



Full wwPDB X-ray Structure Validation Report ⓘ

Jan 28, 2024 – 12:17 PM EST

PDB ID : 1EI6
Title : CRYSTAL STRUCTURE OF PHOSPHONOACETATE HYDROLASE
COMPLEXED WITH PHOSPHONOFORMATE
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Deposited on : 2000-02-24
Resolution : 2.10 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 : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

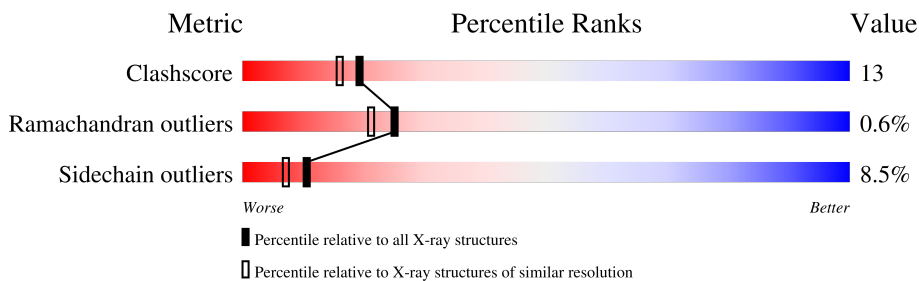
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.10 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))
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)

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 $\leq 5\%$

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	406	
1	B	406	
1	C	406	
1	D	406	

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
3	PPF	C	413	-	-	X	-

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 12751 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 PHOSPHONOACETATE HYDROLASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	404	3087	1953	535	586	13	0	0	0
1	B	403	3068	1941	534	580	13	0	0	0
1	C	401	3047	1928	529	577	13	0	0	0
1	D	395	3011	1906	522	570	13	0	0	0

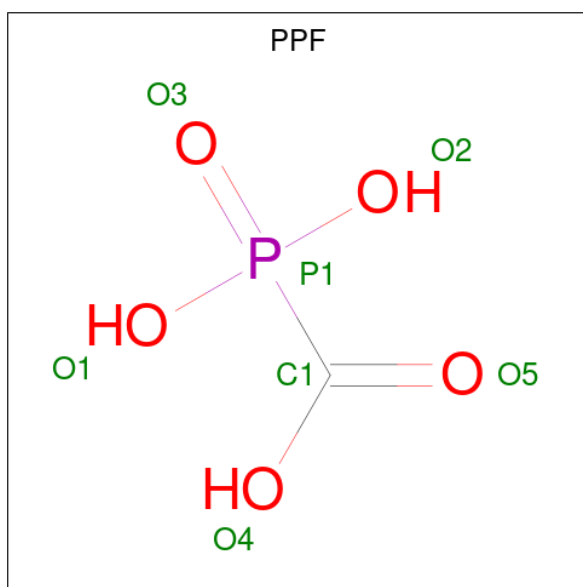
There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	3	ASN	GLN	conflict	UNP Q51782
B	3	ASN	GLN	conflict	UNP Q51782
C	3	ASN	GLN	conflict	UNP Q51782
D	3	ASN	GLN	conflict	UNP Q51782

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

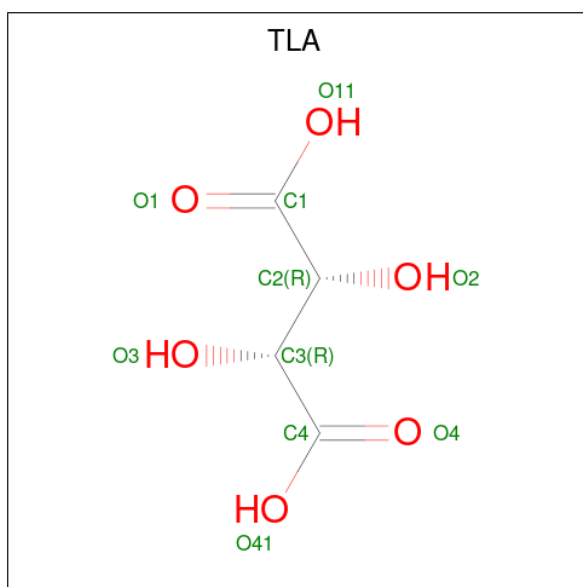
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	2	Total 2	Zn 2	0	0
2	B	2	Total 2	Zn 2	0	0
2	C	2	Total 2	Zn 2	0	0
2	D	2	Total 2	Zn 2	0	0

- Molecule 3 is PHOSPHONOFORMIC ACID (three-letter code: PPF) (formula: CH₃O₅P).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	O	P		
3	A	1	7	1	5	1	0	0
3	C	1	7	1	5	1	0	0
3	D	1	7	1	5	1	0	0

- Molecule 4 is L(+)-TARTARIC ACID (three-letter code: TLA) (formula: C₄H₆O₆).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	C	O		
4	B	1	10	4	6	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	137	Total 137	O 137	0	0
5	B	137	Total 137	O 137	0	0
5	C	108	Total 108	O 108	0	0
5	D	117	Total 117	O 117	0	0

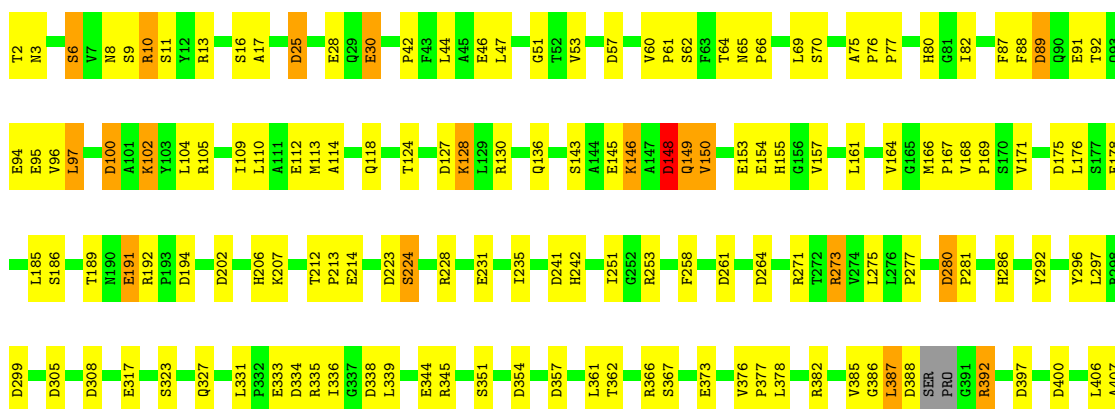
3 Residue-property plots [i](#)

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. 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. 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.

Note EDS was not executed.

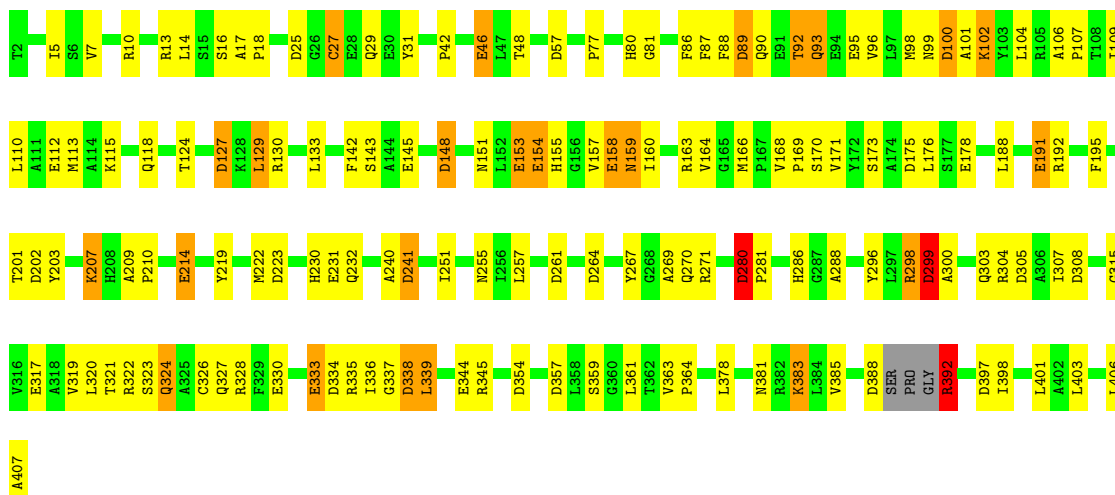
• Molecule 1: PHOSPHONOACETATE HYDROLASE

