Full wwPDB X-ray Structure Validation Report (i)

Apr 12, 2022 – 02:33 PM JST

PDB ID	:	7VVX
Title	:	MmtN-SAH-Met complex
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Deposited on	:	2021-11-09
Resolution	:	2.51 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

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	:	2.27
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)	:	2.27
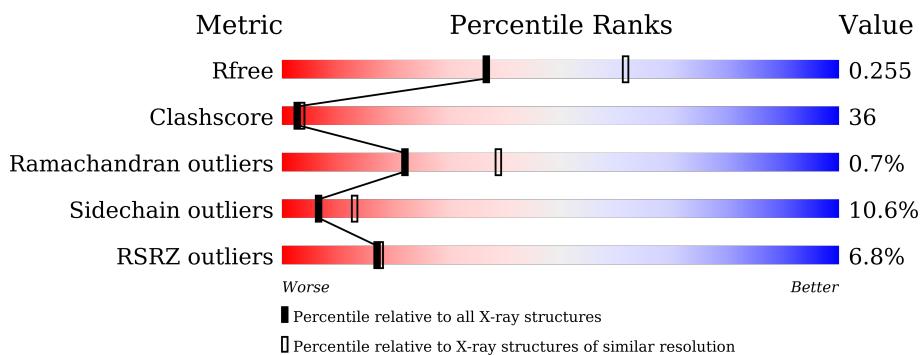
1   Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION
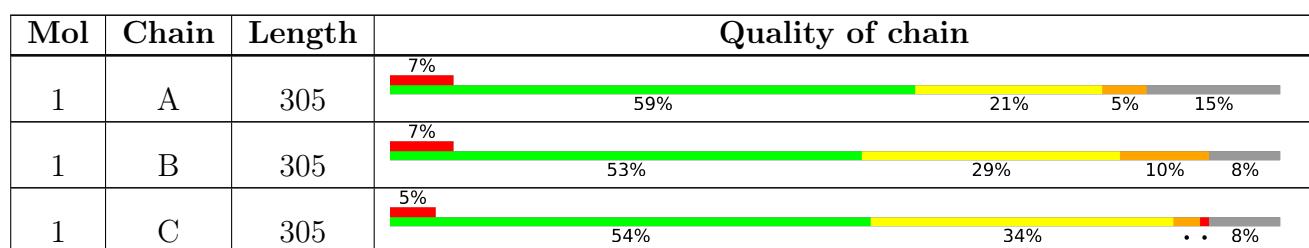
The reported resolution of this entry is 2.51 Å.

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

Metric	Percentile Ranks	Value
Rfree		0.255
Clashscore		36
Ramachandran outliers		0.7%
Sidechain outliers		10.6%
RSRZ outliers		6.8%

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	4661 (2.50-2.50)
Clashscore	141614	5346 (2.50-2.50)
Ramachandran outliers	138981	5231 (2.50-2.50)
Sidechain outliers	138945	5233 (2.50-2.50)
RSRZ outliers	127900	4559 (2.50-2.50)

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	305	7% — 59% / 21% / 5% / 15%
1	B	305	7% — 53% / 29% / 10% / 8%
1	C	305	5% — 54% / 34% / •• / 8%

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
4	PO4	C	401	-	-	-	X

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 6316 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.
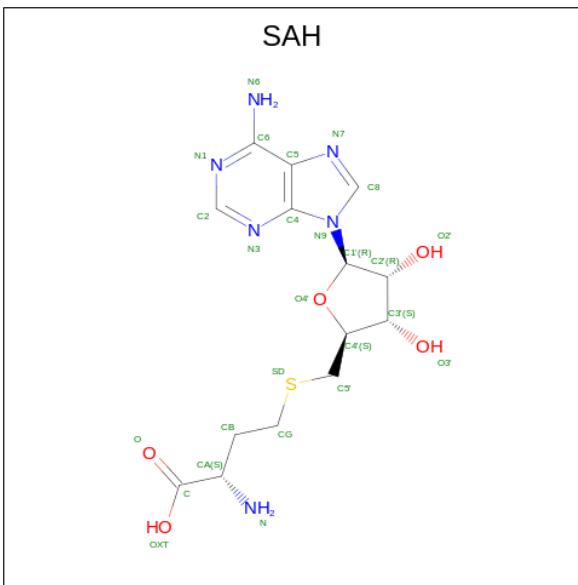
- Molecule 1 is a protein called SAM-dependent methyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	258	Total	C	N	O	S	0	0	0
			1966	1238	345	378	5			
1	B	281	Total	C	N	O	S	0	0	0
			2140	1344	379	412	5			
1	C	280	Total	C	N	O	S	0	0	0
			2129	1343	375	406	5			

There are 9 discrepancies between the modelled and reference sequences:
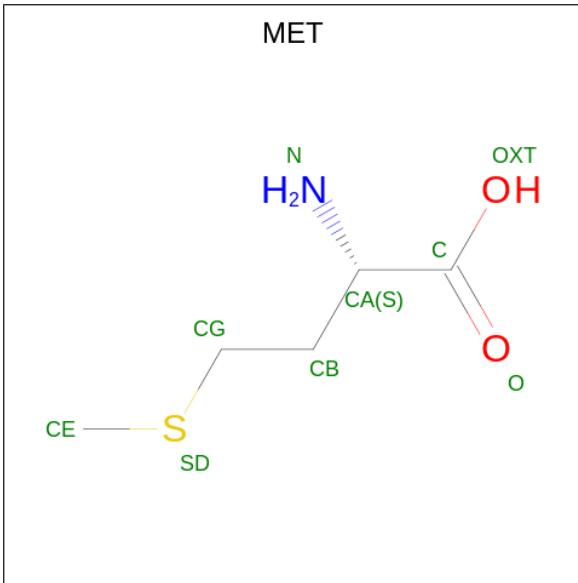
Chain	Residue	Modelled	Actual	Comment	Reference
A	141	ALA	LYS	engineered mutation	UNP A0A0T5PCK9
A	143	ALA	LYS	engineered mutation	UNP A0A0T5PCK9
A	146	ALA	LYS	engineered mutation	UNP A0A0T5PCK9
B	141	ALA	LYS	engineered mutation	UNP A0A0T5PCK9
B	143	ALA	LYS	engineered mutation	UNP A0A0T5PCK9
B	146	ALA	LYS	engineered mutation	UNP A0A0T5PCK9
C	141	ALA	LYS	engineered mutation	UNP A0A0T5PCK9
C	143	ALA	LYS	engineered mutation	UNP A0A0T5PCK9
C	146	ALA	LYS	engineered mutation	UNP A0A0T5PCK9

- Molecule 2 is S-ADENOSYL-L-HOMOCYSTEINE (three-letter code: SAH) (formula: $C_{14}H_{20}N_6O_5S$).
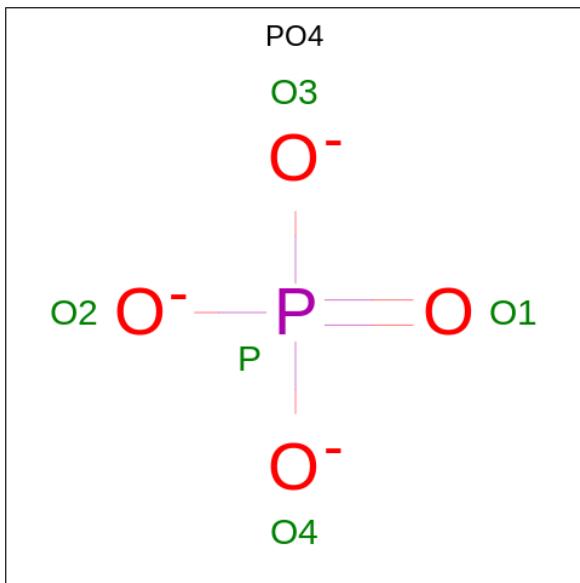
SAH

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			26	14	6	5	1		
2	B	1	Total	C	N	O	S	0	0
			26	14	6	5	1		

- Molecule 3 is METHIONINE (three-letter code: MET) (formula: $C_5H_{11}NO_2S$).

