



Full wwPDB X-ray Structure Validation Report ⓘ

Sep 26, 2023 – 08:56 PM EDT

PDB ID : 6CHG
Title : Crystal structure of the yeast COMPASS catalytic module
Authors : Hsu, P.L.; Li, H.; Zheng, N.
Deposited on : 2018-02-22
Resolution : 2.98 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 : 2.35.1
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) : 2.35.1

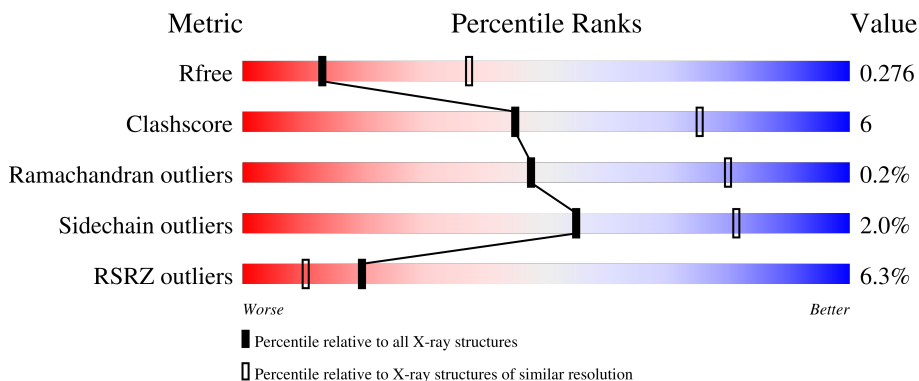
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.98 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	2754 (3.00-2.96)
Clashscore	141614	3103 (3.00-2.96)
Ramachandran outliers	138981	2993 (3.00-2.96)
Sidechain outliers	138945	2996 (3.00-2.96)
RSRZ outliers	127900	2644 (3.00-2.96)

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	312	
2	B	405	
3	C	153	
4	D	439	
5	E	61	

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
5	F	61	 <p>18% 46% 25% 30%</p>
6	J	4	 <p>75% 75% 25%</p>

2 Entry composition [i](#)

There are 9 unique types of molecules in this entry. The entry contains 21039 atoms, of which 10402 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 KLLA0E24487p.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
1	A	305	4730	1500	2361	395	455	19	0	0	0

- Molecule 2 is a protein called KLLA0C10945p.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
2	B	382	6139	1985	3011	519	609	15	0	0	0

- Molecule 3 is a protein called Histone-lysine N-methyltransferase, H3 lysine-4 specific.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
3	C	143	2297	722	1163	201	203	8	0	0	0

- Molecule 4 is a protein called KLLA0A08800p.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
4	D	408	6400	2095	3127	539	622	17	0	0	0

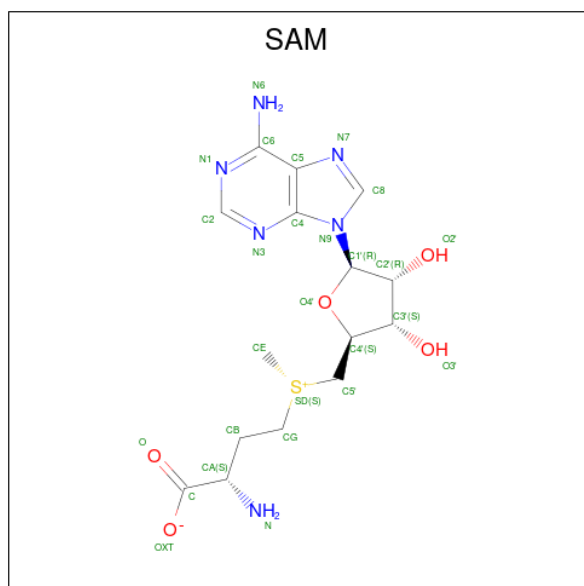
- Molecule 5 is a protein called KLLA0E03521p.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
5	E	42	697	216	355	63	62	1	0	0	0
5	F	43	670	211	341	57	59	2	0	0	0