Chain A: 



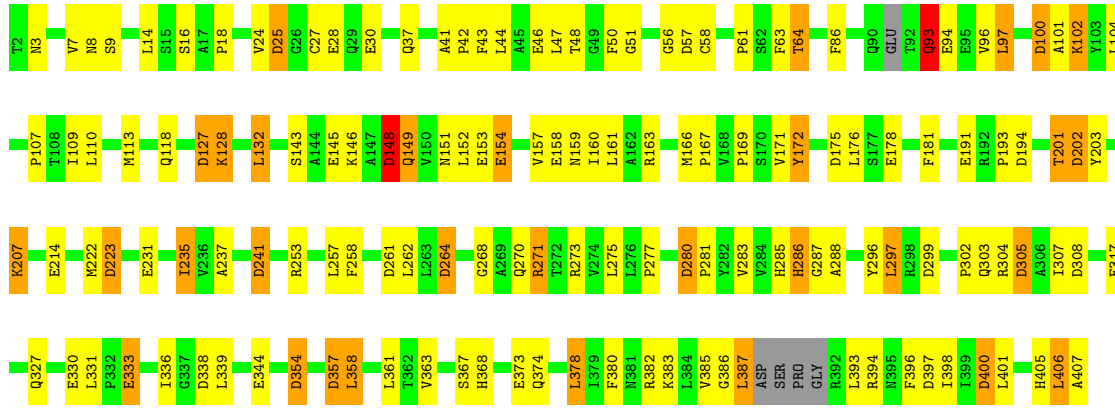
• Molecule 1: PHOSPHONOACETATE HYDROLASE

Chain B: 



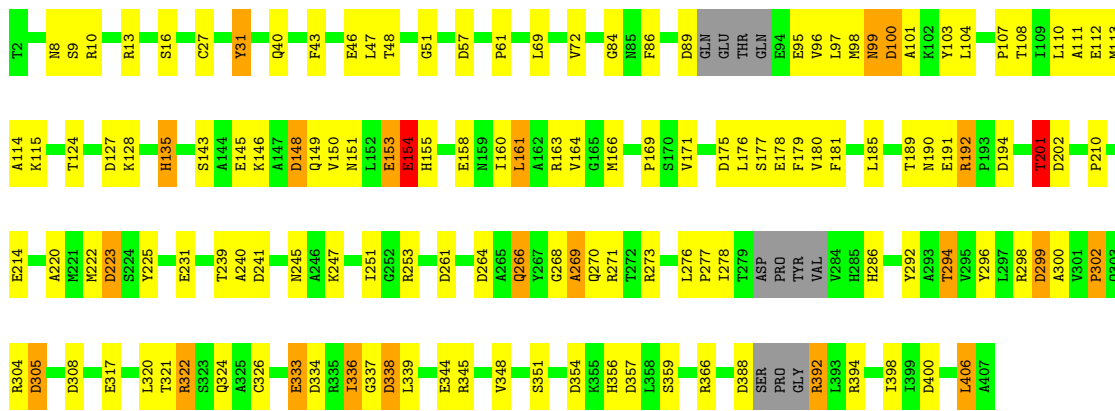
• Molecule 1: PHOSPHONOACETATE HYDROLASE

Chain C: 



● Molecule 1: PHOSPHONOACETATE HYDROLASE

Chain D: 64% 28% 5%



4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	57.50Å 129.54Å 133.38Å 90.00° 96.90° 90.00°	Depositor
Resolution (Å)	20.00 – 2.10	Depositor
% Data completeness (in resolution range)	90.0 (20.00-2.10)	Depositor
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	TNT 5E	Depositor
R, R_{free}	0.192 , 0.249	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	12751	wwPDB-VP
Average B, all atoms (Å ²)	33.0	wwPDB-VP

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: TLA, ZN, PPF

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	0.98	18/3146 (0.6%)	1.27	40/4276 (0.9%)
1	B	0.94	13/3126 (0.4%)	1.27	44/4250 (1.0%)
1	C	0.96	15/3104 (0.5%)	1.25	46/4218 (1.1%)
1	D	0.95	15/3066 (0.5%)	1.23	45/4163 (1.1%)
All	All	0.96	61/12442 (0.5%)	1.26	175/16907 (1.0%)

All (61) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	28	GLU	CD-OE2	7.22	1.33	1.25
1	C	330	GLU	CD-OE2	7.01	1.33	1.25
1	D	231	GLU	CD-OE2	6.85	1.33	1.25
1	C	178	GLU	CD-OE2	6.50	1.32	1.25
1	A	112	GLU	CD-OE2	6.49	1.32	1.25
1	C	344	GLU	CD-OE2	6.44	1.32	1.25
1	B	231	GLU	CD-OE2	6.42	1.32	1.25
1	C	231	GLU	CD-OE2	6.33	1.32	1.25
1	A	154	GLU	CD-OE2	6.26	1.32	1.25
1	D	158	GLU	CD-OE2	6.23	1.32	1.25
1	A	191	GLU	CD-OE2	6.23	1.32	1.25
1	C	214	GLU	CD-OE2	6.20	1.32	1.25
1	D	112	GLU	CD-OE2	6.18	1.32	1.25
1	D	135	HIS	CG-CD2	6.11	1.46	1.35
1	A	231	GLU	CD-OE2	6.07	1.32	1.25
1	A	344	GLU	CD-OE1	-6.04	1.19	1.25
1	C	94	GLU	CD-OE2	6.02	1.32	1.25
1	A	317	GLU	CD-OE2	6.01	1.32	1.25
1	A	94	GLU	CD-OE2	5.98	1.32	1.25
1	D	153	GLU	CD-OE2	5.98	1.32	1.25
1	A	214	GLU	CD-OE2	5.91	1.32	1.25
1	B	178	GLU	CD-OE2	5.91	1.32	1.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	46	GLU	CD-OE2	5.85	1.32	1.25
1	C	333	GLU	CD-OE2	5.84	1.32	1.25
1	D	191	GLU	CD-OE2	5.79	1.32	1.25
1	C	30	GLU	CD-OE2	5.79	1.32	1.25
1	B	344	GLU	CD-OE2	5.77	1.31	1.25
1	A	95	GLU	CD-OE2	5.67	1.31	1.25
1	C	317	GLU	CD-OE2	5.60	1.31	1.25
1	C	153	GLU	CD-OE2	5.53	1.31	1.25
1	D	46	GLU	CD-OE2	5.52	1.31	1.25
1	B	153	GLU	CD-OE2	5.48	1.31	1.25
1	B	191	GLU	CD-OE2	5.45	1.31	1.25
1	A	153	GLU	CD-OE2	5.44	1.31	1.25
1	D	95	GLU	CD-OE2	5.42	1.31	1.25
1	D	154	GLU	CD-OE2	5.42	1.31	1.25
1	B	158	GLU	CD-OE2	5.41	1.31	1.25
1	D	344	GLU	CD-OE2	5.38	1.31	1.25
1	A	28	GLU	CD-OE1	-5.38	1.19	1.25
1	B	154	GLU	CD-OE2	5.37	1.31	1.25
1	C	158	GLU	CD-OE2	5.36	1.31	1.25
1	D	178	GLU	CD-OE2	5.35	1.31	1.25
1	A	333	GLU	CD-OE2	5.30	1.31	1.25
1	D	145	GLU	CD-OE2	5.30	1.31	1.25
1	C	154	GLU	CD-OE2	5.30	1.31	1.25
1	A	145	GLU	CD-OE2	5.29	1.31	1.25
1	A	178	GLU	CD-OE2	5.29	1.31	1.25
1	B	214	GLU	CD-OE2	5.26	1.31	1.25
1	B	317	GLU	CD-OE2	5.22	1.31	1.25
1	A	30	GLU	CD-OE2	5.20	1.31	1.25
1	D	333	GLU	CD-OE2	5.20	1.31	1.25
1	B	95	GLU	CD-OE2	5.19	1.31	1.25
1	D	317	GLU	CD-OE2	5.19	1.31	1.25
1	A	373	GLU	CD-OE2	5.17	1.31	1.25
1	D	214	GLU	CD-OE2	5.16	1.31	1.25
1	B	145	GLU	CD-OE2	5.09	1.31	1.25
1	C	145	GLU	CD-OE2	5.08	1.31	1.25
1	A	46	GLU	CD-OE2	5.07	1.31	1.25
1	B	333	GLU	CD-OE2	5.05	1.31	1.25
1	A	91	GLU	CD-OE2	5.04	1.31	1.25
1	C	46	GLU	CD-OE2	5.03	1.31	1.25

