Full wwPDB X-ray Structure Validation Report (i)

Oct 3, 2021 – 05:02 AM EDT

PDB ID	:	3HBL
Title	:	Crystal Structure of S. aureus Pyruvate Carboxylase T908A Mutant
Authors	:	Tong, L.; Yu, L.P.C.
Deposited on	:	2009-05-04
Resolution	:	2.71 Å(reported)

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

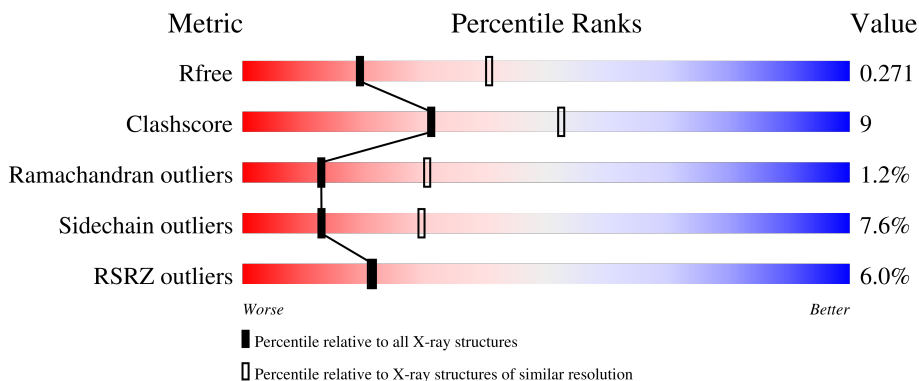|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.23.2
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.23.2

1   Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.71 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	Percentile Ranks	Value
Rfree		0.271
Clashscore		9
Ramachandran outliers		1.2%
Sidechain outliers		7.6%
RSRZ outliers		6.0%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3359 (2.74-2.70)
Clashscore	141614	3686 (2.74-2.70)
Ramachandran outliers	138981	3622 (2.74-2.70)
Sidechain outliers	138945	3623 (2.74-2.70)
RSRZ outliers	127900	3276 (2.74-2.70)

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 <=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	1150	6% / 76% / 19% / · ·
1	B	1150	7% / 72% / 18% / · / 7%
1	C	1150	4% / 71% / 19% / · / 7%
1	D	1150	6% / 68% / 23% / · / 7%

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 34327 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.
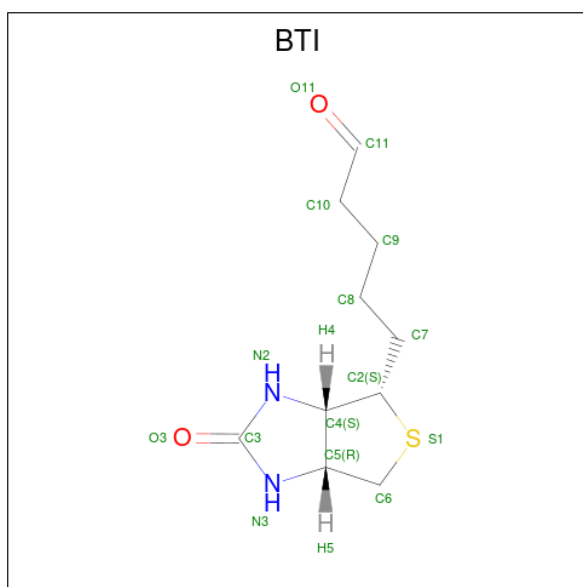
- Molecule 1 is a protein called Pyruvate carboxylase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	1131	Total 8923	C 5654	N 1502	O 1737	S 30	0	0	0
1	B	1074	Total 8463	C 5364	N 1427	O 1643	S 29	0	0	0
1	C	1067	Total 8439	C 5349	N 1421	O 1639	S 30	0	0	0
1	D	1067	Total 8411	C 5333	N 1416	O 1633	S 29	0	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	908	ALA	THR	engineered mutation	UNP Q99UY8
B	908	ALA	THR	engineered mutation	UNP Q99UY8
C	908	ALA	THR	engineered mutation	UNP Q99UY8
D	908	ALA	THR	engineered mutation	UNP Q99UY8

- Molecule 2 is 5-(HEXAHYDRO-2-OXO-1H-THIENO[3,4-D]IMIDAZOL-6-YL)PENTANAL (three-letter code: BTI) (formula: $C_{10}H_{16}N_2O_2S$).

BTI

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			15	10	2	2	1		
2	B	1	Total	C	N	O	S	0	0
			15	10	2	2	1		
2	C	1	Total	C	N	O	S	0	0
			15	10	2	2	1		
2	D	1	Total	C	N	O	S	0	0
			15	10	2	2	1		

- Molecule 3 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	1	Total	Mn	0	0
			1	1		
3	B	1	Total	Mn	0	0
			1	1		
3	C	1	Total	Mn	0	0
			1	1		
3	D	1	Total	Mn	0	0
			1	1		

- Molecule 4 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: $C_{10}H_{15}N_5O_{10}P_2$).

ADP

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	C	1	Total	C	N	O	P	0	0
			27	10	5	10	2		

3 Residue-property plots ⓘ

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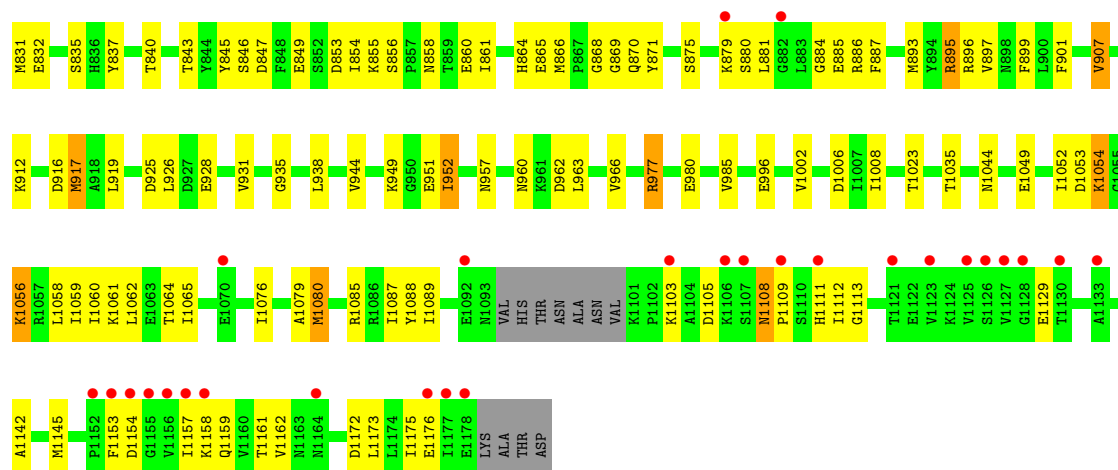
• Molecule 1: Pyruvate carboxylase

• Molecule 1: Pyruvate carboxylase

• Molecule 1: Pyruvate carboxylase

• Molecule 1: Pyruvate carboxylase

Chain D:
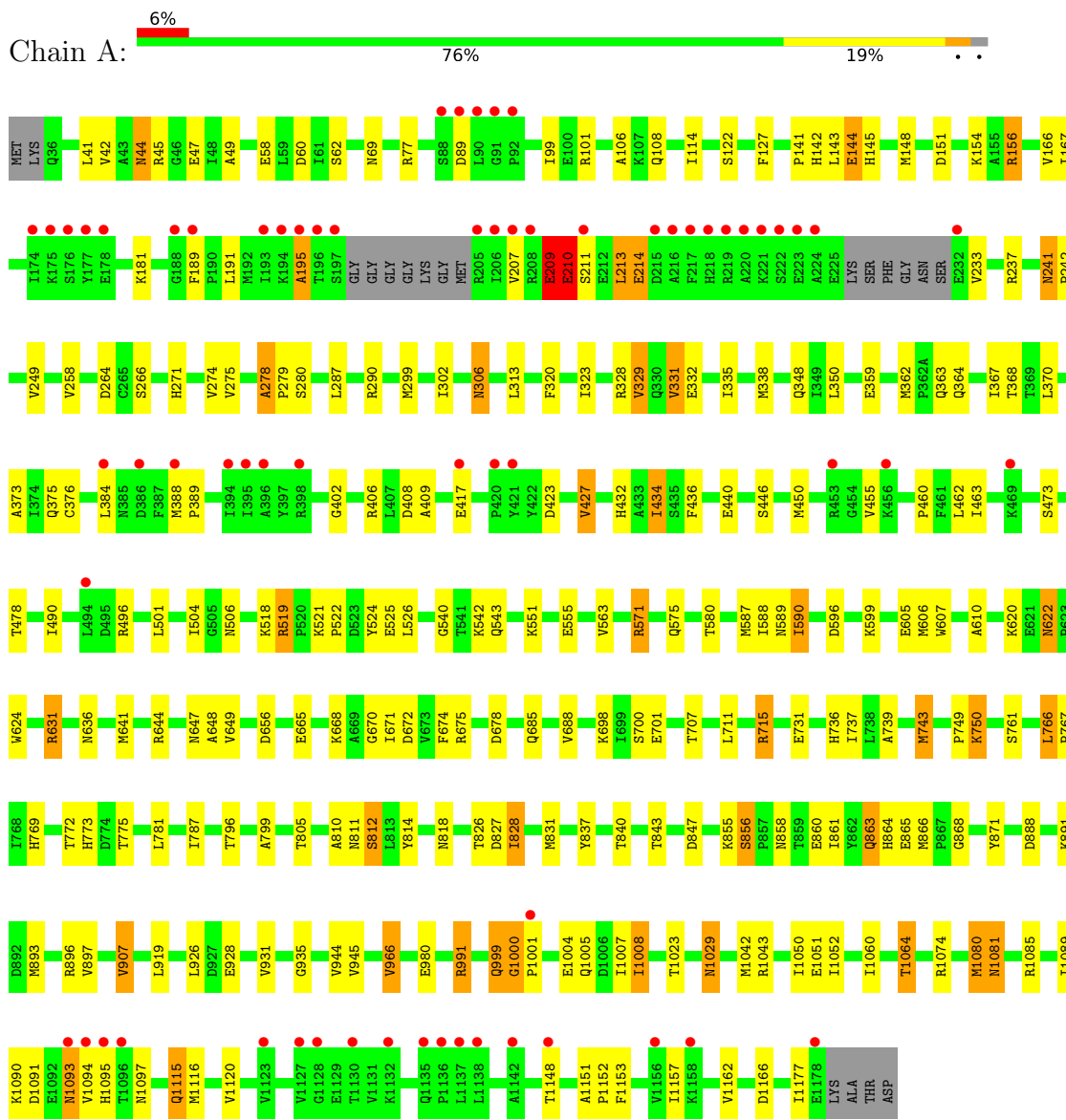
4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	96.53Å 257.15Å 130.32Å 90.00° 114.35° 90.00°	Depositor
Resolution (Å)	29.95 – 2.71 29.72 – 2.71	Depositor EDS
% Data completeness (in resolution range)	86.2 (29.95-2.71) 86.2 (29.72-2.71)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.37 (at 2.72Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.228 , 0.279 0.222 , 0.271	Depositor DCC
R_{free} test set	6799 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å^2)	57.1	Xtriage
Anisotropy	0.177	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 35.8	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.30$	Xtriage
Estimated twinning fraction	0.027 for h,-k,-h-l	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	34327	wwPDB-VP
Average B, all atoms (Å^2)	70.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.53% of the height of the origin peak. No significant pseudotranslation is detected.*

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[1]Intensities estimated from amplitudes.
[2]Theoretical values of $< |L| >$, $< L^2 >$ 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: MN, ADP, BTI

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	0.41	0/9091	0.58	0/12299
1	B	0.37	0/8623	0.53	0/11672
1	C	0.37	0/8601	0.53	1/11624 (0.0%)
1	D	0.40	0/8569	0.55	0/11595
All	All	0.39	0/34884	0.55	1/47190 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	494	LEU	CA-CB-CG	5.01	126.82	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	8923	0	8850	160	0
1	B	8463	0	8410	159	0
1	C	8439	0	8348	142	0
1	D	8411	0	8360	171	0
2	A	15	0	15	0	0
2	B	15	0	15	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	15	0	15	1	0
2	D	15	0	15	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
3	C	1	0	0	0	0
3	D	1	0	0	0	0
4	C	27	0	12	1	0
All	All	34327	0	34040	622	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 9.

