



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 26, 2025 – 03:56 pm BST

PDB ID : 2XD1 / pdb_00002xd1
Title : ACTIVE SITE RESTRUCTURING REGULATES LIGAND RECOGNITION IN CLASS A PENICILLIN-BINDING PROTEINS
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Deposited on : 2010-04-28
Resolution : 3.00 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 Phenix2.0rc1
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.45.1

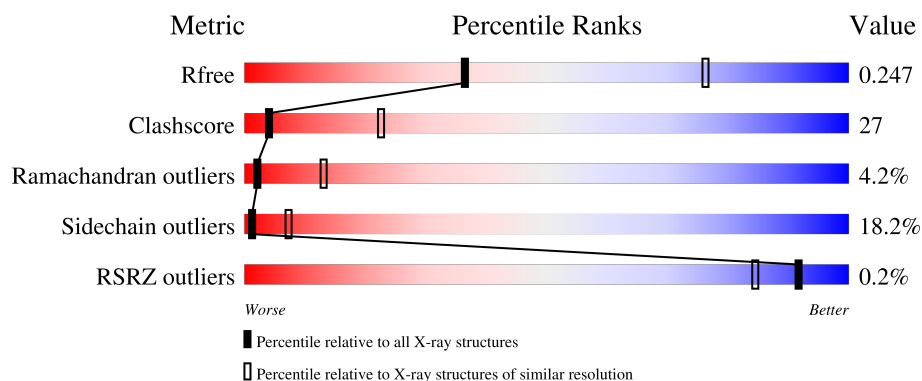
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.00 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}	164625	2511 (3.00-3.00)
Clashscore	180529	2866 (3.00-3.00)
Ramachandran outliers	177936	2778 (3.00-3.00)
Sidechain outliers	177891	2781 (3.00-3.00)
RSRZ outliers	164620	2523 (3.00-3.00)

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	494	 38% 38% 15% 5%
1	B	494	 36% 38% 13% 5% 8%

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 7278 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.

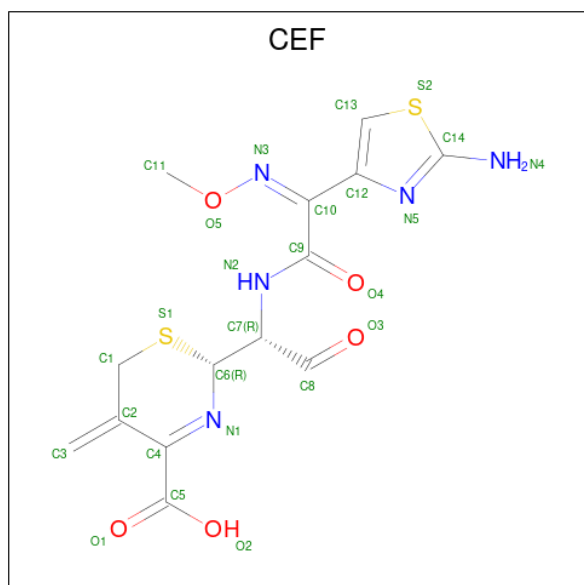
- Molecule 1 is a protein called PENICILLIN-BINDING PROTEIN 1B.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	469	Total	C	N	O	S	0	0	0
			3617	2263	613	726	15			
1	B	455	Total	C	N	O	S	0	0	0
			3508	2195	594	704	15			

There are 4 discrepancies between the modelled and reference sequences:

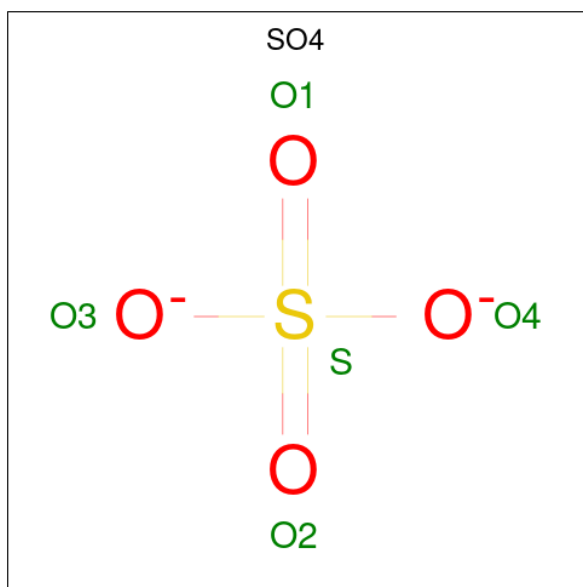
Chain	Residue	Modelled	Actual	Comment	Reference
A	686	GLN	ARG	engineered mutation	UNP Q7CRA4
A	687	GLN	ARG	engineered mutation	UNP Q7CRA4
B	686	GLN	ARG	engineered mutation	UNP Q7CRA4
B	687	GLN	ARG	engineered mutation	UNP Q7CRA4

- Molecule 2 is CEFOTAXIME, C3' cleaved, open, bound form (CCD ID: CEF) (formula: $C_{14}H_{15}N_5O_5S_2$).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			26	14	5	5	2		
2	B	1	Total	C	N	O	S	0	0
			26	14	5	5	2		

- Molecule 3 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	O	S	0	0
			5	4	1		
3	B	1	Total	O	S	0	0
			5	4	1		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	44	Total	O	0	0
			44	44		
4	B	47	Total	O	0	0
			47	47		

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4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	96.60Å 102.30Å 146.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.22 – 3.00 45.22 – 3.00	Depositor EDS
% Data completeness (in resolution range)	99.7 (45.22-3.00) 99.7 (45.22-3.00)	Depositor EDS
R_{merge}	0.07	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	4.74 (at 3.01Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.161 , 0.248 0.163 , 0.247	Depositor DCC
R_{free} test set	2955 reflections (9.96%)	wwPDB-VP
Wilson B-factor (Å ²)	46.5	Xtriage
Anisotropy	0.140	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 44.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.47$, $\langle L^2 \rangle = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.94	EDS
Total number of atoms	7278	wwPDB-VP
Average B, all atoms (Å ²)	37.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.28% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: CEF, SO4

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	2.01	77/3690 (2.1%)	1.91	101/5009 (2.0%)
1	B	2.02	77/3579 (2.2%)	1.91	92/4858 (1.9%)
All	All	2.02	154/7269 (2.1%)	1.91	193/9867 (2.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	2
1	B	0	4
All	All	0	6

All (154) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	459	ALA	C-N	25.83	1.70	1.33
1	B	502	LYS	C-N	18.89	1.62	1.33
1	A	460	SER	C-N	15.84	1.54	1.33
1	A	519	ILE	CA-CB	-15.17	1.46	1.54
1	B	505	GLY	C-N	13.84	1.51	1.33
1	B	503	GLY	C-O	10.65	1.36	1.23
1	B	586	ILE	CA-CB	10.49	1.66	1.54
1	A	360	ASN	CA-C	10.23	1.66	1.52
1	A	363	ALA	N-CA	10.06	1.59	1.46
1	B	503	GLY	CA-C	9.65	1.64	1.52
1	B	116	ILE	CA-CB	9.52	1.66	1.54
1	A	105	ILE	CA-CB	9.09	1.67	1.54
1	B	438	VAL	CA-CB	-9.01	1.43	1.54
1	B	478	GLY	N-CA	8.96	1.53	1.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	506	MET	C-N	8.94	1.44	1.33
1	A	364	LYS	CA-C	8.86	1.64	1.52
1	A	451	ALA	CA-CB	-8.85	1.39	1.53
1	B	626	SER	C-O	-8.71	1.12	1.24
1	B	505	GLY	N-CA	8.51	1.57	1.45
1	A	568	THR	CA-CB	-8.30	1.39	1.53
1	B	419	ARG	C-O	8.21	1.34	1.23
1	B	703	ALA	CA-CB	-8.02	1.40	1.53
1	B	725	LYS	C-O	-7.92	1.14	1.24
1	B	114	THR	CA-CB	7.86	1.66	1.53
1	B	534	ASP	C-O	7.78	1.32	1.23
1	B	116	ILE	CG1-CD1	7.77	1.82	1.51
1	B	698	ALA	CA-CB	-7.73	1.41	1.53
1	B	506	MET	CA-CB	-7.48	1.42	1.53
1	B	505	GLY	C-O	7.43	1.33	1.23
1	A	592	ALA	CA-C	7.43	1.62	1.52
1	A	407	ALA	C-O	-7.35	1.15	1.24
1	A	701	VAL	CA-CB	-7.32	1.45	1.54
1	B	455	LYS	CA-C	-7.30	1.44	1.52
1	A	703	ALA	CA-CB	-7.26	1.42	1.53
1	A	512	ALA	CA-CB	-7.21	1.41	1.53
1	B	379	ALA	CA-CB	7.19	1.65	1.53
1	B	486	TYR	C-O	7.09	1.33	1.24
1	B	787	VAL	CA-C	7.09	1.61	1.52
1	B	590	GLU	N-CA	7.08	1.54	1.46
1	B	467	ALA	CA-CB	-7.00	1.44	1.53
1	B	661	MET	CA-C	-6.96	1.44	1.52
1	A	362	SER	CA-C	6.86	1.61	1.53
1	A	615	ILE	CA-CB	-6.82	1.46	1.54
1	A	698	ALA	CA-CB	-6.82	1.42	1.53
1	B	670	LEU	N-CA	6.78	1.54	1.45
1	A	750	GLY	N-CA	6.78	1.51	1.45
1	B	593	ASP	N-CA	6.77	1.54	1.46
1	B	725	LYS	N-CA	6.77	1.54	1.46
1	B	646	ALA	CA-CB	-6.73	1.43	1.53
1	A	586	ILE	C-O	6.69	1.31	1.24
1	A	362	SER	C-O	6.67	1.31	1.24
1	A	391	THR	C-O	6.65	1.31	1.24
1	B	787	VAL	CA-CB	6.65	1.63	1.54
1	B	477	MET	C-O	6.65	1.31	1.23
1	A	602	ASP	C-O	-6.62	1.15	1.24
1	A	106	SER	N-CA	6.62	1.54	1.46