MET

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	B	1	Total	C	N	O	S	0	0
			9	5	1	2	1		
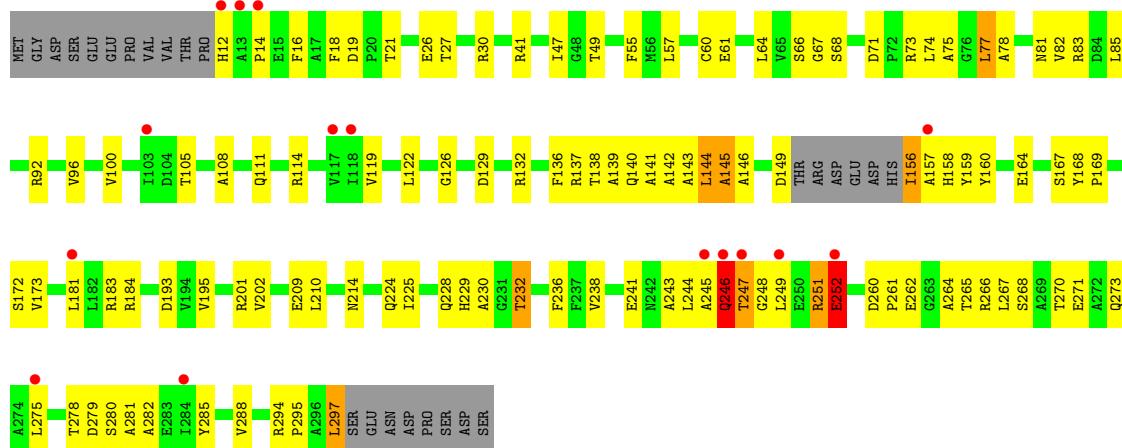
- Molecule 4 is PHOSPHATE ION (three-letter code: PO4) (formula: O_4P).

PO4

O3

O⁻

O2 O⁻ —— P ══ O O1

P

O⁻

O4

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	C	1	Total 5	O 4	P 1	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	6	Total 6	O 6	0	0
5	B	3	Total 3	O 3	0	0
5	C	6	Total 6	O 6	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: SAM-dependent methyltransferase

• Molecule 1: SAM-dependent methyltransferase

• Molecule 1: SAM-dependent methyltransferase

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α, β, γ	66.91Å 131.10Å 134.71Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	41.57 – 2.51 93.95 – 2.51	Depositor EDS
% Data completeness (in resolution range)	99.7 (41.57-2.51) 99.8 (93.95-2.51)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.20 (at 2.51Å)	Xtriage
Refinement program	PHENIX 1.17.1_3660	Depositor
R, R_{free}	0.232 , 0.255 0.232 , 0.255	Depositor DCC
R_{free} test set	2071 reflections (5.02%)	wwPDB-VP
Wilson B-factor (Å^2)	67.7	Xtriage
Anisotropy	0.588	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.35 , 68.3	EDS
L-test for twinning[2]	$< |L| > = 0.50, < L^2 > = 0.33$	Xtriage
Estimated twinning fraction	0.011 for -h,l,k	Xtriage
F_o,F_c correlation	0.94	EDS
Total number of atoms	6316	wwPDB-VP
Average B, all atoms (Å^2)	76.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.52% 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 (i)

5.1 Standard geometry (i)

Bond lengths and bond angles in the following residue types are not validated in this section: SAH, PO4

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	1.07	0/2006	0.78	0/2728
1	B	1.11	0/2184	0.89	4/2974 (0.1%)
1	C	1.14	0/2174	0.81	1/2960 (0.0%)
All	All	1.11	0/6364	0.83	5/8662 (0.1%)

There are no bond length outliers.

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	160	TYR	C-N-CD	-8.68	101.51	120.60
1	B	154	ASP	N-CA-C	-7.48	90.80	111.00
1	B	155	HIS	N-CA-C	5.86	126.83	111.00
1	B	150	THR	N-CA-C	5.36	125.47	111.00
1	C	252	GLU	N-CA-C	-5.30	96.69	111.00

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1966	0	1913	130	0
1	B	2140	0	2073	188	0
1	C	2129	0	2065	148	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	A	26	0	19	2	0
2	B	26	0	19	2	0
3	B	9	0	8	0	0
4	C	5	0	0	1	0
5	A	6	0	0	0	0
5	B	3	0	0	0	0
5	C	6	0	0	0	0
All	All	6316	0	6097	444	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 36.

All (444) 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:A:71:ASP:HB3	1:A:74:LEU:CD1	1.45	1.44
1:C:132:ARG:HG2	1:C:159:TYR:CE2	1.57	1.38
1:A:71:ASP:CB	1:A:74:LEU:HD11	1.57	1.33
1:B:41:ARG:HG2	1:B:64:LEU:CD2	1.63	1.27
1:A:252:GLU:N	1:B:162:TRP:HH2	1.37	1.22
1:A:257:PHE:HB2	1:A:267:LEU:HD12	1.23	1.20
1:C:243:ALA:HB1	1:C:251:ARG:HE	1.06	1.16
1:B:247:THR:HG21	1:B:249:LEU:HD22	1.28	1.15
1:C:245:ALA:HA	1:C:249:LEU:O	1.47	1.14
1:A:273:GLN:HE21	1:A:276:VAL:CG2	1.61	1.13
1:B:148:ALA:HB3	1:B:149:ASP:HA	1.16	1.13
1:B:41:ARG:HG2	1:B:64:LEU:HD21	1.20	1.12
1:B:41:ARG:CG	1:B:64:LEU:HD21	1.80	1.09
1:B:144:LEU:HA	1:B:148:ALA:HB2	1.34	1.08
1:C:132:ARG:CG	1:C:159:TYR:HE2	1.65	1.08
1:A:228:GLN:CG	1:A:232:THR:HG21	1.84	1.07
1:A:74:LEU:HD12	1:A:74:LEU:H	1.19	1.07
1:A:279:ASP:OD1	1:A:280:SER:N	1.89	1.06
1:A:228:GLN:HG3	1:A:232:THR:HG21	1.07	1.05
1:B:41:ARG:CG	1:B:64:LEU:CD2	2.36	1.04
1:B:159:TYR:H	1:B:160:TYR:HB3	1.23	1.04
1:C:246:GLN:HG3	1:C:249:LEU:HD12	1.38	1.01
1:C:243:ALA:HB1	1:C:251:ARG:NE	1.75	1.01
1:B:158:HIS:HB3	1:B:160:TYR:O	1.62	1.00
1:C:246:GLN:HG3	1:C:249:LEU:CD1	1.91	1.00
1:A:273:GLN:NE2	1:A:276:VAL:CG2	2.25	0.99

