



Full wwPDB X-ray Structure Validation Report ⓘ

Nov 22, 2023 – 11:23 AM JST

PDB ID : 7EWH
Title : Crystal structure of human PHGDH in complex with Homoharringtonine
Authors : Hsieh, C.H.; Cheng, Y.S.; Lee, Y.S.; Huang, H.C.; Juan, H.F.
Deposited on : 2021-05-25
Resolution : 2.99 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

MolProbity : 4.02b-467
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36
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) : 2.36

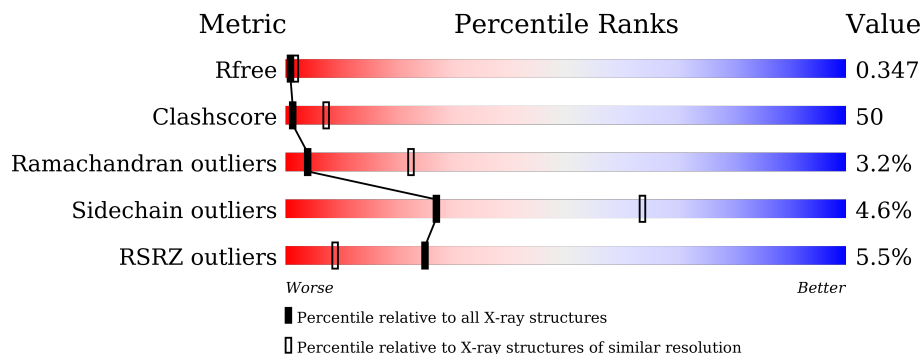
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.99 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}	130704	2092 (3.00-3.00)
Clashscore	141614	2416 (3.00-3.00)
Ramachandran outliers	138981	2333 (3.00-3.00)
Sidechain outliers	138945	2336 (3.00-3.00)
RSRZ outliers	127900	1990 (3.00-3.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	302	
1	B	302	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
2	HMT	B	400	-	-	X	-

2 Entry composition [i](#)

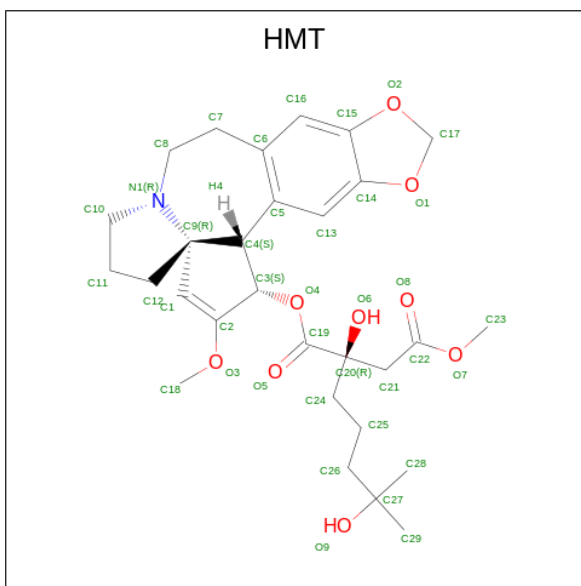
There are 3 unique types of molecules in this entry. The entry contains 4622 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 D-3-phosphoglycerate dehydrogenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	302	Total	C	N	O	S	0	0	0
			2260	1404	400	437	19			
1	B	302	Total	C	N	O	S	0	0	0
			2260	1404	400	437	19			

- Molecule 2 is (3beta)-O 3 -[(2R)-2,6-dihydroxy-2-(2-methoxy-2-oxoethyl)-6-methylheptanoyl]cephalotaxine (three-letter code: HMT) (formula: C₂₉H₃₉NO₉) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
2	A	1	Total	C	N	O	0	0
			39	29	1	9		
2	B	1	Total	C	N	O	0	0
			39	29	1	9		

- Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	12	Total O 12 12	0	0
3	B	12	Total O 12 12	0	0

4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	43.16Å 120.64Å 59.48Å 90.00° 100.72° 90.00°	Depositor
Resolution (Å)	27.55 – 2.99 29.22 – 2.99	Depositor EDS
% Data completeness (in resolution range)	76.0 (27.55-2.99) 75.9 (29.22-2.99)	Depositor EDS
R_{merge}	0.14	Depositor
R_{sym}	0.16	Depositor
$\langle I/\sigma(I) \rangle$ ¹	3.07 (at 3.00Å)	Xtrriage
Refinement program	PHENIX 1.14_3260	Depositor
R, R_{free}	0.237 , 0.348 0.239 , 0.347	Depositor DCC
R_{free} test set	998 reflections (10.00%)	wwPDB-VP
Wilson B-factor (Å ²)	53.8	Xtrriage
Anisotropy	0.376	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.23 , 42.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.46$, $\langle L^2 \rangle = 0.29$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.87	EDS
Total number of atoms	4622	wwPDB-VP
Average B, all atoms (Å ²)	56.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 7.12% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

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

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

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	0.55	1/2286 (0.0%)	0.96	7/3089 (0.2%)
1	B	0.66	2/2286 (0.1%)	1.09	15/3089 (0.5%)
All	All	0.61	3/4572 (0.1%)	1.02	22/6178 (0.4%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	3
All	All	0	4

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	29	VAL	CB-CG2	-11.87	1.27	1.52
1	A	89	ARG	CB-CG	-7.29	1.32	1.52
1	B	43	GLU	CG-CD	-5.28	1.44	1.51

All (22) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	89	ARG	NE-CZ-NH2	-25.52	107.54	120.30
1	B	84	LEU	CB-CG-CD1	-12.23	90.21	111.00
1	B	9	LEU	CA-CB-CG	-10.96	90.10	115.30
1	B	32	LYS	CD-CE-NZ	-10.76	86.95	111.70
1	B	93	LEU	CB-CG-CD2	9.40	126.98	111.00
1	B	250	SER	CB-CA-C	9.21	127.60	110.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	84	LEU	CB-CG-CD2	9.13	126.52	111.00
1	A	89	ARG	NH1-CZ-NH2	8.26	128.48	119.40
1	B	190	LEU	CA-CB-CG	8.17	134.08	115.30
1	A	89	ARG	CG-CD-NE	-7.57	95.90	111.80
1	B	118	ARG	N-CA-C	7.19	130.42	111.00
1	B	304	ASP	CB-CG-OD2	-6.62	112.34	118.30
1	A	293	ARG	NE-CZ-NH1	-6.24	117.18	120.30
1	A	89	ARG	NE-CZ-NH1	6.10	123.35	120.30
1	B	27	LEU	CA-CB-CG	5.93	128.94	115.30
1	B	83	ASP	C-N-CA	-5.79	107.24	121.70
1	B	267	ARG	NE-CZ-NH2	-5.55	117.52	120.30
1	B	32	LYS	CG-CD-CE	-5.49	95.45	111.90
1	A	71	VAL	CG1-CB-CG2	5.37	119.49	110.90
1	A	215	LEU	CA-CB-CG	5.26	127.41	115.30
1	B	303	VAL	C-N-CA	-5.08	109.00	121.70
1	B	89	ARG	NE-CZ-NH1	-5.06	117.77	120.30

There are no chirality outliers.

All (4) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	34	ASN	Peptide
1	B	34	ASN	Peptide
1	B	69	LEU	Peptide
1	B	7	LYS	Peptide

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2260	0	2310	193	0
1	B	2260	0	2310	288	0
2	A	39	0	39	18	0
2	B	39	0	39	28	0
3	A	12	0	0	0	0
3	B	12	0	0	1	0
All	All	4622	0	4698	462	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 50.