- Molecule 6 is a protein called H3.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace	
			Total	C	H	N	O				S
6	J	3	47	14	23	4	5	1	0	0	0

- Molecule 7 is S-ADENOSYLMETHIONINE (three-letter code: SAM) (formula: C₁₅H₂₂N₆O₅S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	
			Total	C	H	N	O			S
7	C	1	48	15	21	6	5	1	0	0

- Molecule 8 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Zn		
8	C	1	1	1	0	0

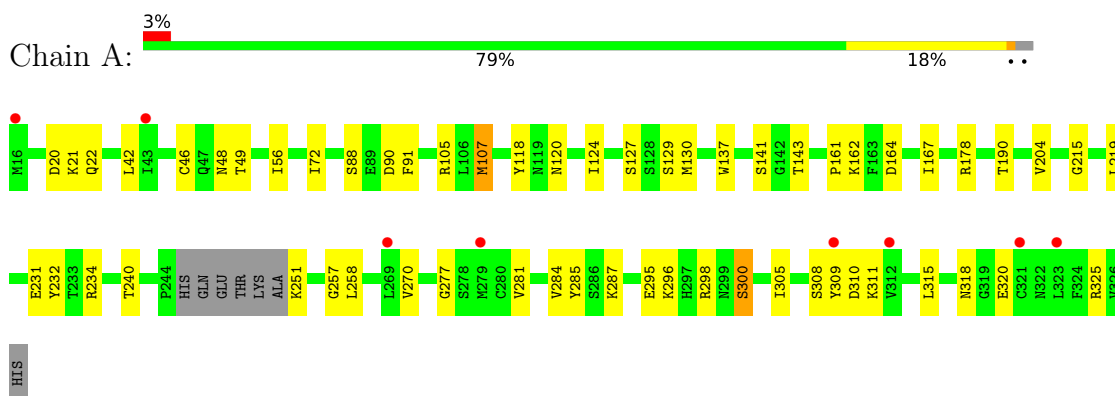
- Molecule 9 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
9	A	1	Total	O	0	0
			1	1		
9	B	3	Total	O	0	0
			3	3		
9	C	1	Total	O	0	0
			1	1		
9	D	5	Total	O	0	0
			5	5		

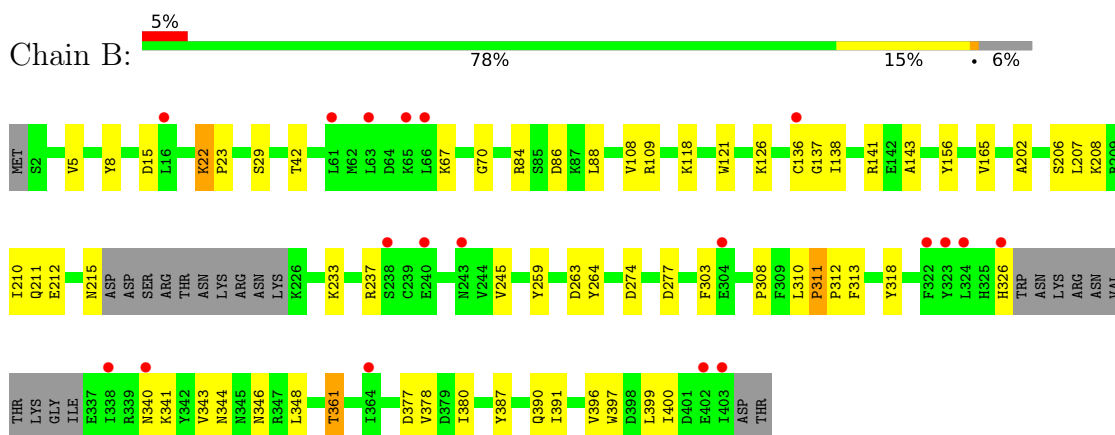
3 Residue-property plots

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.