All (175) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	392	ARG	NE-CZ-NH1	8.95	124.78	120.30
1	D	127	ASP	CB-CG-OD2	-8.51	110.65	118.30
1	A	194	ASP	CB-CG-OD2	-8.38	110.76	118.30
1	B	354	ASP	CB-CG-OD2	-8.13	110.99	118.30
1	D	202	ASP	CB-CG-OD2	-7.94	111.16	118.30
1	C	241	ASP	CB-CG-OD2	-7.73	111.34	118.30
1	D	354	ASP	CB-CG-OD2	-7.68	111.39	118.30
1	C	194	ASP	CB-CG-OD2	-7.66	111.40	118.30
1	B	241	ASP	CB-CG-OD1	7.60	125.14	118.30
1	B	10	ARG	NE-CZ-NH1	7.52	124.06	120.30
1	A	397	ASP	CB-CG-OD2	-7.44	111.60	118.30
1	C	394	ARG	NE-CZ-NH1	7.44	124.02	120.30
1	B	345	ARG	NE-CZ-NH2	-7.34	116.63	120.30
1	A	280	ASP	CB-CG-OD2	-7.28	111.75	118.30
1	D	264	ASP	CB-CG-OD2	-7.22	111.80	118.30
1	C	202	ASP	CB-CG-OD2	-7.20	111.82	118.30
1	A	261	ASP	CB-CG-OD1	7.19	124.77	118.30
1	D	261	ASP	CB-CG-OD2	-7.07	111.94	118.30
1	B	127	ASP	CB-CG-OD2	-6.94	112.05	118.30
1	C	305	ASP	CB-CG-OD2	-6.92	112.08	118.30
1	C	25	ASP	CB-CG-OD2	-6.86	112.12	118.30
1	A	194	ASP	CB-CG-OD1	6.84	124.46	118.30
1	B	86	PHE	N-CA-CB	-6.77	98.42	110.60
1	C	357	ASP	CB-CG-OD2	-6.74	112.23	118.30
1	C	357	ASP	CB-CG-OD1	6.71	124.34	118.30
1	B	25	ASP	CB-CG-OD2	-6.70	112.27	118.30
1	D	194	ASP	CB-CG-OD2	-6.66	112.31	118.30
1	B	264	ASP	CB-CG-OD2	-6.65	112.32	118.30
1	D	201	THR	N-CA-CB	6.65	122.93	110.30
1	C	354	ASP	CB-CG-OD2	-6.63	112.33	118.30
1	C	305	ASP	CB-CG-OD1	6.57	124.21	118.30
1	C	194	ASP	CB-CG-OD1	6.52	124.16	118.30
1	D	100	ASP	CB-CG-OD2	-6.48	112.47	118.30
1	D	202	ASP	CB-CG-OD1	6.45	124.11	118.30
1	C	241	ASP	CB-CG-OD1	6.45	124.11	118.30
1	D	400	ASP	CB-CG-OD2	-6.40	112.54	118.30
1	C	223	ASP	CB-CG-OD2	-6.37	112.57	118.30
1	A	25	ASP	CB-CG-OD1	6.34	124.01	118.30
1	B	10	ARG	NE-CZ-NH2	-6.32	117.14	120.30
1	C	261	ASP	CB-CG-OD1	6.30	123.97	118.30
1	C	223	ASP	CB-CG-OD1	6.30	123.97	118.30
1	D	194	ASP	CB-CG-OD1	6.29	123.96	118.30
1	A	148	ASP	CB-CG-OD2	-6.28	112.65	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	25	ASP	CB-CG-OD2	-6.27	112.66	118.30
1	B	175	ASP	CB-CG-OD2	-6.26	112.67	118.30
1	A	305	ASP	CB-CG-OD1	6.21	123.89	118.30
1	A	10	ARG	NE-CZ-NH1	6.20	123.40	120.30
1	D	261	ASP	CB-CG-OD1	6.17	123.85	118.30
1	D	31	TYR	CB-CG-CD2	-6.15	117.31	121.00
1	A	354	ASP	CB-CG-OD2	-6.11	112.80	118.30
1	A	299	ASP	CB-CG-OD2	-6.11	112.80	118.30
1	B	261	ASP	CB-CG-OD1	6.10	123.79	118.30
1	A	261	ASP	CB-CG-OD2	-6.05	112.86	118.30
1	D	223	ASP	CB-CG-OD2	-6.04	112.86	118.30
1	C	100	ASP	CB-CG-OD2	-6.03	112.87	118.30
1	C	400	ASP	CB-CG-OD2	-6.02	112.88	118.30
1	B	305	ASP	CB-CG-OD2	-5.99	112.91	118.30
1	D	299	ASP	CB-CG-OD1	5.98	123.68	118.30
1	A	89	ASP	CB-CG-OD2	-5.96	112.94	118.30
1	B	299	ASP	CB-CG-OD1	5.96	123.67	118.30
1	C	299	ASP	CB-CG-OD1	5.94	123.65	118.30
1	A	305	ASP	CB-CG-OD2	-5.93	112.96	118.30
1	B	89	ASP	CB-CG-OD2	-5.93	112.96	118.30
1	D	308	ASP	CB-CG-OD2	-5.93	112.97	118.30
1	C	397	ASP	CB-CG-OD2	-5.92	112.97	118.30
1	D	305	ASP	CB-CG-OD2	-5.92	112.97	118.30
1	A	273	ARG	NE-CZ-NH1	5.91	123.25	120.30
1	D	100	ASP	CB-CG-OD1	5.91	123.61	118.30
1	A	127	ASP	CB-CG-OD2	-5.88	113.00	118.30
1	C	264	ASP	CB-CG-OD2	-5.88	113.01	118.30
1	A	388	ASP	CB-CG-OD2	-5.87	113.02	118.30
1	D	400	ASP	CB-CG-OD1	5.86	123.57	118.30
1	B	308	ASP	CB-CG-OD2	-5.86	113.03	118.30
1	A	308	ASP	CB-CG-OD2	-5.84	113.05	118.30
1	A	299	ASP	CB-CG-OD1	5.83	123.55	118.30
1	B	223	ASP	CB-CG-OD2	-5.79	113.09	118.30
1	B	148	ASP	CB-CG-OD1	5.77	123.50	118.30
1	A	308	ASP	CB-CG-OD1	5.77	123.50	118.30
1	C	253	ARG	NE-CZ-NH1	5.76	123.18	120.30
1	C	280	ASP	CB-CG-OD2	-5.76	113.11	118.30
1	C	299	ASP	CB-CG-OD2	-5.75	113.12	118.30
1	D	127	ASP	CB-CG-OD1	5.74	123.47	118.30
1	D	322	ARG	NE-CZ-NH2	-5.73	117.43	120.30
1	C	148	ASP	CB-CG-OD2	-5.71	113.16	118.30
1	A	100	ASP	CB-CG-OD1	5.69	123.42	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	338	ASP	CB-CG-OD2	-5.67	113.20	118.30