All (462) 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:40:LEU:HA	1:B:43:GLU:OE1	1.39	1.20
1:B:32:LYS:HE3	1:B:35:LEU:HD11	1.22	1.12
1:A:208:LEU:HD12	1:A:235:ARG:HD2	1.29	1.11
1:B:151:GLY:C	2:B:400:HMT:H17A	1.74	1.08
1:B:156:GLY:H	2:B:400:HMT:H16	1.16	1.05
1:B:69:LEU:HD23	1:B:70:GLN:HA	1.41	1.01
1:A:89:ARG:CZ	1:A:90:LYS:HZ3	1.79	0.95
1:B:151:GLY:O	1:B:152:LEU:HG	1.65	0.95
1:B:32:LYS:HE3	1:B:35:LEU:CD1	1.97	0.95
1:B:34:ASN:H	1:B:35:LEU:HG	1.30	0.95
1:B:151:GLY:O	2:B:400:HMT:H17A	1.66	0.94
1:A:205:HIS:HA	1:A:234:ALA:HB2	1.49	0.94
1:A:156:GLY:H	2:A:400:HMT:H16	1.33	0.92
1:B:23:GLN:CD	1:B:28:GLN:HB2	1.90	0.92
1:B:59:THR:HG22	1:B:60:ALA:H	1.33	0.91
1:B:43:GLU:CD	1:B:43:GLU:H	1.75	0.90
1:A:89:ARG:NH1	1:A:90:LYS:HZ3	1.70	0.88
1:B:57:LYS:HA	1:B:81:ASN:HB2	1.55	0.87
1:B:8:VAL:C	1:B:9:LEU:HG	1.94	0.87
1:A:279:SER:O	1:B:124:THR:HG22	1.75	0.86
1:B:156:GLY:H	2:B:400:HMT:C16	1.88	0.86
1:B:9:LEU:HD13	1:B:43:GLU:HB2	1.58	0.85
1:B:59:THR:HG22	1:B:60:ALA:N	1.91	0.85
1:B:67:GLU:HA	1:B:89:ARG:NH1	1.92	0.85
1:A:10:ILE:HG13	1:A:51:ILE:HB	1.58	0.84
2:A:400:HMT:H3	2:A:400:HMT:H24	1.60	0.83
1:A:283:LEU:O	1:B:118:ARG:NH2	2.11	0.82
1:B:8:VAL:HG12	1:B:9:LEU:H	1.45	0.82
1:B:77:THR:HG22	1:B:235:ARG:HH22	1.44	0.81
1:B:88:THR:HA	1:B:92:ILE:HB	1.61	0.81
1:A:76:GLY:HA2	1:A:101:ASN:HD21	1.46	0.81
1:B:72:VAL:O	1:B:94:VAL:HA	1.82	0.80
1:B:178:SER:HB2	1:B:181:VAL:HG23	1.64	0.80
1:B:283:LEU:O	1:B:286:SER:OG	2.00	0.79
1:B:84:LEU:O	1:B:84:LEU:HD12	1.81	0.79
1:B:40:LEU:CA	1:B:43:GLU:OE1	2.29	0.78
1:B:155:ILE:H	2:B:400:HMT:H7	1.48	0.78