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	592	ALA	CA-C	6.60	1.61	1.52
1	B	107	GLU	N-CA	6.58	1.53	1.45
1	A	717	PHE	CA-C	-6.54	1.44	1.52
1	A	646	ALA	CA-CB	-6.53	1.42	1.53
1	B	389	LYS	C-O	6.50	1.31	1.24
1	B	623	VAL	CA-CB	-6.47	1.46	1.54
1	A	473	ASP	C-O	-6.47	1.15	1.24
1	B	397	LYS	N-CA	-6.46	1.37	1.46
1	A	384	GLU	CA-C	6.36	1.61	1.52
1	A	727	GLU	CG-CD	6.36	1.68	1.52
1	A	467	ALA	CA-CB	-6.27	1.42	1.53
1	B	434	ILE	CA-CB	-6.26	1.46	1.54
1	A	360	ASN	N-CA	-6.23	1.38	1.46
1	A	432	GLY	N-CA	6.21	1.54	1.45
1	B	471	ALA	CA-CB	-6.17	1.43	1.53
1	A	597	VAL	CA-C	6.15	1.60	1.52
1	A	486	TYR	N-CA	6.11	1.53	1.45
1	A	625	SER	CA-C	-6.11	1.45	1.52
1	A	343	THR	CA-C	6.02	1.60	1.52
1	A	451	ALA	CA-C	-6.02	1.44	1.52
1	A	720	ASP	CA-C	5.99	1.60	1.53
1	B	388	TYR	N-CA	5.98	1.52	1.45
1	A	732	THR	CA-CB	5.97	1.61	1.53
1	B	617	GLN	C-O	5.96	1.31	1.24
1	A	359	ASP	CA-C	5.96	1.60	1.52
1	A	112	ASP	N-CA	5.94	1.53	1.46
1	A	482	ILE	CA-C	-5.93	1.45	1.52
1	B	761	SER	C-O	-5.93	1.17	1.23
1	B	608	TYR	N-CA	5.87	1.53	1.45
1	A	492	ASN	CA-C	5.87	1.61	1.52
1	B	459	ALA	C-N	5.83	1.42	1.33
1	A	363	ALA	CA-CB	5.70	1.63	1.53
1	B	463	LYS	C-O	-5.67	1.19	1.24
1	B	554	LEU	CA-C	5.67	1.59	1.52
1	A	603	LYS	CA-C	5.63	1.59	1.52
1	B	589	ILE	CA-C	5.62	1.60	1.52
1	A	358	ARG	CA-C	-5.60	1.45	1.52
1	A	615	ILE	C-O	5.59	1.30	1.24
1	B	113	GLY	N-CA	5.58	1.50	1.45
1	A	106	SER	CA-C	5.55	1.59	1.52
1	B	569	ASN	N-CA	5.55	1.53	1.46
1	B	546	ILE	C-O	-5.54	1.18	1.23

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	571	TYR	CA-C	5.50	1.60	1.52
1	A	716	ARG	C-O	-5.48	1.17	1.23
1	B	452	PHE	N-CA	5.45	1.53	1.46
1	A	398	ILE	CA-CB	-5.42	1.47	1.54
1	A	727	GLU	CA-CB	5.42	1.61	1.53
1	B	612	THR	N-CA	-5.41	1.39	1.46
1	A	637	THR	CA-CB	5.41	1.61	1.53
1	A	359	ASP	C-O	5.40	1.30	1.24
1	A	505	GLY	CA-C	5.40	1.59	1.51
1	B	739	VAL	N-CA	5.38	1.51	1.46
1	A	686	GLN	C-O	-5.37	1.17	1.24
1	A	455	LYS	N-CA	5.37	1.52	1.46
1	B	119	ILE	CA-C	5.36	1.59	1.52
1	A	345	ALA	N-CA	5.32	1.52	1.46
1	B	389	LYS	CA-C	5.32	1.59	1.52
1	A	339	LEU	CA-C	5.30	1.59	1.52
1	A	383	ILE	CA-CB	-5.30	1.48	1.54
1	A	590	GLU	CA-C	-5.29	1.46	1.52
1	B	455	LYS	CA-CB	-5.29	1.45	1.53
1	A	389	LYS	CA-C	5.28	1.59	1.52
1	B	606	GLN	CG-CD	5.28	1.65	1.52
1	B	345	ALA	CA-CB	-5.27	1.45	1.53
1	B	619	LEU	CG-CD1	-5.27	1.35	1.52
1	B	566	GLN	C-O	5.27	1.30	1.24
1	A	546	ILE	CA-CB	-5.24	1.47	1.54
1	B	455	LYS	C-O	5.24	1.29	1.23
1	B	597	VAL	CA-CB	5.24	1.61	1.54
1	A	346	GLU	CG-CD	5.23	1.65	1.52
1	B	554	LEU	C-O	-5.23	1.19	1.24
1	B	711	ILE	CG1-CD1	5.23	1.72	1.51
1	B	647	ASP	N-CA	-5.22	1.40	1.46
1	A	431	THR	CA-C	5.21	1.59	1.52
1	A	700	LEU	N-CA	-5.20	1.40	1.46
1	B	626	SER	CA-C	-5.18	1.45	1.52
1	A	618	GLY	C-O	5.17	1.30	1.23
1	B	488	THR	CA-C	-5.17	1.45	1.52
1	B	358	ARG	N-CA	5.16	1.52	1.46
1	B	654	THR	C-O	-5.16	1.17	1.23
1	A	388	TYR	N-CA	5.11	1.52	1.45
1	A	108	ILE	N-CA	5.09	1.52	1.46
1	B	390	ILE	CA-CB	-5.09	1.47	1.53
1	B	358	ARG	CA-C	5.09	1.59	1.52

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	611	ALA	CA-CB	-5.08	1.45	1.53
1	A	431	THR	C-O	-5.08	1.18	1.24
1	A	457	SER	N-CA	-5.07	1.38	1.46
1	A	760	LYS	CG-CD	5.06	1.67	1.52
1	A	357	GLN	CA-C	-5.06	1.47	1.52
1	A	651	LYS	C-O	5.06	1.30	1.23
1	A	360	ASN	CB-CG	5.06	1.64	1.52
1	A	568	THR	N-CA	-5.03	1.39	1.46
1	B	420	VAL	CA-CB	-5.03	1.48	1.54
1	B	598	TYR	N-CA	5.02	1.52	1.46
1	A	629	THR	CA-C	5.02	1.59	1.52
1	A	732	THR	C-O	-5.02	1.19	1.24
1	B	764	PRO	CA-C	5.01	1.58	1.52
1	B	571	TYR	N-CA	-5.01	1.40	1.46

All (193) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	460	SER	O-C-N	-16.19	101.50	122.39
1	B	546	ILE	CA-C-N	-15.05	104.44	119.64
1	B	546	ILE	C-N-CA	-15.05	104.44	119.64
1	B	113	GLY	N-CA-C	-12.70	96.96	112.33
1	A	460	SER	CA-C-N	-11.85	103.69	122.65
1	A	460	SER	C-N-CA	-11.85	103.69	122.65
1	A	459	ALA	O-C-N	-10.84	107.68	121.33
1	A	717	PHE	N-CA-C	-10.54	93.56	110.32
1	A	667	THR	CA-C-N	-10.40	109.05	119.87
1	A	667	THR	C-N-CA	-10.40	109.05	119.87
1	B	762	GLY	N-CA-C	-10.29	96.54	110.43
1	A	500	ASN	N-CA-C	10.27	126.02	113.38
1	B	554	LEU	CA-C-N	-9.82	109.44	120.04
1	B	554	LEU	C-N-CA	-9.82	109.44	120.04
1	B	400	SER	N-CA-C	9.47	121.20	111.07
1	B	119	ILE	N-CA-C	9.19	121.90	107.28
1	B	340	TYR	N-CA-C	9.05	120.84	110.97
1	A	787	VAL	N-CA-C	8.97	119.77	110.36
1	A	530	GLU	N-CA-C	8.68	121.69	111.71
1	B	397	LYS	N-CA-C	-8.57	102.61	113.23
1	A	362	SER	N-CA-C	8.57	124.67	111.56
1	A	346	GLU	N-CA-C	-8.42	102.05	111.82
1	B	393	THR	N-CA-C	-8.17	102.36	113.30
1	B	728	VAL	N-CA-C	8.07	118.37	108.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	410	GLY	N-CA-C	-7.97	103.17	112.73
1	A	711	ILE	N-CA-C	7.94	119.65	111.00
1	B	447	GLN	CA-C-N	-7.81	110.26	121.42
1	B	447	GLN	C-N-CA	-7.81	110.26	121.42
1	A	106	SER	N-CA-C	7.80	121.24	110.24
1	B	107	GLU	N-CA-C	7.72	122.07	109.72
1	A	644	ALA	N-CA-C	-7.63	103.86	113.01
1	A	452	PHE	N-CA-C	7.60	123.13	113.55
1	A	358	ARG	N-CA-C	-7.59	94.64	110.80
1	B	114	THR	N-CA-CB	7.54	123.23	110.49
1	B	436	GLY	N-CA-C	-7.53	98.43	110.18
1	A	787	VAL	CA-C-O	-7.51	113.45	121.27
1	A	546	ILE	CA-C-N	-7.50	111.99	119.56
1	A	546	ILE	C-N-CA	-7.50	111.99	119.56
1	B	708	SER	CA-C-N	-7.50	112.47	119.82
1	B	708	SER	C-N-CA	-7.50	112.47	119.82
1	A	454	THR	N-CA-C	7.48	120.52	110.35
1	B	420	VAL	CB-CA-C	-7.46	102.35	111.08
1	A	731	SER	N-CA-C	7.38	121.20	111.75
1	A	645	ASN	N-CA-C	7.37	122.09	113.18
1	A	623	VAL	N-CA-C	-7.31	103.34	110.72
1	B	750	GLY	N-CA-C	-7.31	100.00	110.38
1	A	107	GLU	N-CA-C	7.22	120.04	109.07
1	A	597	VAL	N-CA-C	7.14	117.93	110.72
1	A	459	ALA	CB-CA-C	-7.13	107.54	117.23
1	A	457	SER	CA-C-N	-7.12	112.22	120.12
1	A	457	SER	C-N-CA	-7.12	112.22	120.12
1	A	401	ALA	N-CA-C	-7.11	103.27	112.23
1	A	625	SER	CA-CB-OG	-7.09	96.93	111.10
1	A	384	GLU	N-CA-C	7.01	119.57	111.02
1	A	360	ASN	CB-CA-C	6.94	124.23	110.42
1	B	461	THR	N-CA-C	-6.94	104.81	113.20
1	B	670	LEU	N-CA-C	6.93	120.44	109.50
1	B	603	LYS	N-CA-C	6.91	119.60	109.30
1	A	447	GLN	N-CA-C	6.90	121.87	113.38
1	B	590	GLU	N-CA-CB	6.89	121.88	110.52
1	A	739	VAL	N-CA-C	6.85	118.22	108.42
1	B	401	ALA	N-CA-C	-6.82	103.85	111.28
1	B	538	TYR	N-CA-C	-6.78	103.82	111.14
1	B	506	MET	N-CA-CB	6.69	119.39	110.29
1	A	761	SER	N-CA-C	6.66	121.01	113.02
1	B	375	TYR	CA-CB-CG	-6.66	101.92	113.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	437	PHE	CA-C-N	-6.61	114.48	123.14
1	B	437	PHE	C-N-CA	-6.61	114.48	123.14
1	B	545	GLU	CA-C-N	-6.55	117.63	123.33
1	B	545	GLU	C-N-CA	-6.55	117.63	123.33
1	B	459	ALA	CA-C-N	6.51	131.60	120.72
1	B	459	ALA	C-N-CA	6.51	131.60	120.72
1	A	681	ASN	N-CA-C	6.49	123.59	113.72
1	B	115	VAL	CB-CA-C	6.48	118.80	110.96
1	A	786	ILE	CB-CA-C	-6.46	102.62	112.05
1	A	585	VAL	N-CA-C	-6.38	107.28	113.53
1	A	735	LYS	CA-C-N	6.31	126.22	119.85
1	A	735	LYS	C-N-CA	6.31	126.22	119.85
1	A	504	THR	CA-C-N	-6.29	109.08	121.41
1	A	504	THR	C-N-CA	-6.29	109.08	121.41
1	B	116	ILE	N-CA-CB	6.28	120.00	110.58
1	A	341	PHE	N-CA-C	6.25	119.75	111.75
1	B	377	ASP	N-CA-C	6.23	120.73	113.20
1	B	445	GLU	N-CA-C	6.20	118.55	111.11
1	A	365	GLU	N-CA-C	-6.18	105.22	112.89
1	B	112	ASP	N-CA-C	6.18	120.08	112.54
1	B	717	PHE	N-CA-C	-6.15	100.54	110.32
1	A	750	GLY	N-CA-C	-6.15	101.84	110.63
1	B	372	GLN	N-CA-C	-6.13	105.56	113.16
1	A	573	THR	N-CA-C	6.12	117.65	110.97
1	B	730	LYS	CA-C-N	-6.11	110.91	121.66
1	B	730	LYS	C-N-CA	-6.11	110.91	121.66
1	A	615	ILE	O-C-N	6.08	127.87	121.91
1	A	478	GLY	N-CA-C	6.03	119.98	111.42
1	A	632	PHE	N-CA-C	6.01	118.35	111.02
1	B	419	ARG	CG-CD-NE	-5.99	98.81	112.00
1	A	346	GLU	CB-CG-CD	5.97	122.75	112.60
1	B	503	GLY	O-C-N	-5.97	116.36	122.98
1	B	704	ILE	N-CA-CB	5.96	116.88	110.62
1	A	584	HIS	N-CA-C	5.96	117.60	108.42
1	A	364	LYS	N-CA-C	5.94	123.46	110.80
1	B	459	ALA	CB-CA-C	-5.93	109.75	116.63
1	A	440	GLY	N-CA-C	-5.91	102.13	110.75
1	A	671	THR	N-CA-C	5.89	119.08	109.59
1	B	661	MET	N-CA-C	-5.89	100.19	109.50
1	B	492	ASN	N-CA-C	-5.89	106.06	113.18
1	B	667	THR	CA-C-N	-5.87	112.63	119.32
1	B	667	THR	C-N-CA	-5.87	112.63	119.32