All (622) 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:908:ALA:HB1	1:B:909:PRO:HD2	1.35	1.09
1:B:288:ARG:HG3	1:B:288:ARG:HH11	1.24	1.01
1:D:329:VAL:HG22	1:D:348:GLN:HE22	1.26	1.00
1:B:44:ASN:HD22	1:B:45:ARG:H	1.03	0.98
1:C:504:ILE:HG21	1:C:1042:MET:HE2	1.46	0.96
1:D:44:ASN:HD22	1:D:45:ARG:H	1.12	0.92
1:B:826:THR:HG21	1:B:831:MET:HE2	1.53	0.90
1:B:77:ARG:HG2	1:B:77:ARG:HH11	1.35	0.90
1:A:278:ALA:HB1	1:A:279:PRO:HD2	1.55	0.88
1:B:377:ARG:HH11	1:B:377:ARG:HG2	1.38	0.88
1:A:44:ASN:HD22	1:A:45:ARG:H	1.21	0.88
1:C:44:ASN:HD22	1:C:45:ARG:H	1.16	0.87
1:D:259:HIS:H	1:D:364:GLN:HE22	1.22	0.85
1:C:504:ILE:HG21	1:C:1042:MET:CE	2.06	0.85
1:A:278:ALA:CB	1:A:279:PRO:HD2	2.07	0.84
1:A:278:ALA:HB1	1:A:279:PRO:CD	2.07	0.84
1:B:1000:GLY:H	1:B:1001:PRO:HD3	1.41	0.83
1:D:101:ARG:HG2	1:D:101:ARG:HH21	1.43	0.83
1:D:700:SER:H	1:D:736:HIS:HD2	1.28	0.82
1:A:743:MET:HG3	1:A:907:VAL:HG13	1.62	0.81
1:A:620:LYS:HG2	1:A:1023:THR:HG21	1.60	0.81
1:B:700:SER:H	1:B:736:HIS:HD2	1.29	0.81
1:A:700:SER:H	1:A:736:HIS:HD2	1.27	0.81
1:C:54:ARG:CG	1:C:54:ARG:HH11	1.93	0.80
1:D:644:ARG:HH11	1:D:647:ASN:HD21	1.30	0.79
1:D:960:ASN:HD22	1:D:963:LEU:H	1.29	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:77:ARG:HH11	1:B:77:ARG:CG	1.99	0.76
1:A:77:ARG:HG2	1:A:77:ARG:HH11	1.49	0.76
1:A:504:ILE:HD13	1:A:1042:MET:HE2	1.68	0.76
1:A:896:ARG:HD2	1:A:928:GLU:OE2	1.86	0.76
1:A:406:ARG:HD3	1:C:403:PHE:HA	1.67	0.76
1:B:48:ILE:O	1:B:52:ILE:HG12	1.86	0.76
1:B:44:ASN:ND2	1:B:45:ARG:H	1.83	0.75
1:C:700:SER:H	1:C:736:HIS:HD2	1.33	0.75
1:A:504:ILE:HG21	1:A:1042:MET:HE2	1.70	0.74
1:A:641:MET:HE2	1:A:671:ILE:HG13	1.70	0.73
1:D:1108:ASN:HB2	1:D:1109:PRO:HD3	1.70	0.73
1:C:641:MET:HG2	1:C:671:ILE:HG21	1.72	0.72
1:D:935:GLY:HA3	1:D:966:VAL:CG1	2.20	0.72
1:A:363:GLN:HE21	1:A:364:GLN:H	1.39	0.71
1:A:313:LEU:HD13	1:A:323:ILE:HG13	1.72	0.71
1:A:1000:GLY:H	1:A:1001:PRO:HD2	1.55	0.71
1:B:814:TYR:CZ	1:B:828:ILE:HG12	2.25	0.71
1:B:908:ALA:O	1:B:910:SER:N	2.24	0.71
1:D:313:LEU:HB2	1:D:323:ILE:HD11	1.71	0.71
1:D:570:PHE:O	1:D:574:HIS:HE1	1.74	0.71
1:B:908:ALA:CB	1:B:909:PRO:HD2	2.15	0.71
1:A:1093:ASN:HB2	1:A:1095:HIS:O	1.92	0.70
1:C:116:PRO:HB2	1:C:122:SER:HA	1.74	0.70
1:D:329:VAL:HG22	1:D:348:GLN:NE2	2.02	0.70
1:C:700:SER:H	1:C:736:HIS:CD2	2.08	0.70
1:C:54:ARG:HH11	1:C:54:ARG:HG2	1.56	0.69
1:C:152:LYS:HG3	1:C:197:SER:H	1.55	0.69
1:D:840:THR:O	1:D:843:THR:HB	1.91	0.69
1:B:39:LYS:HB3	1:B:62:SER:HB3	1.75	0.69
1:A:840:THR:O	1:A:843:THR:HB	1.92	0.69
1:B:675:ARG:HA	1:B:701:GLU:HB3	1.75	0.69
1:B:504:ILE:HG21	1:B:1042:MET:CE	2.22	0.69
1:A:278:ALA:CB	1:A:279:PRO:CD	2.68	0.68
1:A:99:ILE:HG23	1:A:127:PHE:HD1	1.58	0.68
1:C:590:ILE:HG12	1:C:837:TYR:CE2	2.28	0.68
1:C:437:LYS:H	1:C:437:LYS:HD3	1.57	0.67
1:D:142:HIS:H	1:D:145:HIS:HD2	1.43	0.67
1:D:572:ASP:HB3	1:D:807:GLN:NE2	2.10	0.67
1:B:506:ASN:ND2	1:B:510:ASN:HD22	1.93	0.67
1:C:811:ASN:HD22	1:C:811:ASN:H	1.42	0.67
1:B:927:ASP:H	1:B:930:SER:HB3	1.59	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:622:ASN:HD22	1:C:623:PRO:HD2	1.60	0.66
1:D:350:LEU:HD22	1:D:359:GLU:HB3	1.77	0.66
1:A:1064:THR:HG21	1:C:1066:SER:HA	1.76	0.66
1:B:811:ASN:H	1:B:811:ASN:HD22	1.43	0.66
1:D:101:ARG:HH21	1:D:101:ARG:CG	2.09	0.66
1:B:435:SER:HB3	1:B:438:GLN:HB2	1.78	0.66
1:C:269:ARG:HG3	1:C:270:ARG:H	1.59	0.66
1:D:558:LYS:HD2	1:D:765:ASP:O	1.96	0.66
1:D:743:MET:HG3	1:D:907:VAL:HG13	1.78	0.66
1:A:209:GLU:HG2	1:A:210:GLU:N	2.11	0.65
1:D:470:LYS:HB2	1:D:480:PHE:HE1	1.61	0.65
1:B:750:LYS:HG3	1:C:819:GLY:HA3	1.76	0.65
1:A:590:ILE:HG12	1:A:837:TYR:CE2	2.32	0.65
1:A:1081:ASN:HB2	1:C:78:TYR:CE2	2.32	0.65
1:A:209:GLU:CG	1:A:210:GLU:H	2.09	0.64
1:A:543:GLN:HE22	1:A:636:ASN:HA	1.62	0.64
1:A:799:ALA:H	1:A:811:ASN:ND2	1.96	0.64
1:A:209:GLU:CG	1:A:210:GLU:N	2.60	0.64
1:A:328:ARG:HD2	1:A:329:VAL:O	1.98	0.64
1:C:51:ARG:NH2	1:C:337:GLU:OE2	2.31	0.64
1:D:563:VAL:HG21	1:D:787:ILE:HG12	1.79	0.63
1:D:901:PHE:CZ	1:D:917:MET:HG3	2.32	0.63
1:D:87:GLY:HA3	1:D:90:LEU:HD12	1.80	0.63
1:C:90:LEU:HB3	1:C:95:SER:HB3	1.79	0.63
1:C:313:LEU:HB2	1:C:323:ILE:HD11	1.81	0.63
1:D:543:GLN:HE22	1:D:636:ASN:HA	1.64	0.63
1:C:54:ARG:HG2	1:C:54:ARG:NH1	2.13	0.62
1:A:143:LEU:HD12	1:A:143:LEU:H	1.64	0.62
1:A:715:ARG:HH12	1:A:865:GLU:CD	2.02	0.62
1:A:641:MET:CE	1:A:671:ILE:HG13	2.28	0.62
1:C:866:MET:CE	1:C:871:TYR:HA	2.29	0.62
1:A:144:GLU:O	1:A:148:MET:HB2	2.00	0.61
1:D:259:HIS:H	1:D:364:GLN:NE2	1.96	0.61
1:C:435:SER:HB2	1:C:437:LYS:HE3	1.82	0.61
1:D:893:MET:O	1:D:897:VAL:HG23	2.00	0.61
1:A:811:ASN:HD22	1:A:811:ASN:H	1.48	0.61
1:B:1057:ARG:HD3	1:B:1059:ILE:HD11	1.82	0.61
1:C:338:MET:HE3	1:C:373:ALA:HB1	1.82	0.61
1:A:290:ARG:HG2	1:A:320:PHE:HE1	1.64	0.61
1:B:864:HIS:HD2	1:B:866:MET:H	1.49	0.61
1:D:400:SER:OG	1:D:449:GLU:HB3	2.00	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:620:LYS:HG2	1:D:1023:THR:HG21	1.83	0.61
1:B:288:ARG:HG3	1:B:288:ARG:NH1	2.01	0.61
1:B:622:ASN:HD22	1:B:623:PRO:HD2	1.66	0.61
1:B:504:ILE:HG21	1:B:1042:MET:HE2	1.80	0.61
1:D:814:TYR:CE2	1:D:828:ILE:HG12	2.36	0.61
1:B:631:ARG:NH2	1:B:672:ASP:OD1	2.34	0.60
1:D:647:ASN:HD22	1:D:647:ASN:C	2.03	0.60
1:C:940:PHE:HB3	1:C:944:VAL:CG1	2.31	0.60
1:A:504:ILE:HD13	1:A:1042:MET:CE	2.30	0.60
1:C:269:ARG:HG3	1:C:270:ARG:N	2.16	0.60
1:C:866:MET:HE1	1:C:871:TYR:HA	1.83	0.60
1:A:504:ILE:HG21	1:A:1042:MET:CE	2.31	0.60
1:A:864:HIS:CD2	1:A:866:MET:HG3	2.36	0.60
1:B:41:LEU:O	1:B:64:VAL:O	2.20	0.60
1:B:142:HIS:H	1:B:145:HIS:HD2	1.50	0.60
1:B:504:ILE:HD13	1:B:1042:MET:CE	2.31	0.60
1:B:856:SER:HB2	1:B:857:PRO:HD2	1.84	0.60
1:C:858:ASN:O	1:C:861:ILE:HG12	2.02	0.60
1:D:357:LEU:HA	1:D:360:ILE:HD13	1.83	0.60
1:C:768:ILE:HG22	1:C:791:VAL:HG23	1.83	0.60
1:D:519:ARG:NH2	1:D:847:ASP:OD2	2.31	0.60
1:B:927:ASP:HB3	1:B:930:SER:H	1.67	0.59
1:D:1065:ILE:HG12	1:D:1076:ILE:HG12	1.84	0.59
1:A:575:GLN:NE2	1:A:610:ALA:H	2.00	0.59
1:B:934:ASP:O	1:B:938:LEU:HG	2.02	0.59
1:B:1177:ILE:HD13	1:B:1177:ILE:H	1.67	0.59
1:D:249:VAL:HG21	1:D:299:MET:HG3	1.84	0.59
1:A:524:TYR:CD2	1:A:843:THR:HG22	2.36	0.59
1:B:408:ASP:HB2	1:B:428:LYS:HB3	1.84	0.59
1:A:700:SER:H	1:A:736:HIS:CD2	2.15	0.59
1:B:1000:GLY:N	1:B:1001:PRO:HD3	2.16	0.59
1:A:814:TYR:CZ	1:A:828:ILE:HG12	2.38	0.59
1:A:675:ARG:HA	1:A:701:GLU:HB3	1.85	0.58
1:A:264:ASP:HB2	1:A:280:SER:HB3	1.84	0.58
1:A:737:ILE:HG12	1:A:767:PRO:HG2	1.84	0.58
1:A:991:ARG:NH2	1:A:1004:GLU:OE1	2.35	0.58
1:B:99:ILE:HG23	1:B:127:PHE:HD1	1.68	0.58
1:D:572:ASP:HB3	1:D:807:GLN:HE22	1.66	0.58
1:A:151:ASP:HB3	1:A:154:LYS:HB2	1.85	0.58
1:A:1081:ASN:HB2	1:C:78:TYR:CD2	2.39	0.58
1:B:41:LEU:HB2	1:B:111:VAL:HG11	1.85	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:151:ASP:HB3	1:D:154:LYS:HG3	1.85	0.58
1:C:672:ASP:HA	1:C:698:LYS:HD2	1.86	0.58
1:D:811:ASN:H	1:D:811:ASN:HD22	1.49	0.58
1:D:901:PHE:HZ	1:D:917:MET:HG3	1.68	0.58
1:C:278:ALA:HB3	1:C:335:ILE:HG23	1.86	0.58
1:D:960:ASN:ND2	1:D:963:LEU:H	2.00	0.57
1:B:42:VAL:HA	1:B:115:HIS:O	2.05	0.57
1:D:935:GLY:HA3	1:D:966:VAL:HG11	1.85	0.57
1:C:920:TYR:OH	1:C:938:LEU:HB3	2.04	0.57
1:D:1103:LYS:O	1:D:1173:LEU:HB2	2.05	0.57
1:C:41:LEU:HD11	1:C:66:ILE:HG23	1.86	0.56
1:B:743:MET:HG3	1:B:907:VAL:HG13	1.86	0.56
1:B:543:GLN:HE22	1:B:636:ASN:HA	1.69	0.56
1:D:1049:GLU:HG2	1:D:1059:ILE:HD12	1.86	0.56
1:B:622:ASN:HD21	1:B:624:TRP:HD1	1.53	0.56
1:A:306:ASN:OD1	1:A:348:GLN:HG2	2.06	0.56
1:B:244:HIS:HD2	1:B:265:CYS:HB2	1.70	0.56
1:D:631:ARG:HG2	1:D:670:GLY:HA3	1.87	0.56
1:D:645:ALA:HB1	1:D:685:GLN:O	2.04	0.56
1:D:656:ASP:OD2	1:D:977:ARG:NH2	2.39	0.56
1:A:370:LEU:O	1:A:432:HIS:HE1	1.87	0.56
1:B:1157:ILE:HA	1:B:1177:ILE:HG22	1.86	0.56
1:D:1061:LYS:HB3	1:D:1079:ALA:HB3	1.87	0.56
1:C:787:ILE:HA	1:C:791:VAL:HG12	1.87	0.56
1:A:145:HIS:HE1	1:A:302:ILE:O	1.87	0.56
1:B:377:ARG:HG2	1:B:377:ARG:NH1	2.15	0.56
1:D:935:GLY:HA2	1:D:938:LEU:HD12	1.88	0.56
1:B:506:ASN:HD22	1:B:510:ASN:HD22	1.53	0.56
1:D:529:ILE:HD13	1:D:589:ASN:HB3	1.88	0.56
1:D:583:ARG:HD3	1:D:1035:THR:HG23	1.87	0.55
1:D:776:SER:HB3	1:D:861:ILE:HD11	1.88	0.55
1:D:1112:ILE:HD12	1:D:1175:ILE:HB	1.88	0.55
1:A:864:HIS:HD2	1:A:866:MET:H	1.54	0.55
1:C:225:GLU:HB2	1:C:231:SER:HB3	1.89	0.55
1:C:606:MET:HE1	1:C:639:PHE:HB3	1.87	0.55
1:A:335:ILE:HD11	1:A:375:GLN:HB3	1.89	0.55
1:D:1142:ALA:HB3	1:D:1145:MET:HB3	1.87	0.55
1:B:370:LEU:O	1:B:432:HIS:HE1	1.89	0.55
1:D:866:MET:CE	1:D:871:TYR:HA	2.36	0.55
1:C:528:SER:O	1:C:530:PRO:HD3	2.07	0.55
1:B:309:THR:HG21	1:B:330:GLN:HE21	1.72	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:519:ARG:HB2	1:B:520:PRO:HD2	1.88	0.55
1:D:90:LEU:HD13	1:D:95:SER:HA	1.89	0.55
1:D:864:HIS:HD2	1:D:866:MET:H	1.54	0.55
1:A:860:GLU:HA	1:A:863:GLN:HE21	1.71	0.54
1:D:408:ASP:HB2	1:D:428:LYS:HB3	1.88	0.54
1:D:866:MET:HE2	1:D:871:TYR:HA	1.90	0.54
1:A:864:HIS:HD2	1:A:866:MET:HG3	1.71	0.54
1:C:188:GLY:HA3	1:C:237:ARG:HH12	1.71	0.54
1:A:810:ALA:HB1	1:A:831:MET:CE	2.37	0.54
1:B:1097:ASN:HB2	1:B:1166:ASP:HA	1.89	0.54
1:A:58:GLU:HG3	1:C:445:ARG:HD3	1.90	0.54
1:D:1053:ASP:OD2	1:D:1054:LYS:N	2.41	0.54
1:A:278:ALA:O	1:A:279:PRO:C	2.44	0.54
1:A:893:MET:O	1:A:897:VAL:HG23	2.07	0.54
1:D:575:GLN:NE2	1:D:610:ALA:H	2.05	0.54
1:B:398:ARG:HG2	1:B:1083:GLN:HE22	1.73	0.54
1:C:53:PHE:CZ	1:C:65:ALA:HB2	2.43	0.54
1:D:1159:GLN:HG2	1:D:1176:GLU:HG2	1.89	0.54
