



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 8, 2026 – 11:51 AM UTC

PDB ID : 6DU6 / pdb_00006du6
Title : Crystal structure of the pyruvate kinase (PK1) from the mosquito *Aedes aegypti*
Authors : Pizarro, J.C.; Scaraffia, P.Y.; Petchampai, N.; Murillo-Solano, C.
Deposited on : 2018-06-19
Resolution : 3.51 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

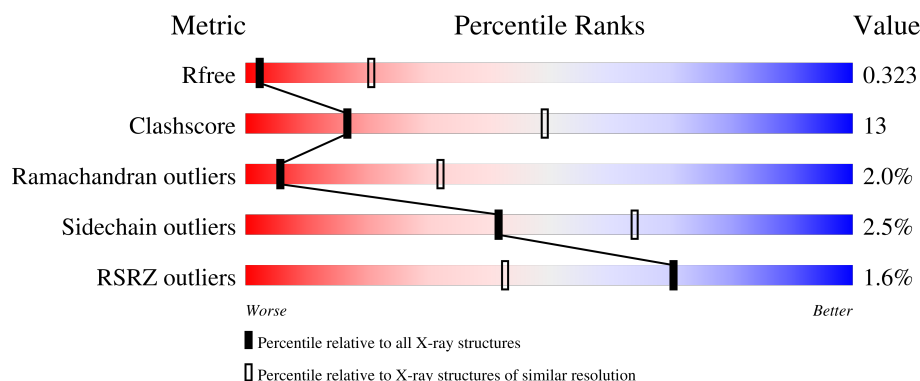
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.51 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	1025 (3.56-3.48)
Clashscore	190562	1079 (3.56-3.48)
Ramachandran outliers	187476	1052 (3.56-3.48)
Sidechain outliers	187428	1053 (3.56-3.48)
RSRZ outliers	180081	1024 (3.56-3.48)

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	565	
1	B	565	
1	C	565	
1	D	565	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 15364 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 Pyruvate kinase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	503	Total	C	N	O	S	0	0	0
			3786	2379	663	721	23			
1	B	509	Total	C	N	O	S	0	0	0
			3811	2393	663	732	23			
1	C	512	Total	C	N	O	S	0	0	0
			3873	2432	678	740	23			
1	D	505	Total	C	N	O	S	0	0	0
			3814	2396	666	729	23			

There are 144 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-17	MET	-	initiating methionine	UNP Q16F38
A	-16	ALA	-	expression tag	UNP Q16F38
A	-15	SER	-	expression tag	UNP Q16F38
A	-14	TRP	-	expression tag	UNP Q16F38
A	-13	SER	-	expression tag	UNP Q16F38
A	-12	HIS	-	expression tag	UNP Q16F38
A	-11	PRO	-	expression tag	UNP Q16F38
A	-10	GLN	-	expression tag	UNP Q16F38
A	-9	PHE	-	expression tag	UNP Q16F38
A	-8	GLU	-	expression tag	UNP Q16F38
A	-7	LYS	-	expression tag	UNP Q16F38
A	-6	GLY	-	expression tag	UNP Q16F38
A	-5	ALA	-	expression tag	UNP Q16F38
A	-4	ASP	-	expression tag	UNP Q16F38
A	-3	ASP	-	expression tag	UNP Q16F38
A	-2	ASP	-	expression tag	UNP Q16F38
A	-1	ASP	-	expression tag	UNP Q16F38
A	0	LYS	-	expression tag	UNP Q16F38
A	530	PRO	-	expression tag	UNP Q16F38
A	531	GLY	-	expression tag	UNP Q16F38
A	532	PHE	-	expression tag	UNP Q16F38

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Chain	Residue	Modelled	Actual	Comment	Reference
A	533	SER	-	expression tag	UNP Q16F38
A	534	SER	-	expression tag	UNP Q16F38
A	535	ILE	-	expression tag	UNP Q16F38
A	536	SER	-	expression tag	UNP Q16F38
A	537	ALA	-	expression tag	UNP Q16F38
A	538	HIS	-	expression tag	UNP Q16F38
A	539	HIS	-	expression tag	UNP Q16F38
A	540	HIS	-	expression tag	UNP Q16F38
A	541	HIS	-	expression tag	UNP Q16F38
A	542	HIS	-	expression tag	UNP Q16F38
A	543	HIS	-	expression tag	UNP Q16F38
A	544	HIS	-	expression tag	UNP Q16F38
A	545	HIS	-	expression tag	UNP Q16F38
A	546	HIS	-	expression tag	UNP Q16F38
A	547	HIS	-	expression tag	UNP Q16F38
B	-17	MET	-	initiating methionine	UNP Q16F38
B	-16	ALA	-	expression tag	UNP Q16F38
B	-15	SER	-	expression tag	UNP Q16F38
B	-14	TRP	-	expression tag	UNP Q16F38
B	-13	SER	-	expression tag	UNP Q16F38
B	-12	HIS	-	expression tag	UNP Q16F38
B	-11	PRO	-	expression tag	UNP Q16F38
B	-10	GLN	-	expression tag	UNP Q16F38
B	-9	PHE	-	expression tag	UNP Q16F38
B	-8	GLU	-	expression tag	UNP Q16F38
B	-7	LYS	-	expression tag	UNP Q16F38
B	-6	GLY	-	expression tag	UNP Q16F38
B	-5	ALA	-	expression tag	UNP Q16F38
B	-4	ASP	-	expression tag	UNP Q16F38
B	-3	ASP	-	expression tag	UNP Q16F38
B	-2	ASP	-	expression tag	UNP Q16F38
B	-1	ASP	-	expression tag	UNP Q16F38
B	0	LYS	-	expression tag	UNP Q16F38
B	530	PRO	-	expression tag	UNP Q16F38
B	531	GLY	-	expression tag	UNP Q16F38
B	532	PHE	-	expression tag	UNP Q16F38
B	533	SER	-	expression tag	UNP Q16F38
B	534	SER	-	expression tag	UNP Q16F38
B	535	ILE	-	expression tag	UNP Q16F38
B	536	SER	-	expression tag	UNP Q16F38
B	537	ALA	-	expression tag	UNP Q16F38
B	538	HIS	-	expression tag	UNP Q16F38

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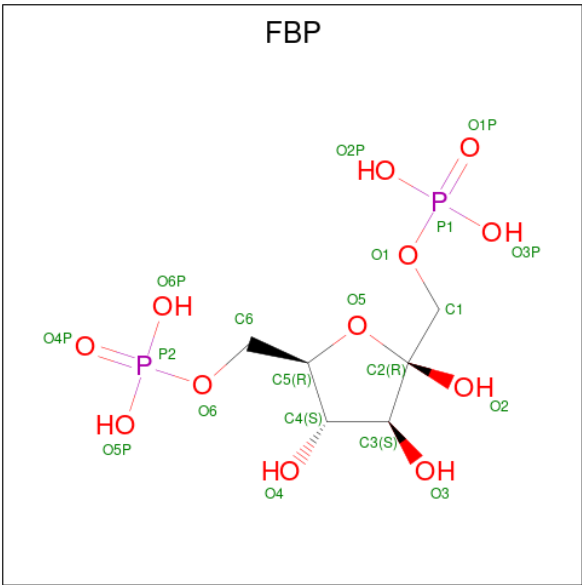
Chain	Residue	Modelled	Actual	Comment	Reference
B	539	HIS	-	expression tag	UNP Q16F38
B	540	HIS	-	expression tag	UNP Q16F38
B	541	HIS	-	expression tag	UNP Q16F38
B	542	HIS	-	expression tag	UNP Q16F38
B	543	HIS	-	expression tag	UNP Q16F38
B	544	HIS	-	expression tag	UNP Q16F38
B	545	HIS	-	expression tag	UNP Q16F38
B	546	HIS	-	expression tag	UNP Q16F38
B	547	HIS	-	expression tag	UNP Q16F38
C	-17	MET	-	initiating methionine	UNP Q16F38
C	-16	ALA	-	expression tag	UNP Q16F38
C	-15	SER	-	expression tag	UNP Q16F38
C	-14	TRP	-	expression tag	UNP Q16F38
C	-13	SER	-	expression tag	UNP Q16F38
C	-12	HIS	-	expression tag	UNP Q16F38
C	-11	PRO	-	expression tag	UNP Q16F38
C	-10	GLN	-	expression tag	UNP Q16F38
C	-9	PHE	-	expression tag	UNP Q16F38
C	-8	GLU	-	expression tag	UNP Q16F38
C	-7	LYS	-	expression tag	UNP Q16F38
C	-6	GLY	-	expression tag	UNP Q16F38
C	-5	ALA	-	expression tag	UNP Q16F38
C	-4	ASP	-	expression tag	UNP Q16F38
C	-3	ASP	-	expression tag	UNP Q16F38
C	-2	ASP	-	expression tag	UNP Q16F38
C	-1	ASP	-	expression tag	UNP Q16F38
C	0	LYS	-	expression tag	UNP Q16F38
C	530	PRO	-	expression tag	UNP Q16F38
C	531	GLY	-	expression tag	UNP Q16F38
C	532	PHE	-	expression tag	UNP Q16F38
C	533	SER	-	expression tag	UNP Q16F38
C	534	SER	-	expression tag	UNP Q16F38
C	535	ILE	-	expression tag	UNP Q16F38
C	536	SER	-	expression tag	UNP Q16F38
C	537	ALA	-	expression tag	UNP Q16F38
C	538	HIS	-	expression tag	UNP Q16F38
C	539	HIS	-	expression tag	UNP Q16F38
C	540	HIS	-	expression tag	UNP Q16F38
C	541	HIS	-	expression tag	UNP Q16F38
C	542	HIS	-	expression tag	UNP Q16F38
C	543	HIS	-	expression tag	UNP Q16F38
C	544	HIS	-	expression tag	UNP Q16F38

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Chain	Residue	Modelled	Actual	Comment	Reference
C	545	HIS	-	expression tag	UNP Q16F38
C	546	HIS	-	expression tag	UNP Q16F38
C	547	HIS	-	expression tag	UNP Q16F38
D	-17	MET	-	initiating methionine	UNP Q16F38
D	-16	ALA	-	expression tag	UNP Q16F38
D	-15	SER	-	expression tag	UNP Q16F38
D	-14	TRP	-	expression tag	UNP Q16F38
D	-13	SER	-	expression tag	UNP Q16F38
D	-12	HIS	-	expression tag	UNP Q16F38
D	-11	PRO	-	expression tag	UNP Q16F38
D	-10	GLN	-	expression tag	UNP Q16F38
D	-9	PHE	-	expression tag	UNP Q16F38
D	-8	GLU	-	expression tag	UNP Q16F38
D	-7	LYS	-	expression tag	UNP Q16F38
D	-6	GLY	-	expression tag	UNP Q16F38
D	-5	ALA	-	expression tag	UNP Q16F38
D	-4	ASP	-	expression tag	UNP Q16F38
D	-3	ASP	-	expression tag	UNP Q16F38
D	-2	ASP	-	expression tag	UNP Q16F38
D	-1	ASP	-	expression tag	UNP Q16F38
D	0	LYS	-	expression tag	UNP Q16F38
D	530	PRO	-	expression tag	UNP Q16F38
D	531	GLY	-	expression tag	UNP Q16F38
D	532	PHE	-	expression tag	UNP Q16F38
D	533	SER	-	expression tag	UNP Q16F38
D	534	SER	-	expression tag	UNP Q16F38
D	535	ILE	-	expression tag	UNP Q16F38
D	536	SER	-	expression tag	UNP Q16F38
D	537	ALA	-	expression tag	UNP Q16F38
D	538	HIS	-	expression tag	UNP Q16F38
D	539	HIS	-	expression tag	UNP Q16F38
D	540	HIS	-	expression tag	UNP Q16F38
D	541	HIS	-	expression tag	UNP Q16F38
D	542	HIS	-	expression tag	UNP Q16F38
D	543	HIS	-	expression tag	UNP Q16F38
D	544	HIS	-	expression tag	UNP Q16F38
D	545	HIS	-	expression tag	UNP Q16F38
D	546	HIS	-	expression tag	UNP Q16F38
D	547	HIS	-	expression tag	UNP Q16F38

- Molecule 2 is 1,6-di-O-phosphono-beta-D-fructofuranose (CCD ID: FBP) (formula: $C_6H_{14}O_{12}P_2$).