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	367	LYS	N-CA-C	5.86	117.33	111.07
1	B	483	LEU	CA-C-O	-5.84	114.62	121.46
1	B	408	ASP	N-CA-C	5.82	118.58	111.82
1	A	397	LYS	N-CA-C	-5.82	105.28	112.90
1	A	635	ASN	N-CA-C	-5.78	104.89	111.07
1	B	375	TYR	N-CA-C	5.77	119.50	112.23
1	B	505	GLY	O-C-N	5.77	130.20	122.70
1	A	542	MET	CA-C-N	-5.77	114.10	122.29
1	A	542	MET	C-N-CA	-5.77	114.10	122.29
1	B	509	LEU	N-CA-C	-5.76	105.14	111.82
1	A	457	SER	CA-C-O	5.73	126.07	120.23
1	A	677	GLY	N-CA-C	5.72	119.10	110.75
1	A	494	ASN	N-CA-C	5.71	117.08	109.83
1	A	622	GLU	CA-C-N	-5.69	112.34	120.42
1	A	622	GLU	C-N-CA	-5.69	112.34	120.42
1	A	484	SER	CB-CA-C	-5.68	101.73	110.26
1	A	470	ILE	N-CA-C	5.67	115.86	110.42
1	A	669	ARG	CB-CG-CD	-5.66	98.27	111.30
1	A	536	LYS	CD-CE-NZ	-5.65	93.81	111.90
1	A	657	GLN	CB-CA-C	-5.63	103.73	111.73
1	B	626	SER	N-CA-C	5.62	119.24	112.38
1	B	110	TYR	N-CA-C	-5.61	100.88	109.41
1	B	505	GLY	N-CA-C	5.56	126.35	113.18
1	B	350	ARG	N-CA-C	-5.54	105.15	111.14
1	A	653	GLY	O-C-N	-5.52	118.76	123.23
1	B	444	GLN	N-CA-CB	-5.47	101.24	110.49
1	B	528	LEU	N-CA-C	-5.46	105.43	111.71
1	B	526	ARG	CG-CD-NE	5.44	123.97	112.00
1	B	507	MET	N-CA-C	5.43	116.71	108.07
1	A	489	ASN	N-CA-C	5.42	118.24	109.40
1	B	633	LYS	N-CA-C	-5.41	106.18	112.89
1	B	506	MET	O-C-N	-5.41	116.30	122.68
1	B	679	ASP	N-CA-CB	5.41	118.62	110.30
1	A	383	ILE	CB-CA-C	5.40	119.09	112.02
1	B	463	LYS	CA-C-N	-5.39	113.35	119.28
1	B	463	LYS	C-N-CA	-5.39	113.35	119.28
1	A	747	GLU	N-CA-C	-5.34	100.59	109.46
1	B	681	ASN	N-CA-C	5.34	121.84	113.72
1	A	772	ILE	CB-CA-C	-5.34	104.84	111.08
1	B	486	TYR	O-C-N	5.32	126.78	121.30
1	B	544	TYR	CA-C-N	-5.32	115.55	123.11
1	B	544	TYR	C-N-CA	-5.32	115.55	123.11

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	489	ASN	N-CA-C	5.32	118.38	110.14
1	B	526	ARG	NE-CZ-NH1	-5.31	116.19	121.50
1	A	457	SER	CB-CA-C	5.30	117.05	109.26
1	B	577	ASN	N-CA-C	5.29	122.06	110.80
1	A	642	THR	CB-CA-C	-5.29	102.76	110.95
1	A	453	ASP	CA-C-N	-5.27	112.80	120.75
1	A	453	ASP	C-N-CA	-5.27	112.80	120.75
1	A	388	TYR	CB-CA-C	-5.26	99.45	109.66
1	B	640	ASN	CA-C-N	5.26	124.77	119.19
1	B	640	ASN	C-N-CA	5.26	124.77	119.19
1	B	378	LEU	N-CA-C	-5.24	102.72	111.37
1	A	376	ARG	NE-CZ-NH2	5.24	123.91	119.20
1	B	387	GLY	N-CA-C	5.20	124.56	114.16
1	A	767	SER	N-CA-C	-5.20	101.40	109.14
1	A	620	LEU	N-CA-C	-5.19	106.94	113.28
1	A	751	SER	N-CA-CB	5.19	118.34	110.45
1	B	533	VAL	CB-CA-C	-5.18	104.13	111.28
1	A	474	GLN	CB-CA-C	-5.16	102.83	111.13
1	B	514	ASN	CB-CG-ND2	5.15	124.13	116.40
1	A	567	HIS	N-CA-C	-5.14	107.14	113.41
1	A	711	ILE	O-C-N	5.13	128.61	121.84
1	A	395	ASP	N-CA-C	-5.12	99.45	108.20
1	A	461	THR	N-CA-C	-5.12	106.63	112.92
1	A	431	THR	CA-CB-CG2	5.12	119.19	110.50
1	A	358	ARG	CG-CD-NE	5.11	123.23	112.00
1	A	600	TYR	CA-C-N	-5.10	115.41	122.30
1	A	600	TYR	C-N-CA	-5.10	115.41	122.30
1	B	346	GLU	N-CA-CB	5.09	117.69	110.16
1	A	389	LYS	CB-CA-C	5.07	119.06	110.79
1	B	481	THR	N-CA-C	5.07	117.25	110.35
1	B	394	ILE	CG1-CB-CG2	-5.07	95.50	110.70
1	B	590	GLU	CA-CB-CG	5.07	124.23	114.10
1	B	628	VAL	CA-C-N	-5.06	114.58	122.37
1	B	628	VAL	C-N-CA	-5.06	114.58	122.37
1	A	477	MET	CA-C-N	5.06	126.67	122.17
1	A	477	MET	C-N-CA	5.06	126.67	122.17
1	A	635	ASN	CB-CA-C	-5.05	102.95	110.88
1	B	690	TYR	N-CA-C	-5.04	105.25	111.40
1	B	502	LYS	N-CA-C	-5.03	106.42	113.37
1	B	614	THR	N-CA-C	-5.03	106.65	112.89
1	A	474	GLN	N-CA-C	-5.03	105.62	112.26
1	A	115	VAL	CB-CA-C	5.02	116.96	111.08

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	505	GLY	N-CA-C	5.01	125.05	113.18

There are no chirality outliers.

All (6) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	359	ASP	Peptide
1	A	460	SER	Mainchain
1	B	371	THR	Peptide
1	B	375	TYR	Peptide
1	B	459	ALA	Mainchain
1	B	666	SER	Peptide

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	3617	0	3484	171	1
1	B	3508	0	3363	211	0
2	A	26	0	0	2	0
2	B	26	0	0	1	0
3	A	5	0	0	0	0
3	B	5	0	0	0	0
4	A	44	0	0	3	0
4	B	47	0	0	6	0
All	All	7278	0	6847	382	1

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 27.

