WORLDWIDE PDB

PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Apr 28, 2025 – 08:12 PM JST

PDB ID	:	6LTD / pdb_00006ltd
Title	:	Crystal Structure of Nonribosomal peptide synthetases (NRPS), FmoA3 (S10 46A)-alpha-methyl-L-serine-AMP bound form
Authors	:	Senda, T.; Harada, A.
Deposited on	:	2020-01-22
Resolution	:	4.10 Å(reported)

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

|		
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	1.8.5 (274361), 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)	:	2.43.1

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 4.10 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.
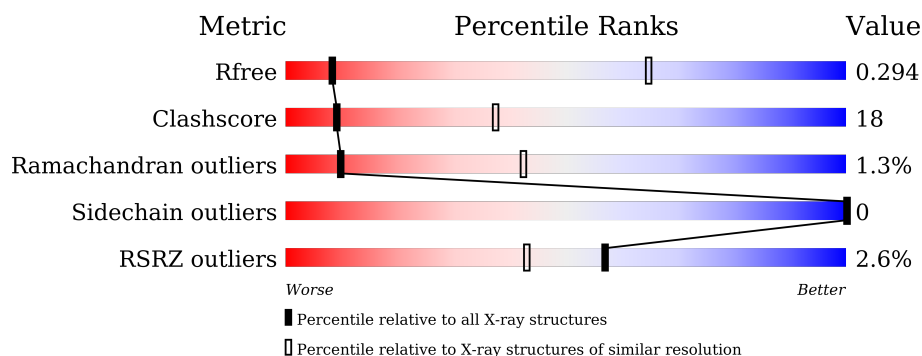
Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	1145 (4.40-3.80)
Clashscore	180529	1211 (4.40-3.80)
Ramachandran outliers	177936	1140 (4.40-3.80)
Sidechain outliers	177891	1127 (4.40-3.80)
RSRZ outliers	164620	1143 (4.40-3.80)

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	1153	2% red; 52% / 25% / 23%
1	B	1153	2% red; 52% / 24% / 24%

2　Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 12031 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 Nonribosomal peptide synthetase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	883	Total 5996	C 3805	N 1032	O 1149	S 10	0	1	0
1	B	882	Total 5975	C 3786	N 1035	O 1142	S 12	0	0	0

There are 54 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-15	MET	-	expression tag	UNP A0A077JG85
A	-14	ASN	-	expression tag	UNP A0A077JG85
A	-13	HIS	-	expression tag	UNP A0A077JG85
A	-12	LYS	-	expression tag	UNP A0A077JG85
A	-11	VAL	-	expression tag	UNP A0A077JG85
A	-10	HIS	-	expression tag	UNP A0A077JG85
A	-9	HIS	-	expression tag	UNP A0A077JG85
A	-8	HIS	-	expression tag	UNP A0A077JG85
A	-7	HIS	-	expression tag	UNP A0A077JG85
A	-6	HIS	-	expression tag	UNP A0A077JG85
A	-5	HIS	-	expression tag	UNP A0A077JG85
A	-4	ILE	-	expression tag	UNP A0A077JG85
A	-3	GLU	-	expression tag	UNP A0A077JG85
A	-2	GLY	-	expression tag	UNP A0A077JG85
A	-1	ARG	-	expression tag	UNP A0A077JG85
A	0	HIS	-	expression tag	UNP A0A077JG85
A	1046	ALA	SER	engineered mutation	UNP A0A077JG85
A	1128	SER	-	expression tag	UNP A0A077JG85
A	1129	ALA	-	expression tag	UNP A0A077JG85
A	1130	TRP	-	expression tag	UNP A0A077JG85
A	1131	SER	-	expression tag	UNP A0A077JG85
A	1132	HIS	-	expression tag	UNP A0A077JG85
A	1133	PRO	-	expression tag	UNP A0A077JG85
A	1134	GLN	-	expression tag	UNP A0A077JG85
A	1135	PHE	-	expression tag	UNP A0A077JG85

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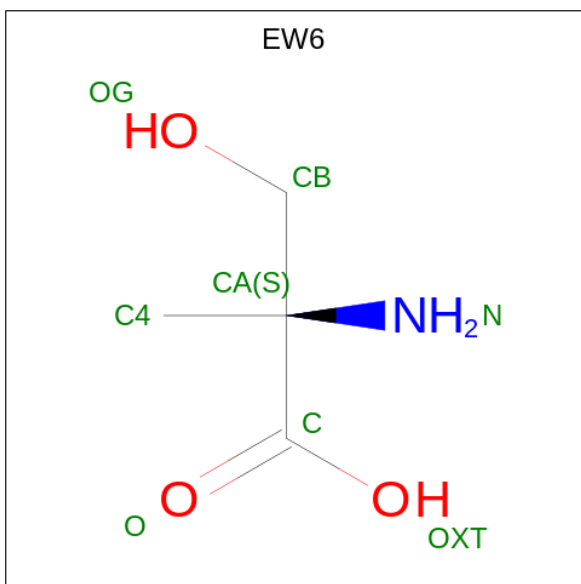
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Chain	Residue	Modelled	Actual	Comment	Reference
A	1136	GLU	-	expression tag	UNP A0A077JG85
A	1137	LYS	-	expression tag	UNP A0A077JG85
B	-15	MET	-	expression tag	UNP A0A077JG85
B	-14	ASN	-	expression tag	UNP A0A077JG85
B	-13	HIS	-	expression tag	UNP A0A077JG85
B	-12	LYS	-	expression tag	UNP A0A077JG85
B	-11	VAL	-	expression tag	UNP A0A077JG85
B	-10	HIS	-	expression tag	UNP A0A077JG85
B	-9	HIS	-	expression tag	UNP A0A077JG85
B	-8	HIS	-	expression tag	UNP A0A077JG85
B	-7	HIS	-	expression tag	UNP A0A077JG85
B	-6	HIS	-	expression tag	UNP A0A077JG85
B	-5	HIS	-	expression tag	UNP A0A077JG85
B	-4	ILE	-	expression tag	UNP A0A077JG85
B	-3	GLU	-	expression tag	UNP A0A077JG85
B	-2	GLY	-	expression tag	UNP A0A077JG85
B	-1	ARG	-	expression tag	UNP A0A077JG85
B	0	HIS	-	expression tag	UNP A0A077JG85
B	1046	ALA	SER	engineered mutation	UNP A0A077JG85
B	1128	SER	-	expression tag	UNP A0A077JG85
B	1129	ALA	-	expression tag	UNP A0A077JG85
B	1130	TRP	-	expression tag	UNP A0A077JG85
B	1131	SER	-	expression tag	UNP A0A077JG85
B	1132	HIS	-	expression tag	UNP A0A077JG85
B	1133	PRO	-	expression tag	UNP A0A077JG85
B	1134	GLN	-	expression tag	UNP A0A077JG85
B	1135	PHE	-	expression tag	UNP A0A077JG85
B	1136	GLU	-	expression tag	UNP A0A077JG85
B	1137	LYS	-	expression tag	UNP A0A077JG85

- Molecule 2 is ADENOSINE MONOPHOSPHATE (CCD ID: AMP) (formula: $C_{10}H_{14}N_5O_7P$) (labeled as "Ligand of Interest" by depositor).
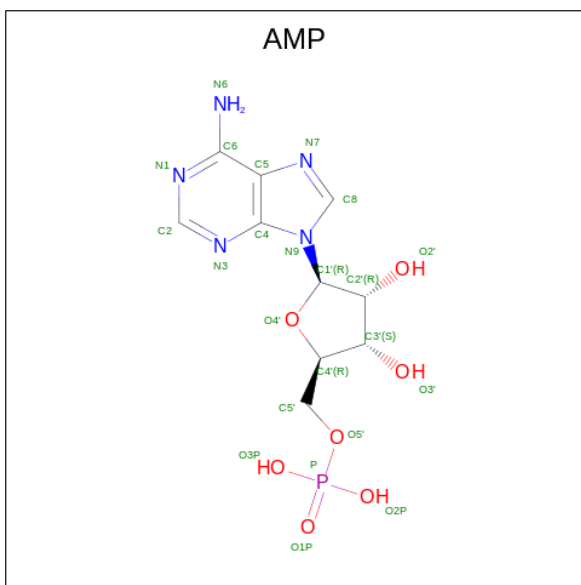
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	P	0	0
			23	10	5	7	1		
2	B	1	Total	C	N	O	P	0	0
			23	10	5	7	1		

- Molecule 3 is alpha-methyl-L-serine (CCD ID: EW6) (formula: $C_4H_9NO_3$) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			7	4	1	2		

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	B	1	Total 7	C 4	N 1	O 2	0	0

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: Nonribosomal peptide synthetase

• Molecule 1: Nonribosomal peptide synthetase

Chain B:

LEU ALA SER ARG LEU GLN ASP LEU LEU GLY ALA PRO VAL PRO ILE ARG THR VAL PHE GLY ASN PRO VAL LEU GLY ASP LEU ALA SER ALA ILE ALA GLY ASP PRO ALA ALA GLY PRO GLN ALA ILE ARG VAL ALA ARG LEU LEU HIS THR LEU GLU GLU PRO ASP GLU LYS PRO GLY GLU