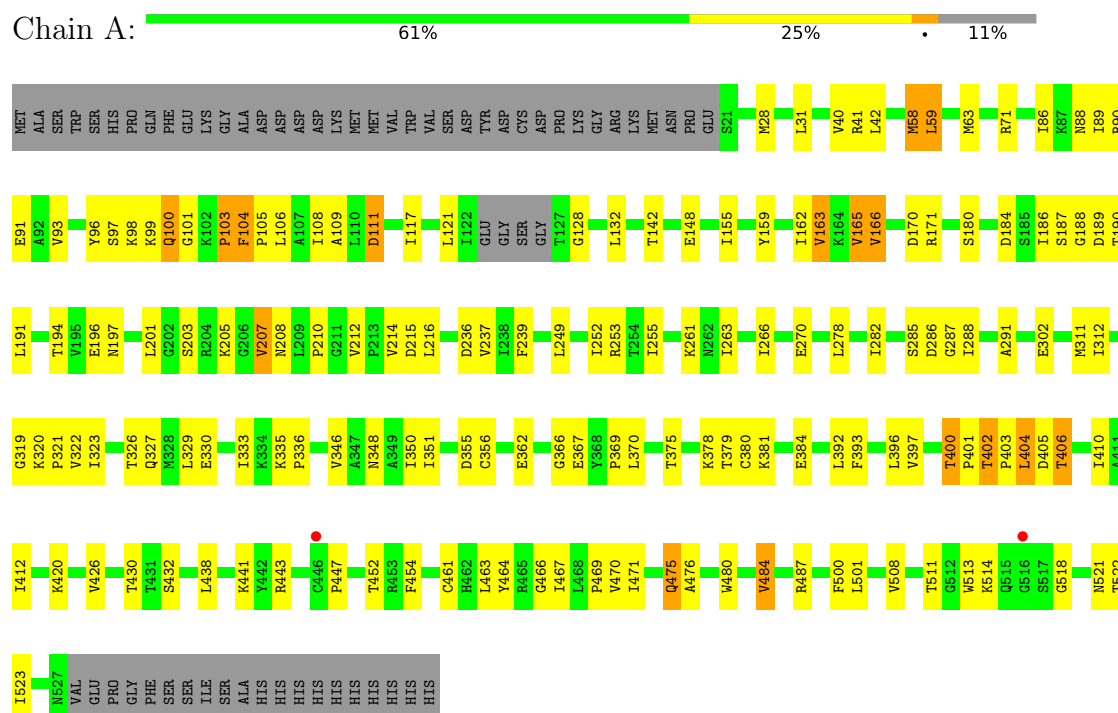


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
2	A	1	Total	C	O	P	0	0
			20	6	12	2		
2	B	1	Total	C	O	P	0	0
			20	6	12	2		
2	C	1	Total	C	O	P	0	0
			20	6	12	2		
2	D	1	Total	C	O	P	0	0
			20	6	12	2		

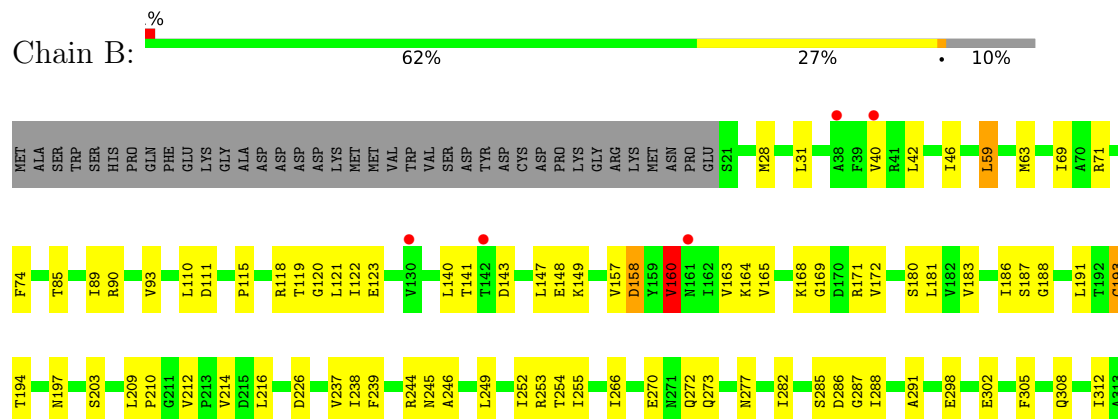
3 Residue-property plots [i](#)

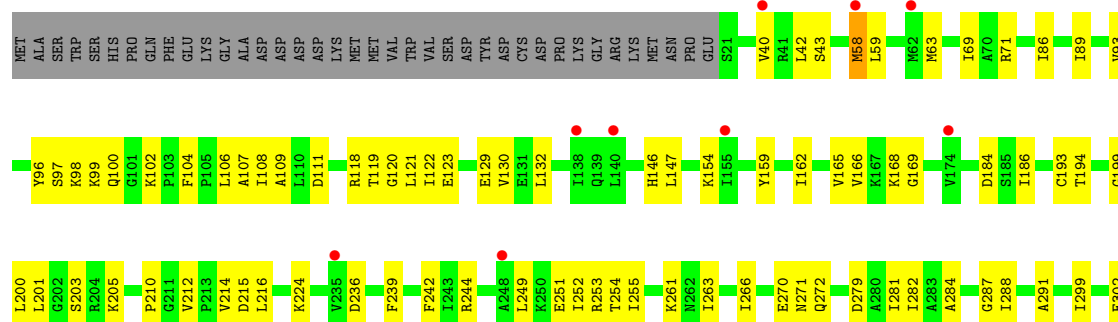
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density.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

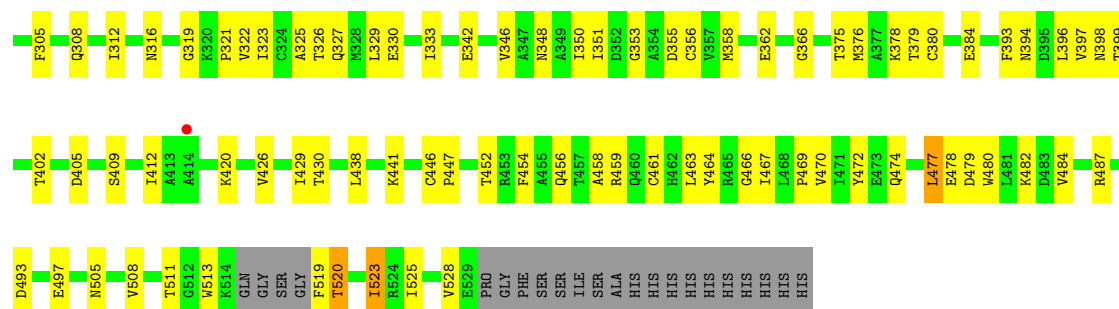
• Molecule 1: Pyruvate kinase



• Molecule 1: Pyruvate kinase







4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	109.23Å 113.65Å 202.07Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	49.53 – 3.51 49.53 – 3.51	Depositor EDS
% Data completeness (in resolution range)	99.7 (49.53-3.51) 87.0 (49.53-3.51)	Depositor EDS
R_{merge}	0.28	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	0.42 (at 3.48Å)	Xtriage
Refinement program	PHENIX 1.13_2998	Depositor
R, R_{free}	0.271 , 0.319 0.273 , 0.323	Depositor DCC
R_{free} test set	2558 reflections (7.97%)	wwPDB-VP
Wilson B-factor (Å ²)	79.1	Xtriage
Anisotropy	0.468	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.28 , 86.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtriage
Estimated twinning fraction	0.036 for k,h,-l	Xtriage
F_o, F_c correlation	0.86	EDS
Total number of atoms	15364	wwPDB-VP
Average B, all atoms (Å ²)	121.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.61% 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: FBP

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	0.17	0/3841	0.44	0/5196
1	B	0.17	0/3867	0.45	0/5236
1	C	0.16	0/3930	0.40	0/5313
1	D	0.15	0/3868	0.41	0/5230
All	All	0.16	0/15506	0.42	0/20975

There are no bond length outliers.

There are no bond angle outliers.