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:155:ILE:HG13	2:B:400:HMT:H8	1.65	0.78
1:B:28:GLN:HG3	1:B:29:VAL:H	1.47	0.77
1:A:191:PRO:HB2	1:A:193:GLU:HG2	1.66	0.77
1:B:35:LEU:HD22	1:B:39:GLU:HG3	1.66	0.77
1:B:152:LEU:HD12	1:B:174:ASP:HB2	1.66	0.76
1:A:209:LEU:O	1:A:213:THR:N	2.18	0.76
1:A:84:LEU:O	1:A:88:THR:HG23	1.86	0.76
1:A:128:LYS:NZ	1:B:272:VAL:O	2.17	0.76
1:B:305:MET:HG2	1:B:306:VAL:HG23	1.68	0.75
1:B:155:ILE:HD12	2:B:400:HMT:H10A	1.69	0.75
1:B:69:LEU:HD13	1:B:89:ARG:NH1	2.01	0.75
1:B:151:GLY:O	2:B:400:HMT:C17	2.35	0.75
1:A:208:LEU:HD12	1:A:235:ARG:CD	2.14	0.75
1:B:28:GLN:CG	1:B:29:VAL:H	2.01	0.74
1:B:116:LEU:HD12	1:B:231:VAL:HG22	1.69	0.74
1:B:147:LEU:HD12	1:B:201:PHE:HB2	1.69	0.74
1:B:151:GLY:C	2:B:400:HMT:C17	2.55	0.74
1:A:89:ARG:NH1	1:A:90:LYS:NZ	2.37	0.73
1:B:224:CYS:O	1:B:252:GLN:NE2	2.22	0.73
1:A:246:ARG:HA	1:A:249:GLN:HG3	1.71	0.73
1:B:59:THR:CG2	1:B:60:ALA:H	2.01	0.73
1:A:25:GLY:HA3	1:A:303:VAL:HG11	1.71	0.73
1:A:240:ASP:HB3	1:A:243:ALA:HB3	1.69	0.73
1:A:287:THR:HG23	1:A:290:ALA:H	1.53	0.73
1:A:9:LEU:HB3	1:A:44:LEU:HD21	1.71	0.73
1:B:266:PRO:O	1:B:269:ARG:NH1	2.21	0.73
1:A:78:GLY:HA3	1:A:235:ARG:HH22	1.54	0.72
1:B:283:LEU:CA	1:B:286:SER:OG	2.38	0.72
1:B:156:GLY:N	2:B:400:HMT:H16	1.98	0.72
1:A:16:PRO:HG3	1:A:19:ARG:HH21	1.55	0.72
1:B:205:HIS:HB2	2:B:400:HMT:C14	2.19	0.72
1:B:8:VAL:CG1	1:B:9:LEU:H	2.03	0.71
1:A:208:LEU:CD1	1:A:235:ARG:HB3	2.20	0.71
2:B:400:HMT:H3	2:B:400:HMT:H26A	1.72	0.71
1:A:130:GLY:HA2	1:B:269:ARG:HH21	1.55	0.71
1:B:240:ASP:HB3	1:B:243:ALA:HB3	1.74	0.70
1:A:16:PRO:HB2	1:A:20:LYS:HE3	1.70	0.70
1:A:89:ARG:CZ	1:A:90:LYS:NZ	2.55	0.70
1:B:12:ASP:HB3	1:B:53:ARG:HB3	1.73	0.69
1:A:33:GLN:O	1:A:35:LEU:N	2.24	0.69
1:A:6:ARG:HA	1:A:27:LEU:HD22	1.74	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:89:ARG:HH12	1:A:90:LYS:NZ	1.91	0.69
1:A:77:THR:HG23	1:A:101:ASN:HD22	1.58	0.68
1:B:74:ARG:HE	1:B:79:VAL:HA	1.58	0.68
1:B:190:LEU:HD23	1:B:194:GLU:HB2	1.75	0.68
1:B:76:GLY:N	1:B:97:THR:OG1	2.27	0.68
1:A:5:LEU:HD12	1:A:48:GLU:HG3	1.76	0.68
1:B:11:SER:O	1:B:33:GLN:HG3	1.93	0.68
1:B:40:LEU:HD22	1:B:43:GLU:CD	2.14	0.68
1:A:102:SER:HB3	1:A:154:ARG:HB3	1.77	0.67
1:A:130:GLY:HA2	1:B:269:ARG:NH2	2.10	0.67
2:B:400:HMT:O8	2:B:400:HMT:O6	2.06	0.67
1:B:190:LEU:HB2	1:B:195:ILE:HG13	1.77	0.67
1:B:8:VAL:HG12	1:B:9:LEU:N	2.09	0.66
1:B:156:GLY:HA3	2:B:400:HMT:O2	1.95	0.66
1:A:154:ARG:N	2:A:400:HMT:H7	2.11	0.66
1:A:279:SER:H	1:B:124:THR:HG21	1.61	0.66
1:B:69:LEU:CD2	1:B:70:GLN:HA	2.22	0.66
1:B:11:SER:HB2	1:B:50:LEU:HD11	1.78	0.65
1:A:208:LEU:CD1	1:A:235:ARG:HD2	2.16	0.65
1:B:287:THR:HB	1:B:289:GLU:OE2	1.94	0.65
1:B:192:LEU:HA	1:B:195:ILE:HD12	1.79	0.65
1:B:283:LEU:HA	1:B:286:SER:OG	1.95	0.65
1:B:9:LEU:CD1	1:B:43:GLU:HB2	2.25	0.65
1:B:221:PHE:O	1:B:252:GLN:NE2	2.30	0.65
1:B:9:LEU:HA	1:B:29:VAL:HG23	1.79	0.65
1:B:44:LEU:HD21	1:B:62:VAL:HG13	1.77	0.65
1:B:160:ALA:O	1:B:164:GLN:HG3	1.98	0.64
1:A:279:SER:O	1:B:124:THR:CG2	2.46	0.63
1:A:192:LEU:HA	1:A:195:ILE:HG12	1.80	0.63
1:B:19:ARG:HD3	1:B:28:GLN:HE22	1.63	0.63
1:A:126:SER:HB2	1:A:131:LYS:HG3	1.81	0.63
1:A:279:SER:C	1:B:124:THR:HG22	2.18	0.63
2:A:400:HMT:O8	2:A:400:HMT:O6	2.18	0.62
1:B:9:LEU:HB2	1:B:50:LEU:HD13	1.80	0.62
1:A:61:ASP:O	1:A:64:ASN:N	2.33	0.62
1:A:59:THR:OG1	1:A:62:VAL:N	2.27	0.62
1:B:190:LEU:HD22	1:B:195:ILE:HG13	1.82	0.62
1:B:50:LEU:HB3	1:B:72:VAL:CG2	2.30	0.62
1:B:174:ASP:H	1:B:189:GLN:HE21	1.48	0.62
1:A:279:SER:H	1:B:124:THR:CG2	2.12	0.62
1:B:212:THR:HA	1:B:215:LEU:HB2	1.81	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:205:HIS:HA	1:B:234:ALA:HB2	1.81	0.61
1:A:89:ARG:HH22	1:A:90:LYS:HZ2	1.49	0.61
1:B:176:ILE:HG13	1:B:177:ILE:N	2.14	0.61
1:A:208:LEU:HG	1:A:235:ARG:CB	2.30	0.61
1:A:264:GLU:HB3	1:A:265:PRO:CD	2.29	0.61
1:B:153:GLY:O	1:B:157:ARG:NE	2.33	0.61
1:B:154:ARG:N	2:B:400:HMT:H7	2.15	0.61
1:A:131:LYS:HD2	1:A:133:GLU:OE2	2.01	0.61
1:B:6:ARG:NH1	1:B:8:VAL:HG23	2.16	0.61
1:A:72:VAL:HG12	1:A:73:GLY:H	1.65	0.61
1:A:147:LEU:HB3	1:A:170:THR:HG22	1.83	0.61
1:B:281:PRO:HG2	1:B:283:LEU:HD21	1.82	0.61
1:B:260:VAL:HG12	1:B:261:PHE:H	1.66	0.61
1:A:9:LEU:HD22	1:A:44:LEU:HD11	1.82	0.60
1:B:8:VAL:O	1:B:9:LEU:HG	1.99	0.60
1:A:205:HIS:N	2:A:400:HMT:H17	2.16	0.60
1:B:264:GLU:HB3	1:B:265:PRO:HD3	1.83	0.60
1:A:288:LYS:HA	1:A:291:GLN:HB2	1.81	0.60
1:B:9:LEU:CA	1:B:29:VAL:HG23	2.31	0.60
1:B:11:SER:CB	1:B:50:LEU:HD11	2.32	0.60
1:B:43:GLU:CD	1:B:43:GLU:N	2.50	0.60
1:B:9:LEU:HB2	1:B:50:LEU:CD1	2.32	0.60
1:A:89:ARG:NH2	1:A:90:LYS:NZ	2.49	0.60
1:A:170:THR:O	1:A:187:VAL:HA	2.01	0.60
1:B:69:LEU:HD23	1:B:70:GLN:CA	2.27	0.59
1:B:205:HIS:HB2	2:B:400:HMT:C15	2.31	0.59
1:A:141:GLU:OE2	1:B:104:SER:OG	2.20	0.59
1:B:6:ARG:NH1	1:B:8:VAL:CG2	2.65	0.59
1:B:89:ARG:N	1:B:92:ILE:HD13	2.17	0.59
1:B:95:MET:HB2	1:B:302:PHE:HE2	1.67	0.59
1:B:19:ARG:HD3	1:B:28:GLN:NE2	2.18	0.59
2:B:400:HMT:C2	2:B:400:HMT:H7A	2.32	0.59
1:A:293:ARG:NH2	1:B:141:GLU:OE1	2.35	0.59
1:A:25:GLY:HA3	1:A:303:VAL:CG1	2.32	0.59
1:A:269:ARG:HH21	1:A:273:ASP:CG	2.06	0.59
1:B:118:ARG:O	1:B:119:GLN:HB2	2.02	0.59
1:B:67:GLU:HA	1:B:89:ARG:HH12	1.67	0.58
1:A:123:ALA:O	1:A:127:MET:HG2	2.03	0.58
1:A:287:THR:HG21	1:B:141:GLU:HG3	1.85	0.58
1:B:26:GLY:O	1:B:27:LEU:HD23	2.03	0.58
2:B:400:HMT:H3	2:B:400:HMT:H24	1.84	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:74:ARG:NH1	1:A:80:ASP:OD1	2.36	0.58
1:B:154:ARG:O	1:B:157:ARG:HG2	2.04	0.58
1:A:176:ILE:HG13	1:A:177:ILE:N	2.18	0.58
1:B:154:ARG:HG3	2:B:400:HMT:H18B	1.84	0.58
1:A:178:SER:HB2	1:A:181:VAL:H	1.69	0.58
1:A:196:TRP:HB2	1:A:197:PRO:HD3	1.85	0.58
1:A:121:PRO:HG3	1:B:121:PRO:HG3	1.85	0.57
1:A:193:GLU:HG3	1:A:194:GLU:H	1.68	0.57
1:A:208:LEU:HG	1:A:235:ARG:HB3	1.86	0.57
1:B:174:ASP:HB3	1:B:177:ILE:HB	1.84	0.57
2:A:400:HMT:C2	2:A:400:HMT:H7A	2.34	0.57
1:A:40:LEU:HD12	1:A:44:LEU:HD12	1.86	0.57
1:A:41:ILE:O	1:A:45:GLN:HB2	2.04	0.57
1:A:48:GLU:OE2	1:A:70:GLN:N	2.38	0.57
1:B:69:LEU:HD13	1:B:89:ARG:HH11	1.69	0.57
1:A:225:LYS:O	1:A:226:LYS:HB2	2.03	0.57
1:B:23:GLN:O	1:B:26:GLY:N	2.38	0.57
1:B:99:ASN:OD1	1:B:154:ARG:NH2	2.36	0.57
1:B:56:THR:HG22	1:B:58:VAL:HG13	1.87	0.57
1:B:84:LEU:HA	1:B:87:ALA:HB3	1.87	0.57