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:132:ARG:NE	1:C:159:TYR:CD2	2.30	0.98
1:C:246:GLN:HA	1:C:248:GLY:HA2	1.47	0.96
1:B:18:PHE:HE2	1:B:30:ARG:HH11	1.10	0.96
1:C:248:GLY:CA	1:C:249:LEU:HD13	1.95	0.96
1:A:267:LEU:HD13	1:A:272:ALA:HB2	1.46	0.96
1:A:252:GLU:N	1:B:162:TRP:CH2	2.21	0.95
1:C:132:ARG:CG	1:C:159:TYR:CE2	2.44	0.95
1:A:257:PHE:HB3	1:A:267:LEU:HD11	1.44	0.94
1:A:257:PHE:CB	1:A:267:LEU:HD12	1.97	0.94
1:A:273:GLN:NE2	1:A:276:VAL:HG21	1.83	0.94
1:C:132:ARG:HG2	1:C:159:TYR:HE2	0.89	0.94
1:B:247:THR:CG2	1:B:249:LEU:HD22	1.98	0.94
1:B:93:PHE:CZ	1:B:95:PRO:HG3	2.02	0.93
1:A:272:ALA:HA	1:A:275:LEU:HD21	1.51	0.93
1:A:89:ARG:HH11	1:A:89:ARG:HG2	1.31	0.92
1:A:273:GLN:HE21	1:A:276:VAL:HG23	1.33	0.92
1:C:132:ARG:HE	1:C:159:TYR:HD2	1.10	0.92
1:B:148:ALA:HB3	1:B:149:ASP:CA	1.98	0.92
1:C:280:SER:O	1:C:281:ALA:HB3	1.66	0.92
1:A:257:PHE:CB	1:A:267:LEU:CD1	2.47	0.92
1:C:266:ARG:C	1:C:267:LEU:HD22	1.91	0.91
1:B:58:GLN:HE22	1:B:86:ALA:HA	1.35	0.91
1:C:248:GLY:C	1:C:249:LEU:HD22	1.92	0.91
1:A:202:VAL:HG12	1:A:206:VAL:HG11	1.53	0.91
1:C:243:ALA:CB	1:C:251:ARG:HE	1.84	0.90
1:B:18:PHE:CE2	1:B:30:ARG:HD2	2.07	0.89
1:C:132:ARG:HH11	1:C:159:TYR:HB3	1.37	0.88
1:B:89:ARG:O	1:B:90:ALA:HB3	1.72	0.87
1:A:257:PHE:HB2	1:A:267:LEU:CD1	2.03	0.87
1:C:246:GLN:H	1:C:249:LEU:HA	1.40	0.86
1:B:57:LEU:HD22	1:B:92:ARG:HG3	1.55	0.86
1:C:261:PRO:HG3	1:C:285:TYR:CE2	2.11	0.86
1:B:18:PHE:HE2	1:B:30:ARG:NH1	1.74	0.86
1:B:159:TYR:H	1:B:160:TYR:CB	1.89	0.85
1:B:267:LEU:HD21	1:B:271:GLU:HB2	1.59	0.84
1:C:248:GLY:HA2	1:C:249:LEU:HD13	1.56	0.84
1:B:41:ARG:CD	1:B:64:LEU:HD21	2.08	0.84
1:A:132:ARG:HA	1:A:133:LEU:O	1.78	0.83
1:B:158:HIS:CB	1:B:160:TYR:O	2.26	0.82
1:A:257:PHE:HB3	1:A:267:LEU:CD1	2.07	0.82
1:B:260:ASP:OD1	1:B:265:THR:HG22	1.78	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:275:LEU:O	1:A:279:ASP:HB3	1.80	0.82
1:A:88:ARG:HG2	1:A:88:ARG:HH21	1.44	0.81
1:B:131:VAL:HG21	2:B:401:SAH:HB1	1.63	0.81
1:A:132:ARG:H	1:A:133:LEU:HB3	1.45	0.81
1:A:228:GLN:HG3	1:A:232:THR:CG2	2.01	0.81
1:B:159:TYR:N	1:B:160:TYR:O	2.14	0.81
1:A:273:GLN:NE2	1:A:276:VAL:HG23	1.92	0.81
1:A:275:LEU:HD22	1:A:275:LEU:H	1.45	0.81
1:C:280:SER:O	1:C:281:ALA:CB	2.28	0.80
1:B:18:PHE:CZ	1:B:30:ARG:HD2	2.16	0.80
1:A:88:ARG:HG2	1:A:88:ARG:NH2	1.97	0.79
1:A:273:GLN:HE21	1:A:273:GLN:HA	1.46	0.79
1:A:27:THR:HG22	1:A:224:GLN:CD	2.03	0.79
1:B:89:ARG:O	1:B:90:ALA:CB	2.30	0.79
1:C:144:LEU:O	1:C:146:ALA:N	2.16	0.79
1:B:58:GLN:NE2	1:B:86:ALA:HA	1.98	0.78
1:B:159:TYR:OH	1:B:162:TRP:CZ2	2.35	0.78
1:C:132:ARG:HH11	1:C:159:TYR:CB	1.95	0.78
1:C:77:LEU:HD22	1:C:77:LEU:O	1.83	0.78
1:B:41:ARG:HG2	1:B:64:LEU:HD23	1.61	0.78
1:C:141:ALA:O	1:C:143:ALA:N	2.18	0.77
1:B:86:ALA:O	1:B:90:ALA:HB2	1.84	0.76
1:A:273:GLN:HA	1:A:276:VAL:CG2	2.14	0.76
1:B:143:ALA:O	1:B:148:ALA:HB1	1.84	0.76
1:B:247:THR:HG21	1:B:249:LEU:CD2	2.14	0.76
1:B:45:VAL:HG23	1:B:122:LEU:HD21	1.69	0.75
1:B:41:ARG:NE	1:B:64:LEU:HD21	2.02	0.74
1:A:225:ILE:N	1:A:225:ILE:HD12	2.03	0.74
1:B:93:PHE:CE1	1:B:95:PRO:HG3	2.22	0.74
1:C:267:LEU:HD22	1:C:267:LEU:N	2.01	0.74
1:A:129:ASP:OD1	1:A:129:ASP:N	2.22	0.73
1:C:144:LEU:HG	1:C:145:ALA:H	1.52	0.73
1:C:156:ILE:O	1:C:158:HIS:N	2.22	0.73
1:B:159:TYR:CZ	1:B:162:TRP:CZ2	2.77	0.73
1:A:228:GLN:CG	1:A:232:THR:CG2	2.65	0.72
1:C:266:ARG:O	1:C:267:LEU:HD13	1.89	0.72
1:B:250:GLU:CD	1:B:250:GLU:H	1.93	0.72
1:C:260:ASP:OD2	1:C:262:GLU:HB2	1.90	0.72
1:B:143:ALA:O	1:B:148:ALA:CB	2.38	0.72
1:B:150:THR:OG1	1:B:151:ARG:N	2.22	0.71
1:C:261:PRO:HG3	1:C:285:TYR:CZ	2.25	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:248:GLY:HA3	1:C:249:LEU:HD13	1.72	0.71
1:A:27:THR:HG22	1:A:224:GLN:OE1	1.91	0.71
1:C:19:ASP:OD1	1:C:21:THR:HG22	1.89	0.71
1:A:251:ARG:HA	1:B:162:TRP:CZ3	2.26	0.71
1:C:19:ASP:CG	1:C:21:THR:HG22	2.11	0.71
1:B:245:ALA:O	1:B:248:GLY:HA2	1.92	0.70
1:B:83:ARG:O	1:B:87:PRO:HG3	1.92	0.70
1:A:74:LEU:HD12	1:A:74:LEU:N	2.02	0.70
1:B:27:THR:HG22	1:B:224:GLN:CD	2.12	0.70
1:B:57:LEU:CD2	1:B:92:ARG:HG3	2.22	0.70
1:C:229:HIS:O	1:C:232:THR:HG22	1.92	0.70
1:C:249:LEU:HD22	1:C:249:LEU:N	2.06	0.69
1:A:89:ARG:HG2	1:A:89:ARG:NH1	2.02	0.69
1:B:267:LEU:HD23	1:B:268:SER:N	2.07	0.69
1:A:200:ALA:HB3	1:A:287:GLU:HB3	1.73	0.68
1:A:252:GLU:HB2	1:B:162:TRP:CZ2	2.29	0.68
1:B:151:ARG:CG	1:B:152:ASP:H	2.05	0.68
1:B:91:ASP:N	1:B:91:ASP:OD1	2.23	0.68
1:C:139:ALA:O	1:C:143:ALA:HB3	1.93	0.68
1:B:41:ARG:CG	1:B:64:LEU:HD23	2.15	0.68
1:A:71:ASP:HB3	1:A:74:LEU:HD11	0.73	0.67
1:A:71:ASP:HB3	1:A:74:LEU:HD13	1.68	0.67
1:A:132:ARG:HA	1:A:133:LEU:C	2.15	0.67
1:C:19:ASP:OD2	1:C:21:THR:HG22	1.95	0.67
1:C:297:LEU:C	1:C:297:LEU:HD22	2.14	0.67
1:C:122:LEU:HD11	1:C:181:LEU:HD22	1.77	0.67
1:C:68:SER:HB3	1:C:96:VAL:CG2	2.25	0.67
1:B:18:PHE:CE2	1:B:30:ARG:NH1	2.60	0.66
1:B:158:HIS:O	1:B:159:TYR:HB2	1.95	0.66
1:A:161:PRO:O	1:A:162:TRP:HE3	1.78	0.66
1:B:86:ALA:N	1:B:87:PRO:HD3	2.11	0.66
1:A:164:GLU:OE2	1:A:164:GLU:N	2.27	0.65
1:A:275:LEU:HD22	1:A:275:LEU:N	2.09	0.65
1:B:148:ALA:H	1:B:149:ASP:CG	2.00	0.65
1:B:273:GLN:HA	1:B:276:VAL:CG2	2.26	0.65
1:B:212:GLU:HG2	1:C:184:ARG:CZ	2.26	0.65
1:A:251:ARG:HA	1:B:162:TRP:HZ3	1.62	0.65
1:A:71:ASP:O	1:A:74:LEU:HD12	1.97	0.65
1:A:121:CYS:SG	2:A:401:SAH:HA	2.37	0.65
1:B:271:GLU:O	1:B:274:ALA:HB3	1.96	0.65
1:C:238:VAL:HG13	1:C:270:THR:HG22	1.79	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:273:GLN:NE2	1:A:273:GLN:HA	2.11	0.64
1:A:71:ASP:CG	1:A:74:LEU:HD11	2.17	0.64
1:A:236:PHE:CE2	1:C:247:THR:HG22	2.33	0.64
1:A:266:ARG:HG2	1:A:266:ARG:NH1	2.10	0.64
1:C:19:ASP:O	1:C:26:GLU:HB2	1.97	0.64
1:B:136:PHE:HD1	1:B:154:ASP:O	1.79	0.64
1:A:267:LEU:CD1	1:A:272:ALA:HB2	2.24	0.64
1:C:158:HIS:CD2	1:C:159:TYR:CE1	2.86	0.64
1:B:86:ALA:N	1:B:87:PRO:CD	2.61	0.64
1:B:151:ARG:HG3	1:B:152:ASP:H	1.63	0.63
1:A:272:ALA:HA	1:A:275:LEU:CD2	2.27	0.63
1:C:158:HIS:HD2	1:C:159:TYR:CE1	2.15	0.63
1:A:273:GLN:HE21	1:A:273:GLN:CA	2.12	0.63
1:A:132:ARG:N	1:A:133:LEU:HB3	2.13	0.63
1:B:148:ALA:CB	1:B:149:ASP:HA	2.07	0.62
1:A:133:LEU:C	1:A:133:LEU:HD23	2.19	0.62
1:B:295:PRO:O	1:B:297:LEU:HD22	1.98	0.62