All (382) 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:116:ILE:CD1	1:B:116:ILE:CG1	1.82	1.53
1:A:459:ALA:C	1:A:460:SER:N	1.70	1.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:376:ARG:NH1	1:B:380:ALA:HB2	1.47	1.28
1:B:373:LYS:O	1:B:376:ARG:HB3	1.49	1.10
1:B:706:GLN:HA	1:B:706:GLN:NE2	1.69	1.05
1:B:376:ARG:HH12	1:B:380:ALA:HB2	0.90	1.02
1:B:734:GLN:HG2	1:B:764:PRO:HG2	1.40	1.02
1:A:687:GLN:HA	1:A:687:GLN:OE1	1.59	0.98
1:B:706:GLN:HE21	1:B:706:GLN:CA	1.78	0.96
1:B:376:ARG:NH1	1:B:380:ALA:CB	2.29	0.94
1:A:643:LEU:HD22	1:A:705:GLN:CG	1.98	0.94
1:A:376:ARG:HD3	4:A:2005:HOH:O	1.68	0.93
1:A:643:LEU:HD22	1:A:705:GLN:HG2	1.50	0.93
1:A:720:ASP:O	1:A:723:VAL:HG23	1.68	0.92
1:B:108:ILE:HD13	1:B:343:THR:CG2	2.00	0.92
1:A:485:ASN:HB3	1:A:507:MET:HE3	1.49	0.91
1:B:459:ALA:HB1	2:B:1460:CEF:O3	1.70	0.90
1:B:706:GLN:HA	1:B:706:GLN:HE21	1.33	0.88
1:B:621:ARG:HD2	4:B:2027:HOH:O	1.73	0.86
1:B:525:TYR:HB2	1:B:555:PRO:HG3	1.56	0.86
1:A:642:THR:O	1:A:645:ASN:HB2	1.77	0.85
1:B:108:ILE:HD13	1:B:343:THR:HG22	1.60	0.83
1:B:376:ARG:HG3	1:B:377:ASP:N	1.94	0.83
1:A:402:MET:HG2	1:A:700:LEU:HD11	1.61	0.83
1:A:732:THR:O	1:A:734:GLN:N	2.12	0.82
1:B:680:ASP:OD1	1:B:682:HIS:HD2	1.61	0.82
1:A:640:ASN:C	1:A:640:ASN:HD22	1.88	0.82
1:A:481:THR:HG22	1:A:482:ILE:H	1.45	0.81
1:B:417:THR:O	1:B:682:HIS:HE1	1.62	0.81
1:A:687:GLN:OE1	1:A:687:GLN:CA	2.29	0.81
1:A:358:ARG:HG2	1:A:358:ARG:HH11	1.47	0.80
1:B:108:ILE:CD1	1:B:343:THR:CG2	2.62	0.78
1:B:108:ILE:HG23	1:B:116:ILE:HG23	1.65	0.77
1:A:358:ARG:O	1:A:360:ASN:N	2.16	0.77
1:A:715:GLU:CD	1:A:715:GLU:H	1.93	0.77
1:A:362:SER:HB2	1:A:366:LEU:HD22	1.67	0.77
1:A:622:GLU:O	1:A:626:SER:HB3	1.85	0.76
1:A:741:VAL:O	1:A:742:GLU:HG2	1.86	0.76
1:B:118:SER:C	1:B:119:ILE:HD13	2.11	0.74
1:B:376:ARG:HH12	1:B:380:ALA:CB	1.85	0.74
1:B:743:GLY:O	1:B:744:LYS:HB2	1.86	0.74
1:B:377:ASP:C	1:B:377:ASP:OD2	2.31	0.74
1:B:358:ARG:HH11	1:B:358:ARG:CG	2.00	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:729:LEU:HD21	1:B:736:PRO:HB3	1.71	0.73
1:A:668:PRO:HA	1:A:717:PHE:CZ	2.24	0.72
1:A:680:ASP:OD1	1:A:682:HIS:HD2	1.73	0.72
1:B:697:MET:O	1:B:701:VAL:HG23	1.89	0.72
1:A:728:VAL:HG12	1:A:735:LYS:N	2.05	0.71
1:B:645:ASN:O	1:B:716:ARG:NH2	2.24	0.71
1:B:778:ASP:OD2	4:B:2047:HOH:O	2.07	0.71
1:B:485:ASN:HD22	1:B:520:PRO:HD3	1.56	0.70
1:A:537:GLY:O	1:A:541:LYS:HG3	1.92	0.69
1:B:741:VAL:HG12	1:B:741:VAL:O	1.91	0.69
1:A:362:SER:HB2	1:A:366:LEU:CD2	2.22	0.69
1:B:358:ARG:HH11	1:B:358:ARG:HG2	1.57	0.69
1:B:544:TYR:OH	1:B:567:HIS:HD2	1.74	0.69
1:B:399:HIS:HD2	1:B:436:GLY:HA2	1.57	0.69
1:B:337:ASP:HA	4:B:2004:HOH:O	1.92	0.68
1:B:376:ARG:CG	1:B:377:ASP:N	2.56	0.68
1:B:354:TYR:CZ	1:B:597:VAL:HG12	2.29	0.68
1:A:363:ALA:O	1:A:365:GLU:N	2.27	0.67
1:B:743:GLY:O	1:B:744:LYS:CB	2.41	0.67
1:A:739:VAL:HG12	1:A:740:SER:H	1.60	0.67
1:B:375:TYR:CD1	1:B:375:TYR:N	2.61	0.67
1:B:633:LYS:NZ	4:B:2031:HOH:O	2.27	0.66
1:A:385:ASN:O	1:A:387:GLY:N	2.28	0.66
1:A:426:LEU:HD11	1:A:670:LEU:HD13	1.77	0.66
1:B:780:GLN:CG	1:B:781:ASN:N	2.59	0.66
1:A:739:VAL:HG12	1:A:740:SER:N	2.09	0.66
1:A:640:ASN:C	1:A:640:ASN:ND2	2.52	0.65
1:B:503:GLY:C	1:B:504:THR:HG23	2.21	0.65
1:B:611:ALA:O	1:B:615:ILE:HG13	1.98	0.64
1:B:706:GLN:HE21	1:B:706:GLN:N	1.94	0.64
1:B:403:GLN:NE2	1:B:403:GLN:HA	2.11	0.64
1:A:621:ARG:HB2	1:A:649:ILE:HG22	1.78	0.64
1:A:643:LEU:HD22	1:A:705:GLN:HG3	1.77	0.64
1:B:481:THR:HG23	4:B:2044:HOH:O	1.97	0.64
1:A:362:SER:CB	1:A:366:LEU:HD22	2.28	0.63
1:B:358:ARG:HB3	1:B:358:ARG:NH1	2.13	0.63
1:B:542:MET:HA	1:B:580:TYR:CE1	2.34	0.63
1:A:544:TYR:OH	1:A:567:HIS:HD2	1.80	0.63
1:B:380:ALA:O	1:B:386:GLY:CA	2.47	0.63
1:B:465:LEU:O	1:B:470:ILE:HG13	1.98	0.63
1:B:358:ARG:O	1:B:359:ASP:C	2.38	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:380:ALA:O	1:B:386:GLY:N	2.31	0.63
1:A:729:LEU:HD21	1:A:736:PRO:HB3	1.81	0.63
1:A:417:THR:OG1	1:A:678:HIS:HE1	1.82	0.62
1:B:640:ASN:HD22	1:B:640:ASN:C	2.08	0.62
1:B:424:ASN:HB2	1:B:438:VAL:HB	1.82	0.62
1:A:760:LYS:H	1:A:760:LYS:HD3	1.63	0.62
1:A:728:VAL:HG12	1:A:734:GLN:C	2.24	0.61
1:A:734:GLN:HG2	1:A:764:PRO:HG2	1.82	0.61
1:B:613:ALA:O	1:B:617:GLN:HG3	2.00	0.61
1:B:569:ASN:O	1:B:572:GLN:HB3	2.01	0.61
1:A:368:ASN:HD21	1:A:371:THR:H	1.48	0.61
1:B:116:ILE:HD12	1:B:116:ILE:O	2.01	0.61
1:A:669:ARG:HD3	4:A:2039:HOH:O	1.99	0.60
1:B:501:SER:C	1:B:503:GLY:H	2.09	0.60
1:A:606:GLN:HE22	1:A:610:LYS:HG2	1.67	0.60
1:B:654:THR:HG23	1:B:661:MET:CE	2.32	0.60
1:B:680:ASP:OD1	1:B:682:HIS:CD2	2.51	0.60
1:A:360:ASN:O	1:A:361:VAL:C	2.45	0.60
1:A:485:ASN:HD22	1:A:519:ILE:HB	1.66	0.60
1:A:745:GLU:O	1:A:745:GLU:HG3	1.94	0.59
1:B:627:ARG:HG3	1:B:627:ARG:HH11	1.67	0.59
1:B:358:ARG:NH1	1:B:359:ASP:OD1	2.30	0.59
1:B:108:ILE:CD1	1:B:343:THR:HG22	2.31	0.59
1:B:741:VAL:O	1:B:741:VAL:CG1	2.51	0.59
1:A:368:ASN:ND2	1:A:371:THR:H	1.99	0.59
1:B:368:ASN:O	1:B:368:ASN:ND2	2.22	0.59
1:B:461:THR:OG1	1:B:567:HIS:HE1	1.86	0.59
1:B:739:VAL:HG23	1:B:748:VAL:HG23	1.85	0.59
1:B:503:GLY:O	1:B:504:THR:CG2	2.50	0.59
1:A:479:SER:HB3	1:A:756:TYR:HB2	1.85	0.58
1:B:351:MET:O	1:B:354:TYR:HB3	2.02	0.58
1:B:402:MET:HG2	1:B:700:LEU:HD11	1.86	0.58
1:B:357:GLN:C	1:B:357:GLN:CD	2.71	0.58
1:B:760:LYS:HG2	1:B:761:SER:N	2.19	0.58
1:B:490:PHE:CZ	1:B:496:ILE:HG12	2.38	0.57
1:B:621:ARG:HH21	1:B:647:ASP:CG	2.13	0.57
1:A:738:LYS:HD2	1:A:747:GLU:OE2	2.04	0.57
1:B:640:ASN:ND2	1:B:643:LEU:H	2.02	0.57
1:B:457:SER:HB2	1:B:560:ILE:O	2.04	0.57
1:A:614:THR:HA	1:A:617:GLN:HG3	1.87	0.57
1:A:552:GLU:HG3	4:A:2024:HOH:O	2.04	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:468:TYR:O	1:A:469:GLY:C	2.48	0.57
1:A:596:VAL:HG12	1:A:596:VAL:O	2.05	0.57
1:B:473:ASP:HA	1:B:612:THR:OG1	2.05	0.57
1:B:350:ARG:HD2	1:B:598:TYR:CE2	2.40	0.56
1:B:626:SER:HB2	1:B:628:VAL:HG23	1.87	0.56
1:B:680:ASP:O	1:B:681:ASN:HB2	2.04	0.56
1:A:360:ASN:O	1:A:362:SER:N	2.39	0.56
1:A:446:ASN:C	1:A:446:ASN:OD1	2.48	0.56
1:B:119:ILE:HD13	1:B:119:ILE:N	2.20	0.56
1:B:368:ASN:O	1:B:369:GLU:OE1	2.23	0.56
1:A:411:TYR:HA	1:A:441:ARG:NH2	2.21	0.56
1:B:680:ASP:CG	1:B:682:HIS:HD2	2.14	0.56
1:A:351:MET:HE3	1:A:382:GLU:HB3	1.86	0.55
1:A:632:PHE:HA	1:A:635:ASN:HD22	1.69	0.55
1:B:108:ILE:CG2	1:B:116:ILE:HG23	2.33	0.55
1:B:466:LEU:HD12	1:B:539:MET:HE2	1.87	0.55
1:A:504:THR:O	1:A:505:GLY:C	2.48	0.55
1:A:743:GLY:O	1:A:744:LYS:C	2.49	0.55
1:B:536:LYS:O	1:B:540:GLU:HB2	2.07	0.55
1:A:351:MET:HE1	1:A:388:TYR:CZ	2.42	0.55
1:A:375:TYR:O	1:A:376:ARG:C	2.44	0.55
1:B:485:ASN:HD22	1:B:519:ILE:HB	1.71	0.55
1:B:541:LYS:HB2	1:B:607:VAL:HG22	1.89	0.55
1:A:624:LEU:HD11	1:A:649:ILE:C	2.32	0.55
1:B:485:ASN:ND2	1:B:520:PRO:HD3	2.22	0.55
1:A:481:THR:HG22	1:A:482:ILE:N	2.20	0.55
1:A:760:LYS:HG2	1:A:761:SER:N	2.22	0.55
1:B:358:ARG:HH11	1:B:358:ARG:CB	2.20	0.55
1:B:469:GLY:HA2	1:B:616:MET:HE3	1.89	0.55
1:B:503:GLY:O	1:B:504:THR:HG23	2.07	0.54
1:A:362:SER:O	1:A:363:ALA:O	2.24	0.54
1:A:715:GLU:CD	1:A:715:GLU:N	2.64	0.54
1:B:525:TYR:CB	1:B:555:PRO:HG3	2.32	0.54
1:A:732:THR:C	1:A:734:GLN:H	2.16	0.54
1:B:378:LEU:HB3	1:B:388:TYR:CE2	2.43	0.54
1:B:446:ASN:OD1	1:B:446:ASN:C	2.50	0.54
1:B:656:ASN:O	1:B:657:GLN:HB2	2.08	0.54
1:A:459:ALA:HB1	2:A:1460:CEF:O3	2.08	0.54
1:B:544:TYR:OH	1:B:567:HIS:CD2	2.59	0.54
1:B:355:LEU:HD22	1:B:358:ARG:NH2	2.23	0.53
1:A:371:THR:O	1:A:372:GLN:C	2.51	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:621:ARG:NH2	1:B:647:ASP:OD2	2.40	0.53
1:B:350:ARG:HD2	1:B:598:TYR:CZ	2.42	0.53
1:A:418:GLY:O	1:A:419:ARG:C	2.51	0.53
1:A:525:TYR:HB2	1:A:555:PRO:HG3	1.90	0.53
1:A:780:GLN:O	1:A:784:SER:HB2	2.09	0.53
1:A:544:TYR:OH	1:A:567:HIS:CD2	2.61	0.53
1:B:668:PRO:HD3	1:B:717:PHE:CE2	2.43	0.53
1:A:399:HIS:O	1:A:403:GLN:HG2	2.08	0.52
1:B:108:ILE:CD1	1:B:343:THR:HG23	2.39	0.52
1:A:419:ARG:O	1:A:678:HIS:CD2	2.62	0.52
1:A:675:TRP:CZ2	1:A:677:GLY:HA3	2.44	0.52
1:B:358:ARG:HH11	1:B:358:ARG:HB3	1.72	0.52
1:B:688:ALA:HA	1:B:692:ASN:HB2	1.92	0.52
1:B:417:THR:HG21	1:B:683:SER:O	2.10	0.52
1:B:399:HIS:CD2	1:B:436:GLY:HA2	2.42	0.52
1:B:654:THR:HG23	1:B:661:MET:HE1	1.90	0.52
1:B:734:GLN:NE2	1:B:770:PHE:HB2	2.24	0.52
1:A:489:ASN:OD1	1:A:495:PRO:HA	2.08	0.52
1:A:639:LEU:O	1:A:640:ASN:HB2	2.10	0.52
1:B:371:THR:HB	1:B:374:PHE:CD2	2.45	0.52
1:B:507:MET:HE1	1:B:517:TRP:CD1	2.45	0.52
1:B:108:ILE:HG21	1:B:343:THR:HG21	1.92	0.52
1:A:350:ARG:HH11	1:A:350:ARG:HG2	1.74	0.51
1:A:459:ALA:CB	1:A:460:SER:N	2.73	0.51