1:A:162:ARG:HG2	1:B:166:PHE:CD2	2.40	0.57
1:A:10:ILE:HG21	1:A:14:LEU:HG	1.87	0.56
1:A:121:PRO:HA	1:B:121:PRO:HB3	1.85	0.56
2:A:400:HMT:H3	2:A:400:HMT:H26A	1.86	0.56
1:B:7:LYS:HE3	1:B:28:GLN:H	1.70	0.56
1:B:72:VAL:C	1:B:302:PHE:HZ	2.09	0.56
1:B:157:ARG:O	1:B:161:THR:HG23	2.06	0.56
1:B:176:ILE:HG13	1:B:177:ILE:HG12	1.88	0.56
2:B:400:HMT:H26A	2:B:400:HMT:C3	2.35	0.56
1:A:155:ILE:HG21	1:A:205:HIS:CD2	2.41	0.56
1:B:152:LEU:N	2:B:400:HMT:H17A	2.18	0.56
1:A:206:THR:HA	2:A:400:HMT:H13	1.86	0.56
1:B:50:LEU:HB3	1:B:72:VAL:HG23	1.88	0.56
1:B:209:LEU:O	1:B:213:THR:N	2.39	0.56
1:A:19:ARG:O	1:A:23:GLN:HG3	2.06	0.56
1:A:296:GLU:HB3	1:A:297:GLU:OE1	2.06	0.55
1:A:52:VAL:O	1:A:74:ARG:HA	2.07	0.55
1:B:155:ILE:N	2:B:400:HMT:H7	2.21	0.55
1:A:14:LEU:HD11	1:A:18:CYS:HB3	1.89	0.55
1:A:114:MET:HG3	1:B:114:MET:CE	2.36	0.55
1:B:11:SER:O	1:B:11:SER:OG	2.24	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:84:LEU:HD12	1:B:84:LEU:C	2.27	0.55
1:A:268:ASP:OD1	1:A:268:ASP:N	2.39	0.55
1:B:103:LEU:HD11	1:B:162:ARG:HH21	1.71	0.55
1:B:32:LYS:HB2	1:B:34:ASN:ND2	2.22	0.55
1:B:84:LEU:HA	1:B:87:ALA:CB	2.36	0.54
1:B:8:VAL:CG1	1:B:9:LEU:N	2.67	0.54
1:A:236:GLY:HA3	1:A:261:PHE:O	2.08	0.54
1:A:176:ILE:HG13	1:A:177:ILE:HG12	1.88	0.54
1:B:41:ILE:HA	1:B:44:LEU:HD12	1.89	0.54
1:A:174:ASP:OD1	2:A:400:HMT:H21	2.08	0.54
1:B:69:LEU:HD21	1:B:92:ILE:HD11	1.89	0.54
1:B:268:ASP:OD1	1:B:268:ASP:N	2.40	0.54
1:A:40:LEU:HD23	1:A:40:LEU:H	1.72	0.54
1:B:103:LEU:HD13	1:B:158:GLU:OE1	2.07	0.54
1:B:150:LEU:HB2	1:B:204:VAL:HG12	1.90	0.54
1:B:206:THR:HG21	1:B:212:THR:HB	1.89	0.54
1:A:97:THR:HB	1:A:294:CYS:SG	2.48	0.53
1:B:67:GLU:OE1	1:B:89:ARG:NE	2.42	0.53
1:B:54:SER:OG	1:B:80:ASP:OD2	2.25	0.53
1:A:35:LEU:HB3	1:A:39:GLU:OE2	2.08	0.53
1:B:40:LEU:HD22	1:B:43:GLU:OE1	2.08	0.53
1:B:72:VAL:HG22	1:B:73:GLY:N	2.24	0.53
1:A:286:SER:OG	1:B:138:MET:HG2	2.09	0.53
2:A:400:HMT:H3	2:A:400:HMT:C24	2.36	0.53
1:B:11:SER:O	1:B:56:THR:OG1	2.26	0.53
1:A:174:ASP:HB3	1:A:177:ILE:HB	1.91	0.53
1:A:118:ARG:NH1	1:B:108:LEU:HB2	2.23	0.53
1:A:208:LEU:HD12	1:A:235:ARG:HB3	1.90	0.53
1:B:6:ARG:HG3	1:B:48:GLU:HB3	1.89	0.53
1:B:283:LEU:C	1:B:286:SER:OG	2.46	0.53
1:A:109:THR:HG21	1:A:205:HIS:HE1	1.74	0.53
1:B:216:LEU:HD22	1:B:239:VAL:HG22	1.90	0.53
1:A:192:LEU:HA	1:A:195:ILE:CG1	2.38	0.53
1:A:235:ARG:HB2	1:A:238:ILE:HD11	1.92	0.52
1:A:32:LYS:HG3	1:A:34:ASN:HD21	1.75	0.52
1:A:156:GLY:N	2:A:400:HMT:H16	2.14	0.52
1:A:57:LYS:HB3	1:A:81:ASN:HB2	1.91	0.52
1:B:10:ILE:HB	1:B:30:VAL:O	2.09	0.52
1:B:89:ARG:H	1:B:92:ILE:HD13	1.74	0.52
1:B:6:ARG:HG3	1:B:48:GLU:CB	2.40	0.52
1:B:73:GLY:HA3	1:B:302:PHE:CE2	2.45	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:174:ASP:O	1:B:189:GLN:NE2	2.43	0.52
1:A:73:GLY:HA3	1:A:298:ILE:HD11	1.91	0.51
1:A:264:GLU:HB3	1:A:265:PRO:HD2	1.91	0.51
1:A:22:LEU:HD23	1:A:29:VAL:HG11	1.93	0.51
1:A:36:SER:OG	1:A:37:LYS:N	2.42	0.51
1:B:7:LYS:CE	1:B:28:GLN:H	2.24	0.51
1:B:74:ARG:NH2	1:B:77:THR:O	2.43	0.51
1:B:82:VAL:HG12	1:B:87:ALA:HB2	1.93	0.51
1:A:10:ILE:HG21	1:A:14:LEU:HB2	1.91	0.51
1:A:147:LEU:HD23	1:A:149:ILE:HD11	1.92	0.51
1:A:208:LEU:CG	1:A:235:ARG:HB3	2.41	0.51
1:B:190:LEU:HB2	1:B:195:ILE:CG1	2.40	0.51
1:A:154:ARG:HB2	2:A:400:HMT:C8	2.41	0.51
1:B:7:LYS:HG2	1:B:28:GLN:N	2.26	0.51
1:B:35:LEU:HB3	1:B:39:GLU:CG	2.40	0.51
1:B:70:GLN:HG3	1:B:90:LYS:HE3	1.93	0.51
1:B:77:THR:HG22	1:B:235:ARG:NH2	2.19	0.51
1:B:77:THR:HG21	1:B:235:ARG:HH12	1.76	0.51
1:A:9:LEU:HA	1:A:29:VAL:HG23	1.94	0.50
1:B:79:VAL:HG23	1:B:79:VAL:O	2.10	0.50
1:B:219:ASN:OD1	1:B:223:GLN:NE2	2.44	0.50
1:A:206:THR:HG23	1:A:207:PRO:HD2	1.93	0.50
1:B:7:LYS:HG2	1:B:28:GLN:H	1.76	0.50
1:B:118:ARG:O	1:B:119:GLN:CB	2.59	0.50
1:B:23:GLN:C	1:B:25:GLY:H	2.14	0.50
1:A:231:VAL:HG13	1:A:257:ALA:HB3	1.92	0.50
1:A:108:LEU:HD12	1:B:118:ARG:CZ	2.42	0.50
1:B:75:ALA:HB2	1:B:298:ILE:HG21	1.94	0.50
1:A:191:PRO:HB2	1:A:193:GLU:CG	2.41	0.50
1:A:260:VAL:HG12	1:A:282:HIS:ND1	2.27	0.50
1:A:154:ARG:H	2:A:400:HMT:H7	1.76	0.49
1:A:287:THR:HA	1:B:138:MET:SD	2.52	0.49
1:B:23:GLN:O	1:B:25:GLY:N	2.45	0.49
1:B:50:LEU:HD12	1:B:51:ILE:H	1.78	0.49
1:B:92:ILE:N	1:B:92:ILE:HD12	2.26	0.49
1:B:142:LEU:HD12	1:B:166:PHE:HD1	1.78	0.49
1:A:289:GLU:O	1:A:293:ARG:HB2	2.11	0.49
1:A:289:GLU:C	1:A:293:ARG:HE	2.15	0.49
1:A:57:LYS:HD3	1:A:81:ASN:HA	1.94	0.49
1:B:59:THR:CG2	1:B:60:ALA:N	2.60	0.49
1:A:108:LEU:HD12	1:B:118:ARG:NH1	2.28	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:21:ILE:HD11	1:B:299:ALA:HB3	1.94	0.49
1:A:208:LEU:HG	1:A:235:ARG:HB2	1.94	0.49
1:A:205:HIS:H	2:A:400:HMT:H17	1.77	0.49
1:B:154:ARG:NH1	2:B:400:HMT:O3	2.46	0.49
1:A:8:VAL:O	1:A:29:VAL:HG23	2.13	0.49
1:B:9:LEU:C	1:B:29:VAL:HG21	2.34	0.48
1:B:174:ASP:OD1	1:B:175:PRO:HD2	2.13	0.48
1:A:9:LEU:CB	1:A:44:LEU:HD21	2.41	0.48
1:A:14:LEU:HD21	1:A:18:CYS:HB3	1.93	0.48
1:A:281:PRO:O	1:B:134:ARG:HG3	2.13	0.48
1:A:103:LEU:HD11	1:A:162:ARG:HH21	1.78	0.48
1:B:103:LEU:HD11	1:B:162:ARG:NH2	2.27	0.48
1:B:9:LEU:C	1:B:29:VAL:CG2	2.82	0.48
1:B:35:LEU:HB3	1:B:39:GLU:OE2	2.12	0.48
1:B:208:LEU:HD12	1:B:208:LEU:HA	1.74	0.48
1:B:23:GLN:CG	1:B:28:GLN:HB2	2.43	0.48
1:B:52:VAL:HG22	1:B:74:ARG:HB3	1.96	0.48
1:A:192:LEU:HD22	1:A:196:TRP:CZ2	2.48	0.48
1:A:216:LEU:HB2	1:A:239:VAL:HG22	1.96	0.48
1:B:12:ASP:HB3	1:B:53:ARG:CB	2.42	0.48
1:A:297:GLU:HA	1:A:300:VAL:HG12	1.95	0.47
1:A:118:ARG:HH11	1:B:108:LEU:HD13	1.78	0.47
1:B:72:VAL:HG22	1:B:73:GLY:H	1.79	0.47
1:B:88:THR:HA	1:B:92:ILE:CB	2.39	0.47
1:A:104:SER:HB2	1:B:141:GLU:OE1	2.14	0.47
1:A:150:LEU:HD21	1:A:195:ILE:HD13	1.97	0.47
1:A:156:GLY:H	2:A:400:HMT:C16	2.16	0.47
1:A:89:ARG:HH22	1:A:90:LYS:NZ	2.08	0.47
1:A:183:ALA:O	1:A:185:PHE:N	2.48	0.47
1:A:109:THR:OG1	1:A:205:HIS:NE2	2.48	0.47
1:A:193:GLU:HG3	1:A:194:GLU:N	2.30	0.47
1:A:236:GLY:HA3	1:A:261:PHE:C	2.34	0.47
1:A:11:SER:O	1:A:11:SER:OG	2.24	0.47
1:B:70:GLN:O	1:B:92:ILE:HA	2.15	0.47
1:B:298:ILE:O	1:B:302:PHE:HB2	2.14	0.47
1:A:235:ARG:O	1:A:238:ILE:HD12	2.14	0.47
1:B:155:ILE:H	2:B:400:HMT:C7	2.23	0.47
1:B:264:GLU:HB3	1:B:265:PRO:CD	2.44	0.47
1:A:61:ASP:C	1:A:63:ILE:N	2.68	0.47
1:A:116:LEU:HD23	1:A:116:LEU:HA	1.78	0.47