1:C:30:ARG:HD2	1:C:224:GLN:NE2	2.14	0.62
1:A:266:ARG:HG2	1:A:266:ARG:HH11	1.63	0.62
1:B:18:PHE:CE2	1:B:30:ARG:CD	2.82	0.62
1:A:228:GLN:OE1	1:A:284:ILE:HB	2.00	0.62
1:A:71:ASP:O	1:A:74:LEU:CD1	2.48	0.62
1:B:283:GLU:O	1:B:284:ILE:HD13	2.00	0.61
1:A:78:ALA:O	1:A:82:VAL:HG23	2.00	0.61
1:C:252:GLU:HG3	1:C:252:GLU:O	2.00	0.61
1:C:144:LEU:CG	1:C:145:ALA:H	2.13	0.61
1:B:126:GLY:O	1:B:201:ARG:NH2	2.33	0.61
1:A:252:GLU:HB2	1:B:162:TRP:CH2	2.36	0.60
1:A:71:ASP:CB	1:A:74:LEU:CD1	2.40	0.60
1:A:275:LEU:N	1:A:275:LEU:HD13	2.16	0.60
1:A:246:GLN:HG3	1:B:166:ASP:O	2.00	0.60
1:A:73:ARG:HG2	1:A:73:ARG:HH11	1.66	0.60
1:C:132:ARG:NH1	1:C:159:TYR:HB3	2.13	0.60
1:C:265:THR:O	1:C:265:THR:HG23	2.01	0.60
1:B:61:GLU:OE1	1:B:89:ARG:NH2	2.34	0.59
1:C:14:PRO:CG	1:C:16:PHE:CE2	2.86	0.59
1:A:273:GLN:HA	1:A:276:VAL:HG22	1.84	0.59
1:C:243:ALA:HB1	1:C:251:ARG:CD	2.32	0.59
1:B:121:CYS:SG	2:B:401:SAH:HA	2.43	0.59
1:A:119:VAL:HG12	1:A:195:VAL:HB	1.83	0.59
1:B:204:SER:OG	1:B:220:LYS:NZ	2.35	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:279:ASP:O	1:B:280:SER:HB3	2.03	0.58
1:A:275:LEU:H	1:A:275:LEU:HD13	1.66	0.58
1:B:160:TYR:HD1	1:B:161:PRO:HB3	1.69	0.58
1:C:246:GLN:H	1:C:249:LEU:CA	2.16	0.58
1:A:89:ARG:HH12	1:A:92:ARG:NH1	2.01	0.58
1:B:273:GLN:HA	1:B:276:VAL:HG22	1.84	0.58
1:B:93:PHE:CZ	1:B:95:PRO:CG	2.82	0.58
1:A:247:THR:C	1:A:249:LEU:H	2.07	0.58
1:B:48:GLY:HA2	1:B:74:LEU:HD13	1.86	0.58
1:B:56:MET:O	1:B:60:CYS:HB2	2.05	0.57
1:B:247:THR:CB	1:B:249:LEU:H	2.16	0.57
1:B:77:LEU:HD11	1:B:143:ALA:HB2	1.84	0.57
1:A:266:ARG:HH11	1:A:266:ARG:CG	2.17	0.57
1:C:14:PRO:HG2	1:C:16:PHE:CE2	2.40	0.57
1:C:141:ALA:O	1:C:142:ALA:HB3	2.04	0.57
1:B:159:TYR:N	1:B:160:TYR:HB3	2.06	0.57
1:B:88:ARG:HA	1:B:88:ARG:CZ	2.35	0.57
1:B:285:TYR:CD1	1:B:285:TYR:N	2.73	0.57
1:C:142:ALA:C	1:C:144:LEU:H	2.06	0.57
1:C:156:ILE:O	1:C:157:ALA:HB3	2.05	0.57
1:C:126:GLY:O	1:C:201:ARG:NH2	2.38	0.56
1:C:159:TYR:O	1:C:160:TYR:C	2.43	0.56
1:C:245:ALA:O	1:C:246:GLN:O	2.22	0.56
1:B:158:HIS:C	1:B:160:TYR:O	2.42	0.56
1:C:246:GLN:N	1:C:249:LEU:HA	2.16	0.56
1:A:23:PRO:O	1:A:27:THR:HG23	2.06	0.56
1:B:71:ASP:HB3	1:B:74:LEU:HG	1.86	0.56
1:C:201:ARG:NH1	1:C:228:GLN:OE1	2.38	0.56
1:B:247:THR:CB	1:B:249:LEU:N	2.69	0.56
1:B:247:THR:HB	1:B:249:LEU:N	2.21	0.56
1:B:244:LEU:HD12	1:B:250:GLU:HA	1.88	0.56
1:C:158:HIS:CD2	1:C:159:TYR:HE1	2.22	0.56
1:B:86:ALA:O	1:B:90:ALA:CB	2.53	0.56
1:B:266:ARG:HH11	1:B:266:ARG:HG2	1.70	0.56
1:C:225:ILE:HG21	1:C:261:PRO:O	2.06	0.56
1:B:283:GLU:O	1:B:284:ILE:CD1	2.54	0.56
1:A:275:LEU:O	1:A:279:ASP:CB	2.53	0.55
1:B:247:THR:HG22	1:C:236:PHE:CD2	2.41	0.55
1:B:23:PRO:O	1:B:27:THR:HG23	2.06	0.55
1:A:222:HIS:NE2	1:A:224:GLN:NE2	2.48	0.55
1:B:283:GLU:O	1:B:284:ILE:HG12	2.07	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:44:GLU:HG3	1:A:119:VAL:HG23	1.86	0.55
1:B:56:MET:CE	1:B:119:VAL:HG21	2.37	0.55
1:C:169:PRO:HG2	4:C:401:PO4:O3	2.06	0.55
1:B:136:PHE:CD1	1:B:154:ASP:O	2.59	0.55
1:B:279:ASP:C	1:B:281:ALA:H	2.10	0.55
1:A:246:GLN:OE1	1:B:168:TYR:O	2.25	0.54
1:A:273:GLN:HG3	1:A:273:GLN:O	2.07	0.54
1:B:245:ALA:O	1:B:248:GLY:CA	2.54	0.54
1:A:238:VAL:HG12	1:A:269:ALA:O	2.08	0.54
1:B:193:ASP:OD1	1:B:294:ARG:HG3	2.07	0.54
1:A:61:GLU:OE2	1:A:89:ARG:NH2	2.41	0.54
1:A:252:GLU:HB2	1:B:159:TYR:OH	2.08	0.54
1:B:221:LEU:HD11	1:B:292:ARG:HB2	1.90	0.54
1:A:77:LEU:O	1:A:80:ARG:HG3	2.08	0.53
1:B:144:LEU:CA	1:B:148:ALA:HB2	2.24	0.53
1:C:132:ARG:NE	1:C:159:TYR:HD2	1.83	0.53
1:C:156:ILE:CG2	1:C:157:ALA:N	2.72	0.53
1:B:227:LEU:HD13	1:B:285:TYR:CE2	2.44	0.52
1:B:266:ARG:HG2	1:B:266:ARG:NH1	2.23	0.52
1:C:241:GLU:C	1:C:243:ALA:H	2.11	0.52
1:C:295:PRO:O	1:C:297:LEU:N	2.43	0.52
1:B:151:ARG:CG	1:B:152:ASP:N	2.72	0.52
1:B:247:THR:N	1:B:248:GLY:HA2	2.24	0.52
1:B:158:HIS:O	1:B:159:TYR:CB	2.58	0.52
1:C:77:LEU:CD2	1:C:81:ASN:OD1	2.58	0.52
1:B:283:GLU:C	1:B:284:ILE:HG12	2.29	0.52
1:C:144:LEU:CG	1:C:145:ALA:N	2.73	0.52
1:A:202:VAL:HG12	1:A:206:VAL:CG1	2.32	0.51
1:A:225:ILE:N	1:A:225:ILE:CD1	2.73	0.51
1:B:40:LYS:O	1:B:63:ALA:HB3	2.10	0.51
1:A:275:LEU:H	1:A:275:LEU:CD2	2.10	0.51
1:B:19:ASP:OD1	1:B:20:PRO:HD2	2.10	0.51
1:C:246:GLN:HA	1:C:249:LEU:HD13	1.93	0.51
1:A:71:ASP:OD1	1:A:72:PRO:HD2	2.11	0.51
1:A:273:GLN:O	1:A:276:VAL:HG23	2.11	0.51
1:C:78:ALA:O	1:C:82:VAL:HG23	2.11	0.51
1:C:249:LEU:N	1:C:249:LEU:CD2	2.73	0.51
1:B:88:ARG:HA	1:B:88:ARG:NE	2.26	0.51
1:B:94:HIS:ND1	1:B:94:HIS:N	2.60	0.50
1:B:159:TYR:CZ	1:B:162:TRP:HZ2	2.26	0.50
1:B:283:GLU:O	1:B:284:ILE:CG1	2.59	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:67:GLY:O	1:C:96:VAL:HG22	2.11	0.50
1:B:27:THR:HG21	1:B:224:GLN:HB2	1.92	0.50
1:C:243:ALA:CB	1:C:251:ARG:NE	2.59	0.50
1:B:18:PHE:CZ	1:B:30:ARG:CD	2.92	0.50
1:C:27:THR:HG21	1:C:288:VAL:HG12	1.94	0.50
1:B:148:ALA:CB	1:B:149:ASP:CA	2.76	0.50
1:A:169:PRO:HB3	1:B:167:SER:O	2.12	0.50
1:B:144:LEU:C	1:B:146:ALA:H	2.15	0.50
1:C:268:SER:H	1:C:271:GLU:HB2	1.75	0.50
1:A:47:ILE:HD11	1:A:75:ALA:HA	1.93	0.50
1:C:68:SER:HB2	1:C:100:VAL:HB	1.94	0.50
1:B:41:ARG:HG2	1:B:64:LEU:CG	2.35	0.50
1:A:238:VAL:HG12	1:A:269:ALA:C	2.32	0.49
1:B:38:GLY:HA2	1:B:61:GLU:O	2.12	0.49
1:C:111:GLN:OE1	1:C:114:ARG:NH2	2.44	0.49
1:C:16:PHE:CD1	1:C:16:PHE:C	2.85	0.49
1:C:241:GLU:C	1:C:243:ALA:N	2.64	0.49
1:B:247:THR:CB	1:B:248:GLY:CA	2.91	0.49
1:B:159:TYR:H	1:B:160:TYR:CA	2.26	0.49
1:C:267:LEU:N	1:C:267:LEU:CD2	2.73	0.49
1:A:132:ARG:H	1:A:133:LEU:CB	2.20	0.49
1:B:278:THR:HG22	1:B:279:ASP:N	2.27	0.49
1:C:74:LEU:O	1:C:77:LEU:N	2.45	0.49
1:A:132:ARG:N	1:A:133:LEU:CB	2.75	0.49
1:A:131:VAL:HG23	1:A:131:VAL:O	2.12	0.49
1:B:156:ILE:HG22	1:B:158:HIS:CE1	2.47	0.49
1:C:144:LEU:HD12	1:C:145:ALA:N	2.28	0.49
1:B:158:HIS:CD2	1:B:158:HIS:H	2.30	0.48
1:C:14:PRO:HG3	1:C:16:PHE:CE2	2.48	0.48
1:C:229:HIS:ND1	1:C:230:ALA:N	2.60	0.48
1:B:159:TYR:CG	1:B:159:TYR:O	2.65	0.48
1:C:41:ARG:HD2	1:C:114:ARG:O	2.13	0.48
1:C:49:THR:O	1:C:78:ALA:HA	2.13	0.48
1:A:247:THR:O	1:A:249:LEU:N	2.45	0.48
1:A:272:ALA:O	1:A:275:LEU:CD2	2.61	0.48
1:B:247:THR:OG1	1:B:249:LEU:N	2.29	0.48
1:C:229:HIS:HD1	1:C:230:ALA:N	2.11	0.48