LYS PRO ASP ALA GLU PRO ALA GLY GLU PRO ASP ALA GLY SER ARG THR SER ALA TRP SER HIS PRO GLN PHE GLU LYS

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	96.62Å 97.05Å 107.82Å 69.71° 74.91° 63.96°	Depositor
Resolution (Å)	48.15 – 4.10 48.15 – 4.10	Depositor EDS
% Data completeness (in resolution range)	98.7 (48.15-4.10) 98.8 (48.15-4.10)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.33 (at 4.14Å)	Xtriage
Refinement program	PHENIX 1.15.2_3472	Depositor
R, R_{free}	0.237 , 0.297 0.236 , 0.294	Depositor DCC
R_{free} test set	1218 reflections (4.74%)	wwPDB-VP
Wilson B-factor (Å^2)	133.6	Xtriage
Anisotropy	0.615	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.31 , 175.2	EDS
L-test for twinning[2]	$< |L| > = 0.44, < L^2 > = 0.27$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.89	EDS
Total number of atoms	12031	wwPDB-VP
Average B, all atoms (Å^2)	143.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.97% 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: EW6, AMP

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	0.50	0/6145	0.76	0/8493
1	B	0.52	0/6128	0.79	0/8471
All	All	0.51	0/12273	0.77	0/16964

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2   Too-close contacts ⓘ

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	5996	0	5204	212	0
1	B	5975	0	5103	190	0
2	A	23	0	12	5	0
2	B	23	0	11	5	0
3	A	7	0	0	2	0
3	B	7	0	0	2	0
All	All	12031	0	10330	403	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 18.