1:B:606:MET:HE1	1:B:671:ILE:HD13	1.90	0.54
1:C:266:SER:O	1:C:478:THR:HA	2.08	0.54
1:B:504:ILE:HG21	1:B:1042:MET:HE3	1.88	0.54
1:C:717(A):ILE:HG12	1:C:957:ASN:HD21	1.73	0.53
1:C:575:GLN:HE22	1:C:610:ALA:H	1.55	0.53
1:A:44:ASN:ND2	1:A:45:ARG:H	1.99	0.53
1:C:39:LYS:HG2	1:C:62:SER:HB3	1.89	0.53
1:D:1053:ASP:HB3	1:D:1056:LYS:HG2	1.90	0.53
1:A:338:MET:HE3	1:A:373:ALA:HB1	1.91	0.53
1:B:1000:GLY:H	1:B:1001:PRO:CD	2.18	0.53
1:C:167:ILE:HD11	1:C:323:ILE:HD13	1.91	0.53
1:C:396:ALA:HB3	1:C:453:ARG:HH12	1.73	0.53
1:D:846:SER:HA	1:D:849:GLU:HG2	1.90	0.53
1:B:999:GLN:HG2	1:B:1001:PRO:HD3	1.91	0.53
1:C:898:ASN:ND2	1:C:906:LYS:HE3	2.24	0.53
1:B:1053:ASP:HB3	1:B:1056:LYS:HG3	1.90	0.53
1:D:952:ILE:CG2	1:D:952:ILE:O	2.56	0.53
1:D:977:ARG:HG3	1:D:980:GLU:HG3	1.91	0.53
1:B:375:GLN:HG3	1:B:430:SER:HB3	1.89	0.53
1:D:917:MET:HG2	1:D:944:VAL:HG11	1.90	0.53
1:A:446:SER:O	1:A:450:MET:HG2	2.09	0.53
1:A:47:GLU:HB2	1:A:408:ASP:HB3	1.91	0.52
1:A:278:ALA:HB3	1:A:279:PRO:HD2	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:524:TYR:HD2	1:A:843:THR:CG2	2.22	0.52
1:B:44:ASN:HD22	1:B:45:ARG:N	1.87	0.52
1:B:341:GLY:O	1:D:434:ILE:HG12	2.09	0.52
1:B:435:SER:HB3	1:B:438:GLN:CB	2.39	0.52
1:D:44:ASN:ND2	1:D:45:ARG:H	1.94	0.52
1:D:391:THR:HG21	1:D:420:PRO:HG3	1.91	0.52
1:B:259:HIS:HB3	1:B:296:ILE:HD11	1.91	0.52
1:B:543:GLN:O	1:B:547:GLU:HG2	2.09	0.52
1:C:71:ASP:C	1:C:73:SER:H	2.11	0.52
1:C:811:ASN:H	1:C:811:ASN:ND2	2.08	0.52
1:D:772:THR:HG22	1:D:783:TYR:CE2	2.45	0.52
1:B:641:MET:HE3	1:B:674:PHE:CE1	2.45	0.52
1:C:209:GLU:HG2	1:C:210:GLU:H	1.75	0.52
1:C:948:PHE:HD2	1:C:964:GLN:HG3	1.75	0.52
1:D:257:ILE:HD12	1:D:300:GLU:HG3	1.92	0.52
1:D:575:GLN:HE22	1:D:610:ALA:H	1.57	0.52
1:D:1002:VAL:HG13	1:D:1006:ASP:HB2	1.92	0.52
1:B:574:HIS:HD2	1:B:580:THR:HA	1.75	0.52
1:B:905:VAL:HG12	1:B:907:VAL:HG23	1.91	0.52
1:D:717(A):ILE:HG13	1:D:957:ASN:HD21	1.75	0.52
1:C:929:GLN:HG2	1:C:932:ILE:HD12	1.92	0.52
1:D:446:SER:O	1:D:450:MET:HG2	2.10	0.52
1:D:571:ARG:HH11	1:D:575:GLN:NE2	2.08	0.52
1:D:647:ASN:C	1:D:647:ASN:ND2	2.63	0.51
1:A:44:ASN:HD22	1:A:45:ARG:N	1.99	0.51
1:A:641:MET:HG2	1:A:671:ILE:HG21	1.91	0.51
1:C:194:LYS:HB2	1:C:204:MET:HG2	1.92	0.51
1:C:409:ALA:HA	1:C:427:VAL:HG12	1.92	0.51
1:C:574:HIS:HD2	1:C:580:THR:HA	1.76	0.51
1:A:266:SER:O	1:A:478:THR:HA	2.10	0.51
1:A:622:ASN:ND2	1:A:624:TRP:H	2.08	0.51
1:C:884:GLY:O	1:C:885:GLU:HB3	2.11	0.51
1:A:402:GLY:HA3	1:C:54:ARG:HE	1.76	0.51
1:B:266:SER:HB2	1:B:476:TYR:CE2	2.45	0.51
1:C:1068:PRO:HG3	1:C:1074:ARG:HH11	1.76	0.51
1:B:41:LEU:O	1:B:42:VAL:HB	2.11	0.51
1:D:869:GLY:O	1:D:871:TYR:N	2.44	0.51
1:A:856:SER:OG	1:D:800:SER:HA	2.11	0.51
1:B:672:ASP:HA	1:B:698:LYS:HD2	1.92	0.51
1:D:798:VAL:CG1	1:D:835:SER:HA	2.40	0.51
1:C:362:MET:HE3	1:C:362(A):PRO:HD2	1.94	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:913:VAL:HG22	1:C:943:SER:HB2	1.93	0.50
1:D:254:HIS:NE2	1:D:354:GLY:O	2.45	0.50
1:D:756:ILE:HD11	1:D:770:LEU:HD22	1.93	0.50
1:A:665:GLU:OE1	1:A:668:LYS:HE3	2.12	0.50
1:B:404:GLY:O	1:B:431:THR:HA	2.11	0.50
1:B:776:SER:HB3	1:B:861:ILE:HD11	1.93	0.50
1:A:524:TYR:CD2	1:A:843:THR:CG2	2.95	0.50
1:A:1074:ARG:NH1	1:A:1091:ASP:OD2	2.44	0.50
1:B:90:LEU:HG	1:B:94:GLU:HB2	1.93	0.50
1:D:470:LYS:HB2	1:D:480:PHE:CE1	2.44	0.50
1:D:879:LYS:HG3	1:D:884:GLY:HA3	1.94	0.50
1:B:811:ASN:HD22	1:B:811:ASN:N	2.09	0.50
1:C:257:ILE:HD13	1:C:300:GLU:HG3	1.94	0.50
1:C:1049:GLU:HG2	1:C:1059:ILE:HD12	1.93	0.50
1:B:570:PHE:O	1:B:574:HIS:HE1	1.94	0.50
1:B:755:LEU:O	1:B:759:LEU:HG	2.12	0.50
1:B:1153:PHE:CE1	1:B:1177:ILE:HG12	2.46	0.50
1:C:574:HIS:CD2	1:C:580:THR:HA	2.47	0.50
1:D:38:LYS:HA	1:D:38:LYS:HE2	1.92	0.50
1:C:396:ALA:HB3	1:C:453:ARG:NH1	2.26	0.50
1:C:707:THR:HG22	1:C:708:GLY:H	1.77	0.50
1:D:370:LEU:O	1:D:432:HIS:HE1	1.95	0.50
1:B:574:HIS:CD2	1:B:580:THR:HA	2.46	0.49
1:A:519:ARG:HH22	1:A:847:ASP:CG	2.14	0.49
1:A:810:ALA:HB1	1:A:831:MET:HE1	1.93	0.49
1:A:1093:ASN:ND2	1:A:1093:ASN:H	2.10	0.49
1:A:1005:GLN:HA	1:A:1008:ILE:HD11	1.92	0.49
1:C:622:ASN:HD21	1:C:624:TRP:HD1	1.59	0.49
1:D:641:MET:HE3	1:D:671:ILE:HG21	1.94	0.49
1:C:223:GLU:O	1:C:227:SER:HB2	2.11	0.49
1:C:580:THR:HB	1:C:614:VAL:HG21	1.95	0.49
1:A:191:LEU:HD23	1:A:237:ARG:HA	1.93	0.49
1:D:574:HIS:CD2	1:D:580:THR:HA	2.47	0.49
1:D:1129:GLU:HB3	1:D:1157:ILE:HD12	1.93	0.49
1:A:249:VAL:HG11	1:A:299:MET:HG3	1.95	0.49
1:B:382:ASP:HB3	1:B:456:LYS:O	2.13	0.49
1:A:142:HIS:H	1:A:145:HIS:HD2	1.60	0.49
1:D:590:ILE:HG12	1:D:837:TYR:CE2	2.48	0.49
1:A:1120:VAL:HG23	1:A:1166:ASP:O	2.13	0.49
1:B:858:ASN:HD21	1:B:860:GLU:CG	2.25	0.48
1:C:54:ARG:HH11	1:C:54:ARG:HG3	1.75	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:290:ARG:HG2	1:A:320:PHE:CE1	2.47	0.48
1:C:419:SER:HB2	1:C:421:TYR:HD1	1.78	0.48
1:A:1000:GLY:N	1:A:1001:PRO:HD2	2.26	0.48
1:C:451:ARG:HG3	1:C:453:ARG:HH21	1.79	0.48
1:D:101:ARG:CG	1:D:101:ARG:NH2	2.73	0.48
1:D:274:VAL:HG12	1:D:275:VAL:HG23	1.95	0.48
1:D:811:ASN:H	1:D:811:ASN:ND2	2.11	0.48
1:A:571:ARG:HD3	1:A:605:GLU:OE1	2.12	0.48
1:B:826:THR:HG22	1:B:827:ASP:N	2.28	0.48
1:D:1158:LYS:HB2	1:D:1176:GLU:HG3	1.94	0.48
1:B:1127:VAL:HA	1:B:1157:ILE:HG22	1.95	0.48
1:C:551:LYS:O	1:C:555:GLU:HG2	2.14	0.48
1:D:259:HIS:HD2	1:D:296:ILE:HD12	1.78	0.48
1:A:278:ALA:O	1:A:280:SER:N	2.47	0.48
1:B:1029:ASN:ND2	1:B:1031:SER:OG	2.46	0.48
1:C:550:PRO:HB2	1:C:736:HIS:CE1	2.48	0.48
1:C:913:VAL:HG13	1:C:944:VAL:HA	1.95	0.48
1:C:276:GLU:O	1:C:335:ILE:HD11	2.14	0.48
1:C:398:ARG:HH11	1:C:451:ARG:HE	1.62	0.48
1:C:667:ALA:HB1	1:C:698:LYS:HE3	1.95	0.48
1:A:631:ARG:HA	1:A:631:ARG:HD3	1.69	0.48
1:B:820:PHE:HB3	1:B:821:PRO:HD2	1.95	0.48
1:C:259:HIS:HB3	1:C:296:ILE:HD11	1.95	0.48
1:D:574:HIS:HD2	1:D:580:THR:HA	1.79	0.48
1:B:519:ARG:NH2	1:B:846:SER:OG	2.46	0.47
1:C:338:MET:CE	1:C:430:SER:HB3	2.44	0.47
1:C:1013:TYR:HB3	1:C:1016:VAL:HB	1.95	0.47
1:D:799:ALA:H	1:D:811:ASN:ND2	2.12	0.47
1:A:1115:GLN:H	1:A:1115:GLN:NE2	2.12	0.47
1:B:908:ALA:HB1	1:B:909:PRO:CD	2.25	0.47
1:A:812:SER:HB2	1:D:778:ASN:HD21	1.79	0.47
1:C:572:ASP:HB3	1:C:807:GLN:HE22	1.80	0.47
1:D:720:LEU:HD21	1:D:758:GLU:HG3	1.95	0.47
1:D:804:LEU:HD13	1:D:854:ILE:HG22	1.95	0.47
1:A:631:ARG:NH2	1:A:672:ASP:OD1	2.47	0.47
1:B:1024:ARG:HH11	1:B:1024:ARG:HB2	1.79	0.47
1:C:77:ARG:HD3	1:C:78:TYR:CE2	2.50	0.47
1:C:799:ALA:H	1:C:811:ASN:ND2	2.13	0.47
1:D:41:LEU:HB2	1:D:111:VAL:HG21	1.96	0.47
1:D:661:LYS:HB3	1:D:1008:ILE:HD13	1.95	0.47
1:D:1044:ASN:HD22	1:D:1062:LEU:HD22	1.79	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:409:ALA:HA	1:A:427:VAL:HG13	1.96	0.47
1:A:826:THR:OG1	1:A:827:ASP:N	2.48	0.47
1:B:569:THR:HA	1:B:573:ALA:HB3	1.96	0.47
1:A:384:LEU:HD11	1:A:490:ILE:HD11	1.96	0.47
1:C:263:ARG:HG2	1:C:278:ALA:HB2	1.96	0.47
1:C:263:ARG:HH21	1:C:330:GLN:HE21	1.63	0.47
1:C:494:LEU:HB2	1:C:496:ARG:HH11	1.80	0.47
1:C:504:ILE:HG21	1:C:1042:MET:HE3	1.94	0.47
1:C:644:ARG:O	1:C:645:ALA:C	2.52	0.47
1:D:715:ARG:HH12	1:D:865:GLU:CD	2.18	0.47
1:D:928:GLU:O	1:D:931:VAL:HG12	2.14	0.47
1:A:496:ARG:HD2	1:A:1052:ILE:HD13	1.96	0.47
1:B:141:PRO:HB2	1:B:145:HIS:HB2	1.96	0.47
1:D:477:THR:HG23	1:D:479:LYS:H	1.79	0.47
1:D:895:ARG:HE	1:D:899:PHE:HE1	1.61	0.47
1:D:912:LYS:NZ	1:D:916:ASP:OD1	2.48	0.47
1:D:1087:ILE:HG22	1:D:1088:TYR:N	2.30	0.47
1:A:596:ASP:O	1:A:599:LYS:HG2	2.15	0.47
1:A:1093:ASN:H	1:A:1093:ASN:HD22	1.63	0.47
1:B:700:SER:H	1:B:736:HIS:CD2	2.20	0.47
1:B:909:PRO:HB2	1:B:952:ILE:HG12	1.97	0.47
1:D:743:MET:CG	1:D:907:VAL:HG13	2.44	0.47
1:A:460:PRO:HA	1:A:463:ILE:HD12	1.96	0.47
1:A:672:ASP:HA	1:A:698:LYS:HD2	1.97	0.47
1:A:77:ARG:HG2	1:A:77:ARG:NH1	2.25	0.46
1:A:521:LYS:HA	1:A:522:PRO:HD3	1.82	0.46
1:B:537:ILE:HA	1:B:538(B):PHE:CD1	2.50	0.46
1:A:641:MET:HE3	1:A:674:PHE:CE1	2.50	0.46
1:B:558:LYS:HE3	1:B:767:PRO:HD3	1.96	0.46
1:D:566:THR:HB	1:D:795:ASP:OD1	2.16	0.46
1:B:251:GLY:O	1:B:306:ASN:N	2.47	0.46
1:C:260:LEU:HD21	1:C:362:MET:HE1	1.98	0.46
1:A:1120:VAL:HG21	1:A:1162:VAL:HB	1.97	0.46
1:C:960:ASN:HB3	1:C:963:LEU:HB3	1.96	0.46
1:D:622:ASN:ND2	1:D:624:TRP:H	2.13	0.46
1:A:41:LEU:HD13	1:A:106:ALA:HB2	1.97	0.46
1:B:258:VAL:HG22	1:B:357:LEU:HD11	1.96	0.46
1:D:569:THR:HG23	1:D:801:MET:HG3	1.98	0.46
1:D:828:ILE:O	1:D:832:GLU:HG2	2.16	0.46
1:A:858:ASN:HD21	1:A:860:GLU:HB2	1.80	0.46
1:B:583:ARG:HG2	1:B:619:LEU:HD22	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:290:ARG:NH2	1:C:318:ASP:O	2.49	0.46
1:A:644:ARG:HG2	1:A:647:ASN:OD1	2.16	0.46
1:A:711:LEU:HD21	1:A:750:LYS:HB3	1.98	0.46
1:C:44:ASN:ND2	1:C:45:ARG:H	1.98	0.46
1:D:1108:ASN:CB	1:D:1109:PRO:HD3	2.44	0.46
1:D:631:ARG:HA	1:D:631:ARG:HD3	1.72	0.46
1:B:715:ARG:HE	1:B:715:ARG:C	2.19	0.46
1:D:826:THR:HG21	1:D:831:MET:HE1	1.98	0.46
1:B:864:HIS:CD2	1:B:866:MET:H	2.31	0.46
1:C:313:LEU:HD13	1:C:323:ILE:HG13	1.98	0.46
1:A:436:PHE:O	1:A:440:GLU:HB2	2.15	0.45
1:A:749:PRO:HG3	1:A:781:LEU:HB3	1.98	0.45
1:B:624:TRP:HB3	1:B:1005:GLN:NE2	2.31	0.45
1:C:931:VAL:HA	1:C:935:GLY:H	1.81	0.45
1:A:214:GLU:O	1:A:214:GLU:HG2	2.16	0.45
1:B:244:HIS:CD2	1:B:265:CYS:HB2	2.50	0.45
1:B:1123:VAL:HG12	1:B:1164:ASN:OD1	2.15	0.45
1:D:398:ARG:HH21	1:D:449:GLU:HG2	1.81	0.45
1:A:274:VAL:HG12	1:A:275:VAL:HG23	1.97	0.45
1:B:558:LYS:NZ	1:B:765:ASP:HB3	2.32	0.45
1:B:1053:ASP:HB3	1:B:1056:LYS:CG	2.45	0.45
1:A:739:ALA:HA	1:A:769:HIS:O	2.17	0.45