1:B:70:LEU:HD21	1:B:161:PRO:HD3	1.95	0.48
1:C:260:ASP:OD1	1:C:265:THR:HG22	2.12	0.48
1:B:159:TYR:OH	1:B:162:TRP:HZ2	1.95	0.48
1:C:30:ARG:HD2	1:C:224:GLN:HE21	1.78	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:246:GLN:CG	1:B:166:ASP:O	2.62	0.48
1:B:253:PHE:HD1	1:B:254:THR:N	2.11	0.48
1:C:241:GLU:OE1	1:C:270:THR:HG23	2.14	0.48
1:A:241:GLU:CD	1:A:269:ALA:HB3	2.34	0.48
1:B:80:ARG:O	1:B:81:ASN:C	2.50	0.48
1:B:159:TYR:CE1	1:B:162:TRP:NE1	2.82	0.48
1:B:41:ARG:HG3	1:B:64:LEU:HD23	1.92	0.48
1:C:66:SER:OG	1:C:111:GLN:HG2	2.14	0.48
1:A:73:ARG:HG2	1:A:73:ARG:NH1	2.26	0.47
1:B:159:TYR:CE1	1:B:162:TRP:CE2	3.01	0.47
1:B:160:TYR:CD1	1:B:161:PRO:HB3	2.49	0.47
1:B:27:THR:HG22	1:B:224:GLN:NE2	2.29	0.47
1:B:143:ALA:O	1:B:148:ALA:HB2	2.13	0.47
1:C:248:GLY:HA3	1:C:249:LEU:CD1	2.44	0.47
1:A:229:HIS:ND1	1:A:229:HIS:N	2.60	0.47
1:B:247:THR:HG22	1:C:236:PHE:CE2	2.48	0.47
1:B:200:ALA:HB3	1:B:287:GLU:HB3	1.96	0.47
1:A:88:ARG:HH21	1:A:88:ARG:CG	2.16	0.47
1:A:261:PRO:HB3	1:A:285:TYR:CE2	2.50	0.47
1:C:260:ASP:OD1	1:C:264:ALA:N	2.42	0.47
1:B:159:TYR:N	1:B:160:TYR:CA	2.78	0.47
1:A:252:GLU:HB2	1:B:162:TRP:HZ2	1.76	0.47
1:B:56:MET:HE3	1:B:119:VAL:HG21	1.97	0.47
1:B:267:LEU:CD2	1:B:271:GLU:HB2	2.40	0.46
1:C:136:PHE:O	1:C:139:ALA:N	2.43	0.46
1:C:273:GLN:HA	1:C:273:GLN:OE1	2.14	0.46
1:B:60:CYS:O	1:B:61:GLU:HB2	2.16	0.46
1:A:227:LEU:HD12	1:A:285:TYR:CE2	2.51	0.46
1:C:92:ARG:HG2	1:C:92:ARG:HH11	1.81	0.46
1:C:105:THR:HG23	1:C:108:ALA:H	1.81	0.46
1:B:235:SER:O	1:B:238:VAL:HG22	2.15	0.46
1:A:132:ARG:CA	1:A:133:LEU:C	2.84	0.46
1:C:77:LEU:HD22	1:C:81:ASN:OD1	2.14	0.46
1:A:168:TYR:OH	1:C:209:GLU:OE2	2.24	0.46
1:B:244:LEU:N	1:B:244:LEU:HD22	2.30	0.46
1:A:258:TYR:HB2	1:A:285:TYR:HB2	1.97	0.46
1:B:159:TYR:N	1:B:160:TYR:C	2.70	0.45
1:A:273:GLN:NE2	1:A:273:GLN:CA	2.72	0.45
1:B:272:ALA:O	1:B:276:VAL:HG22	2.16	0.45
1:A:80:ARG:O	1:A:83:ARG:N	2.50	0.45
1:C:158:HIS:C	1:C:159:TYR:CD1	2.90	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:244:LEU:HB3	1:B:249:LEU:O	2.16	0.45
1:B:247:THR:CB	1:B:248:GLY:HA2	2.47	0.45
1:B:159:TYR:O	1:B:159:TYR:CD2	2.70	0.45
1:B:246:GLN:HG2	1:C:172:SER:HA	1.98	0.45
1:C:278:THR:OG1	1:C:279:ASP:N	2.50	0.45
1:C:173:VAL:HB	1:C:202:VAL:HG11	1.98	0.45
1:C:105:THR:CG2	1:C:108:ALA:H	2.30	0.45
1:B:209:GLU:OE2	1:C:168:TYR:OH	2.25	0.44
1:B:73:ARG:H	1:B:73:ARG:HG2	1.57	0.44
1:C:105:THR:HG22	1:C:108:ALA:HB3	1.98	0.44
1:C:132:ARG:NE	1:C:159:TYR:CE2	2.73	0.44
1:A:275:LEU:H	1:A:275:LEU:CD1	2.26	0.44
1:C:157:ALA:C	1:C:159:TYR:H	2.19	0.44
1:A:89:ARG:NH1	1:A:92:ARG:NH1	2.64	0.44
1:B:156:ILE:HG13	1:B:156:ILE:O	2.18	0.44
1:B:260:ASP:OD1	1:B:265:THR:CG2	2.59	0.44
1:A:30:ARG:HD2	1:A:224:GLN:NE2	2.31	0.44
1:C:281:ALA:O	1:C:282:ALA:C	2.53	0.44
1:B:23:PRO:O	1:B:24:TRP:C	2.55	0.44
1:A:273:GLN:CA	1:A:276:VAL:HG22	2.45	0.44
1:C:142:ALA:C	1:C:144:LEU:N	2.71	0.44
1:C:193:ASP:OD1	1:C:294:ARG:HD3	2.18	0.44
1:C:243:ALA:CB	1:C:251:ARG:HG3	2.48	0.43
1:A:133:LEU:C	1:A:133:LEU:CD2	2.85	0.43
1:A:273:GLN:CA	1:A:276:VAL:CG2	2.90	0.43
1:B:279:ASP:O	1:B:281:ALA:N	2.50	0.43
1:C:60:CYS:O	1:C:61:GLU:HB2	2.18	0.43
1:C:138:THR:O	1:C:138:THR:HG22	2.17	0.43
1:A:272:ALA:HB1	1:A:284:ILE:HD12	2.00	0.43
1:B:144:LEU:C	1:B:146:ALA:N	2.72	0.43
1:B:267:LEU:HD23	1:B:267:LEU:C	2.37	0.43
1:C:14:PRO:HG3	1:C:16:PHE:HE2	1.83	0.43
1:B:44:GLU:HA	1:B:119:VAL:O	2.18	0.43
1:B:92:ARG:HE	1:B:92:ARG:HB3	1.69	0.43
1:A:121:CYS:O	2:A:401:SAH:HG2	2.18	0.43
1:B:173:VAL:HB	1:B:202:VAL:HG11	2.01	0.43
1:C:85:LEU:HD23	1:C:85:LEU:HA	1.83	0.43
1:C:156:ILE:HG22	1:C:157:ALA:H	1.84	0.43
1:B:156:ILE:CG2	1:B:158:HIS:CE1	3.02	0.43
1:B:203:GLY:HA2	1:B:256:GLU:OE1	2.18	0.43
1:C:142:ALA:O	1:C:144:LEU:N	2.46	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:34:ILE:O	1:A:34:ILE:HG22	2.19	0.42
1:B:279:ASP:C	1:B:281:ALA:N	2.72	0.42
1:C:251:ARG:HH11	1:C:251:ARG:HD2	1.70	0.42
1:C:14:PRO:HG2	1:C:16:PHE:CD2	2.54	0.42
1:C:68:SER:HB3	1:C:96:VAL:HG22	1.99	0.42
1:C:243:ALA:HB1	1:C:251:ARG:CG	2.48	0.42
1:A:60:CYS:O	1:A:61:GLU:HB2	2.19	0.42
1:B:223:SER:HB2	1:B:289:CYS:HB3	2.01	0.42
1:C:136:PHE:O	1:C:139:ALA:HB3	2.19	0.42
1:B:276:VAL:O	1:B:280:SER:HA	2.19	0.42
1:C:156:ILE:C	1:C:158:HIS:N	2.72	0.42
1:B:274:ALA:O	1:B:277:ASP:HB2	2.20	0.42
1:A:30:ARG:O	1:A:34:ILE:HG13	2.20	0.42
1:B:156:ILE:O	1:B:156:ILE:CG1	2.67	0.42
1:B:144:LEU:CD2	1:B:149:ASP:OD1	2.68	0.42
1:B:209:GLU:HG2	1:C:164:GLU:O	2.18	0.42
1:C:41:ARG:HG3	1:C:64:LEU:HB3	2.01	0.42
1:C:246:GLN:CA	1:C:248:GLY:HA2	2.34	0.42
1:A:252:GLU:CA	1:B:162:TRP:HH2	2.24	0.42
1:C:57:LEU:HA	1:C:57:LEU:HD23	1.83	0.42
1:B:267:LEU:HD23	1:B:268:SER:H	1.81	0.42
1:B:235:SER:HA	1:B:238:VAL:HG22	2.01	0.42
1:A:236:PHE:CD2	1:C:247:THR:HG22	2.55	0.41
1:B:158:HIS:CD2	1:B:158:HIS:N	2.87	0.41
1:B:162:TRP:CD1	1:B:162:TRP:N	2.88	0.41
1:C:246:GLN:HA	1:C:248:GLY:CA	2.35	0.41
1:A:247:THR:C	1:A:249:LEU:N	2.72	0.41
1:C:275:LEU:HD23	1:C:275:LEU:HA	1.89	0.41
1:C:18:PHE:HE1	1:C:55:PHE:HZ	1.67	0.41
1:C:71:ASP:OD1	1:C:73:ARG:HG3	2.21	0.41
1:C:141:ALA:C	1:C:143:ALA:N	2.72	0.41
1:C:158:HIS:O	1:C:159:TYR:CD1	2.73	0.41
1:C:168:TYR:HE1	1:C:183:ARG:HG3	1.86	0.41
1:A:201:ARG:HD2	1:A:237:PHE:CZ	2.56	0.41
1:B:92:ARG:H	1:B:92:ARG:HG2	1.59	0.41
1:B:276:VAL:O	1:B:280:SER:N	2.53	0.41
1:C:119:VAL:HG12	1:C:195:VAL:HB	2.03	0.41
1:C:210:LEU:O	1:C:214:ASN:ND2	2.47	0.41
1:A:275:LEU:HD23	1:A:284:ILE:HD11	2.02	0.40
1:B:251:ARG:CG	1:B:252:GLU:N	2.84	0.40
1:B:297:LEU:HD13	1:B:297:LEU:HA	1.93	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:32:LEU:HD13	1:B:56:MET:CE	2.51	0.40
1:B:283:GLU:H	1:B:283:GLU:HG2	1.67	0.40
1:C:47:ILE:HD11	1:C:75:ALA:HB2	2.03	0.40
1:C:77:LEU:HD21	1:C:81:ASN:OD1	2.20	0.40
1:A:240:LEU:HD23	1:A:240:LEU:HA	1.90	0.40
1:A:229:HIS:O	1:A:232:THR:HG22	2.21	0.40
1:A:279:ASP:OD1	1:A:281:ALA:N	2.40	0.40
1:B:122:LEU:HD11	1:B:181:LEU:HD22	2.03	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	254/305 (83%)	230 (91%)	24 (9%)	0	100	100
1	B	279/305 (92%)	245 (88%)	31 (11%)	3 (1%)	14	26
1	C	276/305 (90%)	247 (90%)	26 (9%)	3 (1%)	14	26
All	All	809/915 (88%)	722 (89%)	81 (10%)	6 (1%)	22	39