1:B:357:GLN:C	1:B:358:ARG:O	2.53	0.51
1:B:783:TRP:O	1:B:784:SER:C	2.53	0.51
1:A:665:LEU:O	1:A:671:THR:HG23	2.10	0.51
1:A:472:ILE:HA	1:A:477:MET:O	2.10	0.51
1:B:106:SER:HB2	1:B:387:GLY:H	1.74	0.51
1:B:728:VAL:O	1:B:752:THR:HG22	2.11	0.51
1:A:360:ASN:O	1:A:362:SER:OG	2.25	0.51
1:B:396:GLN:O	1:B:396:GLN:HG3	2.06	0.51
1:B:650:GLY:HA2	1:B:664:MET:O	2.11	0.51
1:B:611:ALA:HB3	1:B:758:ALA:HB1	1.93	0.51
1:A:734:GLN:NE2	1:A:770:PHE:HB3	2.26	0.50
1:A:610:LYS:HE2	1:A:720:ASP:OD1	2.11	0.50
1:B:643:LEU:HD22	1:B:705:GLN:HG3	1.93	0.50
1:B:424:ASN:ND2	1:B:696:TYR:OH	2.44	0.50
1:A:362:SER:O	1:A:365:GLU:OE2	2.29	0.50
1:A:620:LEU:HD22	1:A:650:GLY:O	2.12	0.50
1:A:376:ARG:O	1:A:379:ALA:HB3	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:460:SER:N	2:A:1460:CEF:O3	2.45	0.50
1:A:485:ASN:CB	1:A:507:MET:HE3	2.33	0.50
1:A:760:LYS:H	1:A:760:LYS:CD	2.24	0.50
1:B:375:TYR:N	1:B:375:TYR:HD1	2.09	0.50
1:B:759:ASN:HB2	1:B:760:LYS:HD3	1.93	0.50
1:B:389:LYS:HB3	1:B:590:GLU:OE2	2.11	0.50
1:A:346:GLU:OE1	1:A:585:VAL:HB	2.12	0.50
1:A:551:ILE:HG22	1:A:553:SER:H	1.77	0.50
1:B:339:LEU:O	1:B:343:THR:HB	2.12	0.50
1:A:358:ARG:NH1	1:A:360:ASN:OD1	2.45	0.49
1:A:643:LEU:CD2	1:A:705:GLN:HG2	2.33	0.49
1:A:746:VAL:HG12	1:A:747:GLU:O	2.11	0.49
1:B:622:GLU:HB3	4:B:2028:HOH:O	2.11	0.49
1:A:358:ARG:HG2	1:A:358:ARG:NH1	2.24	0.49
1:A:787:VAL:O	1:A:789:SER:N	2.46	0.49
1:B:376:ARG:HG3	1:B:377:ASP:H	1.71	0.49
1:B:449:ASN:O	1:B:453:ASP:HB2	2.11	0.49
1:B:485:ASN:CB	1:B:507:MET:HE3	2.43	0.49
1:A:399:HIS:CD2	1:A:437:PHE:H	2.31	0.49
1:A:702:ASN:O	1:A:705:GLN:HB3	2.12	0.49
1:A:742:GLU:CG	1:A:742:GLU:O	2.60	0.49
1:B:503:GLY:C	1:B:504:THR:CG2	2.86	0.49
1:A:487:PRO:O	1:A:488:THR:HB	2.12	0.49
1:B:654:THR:HG23	1:B:661:MET:SD	2.52	0.49
1:A:656:ASN:O	1:A:659:GLU:HG3	2.13	0.48
1:A:726:SER:O	1:A:754:THR:HA	2.13	0.48
1:B:113:GLY:O	1:B:114:THR:CB	2.61	0.48
1:A:457:SER:HB2	1:A:560:ILE:O	2.13	0.48
1:A:620:LEU:HA	1:A:620:LEU:HD23	1.57	0.48
1:B:485:ASN:HB3	1:B:505:GLY:O	2.13	0.48
1:B:760:LYS:HG2	1:B:761:SER:H	1.78	0.48
1:B:768:TYR:CE2	1:B:783:TRP:CD1	3.01	0.48
1:B:486:TYR:CE1	1:B:505:GLY:HA2	2.48	0.48
1:B:734:GLN:HB2	1:B:766:THR:HA	1.96	0.48
1:A:503:GLY:C	1:A:504:THR:HG23	2.39	0.48
1:B:734:GLN:HE22	1:B:770:PHE:CB	2.27	0.48
1:A:622:GLU:HA	1:A:625:SER:HB2	1.96	0.47
1:A:487:PRO:HG3	1:A:502:LYS:O	2.15	0.47
1:A:528:LEU:HD22	1:A:533:VAL:HG21	1.96	0.47
1:B:375:TYR:C	1:B:377:ASP:H	2.23	0.47
1:A:523:TRP:CG	1:A:773:GLY:HA3	2.49	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:760:LYS:HG2	1:A:761:SER:H	1.79	0.47
1:B:352:TYR:CD2	1:B:352:TYR:C	2.92	0.47
1:B:403:GLN:HA	1:B:403:GLN:HE21	1.80	0.47
1:A:112:ASP:OD1	1:A:113:GLY:N	2.48	0.47
1:B:378:LEU:O	1:B:386:GLY:HA2	2.14	0.47
1:B:417:THR:O	1:B:682:HIS:CE1	2.54	0.47
1:B:460:SER:HB2	1:B:653:GLY:HA2	1.97	0.47
1:A:358:ARG:HH12	1:A:360:ASN:HD21	1.62	0.47
1:A:364:LYS:HD3	1:A:364:LYS:C	2.40	0.47
1:B:640:ASN:HA	1:B:641:PRO:HD3	1.59	0.47
1:A:462:THR:HB	1:A:555:PRO:O	2.16	0.46
1:A:569:ASN:HD21	1:A:583:LYS:H	1.62	0.46
1:B:376:ARG:HG3	1:B:377:ASP:HB3	1.97	0.46
1:A:473:ASP:HA	1:A:612:THR:OG1	2.15	0.46
1:A:643:LEU:C	1:A:645:ASN:N	2.70	0.46
1:B:108:ILE:O	1:B:116:ILE:N	2.43	0.46
1:B:655:THR:O	1:B:656:ASN:C	2.59	0.46
1:A:441:ARG:O	1:A:442:ASN:HB2	2.15	0.46
1:A:466:LEU:O	1:A:466:LEU:HD23	2.16	0.46
1:B:473:ASP:HB2	1:B:612:THR:HG21	1.96	0.46
1:A:738:LYS:HA	1:A:746:VAL:O	2.15	0.46
1:B:375:TYR:C	1:B:377:ASP:N	2.74	0.46
1:A:739:VAL:CG1	1:A:740:SER:N	2.78	0.46
1:B:729:LEU:CD2	1:B:736:PRO:HB3	2.42	0.46
1:B:376:ARG:HD2	1:B:376:ARG:C	2.41	0.46
1:B:437:PHE:CD1	1:B:437:PHE:C	2.93	0.46
1:B:729:LEU:CD1	1:B:748:VAL:HG12	2.45	0.46
1:B:729:LEU:HD13	1:B:748:VAL:HG12	1.96	0.46
1:B:738:LYS:HA	1:B:746:VAL:O	2.15	0.46
1:A:579:VAL:O	1:A:579:VAL:HG12	2.14	0.46
1:B:452:PHE:N	1:B:452:PHE:CD2	2.84	0.46
1:A:591:ALA:O	1:A:592:ALA:C	2.59	0.46
1:B:625:SER:O	1:B:627:ARG:HG3	2.16	0.46
1:A:514:ASN:O	1:A:628:VAL:HB	2.16	0.46
1:A:357:GLN:O	1:A:359:ASP:N	2.49	0.45
1:B:740:SER:O	1:B:742:GLU:N	2.49	0.45
1:B:688:ALA:O	1:B:692:ASN:HB2	2.16	0.45
1:B:460:SER:HA	1:B:463:LYS:HE3	1.98	0.45
1:A:554:LEU:HD12	1:A:558:GLY:O	2.17	0.45
1:B:375:TYR:O	1:B:377:ASP:N	2.50	0.45
1:B:735:LYS:HB2	1:B:765:ALA:HA	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:760:LYS:H	1:B:760:LYS:CD	2.30	0.45
1:B:780:GLN:HG3	1:B:781:ASN:N	2.20	0.45
1:A:350:ARG:HG2	1:A:350:ARG:NH1	2.32	0.45
1:A:455:LYS:HA	1:A:562:VAL:O	2.17	0.45
1:B:487:PRO:O	1:B:488:THR:HB	2.17	0.45
1:A:615:ILE:HD11	1:A:723:VAL:HG13	1.99	0.45
1:A:498:TYR:CD1	1:A:517:TRP:HA	2.52	0.45
1:B:661:MET:HB2	1:B:676:ILE:HG12	1.99	0.45
1:A:569:ASN:ND2	1:A:583:LYS:H	2.15	0.45
1:A:615:ILE:HD13	1:A:756:TYR:CB	2.47	0.45
1:A:611:ALA:O	1:A:615:ILE:HG13	2.17	0.44
1:A:739:VAL:CG1	1:A:740:SER:H	2.26	0.44
1:B:542:MET:HG3	1:B:607:VAL:HG21	1.99	0.44
1:A:640:ASN:HD21	1:A:643:LEU:H	1.64	0.44
1:B:116:ILE:HG12	1:B:339:LEU:HG	1.99	0.44
1:A:734:GLN:NE2	1:A:770:PHE:CB	2.80	0.44
1:B:504:THR:O	1:B:505:GLY:O	2.36	0.44
1:B:784:SER:OG	1:B:785:SER:N	2.47	0.44
1:A:618:GLY:HA2	1:A:621:ARG:NH1	2.32	0.44
1:A:402:MET:HG2	1:A:700:LEU:CD1	2.41	0.44
1:B:368:ASN:C	1:B:370:ALA:H	2.26	0.44
1:A:671:THR:HG22	1:A:672:LEU:N	2.33	0.44
1:B:485:ASN:ND2	1:B:519:ILE:HB	2.33	0.44
1:B:756:TYR:C	1:B:757:TRP:CD1	2.95	0.43
1:A:596:VAL:O	1:A:596:VAL:CG1	2.66	0.43
1:B:485:ASN:HB2	1:B:507:MET:HE3	2.00	0.43
1:A:522:TYR:CD2	1:A:522:TYR:C	2.97	0.43
1:A:723:VAL:HG12	1:A:724:VAL:N	2.34	0.43
1:B:706:GLN:NE2	1:B:706:GLN:CA	2.39	0.43
1:A:589:ILE:HB	1:A:597:VAL:HG12	1.99	0.43
1:B:620:LEU:HD23	1:B:620:LEU:HA	1.84	0.43
1:A:539:MET:O	1:A:544:TYR:HB2	2.18	0.43
1:B:471:ALA:O	1:B:472:ILE:C	2.61	0.43
1:B:521:ALA:O	1:B:555:PRO:HG2	2.19	0.43
1:B:734:GLN:NE2	1:B:770:PHE:CB	2.82	0.43
1:A:553:SER:O	1:A:554:LEU:C	2.62	0.43
1:A:671:THR:CG2	1:A:672:LEU:N	2.82	0.43
1:A:728:VAL:HG21	1:A:755:SER:HB2	2.00	0.43
1:A:454:THR:O	1:A:563:THR:HG22	2.19	0.42
1:B:765:ALA:O	1:B:766:THR:C	2.62	0.42
1:A:391:THR:HG22	1:A:587:SER:OG	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:485:ASN:ND2	1:A:519:ILE:HB	2.34	0.42
1:A:643:LEU:C	1:A:645:ASN:H	2.26	0.42
1:B:372:GLN:HE21	1:B:372:GLN:HB3	1.65	0.42
1:B:640:ASN:C	1:B:640:ASN:ND2	2.74	0.42
1:B:446:ASN:OD1	1:B:447:GLN:N	2.53	0.42
1:A:732:THR:C	1:A:734:GLN:N	2.71	0.42
1:B:501:SER:C	1:B:503:GLY:N	2.77	0.42
1:A:358:ARG:O	1:A:359:ASP:C	2.63	0.42
1:A:613:ALA:O	1:A:617:GLN:HG2	2.19	0.42
1:B:542:MET:HA	1:B:580:TYR:CD1	2.54	0.42
1:B:776:ASP:O	1:B:777:ALA:C	2.62	0.42
1:B:424:ASN:HA	1:B:673:GLY:O	2.20	0.42
1:B:654:THR:CG2	1:B:661:MET:HE1	2.50	0.42
1:A:362:SER:HA	1:A:365:GLU:OE2	2.19	0.42
1:B:631:THR:O	1:B:632:PHE:C	2.60	0.42
1:B:728:VAL:C	1:B:752:THR:HG22	2.45	0.42
1:A:614:THR:HA	1:A:617:GLN:CG	2.48	0.42
1:B:772:ILE:H	1:B:772:ILE:HG12	1.45	0.42
1:A:612:THR:HG22	1:A:613:ALA:N	2.32	0.42
1:A:668:PRO:HA	1:A:717:PHE:CE1	2.54	0.42
1:B:636:LEU:O	1:B:637:THR:C	2.60	0.42
1:A:375:TYR:C	1:A:377:ASP:N	2.73	0.41
1:A:466:LEU:HD23	1:A:466:LEU:C	2.45	0.41
1:A:655:THR:O	1:A:656:ASN:C	2.63	0.41
1:B:377:ASP:C	1:B:379:ALA:N	2.78	0.41
1:B:667:THR:O	1:B:668:PRO:C	2.61	0.41
1:A:385:ASN:HB2	1:A:386:GLY:H	1.76	0.41
1:B:476:LEU:HB3	1:B:527:MET:HE3	2.02	0.41
1:B:480:GLU:HB2	1:B:755:SER:HB2	2.03	0.41
1:B:487:PRO:HG3	1:B:502:LYS:O	2.21	0.41
1:B:787:VAL:O	1:B:789:SER:N	2.53	0.41
1:B:603:LYS:HB3	1:B:603:LYS:HE3	1.37	0.41
1:B:622:GLU:HA	1:B:625:SER:HB2	2.01	0.41
1:A:639:LEU:O	1:A:640:ASN:CB	2.68	0.41
1:A:680:ASP:OD1	1:A:682:HIS:CD2	2.64	0.41
1:A:753:VAL:HG22	1:A:754:THR:N	2.35	0.41
1:B:428:ASP:C	1:B:428:ASP:OD1	2.63	0.41
1:B:611:ALA:HB3	1:B:758:ALA:CB	2.51	0.41
1:B:627:ARG:HH11	1:B:627:ARG:CG	2.31	0.41
1:A:419:ARG:O	1:A:678:HIS:HD2	2.03	0.41
1:B:476:LEU:HD13	1:B:527:MET:HE3	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:719:LEU:HD12	1:B:719:LEU:HA	1.85	0.41
1:B:442:ASN:OD1	1:B:442:ASN:C	2.64	0.40
1:B:659:GLU:HG2	1:B:681:ASN:O	2.21	0.40
1:B:389:LYS:O	1:B:589:ILE:HA	2.20	0.40
1:B:337:ASP:HB2	1:B:338:TYR:H	1.48	0.40
1:B:354:TYR:CE1	1:B:597:VAL:CG1	3.04	0.40
1:B:504:THR:O	1:B:504:THR:OG1	2.33	0.40
1:A:355:LEU:O	1:A:356:ALA:C	2.62	0.40
1:A:362:SER:C	1:A:363:ALA:O	2.64	0.40
1:A:535:VAL:O	1:A:538:TYR:HB2	2.21	0.40
1:B:583:LYS:O	1:B:584:HIS:HB3	2.22	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:359:ASP:CB	1:A:411:TYR:CD2[3_645]	2.05	0.15