All (403) 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:787:PRO:O	1:B:790:THR:HG22	1.52	1.09
1:A:787:PRO:O	1:A:790:THR:HG22	1.53	1.09
1:B:258:MET:HB2	1:B:427:VAL:HG22	1.47	0.96
1:A:329:LEU:HD22	1:A:349:LEU:HD13	1.53	0.89
1:B:787:PRO:HB3	2:B:1201:AMP:H5'2	1.54	0.87
1:B:520:THR:HG23	1:B:523:GLU:H	1.37	0.87
1:A:549:VAL:HG22	1:A:573:ILE:HB	1.58	0.85
1:B:667:ARG:HA	1:B:672:VAL:HG21	1.60	0.83
1:B:920:ALA:HA	1:B:930:ALA:HA	1.62	0.81
1:B:484:ASN:HB3	1:B:819:ARG:HG2	1.61	0.81
1:B:147:THR:HG22	1:B:149:PRO:HD2	1.64	0.78
1:A:334:GLU:O	1:A:341:ARG:HA	1.85	0.75
1:A:379:PRO:HB2	1:A:412:SER:OG	1.86	0.75
1:A:260:ARG:NH2	1:A:425:ARG:HE	1.86	0.74
1:A:484:ASN:HB3	1:A:819:ARG:HG2	1.70	0.73
1:A:279:THR:H	1:A:282:GLU:HB2	1.54	0.72
1:B:334:GLU:O	1:B:341:ARG:HA	1.89	0.71
1:B:413:LEU:HD13	1:B:430:HIS:HB3	1.72	0.71
1:B:490:VAL:HG21	1:B:661:ASN:HB2	1.71	0.71
1:B:822:ILE:O	1:B:830:ARG:HG2	1.90	0.71
1:A:639:VAL:HA	1:A:652:VAL:O	1.91	0.71
1:B:678:LEU:HD12	1:B:728:PHE:CD2	2.26	0.70
1:A:273:ALA:HB2	1:A:283:LEU:HD23	1.72	0.70
1:A:878:GLY:HA2	1:A:889:LEU:HG	1.74	0.69
1:B:295:TRP:CH2	1:B:443:ALA:HA	2.27	0.69
1:B:878:GLY:HA2	1:B:889:LEU:HG	1.75	0.69
1:B:244:ALA:HB2	1:B:436:ALA:HA	1.75	0.68
1:A:279:THR:HG23	1:A:282:GLU:HG3	1.75	0.68
1:B:850:TYR:HB2	1:B:857:THR:OG1	1.93	0.68
1:A:258:MET:HB2	1:A:427:VAL:HG22	1.76	0.68
1:B:227:TYR:CE1	1:B:231:ARG:HD2	2.29	0.68
1:B:679:LEU:HD23	1:B:729:TRP:HZ3	1.58	0.67
1:A:787:PRO:HB3	2:A:1201:AMP:H5'2	1.77	0.67
1:B:639:VAL:HA	1:B:652:VAL:O	1.94	0.67
1:A:413:LEU:HD13	1:A:430:HIS:HB3	1.77	0.67
1:A:96:ARG:HA	1:A:148:TRP:HE1	1.60	0.66
1:A:326:PRO:HG2	1:A:360:GLY:HA3	1.77	0.66
1:A:787:PRO:HB3	2:A:1201:AMP:H3'	1.77	0.66
1:A:850:TYR:HB2	1:A:857:THR:OG1	1.96	0.66
1:B:752:ALA:HA	1:B:776:ALA:HB2	1.78	0.66
1:A:678:LEU:HD12	1:A:728:PHE:CD2	2.31	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:842:SER:HB3	1:A:846:LEU:HG	1.77	0.65
1:B:572:PRO:HD2	1:B:639:VAL:O	1.97	0.65
1:B:891:ARG:HD2	2:B:1201:AMP:O2'	1.97	0.65
1:A:90:ALA:O	1:A:92:HIS:N	2.30	0.64
1:A:237:PRO:O	1:A:301:PHE:HA	1.97	0.64
1:A:815:ILE:HG12	1:A:816:ALA:H	1.61	0.64
1:A:520:THR:HG23	1:A:523:GLU:H	1.62	0.64
1:B:69:PHE:HA	1:B:404:SER:HB2	1.80	0.64
1:B:495:LEU:HD11	1:B:659:VAL:HB	1.81	0.63
1:A:260:ARG:HH22	1:A:425:ARG:HE	1.46	0.63
1:B:760:SER:HB3	1:B:784:SER:H	1.63	0.63
1:B:438:GLY:O	1:B:441:GLU:N	2.32	0.62
1:A:272:ARG:HD2	1:A:464:TRP:CZ2	2.35	0.62
1:B:281:THR:O	1:B:285:VAL:HG23	1.99	0.62
1:A:272:ARG:HD2	1:A:464:TRP:HZ2	1.64	0.61
1:B:687:ASP:HB2	1:B:788:THR:OG1	2.00	0.61
1:A:166:LEU:HG	1:A:167:GLY:O	2.00	0.61
1:A:502:GLN:OE1	1:A:505:ARG:NH2	2.31	0.61
1:B:80:ARG:NH1	1:B:190:TYR:O	2.32	0.61
1:A:217:GLY:H	1:A:221:TRP:CG	2.18	0.61
1:A:782:VAL:HG22	1:A:798:PRO:HA	1.83	0.61
1:B:714:PRO:HG3	1:B:738:LEU:HB3	1.81	0.61
1:B:823:VAL:HG12	1:B:829:PRO:HA	1.83	0.61
1:A:822:ILE:HD11	1:A:838:MET:HG2	1.82	0.61
1:B:667:ARG:HA	1:B:672:VAL:CG2	2.29	0.61
1:B:70:GLU:HG3	1:B:165:GLN:HG2	1.82	0.60
1:A:490:VAL:HG21	1:A:661:ASN:HB2	1.82	0.60
1:B:306:PRO:HD2	1:B:382:VAL:O	2.01	0.60
1:B:679:LEU:HD23	1:B:729:TRP:CZ3	2.35	0.60
1:A:269:LEU:HD11	1:A:283:LEU:HD11	1.83	0.60
1:A:258:MET:HE3	1:A:260:ARG:HG3	1.83	0.60
1:A:572:PRO:HD2	1:A:639:VAL:O	2.01	0.60
1:B:166:LEU:HG	1:B:167:GLY:O	2.01	0.59
1:B:379:PRO:HB2	1:B:412:SER:OG	2.02	0.59
1:A:642:THR:HG21	1:A:788:THR:HG21	1.84	0.59
1:B:293:ARG:HG2	1:B:299:PRO:HA	1.83	0.59
1:A:787:PRO:HD2	1:A:790:THR:HG21	1.85	0.59
1:A:746:ARG:NH2	1:A:748:ASP:OD2	2.34	0.58
1:B:688:ALA:HA	1:B:792:CYS:SG	2.42	0.58
1:A:823:VAL:HA	1:A:828:ARG:O	2.02	0.58
1:B:338:VAL:O	1:B:341:ARG:N	2.36	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:73:ARG:O	1:B:162:VAL:HG12	2.03	0.58
1:A:89:VAL:HG21	1:A:114:VAL:HG22	1.86	0.58
1:B:33:GLU:O	1:B:35:GLY:N	2.36	0.57
1:A:244:ALA:HB2	1:A:436:ALA:HA	1.86	0.57
1:B:486:THR:O	1:B:817:ASN:N	2.34	0.57
1:A:295:TRP:CH2	1:A:443:ALA:HA	2.40	0.57
1:B:259:VAL:HG11	1:B:448:LEU:HD21	1.86	0.57
1:B:486:THR:HB	1:B:816:ALA:HA	1.86	0.57
1:A:444:PHE:CE2	1:A:448:LEU:HD11	2.40	0.57
1:A:691:TYR:O	1:A:696:PRO:HD3	2.05	0.56
1:A:258:MET:HG3	1:A:259:VAL:N	2.21	0.56
1:A:70:GLU:HG3	1:A:165:GLN:HG2	1.87	0.56
1:B:457:ASP:OD2	1:B:463:VAL:HG12	2.05	0.56
1:A:273:ALA:CB	1:A:283:LEU:HD23	2.35	0.56
1:B:782:VAL:HG22	1:B:798:PRO:HA	1.88	0.56
1:B:192:ASP:HB3	1:B:195:ALA:HB2	1.88	0.56
1:B:279:THR:O	1:B:282:GLU:N	2.33	0.56
1:A:781:VAL:HG12	1:A:799:ILE:HD12	1.86	0.55
1:A:495:LEU:HD11	1:A:659:VAL:HB	1.88	0.55
1:B:154:ARG:O	1:B:155:VAL:HG23	2.07	0.55
1:A:437:PRO:HD2	1:A:833:TRP:CZ2	2.42	0.55
1:B:236:PRO:O	1:B:302:THR:OG1	2.19	0.55
1:B:450:LEU:HD11	1:B:454:MET:HE3	1.89	0.55
1:A:667:ARG:HA	1:A:672:VAL:HB	1.88	0.55
1:B:795:LEU:HD13	1:B:820:TYR:CE2	2.41	0.55
1:A:586:LEU:HD23	1:A:591:ALA:HB3	1.89	0.54
1:A:492:ALA:O	1:B:268:LEU:HD22	2.07	0.54
1:A:616:ASP:OD1	1:A:616:ASP:N	2.39	0.54
1:B:572:PRO:CG	1:B:640:ILE:HG12	2.38	0.54
1:B:224:ASP:OD2	1:B:357:SER:OG	2.24	0.54
1:B:163:ARG:CZ	1:B:402:VAL:HG11	2.37	0.54
1:A:784:SER:HB2	1:A:796:PHE:CE1	2.42	0.54
1:B:616:ASP:OD1	1:B:616:ASP:N	2.35	0.54
1:B:653:VAL:O	1:B:847:ALA:HB1	2.07	0.54
1:A:451:VAL:O	1:A:455:LEU:HG	2.08	0.54
1:B:758:VAL:HA	1:B:782:VAL:O	2.07	0.54
1:A:769:PRO:O	1:A:773:ARG:HB2	2.08	0.54
1:A:686:PHE:HB2	1:A:980:ASN:OD1	2.08	0.53
1:B:731:SER:O	1:B:759:VAL:HA	2.08	0.53
1:B:557:TYR:HE2	1:B:693:VAL:HA	1.72	0.53
1:B:765:PRO:HB2	1:B:768:LEU:HB2	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:787:PRO:CD	1:A:790:THR:HG21	2.38	0.53
1:B:269:LEU:HD21	1:B:284:LEU:HD11	1.88	0.53
1:B:788:THR:HB	2:B:1201:AMP:P	2.48	0.53
1:A:258:MET:HE1	1:A:260:ARG:HH21	1.74	0.53
1:A:614:ARG:O	1:A:618:ASP:HB2	2.09	0.53
1:A:678:LEU:HD12	1:A:728:PHE:CG	2.43	0.53
1:B:614:ARG:O	1:B:618:ASP:HB2	2.08	0.53
1:A:85:TRP:CH2	1:A:153:LEU:HD11	2.44	0.53
1:B:784:SER:OG	1:B:785:GLY:N	2.41	0.53
1:A:147:THR:HG22	1:A:149:PRO:HD2	1.91	0.52
1:A:653:VAL:HG12	1:A:848:LEU:HB2	1.91	0.52
1:A:149:PRO:C	1:A:151:PHE:H	2.16	0.52
1:A:328:LEU:HD13	1:A:378:MET:HE3	1.92	0.52
1:A:567:GLY:HA2	1:A:631:GLN:NE2	2.25	0.52
1:A:393:ARG:NH2	1:A:397:GLU:OE1	2.40	0.52
1:A:784:SER:HB2	1:A:796:PHE:CD1	2.44	0.52
1:A:457:ASP:OD2	1:A:463:VAL:HG12	2.10	0.52
1:A:499:PHE:CZ	1:A:524:LEU:HD23	2.45	0.51
1:A:30:LEU:O	1:A:32:PRO:HD3	2.10	0.51
1:B:413:LEU:HD12	1:B:414:ASP:H	1.75	0.51
1:B:623:SER:C	1:B:625:ALA:H	2.19	0.51
1:B:115:PRO:HD3	1:B:148:TRP:HZ3	1.74	0.51
1:B:227:TYR:HB2	1:B:355:HIS:CD2	2.45	0.51
1:A:758:VAL:HG11	1:A:793:TRP:CE2	2.46	0.51
1:B:44:THR:HB	1:B:45:PRO:HD2	1.92	0.51
1:B:567:GLY:HA2	1:B:631:GLN:NE2	2.24	0.51
1:B:849:GLY:HA3	1:B:857:THR:HG23	1.92	0.51
1:B:473:SER:O	1:B:476:ASP:HB2	2.10	0.51
1:B:687:ASP:OD2	1:B:792:CYS:HA	2.11	0.51
1:A:192:ASP:HB3	1:A:195:ALA:HB2	1.92	0.51
1:A:762:ASP:CG	1:A:763:TRP:H	2.19	0.51
1:A:826:ASP:HB2	1:A:828:ARG:HG3	1.93	0.51
1:B:217:GLY:H	1:B:221:TRP:CG	2.28	0.51
1:B:815:ILE:HG22	1:B:818:GLN:HG3	1.92	0.51
1:A:319:VAL:O	1:A:323:TYR:OH	2.22	0.51
1:B:787:PRO:O	1:B:790:THR:N	2.43	0.51
1:B:836:GLY:O	1:B:877:PHE:HA	2.11	0.51
1:A:200:GLN:NE2	1:A:318:ASP:O	2.43	0.51
1:A:687:ASP:HB2	1:A:788:THR:OG1	2.10	0.51
1:B:503:ALA:O	1:B:507:PRO:HB3	2.10	0.50
1:B:177:SER:HA	1:B:181:ASN:OD1	2.11	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:766:LEU:O	1:B:802:VAL:HG21	2.10	0.50
1:A:25:ALA:HB1	1:A:219:ALA:HB1	1.94	0.50
1:B:124:ASP:O	1:B:127:ALA:HB2	2.12	0.50
1:A:560:VAL:HG22	1:A:570:TYR:CD2	2.47	0.50
1:B:393:ARG:HE	1:B:397:GLU:CD	2.19	0.50
1:B:765:PRO:O	1:B:769:PRO:HD3	2.11	0.50
1:B:737:GLU:HB2	1:B:768:LEU:HD22	1.94	0.50
1:A:393:ARG:HE	1:A:397:GLU:CD	2.19	0.49
1:A:406:THR:HG22	1:A:408:THR:H	1.77	0.49
1:A:124:ASP:O	1:A:127:ALA:HB2	2.12	0.49
1:B:830:ARG:HH12	1:B:834:ALA:C	2.21	0.49
1:A:40:PRO:HG3	1:A:106:HIS:HB3	1.93	0.49
1:A:167:GLY:O	1:A:168:ILE:HB	2.11	0.49
1:B:437:PRO:HD2	1:B:833:TRP:CZ2	2.47	0.49
1:B:636:PRO:HA	1:B:655:ALA:HA	1.94	0.49
1:A:359:ASN:OD1	1:A:361:VAL:HG23	2.12	0.49
1:B:85:TRP:CE2	1:B:153:LEU:HD21	2.48	0.49
1:B:279:THR:O	1:B:280:GLU:C	2.55	0.49
1:B:823:VAL:O	1:B:837:GLU:N	2.45	0.49
1:A:291:VAL:HA	1:A:471:MET:HE3	1.95	0.49
1:A:438:GLY:HA2	1:A:441:GLU:OE1	2.13	0.48
1:B:293:ARG:NH1	1:B:299:PRO:O	2.42	0.48
1:A:330:GLU:HG2	1:A:332:ARG:HG3	1.95	0.48
1:A:752:ALA:HA	1:A:776:ALA:HB2	1.94	0.48
1:A:833:TRP:O	1:A:879:ARG:HD2	2.14	0.48
1:A:73:ARG:O	1:A:162:VAL:HG12	2.13	0.48
1:A:615:ALA:HA	1:A:619:PHE:HD2	1.78	0.48
1:B:759:VAL:O	1:B:783:GLY:HA2	2.13	0.48
1:A:878:GLY:HA2	1:A:889:LEU:CG	2.41	0.48
1:A:260:ARG:CZ	1:A:425:ARG:HE	2.27	0.48
1:A:488:GLU:H	1:A:817:ASN:HD21	1.60	0.48
1:A:534:THR:HB	1:A:619:PHE:HE1	1.78	0.48
1:B:231:ARG:O	1:B:234:GLY:N	2.41	0.48
1:B:849:GLY:CA	1:B:857:THR:HG23	2.44	0.48
1:A:578:PRO:O	1:A:582:VAL:HG23	2.14	0.48
1:A:811:TYR:N	1:A:886:ILE:O	2.43	0.47
1:B:258:MET:HE1	1:B:260:ARG:NH2	2.29	0.47
1:A:258:MET:HE1	1:A:260:ARG:NH2	2.28	0.47
1:A:534:THR:O	1:A:538:ARG:HG3	2.14	0.47