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	3786	0	3844	95	0
1	B	3811	0	3851	104	0
1	C	3873	0	3958	109	0
1	D	3814	0	3896	102	0
2	A	20	0	10	2	0
2	B	20	0	10	3	0
2	C	20	0	10	2	0
2	D	20	0	10	5	0
All	All	15364	0	15589	397	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 (397) 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:410:ILE:HG13	1:B:521:ASN:HA	1.52	0.92
1:A:402:THR:HB	1:A:403:PRO:HD2	1.63	0.80
1:A:513:TRP:HE1	1:A:521:ASN:HD21	1.29	0.80
1:A:302:GLU:HG2	1:C:378:LYS:HB3	1.63	0.78
1:B:378:LYS:HB3	1:D:302:GLU:HG2	1.67	0.76
1:B:475:GLN:HG2	1:B:476:ALA:H	1.50	0.76
1:B:426:VAL:HG12	1:B:508:VAL:HB	1.66	0.76
1:B:495:GLY:HA2	1:B:500:PHE:HD2	1.50	0.76
1:A:180:SER:OG	1:A:196:GLU:O	2.02	0.76
1:B:452:THR:HG22	1:B:454:PHE:H	1.50	0.75
1:C:249:LEU:HD22	1:C:265:ILE:HD12	1.67	0.75
1:D:282:ILE:HG13	1:D:288:ILE:HD13	1.67	0.75
1:B:140:LEU:HD21	1:B:157:VAL:HG23	1.69	0.74
1:D:96:TYR:O	1:D:98:LYS:N	2.19	0.74
1:A:378:LYS:HB3	1:C:302:GLU:HG2	1.68	0.74
1:C:452:THR:HG22	1:C:454:PHE:H	1.53	0.74
1:B:327:GLN:HA	1:B:330:GLU:HG2	1.71	0.73
1:C:503:PRO:HA	1:C:528:VAL:HB	1.71	0.73
1:C:426:VAL:HG12	1:C:508:VAL:HB	1.70	0.72
1:A:327:GLN:HA	1:A:330:GLU:HG2	1.70	0.72
1:A:58:MET:HE1	1:A:370:LEU:HG	1.72	0.72
1:A:452:THR:HG22	1:A:454:PHE:H	1.53	0.72
1:A:333:ILE:HG23	1:A:366:GLY:HA2	1.71	0.71
1:A:410:ILE:HG13	1:A:521:ASN:HA	1.72	0.70
1:B:302:GLU:HG2	1:D:378:LYS:HB3	1.73	0.70
1:A:100:GLN:HB3	1:A:103:PRO:HG3	1.74	0.69
1:C:397:VAL:HG22	1:C:412:ILE:HD11	1.73	0.69
1:B:456:GLN:HA	1:B:459:ARG:HD3	1.74	0.69
1:D:456:GLN:HA	1:D:459:ARG:HD3	1.74	0.68
1:C:282:ILE:HD11	1:C:315:CYS:HA	1.75	0.68
1:B:181:LEU:HB3	1:B:193:CYS:SG	2.34	0.68
1:D:40:VAL:HG11	1:D:447:PRO:HB3	1.75	0.67
1:D:122:ILE:HG22	1:D:123:GLU:H	1.58	0.67
1:B:501:LEU:HD13	1:B:528:VAL:HG21	1.77	0.67
1:C:325:ALA:HB1	1:C:358:MET:HE2	1.76	0.67
1:B:397:VAL:HG22	1:B:412:ILE:HD11	1.75	0.67
1:C:327:GLN:HA	1:C:330:GLU:HG2	1.77	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:333:ILE:HG23	1:D:366:GLY:HA2	1.76	0.66
1:B:40:VAL:HG21	1:B:447:PRO:HD3	1.77	0.66
1:C:333:ILE:HG23	1:C:366:GLY:HA2	1.78	0.66
1:D:430:THR:HA	2:D:601:FBP:H61	1.78	0.65
1:B:333:ILE:HG23	1:B:366:GLY:HA2	1.79	0.65
1:A:165:VAL:HG23	1:A:166:VAL:HG23	1.78	0.64
1:C:134:LYS:HA	1:C:195:VAL:HB	1.78	0.64
1:B:380:CYS:O	1:B:384:GLU:HB2	1.96	0.64
1:D:327:GLN:HA	1:D:330:GLU:HG2	1.80	0.64
1:A:163:VAL:HG22	1:A:191:LEU:HD11	1.79	0.63
1:D:430:THR:OG1	2:D:601:FBP:O4P	2.16	0.63
1:D:325:ALA:HB1	1:D:358:MET:HE2	1.79	0.63
1:D:224:LYS:HG3	1:D:255:ILE:HD11	1.80	0.63
1:A:426:VAL:HG12	1:A:508:VAL:HB	1.81	0.63
1:C:500:PHE:HB2	1:C:501:LEU:HD23	1.79	0.63
1:B:245:ASN:HA	1:B:277:ASN:HD21	1.63	0.62
1:C:329:LEU:HB2	1:C:362:GLU:HG2	1.80	0.62
1:A:401:PRO:HB3	1:A:404:LEU:HD13	1.80	0.62
1:B:237:VAL:HG21	1:B:463:LEU:HD11	1.81	0.61
1:B:526:VAL:HG13	1:C:513:TRP:HZ3	1.65	0.61
1:B:282:ILE:HD11	1:B:315:CYS:HA	1.82	0.61
1:B:115:PRO:HB2	1:B:216:LEU:HD13	1.83	0.61
1:B:325:ALA:HB1	1:B:358:MET:HE2	1.81	0.61
1:C:430:THR:OG1	2:C:601:FBP:O4P	2.12	0.60
1:B:40:VAL:HG11	1:B:447:PRO:HB3	1.82	0.60
1:D:323:ILE:HG12	1:D:356:CYS:HB2	1.83	0.60
1:D:397:VAL:HG22	1:D:412:ILE:HD11	1.83	0.60
1:A:253:ARG:NH2	1:A:261:LYS:O	2.34	0.60
1:C:119:THR:HG23	1:C:155:ILE:HG13	1.84	0.60
1:D:93:VAL:HG23	1:D:104:PHE:HD2	1.66	0.60
1:A:117:ILE:HB	1:A:207:VAL:CB	2.31	0.60
1:A:400:THR:H	1:A:401:PRO:CD	2.15	0.59
1:C:355:ASP:OD1	1:C:443:ARG:NH2	2.35	0.59
1:D:458:ALA:HB1	1:D:469:PRO:HB2	1.82	0.59
1:D:319:GLY:HA2	1:D:441:LYS:HG3	1.82	0.59
1:A:513:TRP:NE1	1:A:521:ASN:HD21	2.00	0.59
1:B:121:LEU:HA	1:B:203:SER:HB2	1.84	0.59
1:B:239:PHE:HD1	1:B:266:ILE:HB	1.68	0.59
1:B:412:ILE:HD13	1:C:420:LYS:HG3	1.83	0.59
1:D:472:TYR:CE2	1:D:474:GLN:HB3	2.37	0.59
1:C:348:ASN:HA	1:C:351:ILE:HG22	1.85	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:58:MET:SD	1:D:58:MET:N	2.75	0.59
1:D:69:ILE:HD11	1:D:109:ALA:HB2	1.83	0.59
1:D:216:LEU:O	1:D:244:ARG:NH2	2.35	0.59
1:C:361:GLY:O	1:C:366:GLY:N	2.36	0.59
1:C:270:GLU:HG2	1:C:291:ALA:HB3	1.83	0.58
1:A:380:CYS:O	1:A:384:GLU:HB2	2.03	0.58
1:A:159:TYR:OH	1:A:215:ASP:OD1	2.12	0.58
1:A:480:TRP:O	1:A:484:VAL:HG12	2.04	0.58
1:B:147:LEU:HD12	1:B:148:GLU:HG2	1.85	0.58
1:B:464:TYR:HB2	1:B:467:ILE:HD12	1.83	0.58
1:D:519:PHE:N	2:D:601:FBP:HO4	2.01	0.58
1:A:239:PHE:HD1	1:A:266:ILE:HB	1.69	0.57
1:B:512:GLY:HA2	1:B:520:THR:O	2.05	0.57
1:B:282:ILE:HA	1:B:288:ILE:HD11	1.86	0.57
1:D:71:ARG:NH2	1:D:111:ASP:OD2	2.38	0.57
1:B:183:VAL:HG22	1:B:191:LEU:HD11	1.86	0.57
1:A:99:LYS:O	1:A:101:GLY:N	2.37	0.57
1:B:214:VAL:HG12	1:B:216:LEU:H	1.68	0.57
1:C:71:ARG:NH2	1:C:111:ASP:OD2	2.39	0.56
1:C:517:SER:O	1:C:519:PHE:N	2.38	0.56
1:D:253:ARG:NH2	1:D:261:LYS:O	2.39	0.56
1:A:282:ILE:HA	1:A:288:ILE:HD11	1.87	0.56
1:B:355:ASP:OD1	1:B:443:ARG:NH2	2.38	0.56
1:C:464:TYR:HB2	1:C:467:ILE:HD12	1.87	0.56
1:C:453:ARG:NH2	1:C:483:ASP:OD2	2.38	0.56
1:D:99:LYS:HB2	1:D:102:LYS:HB2	1.88	0.56
1:B:346:VAL:O	1:B:350:ILE:HG22	2.06	0.56
1:C:121:LEU:HA	1:C:203:SER:HB2	1.88	0.55
1:B:348:ASN:HA	1:B:351:ILE:HG22	1.88	0.55
1:C:430:THR:HA	2:C:601:FBP:H61	1.88	0.55
1:A:253:ARG:NH1	1:A:263:ILE:O	2.36	0.55
1:B:270:GLU:HG2	1:B:291:ALA:HB3	1.88	0.55
1:A:278:LEU:O	1:A:282:ILE:HG13	2.07	0.55
1:D:119:THR:HG22	1:D:120:GLY:H	1.71	0.55
1:D:346:VAL:O	1:D:350:ILE:HG22	2.06	0.55
1:B:180:SER:HB3	1:B:197:ASN:HB3	1.87	0.55
1:D:165:VAL:HG12	1:D:212:VAL:HB	1.88	0.55
1:D:316:ASN:HD21	1:D:353:GLY:HA3	1.71	0.55
1:D:426:VAL:HG12	1:D:508:VAL:HB	1.87	0.55
1:D:43:SER:HB2	1:D:380:CYS:SG	2.47	0.55
1:C:475:GLN:HG2	1:C:476:ALA:H	1.71	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:123:GLU:HG3	1:B:149:LYS:HA	1.88	0.55
1:C:239:PHE:HD1	1:C:266:ILE:HB	1.72	0.55
1:D:348:ASN:HA	1:D:351:ILE:HG22	1.88	0.54
1:A:348:ASN:HA	1:A:351:ILE:HG22	1.88	0.54
1:A:184:ASP:OD2	1:A:194:THR:OG1	2.23	0.54
1:C:172:VAL:HG22	1:C:209:LEU:HG	1.89	0.54
1:A:59:LEU:HD11	1:A:89:ILE:HG13	1.89	0.54
1:A:71:ARG:HA	1:A:109:ALA:HB3	1.89	0.54