1:B:226:LYS:HD3	1:B:252:GLN:HA	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:209:LEU:O	1:A:213:THR:OG1	2.27	0.46
1:B:20:LYS:HA	1:B:20:LYS:HD3	1.62	0.46
1:B:115:CYS:SG	1:B:121:PRO:HD3	2.55	0.46
1:B:231:VAL:HG13	1:B:257:ALA:HB3	1.97	0.46
1:B:283:LEU:HB3	1:B:286:SER:OG	2.15	0.46
1:B:209:LEU:O	1:B:213:THR:OG1	2.30	0.46
1:B:281:PRO:HD2	1:B:283:LEU:HD11	1.97	0.46
1:A:118:ARG:HH21	1:B:104:SER:HB3	1.80	0.46
1:B:116:LEU:HD23	1:B:116:LEU:HA	1.68	0.46
1:B:41:ILE:HD12	1:B:41:ILE:H	1.80	0.46
1:B:151:GLY:C	1:B:152:LEU:HG	2.33	0.46
1:B:50:LEU:HB3	1:B:72:VAL:HG21	1.96	0.46
1:B:97:THR:HG22	1:B:297:GLU:HG3	1.97	0.46
1:A:63:ILE:HG21	1:A:92:ILE:HD13	1.98	0.46
1:B:23:GLN:C	1:B:25:GLY:N	2.69	0.46
1:A:57:LYS:NZ	1:A:81:ASN:HB3	2.31	0.46
1:B:233:CYS:HA	1:B:259:ASP:HB3	1.97	0.46
1:A:12:ASP:OD2	1:A:53:ARG:N	2.27	0.46
1:A:103:LEU:HD11	1:A:162:ARG:NH2	2.31	0.46
1:B:255:GLY:HA2	1:B:276:ASN:HB3	1.98	0.46
1:B:35:LEU:HB3	1:B:39:GLU:CD	2.37	0.45
1:A:77:THR:HG23	1:A:101:ASN:ND2	2.29	0.45
1:B:69:LEU:HD21	1:B:92:ILE:CD1	2.46	0.45
1:B:8:VAL:O	1:B:9:LEU:CD2	2.65	0.45
1:B:34:ASN:N	1:B:35:LEU:HG	2.13	0.45
1:B:116:LEU:HG	1:B:257:ALA:HB2	1.99	0.45
1:B:143:ASN:OD1	1:B:167:GLY:HA3	2.16	0.45
1:A:160:ALA:HB1	1:A:187:VAL:HG13	1.97	0.45
1:B:174:ASP:OD2	2:B:400:HMT:H21	2.16	0.45
1:B:95:MET:HB2	1:B:302:PHE:CE2	2.51	0.45
1:B:235:ARG:HB2	1:B:238:ILE:HD11	1.99	0.45
1:B:181:VAL:HG12	1:B:185:PHE:CE2	2.52	0.45
1:A:121:PRO:HB3	1:B:121:PRO:HA	1.98	0.45
1:B:170:THR:O	1:B:187:VAL:HA	2.17	0.45
1:A:22:LEU:HD12	1:A:27:LEU:HD12	1.99	0.44
1:A:52:VAL:HG21	1:A:58:VAL:HG22	1.99	0.44
1:A:53:ARG:HA	1:A:74:ARG:HG3	1.99	0.44
1:A:273:ASP:N	1:A:273:ASP:OD2	2.49	0.44
1:B:133:GLU:OE2	1:B:136:LYS:CB	2.65	0.44
1:A:12:ASP:OD1	1:A:55:ALA:HB3	2.17	0.44
1:B:83:ASP:O	1:B:87:ALA:N	2.51	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:114:MET:HG3	1:B:114:MET:HE3	1.98	0.44
1:A:183:ALA:O	1:A:186:GLY:N	2.31	0.44
1:B:141:GLU:O	1:B:145:LYS:HG2	2.18	0.44
1:B:142:LEU:HD12	1:B:166:PHE:CD1	2.53	0.44
1:A:12:ASP:HB3	1:A:53:ARG:HH11	1.83	0.44
1:A:70:GLN:O	1:A:92:ILE:HG23	2.17	0.44
1:A:134:ARG:HH12	1:B:53:ARG:HD3	1.82	0.44
1:B:6:ARG:NH1	1:B:8:VAL:HG21	2.32	0.44
1:A:51:ILE:HD12	1:A:298:ILE:HG13	1.98	0.44
1:B:52:VAL:HG22	1:B:74:ARG:CB	2.47	0.44
1:B:145:LYS:NZ	3:B:503:HOH:O	2.38	0.44
1:B:11:SER:HB3	1:B:52:VAL:HG12	1.99	0.44
1:B:84:LEU:HB2	1:B:87:ALA:HB3	2.00	0.43
1:B:206:THR:HG22	1:B:207:PRO:O	2.18	0.43
1:B:97:THR:CG2	1:B:298:ILE:HB	2.48	0.43
1:B:12:ASP:HB2	1:B:53:ARG:H	1.83	0.43
1:B:206:THR:HG21	1:B:212:THR:CB	2.48	0.43
1:A:108:LEU:HD23	1:A:112:MET:HG3	2.00	0.43
1:A:201:PHE:HA	1:A:229:ARG:O	2.18	0.43
1:B:9:LEU:HA	1:B:9:LEU:HD23	1.77	0.43
1:B:50:LEU:O	1:B:72:VAL:HG23	2.18	0.43
1:B:103:LEU:HD12	1:B:103:LEU:HA	1.79	0.43
1:B:155:ILE:N	2:B:400:HMT:H16	2.33	0.43
1:B:239:VAL:HG12	1:B:244:LEU:HB2	2.01	0.43
1:B:6:ARG:HH12	1:B:8:VAL:CG2	2.32	0.43
1:A:40:LEU:O	1:A:44:LEU:HB2	2.19	0.43
1:B:28:GLN:CG	1:B:29:VAL:N	2.77	0.43
1:B:6:ARG:CG	1:B:48:GLU:HB3	2.49	0.43
1:A:22:LEU:CD1	1:A:27:LEU:HD12	2.49	0.43
1:A:297:GLU:O	1:A:300:VAL:HG12	2.19	0.43
1:B:57:LYS:HE3	1:B:57:LYS:HB3	1.78	0.43
1:B:209:LEU:HA	1:B:209:LEU:HD23	1.73	0.43
1:A:209:LEU:HB3	1:A:211:SER:HB3	2.01	0.43
1:B:46:ASP:HB3	1:B:47:CYS:H	1.67	0.43
1:A:89:ARG:NH2	1:A:90:LYS:HZ3	2.07	0.42
1:B:15:ASP:O	1:B:18:CYS:HB3	2.18	0.42
1:B:74:ARG:HH21	1:B:79:VAL:HA	1.84	0.42
1:B:133:GLU:OE2	1:B:136:LYS:HB2	2.19	0.42
1:B:267:ARG:HD2	1:B:267:ARG:HA	1.70	0.42
1:A:141:GLU:HA	1:B:107:GLU:OE1	2.20	0.42
1:A:149:ILE:HD12	1:A:171:ILE:O	2.19	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:400:HMT:H3	2:B:400:HMT:C24	2.47	0.42
1:B:88:THR:O	1:B:88:THR:HG23	2.18	0.42
1:B:117:ALA:HB2	1:B:142:LEU:HD21	2.01	0.42
1:A:141:GLU:N	1:B:289:GLU:OE2	2.52	0.42
1:B:90:LYS:H	1:B:92:ILE:CD1	2.32	0.42
1:B:147:LEU:HG	1:B:148:GLY:N	2.34	0.42
1:A:59:THR:HG1	1:A:62:VAL:H	1.56	0.42
1:A:93:LEU:HD23	1:A:93:LEU:HA	1.88	0.42
1:B:122:GLN:OE1	1:B:278:ILE:HG22	2.20	0.42
1:B:293:ARG:HE	1:B:293:ARG:HB2	1.47	0.42
1:B:33:GLN:H	1:B:34:ASN:ND2	2.18	0.42
1:B:83:ASP:HB3	1:B:86:ALA:HB3	2.02	0.42
1:A:109:THR:HG21	1:A:203:THR:HG21	2.01	0.42
1:B:74:ARG:CZ	1:B:77:THR:O	2.68	0.42
1:A:205:HIS:H	2:A:400:HMT:C17	2.33	0.41
1:B:8:VAL:HG22	1:B:49:GLY:H	1.85	0.41
1:B:97:THR:HG21	1:B:298:ILE:HB	2.01	0.41
1:A:14:LEU:HD21	1:A:18:CYS:CB	2.50	0.41
1:B:49:GLY:HA2	1:B:71:VAL:O	2.20	0.41
1:B:149:ILE:O	1:B:172:GLY:HA3	2.21	0.41
1:B:247:ALA:O	1:B:250:SER:O	2.38	0.41
1:A:54:SER:OG	1:A:55:ALA:N	2.53	0.41
1:B:99:ASN:O	1:B:102:SER:HB3	2.21	0.41
1:A:118:ARG:HH12	1:B:108:LEU:HD22	1.86	0.41
1:B:9:LEU:CA	1:B:29:VAL:CG2	2.97	0.41
2:B:400:HMT:H3	2:B:400:HMT:C26	2.46	0.41
1:B:7:LYS:HE3	1:B:28:GLN:HB3	2.01	0.41
1:B:72:VAL:CG2	1:B:73:GLY:H	2.34	0.41
1:A:263:GLU:OE2	1:A:267:ARG:HG2	2.20	0.41
1:B:89:ARG:HH11	1:B:89:ARG:HD3	1.70	0.41
1:A:194:GLU:O	1:A:197:PRO:HD2	2.20	0.41
1:B:283:LEU:CB	1:B:286:SER:OG	2.68	0.41
1:A:51:ILE:CD1	1:A:298:ILE:HG13	2.51	0.41
1:A:74:ARG:HH11	1:A:79:VAL:HA	1.86	0.41
1:B:105:ALA:O	1:B:109:THR:HG22	2.19	0.41
1:B:133:GLU:HG2	1:B:135:LYS:HE3	2.03	0.41
1:B:296:GLU:O	1:B:300:VAL:HG22	2.20	0.41
1:A:209:LEU:HD23	1:A:209:LEU:HA	1.96	0.41
1:B:10:ILE:N	1:B:29:VAL:CG2	2.84	0.41
1:B:33:GLN:H	1:B:34:ASN:HD22	1.68	0.41
1:B:239:VAL:HG11	1:B:244:LEU:HD22	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:294:CYS:O	1:B:298:ILE:HG22	2.21	0.41
1:A:61:ASP:OD2	1:A:61:ASP:N	2.45	0.40
1:A:206:THR:N	2:A:400:HMT:O1	2.54	0.40
1:A:19:ARG:O	1:A:22:LEU:HB3	2.21	0.40
1:A:61:ASP:C	1:A:63:ILE:H	2.24	0.40
1:A:79:VAL:HB	1:A:82:VAL:HG12	2.04	0.40
1:A:237:GLY:HA2	1:A:262:THR:HG22	2.03	0.40
1:A:72:VAL:HG12	1:A:73:GLY:N	2.35	0.40
1:A:205:HIS:HB2	2:A:400:HMT:C15	2.52	0.40
1:B:72:VAL:CG2	1:B:73:GLY:N	2.85	0.40
1:A:57:LYS:HZ2	1:A:81:ASN:HB3	1.86	0.40
1:A:289:GLU:O	1:A:293:ARG:CB	2.69	0.40
1:B:11:SER:HB3	1:B:50:LEU:HD11	2.04	0.40
1:B:114:MET:O	1:B:117:ALA:HB3	2.21	0.40
1:B:197:PRO:HB2	1:B:225:LYS:HE2	2.04	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	300/302 (99%)	254 (85%)	39 (13%)	7 (2%)	6	30
1	B	300/302 (99%)	250 (83%)	38 (13%)	12 (4%)	3	17
All	All	600/604 (99%)	504 (84%)	77 (13%)	19 (3%)	4	22