All (6) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	159	TYR
1	C	145	ALA
1	C	246	GLN
1	B	161	PRO
1	B	162	TRP
1	C	140	GLN

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	202/238 (85%)	179 (89%)	23 (11%)	5	11
1	B	216/238 (91%)	189 (88%)	27 (12%)	4	8
1	C	214/238 (90%)	198 (92%)	16 (8%)	13	26
All	All	632/714 (88%)	566 (90%)	66 (10%)	6	13

All (66) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	15	GLU
1	A	18	PHE
1	A	74	LEU
1	A	80	ARG
1	A	89	ARG
1	A	97	GLU
1	A	129	ASP
1	A	130	ASP
1	A	132	ARG
1	A	134	ARG
1	A	204	SER
1	A	226	VAL
1	A	228	GLN
1	A	229	HIS
1	A	246	GLN
1	A	247	THR
1	A	249	LEU
1	A	252	GLU
1	A	266	ARG
1	A	267	LEU
1	A	270	THR
1	A	273	GLN
1	A	275	LEU
1	B	20	PRO
1	B	21	THR
1	B	30	ARG

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Mol	Chain	Res	Type
1	B	40	LYS
1	B	41	ARG
1	B	64	LEU
1	B	73	ARG
1	B	80	ARG
1	B	87	PRO
1	B	91	ASP
1	B	92	ARG
1	B	94	HIS
1	B	144	LEU
1	B	151	ARG
1	B	160	TYR
1	B	212	GLU
1	B	220	LYS
1	B	223	SER
1	B	247	THR
1	B	249	LEU
1	B	251	ARG
1	B	252	GLU
1	B	253	PHE
1	B	262	GLU
1	B	267	LEU
1	B	283	GLU
1	B	297	LEU
1	C	12	HIS
1	C	77	LEU
1	C	83	ARG
1	C	129	ASP
1	C	137	ARG
1	C	144	LEU
1	C	149	ASP
1	C	156	ILE
1	C	167	SER
1	C	232	THR
1	C	244	LEU
1	C	246	GLN
1	C	247	THR
1	C	251	ARG
1	C	252	GLU
1	C	297	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	224	GLN
1	A	273	GLN
1	B	58	GLN
1	B	158	HIS
1	B	224	GLN
1	C	158	HIS
1	C	171	ASN
1	C	242	ASN

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 ⓘ

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	$\#|Z| > 2$
4	PO4	C	401	-	4,4,4	0.91	0	6,6,6	0.43	0
3	MET	B	402	-	4,8,8	0.23	0	2,9,9	0.89	0
2	SAH	A	401	-	21,28,28	1.29	2 (9%)	20,40,40	1.59	2 (10%)
2	SAH	B	401	-	21,28,28	1.24	2 (9%)	20,40,40	1.84	5 (25%)

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	MET	B	402	-	-	2/4/8/8	-
2	SAH	A	401	-	-	0/7/31/31	0/3/3/3
2	SAH	B	401	-	-	5/7/31/31	0/3/3/3

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	401	SAH	C2-N3	4.14	1.38	1.32
2	B	401	SAH	C2-N3	4.07	1.38	1.32
2	A	401	SAH	C2-N1	2.74	1.39	1.33
2	B	401	SAH	C2-N1	2.52	1.38	1.33

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	401	SAH	N3-C2-N1	-5.37	120.29	128.68
2	A	401	SAH	N3-C2-N1	-5.04	120.80	128.68
2	B	401	SAH	C5'-SD-CG	-3.22	92.60	102.27
2	A	401	SAH	C5'-SD-CG	-2.76	93.99	102.27
2	B	401	SAH	C5'-C4'-C3'	-2.66	108.42	115.06
2	B	401	SAH	O4'-C1'-C2'	-2.38	103.45	106.93
2	B	401	SAH	O4'-C4'-C5'	2.11	114.27	108.83

There are no chirality outliers.

