
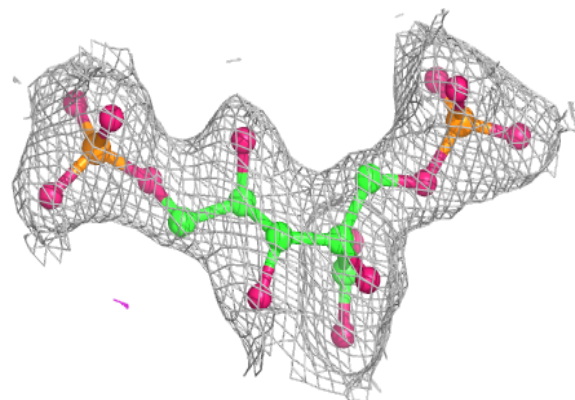


Electron density around CAP R 502:

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

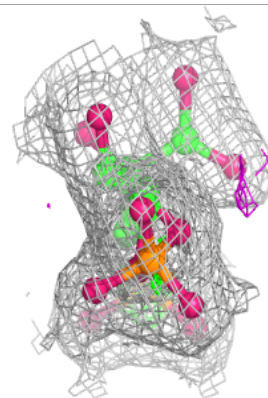
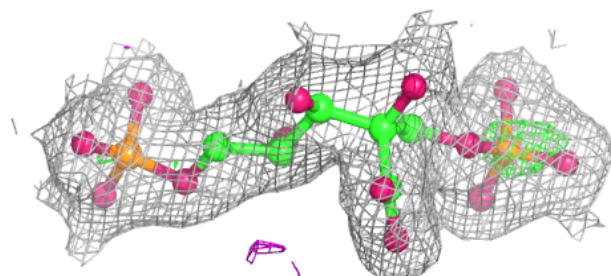
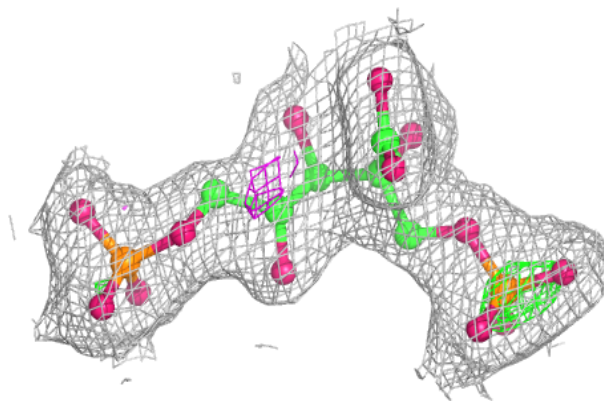
**Electron density around CAP H 502:**

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

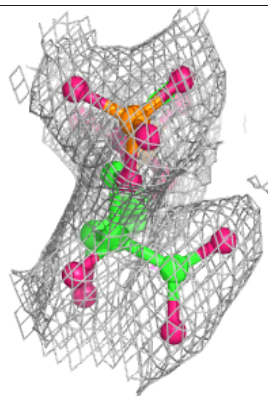
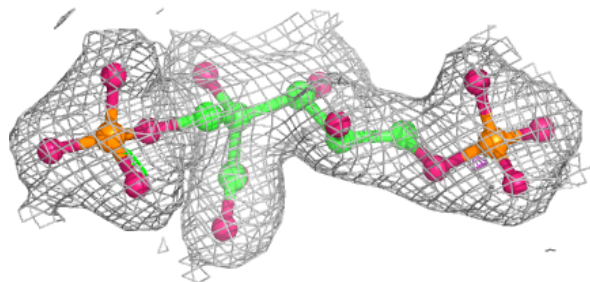
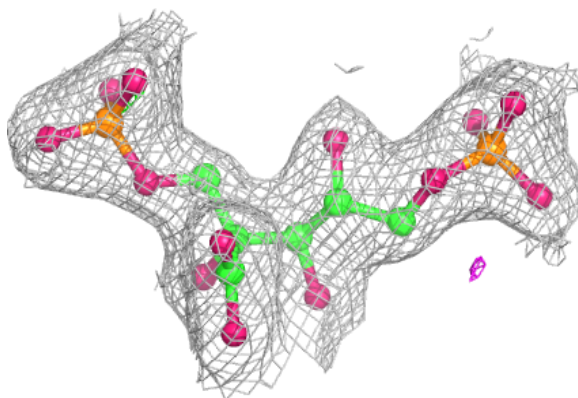


Electron density around CAP K 502:

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

**Electron density around CAP O 502:**

$2mF_o-DF_c$ (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.