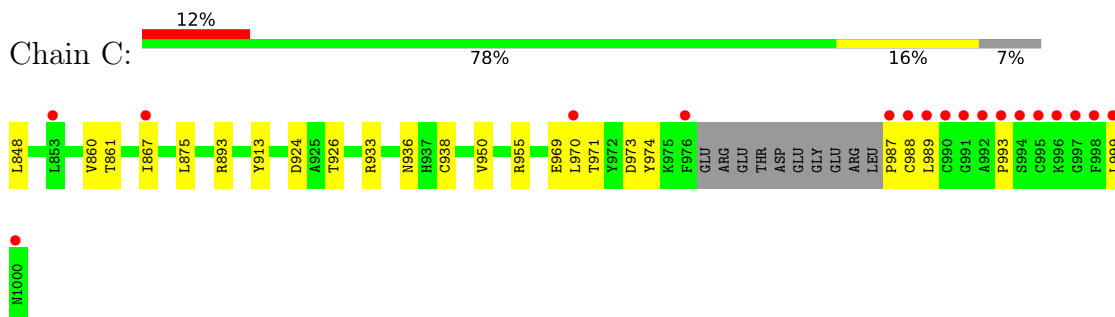
- Molecule 1: KLLA0E24487p



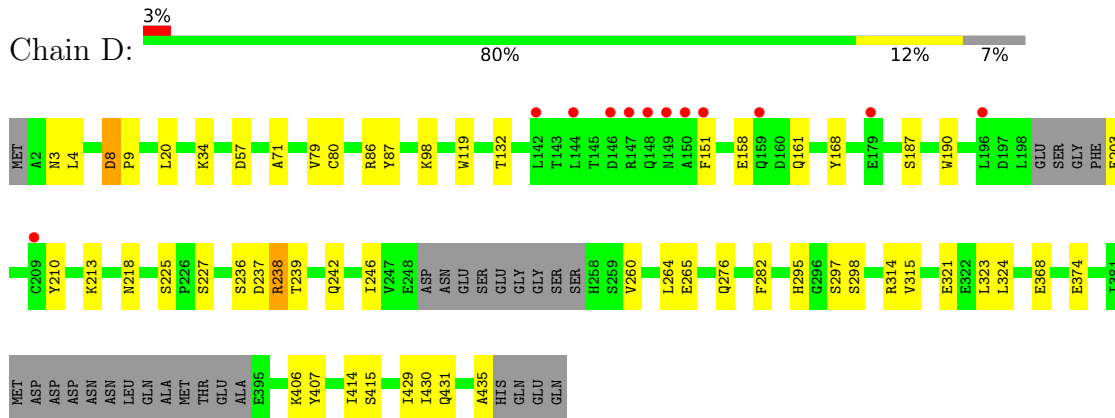
- Molecule 2: KLLA0C10945p



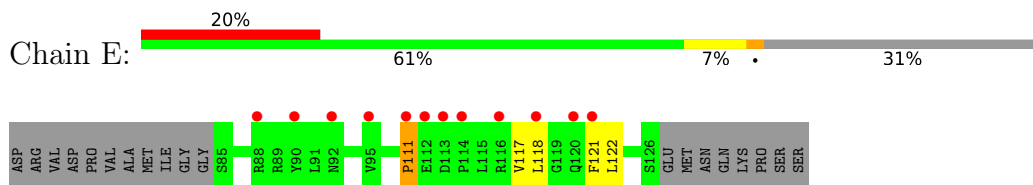
- Molecule 3: Histone-lysine N-methyltransferase, H3 lysine-4 specific