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	465/494 (94%)	399 (86%)	44 (10%)	22 (5%)	2	11
1	B	447/494 (90%)	388 (87%)	43 (10%)	16 (4%)	3	16
All	All	912/988 (92%)	787 (86%)	87 (10%)	38 (4%)	2	13

All (38) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	359	ASP
1	A	360	ASN

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Mol	Chain	Res	Type
1	A	361	VAL
1	A	363	ALA
1	A	386	GLY
1	A	733	GLY
1	A	788	GLY
1	B	114	THR
1	B	376	ARG
1	B	593	ASP
1	B	743	GLY
1	B	744	LYS
1	A	364	LYS
1	A	505	GLY
1	A	532	GLY
1	A	742	GLU
1	A	744	LYS
1	B	358	ARG
1	B	412	LEU
1	B	442	ASN
1	B	505	GLY
1	B	741	VAL
1	A	490	PHE
1	B	444	GLN
1	B	594	GLY
1	A	339	LEU
1	A	358	ARG
1	A	372	GLN
1	A	719	LEU
1	B	656	ASN
1	A	116	ILE
1	A	475	GLY
1	A	602	ASP
1	B	504	THR
1	B	788	GLY
1	A	487	PRO
1	B	733	GLY
1	A	387	GLY

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	386/409 (94%)	315 (82%)	71 (18%)	1	7
1	B	373/409 (91%)	306 (82%)	67 (18%)	1	7
All	All	759/818 (93%)	621 (82%)	138 (18%)	1	7

All (138) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	105	ILE
1	A	106	SER
1	A	107	GLU
1	A	108	ILE
1	A	109	THR
1	A	355	LEU
1	A	358	ARG
1	A	359	ASP
1	A	360	ASN
1	A	364	LYS
1	A	365	GLU
1	A	366	LEU
1	A	367	LYS
1	A	368	ASN
1	A	377	ASP
1	A	385	ASN
1	A	391	THR
1	A	395	ASP
1	A	397	LYS
1	A	404	SER
1	A	446	ASN
1	A	448	ASN
1	A	457	SER
1	A	465	LEU
1	A	479	SER
1	A	487	PRO
1	A	516	SER
1	A	526	ARG
1	A	527	MET
1	A	548	GLU
1	A	561	GLU
1	A	568	THR
1	A	585	VAL