1:C:316:ASN:HD21	1:C:353:GLY:HA3	1.72	0.54
1:C:461:CYS:HB3	1:C:467:ILE:HG21	1.90	0.54
1:C:141:THR:HG23	1:C:143:ASP:H	1.73	0.53
1:C:271:ASN:HA	1:C:298:GLU:HG3	1.89	0.53
1:C:451:VAL:HA	1:C:470:VAL:HG12	1.90	0.53
1:A:464:TYR:HB2	1:A:467:ILE:HD12	1.89	0.53
1:D:429:ILE:HD11	1:D:487:ARG:NE	2.23	0.53
1:C:69:ILE:HD11	1:C:109:ALA:HB2	1.91	0.53
1:D:513:TRP:HD1	1:D:513:TRP:H	1.57	0.53
1:B:40:VAL:HG22	1:B:500:PHE:HD1	1.74	0.52
1:B:287:GLY:C	1:B:288:ILE:HD12	2.35	0.52
1:C:346:VAL:O	1:C:350:ILE:HG22	2.09	0.52
1:D:511:THR:O	1:D:520:THR:HG22	2.10	0.52
1:B:63:MET:HE1	1:B:93:VAL:HA	1.91	0.52
1:D:452:THR:HG22	1:D:454:PHE:H	1.72	0.52
1:A:321:PRO:HA	1:A:355:ASP:OD2	2.09	0.52
1:B:187:SER:OG	1:B:188:GLY:N	2.42	0.52
1:B:193:CYS:SG	1:B:194:THR:N	2.83	0.52
1:D:132:LEU:HB2	1:D:199:GLY:O	2.10	0.52
1:A:346:VAL:O	1:A:350:ILE:HG22	2.09	0.52
1:A:63:MET:HE2	1:A:106:LEU:HD13	1.90	0.52
1:C:40:VAL:HG11	1:C:447:PRO:HB3	1.92	0.52
1:C:380:CYS:O	1:C:384:GLU:HB2	2.09	0.52
1:C:521:ASN:OD1	1:C:522:THR:N	2.37	0.52
1:D:461:CYS:HB3	1:D:467:ILE:HG21	1.91	0.52
1:C:159:TYR:OH	1:C:215:ASP:OD1	2.23	0.52
1:A:500:PHE:HB2	1:A:501:LEU:HD23	1.92	0.52
1:D:513:TRP:H	1:D:513:TRP:CD1	2.28	0.52
1:A:355:ASP:OD1	1:A:443:ARG:NH2	2.43	0.51
1:B:141:THR:C	1:B:143:ASP:H	2.18	0.51
1:C:458:ALA:HB1	1:C:469:PRO:HB2	1.92	0.51
1:C:110:LEU:HB3	1:C:238:ILE:HG13	1.91	0.51
1:B:501:LEU:HD22	1:B:507:VAL:HG11	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:214:VAL:HG12	1:A:216:LEU:H	1.76	0.51
1:D:42:LEU:H	1:D:384:GLU:CD	2.19	0.51
1:D:252:ILE:O	1:D:255:ILE:HG22	2.11	0.51
1:B:288:ILE:O	1:B:322:VAL:HA	2.11	0.51
1:A:397:VAL:HG22	1:A:412:ILE:HD11	1.92	0.51
1:C:18:ASN:N	1:C:19:PRO:HD3	2.26	0.51
1:D:394:ASN:OD1	1:D:398:ASN:ND2	2.43	0.51
1:B:322:VAL:HG13	1:B:354:ALA:HA	1.93	0.50
1:D:214:VAL:HG12	1:D:216:LEU:H	1.76	0.50
1:D:329:LEU:HD23	1:D:342:GLU:HB3	1.92	0.50
1:A:511:THR:OG1	1:A:522:THR:OG1	2.26	0.50
1:D:118:ARG:HA	1:D:205:LYS:O	2.12	0.50
1:B:286:ASP:O	1:B:321:PRO:HD2	2.11	0.50
1:C:43:SER:HB2	1:C:380:CYS:SG	2.51	0.50
1:A:393:PHE:O	1:A:397:VAL:HG23	2.11	0.50
1:A:430:THR:OG1	2:A:601:FBP:O4P	2.18	0.50
1:A:405:ASP:O	1:A:406:THR:HB	2.12	0.50
1:B:511:THR:O	1:B:520:THR:HA	2.12	0.50
1:D:159:TYR:CD2	1:D:162:ILE:HG22	2.47	0.50
1:D:159:TYR:OH	1:D:215:ASP:OD1	2.20	0.50
1:D:287:GLY:C	1:D:288:ILE:HD12	2.36	0.50
1:C:147:LEU:HD12	1:C:148:GLU:HG2	1.93	0.49
1:D:244:ARG:O	1:D:281:ILE:HD11	2.11	0.49
1:A:420:LYS:HG3	1:D:412:ILE:HD13	1.95	0.49
1:A:396:LEU:HD12	1:C:25:LEU:HD22	1.94	0.49
1:A:278:LEU:HD21	1:A:311:MET:HG3	1.93	0.49
1:A:335:LYS:HG3	1:A:336:PRO:HD2	1.94	0.49
1:C:119:THR:HG22	1:C:120:GLY:H	1.77	0.49
1:A:323:ILE:HG12	1:A:356:CYS:HB2	1.95	0.49
1:A:475:GLN:HG2	1:A:476:ALA:N	2.27	0.49
1:B:119:THR:HG22	1:B:120:GLY:H	1.78	0.49
1:A:111:ASP:HA	1:A:239:PHE:O	2.13	0.48
1:B:165:VAL:HG12	1:B:212:VAL:HB	1.95	0.48
1:B:314:ARG:HG2	1:B:317:ARG:HH12	1.78	0.48
1:D:122:ILE:HG22	1:D:123:GLU:N	2.26	0.48
1:A:108:ILE:H	1:A:236:ASP:HB2	1.79	0.48
1:B:452:THR:HG21	1:B:457:THR:OG1	2.12	0.48
1:C:96:TYR:O	1:C:98:LYS:N	2.39	0.48
1:A:171:ARG:O	1:A:210:PRO:HD2	2.13	0.48
1:A:207:VAL:O	1:A:208:ASN:HB2	2.14	0.48
1:A:287:GLY:C	1:A:288:ILE:HD12	2.38	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:59:LEU:HD22	1:B:89:ILE:HA	1.95	0.48
1:C:319:GLY:HA2	1:C:441:LYS:HG3	1.95	0.48
1:C:475:GLN:HG2	1:C:476:ALA:N	2.29	0.48
1:A:187:SER:HB3	1:A:190:THR:OG1	2.13	0.48
1:B:71:ARG:NH2	1:B:111:ASP:OD2	2.45	0.48
1:D:63:MET:HE2	1:D:106:LEU:HD22	1.95	0.48
1:A:523:ILE:HB	1:D:523:ILE:HG23	1.96	0.48
1:D:146:HIS:NE2	1:D:154:LYS:HB2	2.28	0.48
1:A:288:ILE:O	1:A:322:VAL:HA	2.13	0.47
1:D:429:ILE:HD13	1:D:484:VAL:HG23	1.96	0.47
1:A:187:SER:OG	1:A:188:GLY:N	2.47	0.47
1:B:393:PHE:O	1:B:397:VAL:HG23	2.14	0.47
1:B:90:ARG:HA	1:B:93:VAL:HG12	1.96	0.47
1:A:40:VAL:HG11	1:A:447:PRO:HB3	1.96	0.47
1:A:42:LEU:HB3	1:A:466:GLY:HA2	1.97	0.47
1:A:286:ASP:O	1:A:321:PRO:HD2	2.14	0.47
1:B:417:ALA:HB2	1:C:413:ALA:HB2	1.96	0.47
1:C:163:VAL:HG13	1:C:186:ILE:HD11	1.96	0.47
1:C:175:ASP:OD1	1:C:205:LYS:HD2	2.14	0.47
1:D:249:LEU:O	1:D:253:ARG:HG2	2.15	0.47
1:C:42:LEU:HD22	1:C:466:GLY:HA2	1.97	0.47
1:C:89:ILE:HD13	1:C:108:ILE:HG22	1.97	0.47
1:D:119:THR:HG22	1:D:120:GLY:N	2.29	0.47
1:D:420:LYS:HA	1:D:420:LYS:HD3	1.61	0.47
1:B:425:ALA:HA	1:B:446:CYS:HB2	1.96	0.47
1:B:474:GLN:OE1	1:B:474:GLN:N	2.44	0.47
1:C:121:LEU:HD23	1:C:203:SER:HB2	1.96	0.47
1:C:132:LEU:HD11	1:C:201:LEU:HD22	1.96	0.47
1:D:168:LYS:HG3	1:D:169:GLY:H	1.80	0.46
1:D:505:ASN:O	1:D:528:VAL:HG23	2.15	0.46
1:A:121:LEU:HD23	1:A:203:SER:HB2	1.97	0.46
1:A:249:LEU:HD21	1:A:285:SER:OG	2.16	0.46
1:B:140:LEU:HB3	1:B:191:LEU:HB3	1.96	0.46
1:A:86:ILE:HA	1:A:89:ILE:HG22	1.98	0.46
1:C:123:GLU:HG2	1:C:149:LYS:HA	1.98	0.46
1:C:210:PRO:O	1:C:212:VAL:N	2.49	0.46
1:B:432:SER:N	2:B:601:FBP:O5P	2.46	0.46
1:D:239:PHE:HD1	1:D:266:ILE:HB	1.80	0.46
1:D:477:LEU:HD13	1:D:479:ASP:H	1.81	0.46
1:A:237:VAL:HG21	1:A:463:LEU:HD11	1.97	0.46
1:A:312:ILE:HG23	1:A:322:VAL:HG11	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:168:LYS:HG3	1:C:169:GLY:H	1.81	0.46
1:D:166:VAL:HA	1:D:212:VAL:HG11	1.97	0.46
1:D:321:PRO:HB3	1:D:463:LEU:O	2.16	0.46
1:A:103:PRO:HB2	1:A:104:PHE:H	1.42	0.46
1:B:312:ILE:HA	1:B:322:VAL:HG21	1.96	0.46
1:B:59:LEU:HD11	1:B:89:ILE:HG12	1.98	0.45
1:B:122:ILE:HG12	1:B:203:SER:HB3	1.96	0.45
1:D:270:GLU:HG2	1:D:291:ALA:HB3	1.99	0.45
1:D:312:ILE:HG23	1:D:322:VAL:HG11	1.98	0.45
1:D:393:PHE:O	1:D:397:VAL:HG23	2.15	0.45
1:A:329:LEU:HB2	1:A:362:GLU:HG2	1.97	0.45
1:C:214:VAL:HG23	1:C:216:LEU:H	1.82	0.45
1:C:288:ILE:O	1:C:322:VAL:HA	2.16	0.45
1:A:367:GLU:C	1:A:369:PRO:HD3	2.41	0.45
1:A:90:ARG:HA	1:A:93:VAL:HG12	1.97	0.45
1:C:113:LYS:HD3	1:C:222:LYS:HD3	1.97	0.45
1:C:224:LYS:HG3	1:C:255:ILE:HD11	1.97	0.45
1:C:404:LEU:HG	1:C:408:SER:HB2	1.99	0.45
1:C:121:LEU:HD12	1:C:147:LEU:O	2.17	0.45
1:C:278:LEU:HD23	1:C:314:ARG:HD2	1.98	0.45
1:C:139:GLN:OE1	1:C:154:LYS:NZ	2.41	0.45