1:B:1177:ILE:HD13	1:B:1177:ILE:N	2.31	0.45
1:D:145:HIS:CE1	1:D:304:TYR:HA	2.51	0.45
1:A:209:GLU:HG3	1:A:210:GLU:H	1.79	0.45
1:B:641:MET:HE3	1:B:674:PHE:HE1	1.82	0.45
1:A:563:VAL:HG21	1:A:787:ILE:HG12	1.98	0.45
1:B:144:GLU:O	1:B:148:MET:HB2	2.16	0.45
1:B:804:LEU:HD13	1:B:854:ILE:HG22	1.99	0.45
1:A:278:ALA:HB3	1:A:373:ALA:H	1.80	0.45
1:B:575:GLN:HE22	1:B:610:ALA:H	1.63	0.45
1:C:575:GLN:NE2	1:C:610:ALA:H	2.14	0.45
1:C:927:ASP:O	1:C:930:SER:HB2	2.17	0.45
1:D:67:TYR:CD1	1:D:77:ARG:HG3	2.52	0.45
1:A:589:ASN:HD22	1:A:589:ASN:HA	1.61	0.45
1:B:796:THR:HB	1:B:810:ALA:HB2	1.99	0.45
1:D:875:SER:HA	1:D:887:PHE:CE1	2.51	0.45
1:A:141:PRO:HB2	1:A:145:HIS:HB2	1.99	0.45
1:A:799:ALA:H	1:A:811:ASN:HD21	1.63	0.45
1:B:51:ARG:HD3	1:B:406:ARG:HH22	1.82	0.45
1:A:331:VAL:HG23	1:A:332:GLU:OE2	2.17	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:141:PRO:HB2	1:B:145:HIS:CB	2.47	0.45
1:C:606:MET:CE	1:C:639:PHE:HB3	2.46	0.45
1:A:540:GLY:H	1:A:543:GLN:HE21	1.64	0.44
1:C:342:ILE:HG12	1:C:362:MET:CE	2.46	0.44
1:C:641:MET:HB3	1:C:671:ILE:HD12	1.99	0.44
1:D:263:ARG:HH21	1:D:330:GLN:HE21	1.64	0.44
1:D:858:ASN:HD21	1:D:860:GLU:HB2	1.81	0.44
1:B:413:PHE:HE1	1:B:416:ALA:HB3	1.82	0.44
1:C:749:PRO:HG3	1:C:781:LEU:HB3	2.00	0.44
1:D:162:ALA:HB2	1:D:301:ASN:HD22	1.82	0.44
1:B:41:LEU:HB3	1:B:114:ILE:HG12	1.99	0.44
1:D:896:ARG:HD2	1:D:928:GLU:OE1	2.17	0.44
1:A:731:GLU:HG3	1:A:766:LEU:HD13	2.00	0.44
1:A:888:ASP:HA	1:A:891:LYS:HE3	2.00	0.44
1:B:522:PRO:HB2	1:B:523:ASP:H	1.66	0.44
1:B:858:ASN:HD21	1:B:860:GLU:HG2	1.83	0.44
1:C:313:LEU:HD11	4:C:2100:ADP:H2'	2.00	0.44
1:D:116:PRO:HB2	1:D:122:SER:HA	2.00	0.44
1:B:391:THR:HG23	1:B:420:PRO:HD3	1.98	0.44
1:B:597:VAL:HG22	1:B:830:GLY:HA3	1.99	0.44
1:B:631:ARG:HA	1:B:631:ARG:HD3	1.47	0.44
1:D:498:THR:OG1	1:D:1085:ARG:NH2	2.50	0.44
1:A:551:LYS:O	1:A:555:GLU:HG2	2.18	0.44
1:C:854:ILE:H	1:C:854:ILE:HG13	1.63	0.44
1:D:700:SER:H	1:D:736:HIS:CD2	2.19	0.44
1:A:350:LEU:HD13	1:A:359:GLU:HB3	2.00	0.44
1:B:40:LEU:HD11	1:B:349:ILE:HD12	2.00	0.44
1:D:641:MET:HB3	1:D:671:ILE:HD12	1.99	0.44
1:A:631:ARG:HG2	1:A:670:GLY:HA3	2.00	0.44
1:C:152:LYS:HG3	1:C:197:SER:N	2.30	0.44
1:A:195:ALA:HA	1:A:233:VAL:HG12	1.99	0.43
1:A:501:LEU:HD21	1:A:1080:MET:HG3	2.00	0.43
1:B:715:ARG:NH1	1:B:865:GLU:OE2	2.47	0.43
1:A:258:VAL:HG21	1:A:362:MET:HE2	2.00	0.43
1:A:811:ASN:ND2	1:A:811:ASN:H	2.12	0.43
1:C:378:ILE:HB	1:C:427:VAL:HG23	2.00	0.43
1:C:918:ALA:O	1:C:922:VAL:HG23	2.19	0.43
1:D:739:ALA:HA	1:D:769:HIS:O	2.19	0.43
1:A:376:CYS:HB2	1:A:462:LEU:HD22	1.99	0.43
1:B:357:LEU:O	1:B:362:MET:HB3	2.18	0.43
1:C:775:THR:HG22	1:C:861:ILE:HG13	2.00	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:752:ALA:HB2	1:D:782:THR:HG23	2.00	0.43
1:A:434:ILE:H	1:A:434:ILE:HG13	1.56	0.43
1:C:580:THR:O	1:C:614:VAL:HG11	2.18	0.43
1:C:866:MET:HE2	1:C:871:TYR:HA	1.99	0.43
1:A:647:ASN:O	1:A:649:VAL:N	2.52	0.43
1:B:506:ASN:ND2	1:B:510:ASN:ND2	2.65	0.43
1:B:907:VAL:HB	1:B:908:ALA:H	1.58	0.43
1:C:1090:LYS:HE2	1:C:1090:LYS:HB3	1.77	0.43
1:A:258:VAL:HG21	1:A:362:MET:CE	2.48	0.43
1:B:241:ASN:HB2	1:B:477:THR:HG21	2.01	0.43
1:B:565:LEU:HD23	1:B:824:LEU:HD22	2.00	0.43
1:B:571:ARG:C	1:B:571:ARG:HD2	2.39	0.43
1:B:828:ILE:O	1:B:831:MET:HB2	2.19	0.43
1:D:655:PRO:HG3	1:D:985:VAL:HG23	1.99	0.43
1:B:913:VAL:HG22	1:B:943:SER:HB2	2.01	0.43
1:C:144:GLU:O	1:C:148:MET:HB2	2.19	0.43
1:C:704:ILE:HG21	1:C:723:TYR:HD2	1.84	0.43
1:D:641:MET:HE3	1:D:674:PHE:CE1	2.53	0.43
1:C:434:ILE:H	1:C:434:ILE:HG13	1.67	0.43
1:D:655:PRO:CG	1:D:985:VAL:HG23	2.48	0.43
1:B:245:ILE:HD13	1:B:264:ASP:HA	2.00	0.43
1:B:631:ARG:NH1	1:B:634:ILE:O	2.52	0.43
1:B:1078:TYR:HB2	1:B:1085:ARG:HB3	2.01	0.43
1:D:622:ASN:C	1:D:622:ASN:HD22	2.22	0.43
1:B:989:LYS:HA	1:B:992:GLU:HB2	2.01	0.43
1:C:960:ASN:CB	1:C:963:LEU:HB3	2.49	0.43
2:C:2000:BTI:H5	1:D:512:PHE:CZ	2.54	0.43
1:D:1052:ILE:HD13	1:D:1058:LEU:HB2	2.00	0.43
1:A:42:VAL:HG11	1:A:49:ALA:HA	2.01	0.42
1:B:765:ASP:O	1:B:766:LEU:C	2.57	0.42
1:B:1027:TYR:HB3	1:B:1030:LEU:HD21	2.00	0.42
1:C:142:HIS:H	1:C:145:HIS:HD2	1.67	0.42
1:C:584:THR:O	1:C:588:ILE:HG12	2.19	0.42
1:D:338:MET:HE1	1:D:430:SER:HB2	2.01	0.42
1:D:501:LEU:CD1	1:D:1085:ARG:HG2	2.49	0.42
1:A:656:ASP:OD1	1:A:688:VAL:HG21	2.19	0.42
1:D:326:ASN:HA	1:D:327:PRO:HD3	1.91	0.42
1:A:406:ARG:HA	1:A:406:ARG:NE	2.34	0.42
1:B:558:LYS:HG3	1:B:767:PRO:HG3	2.01	0.42
1:B:828:ILE:H	1:B:828:ILE:HG13	1.37	0.42
1:D:1113:GLY:HA2	1:D:1172:ASP:O	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:313:LEU:HB2	1:A:323:ILE:HD11	2.02	0.42
1:B:39:LYS:HD2	1:B:109:ALA:O	2.19	0.42
1:C:382:ASP:HA	1:C:383:PRO:HD3	1.86	0.42
1:D:1153:PHE:HB3	1:D:1154:ASP:H	1.60	0.42
1:A:1060:ILE:HG12	1:A:1080:MET:HG2	2.02	0.42
1:C:937:LYS:H	1:C:937:LYS:HG3	1.64	0.42
1:D:641:MET:HG2	1:D:671:ILE:HG21	2.01	0.42
1:A:678:ASP:OD2	1:A:685:GLN:NE2	2.51	0.42
1:A:1050:ILE:HD12	1:A:1060:ILE:HD12	2.02	0.42
1:B:69:ASN:HD22	1:B:69:ASN:HA	1.67	0.42
1:B:379:THR:HG22	1:B:425:LEU:HA	2.02	0.42
1:C:302:ILE:H	1:C:302:ILE:HG13	1.77	0.42
1:C:917:MET:SD	1:C:944:VAL:HG21	2.60	0.42
1:D:879:LYS:C	1:D:881:LEU:H	2.22	0.42
1:A:796:THR:HB	1:A:810:ALA:HB2	2.02	0.42
1:A:935:GLY:HA3	1:A:966:VAL:HG13	2.01	0.42
1:B:391:THR:HB	1:B:392:GLY:H	1.65	0.42
1:B:787:ILE:HD13	1:B:817:LEU:HD11	2.01	0.42
1:C:606:MET:HE3	1:C:607:TRP:HB2	2.01	0.42
1:D:737:ILE:HG12	1:D:767:PRO:HG2	2.01	0.42
1:A:41:LEU:HB3	1:A:114:ILE:HG12	2.02	0.42
1:B:1097:ASN:C	1:B:1099:ASN:H	2.23	0.42
1:C:370:LEU:O	1:C:432:HIS:HE1	2.02	0.42
1:D:77:ARG:HD3	1:D:78:TYR:CE2	2.55	0.42
1:D:92:PRO:HD2	1:D:94:GLU:HG2	2.02	0.42
1:D:1060:ILE:HG12	1:D:1080:MET:HG2	2.01	0.42
1:D:712:ASN:HA	1:D:713:PRO:HD2	1.95	0.42
1:A:1151:ALA:HA	1:A:1152:PRO:HD3	1.89	0.42
1:B:870:GLN:HA	1:B:873:ASN:HD22	1.84	0.42
1:C:71:ASP:C	1:C:73:SER:N	2.73	0.42
1:C:408:ASP:HB2	1:C:428:LYS:HB3	2.01	0.42
1:A:773:HIS:ND1	1:A:805:THR:O	2.39	0.41
1:B:436:PHE:O	1:B:440:GLU:HB2	2.19	0.41
1:D:622:ASN:HD22	1:D:623:PRO:N	2.18	0.41
1:B:39:LYS:HG3	1:B:111:VAL:HA	2.02	0.41
1:D:622:ASN:HD22	1:D:623:PRO:HD2	1.85	0.41
1:A:622:ASN:HD21	1:A:624:TRP:HD1	1.68	0.41
1:A:828:ILE:H	1:A:828:ILE:HG13	1.60	0.41
1:A:1004:GLU:HA	1:A:1007:ILE:HD12	2.01	0.41
1:A:1029:ASN:C	1:A:1029:ASN:HD22	2.23	0.41
1:B:434:ILE:H	1:B:434:ILE:HG13	1.67	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:606:MET:HE1	1:C:671:ILE:HD13	2.01	0.41
1:C:972:GLU:HB2	1:C:973:ALA:H	1.58	0.41
1:A:364:GLN:HA	1:A:367:ILE:HD12	2.02	0.41
1:B:77:ARG:HG2	1:B:77:ARG:NH1	2.15	0.41
1:B:309:THR:HG21	1:B:330:GLN:NE2	2.34	0.41
1:B:934:ASP:HB2	1:B:937:LYS:HE2	2.03	0.41
1:C:968:LEU:O	1:C:969:LYS:C	2.58	0.41
1:D:263:ARG:HG2	1:D:278:ALA:HB2	2.01	0.41
1:D:1105:ASP:HB3	1:D:1111:HIS:ND1	2.35	0.41
1:A:89:ASP:HB2	1:A:101:ARG:HH12	1.84	0.41
1:A:818:ASN:N	1:A:818:ASN:HD22	2.18	0.41
1:C:338:MET:HE2	1:C:430:SER:HB3	2.03	0.41
1:D:570:PHE:O	1:D:574:HIS:CE1	2.62	0.41
1:D:582:VAL:HA	1:D:845:TYR:CZ	2.56	0.41
1:D:622:ASN:HD22	1:D:623:PRO:CD	2.34	0.41
1:B:45:ARG:HD2	1:B:71:ASP:OD2	2.21	0.41
1:B:145:HIS:HE1	1:B:302:ILE:O	2.03	0.41
1:C:44:ASN:HD22	1:C:45:ARG:N	1.98	0.41
1:C:334:THR:O	1:C:338:MET:HG3	2.21	0.41
1:D:951:GLU:O	1:D:952:ILE:HD13	2.20	0.41
1:A:1157:ILE:HG13	1:A:1177:ILE:HG12	2.03	0.41
1:C:274:VAL:HG12	1:C:275:VAL:HG23	2.01	0.41
1:A:388:MET:HA	1:A:389:PRO:HD3	1.81	0.41
1:B:66:ILE:O	1:B:66:ILE:HG13	2.20	0.41
1:B:137:LYS:HA	1:B:137:LYS:HD2	1.84	0.41
1:B:349:ILE:H	1:B:349:ILE:HG12	1.73	0.41
1:B:977:ARG:NH1	1:B:980:GLU:HB3	2.35	0.41
1:C:91:GLY:HA3	1:C:92:PRO:HD3	1.78	0.41
1:C:252:ASP:HB3	1:C:357:LEU:HD13	2.03	0.41
1:C:406:ARG:NH1	1:C:408:ASP:OD1	2.54	0.41
1:C:556:TRP:O	1:C:560:GLN:HG2	2.21	0.41
1:C:571:ARG:HH11	1:C:575:GLN:NE2	2.18	0.41
1:D:382:ASP:HA	1:D:383:PRO:HD2	1.87	0.41
1:D:406:ARG:NH2	1:D:408:ASP:OD1	2.53	0.41
1:D:960:ASN:HD21	1:D:962:ASP:HB2	1.86	0.41
1:D:1076:ILE:HD12	1:D:1089:ILE:HD13	2.03	0.41
1:A:241:ASN:N	1:A:242:PRO:HD3	2.36	0.41
1:A:524:TYR:CE2	1:A:843:THR:HG22	2.56	0.41
1:B:647:ASN:O	1:B:649:VAL:N	2.54	0.41
1:D:365:LYS:H	1:D:365:LYS:HG2	1.66	0.41
1:D:459:ILE:HB	1:D:460:PRO:HD3	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:1087:ILE:CG2	1:D:1088:TYR:N	2.84	0.41
1:A:524:TYR:HD2	1:A:843:THR:HG21	1.85	0.40
1:C:230:ASN:HD22	1:C:232:GLU:H	1.68	0.40
1:C:907:VAL:O	1:C:910:SER:N	2.55	0.40
1:D:263:ARG:HH21	1:D:330:GLN:NE2	2.19	0.40
1:D:289:GLN:HE21	1:D:289:GLN:HA	1.85	0.40
1:A:587:MET:O	1:A:590:ILE:HD12	2.21	0.40
1:A:810:ALA:CB	1:A:831:MET:HE3	2.51	0.40
1:B:357(B):GLY:C	1:B:359:GLU:H	2.24	0.40
1:C:448:ARG:HH22	1:C:467:LYS:HE3	1.86	0.40
1:B:394:ILE:H	1:B:394:ILE:HG13	1.76	0.40
1:D:755:LEU:O	1:D:759:LEU:HG	2.20	0.40
1:D:820:PHE:HB3	1:D:821:PRO:CD	2.52	0.40
1:D:885:GLU:HA	1:D:885:GLU:OE2	2.22	0.40
1:A:156:ARG:HB3	1:A:156:ARG:HH11	1.86	0.40
1:D:494:LEU:HD23	1:D:495:ASP:N	2.37	0.40
1:D:673:VAL:HG22	1:D:699:ILE:HD12	2.03	0.40
1:D:828:ILE:H	1:D:828:ILE:HG13	1.57	0.40
1:A:99:ILE:HG23	1:A:127:PHE:CD1	2.45	0.40
1:B:582:VAL:HA	1:B:845:TYR:CZ	2.56	0.40
1:B:1050:ILE:HD12	1:B:1060:ILE:HD12	2.04	0.40
1:C:342:ILE:HG12	1:C:362:MET:HE3	2.02	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	1125/1150 (98%)	1034 (92%)	76 (7%)	15 (1%)	12	28
1	B	1070/1150 (93%)	981 (92%)	75 (7%)	14 (1%)	12	28
1	C	1063/1150 (92%)	968 (91%)	79 (7%)	16 (2%)	10	24