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Mol	Chain	Res	Type
1	A	588	LYS
1	A	596	VAL
1	A	597	VAL
1	A	601	GLN
1	A	610	LYS
1	A	615	ILE
1	A	617	GLN
1	A	622	GLU
1	A	625	SER
1	A	626	SER
1	A	633	LYS
1	A	638	SER
1	A	640	ASN
1	A	656	ASN
1	A	657	GLN
1	A	660	ASN
1	A	666	SER
1	A	687	GLN
1	A	705	GLN
1	A	706	GLN
1	A	709	PRO
1	A	711	ILE
1	A	714	ASN
1	A	719	LEU
1	A	727	GLU
1	A	728	VAL
1	A	730	LYS
1	A	738	LYS
1	A	739	VAL
1	A	744	LYS
1	A	745	GLU
1	A	748	VAL
1	A	754	THR
1	A	759	ASN
1	A	760	LYS
1	A	781	ASN
1	A	786	ILE
1	A	787	VAL
1	B	108	ILE
1	B	111	SER
1	B	116	ILE
1	B	119	ILE

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Mol	Chain	Res	Type
1	B	120	GLU
1	B	343	THR
1	B	350	ARG
1	B	357	GLN
1	B	358	ARG
1	B	368	ASN
1	B	371	THR
1	B	372	GLN
1	B	373	LYS
1	B	376	ARG
1	B	377	ASP
1	B	389	LYS
1	B	391	THR
1	B	394	ILE
1	B	395	ASP
1	B	396	GLN
1	B	397	LYS
1	B	400	SER
1	B	428	ASP
1	B	434	ILE
1	B	444	GLN
1	B	457	SER
1	B	466	LEU
1	B	479	SER
1	B	502	LYS
1	B	516	SER
1	B	518	ASN
1	B	545	GLU
1	B	552	GLU
1	B	560	ILE
1	B	585	VAL
1	B	590	GLU
1	B	593	ASP
1	B	597	VAL
1	B	601	GLN
1	B	603	LYS
1	B	619	LEU
1	B	630	THR
1	B	633	LYS
1	B	640	ASN
1	B	649	ILE
1	B	651	LYS

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Mol	Chain	Res	Type
1	B	679	ASP
1	B	684	LEU
1	B	704	ILE
1	B	706	GLN
1	B	710	SER
1	B	711	ILE
1	B	719	LEU
1	B	727	GLU
1	B	739	VAL
1	B	740	SER
1	B	741	VAL
1	B	742	GLU
1	B	744	LYS
1	B	745	GLU
1	B	749	THR
1	B	752	THR
1	B	761	SER
1	B	772	ILE
1	B	780	GLN
1	B	784	SER
1	B	787	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (40) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	348	GLN
1	A	368	ASN
1	A	399	HIS
1	A	403	GLN
1	A	447	GLN
1	A	474	GLN
1	A	485	ASN
1	A	494	ASN
1	A	567	HIS
1	A	569	ASN
1	A	572	GLN
1	A	601	GLN
1	A	606	GLN
1	A	640	ASN
1	A	656	ASN
1	A	678	HIS
1	A	681	ASN

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Mol	Chain	Res	Type
1	A	682	HIS
1	A	699	HIS
1	A	705	GLN
1	A	706	GLN
1	A	714	ASN
1	A	734	GLN
1	B	348	GLN
1	B	372	GLN
1	B	399	HIS
1	B	424	ASN
1	B	447	GLN
1	B	485	ASN
1	B	531	ASN
1	B	567	HIS
1	B	606	GLN
1	B	635	ASN
1	B	640	ASN
1	B	678	HIS
1	B	682	HIS
1	B	692	ASN
1	B	693	ASN
1	B	706	GLN
1	B	734	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
3	SO4	A	1790	-	4,4,4	0.95	0	6,6,6	1.17	0
2	CEF	A	1460	1	19,27,27	3.52	9 (47%)	14,37,37	6.50	7 (50%)
2	CEF	B	1460	1	19,27,27	4.04	10 (52%)	14,37,37	7.17	6 (42%)
3	SO4	B	1790	-	4,4,4	0.58	0	6,6,6	1.35	1 (16%)

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	CEF	A	1460	1	-	3/14/38/38	0/1/2/2
2	CEF	B	1460	1	-	8/14/38/38	0/1/2/2

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1460	CEF	C10-N3	10.14	1.45	1.29
2	B	1460	CEF	C3-C2	9.41	1.52	1.32
2	A	1460	CEF	C10-N3	9.12	1.43	1.29
2	A	1460	CEF	C3-C2	7.21	1.47	1.32
2	B	1460	CEF	C13-S2	5.83	1.79	1.70
2	A	1460	CEF	C13-S2	4.68	1.78	1.70
2	A	1460	CEF	O5-C11	4.30	1.50	1.43
2	B	1460	CEF	C4-N1	4.01	1.38	1.28
2	B	1460	CEF	O5-C11	3.93	1.49	1.43
2	B	1460	CEF	O5-N3	3.83	1.49	1.40
2	A	1460	CEF	C1-S1	-3.56	1.74	1.82
2	B	1460	CEF	O4-C9	-3.34	1.17	1.23
2	A	1460	CEF	C4-N1	3.26	1.36	1.28
2	A	1460	CEF	C4-C2	-3.25	1.35	1.46
2	B	1460	CEF	C1-S1	-3.06	1.75	1.82
2	A	1460	CEF	O5-N3	2.99	1.47	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	1460	CEF	C10-C9	-2.72	1.45	1.50
2	B	1460	CEF	C10-C9	-2.45	1.46	1.50
2	B	1460	CEF	O1-C5	2.28	1.28	1.22

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	1460	CEF	C11-O5-N3	18.95	130.41	108.40
2	A	1460	CEF	C11-O5-N3	15.17	126.02	108.40
2	A	1460	CEF	O5-N3-C10	13.47	126.11	111.28
2	B	1460	CEF	O4-C9-C10	-11.48	107.12	120.35
2	A	1460	CEF	C1-S1-C6	9.27	112.66	94.47
2	B	1460	CEF	C1-S1-C6	8.70	111.53	94.47
2	B	1460	CEF	O5-N3-C10	8.42	120.55	111.28
2	B	1460	CEF	C10-C9-N2	7.99	127.65	114.38
2	A	1460	CEF	O4-C9-C10	-5.94	113.50	120.35
2	A	1460	CEF	C10-C9-N2	5.93	124.24	114.38
2	B	1460	CEF	C12-C13-S2	-3.78	107.14	111.79
2	A	1460	CEF	C12-C13-S2	-3.59	107.39	111.79
3	B	1790	SO4	O3-S-O2	-2.84	94.47	109.31
2	A	1460	CEF	N4-C14-N5	2.18	126.00	123.19

There are no chirality outliers.

All (11) torsion outliers are listed below:

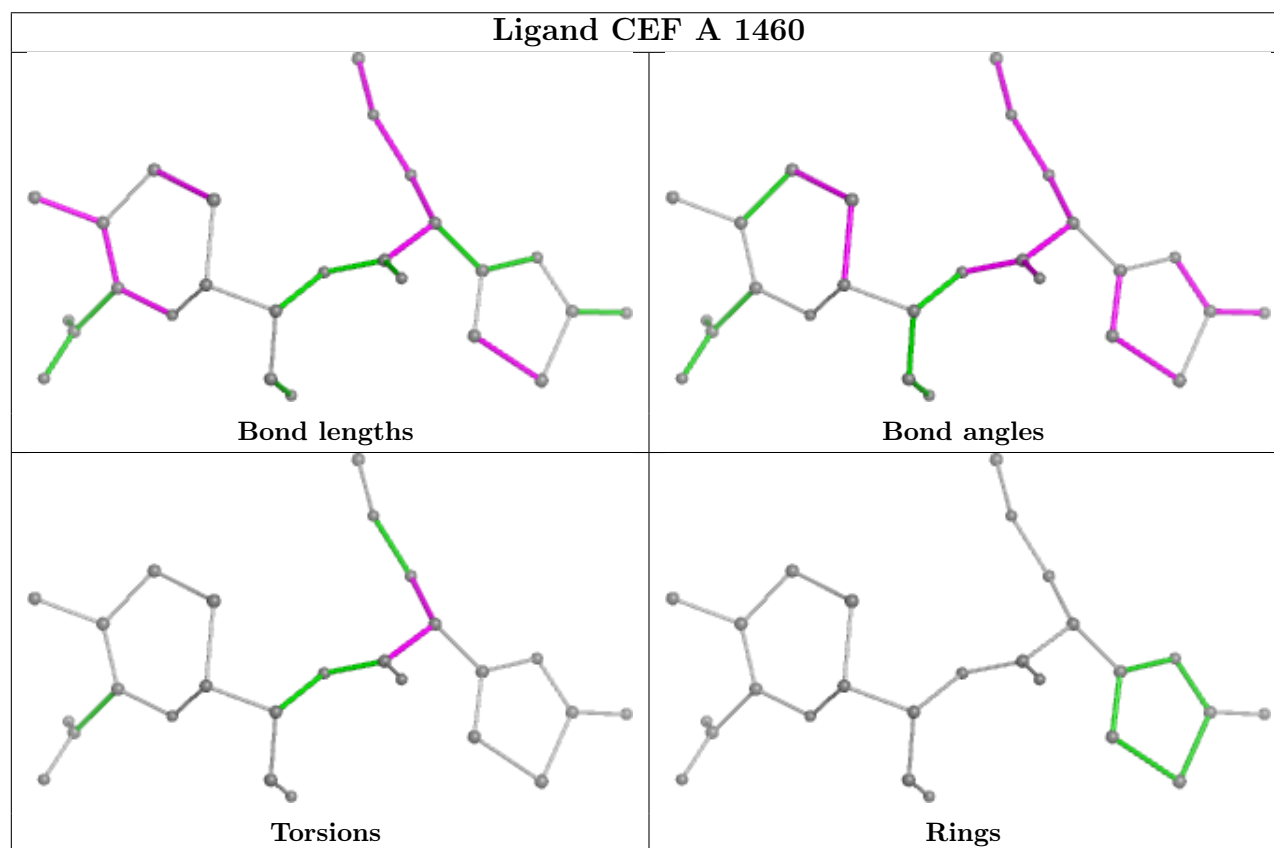
Mol	Chain	Res	Type	Atoms
2	A	1460	CEF	C9-C10-N3-O5
2	B	1460	CEF	C9-C10-N3-O5
2	B	1460	CEF	C10-N3-O5-C11
2	B	1460	CEF	N3-C10-C9-O4
2	A	1460	CEF	N3-C10-C9-N2
2	B	1460	CEF	N3-C10-C9-N2
2	B	1460	CEF	C12-C10-N3-O5
2	B	1460	CEF	N1-C4-C5-O2
2	B	1460	CEF	C2-C4-C5-O1
2	A	1460	CEF	N3-C10-C9-O4
2	B	1460	CEF	C12-C10-C9-O4