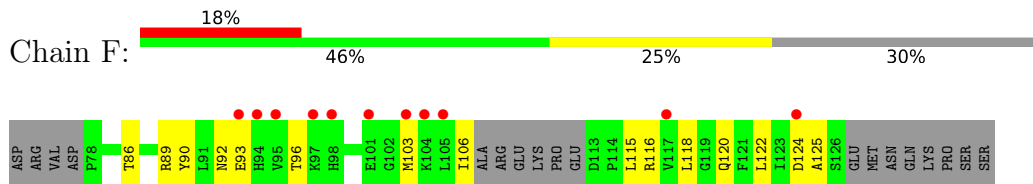
• Molecule 4: KLLA0A08800p



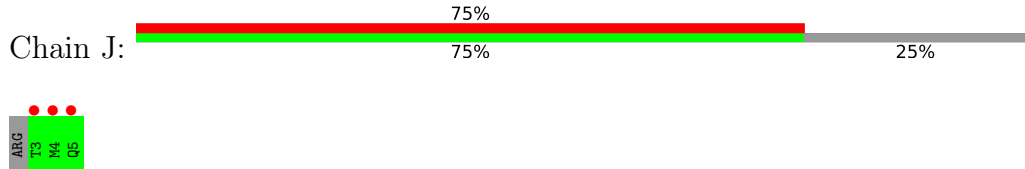
• Molecule 5: KLLA0E03521p



• Molecule 5: KLLA0E03521p



• Molecule 6: H3



4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	163.84Å 138.32Å 136.13Å 90.00° 112.41° 90.00°	Depositor
Resolution (Å)	44.61 – 2.98 48.31 – 2.99	Depositor EDS
% Data completeness (in resolution range)	95.6 (44.61-2.98) 95.6 (48.31-2.99)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.43 (at 3.01Å)	Xtrriage
Refinement program	PHENIX (1.10.1_2155: ???)	Depositor
R, R_{free}	0.228 , 0.271 0.234 , 0.276	Depositor DCC
R_{free} test set	2773 reflections (5.09%)	wwPDB-VP
Wilson B-factor (Å ²)	75.4	Xtrriage
Anisotropy	0.481	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 37.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.48$, $\langle L^2 \rangle = 0.31$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.90	EDS
Total number of atoms	21039	wwPDB-VP
Average B, all atoms (Å ²)	91.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.58% 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: ZN, SAM

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	0.26	0/2414	0.53	1/3267 (0.0%)
2	B	0.26	0/3198	0.48	0/4323
3	C	0.27	0/1154	0.53	1/1550 (0.1%)
4	D	0.25	0/3360	0.56	4/4577 (0.1%)
5	E	0.24	0/347	0.40	0/466
5	F	0.24	0/333	0.45	0/447
6	J	0.24	0/23	0.43	0/29
All	All	0.26	0/10829	0.52	6/14659 (0.0%)

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	D	324	LEU	CB-CA-C	-14.31	83.00	110.20
4	D	324	LEU	N-CA-C	9.76	137.35	111.00
4	D	238	ARG	N-CA-C	-6.61	93.15	111.00
4	D	264	LEU	CB-CA-C	-6.33	98.18	110.20
1	A	107	MET	N-CA-C	5.56	126.01	111.00
3	C	988	CYS	CB-CA-C	5.10	120.60	110.40

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	2369	2361	2380	34	0
2	B	3128	3011	3011	41	0
3	C	1134	1163	1163	19	0
4	D	3273	3127	3136	38	0
5	E	342	355	355	4	0
5	F	329	341	341	8	0
6	J	24	23	23	0	0
7	C	27	21	22	0	0
8	C	1	0	0	0	0
9	A	1	0	0	0	0
9	B	3	0	0	0	0
9	C	1	0	0	0	0
9	D	5	0	0	0	0
All	All	10637	10402	10431	136	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 6.

All (136) 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)
3:C:987:PRO:O	3:C:999:LEU:N	2.11	0.83
4:D:238:ARG:O	4:D:239:THR:HG22	1.79	0.81
5:F:124:ASP:OD1	5:F:125:ALA:N	2.18	0.77
4:D:238:ARG:O	4:D:239:THR:CG2	2.33	0.76
1:A:88:SER:OG	1:A:90:ASP:OD1	2.04	0.75
4:D:236:SER:O	4:D:276:GLN:NE2	2.20	0.75
1:A:231:GLU:OE2	1:A:234:ARG:NH1	2.20	0.74
2:B:311:PRO:HB2	2:B:312:PRO:HD3	1.69	0.74
2:B:109:ARG:NH2	2:B:143:ALA:O	2.21	0.73
1:A:127:SER:HG	1:A:137:TRP:HE1	1.41	0.68
3:C:987:PRO:O	3:C:999:LEU:HB2	1.93	0.68
1:A:105:ARG:NH2	1:A:107:MET:SD	2.69	0.66
1:A:164:ASP:OD2	4:D:3:ASN:HB2	1.97	0.64
4:D:203:GLU:N	4:D:203:GLU:OE1	2.31	0.63
4:D:314:ARG:NH1	4:D:315:VAL:O	2.33	0.61
2:B:70:GLY:O	5:F:89:ARG:NH1	2.34	0.60
3:C:973:ASP:OD1	3:C:974:TYR:N	2.35	0.59
1:A:308:SER:O	1:A:309:TYR:C	2.42	0.58
1:A:120:ASN:ND2	1:A:162:LYS:O	2.37	0.58
4:D:242:GLN:NE2	4:D:265:GLU:OE2	2.38	0.57
2:B:387:TYR:O	2:B:391:ILE:HD12	2.05	0.56