1	B	388	ASP	CB-CG-OD2	-5.66	113.21	118.30
1	B	100	ASP	CB-CG-OD2	-5.64	113.22	118.30
1	A	357	ASP	CB-CG-OD2	-5.64	113.22	118.30
1	B	13	ARG	NE-CZ-NH1	5.62	123.11	120.30
1	D	10	ARG	NE-CZ-NH1	5.62	123.11	120.30
1	A	280	ASP	CB-CG-OD1	5.61	123.34	118.30
1	B	354	ASP	CB-CG-OD1	5.60	123.34	118.30
1	A	100	ASP	CB-CG-OD2	-5.60	113.26	118.30
1	B	334	ASP	CB-CG-OD2	-5.60	113.26	118.30
1	D	299	ASP	CB-CG-OD2	-5.60	113.26	118.30
1	C	280	ASP	CB-CG-OD1	5.59	123.33	118.30
1	B	299	ASP	CB-CG-OD2	-5.59	113.27	118.30
1	B	261	ASP	CB-CG-OD2	-5.59	113.27	118.30
1	A	354	ASP	CB-CG-OD1	5.59	123.33	118.30
1	A	335	ARG	NE-CZ-NH2	5.58	123.09	120.30
1	D	333	GLU	N-CA-CB	5.57	120.63	110.60
1	C	175	ASP	CB-CG-OD1	5.57	123.31	118.30
1	C	338	ASP	CB-CG-OD2	-5.56	113.29	118.30
1	D	308	ASP	CB-CG-OD1	5.56	123.30	118.30
1	C	25	ASP	CB-CG-OD1	5.53	123.28	118.30
1	C	127	ASP	CB-CG-OD2	-5.52	113.33	118.30
1	D	253	ARG	NE-CZ-NH2	-5.52	117.54	120.30
1	D	338	ASP	CB-CG-OD1	5.52	123.27	118.30
1	C	57	ASP	CB-CG-OD1	5.52	123.26	118.30
1	B	305	ASP	CB-CG-OD1	5.51	123.26	118.30
1	A	264	ASP	CB-CG-OD2	-5.50	113.35	118.30
1	C	367	SER	N-CA-CB	5.48	118.72	110.50
1	B	89	ASP	CB-CG-OD1	5.47	123.23	118.30
1	D	305	ASP	CB-CG-OD1	5.47	123.22	118.30
1	C	175	ASP	CB-CG-OD2	-5.47	113.38	118.30
1	C	100	ASP	CB-CG-OD1	5.45	123.20	118.30
1	C	354	ASP	CB-CG-OD1	5.41	123.17	118.30
1	B	148	ASP	CB-CG-OD2	-5.41	113.43	118.30
1	B	264	ASP	CB-CG-OD1	5.41	123.17	118.30
1	D	338	ASP	CB-CG-OD2	-5.41	113.43	118.30
1	D	264	ASP	CB-CG-OD1	5.40	123.16	118.30
1	C	172	TYR	CA-CB-CG	-5.38	103.17	113.40
1	C	57	ASP	CB-CG-OD2	-5.38	113.45	118.30
1	D	334	ASP	CB-CG-OD1	5.38	123.14	118.30
1	C	64	THR	CA-CB-CG2	-5.38	104.87	112.40
1	C	308	ASP	CB-CG-OD1	5.37	123.13	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	396	PHE	N-CA-CB	5.34	120.22	110.60
1	B	333	GLU	N-CA-CB	5.34	120.21	110.60
1	A	400	ASP	CB-CG-OD2	-5.33	113.50	118.30
1	A	57	ASP	CB-CG-OD1	5.33	123.10	118.30
1	A	202	ASP	CB-CG-OD2	-5.32	113.52	118.30
1	B	57	ASP	CB-CG-OD1	5.31	123.08	118.30
1	A	388	ASP	CB-CG-OD1	5.31	123.08	118.30
1	B	175	ASP	CB-CG-OD1	5.30	123.07	118.30
1	D	357	ASP	CB-CG-OD1	5.30	123.07	118.30
1	B	308	ASP	CB-CG-OD1	5.28	123.05	118.30
1	B	334	ASP	CB-CG-OD1	5.28	123.05	118.30
1	C	400	ASP	CB-CG-OD1	5.27	123.04	118.30
1	D	354	ASP	CB-CG-OD1	5.27	123.04	118.30
1	D	334	ASP	CB-CG-OD2	-5.26	113.56	118.30
1	A	334	ASP	CB-CG-OD2	-5.26	113.56	118.30
1	B	397	ASP	CB-CG-OD1	5.25	123.03	118.30
1	C	148	ASP	CB-CG-OD1	5.25	123.03	118.30
1	D	89	ASP	CB-CG-OD2	-5.25	113.58	118.30
1	B	280	ASP	CB-CG-OD2	-5.23	113.59	118.30
1	A	357	ASP	CB-CG-OD1	5.22	123.00	118.30
1	B	388	ASP	CB-CG-OD1	5.22	123.00	118.30
1	D	388	ASP	CB-CG-OD2	-5.21	113.61	118.30
1	C	202	ASP	CB-CG-OD1	5.20	122.98	118.30
1	D	175	ASP	CB-CG-OD2	-5.19	113.63	118.30
1	D	357	ASP	CB-CG-OD2	-5.18	113.63	118.30
1	C	261	ASP	CB-CG-OD2	-5.17	113.64	118.30
1	D	241	ASP	CB-CG-OD1	5.17	122.96	118.30
1	D	175	ASP	CB-CG-OD1	5.17	122.95	118.30
1	D	388	ASP	CB-CG-OD1	5.15	122.93	118.30
1	A	175	ASP	CB-CG-OD2	-5.14	113.67	118.30
1	D	148	ASP	CB-CG-OD1	5.13	122.92	118.30
1	B	357	ASP	CB-CG-OD1	5.12	122.90	118.30
1	C	297	LEU	CB-CA-C	-5.11	100.50	110.20
1	B	100	ASP	CB-CG-OD1	5.10	122.89	118.30
1	D	57	ASP	CB-CG-OD1	5.09	122.88	118.30
1	A	105	ARG	NE-CZ-NH2	-5.08	117.76	120.30
1	A	387	LEU	CB-CA-C	5.08	119.84	110.20
1	B	241	ASP	CB-CG-OD2	-5.07	113.73	118.30
1	B	338	ASP	CB-CG-OD1	5.07	122.86	118.30
1	D	223	ASP	CB-CG-OD1	5.07	122.86	118.30
1	C	308	ASP	CB-CG-OD2	-5.06	113.74	118.30
1	B	354	ASP	CB-CA-C	-5.06	100.28	110.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	89	ASP	CB-CG-OD1	5.05	122.84	118.30
1	B	280	ASP	CB-CG-OD1	5.04	122.83	118.30
1	C	304	ARG	NE-CZ-NH1	5.04	122.82	120.30
1	B	338	ASP	CB-CG-OD2	-5.03	113.77	118.30
1	A	345	ARG	NE-CZ-NH1	5.03	122.81	120.30
1	D	148	ASP	CB-CG-OD2	-5.02	113.78	118.30