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	D	1061/1150 (92%)	985 (93%)	70 (7%)	6 (1%)	25	48
All	All	4319/4600 (94%)	3968 (92%)	300 (7%)	51 (1%)	13	30

All (51) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	211	SER
1	A	278	ALA
1	A	648	ALA
1	B	909	PRO
1	B	1001	PRO
1	C	92	PRO
1	C	168	PRO
1	D	92	PRO
1	D	870	GLN
1	A	209	GLU
1	A	999	GLN
1	A	1000	GLY
1	B	391	THR
1	B	518	LYS
1	B	522	PRO
1	B	766	LEU
1	B	907	VAL
1	C	87	GLY
1	C	199	GLY
1	C	518	LYS
1	C	645	ALA
1	D	868	GLY
1	A	195	ALA
1	A	213	LEU
1	A	518	LYS
1	A	868	GLY
1	A	1081	ASN
1	B	162	ALA
1	B	648	ALA
1	B	903	ASP
1	C	184	ALA
1	C	189	PHE
1	C	197	SER
1	D	1108	ASN
1	A	210	GLU
1	B	42	VAL

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Mol	Chain	Res	Type
1	B	1002	VAL
1	B	1098	ALA
1	C	425	LEU
1	C	885	GLU
1	D	317	GLY
1	D	648	ALA
1	A	1097	ASN
1	C	648	ALA
1	A	1094	VAL
1	C	91	GLY
1	B	87	GLY
1	C	190	PRO
1	C	1014	PRO
1	A	434	ILE
1	C	1001	PRO