1:D:242:PHE:HD1	1:D:271:ASN:HD22	1.64	0.45
1:A:319:GLY:HA2	1:A:441:LYS:HG3	1.98	0.45
1:B:42:LEU:HD22	1:B:466:GLY:HA2	1.99	0.45
1:B:249:LEU:HD21	1:B:285:SER:OG	2.16	0.45
1:C:312:ILE:HA	1:C:322:VAL:HG21	1.99	0.45
1:D:122:ILE:HD11	1:D:201:LEU:HG	1.99	0.45
1:B:85:THR:O	1:B:89:ILE:HG13	2.17	0.45
1:B:398:ASN:HD21	1:C:390:ARG:NH1	2.14	0.45
1:B:512:GLY:HA3	2:B:601:FBP:O3	2.16	0.45
1:D:329:LEU:HB2	1:D:362:GLU:HG2	1.99	0.45
1:A:105:PRO:HG2	1:A:469:PRO:HG2	1.98	0.44
1:B:163:VAL:HG23	1:B:164:LYS:HD2	1.99	0.44
1:C:96:TYR:C	1:C:98:LYS:H	2.22	0.44
1:D:130:VAL:O	1:D:200:LEU:HD13	2.16	0.44
1:D:482:LYS:HD3	1:D:482:LYS:HA	1.79	0.44
1:D:107:ALA:HB2	1:D:459:ARG:O	2.18	0.44
1:B:302:GLU:HG2	1:D:378:LYS:CB	2.45	0.44
1:C:181:LEU:HD13	1:C:195:VAL:HA	2.00	0.44
1:A:28:MET:HA	1:A:31:LEU:HD13	1.99	0.44
1:A:132:LEU:HD11	1:A:201:LEU:HD22	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:432:SER:OG	2:A:601:FBP:O5P	2.30	0.44
1:A:287:GLY:HA2	1:A:320:LYS:HB3	1.99	0.44
1:B:513:TRP:CD1	1:B:521:ASN:HD21	2.36	0.44
1:A:461:CYS:HB3	1:A:467:ILE:HG21	1.98	0.44
1:C:393:PHE:O	1:C:397:VAL:HG23	2.18	0.44
1:D:251:GLU:O	1:D:254:THR:HG22	2.17	0.44
1:D:464:TYR:HB2	1:D:467:ILE:HD12	1.99	0.44
1:A:117:ILE:HG23	1:A:159:TYR:H	1.81	0.44
1:C:472:TYR:CE2	1:C:474:GLN:HB3	2.53	0.44
1:C:312:ILE:HG23	1:C:322:VAL:HG11	2.00	0.44
1:D:121:LEU:HD23	1:D:203:SER:HB2	1.99	0.44
1:A:86:ILE:O	1:A:89:ILE:HG22	2.18	0.44
1:B:518:GLY:HA2	2:B:601:FBP:O6P	2.18	0.44
1:D:42:LEU:HD22	1:D:466:GLY:HA2	2.00	0.44
1:D:409:SER:HA	1:D:412:ILE:HG22	2.00	0.44
1:C:210:PRO:HB3	1:C:298:GLU:O	2.18	0.43
1:A:42:LEU:H	1:A:384:GLU:CD	2.24	0.43
1:B:329:LEU:HB2	1:B:362:GLU:HG2	2.01	0.43
1:C:122:ILE:H	1:C:203:SER:HB3	1.83	0.43
1:C:350:ILE:HG13	1:C:465:ARG:HH22	1.83	0.43
1:C:357:VAL:HB	1:C:376:MET:HE2	2.01	0.43
1:A:484:VAL:HA	1:A:487:ARG:HE	1.83	0.43
1:B:168:LYS:HG3	1:B:169:GLY:N	2.33	0.43
1:C:513:TRP:CD1	1:C:513:TRP:C	2.96	0.43
1:B:28:MET:HA	1:B:31:LEU:HD13	2.00	0.43
1:B:141:THR:O	1:B:143:ASP:N	2.42	0.43
1:B:282:ILE:HG13	1:B:288:ILE:HD13	2.00	0.43
1:B:426:VAL:HG23	1:B:448:ILE:HA	2.00	0.43
1:D:108:ILE:HG12	1:D:459:ARG:HH21	1.83	0.43
1:D:184:ASP:H	1:D:193:CYS:HA	1.84	0.43
1:D:380:CYS:O	1:D:384:GLU:HB2	2.19	0.43
1:A:252:ILE:O	1:A:255:ILE:HG22	2.18	0.43
1:B:74:PHE:HD2	1:B:226:ASP:HB3	1.84	0.43
1:C:42:LEU:H	1:C:384:GLU:CD	2.24	0.43
1:A:392:LEU:O	1:A:396:LEU:HD13	2.19	0.43
1:C:123:GLU:HG3	1:C:150:GLY:O	2.18	0.43
1:C:375:THR:O	1:C:379:THR:HG22	2.19	0.43
1:B:367:GLU:C	1:B:369:PRO:HD3	2.44	0.43
1:B:46:ILE:HG12	1:B:69:ILE:CG2	2.48	0.43
1:C:275:MET:HE1	1:C:307:ALA:HA	2.01	0.43
1:D:86:ILE:O	1:D:89:ILE:HG22	2.19	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:288:ILE:O	1:D:322:VAL:HA	2.18	0.43
1:B:252:ILE:O	1:B:255:ILE:HG22	2.19	0.43
1:D:508:VAL:HG22	1:D:525:ILE:HD13	2.00	0.43
1:D:508:VAL:HG22	1:D:525:ILE:CD1	2.49	0.43
1:C:121:LEU:CD2	1:C:203:SER:HB2	2.49	0.42
1:B:118:ARG:O	1:B:158:ASP:N	2.52	0.42
1:B:171:ARG:HG3	1:B:210:PRO:HG2	2.01	0.42
1:C:141:THR:OG1	1:C:142:THR:N	2.52	0.42
1:D:480:TRP:CH2	2:D:601:FBP:H11	2.54	0.42
1:B:110:LEU:HB3	1:B:238:ILE:HG13	2.00	0.42
1:C:452:THR:HG21	1:C:457:THR:OG1	2.19	0.42
1:B:244:ARG:HD2	1:B:273:GLN:OE1	2.19	0.42
1:C:149:LYS:HA	1:C:149:LYS:HD2	1.83	0.42
1:C:452:THR:HG22	1:C:454:PHE:N	2.29	0.42
1:D:249:LEU:HD11	1:D:284:ALA:HB1	2.00	0.42
1:B:249:LEU:O	1:B:253:ARG:HG2	2.19	0.42
1:C:249:LEU:HD23	1:C:252:ILE:HD12	2.01	0.42
1:C:279:ASP:O	1:C:282:ILE:HG22	2.19	0.42
1:D:426:VAL:HG13	1:D:446:CYS:SG	2.59	0.42
1:B:210:PRO:HB3	1:B:298:GLU:O	2.19	0.42
1:D:493:ASP:O	1:D:497:GLU:HG2	2.19	0.42
1:A:63:MET:HE3	1:A:63:MET:HB2	1.74	0.42
1:B:447:PRO:HG3	1:B:500:PHE:CD1	2.54	0.42
1:D:279:ASP:O	1:D:282:ILE:HG22	2.19	0.42
1:A:375:THR:O	1:A:379:THR:HG22	2.20	0.42
1:C:86:ILE:O	1:C:89:ILE:HG22	2.19	0.42
1:C:184:ASP:N	1:C:192:THR:O	2.45	0.42
1:D:321:PRO:HA	1:D:355:ASP:OD2	2.20	0.42
1:C:28:MET:HA	1:C:31:LEU:HD13	2.02	0.42
1:D:129:GLU:HB3	1:D:200:LEU:HD22	2.01	0.42
1:B:40:VAL:HG22	1:B:500:PHE:CD1	2.54	0.42
1:C:425:ALA:HA	1:C:446:CYS:HB2	2.01	0.42
1:A:31:LEU:HD23	1:C:306:LEU:HA	2.02	0.41
1:B:461:CYS:HB3	1:B:467:ILE:HG21	2.02	0.41
1:B:481:LEU:O	1:B:484:VAL:HG12	2.20	0.41
1:A:96:TYR:C	1:A:98:LYS:H	2.27	0.41
1:A:270:GLU:HG2	1:A:291:ALA:HB3	2.01	0.41
1:D:305:PHE:O	1:D:308:GLN:HG2	2.20	0.41
1:B:160:VAL:HG21	1:B:216:LEU:HD23	2.01	0.41
1:C:239:PHE:HB3	1:C:268:LYS:HD2	2.02	0.41
1:D:396:LEU:O	1:D:399:THR:HG22	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:402:THR:HB	1:A:403:PRO:CD	2.41	0.41
1:B:90:ARG:O	1:B:93:VAL:HG12	2.20	0.41
1:C:409:SER:HA	1:C:412:ILE:HG22	2.03	0.41
1:B:305:PHE:O	1:B:308:GLN:HG2	2.20	0.41
1:C:205:LYS:HD3	1:C:205:LYS:HA	1.67	0.41
1:C:477:LEU:HD13	1:C:479:ASP:H	1.86	0.41
1:B:332:MET:HA	1:B:335:LYS:O	2.21	0.41
1:C:68:ASN:O	1:C:106:LEU:HD12	2.20	0.41
1:C:453:ARG:NH2	1:C:476:ALA:HA	2.35	0.41
1:A:311:MET:HE3	1:A:311:MET:HB2	1.88	0.41
1:B:122:ILE:H	1:B:203:SER:HB3	1.85	0.41
1:A:41:ARG:HB2	1:A:381:LYS:HG2	2.03	0.41
1:A:142:THR:HG22	1:A:189:ASP:HB2	2.03	0.41
1:B:405:ASP:N	1:B:405:ASP:OD1	2.54	0.41
1:C:286:ASP:O	1:C:321:PRO:HD2	2.21	0.41
1:C:351:ILE:HG13	1:C:387:LEU:HD23	2.02	0.41
1:C:399:THR:O	1:C:401:PRO:HD3	2.21	0.41
1:B:119:THR:HG22	1:B:120:GLY:N	2.36	0.41
1:B:163:VAL:HB	1:B:186:ILE:HD11	2.03	0.41
1:B:172:VAL:HG22	1:B:209:LEU:HD22	2.03	0.41
1:D:272:GLN:HG3	1:D:299:ILE:HG22	2.03	0.41
1:A:88:ASN:O	1:A:91:GLU:HG2	2.21	0.40
1:D:375:THR:O	1:D:379:THR:HG22	2.21	0.40
1:D:405:ASP:OD1	1:D:405:ASP:N	2.51	0.40
1:D:480:TRP:CZ2	2:D:601:FBP:H11	2.56	0.40
1:C:242:PHE:HD1	1:C:271:ASN:HD22	1.68	0.40
1:C:292:ARG:HB2	1:C:326:THR:OG1	2.21	0.40
1:B:118:ARG:H	1:B:158:ASP:CB	2.34	0.40
1:D:236:ASP:O	1:D:263:ILE:HG23	2.21	0.40
1:A:205:LYS:HA	1:A:205:LYS:HD3	1.77	0.40
1:A:249:LEU:O	1:A:253:ARG:HG2	2.22	0.40
1:D:477:LEU:HD13	1:D:478:GLU:N	2.37	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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