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	3087	0	3065	72	0
1	B	3068	0	3046	90	0
1	C	3047	0	3013	88	0
1	D	3011	0	2989	67	0
2	A	2	0	0	0	0
2	B	2	0	0	0	0
2	C	2	0	0	0	0
2	D	2	0	0	0	0
3	A	7	0	0	2	0
3	C	7	0	0	6	0
3	D	7	0	0	0	0
4	B	10	0	1	0	0
5	A	137	0	0	3	0
5	B	137	0	0	2	0
5	C	108	0	0	3	0
5	D	117	0	0	3	0
All	All	12751	0	12114	313	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 13.

All (313) 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:385:VAL:HG13	1:A:407:ALA:HB2	1.51	0.91
1:A:77:PRO:HG2	1:A:331:LEU:HD23	1.57	0.85
1:B:7:VAL:HG22	1:B:112:GLU:HG3	1.58	0.84
1:B:154:GLU:HG2	1:B:155:HIS:CE1	2.12	0.84
1:D:166:MET:HE2	1:D:179:PHE:HD1	1.42	0.83
1:D:192:ARG:HG2	1:D:192:ARG:HH11	1.43	0.83
1:B:321:THR:HA	1:B:339:LEU:HD12	1.64	0.80
1:C:64:THR:N	3:C:413:PPF:O5	2.16	0.79
1:C:97:LEU:HD21	1:C:281:PRO:HG2	1.66	0.78
1:D:161:LEU:HD12	1:D:166:MET:O	1.84	0.78
1:C:148:ASP:HB3	1:C:149:GLN:HG2	1.68	0.76
1:A:25:ASP:HA	1:A:241:ASP:OD2	1.87	0.74
1:B:151:ASN:OD1	1:B:153:GLU:HG2	1.88	0.74
1:C:286:HIS:H	1:C:286:HIS:CD2	2.06	0.74
1:B:159:ASN:O	1:B:163:ARG:HG3	1.87	0.73
1:C:86:PHE:CD2	1:C:281:PRO:HD3	2.24	0.73
1:A:386:GLY:C	1:A:387:LEU:HD23	2.08	0.73
1:A:69:LEU:HD13	1:A:82:ILE:HG13	1.71	0.71
1:B:170:SER:O	1:B:173:SER:HB3	1.92	0.70
1:A:89:ASP:OD1	1:A:92:THR:HG23	1.90	0.70
1:B:148:ASP:HB3	1:B:168:VAL:HG21	1.72	0.69
1:C:331:LEU:HB3	1:C:336:ILE:CD1	2.22	0.69
1:D:166:MET:HE2	1:D:179:PHE:CD1	2.25	0.69
1:B:326:CYS:SG	1:B:333:GLU:HB3	2.33	0.69
1:D:169:PRO:HG2	1:D:176:LEU:HD12	1.75	0.69
1:B:203:TYR:CZ	1:B:207:LYS:HD3	2.29	0.68
1:B:298:ARG:HD3	1:B:298:ARG:N	2.09	0.68
1:B:321:THR:OG1	1:B:324:GLN:HG3	1.95	0.67
1:D:201:THR:HG22	5:D:879:HOH:O	1.95	0.66
1:D:192:ARG:HG2	1:D:192:ARG:NH1	2.11	0.65
1:D:268:GLY:O	1:D:271:ARG:HB2	1.97	0.65
1:A:110:LEU:HA	1:A:113:MET:HE2	1.78	0.65
1:B:298:ARG:O	1:B:300:ALA:N	2.29	0.65
1:D:27:CYS:HB3	1:D:240:ALA:HB2	1.78	0.65
1:B:89:ASP:O	1:B:93:GLN:N	2.29	0.65
1:C:235:ILE:N	1:C:235:ILE:HD13	2.09	0.65
1:A:185:LEU:O	1:A:189:THR:HG23	1.97	0.65
1:A:377:PRO:O	1:A:378:LEU:HD22	1.97	0.65
1:C:385:VAL:HG13	1:C:407:ALA:HB2	1.78	0.65
1:B:81:GLY:O	1:B:335:ARG:NH1	2.29	0.64
1:A:77:PRO:HA	1:A:80:HIS:CE1	2.32	0.64
1:B:100:ASP:OD2	1:B:102:LYS:HD3	1.98	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:150:VAL:HA	1:D:155:HIS:CE1	2.34	0.63
1:A:280:ASP:HB3	1:A:281:PRO:HD2	1.80	0.63
1:C:151:ASN:OD1	1:C:154:GLU:HB2	1.98	0.63
1:B:319:VAL:O	1:B:320:LEU:HD23	1.99	0.62
1:A:385:VAL:CG1	1:A:407:ALA:HB2	2.29	0.62
1:A:161:LEU:HD11	1:A:168:VAL:CG2	2.29	0.62
1:A:164:VAL:HG12	1:A:166:MET:HB2	1.79	0.62
1:C:166:MET:HB3	1:C:167:PRO:HD2	1.80	0.62
1:A:212:THR:HB	1:A:213:PRO:HD2	1.82	0.62
1:C:159:ASN:O	1:C:163:ARG:HG3	2.00	0.62
1:A:148:ASP:HB3	1:A:149:GLN:HG2	1.82	0.62
1:C:303:GLN:O	1:C:307:ILE:HG13	1.99	0.62
1:A:97:LEU:HD11	1:A:281:PRO:CD	2.30	0.61
1:A:387:LEU:HD23	1:A:387:LEU:N	2.14	0.61
1:B:27:CYS:HB3	1:B:240:ALA:HB2	1.83	0.61
1:A:128:LYS:HB3	5:A:545:HOH:O	2.00	0.60
1:B:322:ARG:HG3	1:B:336:ILE:HG22	1.83	0.60
1:B:359:SER:HB2	1:D:171:VAL:HG21	1.83	0.60
1:B:392:ARG:O	1:B:392:ARG:HG3	2.02	0.60
1:C:25:ASP:HA	1:C:241:ASP:OD2	2.01	0.60
1:C:172:TYR:HB3	1:C:203:TYR:CE2	2.37	0.60
1:C:101:ALA:O	1:C:104:LEU:HB2	2.02	0.60
1:C:331:LEU:HB3	1:C:336:ILE:HD12	1.82	0.60
1:A:6:SER:HA	1:A:10:ARG:O	2.01	0.60
1:A:150:VAL:HG22	1:A:155:HIS:CB	2.32	0.59
1:A:150:VAL:HG22	1:A:155:HIS:CG	2.37	0.59
1:C:64:THR:OG1	3:C:413:PPF:O3	2.21	0.59
1:A:224:SER:OG	1:A:228:ARG:NH2	2.27	0.58
1:D:13:ARG:HH11	1:D:13:ARG:HG2	1.68	0.58
1:A:146:LYS:C	1:A:148:ASP:H	2.05	0.58
1:D:150:VAL:HA	1:D:155:HIS:ND1	2.19	0.58
1:A:97:LEU:HD11	1:A:281:PRO:CG	2.33	0.58
1:A:224:SER:HG	1:A:228:ARG:HH21	1.47	0.58
1:B:88:PHE:HZ	1:B:93:GLN:NE2	2.00	0.58
1:B:267:TYR:O	1:B:271:ARG:HD3	2.03	0.57
1:C:191:GLU:OE2	1:C:191:GLU:N	2.27	0.57
1:A:75:ALA:HB1	1:A:76:PRO:HD2	1.85	0.57
1:B:100:ASP:OD2	1:B:102:LYS:HB3	2.03	0.57
1:B:269:ALA:O	1:B:270:GLN:HB2	2.05	0.57
1:D:153:GLU:HG3	1:D:154:GLU:N	2.19	0.57
1:A:60:VAL:HG13	1:A:61:PRO:HA	1.87	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:151:ASN:OD1	1:D:154:GLU:HB2	2.05	0.56
1:A:77:PRO:HG2	1:A:331:LEU:CD2	2.33	0.56
1:B:151:ASN:OD1	1:B:154:GLU:HB3	2.05	0.56
1:C:169:PRO:HG2	1:C:176:LEU:HD12	1.86	0.56
1:C:285:HIS:CE1	1:C:287:GLY:HA3	2.41	0.56
1:B:214:GLU:OE2	1:B:214:GLU:N	2.29	0.56
1:C:283:VAL:O	1:C:288:ALA:HB2	2.06	0.56
1:C:61:PRO:HB2	1:C:63:PHE:CD2	2.41	0.56
1:C:50:PHE:C	1:C:383:LYS:HE3	2.26	0.56
1:B:171:VAL:HA	1:B:176:LEU:HD22	1.88	0.56
1:B:363:VAL:HB	1:B:364:PRO:HD2	1.87	0.56
1:B:99:ASN:OD1	1:B:99:ASN:N	2.33	0.55
1:D:351:SER:H	1:D:356:HIS:HE1	1.55	0.55
1:B:5:ILE:HD12	1:B:112:GLU:HB3	1.87	0.55