All (19) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	34	ASN
1	A	225	LYS
1	A	226	LYS

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Mol	Chain	Res	Type
1	A	264	GLU
1	B	33	GLN
1	B	54	SER
1	B	77	THR
1	B	78	GLY
1	B	119	GLN
1	A	184	SER
1	B	36	SER
1	B	39	GLU
1	B	57	LYS
1	B	59	THR
1	B	44	LEU
1	A	33	GLN
1	A	36	SER
1	B	24	ASP
1	B	8	VAL

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	248/248 (100%)	236 (95%)	12 (5%)	25	62
1	B	248/248 (100%)	237 (96%)	11 (4%)	28	65
All	All	496/496 (100%)	473 (95%)	23 (5%)	27	64

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	6	ARG
1	A	18	CYS
1	A	32	LYS
1	A	33	GLN
1	A	85	GLU
1	A	89	ARG
1	A	131	LYS

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Mol	Chain	Res	Type
1	A	157	ARG
1	A	185	PHE
1	A	215	LEU
1	A	226	LYS
1	A	235	ARG
1	B	6	ARG
1	B	18	CYS
1	B	36	SER
1	B	45	GLN
1	B	89	ARG
1	B	182	SER
1	B	267	ARG
1	B	269	ARG
1	B	292	SER
1	B	301	GLN
1	B	302	PHE

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	34	ASN
1	A	101	ASN
1	B	34	ASN
1	B	189	GLN
1	B	205	HIS

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry

2 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	HMT	B	400	-	40,43,43	4.37	16 (40%)	41,66,66	2.44	15 (36%)
2	HMT	A	400	-	40,43,43	4.46	16 (40%)	41,66,66	1.97	10 (24%)

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	HMT	B	400	-	-	18/27/74/74	0/5/5/5
2	HMT	A	400	-	-	18/27/74/74	0/5/5/5

All (32) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	400	HMT	C1-C2	11.65	1.50	1.32
2	A	400	HMT	C1-C2	11.37	1.50	1.32
2	A	400	HMT	C13-C14	10.56	1.58	1.38
2	A	400	HMT	C16-C15	10.33	1.57	1.38
2	B	400	HMT	C16-C15	10.19	1.57	1.38
2	B	400	HMT	C13-C14	9.68	1.56	1.38
2	A	400	HMT	C13-C5	9.66	1.55	1.39
2	A	400	HMT	C16-C6	9.43	1.55	1.39
2	B	400	HMT	C16-C6	8.94	1.54	1.39
2	B	400	HMT	C13-C5	8.92	1.54	1.39
2	B	400	HMT	O4-C19	7.86	1.48	1.34
2	A	400	HMT	O4-C19	7.25	1.47	1.34
2	A	400	HMT	O1-C17	6.29	1.55	1.43
2	B	400	HMT	O1-C17	6.10	1.54	1.43
2	B	400	HMT	C6-C5	6.02	1.49	1.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	400	HMT	C6-C5	6.00	1.49	1.40
2	B	400	HMT	O1-C14	-5.40	1.30	1.38
2	A	400	HMT	O1-C14	-5.03	1.30	1.38
2	B	400	HMT	C14-C15	4.37	1.50	1.39
2	A	400	HMT	C14-C15	4.30	1.50	1.39
2	A	400	HMT	O2-C15	3.94	1.44	1.38
2	B	400	HMT	O2-C15	3.86	1.43	1.38
2	A	400	HMT	O7-C22	3.40	1.43	1.33
2	A	400	HMT	O3-C2	3.38	1.42	1.35
2	A	400	HMT	O2-C17	-3.32	1.36	1.43
2	B	400	HMT	C21-C22	3.32	1.57	1.50
2	A	400	HMT	C21-C22	3.26	1.57	1.50
2	B	400	HMT	O2-C17	-3.13	1.37	1.43
2	B	400	HMT	O7-C22	2.77	1.41	1.33
2	B	400	HMT	O3-C2	2.75	1.40	1.35
2	B	400	HMT	C10-N1	2.72	1.51	1.47
2	A	400	HMT	C10-N1	2.46	1.50	1.47

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	400	HMT	O7-C22-C21	8.00	126.18	111.19
2	A	400	HMT	O7-C22-C21	5.54	121.57	111.19
2	B	400	HMT	O4-C19-C20	5.41	121.31	111.27
2	A	400	HMT	O4-C19-C20	4.80	120.18	111.27
2	A	400	HMT	C25-C24-C20	-4.78	108.33	115.65
2	B	400	HMT	O2-C15-C14	-4.58	104.57	109.78
2	B	400	HMT	O2-C15-C16	4.41	133.75	127.85
2	A	400	HMT	O1-C14-C13	3.71	132.82	127.85
2	B	400	HMT	C20-C21-C22	-3.66	102.82	114.09
2	B	400	HMT	O1-C14-C13	3.34	132.32	127.85
2	B	400	HMT	C3-O4-C19	3.29	122.42	117.24
2	B	400	HMT	O5-C19-C20	-3.09	116.81	123.96
2	A	400	HMT	O2-C15-C16	3.08	131.97	127.85
2	A	400	HMT	O5-C19-C20	-3.07	116.87	123.96
2	B	400	HMT	C13-C14-C15	-2.84	118.41	122.02
2	A	400	HMT	C3-O4-C19	2.78	121.61	117.24
2	B	400	HMT	O1-C17-O2	-2.72	103.74	108.08
2	B	400	HMT	O7-C22-O8	-2.57	115.08	123.14
2	A	400	HMT	C13-C14-C15	-2.55	118.78	122.02
2	B	400	HMT	C13-C5-C6	2.52	122.22	119.39
2	B	400	HMT	C11-C12-C9	2.42	110.15	104.92

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	400	HMT	C11-C12-C9	2.30	109.90	104.92
2	A	400	HMT	O2-C15-C14	-2.27	107.20	109.78
2	B	400	HMT	C10-N1-C9	2.13	113.80	107.71
2	B	400	HMT	C17-O1-C14	-2.10	102.61	105.34

There are no chirality outliers.