1:A:795:LEU:HD13	1:A:820:TYR:CE2	2.49	0.47
1:B:382:VAL:HG22	1:B:415:PHE:HB3	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:266:PHE:O	1:A:269:LEU:N	2.47	0.47
1:B:237:PRO:O	1:B:301:PHE:HA	2.15	0.47
1:A:637:ALA:HB2	1:A:656:HIS:CD2	2.50	0.47
1:A:758:VAL:HA	1:A:782:VAL:O	2.14	0.47
1:A:784:SER:OG	1:A:785:GLY:N	2.48	0.47
1:B:473:SER:O	1:B:476:ASP:N	2.47	0.47
1:B:815:ILE:HG12	1:B:816:ALA:H	1.79	0.47
1:A:115:PRO:HD3	1:A:148:TRP:HZ3	1.79	0.47
1:A:177:SER:HA	1:A:181:ASN:OD1	2.15	0.47
1:A:236:PRO:O	1:A:302:THR:OG1	2.23	0.47
1:A:570:TYR:CE1	1:A:638:TYR:HB3	2.50	0.47
1:B:38:GLY:O	1:B:106:HIS:HB2	2.14	0.47
1:B:85:TRP:CZ2	1:B:153:LEU:HD11	2.50	0.47
1:A:569:ALA:HB2	1:A:636:PRO:O	2.14	0.47
1:B:295:TRP:CH2	1:B:443:ALA:CA	2.97	0.47
1:B:381:VAL:HG22	1:B:414:ASP:HA	1.97	0.47
1:A:689:SER:O	1:A:693:VAL:HG23	2.15	0.47
1:B:578:PRO:HG2	1:B:581:ARG:CB	2.44	0.47
1:A:449:ASP:O	1:A:453:ARG:HG3	2.16	0.46
1:A:787:PRO:HD2	1:A:790:THR:CG2	2.45	0.46
1:A:832:THR:O	1:A:833:TRP:HB2	2.15	0.46
1:A:848:LEU:HD23	1:A:848:LEU:HA	1.78	0.46
1:B:857:THR:O	1:B:861:PHE:HB2	2.15	0.46
1:A:33:GLU:O	1:A:35:GLY:N	2.47	0.46
1:B:453:ARG:HB2	1:B:463:VAL:HG11	1.97	0.46
1:A:243:ALA:O	1:A:436:ALA:HB2	2.15	0.46
1:A:107:VAL:HG12	1:A:108:LEU:O	2.16	0.46
1:A:148:TRP:HB3	1:A:149:PRO:HD3	1.97	0.46
1:A:279:THR:N	1:A:282:GLU:HB2	2.28	0.46
1:A:413:LEU:HD12	1:A:414:ASP:H	1.81	0.46
1:B:578:PRO:O	1:B:582:VAL:HG23	2.16	0.46
1:A:669:ARG:HG2	1:A:670:PHE:CE1	2.51	0.45
1:A:684:LEU:HA	1:A:689:SER:CB	2.46	0.45
1:B:679:LEU:HD11	1:B:706:PRO:HB3	1.98	0.45
1:A:216:ARG:HA	1:A:221:TRP:CD1	2.51	0.45
1:A:273:ALA:CA	1:A:283:LEU:HD23	2.47	0.45
1:B:569:ALA:HB2	1:B:636:PRO:O	2.16	0.45
1:B:888:ILE:O	1:B:888:ILE:HG23	2.15	0.45
1:A:47:GLN:HE21	1:A:322:ASP:HB2	1.82	0.45
1:A:293:ARG:HG3	1:A:301:PHE:HE2	1.81	0.45
1:A:652:VAL:HG21	1:A:788:THR:CG2	2.47	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:564:LEU:HD23	1:A:564:LEU:HA	1.76	0.45
1:A:693:VAL:HB	1:A:694:PHE:CD1	2.51	0.45
1:A:274:LEU:HD23	1:A:278:LEU:O	2.16	0.45
1:B:33:GLU:HG2	1:B:206:ASP:OD1	2.16	0.45
1:B:308:PHE:HB2	1:B:388:LEU:HD11	1.98	0.45
1:B:472:ARG:HA	1:B:831:PRO:HB3	1.98	0.45
1:B:832:THR:O	1:B:833:TRP:HB2	2.17	0.45
1:B:977:LEU:HD22	1:B:982:LYS:O	2.17	0.45
1:A:309:GLN:O	1:A:323:TYR:HB3	2.16	0.45
1:A:338:VAL:O	1:A:339:ALA:C	2.59	0.45
1:B:172:LEU:O	1:B:173:MET:HG2	2.17	0.45
1:B:386:LEU:HA	1:B:386:LEU:HD23	1.72	0.45
1:B:678:LEU:HD12	1:B:728:PHE:CG	2.52	0.45
1:A:93:PRO:HG2	1:A:203:ALA:HB1	1.98	0.45
1:A:658:GLY:O	1:A:661:ASN:HB3	2.17	0.44
1:B:73:ARG:NH1	1:B:398:PHE:O	2.50	0.44
1:B:207:PHE:CE2	1:B:316:ILE:HG12	2.52	0.44
1:B:570:TYR:CE1	1:B:638:TYR:HB3	2.53	0.44
1:B:728:PHE:CE1	1:B:756:LEU:HG	2.53	0.44
1:A:325:ASN:ND2	1:A:356:ALA:O	2.50	0.44
1:A:514:ALA:HB3	1:A:554:TRP:HB3	1.98	0.44
1:B:238:ALA:CB	1:B:379:PRO:HD2	2.47	0.44
1:B:445:GLU:OE2	1:B:474:ARG:HG3	2.18	0.44
1:B:494:LEU:CD1	1:B:631:GLN:HG2	2.47	0.44
1:A:47:GLN:NE2	1:A:322:ASP:HB2	2.33	0.44
1:A:676:ASP:O	1:A:701:ALA:HB1	2.17	0.44
1:B:68:TYR:O	1:B:69:PHE:CG	2.71	0.44
1:B:69:PHE:HB3	1:B:71:TRP:CZ2	2.53	0.44
1:B:100:ARG:N	1:B:104:THR:O	2.50	0.44
1:B:183:PHE:HB3	1:B:395:ILE:HD13	2.00	0.44
1:B:272:ARG:HD2	1:B:464:TRP:CZ2	2.53	0.44
1:B:395:ILE:HD12	1:B:395:ILE:HA	1.84	0.44
1:B:838:MET:N	1:B:876:ASP:O	2.49	0.44
1:A:78:LEU:HD12	1:A:78:LEU:H	1.82	0.44
1:A:714:PRO:HG3	1:A:738:LEU:HB3	1.99	0.44
1:A:759:VAL:O	1:A:783:GLY:HA2	2.17	0.44
1:B:615:ALA:HA	1:B:619:PHE:HD2	1.83	0.44
1:B:787:PRO:N	1:B:790:THR:HG22	2.33	0.44
1:A:266:PHE:O	1:A:269:LEU:HB3	2.17	0.44
1:B:145:PRO:HA	1:B:150:MET:SD	2.58	0.44
1:A:438:GLY:HA2	1:A:441:GLU:CD	2.43	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:173:MET:HB2	1:B:320:ILE:HG23	2.00	0.44
1:B:295:TRP:CZ3	1:B:443:ALA:HA	2.53	0.44
1:A:486:THR:HB	1:A:816:ALA:HA	1.99	0.43
1:A:822:ILE:CD1	1:A:838:MET:HG2	2.46	0.43
1:A:293:ARG:HG2	1:A:299:PRO:HA	1.99	0.43
1:A:507:PRO:HB2	1:A:522:ASP:HB2	1.99	0.43
1:A:652:VAL:HG21	1:A:788:THR:HG23	2.01	0.43
1:A:734:VAL:HG21	1:A:977:LEU:HD21	2.00	0.43
1:B:520:THR:CG2	1:B:523:GLU:H	2.21	0.43
1:B:876:ASP:OD2	2:B:1201:AMP:H2'	2.18	0.43
1:A:365:ARG:O	1:A:368:ALA:N	2.51	0.43
1:A:761:GLY:HA2	2:A:1201:AMP:N7	2.33	0.43
1:A:663:VAL:HG22	1:A:695:GLY:HA2	2.01	0.43
1:A:748:ASP:OD1	1:A:748:ASP:N	2.49	0.43
1:B:878:GLY:HA2	1:B:889:LEU:CG	2.45	0.43
1:B:316:ILE:C	1:B:318:ASP:H	2.25	0.43
1:A:262:PRO:HD2	1:A:265:GLU:HB2	2.01	0.43
1:A:733:PRO:CD	1:A:762:ASP:HB3	2.49	0.43
1:B:451:VAL:O	1:B:455:LEU:HG	2.19	0.43
1:A:284:LEU:HD23	1:A:284:LEU:HA	1.61	0.43
1:A:401:GLU:HG2	1:A:402:VAL:H	1.83	0.43
1:A:672:VAL:HG12	1:A:699:CYS:SG	2.58	0.43
1:A:696:PRO:HG2	1:A:703:VAL:HG22	2.01	0.43
1:B:494:LEU:HD12	1:B:629:PRO:HB3	2.00	0.43
1:A:266:PHE:CZ	1:A:424:LEU:HD13	2.54	0.43
1:A:281:THR:HG22	1:A:281:THR:O	2.18	0.43
1:A:338:VAL:HG23	1:A:466:ALA:O	2.18	0.43
1:A:569:ALA:HB1	1:A:637:ALA:C	2.44	0.43
1:A:572:PRO:CG	1:A:640:ILE:HG12	2.48	0.43
1:B:407:GLN:O	1:B:408:THR:C	2.62	0.43
1:B:292:LEU:C	1:B:294:GLY:N	2.76	0.42
1:B:628:THR:OG1	1:B:629:PRO:HD2	2.20	0.42
1:B:287:ALA:O	1:B:291:VAL:HG23	2.19	0.42
1:A:224:ASP:HB2	1:A:358:VAL:HG23	2.01	0.42
1:A:279:THR:OG1	1:A:282:GLU:HG2	2.19	0.42
1:A:596:THR:HG22	1:A:597:GLN:O	2.18	0.42
1:B:96:ARG:HA	1:B:148:TRP:HE1	1.84	0.42
2:B:1201:AMP:O1P	3:B:1202:EW6:O	2.37	0.42
1:A:225:TRP:HE3	1:A:358:VAL:HG11	1.84	0.42
1:A:803:ASP:HB3	1:A:806:TRP:CD2	2.54	0.42
1:A:73:ARG:HG3	1:A:162:VAL:CG1	2.50	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:696:PRO:HG2	1:B:703:VAL:HG22	2.01	0.42
1:A:239:PRO:HG2	1:A:380:VAL:HG21	2.02	0.42
1:B:71:TRP:O	1:B:163:ARG:HD2	2.20	0.42
1:B:510:GLU:O	1:B:702:THR:OG1	2.32	0.42
1:B:672:VAL:HG23	1:B:672:VAL:O	2.19	0.42
1:B:786:GLY:O	3:B:1202:EW6:C4	2.67	0.42
1:B:902:ARG:O	1:B:905:LEU:N	2.53	0.42
1:A:174:ASP:HB3	1:A:322:ASP:HA	2.02	0.42
1:A:288:PHE:CE2	1:A:292:LEU:HD11	2.55	0.42
1:B:92:HIS:HA	1:B:93:PRO:HD3	1.85	0.42
1:B:438:GLY:O	1:B:439:VAL:C	2.62	0.42
1:B:557:TYR:CE2	1:B:693:VAL:HA	2.53	0.42
1:B:672:VAL:HA	1:B:676:ASP:OD2	2.20	0.42
1:A:577:SER:HB2	1:A:582:VAL:HG22	2.02	0.42
1:A:688:ALA:HA	1:A:792:CYS:SG	2.60	0.42
1:A:758:VAL:HG11	1:A:793:TRP:CZ2	2.55	0.42
1:A:790:THR:O	1:A:791:ILE:HB	2.19	0.42
1:B:122:ARG:H	1:B:122:ARG:HG3	1.65	0.42
1:B:180:LEU:HD23	1:B:391:ALA:HB2	2.01	0.42
1:B:616:ASP:C	1:B:617:THR:HG23	2.44	0.42
1:A:386:LEU:HD23	1:A:386:LEU:HA	1.67	0.41
1:A:85:TRP:O	1:A:89:VAL:HG23	2.19	0.41
1:A:123:GLN:O	1:A:125:PRO:HD3	2.21	0.41
1:A:174:ASP:OD1	1:A:174:ASP:C	2.63	0.41
1:A:726:VAL:O	1:A:754:LEU:HD23	2.20	0.41
1:A:120:ASP:OD1	1:A:122:ARG:NE	2.43	0.41
1:A:145:PRO:HA	1:A:150:MET:SD	2.60	0.41
1:A:795:LEU:H	1:A:795:LEU:HD23	1.84	0.41
1:B:534:THR:HB	1:B:619:PHE:HE1	1.85	0.41
1:A:268:LEU:HD22	1:B:492:ALA:O	2.21	0.41
2:A:1201:AMP:C8	3:A:1202:EW6:N	2.88	0.41
1:B:635:ASP:HA	1:B:636:PRO:HD3	1.89	0.41
1:A:316:ILE:C	1:A:318:ASP:H	2.27	0.41
1:B:94:GLY:C	1:B:96:ARG:H	2.29	0.41
1:A:238:ALA:CB	1:A:379:PRO:HD2	2.51	0.41
1:A:494:LEU:HB2	1:A:497:GLU:HB2	2.02	0.41
1:B:596:THR:HG22	1:B:597:GLN:N	2.36	0.41
1:B:715:ASP:OD1	1:B:715:ASP:N	2.53	0.41
1:A:786:GLY:O	3:A:1202:EW6:C4	2.69	0.41
1:A:791:ILE:HD12	1:A:845:GLY:HA2	2.02	0.41
1:B:496:GLN:H	1:B:496:GLN:CD	2.28	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:496:GLN:OE1	1:B:496:GLN:N	2.41	0.41
1:B:732:VAL:HG22	1:B:735:LEU:HG	2.03	0.41
1:B:787:PRO:N	1:B:790:THR:CG2	2.83	0.41
1:A:94:GLY:O	1:A:97:THR:N	2.53	0.41
1:A:227:TYR:HB2	1:A:355:HIS:CD2	2.56	0.41
1:A:266:PHE:CE1	1:A:424:LEU:HD22	2.56	0.41
1:A:316:ILE:HD12	1:A:316:ILE:HA	1.92	0.41
1:A:338:VAL:O	1:A:341:ARG:N	2.53	0.41
1:A:815:ILE:HD13	1:A:815:ILE:HG21	1.85	0.41
1:B:292:LEU:HD11	1:B:380:VAL:HG11	2.02	0.41
1:B:484:ASN:O	1:B:819:ARG:NH1	2.51	0.41
1:B:976:PRO:HG3	1:B:988:LEU:HD21	2.02	0.41
1:B:977:LEU:O	1:B:984:ASP:HB2	2.21	0.41
1:A:531:ILE:O	1:A:535:LEU:HG	2.20	0.41
2:A:1201:AMP:N3	2:A:1201:AMP:O2'	2.54	0.41
1:B:259:VAL:HG12	1:B:444:PHE:HZ	1.86	0.41
1:B:300:ALA:HA	1:B:331:ALA:O	2.21	0.41
1:A:733:PRO:HG2	1:A:762:ASP:HB3	2.02	0.40
1:B:151:PHE:CD2	1:B:151:PHE:N	2.90	0.40
1:B:583:ALA:HB2	1:B:605:ASP:O	2.20	0.40
1:A:154:ARG:O	1:A:155:VAL:HG23	2.21	0.40
1:A:665:ASP:OD1	1:A:815:ILE:HD11	2.21	0.40
1:A:684:LEU:HA	1:A:689:SER:OG	2.20	0.40
1:B:374:ALA:C	1:B:376:ALA:H	2.29	0.40
1:B:872:TYR:CE2	1:B:874:THR:HA	2.56	0.40
1:B:830:ARG:HH12	1:B:834:ALA:HB1	1.85	0.40
1:A:659:VAL:O	1:A:662:LEU:HB3	2.21	0.40
1:A:669:ARG:HD3	1:A:796:PHE:CD2	2.56	0.40
1:B:228:TRP:HH2	1:B:352:ASP:HB3	1.85	0.40
1:B:480:TRP:CD1	1:B:484:ASN:ND2	2.90	0.40
1:A:816:ALA:O	1:A:817:ASN:HB2	2.21	0.40
1:A:846:LEU:HA	1:A:846:LEU:HD23	1.84	0.40
1:B:298:ASP:HA	1:B:299:PRO:HD3	1.93	0.40
1:B:463:VAL:HA	1:B:466:ALA:HB2	2.04	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	866/1153 (75%)	752 (87%)	105 (12%)	9 (1%)	13	48
1	B	864/1153 (75%)	736 (85%)	114 (13%)	14 (2%)	8	39
All	All	1730/2306 (75%)	1488 (86%)	219 (13%)	23 (1%)	10	42