of similar resolution.

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	499/565 (88%)	459 (92%)	21 (4%)	19 (4%)	2	20
1	B	507/565 (90%)	474 (94%)	26 (5%)	7 (1%)	9	38
1	C	510/565 (90%)	475 (93%)	25 (5%)	10 (2%)	6	32
1	D	501/565 (89%)	474 (95%)	22 (4%)	5 (1%)	12	45
All	All	2017/2260 (89%)	1882 (93%)	94 (5%)	41 (2%)	6	32

All (41) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	400	THR
1	A	402	THR
1	B	401	PRO
1	B	474	GLN
1	C	210	PRO
1	A	103	PRO
1	A	111	ASP
1	A	166	VAL
1	A	406	THR
1	B	158	ASP
1	B	160	VAL
1	C	97	SER
1	C	211	GLY
1	C	518	GLY
1	C	520	THR
1	D	97	SER
1	D	100	GLN
1	A	170	ASP
1	A	197	ASN
1	A	475	GLN
1	C	19	PRO
1	C	522	THR
1	A	97	SER
1	A	100	GLN
1	A	326	THR
1	B	246	ALA
1	B	326	THR
1	C	326	THR

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Mol	Chain	Res	Type
1	D	326	THR
1	D	402	THR
1	A	404	LEU
1	A	514	LYS
1	C	21	SER
1	C	521	ASN
1	A	207	VAL
1	B	403	PRO
1	D	210	PRO
1	A	128	GLY
1	A	518	GLY
1	A	104	PHE
1	A	165	VAL

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	407/470 (87%)	395 (97%)	12 (3%)	37	61
1	B	409/470 (87%)	399 (98%)	10 (2%)	43	64
1	C	421/470 (90%)	412 (98%)	9 (2%)	47	66
1	D	414/470 (88%)	403 (97%)	11 (3%)	39	62
All	All	1651/1880 (88%)	1609 (98%)	42 (2%)	42	64

All (42) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	58	MET
1	A	59	LEU
1	A	148	GLU
1	A	155	ILE
1	A	162	ILE
1	A	163	VAL
1	A	186	ILE
1	A	212	VAL

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Mol	Chain	Res	Type
1	A	438	LEU
1	A	470	VAL
1	A	471	ILE
1	A	484	VAL
1	B	59	LEU
1	B	160	VAL
1	B	193	CYS
1	B	254	THR
1	B	272	GLN
1	B	376	MET
1	B	399	THR
1	B	404	LEU
1	B	438	LEU
1	B	477	LEU
1	C	59	LEU
1	C	147	LEU
1	C	214	VAL
1	C	376	MET
1	C	400	THR
1	C	438	LEU
1	C	477	LEU
1	C	513	TRP
1	C	522	THR
1	D	58	MET
1	D	59	LEU
1	D	147	LEU
1	D	186	ILE
1	D	194	THR
1	D	376	MET
1	D	438	LEU
1	D	470	VAL
1	D	477	LEU
1	D	520	THR
1	D	523	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	521	ASN
1	B	139	GLN
1	B	398	ASN
1	B	527	ASN

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Mol	Chain	Res	Type
1	C	18	ASN
1	C	245	ASN
1	D	88	ASN
1	D	233	GLN
1	D	389	HIS
1	D	489	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

4 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
2	FBP	C	601	-	18,20,20	0.90	1 (5%)	21,32,32	0.74	0
2	FBP	B	601	-	18,20,20	0.90	1 (5%)	21,32,32	0.78	1 (4%)
2	FBP	A	601	-	18,20,20	0.92	1 (5%)	21,32,32	0.78	0
2	FBP	D	601	-	18,20,20	0.93	1 (5%)	21,32,32	0.89	1 (4%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the

Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns.
'-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	FBP	C	601	-	-	6/13/32/32	0/1/1/1
2	FBP	B	601	-	-	8/13/32/32	0/1/1/1
2	FBP	A	601	-	-	8/13/32/32	0/1/1/1
2	FBP	D	601	-	-	6/13/32/32	0/1/1/1

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	601	FBP	O2-C2	2.71	1.45	1.40
2	A	601	FBP	O2-C2	2.70	1.45	1.40
2	B	601	FBP	O2-C2	2.66	1.45	1.40
2	C	601	FBP	O2-C2	2.66	1.45	1.40

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	601	FBP	O6P-P2-O6	2.04	111.98	106.67
2	D	601	FBP	O5-C5-C6	2.04	114.29	109.50

There are no chirality outliers.

All (28) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	601	FBP	C1-O1-P1-O1P
2	A	601	FBP	C1-O1-P1-O2P
2	A	601	FBP	C1-O1-P1-O3P
2	A	601	FBP	O1-C1-C2-O2
2	A	601	FBP	O1-C1-C2-C3
2	A	601	FBP	O1-C1-C2-O5
2	A	601	FBP	O5-C5-C6-O6
2	B	601	FBP	O1-C1-C2-O2
2	B	601	FBP	O1-C1-C2-C3
2	B	601	FBP	O1-C1-C2-O5
2	B	601	FBP	C6-O6-P2-O4P
2	B	601	FBP	C6-O6-P2-O5P
2	B	601	FBP	C6-O6-P2-O6P
2	C	601	FBP	O1-C1-C2-O2
2	C	601	FBP	O1-C1-C2-C3
2	C	601	FBP	O1-C1-C2-O5

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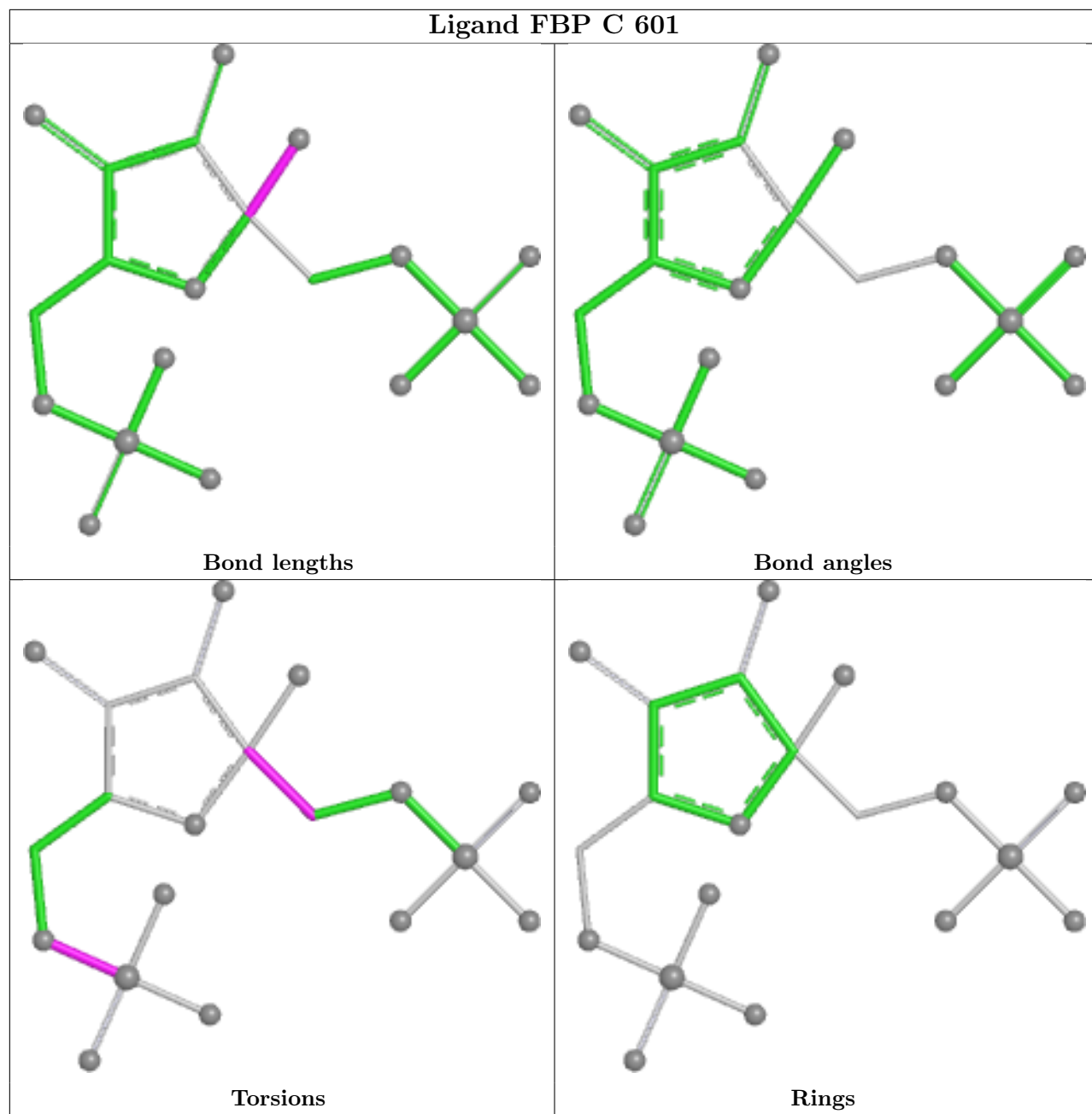
Mol	Chain	Res	Type	Atoms
2	C	601	FBP	C6-O6-P2-O4P
2	C	601	FBP	C6-O6-P2-O5P
2	C	601	FBP	C6-O6-P2-O6P
2	D	601	FBP	C1-O1-P1-O1P
2	D	601	FBP	C1-O1-P1-O2P
2	D	601	FBP	C1-O1-P1-O3P
2	D	601	FBP	C6-O6-P2-O5P
2	A	601	FBP	C4-C5-C6-O6
2	B	601	FBP	O5-C5-C6-O6
2	B	601	FBP	C4-C5-C6-O6
2	D	601	FBP	C6-O6-P2-O6P
2	D	601	FBP	O5-C5-C6-O6