1:C:128:LYS:O	1:C:132:LEU:HD12	2.06	0.55
1:B:109:ILE:O	1:B:113:MET:HG3	2.05	0.55
1:A:17:ALA:HB3	1:A:235:ILE:CD1	2.37	0.55
1:C:368:HIS:HE1	3:C:413:PPF:O5	1.88	0.55
1:C:275:LEU:HD22	1:C:296:TYR:HE2	1.71	0.55
1:A:88:PHE:HB3	1:A:296:TYR:CZ	2.42	0.55
1:B:338:ASP:O	1:B:339:LEU:HD13	2.07	0.55
1:D:13:ARG:HG2	1:D:13:ARG:NH1	2.22	0.55
1:A:64:THR:OG1	3:A:410:PPF:O4	2.22	0.54
1:B:113:MET:HE1	1:B:195:PHE:CD1	2.43	0.54
1:B:296:TYR:CE1	1:B:337:GLY:HA2	2.43	0.54
1:C:25:ASP:HB2	5:C:696:HOH:O	2.07	0.54
1:C:181:PHE:CE2	1:C:222:MET:HG2	2.43	0.54
1:D:98:MET:HA	1:D:103:TYR:CD1	2.43	0.54
1:C:86:PHE:CG	1:C:281:PRO:HD3	2.43	0.53
1:A:171:VAL:HA	1:A:176:LEU:HD22	1.90	0.53
1:C:97:LEU:HD21	1:C:281:PRO:CG	2.37	0.53
1:B:42:PRO:O	1:B:46:GLU:HG2	2.08	0.53
1:C:100:ASP:OD2	1:C:102:LYS:HB3	2.08	0.53
1:C:25:ASP:OD1	1:C:202:ASP:HB3	2.07	0.53
1:C:58:CYS:SG	1:C:374:GLN:HA	2.49	0.53
1:A:69:LEU:HD13	1:A:82:ILE:CG1	2.38	0.52
1:B:322:ARG:HG3	1:B:336:ILE:CG2	2.38	0.52
1:C:146:LYS:C	1:C:148:ASP:H	2.12	0.52
1:B:303:GLN:O	1:B:307:ILE:HG13	2.09	0.52
1:B:101:ALA:O	1:B:104:LEU:HB2	2.09	0.52
1:B:160:ILE:O	1:B:164:VAL:HG23	2.08	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:29:GLN:NE2	5:B:586:HOH:O	2.41	0.52
1:D:86:PHE:HB2	1:D:96:VAL:O	2.10	0.52
1:B:90:GLN:O	1:B:93:GLN:OE1	2.28	0.52
1:D:338:ASP:O	1:D:339:LEU:HD12	2.10	0.52
1:A:113:MET:O	1:A:118:GLN:HB2	2.10	0.51
1:C:97:LEU:HD23	1:C:97:LEU:N	2.25	0.51
1:B:219:TYR:CD2	1:B:222:MET:HE3	2.46	0.51
1:A:42:PRO:HD2	1:A:223:ASP:OD1	2.10	0.51
1:B:188:LEU:HD21	1:B:232:GLN:HB2	1.92	0.51
1:A:150:VAL:HA	1:A:155:HIS:ND1	2.25	0.51
1:A:69:LEU:CD1	1:A:82:ILE:HG13	2.39	0.51
1:D:247:LYS:HG3	1:D:348:VAL:CG1	2.40	0.51
1:C:285:HIS:HE1	1:C:287:GLY:HA3	1.76	0.51
1:C:201:THR:HG22	5:C:720:HOH:O	2.11	0.51
1:C:97:LEU:HD13	1:C:280:ASP:OD2	2.11	0.50
1:A:124:THR:O	1:A:143:SER:HA	2.11	0.50
1:B:87:PHE:CD2	1:B:98:MET:HG3	2.46	0.50
1:C:207:LYS:HG3	1:C:363:VAL:HG21	1.93	0.50
1:B:298:ARG:C	1:B:300:ALA:H	2.14	0.50
1:D:392:ARG:HD3	1:D:394:ARG:HD3	1.93	0.50
1:D:326:CYS:SG	1:D:333:GLU:HB3	2.52	0.50
1:A:64:THR:HB	3:A:410:PPF:C1	2.42	0.50
1:A:212:THR:HB	1:A:213:PRO:CD	2.42	0.50
1:D:47:LEU:O	1:D:51:GLY:N	2.41	0.50
1:B:280:ASP:HB2	1:B:281:PRO:HD2	1.94	0.49
1:B:378:LEU:HD23	1:B:398:ILE:HD12	1.92	0.49
1:B:209:ALA:HB1	1:B:210:PRO:HD2	1.93	0.49
1:B:148:ASP:HB3	1:B:168:VAL:CG2	2.40	0.49
1:C:14:LEU:HB3	1:C:118:GLN:NE2	2.27	0.49
1:D:110:LEU:HA	1:D:113:MET:HE2	1.95	0.49
1:B:14:LEU:HD13	1:B:118:GLN:HG3	1.94	0.49
1:C:358:LEU:N	1:C:358:LEU:HD13	2.27	0.49
1:C:44:LEU:HG	1:C:223:ASP:OD2	2.13	0.49
1:A:386:GLY:O	1:A:387:LEU:HD23	2.12	0.48
1:D:84:GLY:HA2	5:D:899:HOH:O	2.13	0.48
1:A:17:ALA:HB3	1:A:235:ILE:HD11	1.96	0.48
1:C:47:LEU:HD23	1:C:47:LEU:C	2.34	0.48
1:B:207:LYS:HB3	1:B:207:LYS:HE2	1.52	0.48
1:C:64:THR:H	3:C:413:PPF:C1	2.24	0.48
1:A:53:VAL:HG11	1:D:251:ILE:HG12	1.95	0.48
1:B:129:LEU:HD23	1:B:129:LEU:HA	1.69	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:113:MET:HE1	1:B:195:PHE:CG	2.49	0.48
1:B:385:VAL:HG13	1:B:407:ALA:HB2	1.94	0.48
1:B:130:ARG:HD3	1:B:142:PHE:HA	1.96	0.48
1:D:296:TYR:CE1	1:D:337:GLY:HA2	2.49	0.48
1:A:47:LEU:O	1:A:51:GLY:N	2.37	0.48
1:B:106:ALA:HB1	1:B:107:PRO:HD2	1.96	0.48
1:B:157:VAL:HG22	1:B:158:GLU:H	1.78	0.48
1:D:302:PRO:HG2	1:D:305:ASP:OD2	2.13	0.47
1:B:169:PRO:HG2	1:B:176:LEU:HD12	1.96	0.47
1:A:87:PHE:CE2	1:A:96:VAL:HB	2.48	0.47
1:D:298:ARG:O	1:D:300:ALA:N	2.47	0.47
1:D:276:LEU:O	1:D:278:ILE:N	2.43	0.47
1:A:376:VAL:HB	1:A:377:PRO:HD2	1.95	0.47
1:C:172:TYR:CD1	1:C:172:TYR:N	2.79	0.47
1:B:113:MET:O	1:B:118:GLN:HB2	2.15	0.47
1:D:164:VAL:HG11	1:D:179:PHE:CE1	2.50	0.47
1:D:239:THR:HB	1:D:398:ILE:HD12	1.97	0.47
1:B:202:ASP:N	1:B:202:ASP:OD1	2.38	0.47
1:A:109:ILE:O	1:A:113:MET:HG3	2.14	0.47
1:B:171:VAL:HG21	1:D:359:SER:HB3	1.97	0.47
1:C:160:ILE:HG23	1:C:161:LEU:N	2.30	0.47
1:B:130:ARG:CD	1:B:142:PHE:HA	2.46	0.46
1:C:64:THR:HB	3:C:413:PPF:C1	2.45	0.46
1:B:87:PHE:CE2	1:B:96:VAL:CG1	2.98	0.46
1:B:88:PHE:HB3	1:B:296:TYR:CZ	2.50	0.46
1:C:285:HIS:ND1	1:C:287:GLY:N	2.57	0.46
1:D:181:PHE:HB3	1:D:225:TYR:CG	2.50	0.46
1:B:241:ASP:OD2	1:B:241:ASP:N	2.38	0.46
1:A:392:ARG:O	1:A:392:ARG:HG2	2.16	0.46
1:C:283:VAL:O	1:C:283:VAL:HG12	2.15	0.46
1:D:111:ALA:O	1:D:115:LYS:HG3	2.15	0.46
1:B:230:HIS:ND1	1:B:381:ASN:ND2	2.55	0.46
1:C:86:PHE:CE2	1:C:277:PRO:HA	2.51	0.46
1:C:109:ILE:O	1:C:113:MET:HG3	2.16	0.46
1:C:406:LEU:HD12	1:C:406:LEU:HA	1.76	0.46
1:D:72:VAL:HG23	1:D:108:THR:HG22	1.97	0.46
1:C:273:ARG:HD3	1:C:275:LEU:HD11	1.97	0.46
1:B:124:THR:O	1:B:143:SER:HA	2.16	0.46
1:B:385:VAL:HG13	1:B:407:ALA:HA	1.98	0.46
1:C:386:GLY:O	1:C:387:LEU:HD12	2.16	0.46