All (23) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	91	HIS
1	A	918	VAL
1	B	69	PHE
1	B	492	ALA
1	A	791	ILE
1	B	789	GLU
1	A	902	ARG
1	B	403	HIS
1	A	111	PRO
1	B	74	PRO
1	B	91	HIS
1	B	973	PRO
1	A	833	TRP
1	B	155	VAL
1	B	828	ARG
1	B	791	ILE
1	B	218	GLY
1	A	74	PRO
1	A	155	VAL
1	B	167	GLY
1	A	338	VAL
1	B	672	VAL
1	B	853	ASP

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	501/902 (56%)	501 (100%)	0	100	100
1	B	491/902 (54%)	491 (100%)	0	100	100
All	All	992/1804 (55%)	992 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	200	GLN
1	A	481	ASN
1	A	631	GLN
1	A	817	ASN
1	B	123	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	EW6	B	1202	2	2,6,7	0.62	0	2,8,10	2.27	1 (50%)
2	AMP	B	1201	3	22,25,25	2.27	9 (40%)	25,38,38	3.19	17 (68%)
3	EW6	A	1202	2	2,6,7	0.69	0	2,8,10	1.92	1 (50%)
2	AMP	A	1201	3	22,25,25	1.70	5 (22%)	25,38,38	3.24	16 (64%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	EW6	B	1202	2	-	1/4/6/9	-
2	AMP	B	1201	3	-	5/6/26/26	0/3/3/3
3	EW6	A	1202	2	-	3/4/6/9	-
2	AMP	A	1201	3	-	5/6/26/26	0/3/3/3