All (36) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	400	HMT	C1-C2-O3-C18
2	A	400	HMT	C3-C2-O3-C18
2	A	400	HMT	O5-C19-O4-C3
2	A	400	HMT	C20-C19-O4-C3
2	A	400	HMT	O4-C19-C20-C21
2	A	400	HMT	O4-C19-C20-O6
2	A	400	HMT	O5-C19-C20-C21
2	A	400	HMT	O5-C19-C20-O6
2	A	400	HMT	C19-C20-C21-C22
2	A	400	HMT	O6-C20-C21-C22
2	A	400	HMT	C24-C20-C21-C22
2	A	400	HMT	C25-C26-C27-C28
2	A	400	HMT	C25-C26-C27-C29
2	A	400	HMT	C25-C26-C27-O9
2	B	400	HMT	C1-C2-O3-C18
2	B	400	HMT	C3-C2-O3-C18
2	B	400	HMT	O5-C19-O4-C3
2	B	400	HMT	C20-C19-O4-C3
2	B	400	HMT	O4-C19-C20-C21
2	B	400	HMT	O4-C19-C20-O6
2	B	400	HMT	O5-C19-C20-C21
2	B	400	HMT	O5-C19-C20-O6
2	B	400	HMT	C25-C26-C27-C28
2	B	400	HMT	C25-C26-C27-O9
2	B	400	HMT	C19-C20-C21-C22
2	B	400	HMT	C24-C20-C21-C22
2	A	400	HMT	C21-C22-O7-C23
2	A	400	HMT	C20-C24-C25-C26
2	B	400	HMT	C25-C26-C27-C29
2	A	400	HMT	O8-C22-O7-C23
2	B	400	HMT	C20-C24-C25-C26
2	B	400	HMT	O6-C20-C21-C22
2	B	400	HMT	C21-C20-C24-C25

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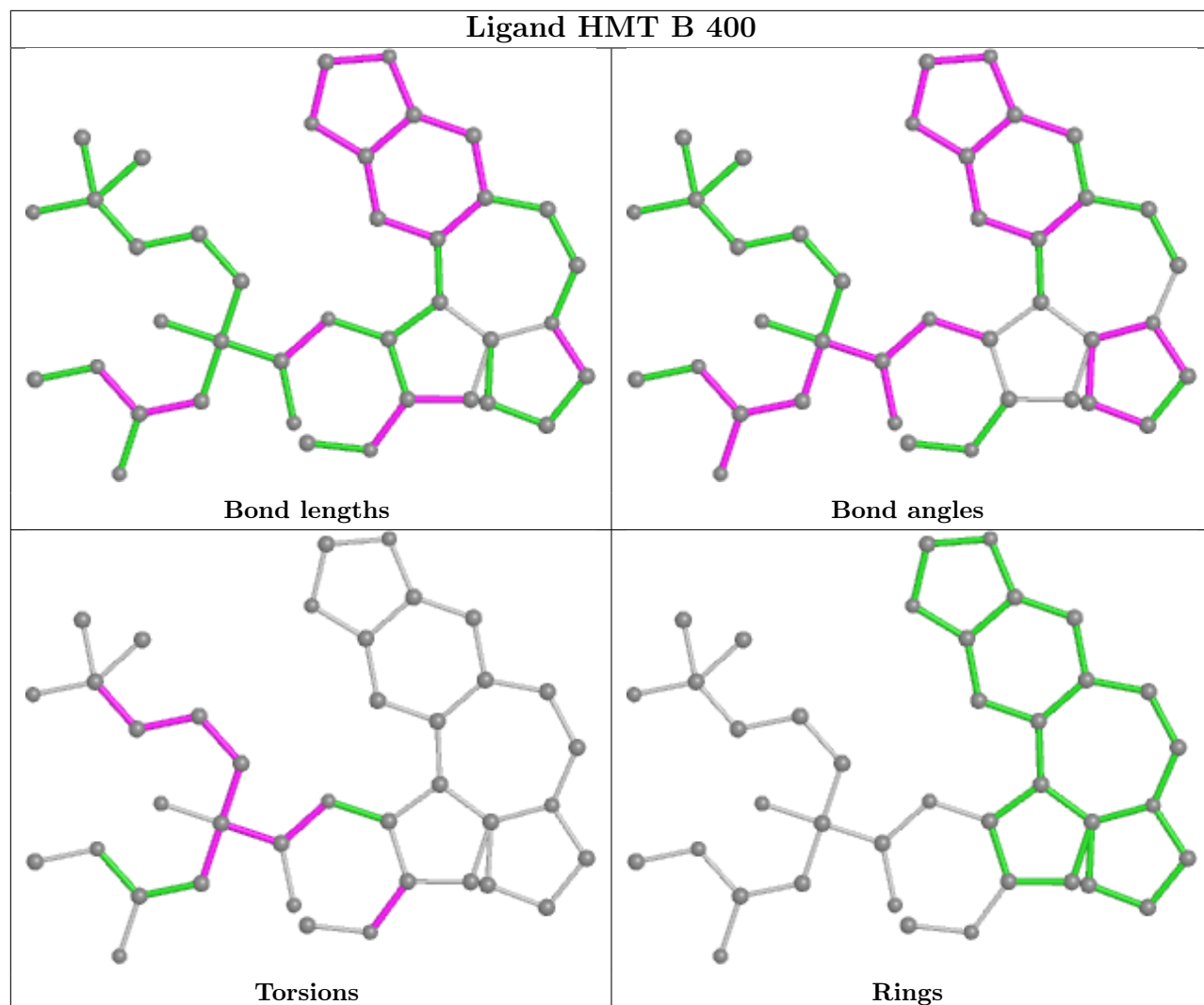
Mol	Chain	Res	Type	Atoms
2	A	400	HMT	C24-C25-C26-C27
2	B	400	HMT	C24-C25-C26-C27
2	B	400	HMT	O4-C19-C20-C24

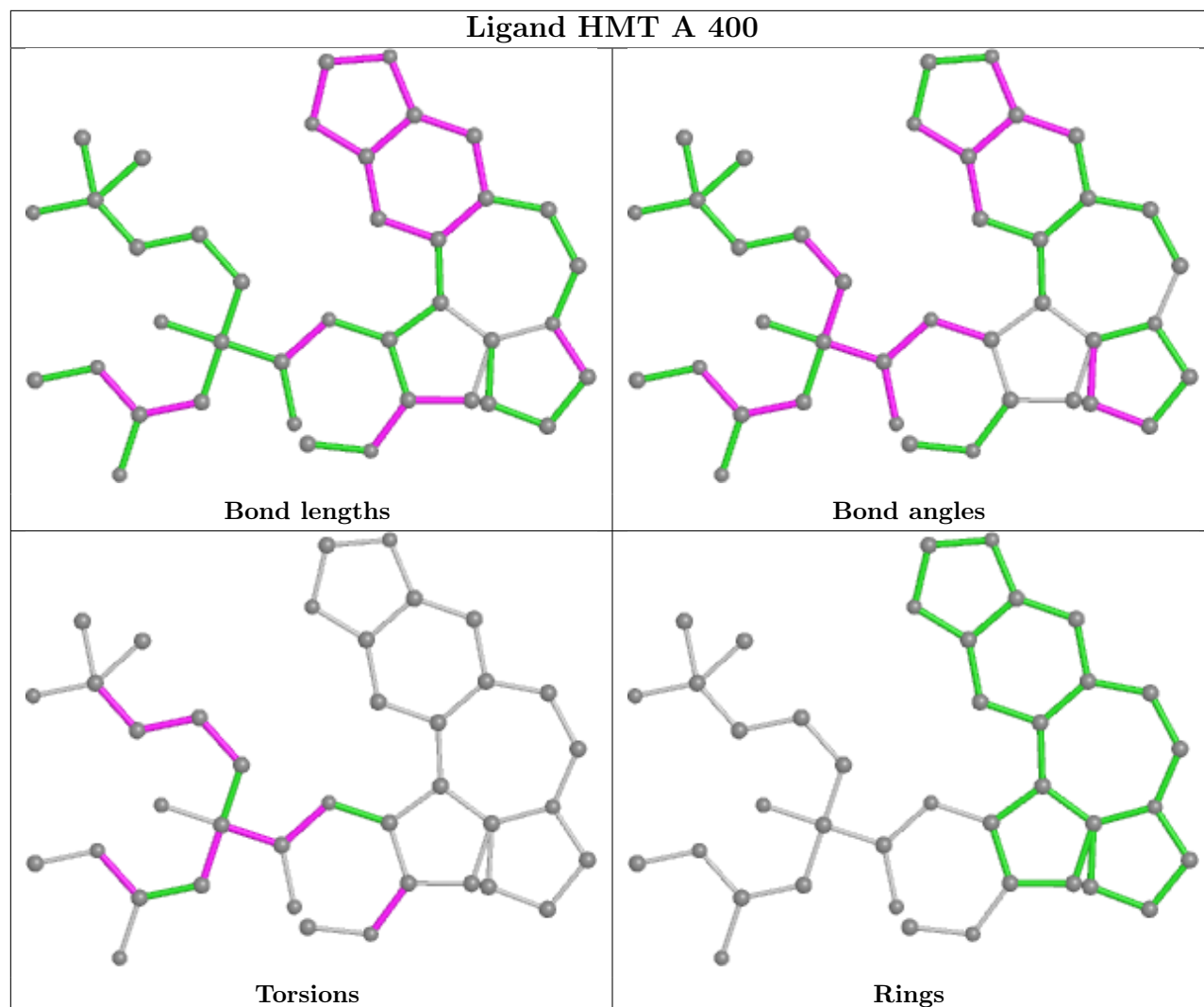
There are no ring outliers.