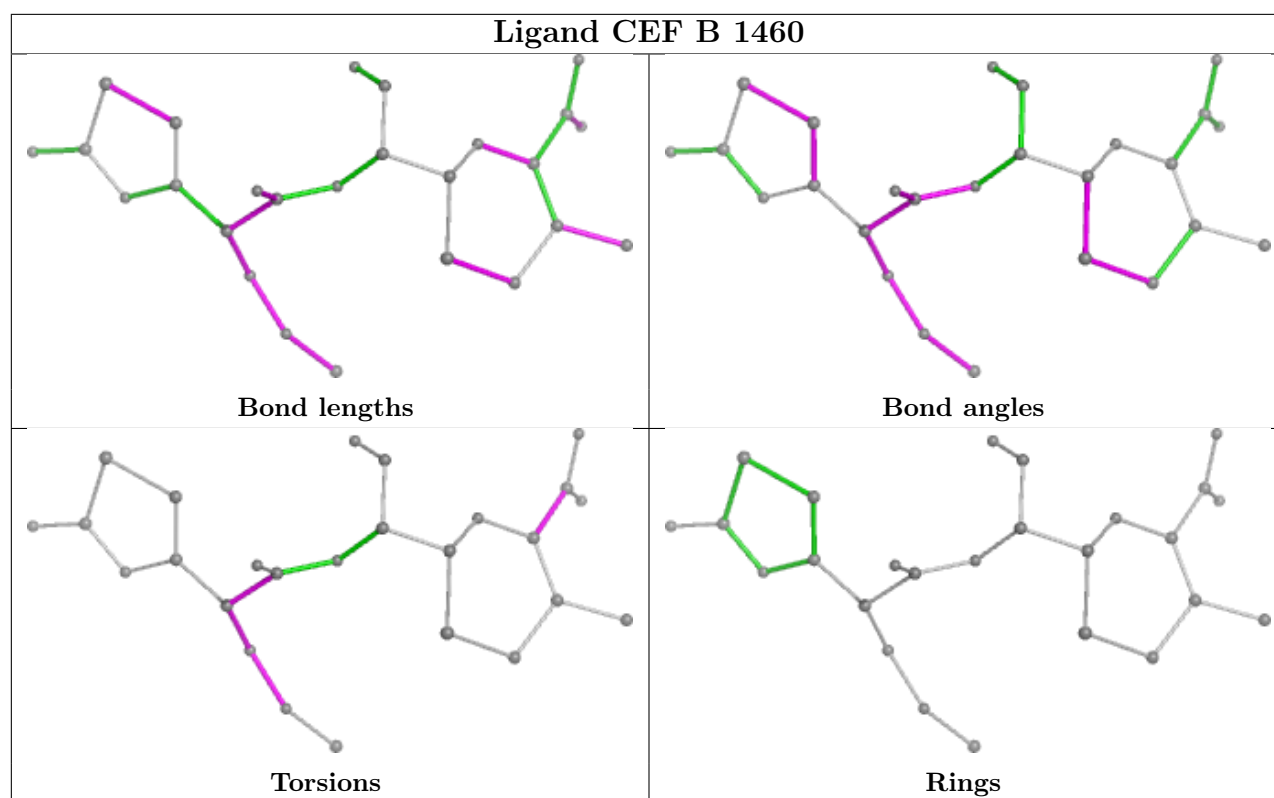
There are no ring outliers.

2 monomers are involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	1460	CEF	2	0
2	B	1460	CEF	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	A	1
1	B	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	459:ALA	C	460:SER	N	1.70
1	B	502:LYS	C	503:GLY	N	1.62

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	469/494 (94%)	-0.95	1 (0%) 92 84	16, 35, 63, 85	0
1	B	455/494 (92%)	-0.92	1 (0%) 92 84	15, 31, 68, 87	0
All	All	924/988 (93%)	-0.94	2 (0%) 92 84	15, 33, 65, 87	0

All (2) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	359	ASP	4.8
1	B	375	TYR	2.5

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.

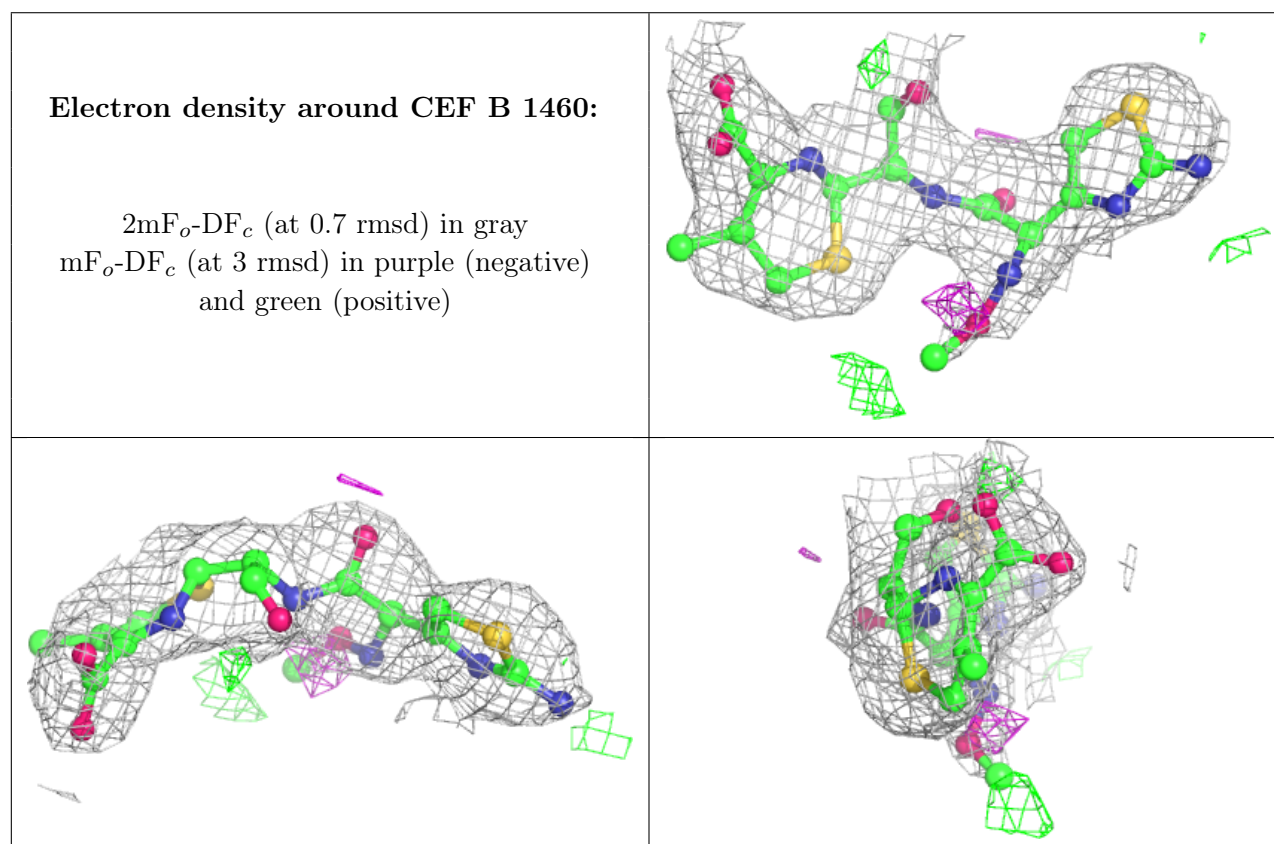
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	CEF	B	1460	26/26	0.96	0.08	31,39,44,54	0
2	CEF	A	1460	26/26	0.97	0.08	28,43,50,56	0
3	SO4	A	1790	5/5	0.97	0.08	25,26,36,37	0

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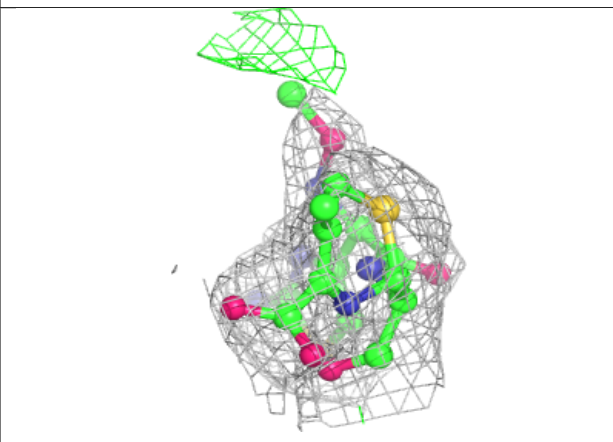
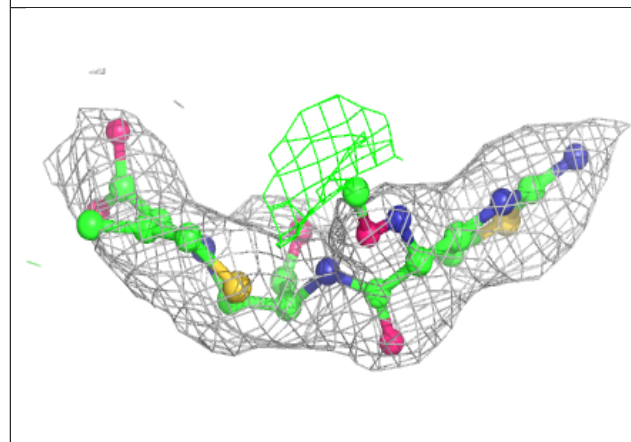
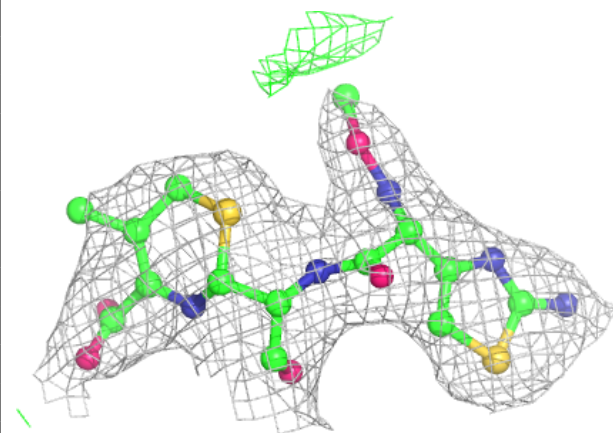
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	SO4	B	1790	5/5	0.97	0.06	37,43,48,50	0

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 CEF A 1460:

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



6.5 Other polymers ⓘ

There are no such residues in this entry.