All (14) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	1201	AMP	C2-N3	4.22	1.38	1.32
2	B	1201	AMP	C2'-C1'	-3.87	1.47	1.53
2	B	1201	AMP	C2'-C3'	3.64	1.63	1.53
2	B	1201	AMP	P-O1P	3.58	1.62	1.50
2	B	1201	AMP	C2-N1	3.44	1.40	1.33
2	A	1201	AMP	C2'-C3'	3.30	1.62	1.53
2	A	1201	AMP	C2'-C1'	-3.15	1.49	1.53
2	A	1201	AMP	O4'-C1'	-3.03	1.36	1.41
2	A	1201	AMP	P-O1P	2.90	1.59	1.50
2	B	1201	AMP	P-O5'	2.89	1.69	1.60
2	B	1201	AMP	O4'-C1'	-2.71	1.37	1.41
2	B	1201	AMP	O3'-C3'	2.54	1.49	1.43
2	B	1201	AMP	P-O3P	2.15	1.63	1.54
2	A	1201	AMP	P-O5'	2.02	1.66	1.60

All (35) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	1201	AMP	C5-C6-N6	5.86	129.25	120.35
2	B	1201	AMP	O3'-C3'-C2'	5.36	129.17	111.82
2	A	1201	AMP	O2'-C2'-C3'	5.27	128.85	111.82
2	B	1201	AMP	C4-C5-N7	-4.94	104.25	109.40
2	B	1201	AMP	O2'-C2'-C3'	4.83	127.44	111.82
2	A	1201	AMP	O4'-C4'-C3'	-4.82	95.57	105.11
2	A	1201	AMP	P-O5'-C5'	4.77	131.43	118.30
2	A	1201	AMP	C4-C5-N7	-4.77	104.43	109.40
2	A	1201	AMP	O3'-C3'-C2'	4.71	127.05	111.82
2	B	1201	AMP	P-O5'-C5'	4.66	131.13	118.30
2	A	1201	AMP	C3'-C2'-C1'	-4.59	94.07	100.98
2	A	1201	AMP	O3P-P-O5'	4.49	118.67	106.73
2	B	1201	AMP	O4'-C4'-C3'	-4.46	96.28	105.11
2	B	1201	AMP	O5'-P-O1P	4.25	118.40	106.47
2	A	1201	AMP	C5-C6-N1	-4.19	110.86	120.35
2	B	1201	AMP	C3'-C2'-C1'	-4.04	94.89	100.98
2	B	1201	AMP	C5-C6-N1	-3.91	111.49	120.35
2	B	1201	AMP	C1'-N9-C4	3.62	133.00	126.64
2	B	1201	AMP	C5-C6-N6	3.35	125.45	120.35
2	B	1201	AMP	O2'-C2'-C1'	-3.14	99.26	110.85
2	B	1201	AMP	O3'-C3'-C4'	3.12	120.07	111.05
2	A	1201	AMP	O3'-C3'-C4'	3.12	120.06	111.05
2	B	1201	AMP	O4'-C4'-C5'	3.06	119.43	109.37
2	A	1201	AMP	O4'-C4'-C5'	2.87	118.80	109.37
3	B	1202	EW6	C4-CA-C	-2.78	98.55	108.99
2	B	1201	AMP	O3P-P-O5'	2.75	114.05	106.73
3	A	1202	EW6	CB-CA-N	-2.61	100.28	108.03
2	A	1201	AMP	O2'-C2'-C1'	-2.57	101.37	110.85
2	B	1201	AMP	O4'-C1'-C2'	2.38	110.41	106.93
2	A	1201	AMP	C2-N1-C6	2.16	122.45	118.75
2	B	1201	AMP	N6-C6-N1	2.16	123.06	118.57
2	A	1201	AMP	C5'-C4'-C3'	-2.15	107.14	115.18
2	A	1201	AMP	C1'-N9-C4	2.14	130.40	126.64
2	A	1201	AMP	O2P-P-O5'	-2.14	101.04	106.73
2	B	1201	AMP	O2P-P-O5'	-2.07	101.23	106.73

There are no chirality outliers.

All (14) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1201	AMP	C5'-O5'-P-O1P

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Mol	Chain	Res	Type	Atoms
2	A	1201	AMP	C5'-O5'-P-O2P
2	A	1201	AMP	C5'-O5'-P-O3P
2	A	1201	AMP	C4'-C5'-O5'-P
2	B	1201	AMP	C5'-O5'-P-O1P
2	B	1201	AMP	C5'-O5'-P-O2P
2	B	1201	AMP	C5'-O5'-P-O3P
2	B	1201	AMP	C4'-C5'-O5'-P
3	A	1202	EW6	N-CA-CB-OG
3	A	1202	EW6	C4-CA-CB-OG
2	A	1201	AMP	C3'-C4'-C5'-O5'
2	B	1201	AMP	C3'-C4'-C5'-O5'
3	A	1202	EW6	O-C-CA-C4
3	B	1202	EW6	O-C-CA-C4

There are no ring outliers.

4 monomers are involved in 12 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	B	1202	EW6	2	0
2	B	1201	AMP	5	0
3	A	1202	EW6	2	0
2	A	1201	AMP	5	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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 EW6 B 1202