2 monomers are involved in 46 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	400	HMT	28	0
2	A	400	HMT	18	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	302/302 (100%)	-0.02	6 (1%) 65 36	19, 40, 95, 116	0
1	B	302/302 (100%)	0.39	27 (8%) 9 3	22, 43, 112, 136	0
All	All	604/604 (100%)	0.19	33 (5%) 25 9	19, 41, 107, 136	0

All (33) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	26	GLY	10.1
1	B	27	LEU	8.4
1	B	36	SER	7.7
1	B	34	ASN	7.7
1	A	13	SER	7.3
1	B	25	GLY	7.2
1	B	5	LEU	6.1
1	A	38	GLU	5.9
1	B	303	VAL	4.9
1	B	304	ASP	4.7
1	B	35	LEU	4.4
1	B	306	VAL	4.2
1	B	15	ASP	4.0
1	B	61	ASP	3.5
1	B	13	SER	3.4
1	B	37	LYS	3.3
1	B	41	ILE	3.2
1	B	302	PHE	3.0
1	B	299	ALA	3.0
1	B	300	VAL	2.8
1	B	305	MET	2.8
1	B	23	GLN	2.6
1	B	79	VAL	2.6
1	B	87	ALA	2.5

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Mol	Chain	Res	Type	RSRZ
1	B	7	LYS	2.4
1	A	71	VAL	2.3
1	B	77	THR	2.3
1	B	28	GLN	2.2
1	B	80	ASP	2.1
1	B	6	ARG	2.1
1	A	268	ASP	2.1
1	A	56	THR	2.1
1	A	100	GLY	2.0

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

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

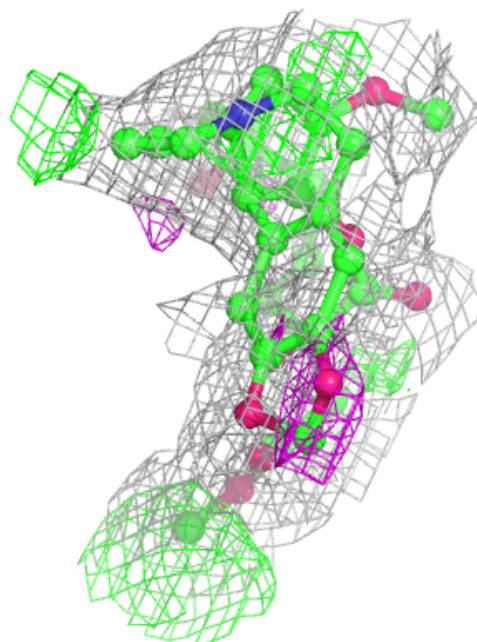
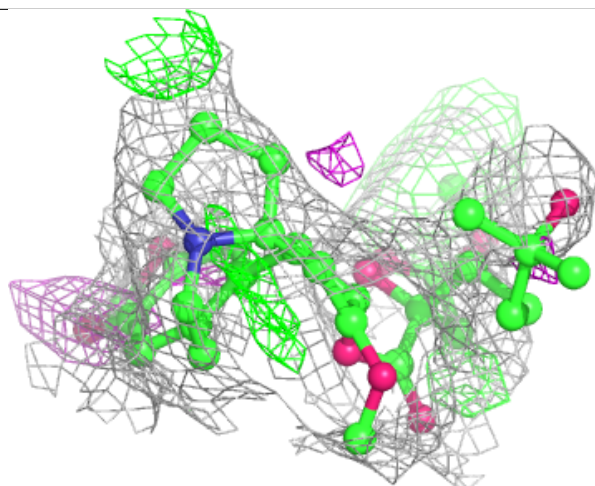
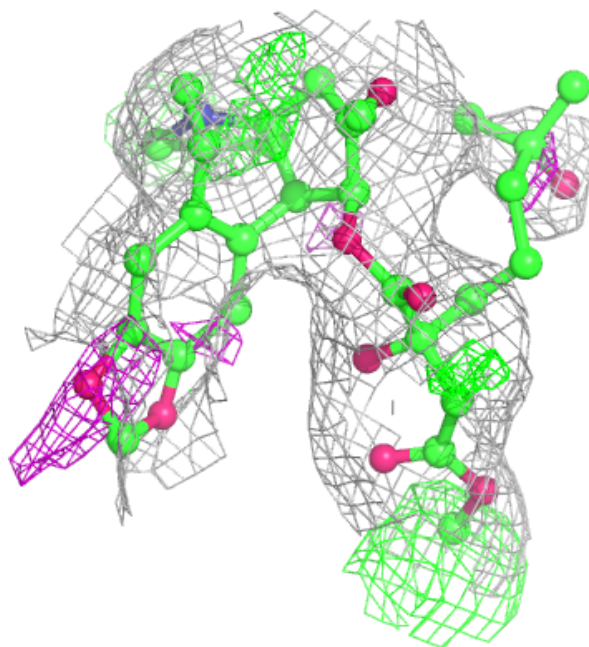
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

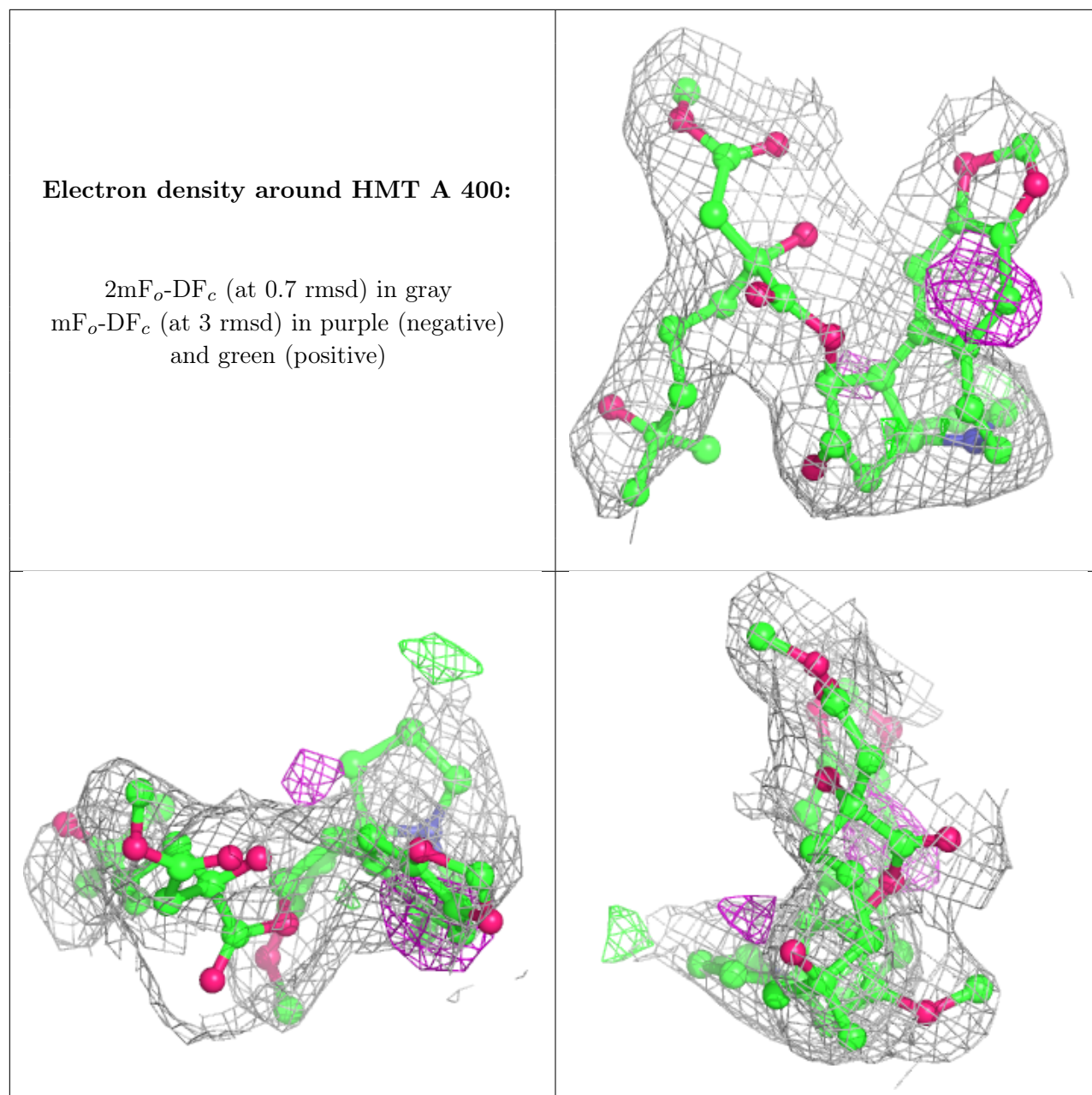
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	HMT	B	400	39/39	0.76	0.27	25,47,68,73	0
2	HMT	A	400	39/39	0.83	0.25	24,39,55,58	0

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 HMT B 400:

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





6.5 Other polymers [i](#)

There are no such residues in this entry.