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	974/986 (99%)	893 (92%)	81 (8%)	11	25
1	B	927/986 (94%)	867 (94%)	60 (6%)	17	37
1	C	916/986 (93%)	833 (91%)	83 (9%)	9	21
1	D	921/986 (93%)	860 (93%)	61 (7%)	16	36
All	All	3738/3944 (95%)	3453 (92%)	285 (8%)	13	29

All (285) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	44	ASN
1	A	60	ASP
1	A	62	SER
1	A	69	ASN
1	A	108	GLN
1	A	122	SER

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Mol	Chain	Res	Type
1	A	144	GLU
1	A	156	ARG
1	A	166	VAL
1	A	167	ILE
1	A	181	LYS
1	A	189	PHE
1	A	207	VAL
1	A	209	GLU
1	A	210	GLU
1	A	213	LEU
1	A	214	GLU
1	A	241	ASN
1	A	271	HIS
1	A	287	LEU
1	A	306	ASN
1	A	329	VAL
1	A	331	VAL
1	A	368	THR
1	A	417	GLU
1	A	423	ASP
1	A	427	VAL
1	A	455	VAL
1	A	473	SER
1	A	506	ASN
1	A	519	ARG
1	A	525	GLU
1	A	526	LEU
1	A	542	LYS
1	A	571	ARG
1	A	580	THR
1	A	588	ILE
1	A	590	ILE
1	A	606	MET
1	A	607	TRP
1	A	622	ASN
1	A	631	ARG
1	A	707	THR
1	A	715	ARG
1	A	743	MET
1	A	750	LYS
1	A	761	SER
1	A	766	LEU

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Mol	Chain	Res	Type
1	A	772	THR
1	A	775	THR
1	A	812	SER
1	A	828	ILE
1	A	855	LYS
1	A	856	SER
1	A	861	ILE
1	A	863	GLN
1	A	871	TYR
1	A	907	VAL
1	A	919	LEU
1	A	926	LEU
1	A	931	VAL
1	A	944	VAL
1	A	945	VAL
1	A	966	VAL
1	A	980	GLU
1	A	991	ARG
1	A	999	GLN
1	A	1008	ILE
1	A	1029	ASN
1	A	1043	ARG
1	A	1051	GLU
1	A	1064	THR
1	A	1080	MET
1	A	1085	ARG
1	A	1089	ILE
1	A	1090	LYS
1	A	1093	ASN
1	A	1115	GLN
1	A	1116	MET
1	A	1148	THR
1	A	1153	PHE
1	B	40	LEU
1	B	44	ASN
1	B	75	LEU
1	B	77	ARG
1	B	95	SER
1	B	110	ASN
1	B	154	LYS
1	B	156	ARG
1	B	157	THR

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Mol	Chain	Res	Type
1	B	241	ASN
1	B	249	VAL
1	B	250	ILE
1	B	288	ARG
1	B	306	ASN
1	B	320	PHE
1	B	329	VAL
1	B	357	LEU
1	B	377	ARG
1	B	391	THR
1	B	394	ILE
1	B	403	PHE
1	B	407	LEU
1	B	413	PHE
1	B	417	GLU
1	B	458	ASN
1	B	461	PHE
1	B	496	ARG
1	B	523	ASP
1	B	524	TYR
1	B	528	SER
1	B	580	THR
1	B	588	ILE
1	B	606	MET
1	B	607	TRP
1	B	631	ARG
1	B	649	VAL
1	B	715	ARG
1	B	743	MET
1	B	750	LYS
1	B	781	LEU
1	B	784	LYS
1	B	811	ASN
1	B	828	ILE
1	B	855	LYS
1	B	880	SER
1	B	926	LEU
1	B	952	ILE
1	B	986	ASP
1	B	991	ARG
1	B	996	GLU
1	B	1008	ILE

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Mol	Chain	Res	Type
1	B	1024	ARG
1	B	1029	ASN
1	B	1051	GLU
1	B	1085	ARG
1	B	1097	ASN
1	B	1147	THR
1	B	1148	THR
1	B	1175	ILE
1	B	1177	ILE
1	C	44	ASN
1	C	54	ARG
1	C	60	ASP
1	C	86	VAL
1	C	97	LEU
1	C	98	ASN
1	C	112	ASP
1	C	179	LEU
1	C	183	PHE
1	C	185	GLU
1	C	189	PHE
1	C	193	ILE
1	C	196	THR
1	C	227	SER
1	C	230	ASN
1	C	262	GLU
1	C	269	ARG
1	C	287	LEU
1	C	313	LEU
1	C	329	VAL
1	C	335	ILE
1	C	377	ARG
1	C	398	ARG
1	C	406	ARG
1	C	414	GLN
1	C	417	GLU
1	C	427	VAL
1	C	437	LYS
1	C	445	ARG
1	C	451	ARG
1	C	456	LYS
1	C	472	THR
1	C	494	LEU

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Mol	Chain	Res	Type
1	C	515	ASN
1	C	519	ARG
1	C	526	LEU
1	C	535	SER
1	C	542	LYS
1	C	543	GLN
1	C	580	THR
1	C	592	SER
1	C	606	MET
1	C	607	TRP
1	C	617	ASN
1	C	641	MET
1	C	649	VAL
1	C	707	THR
1	C	717	ASN
1	C	719	THR
1	C	743	MET
1	C	780	LEU
1	C	792	ASP
1	C	807	GLN
1	C	811	ASN
1	C	828	ILE
1	C	843	THR
1	C	854	ILE
1	C	855	LYS
1	C	866	MET
1	C	888	ASP
1	C	892	ASP
1	C	906	LYS
1	C	907	VAL
1	C	931	VAL
1	C	936	TYR
1	C	937	LYS
1	C	942	GLU
1	C	959	PHE
1	C	960	ASN
1	C	969	LYS
1	C	971	GLN
1	C	972	GLU
1	C	999	GLN
1	C	1008	ILE
1	C	1022	GLN

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Mol	Chain	Res	Type
1	C	1025	ASN
1	C	1029	ASN
1	C	1044	ASN
1	C	1053	ASP
1	C	1054	LYS
1	C	1085	ARG
1	C	1090	LYS
1	C	1147	THR
1	D	44	ASN
1	D	60	ASP
1	D	62	SER
1	D	101	ARG
1	D	122	SER
1	D	239	ILE
1	D	262	GLU
1	D	288	ARG
1	D	289	GLN
1	D	296	ILE
1	D	329	VAL
1	D	335	ILE
1	D	414	GLN
1	D	419	SER
1	D	427	VAL
1	D	434	ILE
1	D	455	VAL
1	D	456	LYS
1	D	523	ASP
1	D	525	GLU
1	D	531	THR
1	D	542	LYS
1	D	580	THR
1	D	588	ILE
1	D	607	TRP
1	D	620	LYS
1	D	622	ASN
1	D	629	ARG
1	D	631	ARG
1	D	632	LYS
1	D	647	ASN
1	D	649	VAL
1	D	707	THR
1	D	715	ARG

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Mol	Chain	Res	Type
1	D	743	MET
1	D	760	LYS
1	D	775	THR
1	D	781	LEU
1	D	807	GLN
1	D	828	ILE
1	D	853	ASP
1	D	855	LYS
1	D	856	SER
1	D	880	SER
1	D	886	ARG
1	D	895	ARG
1	D	907	VAL
1	D	917	MET
1	D	919	LEU
1	D	925	ASP
1	D	926	LEU
1	D	949	LYS
1	D	952	ILE
1	D	977	ARG
1	D	996	GLU
1	D	1054	LYS
1	D	1056	LYS
1	D	1064	THR
1	D	1080	MET
1	D	1161	THR
1	D	1162	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (132) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	44	ASN
1	A	110	ASN
1	A	145	HIS
1	A	241	ASN
1	A	244	HIS
1	A	254	HIS
1	A	256	ASN
1	A	326	ASN
1	A	330	GLN
1	A	363	GLN
1	A	432	HIS