Bond lengths

Bond angles

Torsions

Rings

Ligand AMP B 1201

Bond lengths

Bond angles

Torsions

Rings

Ligand EW6 A 1202

Bond lengths

Bond angles

Torsions

Rings

Ligand AMP A 1201

Bond lengths

Bond angles

Torsions

Rings
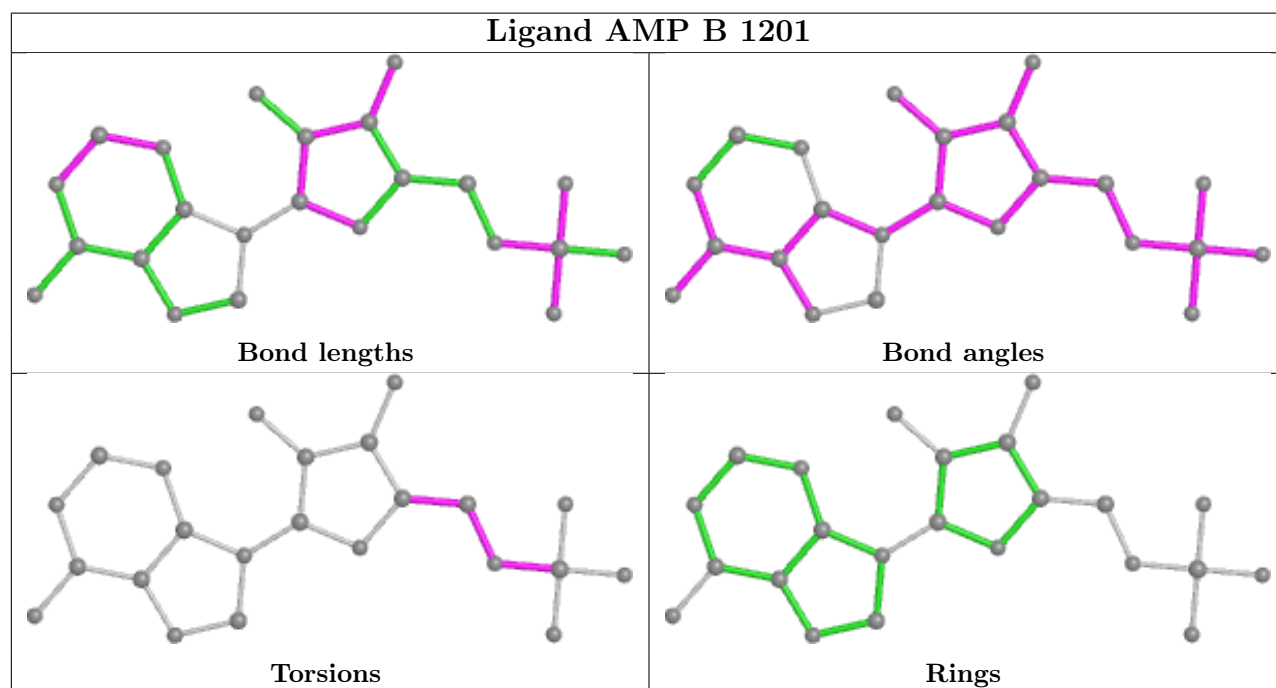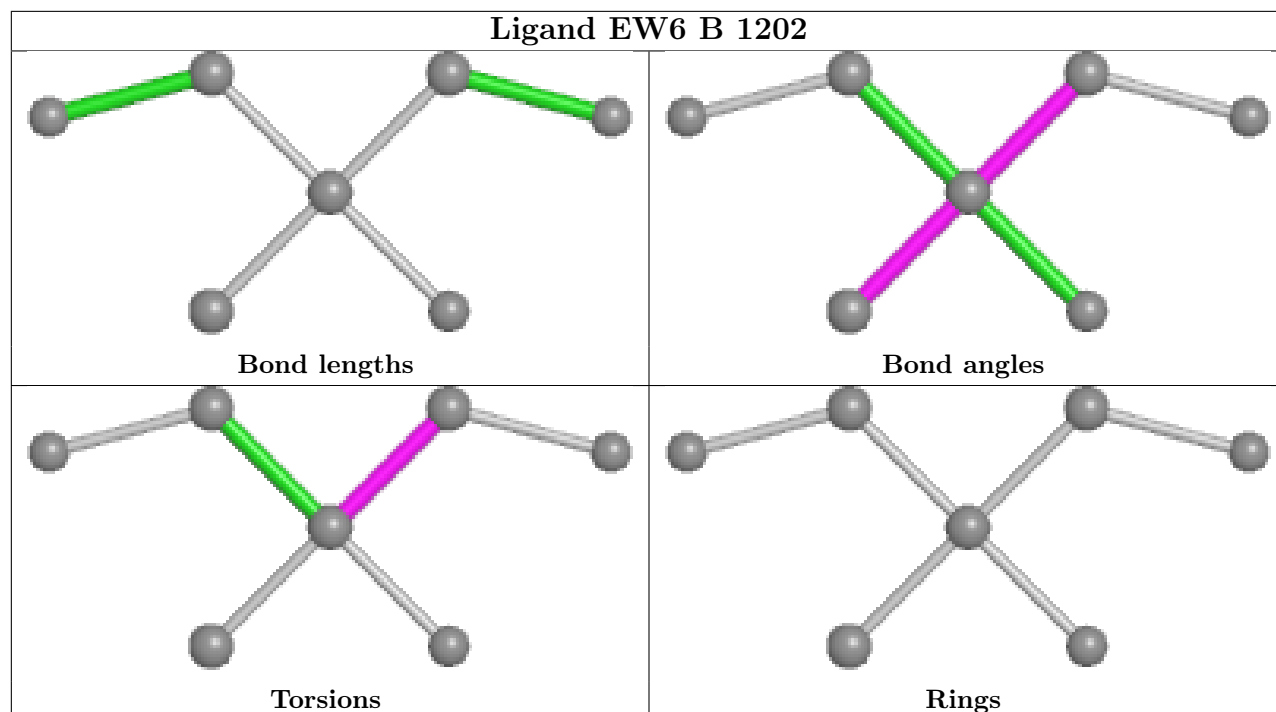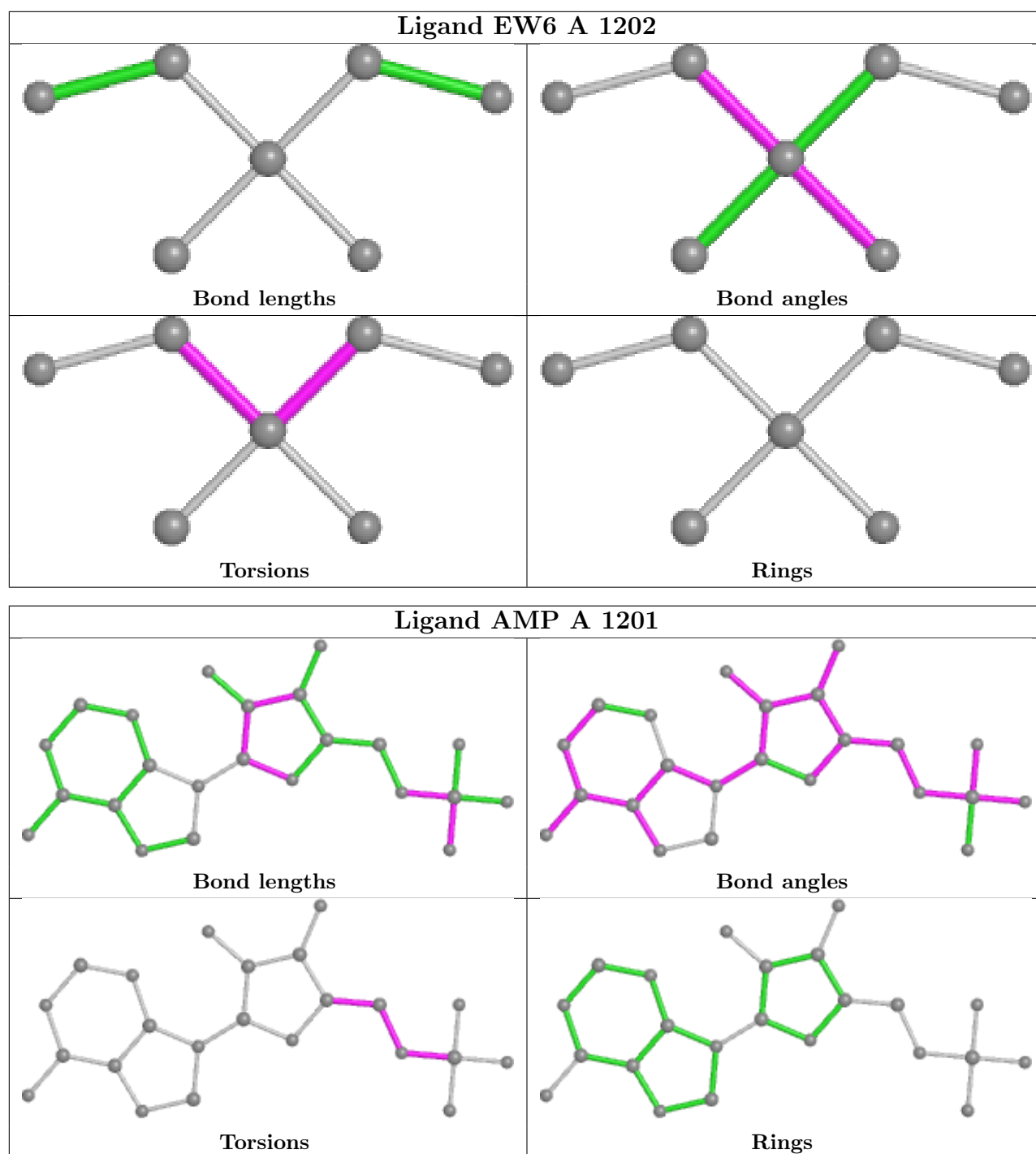
5.7 Other polymers ⓘ

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	883/1153 (76%)	0.35	23 (2%)	57	43	97, 145, 185, 217	1 (0%)
1	B	882/1153 (76%)	0.33	23 (2%)	57	43	93, 142, 185, 211	0
All	All	1765/2306 (76%)	0.34	46 (2%)	57	43	93, 144, 185, 217	1 (0%)

All (46) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	793	TRP	4.3
1	B	933	VAL	3.6
1	B	55	ALA	3.5
1	A	605	ASP	3.3
1	B	194	ASP	3.1
1	A	718	ALA	3.0
1	A	579	ARG	2.9
1	B	794	SER	2.9
1	A	407	GLN	2.8
1	A	194	ASP	2.7
1	B	824	ASP	2.7
1	B	468	PHE	2.6
1	A	297	SER	2.6
1	B	524	LEU	2.6
1	B	156	VAL	2.5
1	A	895	GLN	2.4
1	B	402	VAL	2.4
1	B	901	GLN	2.4
1	B	207	PHE	2.4
1	A	908	ILE	2.4
1	A	133	GLU	2.4
1	A	402	VAL	2.4
1	A	313	VAL	2.3
1	A	642	THR	2.3