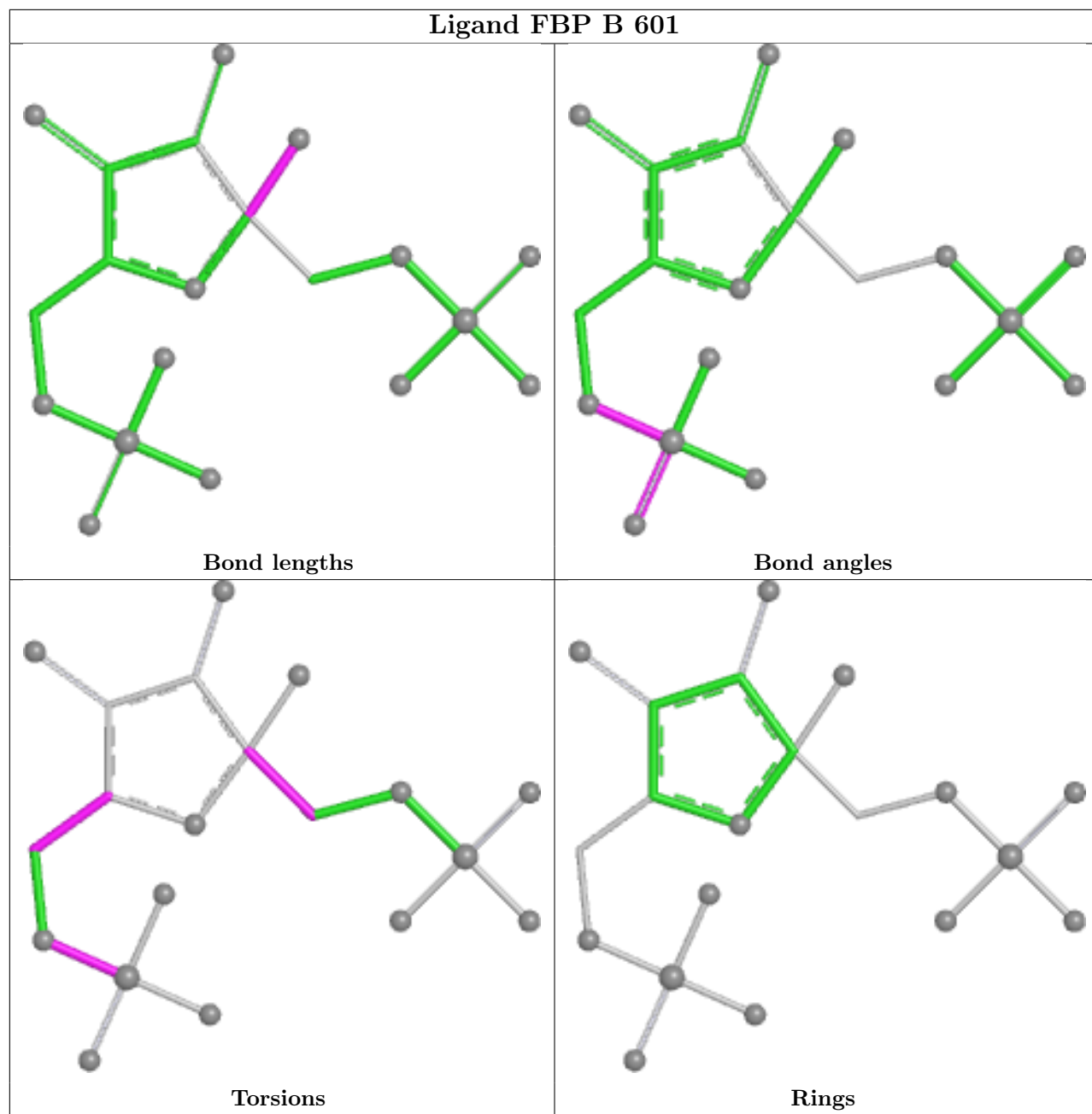
There are no ring outliers.

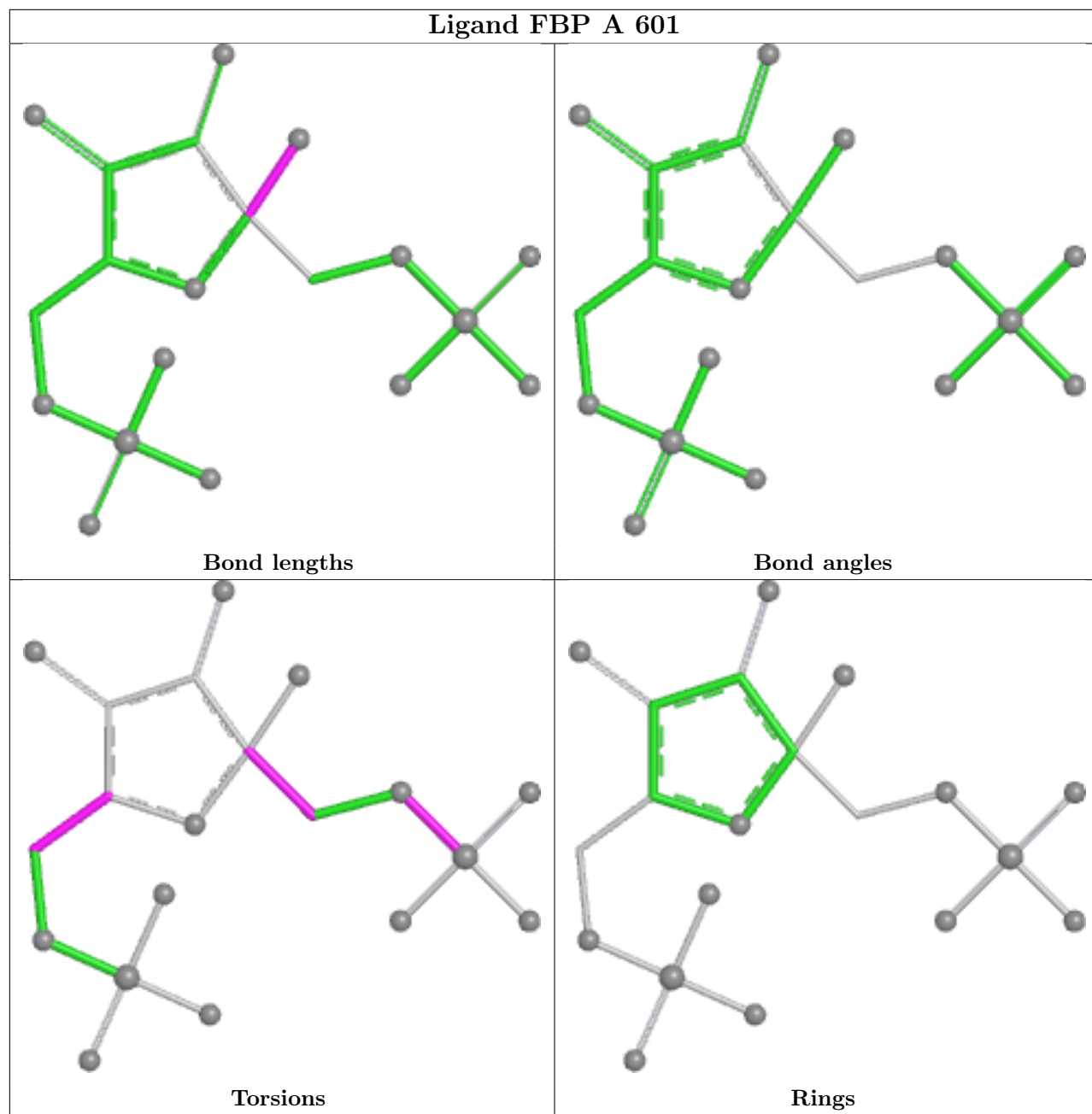
4 monomers are involved in 12 short contacts:

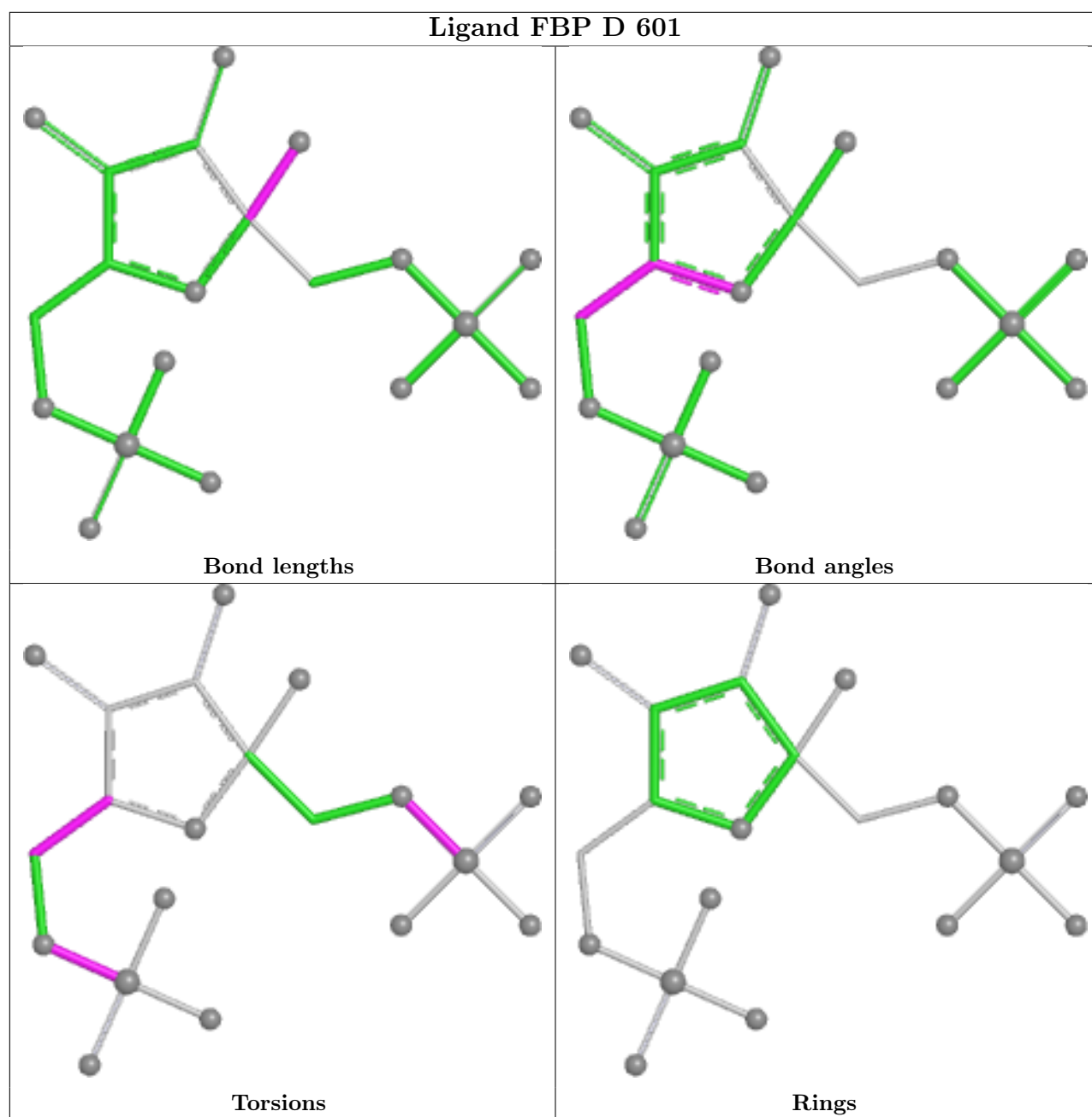
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	601	FBP	2	0
2	B	601	FBP	3	0
2	A	601	FBP	2	0
2	D	601	FBP	5	0