All (7) torsion outliers are listed below:
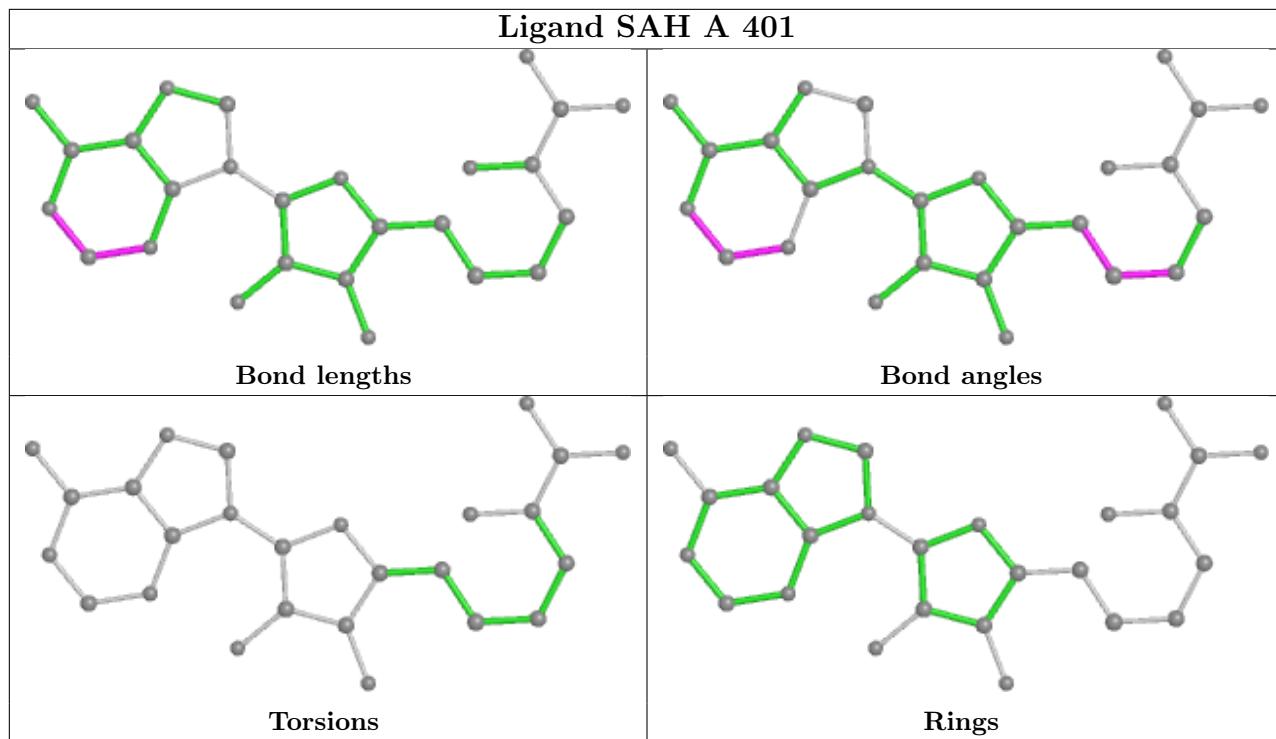
Mol	Chain	Res	Type	Atoms
2	B	401	SAH	N-CA-CB-CG
2	B	401	SAH	C-CA-CB-CG
2	B	401	SAH	O4'-C4'-C5'-SD
2	B	401	SAH	C3'-C4'-C5'-SD
3	B	402	MET	C-CA-CB-CG
2	B	401	SAH	CA-CB-CG-SD
3	B	402	MET	CA-CB-CG-SD
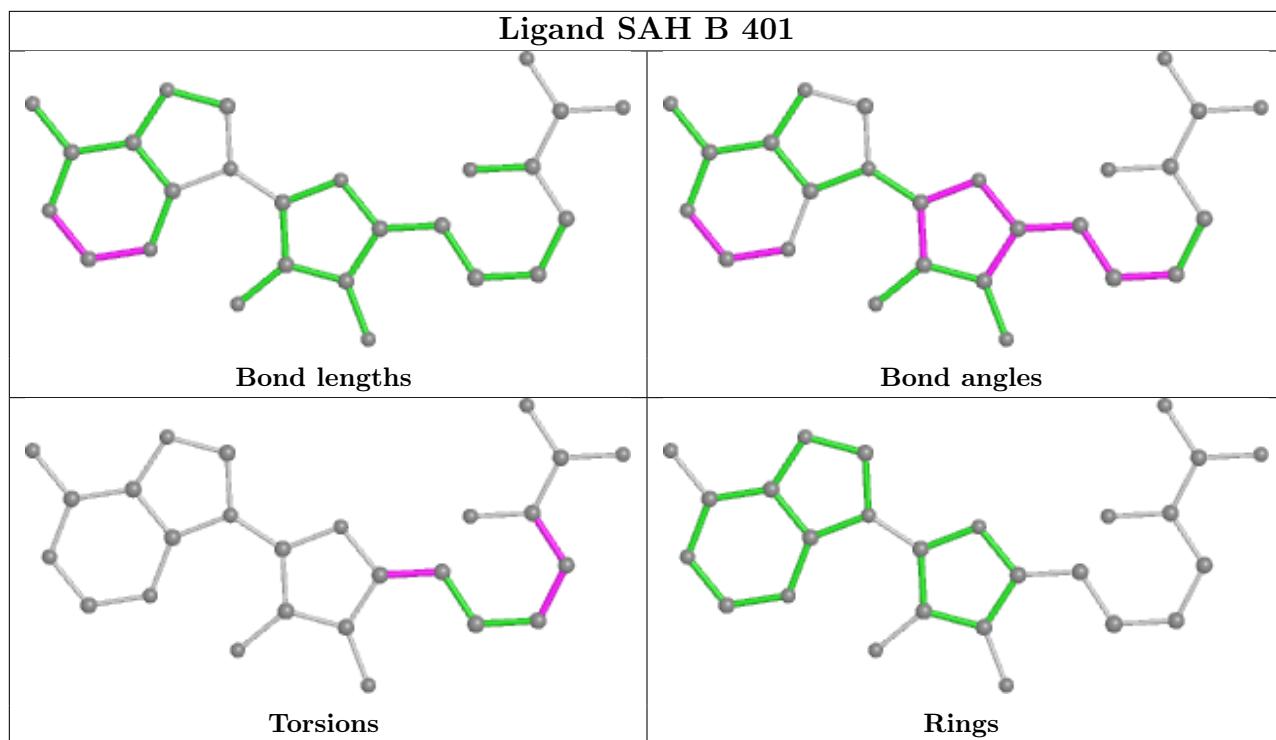
There are no ring outliers.