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Mol	Chain	Res	Type
1	A	506	ASN
1	A	543	GLN
1	A	574	HIS
1	A	575	GLN
1	A	589	ASN
1	A	617	ASN
1	A	622	ASN
1	A	736	HIS
1	A	778	ASN
1	A	807	GLN
1	A	811	ASN
1	A	818	ASN
1	A	858	ASN
1	A	863	GLN
1	A	864	HIS
1	A	873	ASN
1	A	898	ASN
1	A	957	ASN
1	A	1005	GLN
1	A	1019	GLN
1	A	1025	ASN
1	A	1029	ASN
1	A	1044	ASN
1	A	1081	ASN
1	A	1093	ASN
1	A	1095	HIS
1	A	1099	ASN
1	A	1108	ASN
1	A	1134	ASN
1	A	1135	GLN
1	B	44	ASN
1	B	69	ASN
1	B	145	HIS
1	B	244	HIS
1	B	330	GLN
1	B	375	GLN
1	B	385	ASN
1	B	432	HIS
1	B	506	ASN
1	B	543	GLN
1	B	574	HIS
1	B	575	GLN

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Mol	Chain	Res	Type
1	B	589	ASN
1	B	617	ASN
1	B	622	ASN
1	B	736	HIS
1	B	778	ASN
1	B	807	GLN
1	B	811	ASN
1	B	858	ASN
1	B	864	HIS
1	B	873	ASN
1	B	877	GLN
1	B	898	ASN
1	B	923	GLN
1	B	971	GLN
1	B	1005	GLN
1	B	1025	ASN
1	B	1029	ASN
1	B	1044	ASN
1	B	1083	GLN
1	B	1111	HIS
1	C	44	ASN
1	C	108	GLN
1	C	145	HIS
1	C	230	ASN
1	C	326	ASN
1	C	330	GLN
1	C	385	ASN
1	C	432	HIS
1	C	506	ASN
1	C	574	HIS
1	C	575	GLN
1	C	617	ASN
1	C	622	ASN
1	C	653	ASN
1	C	660	HIS
1	C	685	GLN
1	C	694	GLN
1	C	717	ASN
1	C	736	HIS
1	C	778	ASN
1	C	807	GLN
1	C	811	ASN

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Mol	Chain	Res	Type
1	C	877	GLN
1	C	898	ASN
1	C	924	ASN
1	C	957	ASN
1	C	971	GLN
1	C	1025	ASN
1	C	1029	ASN
1	D	44	ASN
1	D	145	HIS
1	D	241	ASN
1	D	289	GLN
1	D	301	ASN
1	D	326	ASN
1	D	330	GLN
1	D	364	GLN
1	D	432	HIS
1	D	506	ASN
1	D	543	GLN
1	D	574	HIS
1	D	575	GLN
1	D	589	ASN
1	D	622	ASN
1	D	647	ASN
1	D	736	HIS
1	D	778	ASN
1	D	807	GLN
1	D	811	ASN
1	D	818	ASN
1	D	858	ASN
1	D	863	GLN
1	D	864	HIS
1	D	898	ASN
1	D	960	ASN
1	D	1005	GLN
1	D	1025	ASN
1	D	1044	ASN
1	D	1083	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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 9 ligands modelled in this entry, 4 are monoatomic - leaving 5 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#$|Z| > 2$	Counts	RMSZ	#$|Z| > 2$
2	BTI	D	2000	1	16,16,16	1.71	2 (12%)	21,21,21	2.05	5 (23%)
4	ADP	C	2100	-	24,29,29	1.04	3 (12%)	29,45,45	1.32	4 (13%)
2	BTI	A	2000	1	16,16,16	1.63	2 (12%)	21,21,21	2.30	4 (19%)
2	BTI	B	2000	1	16,16,16	1.62	2 (12%)	21,21,21	2.25	7 (33%)
2	BTI	C	2000	1	16,16,16	1.70	2 (12%)	21,21,21	1.89	4 (19%)

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	BTI	D	2000	1	-	4/5/27/27	0/2/2/2
4	ADP	C	2100	-	-	7/12/32/32	0/3/3/3
2	BTI	A	2000	1	-	3/5/27/27	0/2/2/2
2	BTI	B	2000	1	-	4/5/27/27	0/2/2/2
2	BTI	C	2000	1	-	4/5/27/27	0/2/2/2

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	2000	BTI	O3-C3	4.82	1.33	1.23
2	B	2000	BTI	O3-C3	4.76	1.33	1.23
2	D	2000	BTI	O3-C3	4.69	1.33	1.23
2	C	2000	BTI	O3-C3	4.64	1.33	1.23
2	D	2000	BTI	C2-S1	-3.82	1.76	1.82
2	C	2000	BTI	C2-S1	-3.71	1.76	1.82
2	B	2000	BTI	C2-S1	-3.43	1.77	1.82
2	A	2000	BTI	C2-S1	-3.19	1.77	1.82
4	C	2100	ADP	C5-C4	2.53	1.47	1.40
4	C	2100	ADP	O4'-C1'	2.12	1.44	1.41
4	C	2100	ADP	C2-N3	2.08	1.35	1.32

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	2000	BTI	C2-C4-N2	-7.65	106.28	113.13
2	D	2000	BTI	C6-C5-N3	-5.53	106.00	113.03
2	C	2000	BTI	C6-C5-N3	-5.42	106.14	113.03
2	A	2000	BTI	C6-C5-N3	-5.32	106.27	113.03
2	D	2000	BTI	C2-C4-N2	-4.69	108.92	113.13
2	B	2000	BTI	C6-C5-N3	-4.57	107.22	113.03
2	B	2000	BTI	C2-C4-N2	-4.55	109.05	113.13
2	C	2000	BTI	C2-C4-N2	-4.05	109.49	113.13
2	B	2000	BTI	C5-C6-S1	3.98	109.72	106.31
2	B	2000	BTI	C4-C2-S1	3.70	108.73	105.20
4	C	2100	ADP	N3-C2-N1	-3.41	123.36	128.68
2	B	2000	BTI	N2-C3-N3	3.09	111.67	108.76
2	D	2000	BTI	N2-C3-N3	2.89	111.48	108.76
4	C	2100	ADP	PA-O3A-PB	-2.88	122.96	132.83
2	C	2000	BTI	N2-C3-N3	2.73	111.33	108.76
2	D	2000	BTI	C5-C6-S1	2.65	108.58	106.31
4	C	2100	ADP	C4-C5-N7	-2.61	106.67	109.40
2	A	2000	BTI	N2-C3-N3	2.39	111.00	108.76
2	A	2000	BTI	C4-C2-S1	2.32	107.41	105.20
4	C	2100	ADP	C3'-C2'-C1'	2.26	104.38	100.98
2	B	2000	BTI	C8-C7-C2	-2.24	109.31	113.86
2	D	2000	BTI	C4-C2-S1	2.19	107.29	105.20
2	B	2000	BTI	C6-S1-C2	2.17	94.35	89.89
2	C	2000	BTI	C5-C6-S1	2.09	108.10	106.31

There are no chirality outliers.

All (22) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	2000	BTI	S1-C2-C7-C8
2	B	2000	BTI	C4-C2-C7-C8
2	C	2000	BTI	S1-C2-C7-C8
2	C	2000	BTI	C4-C2-C7-C8
2	D	2000	BTI	C11-C10-C9-C8
2	D	2000	BTI	S1-C2-C7-C8
2	D	2000	BTI	C4-C2-C7-C8
4	C	2100	ADP	PB-O3A-PA-O5'
4	C	2100	ADP	C5'-O5'-PA-O1A
4	C	2100	ADP	O4'-C4'-C5'-O5'
4	C	2100	ADP	C3'-C4'-C5'-O5'
2	C	2000	BTI	C7-C8-C9-C10
2	A	2000	BTI	S1-C2-C7-C8
2	D	2000	BTI	C2-C7-C8-C9
2	A	2000	BTI	C4-C2-C7-C8
4	C	2100	ADP	C5'-O5'-PA-O3A
2	B	2000	BTI	C7-C8-C9-C10
4	C	2100	ADP	C5'-O5'-PA-O2A
2	A	2000	BTI	C11-C10-C9-C8
2	B	2000	BTI	C11-C10-C9-C8
2	C	2000	BTI	C11-C10-C9-C8
4	C	2100	ADP	C4'-C5'-O5'-PA

There are no ring outliers.

2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	2100	ADP	1	0
2	C	2000	BTI	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 then 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.

Ligand ADP C 2100

Bond lengths

Bond angles

Torsions

Rings
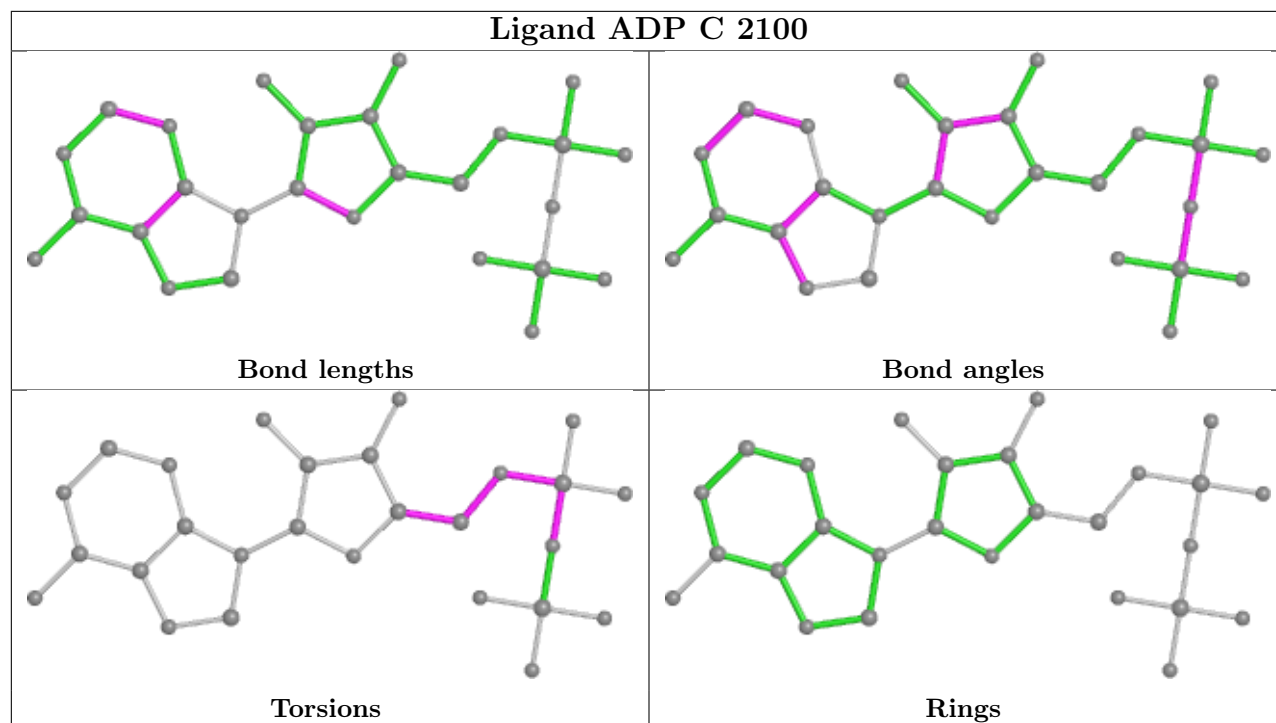
5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	1131/1150 (98%)	0.07	66 (5%)	23	22	25, 52, 127, 194	0
1	B	1074/1150 (93%)	0.35	79 (7%)	14	13	40, 76, 133, 169	0
1	C	1067/1150 (92%)	0.17	51 (4%)	30	29	43, 70, 103, 140	0
1	D	1067/1150 (92%)	0.09	66 (6%)	20	20	23, 57, 130, 250	0
All	All	4339/4600 (94%)	0.17	262 (6%)	21	21	23, 67, 126, 250	0

All (262) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	421	TYR	7.4
1	B	1095	HIS	6.9
1	B	397	TYR	6.7
1	C	933	THR	6.3
1	D	1156	VAL	6.1
1	D	1153	PHE	6.0
1	B	380	THR	5.9
1	A	197	SER	5.8
1	B	398	ARG	5.8
1	B	240	ASP	5.8
1	B	415	GLY	5.7
1	B	413	PHE	5.5
1	C	932	ILE	5.5
1	B	421	TYR	5.5
1	A	1156	VAL	5.3
1	D	1128	GLY	5.2
1	D	1178	GLU	5.1
1	A	218	HIS	5.1
1	B	387	PHE	5.1
1	D	271	HIS	5.1
1	B	393	THR	5.0