1:A:382:ARG:HG3	5:A:498:HOH:O	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:99:ASN:C	1:D:99:ASN:HD22	2.20	0.45
1:A:100:ASP:OD1	1:A:102:LYS:HB3	2.16	0.45
1:D:31:TYR:HA	1:D:210:PRO:HB3	1.98	0.45
1:A:327:GLN:HE21	1:A:327:GLN:HB2	1.65	0.45
1:C:18:PRO:HB3	1:C:193:PRO:O	2.17	0.45
1:D:181:PHE:CE2	1:D:222:MET:HG2	2.51	0.45
1:A:104:LEU:HD23	1:A:104:LEU:HA	1.77	0.45
1:B:77:PRO:HA	1:B:80:HIS:CE1	2.51	0.45
1:A:114:ALA:HB3	5:A:442:HOH:O	2.15	0.45
1:C:271:ARG:HD2	5:C:779:HOH:O	2.16	0.45
1:D:47:LEU:C	1:D:47:LEU:HD23	2.37	0.45
1:A:258:PHE:HB3	1:A:351:SER:O	2.15	0.45
1:A:8:ASN:O	1:A:9:SER:HB2	2.17	0.45
1:A:377:PRO:C	1:A:378:LEU:HD22	2.37	0.45
1:D:294:THR:HG21	1:D:337:GLY:H	1.81	0.45
1:A:206:HIS:CE1	1:A:367:SER:HA	2.52	0.45
1:B:104:LEU:HD23	1:B:104:LEU:HA	1.81	0.45
1:D:61:PRO:HB3	1:D:292:TYR:CG	2.52	0.45
1:C:401:LEU:HA	1:C:405:HIS:CD2	2.52	0.45
1:A:191:GLU:OE2	1:A:191:GLU:N	2.47	0.44
1:C:56:GLY:HA3	1:C:378:LEU:CD1	2.47	0.44
1:C:51:GLY:O	1:C:383:LYS:HE2	2.17	0.44
1:D:61:PRO:HB3	1:D:292:TYR:CD2	2.52	0.44
1:C:235:ILE:CD1	1:C:382:ARG:NH2	2.80	0.44
1:B:188:LEU:HD21	1:B:232:GLN:CB	2.48	0.44
1:B:385:VAL:HG13	1:B:407:ALA:CB	2.48	0.44
1:B:251:ILE:HD13	1:C:48:THR:HG22	1.99	0.44
1:C:368:HIS:CE1	3:C:413:PPF:O5	2.69	0.44
1:D:69:LEU:HD13	1:D:69:LEU:HA	1.69	0.44
1:D:266:GLN:O	1:D:266:GLN:HG3	2.17	0.44
1:A:206:HIS:O	1:A:366:ARG:HB2	2.18	0.44
1:B:129:LEU:HD22	1:B:133:LEU:HG	1.98	0.44
1:A:61:PRO:HB3	1:A:292:TYR:CG	2.53	0.44
1:C:258:PHE:O	1:C:262:LEU:HG	2.18	0.44
1:C:47:LEU:HA	1:C:50:PHE:CZ	2.53	0.43
1:C:61:PRO:O	1:C:63:PHE:N	2.51	0.43
1:C:358:LEU:O	1:C:361:LEU:HB2	2.18	0.43
1:A:110:LEU:HA	1:A:113:MET:CE	2.48	0.43
1:D:101:ALA:HB1	1:D:135:HIS:CG	2.53	0.43
1:B:191:GLU:OE2	1:B:191:GLU:N	2.48	0.43
1:C:8:ASN:OD1	1:C:107:PRO:HD2	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:275:LEU:O	1:A:277:PRO:HD3	2.18	0.43
1:A:251:ILE:HG13	1:A:253:ARG:HG3	2.01	0.43
1:D:321:THR:HG23	1:D:324:GLN:OE1	2.18	0.43
1:B:127:ASP:HA	1:B:143:SER:HB3	1.99	0.43
1:B:319:VAL:C	1:B:320:LEU:HD23	2.38	0.43
1:B:157:VAL:HG22	1:B:158:GLU:N	2.33	0.43
1:A:97:LEU:HD11	1:A:281:PRO:HD2	1.98	0.43
1:B:17:ALA:HB1	1:B:18:PRO:HD2	2.01	0.43
1:B:320:LEU:O	1:B:339:LEU:HA	2.19	0.43
1:C:43:PHE:HB3	1:C:223:ASP:OD1	2.19	0.43
1:D:104:LEU:HA	1:D:104:LEU:HD23	1.73	0.42
1:D:245:ASN:O	1:D:366:ARG:HA	2.19	0.42
1:C:161:LEU:HD23	1:C:161:LEU:HA	1.87	0.42
1:C:264:ASP:O	1:C:268:GLY:N	2.51	0.42
1:D:8:ASN:OD1	1:D:107:PRO:HD2	2.19	0.42
1:D:40:GLN:O	1:D:220:ALA:HA	2.19	0.42
1:A:44:LEU:HD23	1:A:44:LEU:HA	1.86	0.42
1:B:164:VAL:HG12	1:B:166:MET:HB2	1.99	0.42
1:C:109:ILE:O	1:C:109:ILE:HG22	2.18	0.42
1:C:280:ASP:HB3	1:C:281:PRO:HD2	2.01	0.42
1:B:89:ASP:HB3	1:B:92:THR:OG1	2.19	0.42
1:C:257:LEU:HD23	1:C:257:LEU:HA	1.81	0.42
1:C:302:PRO:HG2	1:C:305:ASP:HB2	2.01	0.42
1:D:114:ALA:HB3	5:D:815:HOH:O	2.20	0.42
1:D:177:SER:O	1:D:180:VAL:HB	2.19	0.42
1:B:87:PHE:CD1	1:B:335:ARG:HG2	2.55	0.42
1:D:406:LEU:HD12	1:D:406:LEU:HA	1.83	0.42
1:A:70:SER:HB3	1:A:75:ALA:O	2.20	0.42
1:C:41:ALA:N	1:C:42:PRO:HD3	2.35	0.42
1:C:380:PHE:CD1	1:C:380:PHE:N	2.87	0.42
1:D:101:ALA:O	1:D:104:LEU:HB2	2.19	0.42
1:D:247:LYS:HG3	1:D:348:VAL:HG13	2.01	0.42
1:C:237:ALA:HB1	1:C:398:ILE:HD11	2.02	0.41
1:D:86:PHE:HB3	1:D:97:LEU:HG	2.01	0.41
1:B:255:ASN:ND2	5:B:572:HOH:O	2.53	0.41
1:C:201:THR:HG23	1:C:203:TYR:H	1.85	0.41
1:D:43:PHE:HB3	1:D:223:ASP:OD2	2.19	0.41
1:A:62:SER:HB2	1:A:242:HIS:HB2	2.01	0.41
1:B:129:LEU:HD13	1:B:133:LEU:HD11	2.01	0.41
1:C:7:VAL:HG11	1:C:109:ILE:HA	2.02	0.41
1:D:124:THR:O	1:D:143:SER:HA	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:269:ALA:C	1:D:271:ARG:H	2.24	0.41
1:A:65:ASN:HB2	1:A:66:PRO:HD3	2.03	0.41
1:B:298:ARG:C	1:B:300:ALA:N	2.73	0.41
1:C:93:GLN:HE21	1:C:93:GLN:HB3	1.61	0.41
1:C:127:ASP:OD2	1:C:143:SER:OG	2.28	0.41
1:C:235:ILE:HD12	1:C:382:ARG:CZ	2.51	0.41
1:D:160:ILE:O	1:D:164:VAL:HB	2.20	0.41
1:D:163:ARG:HH21	1:D:190:ASN:HD22	1.68	0.41
1:D:322:ARG:HG3	1:D:336:ILE:HG22	2.03	0.41
1:C:24:VAL:HG12	1:C:27:CYS:HB2	2.01	0.41
1:C:86:PHE:HA	1:C:96:VAL:O	2.21	0.41
1:C:286:HIS:HB3	1:C:361:LEU:HG	2.03	0.41
1:D:148:ASP:HA	1:D:161:LEU:CD2	2.51	0.41
1:D:185:LEU:O	1:D:189:THR:HG23	2.21	0.41
1:B:31:TYR:HA	1:B:210:PRO:HB3	2.03	0.40
1:C:97:LEU:CD2	1:C:281:PRO:CG	2.98	0.40
1:C:368:HIS:HA	1:C:373:GLU:OE2	2.21	0.40
1:B:257:LEU:HD11	1:B:315:GLY:HA3	2.03	0.40
1:C:275:LEU:O	1:C:277:PRO:HD3	2.20	0.40
1:D:247:LYS:NZ	1:D:345:ARG:O	2.40	0.40
1:A:286:HIS:CG	1:A:361:LEU:HG	2.57	0.40
1:A:336:ILE:HD13	1:A:336:ILE:HG21	1.89	0.40
1:B:286:HIS:CE1	1:B:288:ALA:HA	2.57	0.40
1:B:383:LYS:HD2	1:B:383:LYS:HA	1.85	0.40
1:A:167:PRO:O	1:A:169:PRO:HD3	2.21	0.40