3 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	401	PO4	1	0
2	A	401	SAH	2	0
2	B	401	SAH	2	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 SAH A 401

Ligand SAH B 401

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	258/305 (84%)	0.81	20 (7%)	13	13	55, 72, 107, 124	0
1	B	281/305 (92%)	0.73	21 (7%)	14	14	24, 76, 108, 125	0
1	C	280/305 (91%)	0.68	15 (5%)	25	27	24, 67, 111, 141	0
All	All	819/915 (89%)	0.74	56 (6%)	17	17	24, 73, 108, 141	0

All (56) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	245	ALA	12.4
1	B	160	TYR	8.7
1	B	159	TYR	7.4
1	B	21	THR	4.8
1	A	247	THR	4.7
1	A	246	GLN	4.7
1	C	245	ALA	4.3
1	A	244	LEU	4.2
1	A	15	GLU	4.1
1	B	148	ALA	4.0
1	B	162	TRP	3.6
1	C	246	GLN	3.6
1	B	245	ALA	3.4
1	B	247	THR	3.3
1	B	156	ILE	3.2
1	A	276	VAL	3.1
1	A	236	PHE	3.0
1	B	79	GLU	2.9
1	B	57	LEU	2.9
1	A	187	ALA	2.8
1	B	149	ASP	2.8
1	C	103	ILE	2.8
1	A	284	ILE	2.7

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Mol	Chain	Res	Type	RSRZ
1	A	78	ALA	2.7
1	B	64	LEU	2.7
1	C	275	LEU	2.7
1	C	117	VAL	2.6
1	B	249	LEU	2.6
1	C	13	ALA	2.5
1	C	247	THR	2.5
1	C	12	HIS	2.5
1	C	249	LEU	2.4
1	A	234	ILE	2.4
1	B	56	MET	2.3
1	C	157	ALA	2.3
1	A	195	VAL	2.3
1	A	117	VAL	2.2
1	A	269	ALA	2.2
1	A	118	ILE	2.2
1	B	255	CYS	2.2
1	C	14	PRO	2.1
1	A	267	LEU	2.1
1	C	284	ILE	2.1
1	A	27	THR	2.1
1	C	252	GLU	2.1
1	B	253	PHE	2.1
1	C	181	LEU	2.1
1	B	89	ARG	2.1
1	A	202	VAL	2.1
1	B	288	VAL	2.1
1	B	165	PHE	2.1
1	A	77	LEU	2.0
1	A	275	LEU	2.0
1	B	177	LEU	2.0
1	C	118	ILE	2.0
1	B	93	PHE	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 ⓘ
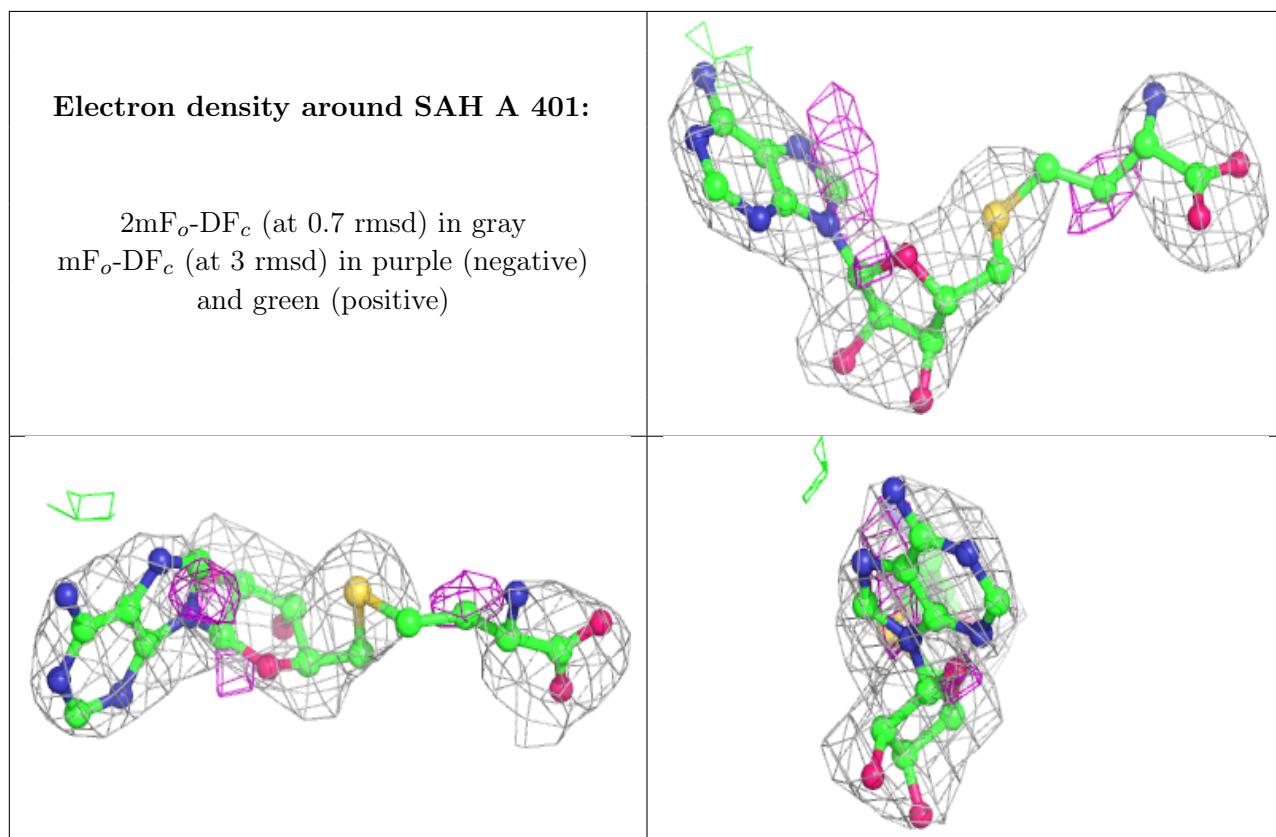
There are no monosaccharides in this entry.
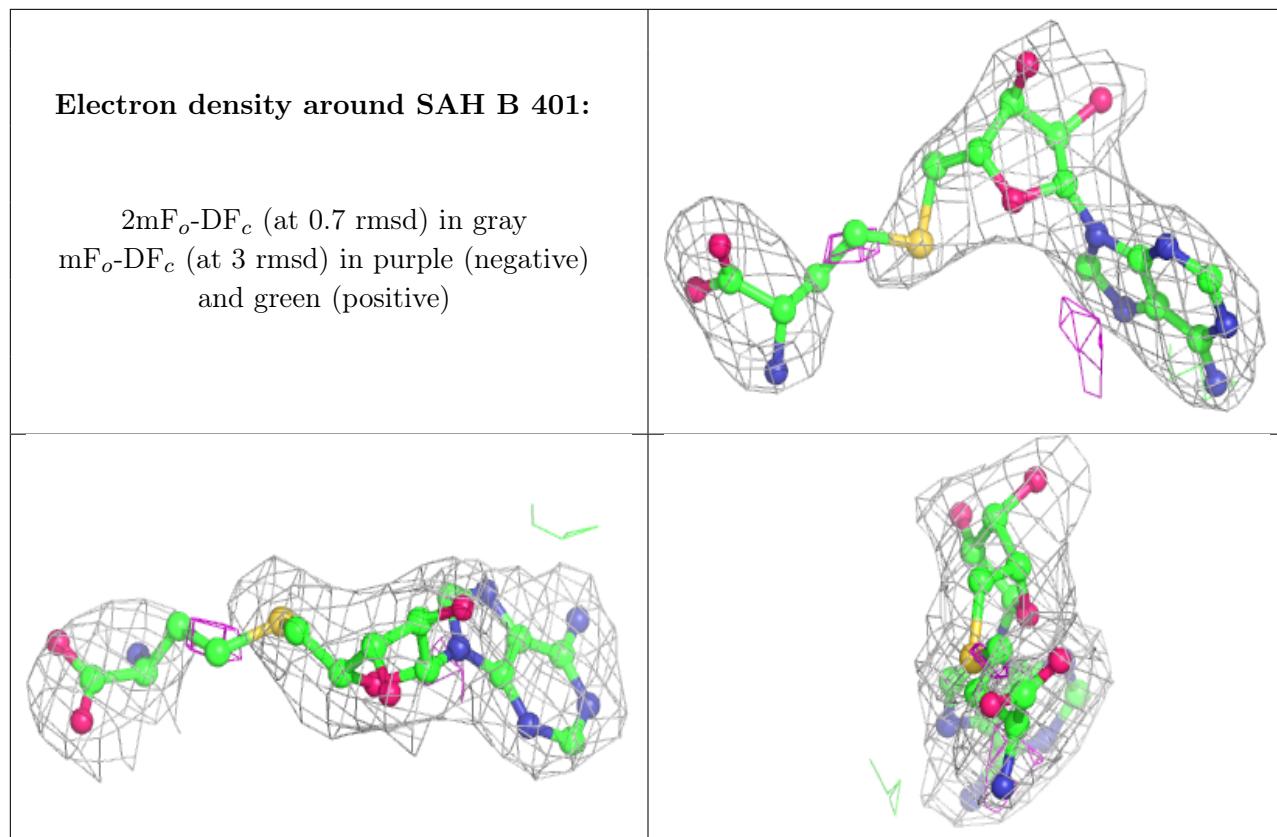
6.4 Ligands ⓘ

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
3	MET	B	402	9/9	0.66	0.37	76,81,93,107	0
4	PO4	C	401	5/5	0.79	0.87	66,73,79,86	5
2	SAH	A	401	26/26	0.88	0.36	69,87,91,92	0
2	SAH	B	401	26/26	0.89	0.23	69,82,95,104	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 SAH A 401:

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

Electron density around SAH B 401:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.