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Mol	Chain	Res	Type	RSRZ
1	B	920	ALA	2.3
1	B	134	SER	2.3
1	B	620	GLU	2.3
1	A	903	ILE	2.3
1	A	793	TRP	2.3
1	B	550	MET	2.2
1	B	671	ALA	2.2
1	B	969	ILE	2.2
1	A	789	GLU	2.2
1	B	647	GLY	2.2
1	A	320	ILE	2.2
1	A	802	VAL	2.2
1	A	620	GLU	2.2
1	A	207	PHE	2.2
1	A	575	ALA	2.2
1	A	487	ALA	2.1
1	A	225	TRP	2.1
1	B	435	PHE	2.1
1	B	228	TRP	2.1
1	B	774	ALA	2.1
1	A	55	ALA	2.0
1	B	827	LEU	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	AMP	A	1201	23/23	0.68	0.18	134,161,175,186	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($Å^2$)	Q<0.9
3	EW6	B	1202	7/8	0.76	0.22	104,130,140,141	0
2	AMP	B	1201	23/23	0.79	0.14	121,160,174,184	0
3	EW6	A	1202	7/8	0.89	0.16	137,143,148,150	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 AMP A 1201:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
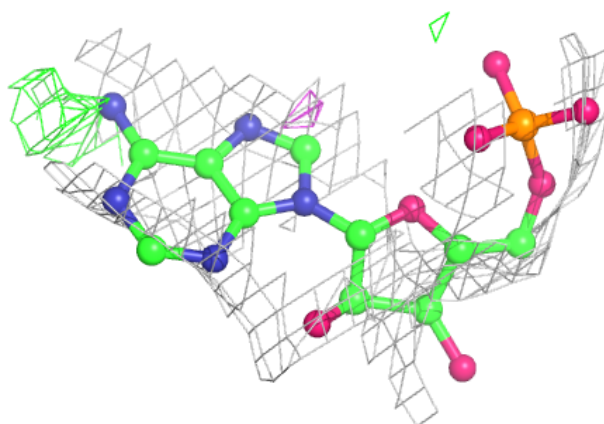and green (positive)
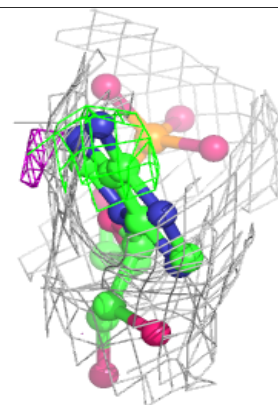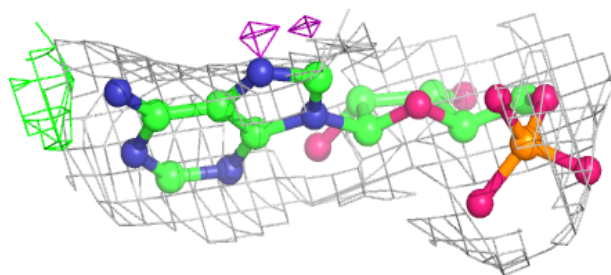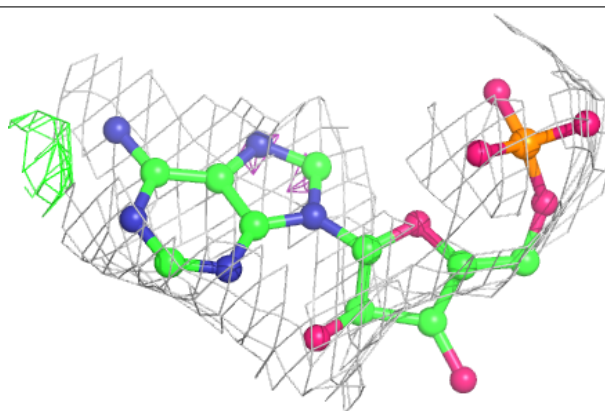
Electron density around EW6 B 1202:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
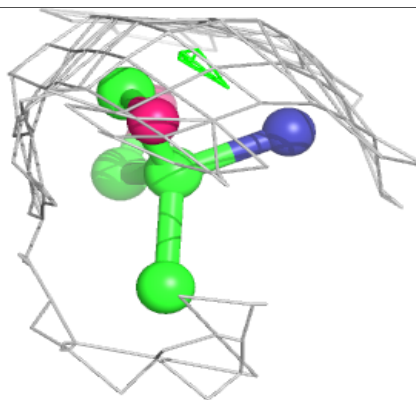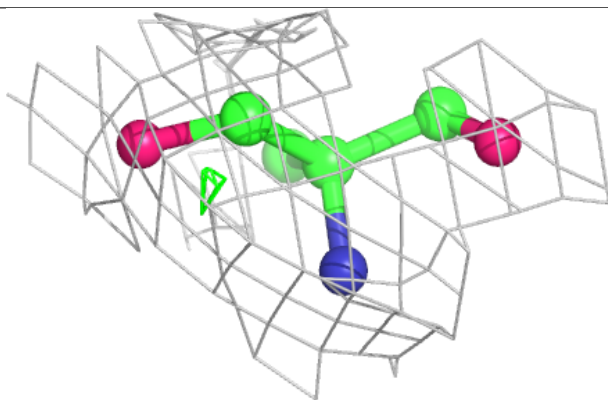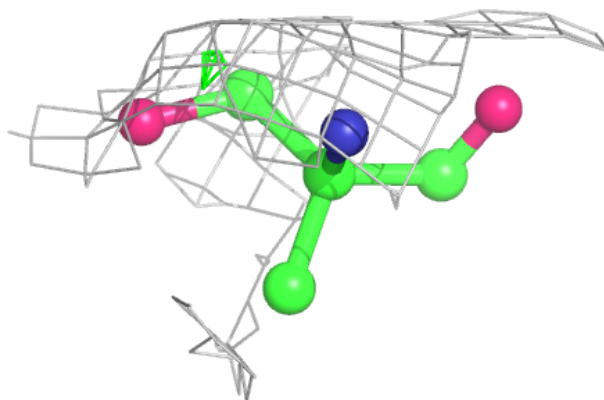mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
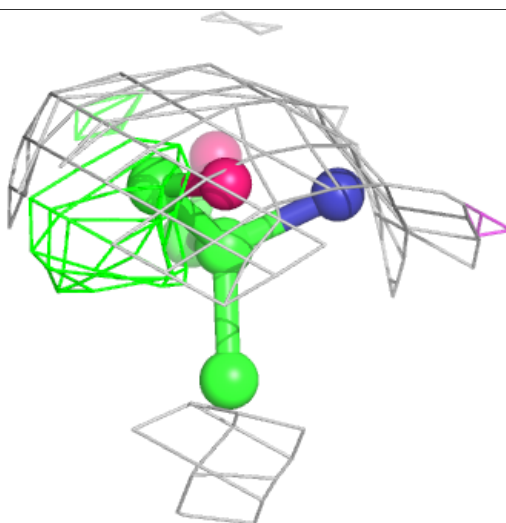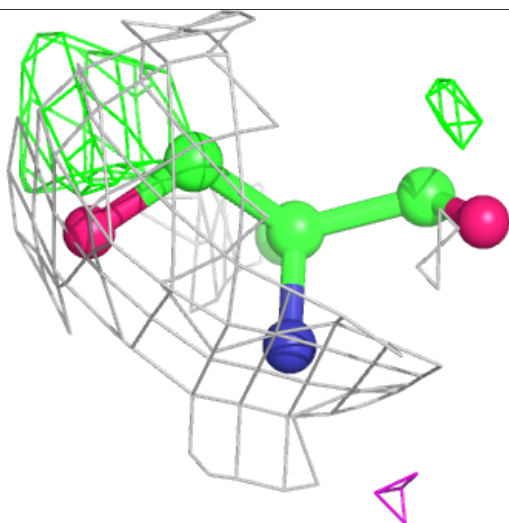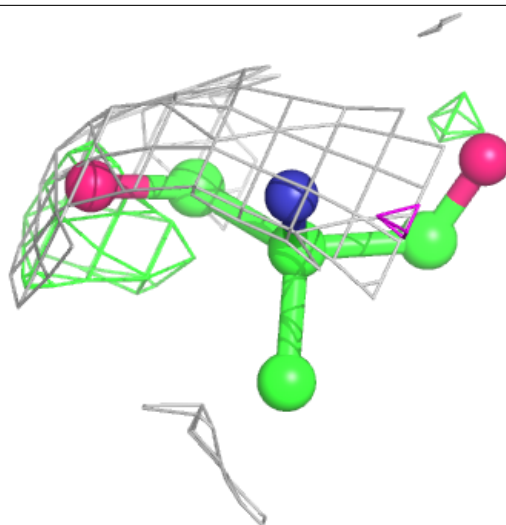
Electron density around AMP B 1201:

$2mF_o\text{-}DF_c$ (at 0.7 rmsd) in gray
$mF_o\text{-}DF_c$ (at 3 rmsd) in purple (negative)
and green (positive)
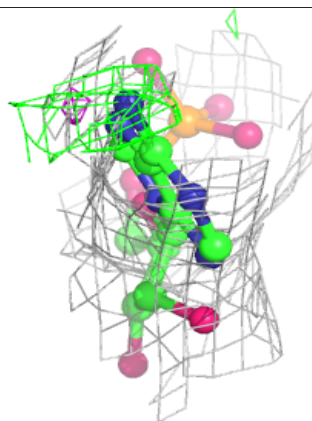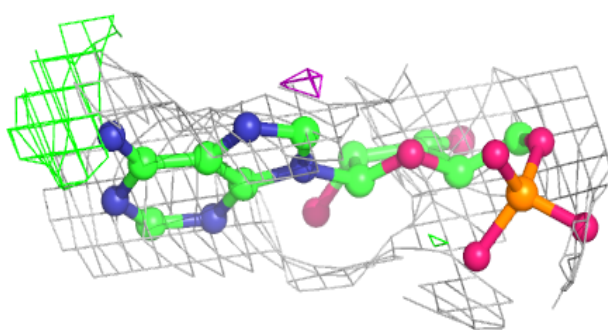
Electron density around EW6 A 1202:

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

6.5 Other polymers (i)

There are no such residues in this entry.