There are no symmetry-related clashes.

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	400/406 (98%)	379 (95%)	21 (5%)	0	100 100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	399/406 (98%)	381 (96%)	15 (4%)	3 (1%)	19	15
1	C	395/406 (97%)	373 (94%)	21 (5%)	1 (0%)	41	41
1	D	387/406 (95%)	366 (95%)	16 (4%)	5 (1%)	12	7
All	All	1581/1624 (97%)	1499 (95%)	73 (5%)	9 (1%)	25	21

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	299	ASP
1	D	299	ASP
1	D	269	ALA
1	D	277	PRO
1	B	330	GLU
1	C	93	GLN
1	D	270	GLN
1	B	27	CYS
1	D	302	PRO

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	330/333 (99%)	301 (91%)	29 (9%)	10	6
1	B	327/333 (98%)	300 (92%)	27 (8%)	11	7
1	C	323/333 (97%)	290 (90%)	33 (10%)	7	4
1	D	321/333 (96%)	300 (94%)	21 (6%)	17	14
All	All	1301/1332 (98%)	1191 (92%)	110 (8%)	10	7

All (110) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	THR
1	A	3	ASN

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Mol	Chain	Res	Type
1	A	6	SER
1	A	11	SER
1	A	13	ARG
1	A	16	SER
1	A	30	GLU
1	A	97	LEU
1	A	102	LYS
1	A	128	LYS
1	A	130	ARG
1	A	136	GLN
1	A	146	LYS
1	A	148	ASP
1	A	149	GLN
1	A	150	VAL
1	A	157	VAL
1	A	186	SER
1	A	192	ARG
1	A	207	LYS
1	A	224	SER
1	A	271	ARG
1	A	273	ARG
1	A	297	LEU
1	A	323	SER
1	A	339	LEU
1	A	362	THR
1	A	392	ARG
1	A	406	LEU
1	B	16	SER
1	B	48	THR
1	B	92	THR
1	B	93	GLN
1	B	102	LYS
1	B	110	LEU
1	B	115	LYS
1	B	129	LEU
1	B	159	ASN
1	B	192	ARG
1	B	201	THR
1	B	207	LYS
1	B	280	ASP
1	B	298	ARG
1	B	299	ASP

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Mol	Chain	Res	Type
1	B	304	ARG
1	B	323	SER
1	B	324	GLN
1	B	327	GLN
1	B	328	ARG
1	B	339	LEU
1	B	361	LEU
1	B	383	LYS
1	B	392	ARG
1	B	401	LEU
1	B	403	LEU
1	B	406	LEU
1	C	3	ASN
1	C	9	SER
1	C	16	SER
1	C	37	GLN
1	C	93	GLN
1	C	97	LEU
1	C	102	LYS
1	C	110	LEU
1	C	128	LYS
1	C	132	LEU
1	C	148	ASP
1	C	149	GLN
1	C	152	LEU
1	C	157	VAL
1	C	171	VAL
1	C	201	THR
1	C	207	LYS
1	C	235	ILE
1	C	270	GLN
1	C	271	ARG
1	C	286	HIS
1	C	297	LEU
1	C	327	GLN
1	C	333	GLU
1	C	339	LEU
1	C	354	ASP
1	C	357	ASP
1	C	358	LEU
1	C	378	LEU
1	C	387	LEU

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Mol	Chain	Res	Type
1	C	393	LEU
1	C	400	ASP
1	C	406	LEU
1	D	9	SER
1	D	16	SER
1	D	48	THR
1	D	99	ASN
1	D	100	ASP
1	D	128	LYS
1	D	146	LYS
1	D	149	GLN
1	D	154	GLU
1	D	161	LEU
1	D	192	ARG
1	D	201	THR
1	D	266	GLN
1	D	273	ARG
1	D	286	HIS
1	D	294	THR
1	D	304	ARG
1	D	320	LEU
1	D	336	ILE
1	D	392	ARG
1	D	406	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	37	GLN
1	A	93	GLN
1	A	149	GLN
1	A	266	GLN
1	A	327	GLN
1	B	29	GLN
1	B	149	GLN
1	B	255	ASN
1	B	266	GLN
1	C	65	ASN
1	C	85	ASN
1	C	93	GLN
1	C	266	GLN
1	C	286	HIS

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Mol	Chain	Res	Type
1	C	405	HIS
1	D	29	GLN
1	D	40	GLN
1	D	65	ASN
1	D	99	ASN
1	D	149	GLN
1	D	190	ASN
1	D	266	GLN
1	D	327	GLN
1	D	356	HIS

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 monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 12 ligands modelled in this entry, 8 are monoatomic - leaving 4 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
3	PPF	C	413	2	4,6,6	2.51	2 (50%)	3,9,9	1.14	0
4	TLA	B	411	2	9,9,9	2.06	3 (33%)	12,12,12	3.00	3 (25%)
3	PPF	D	412	2	4,6,6	1.72	2 (50%)	3,9,9	1.06	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	PPF	A	410	2	4,6,6	2.28	1 (25%)	3,9,9	0.90	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	PPF	C	413	2	-	0/0/6/6	-
4	TLA	B	411	2	-	3/12/12/12	-
3	PPF	D	412	2	-	0/0/6/6	-
3	PPF	A	410	2	-	0/0/6/6	-

All (8) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	B	411	TLA	C3-C2	-4.64	1.38	1.53
3	A	410	PPF	O4-C1	-3.79	1.19	1.30
3	C	413	PPF	O4-C1	-3.78	1.19	1.30
4	B	411	TLA	O2-C2	-3.09	1.35	1.42
4	B	411	TLA	O3-C3	-2.21	1.37	1.42
3	D	412	PPF	P1-O2	-2.13	1.48	1.54
3	C	413	PPF	P1-O2	-2.12	1.48	1.54
3	D	412	PPF	O4-C1	-2.01	1.24	1.30

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	411	TLA	O2-C2-C3	8.09	126.31	110.23
4	B	411	TLA	C2-C3-C4	-5.23	98.20	109.87
4	B	411	TLA	O3-C3-C2	-2.97	104.33	110.23

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	B	411	TLA	O1-C1-C2-O2
4	B	411	TLA	O11-C1-C2-O2
4	B	411	TLA	O1-C1-C2-C3

There are no ring outliers.

2 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	413	PPF	6	0
3	A	410	PPF	2	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

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

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

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates [i](#)

EDS was not executed - this section is therefore empty.

6.4 Ligands [i](#)

EDS was not executed - this section is therefore empty.

6.5 Other polymers [i](#)

EDS was not executed - this section is therefore empty.