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Mol	Chain	Res	Type	RSRZ
1	B	395	ILE	5.0
1	B	394	ILE	4.9
1	A	1132	LYS	4.9
1	A	1137	LEU	4.9
1	B	389	PRO	4.9
1	D	168	PRO	4.9
1	A	177	TYR	4.9
1	B	386	ASP	4.8
1	A	1094	VAL	4.8
1	D	282	GLY	4.8
1	D	1155	GLY	4.8
1	C	1001	PRO	4.8
1	B	492	PRO	4.7
1	A	1138	LEU	4.7
1	B	392	GLY	4.7
1	D	91	GLY	4.7
1	B	388	MET	4.6
1	A	217	PHE	4.6
1	A	1127	VAL	4.6
1	A	395	ILE	4.6
1	A	206	ILE	4.5
1	B	384	LEU	4.5
1	B	385	ASN	4.4
1	A	195	ALA	4.4
1	A	494	LEU	4.4
1	D	494	LEU	4.4
1	A	174	ILE	4.4
1	B	524	TYR	4.3
1	A	1095	HIS	4.3
1	B	457	THR	4.3
1	A	196	THR	4.2
1	A	215	ASP	4.2
1	A	1001	PRO	4.2
1	D	153	VAL	4.2
1	C	492	PRO	4.1
1	B	402	GLY	4.1
1	A	1128	GLY	4.1
1	A	205	ARG	3.9
1	B	526	LEU	3.9
1	D	152	LYS	3.8
1	B	961	LYS	3.8
1	A	219	ARG	3.8

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Mol	Chain	Res	Type	RSRZ
1	B	1096	THR	3.8
1	D	1127	VAL	3.8
1	C	1140	THR	3.8
1	D	1154	ASP	3.7
1	B	89	ASP	3.7
1	D	314	VAL	3.7
1	D	1157	ILE	3.6
1	D	1177	ILE	3.6
1	B	938	LEU	3.6
1	A	90	LEU	3.6
1	A	388	MET	3.5
1	D	1126	SER	3.5
1	D	1130	THR	3.5
1	C	89	ASP	3.5
1	B	407	LEU	3.5
1	D	243	LYS	3.5
1	D	1107	SER	3.5
1	B	490	ILE	3.4
1	B	153	VAL	3.4
1	B	168	PRO	3.4
1	A	222	SER	3.4
1	C	421	TYR	3.4
1	B	1094	VAL	3.4
1	C	1146	GLU	3.4
1	C	770	LEU	3.4
1	A	188	GLY	3.4
1	B	93	ALA	3.4
1	B	403	PHE	3.3
1	C	282	GLY	3.3
1	B	418	ILE	3.3
1	C	1147	THR	3.3
1	D	386	ASP	3.3
1	D	1152	PRO	3.3
1	D	241	ASN	3.3
1	D	309	THR	3.3
1	B	937	LYS	3.3
1	C	176	SER	3.2
1	D	490	ILE	3.2
1	A	1096	THR	3.2
1	D	1123	VAL	3.2
1	C	970	GLY	3.2
1	B	101	ARG	3.2

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Mol	Chain	Res	Type	RSRZ
1	C	934	ASP	3.1
1	A	194	LYS	3.1
1	C	494	LEU	3.1
1	A	469	LYS	3.1
1	C	1093	ASN	3.1
1	A	417	GLU	3.1
1	A	207	VAL	3.1
1	C	182	GLU	3.1
1	C	931	VAL	3.0
1	B	494	LEU	3.0
1	C	183	PHE	3.0
1	A	232	GLU	3.0
1	B	488	PHE	3.0
1	A	211	SER	3.0
1	C	972	GLU	3.0
1	B	401	GLY	3.0
1	A	176	SER	3.0
1	A	1136	PRO	3.0
1	D	89	ASP	2.9
1	A	396	ALA	2.9
1	A	1135	GLN	2.9
1	C	416	ALA	2.9
1	A	453	ARG	2.9
1	D	384	LEU	2.9
1	B	420	PRO	2.9
1	A	175	LYS	2.9
1	A	394	ILE	2.9
1	A	1148	THR	2.9
1	D	151	ASP	2.9
1	B	88	SER	2.9
1	B	981	TYR	2.9
1	C	971	GLN	2.8
1	A	224	ALA	2.8
1	C	218	HIS	2.8
1	A	384	LEU	2.8
1	D	310	VAL	2.8
1	D	1158	LYS	2.8
1	B	412	GLY	2.8
1	D	417	GLU	2.8
1	D	156	ARG	2.8
1	D	247	VAL	2.8
1	D	283	LEU	2.8

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Mol	Chain	Res	Type	RSRZ
1	D	286	THR	2.8
1	D	879	LYS	2.7
1	D	240	ASP	2.7
1	B	452	ILE	2.7
1	D	882	GLY	2.7
1	C	993	LEU	2.7
1	B	454	GLY	2.7
1	C	384	LEU	2.7
1	B	285	PRO	2.7
1	D	492	PRO	2.7
1	B	92	PRO	2.7
1	B	527	ALA	2.7
1	B	90	LEU	2.7
1	A	1130	THR	2.7
1	A	1178	GLU	2.7
1	C	491	GLN	2.6
1	B	282	GLY	2.6
1	B	271	HIS	2.6
1	A	208	ARG	2.6
1	C	215	ASP	2.6
1	A	386	ASP	2.6
1	D	1106	LYS	2.6
1	A	1158	LYS	2.6
1	D	1164	ASN	2.6
1	D	1103	LYS	2.6
1	B	119	GLY	2.6
1	B	456	LYS	2.6
1	C	493	SER	2.6
1	A	178	GLU	2.5
1	D	1109	PRO	2.5
1	D	1176	GLU	2.5
1	B	929	GLN	2.5
1	C	209	GLU	2.5
1	A	91	GLY	2.5
1	B	391	THR	2.5
1	D	1111	HIS	2.5
1	A	221	LYS	2.5
1	C	185	GLU	2.4
1	C	203	GLY	2.4
1	D	388	MET	2.4
1	B	357(B)	GLY	2.4
1	A	220	ALA	2.4

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Mol	Chain	Res	Type	RSRZ
1	B	357(A)	PHE	2.4
1	B	87	GLY	2.4
1	B	1054	LYS	2.4
1	A	398	ARG	2.4
1	C	687	LYS	2.4
1	C	198	GLY	2.4
1	C	199	GLY	2.4
1	D	88	SER	2.4
1	D	308	GLY	2.4
1	B	91	GLY	2.3
1	C	772	THR	2.3
1	D	110	ASN	2.3
1	A	1123	VAL	2.3
1	B	396	ALA	2.3
1	C	208	ARG	2.3
1	D	321	PHE	2.3
1	B	269	ARG	2.3
1	A	88	SER	2.3
1	A	1142	ALA	2.3
1	A	420	PRO	2.3
1	C	643	LEU	2.3
1	D	421	TYR	2.3
1	C	740	ILE	2.3
1	A	1093	ASN	2.3
1	A	216	ALA	2.3
1	C	1142	ALA	2.3
1	B	996	GLU	2.3
1	B	356	ASP	2.2
1	B	381	GLU	2.2
1	C	214	GLU	2.2
1	C	999	GLN	2.2
1	C	496	ARG	2.2
1	A	223	GLU	2.2
1	D	239	ILE	2.2
1	B	460	PRO	2.2
1	C	309	THR	2.2
1	B	1001	PRO	2.2
1	B	739	ALA	2.2
1	D	1121	THR	2.2
1	B	270	ARG	2.2
1	B	377	ARG	2.2
1	B	422	TYR	2.2

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Mol	Chain	Res	Type	RSRZ
1	C	110	ASN	2.2
1	B	641	MET	2.2
1	C	490	ILE	2.1
1	A	89	ASP	2.1
1	A	92	PRO	2.1
1	C	517	GLU	2.1
1	D	92	PRO	2.1
1	C	893	MET	2.1
1	D	272	GLN	2.1
1	A	189	PHE	2.1
1	B	461	PHE	2.1
1	D	143	LEU	2.1
1	D	1133	ALA	2.1
1	A	193	ILE	2.1
1	B	160	ILE	2.1
1	C	705	CYS	2.1
1	D	1092	GLU	2.1
1	B	982	LEU	2.1
1	A	456	LYS	2.1
1	D	38	LYS	2.1
1	B	167	ILE	2.0
1	B	284	SER	2.0
1	C	217	PHE	2.0
1	D	285	PRO	2.0
1	C	648	ALA	2.0
1	D	493	SER	2.0
1	D	1125	VAL	2.0
1	B	1000	GLY	2.0
1	D	1070	GLU	2.0
1	C	175	LYS	2.0
1	D	242	PRO	2.0

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

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

6.3 Carbohydrates ⓘ
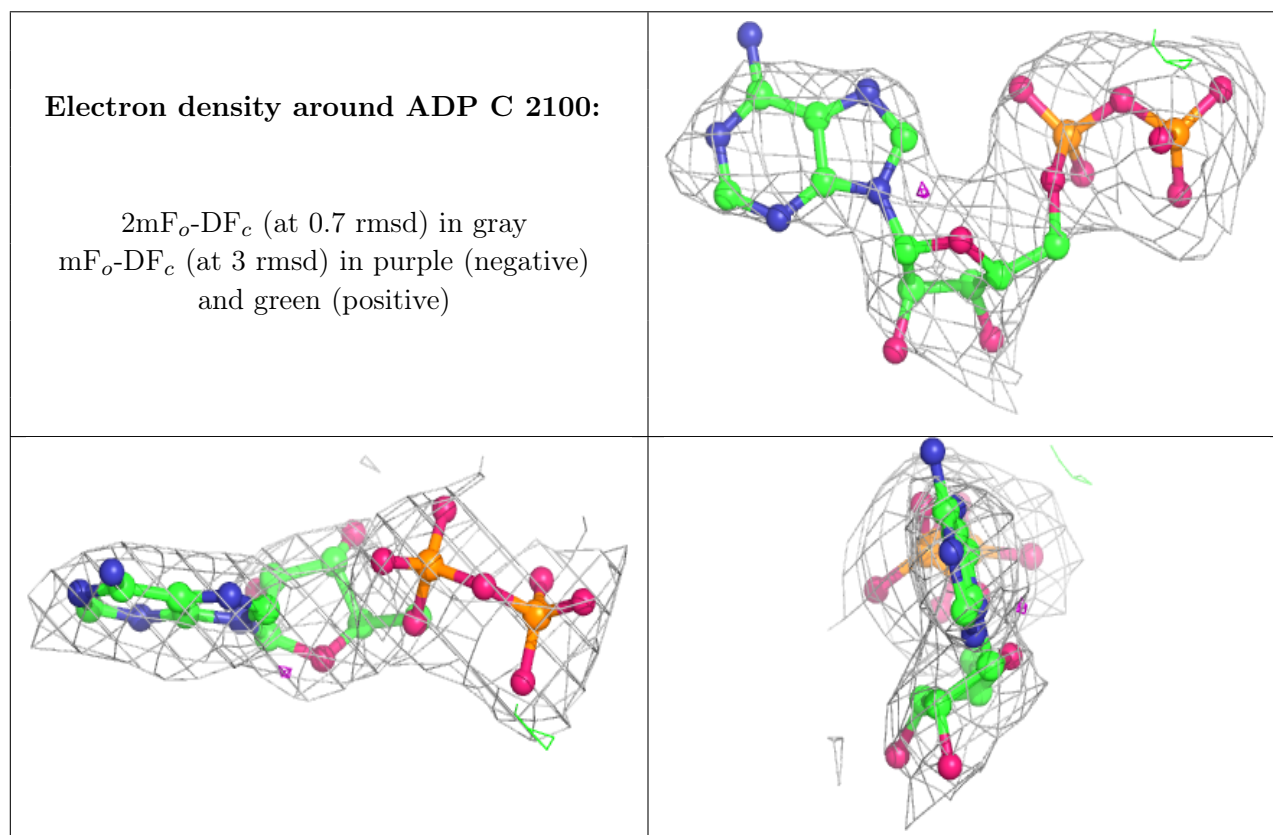
There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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	BTI	A	2000	15/15	0.92	0.20	65,67,69,69	0
2	BTI	D	2000	15/15	0.93	0.17	64,66,67,69	0
3	MN	D	2002	1/1	0.93	0.19	54,54,54,54	0
4	ADP	C	2100	27/27	0.93	0.17	92,92,94,94	0
3	MN	A	2002	1/1	0.94	0.20	54,54,54,54	0
2	BTI	B	2000	15/15	0.95	0.15	50,51,56,57	0
2	BTI	C	2000	15/15	0.96	0.19	58,59,70,70	0
3	MN	C	2002	1/1	0.96	0.36	103,103,103,103	0
3	MN	B	2002	1/1	0.98	0.16	75,75,75,75	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 ADP C 2100:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.