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](#)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ > 2		OWAB(Å ²)	Q < 0.9
1	A	503/565 (89%)	0.27	2 (0%)	88 70	47, 100, 157, 250	0
1	B	509/565 (90%)	0.25	7 (1%)	73 46	44, 93, 205, 297	0
1	C	512/565 (90%)	0.43	14 (2%)	56 32	40, 114, 244, 406	0
1	D	505/565 (89%)	0.55	10 (1%)	65 37	70, 141, 255, 343	0
All	All	2029/2260 (89%)	0.38	33 (1%)	70 43	40, 111, 220, 406	0

All (33) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	248	ALA	3.6
1	C	40	VAL	3.5
1	C	104	PHE	3.4
1	B	38	ALA	3.2
1	D	235	VAL	3.1
1	A	516	GLY	3.1
1	D	174	VAL	3.1
1	D	138	ILE	3.0
1	C	172	VAL	3.0
1	D	155	ILE	3.0
1	C	219	VAL	3.0
1	C	142	THR	2.9
1	D	140	LEU	2.8
1	D	414	ALA	2.6
1	A	446	CYS	2.6
1	C	174	VAL	2.6
1	B	142	THR	2.6
1	C	202	GLY	2.4
1	C	106	LEU	2.4
1	D	62	MET	2.3
1	C	38	ALA	2.3

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Mol	Chain	Res	Type	RSRZ
1	C	140	LEU	2.3
1	C	500	PHE	2.3
1	C	247	ALA	2.3
1	B	520	THR	2.2
1	B	500	PHE	2.1
1	B	161	ASN	2.1
1	D	58	MET	2.1
1	C	151	SER	2.1
1	D	40	VAL	2.1
1	C	248	ALA	2.0
1	B	40	VAL	2.0
1	B	130	VAL	2.0

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

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

6.3 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

6.4 Ligands [i](#)

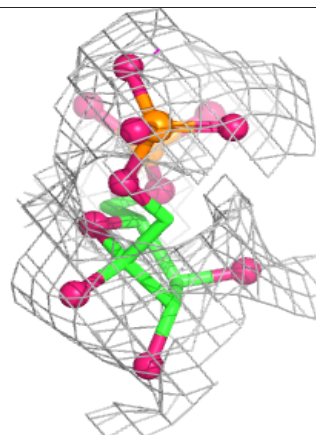
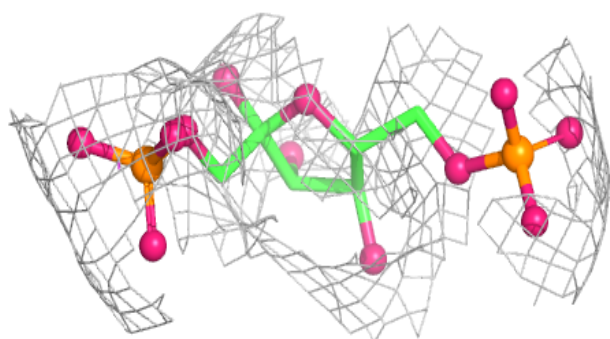
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	FBP	D	601	20/20	0.80	0.09	102,106,111,113	0
2	FBP	B	601	20/20	0.84	0.11	70,76,80,84	0
2	FBP	A	601	20/20	0.87	0.07	89,110,115,115	0
2	FBP	C	601	20/20	0.90	0.09	64,88,95,95	0

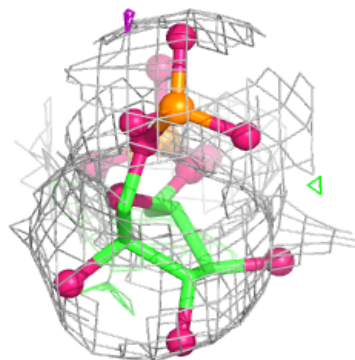
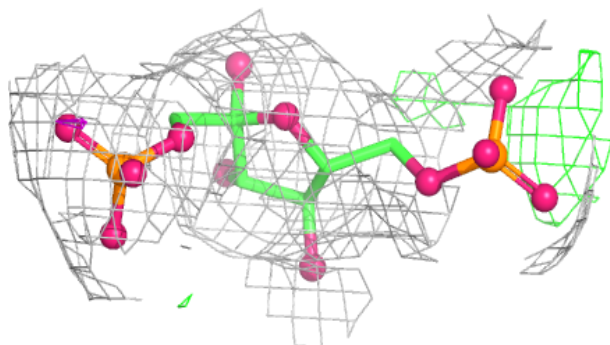
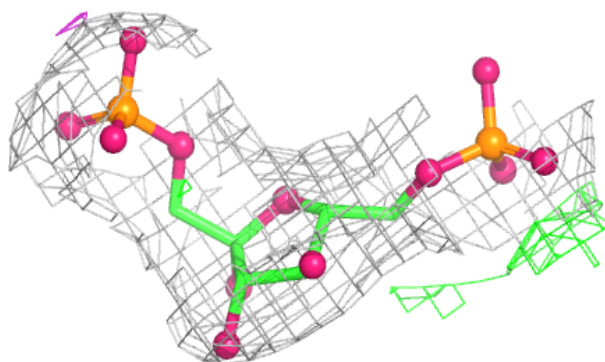
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around FBP D 601:

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

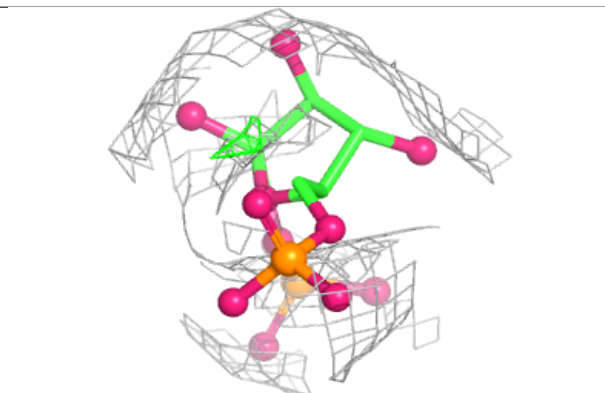
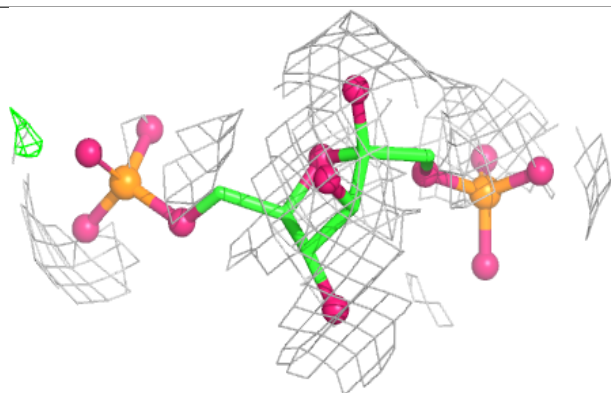
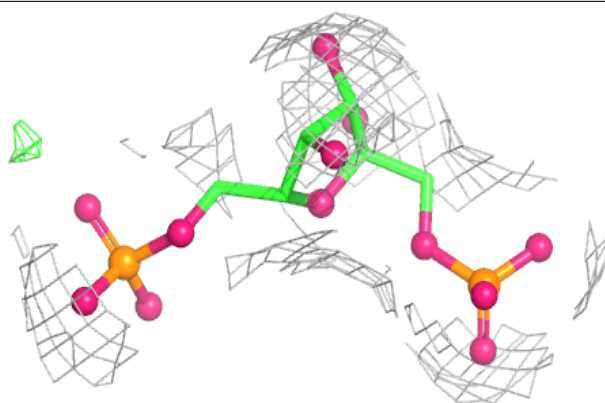
**Electron density around FBP B 601:**

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

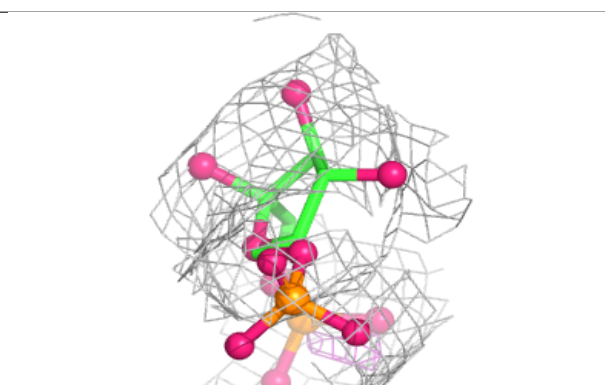
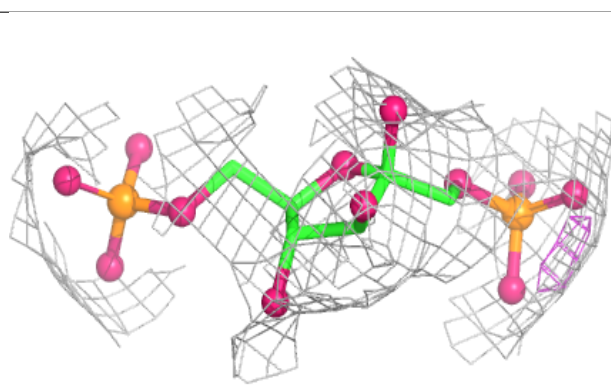
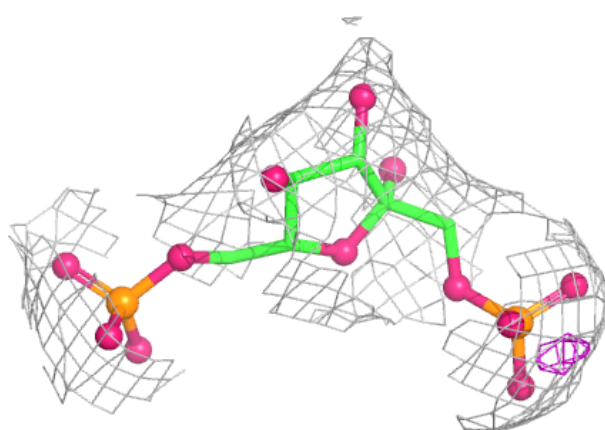


Electron density around FBP A 601:

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

**Electron density around FBP C 601:**

$2mF_o - DF_c$ (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.