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:311:PRO:CB	2:B:312:PRO:HD3	2.35	0.55
2:B:310:LEU:HB3	2:B:311:PRO:HD3	1.89	0.55
4:D:8:ASP:N	4:D:9:PRO:CD	2.70	0.54
3:C:936:ASN:ND2	3:C:969:GLU:OE2	2.40	0.54
3:C:987:PRO:HD2	3:C:999:LEU:HB3	1.90	0.54
3:C:987:PRO:HG2	3:C:999:LEU:HB2	1.89	0.54
2:B:387:TYR:O	2:B:390:GLN:N	2.41	0.54
3:C:893:ARG:HD3	4:D:374:GLU:OE2	2.09	0.53
4:D:86:ARG:NH1	4:D:87:TYR:OH	2.41	0.53
4:D:297:SER:O	4:D:298:SER:OG	2.19	0.53
5:F:90:TYR:O	5:F:93:GLU:N	2.40	0.53
2:B:165:VAL:CG1	2:B:303:PHE:CZ	2.92	0.53
1:A:72:ILE:HA	1:A:88:SER:HA	1.89	0.53
2:B:202:ALA:HB1	2:B:311:PRO:CG	2.39	0.52
4:D:71:ALA:O	4:D:98:LYS:NZ	2.42	0.52
2:B:121:TRP:CZ2	2:B:138:ILE:HD11	2.45	0.52
2:B:264:TYR:CZ	2:B:348:LEU:HD21	2.46	0.51
3:C:867:ILE:HG23	3:C:989:LEU:O	2.09	0.51
4:D:238:ARG:C	4:D:239:THR:CG2	2.78	0.51
2:B:344:ASN:OD1	2:B:346:ASN:N	2.43	0.50
3:C:950:VAL:HG21	3:C:955:ARG:NH1	2.26	0.50
1:A:129:SER:OG	1:A:130:MET:N	2.45	0.50
1:A:124:ILE:HD11	4:D:57:ASP:HB3	1.94	0.50
3:C:860:VAL:HG11	3:C:970:LEU:HD11	1.95	0.49
2:B:5:VAL:HG11	2:B:67:LYS:HB2	1.94	0.49
2:B:88:LEU:CD2	2:B:108:VAL:HB	2.43	0.48
4:D:210:TYR:HB2	4:D:260:VAL:HG11	1.96	0.48
1:A:20:ASP:OD1	1:A:325:ARG:NH1	2.47	0.48
2:B:22:LYS:N	2:B:23:PRO:CD	2.77	0.47
3:C:987:PRO:O	3:C:999:LEU:CA	2.62	0.47
4:D:158:GLU:HB3	4:D:161:GLN:HB2	1.96	0.47
2:B:311:PRO:CB	2:B:312:PRO:CD	2.93	0.47
1:A:300:SER:OG	1:A:318:ASN:OD1	2.32	0.47
4:D:238:ARG:C	4:D:239:THR:HG23	2.35	0.47
2:B:308:PRO:O	2:B:313:PHE:HB3	2.15	0.46
3:C:893:ARG:CD	4:D:374:GLU:OE2	2.63	0.46
5:E:111:PRO:HG3	5:E:117:VAL:HG21	1.97	0.46
2:B:121:TRP:CH2	2:B:138:ILE:HD11	2.50	0.46
2:B:206:SER:O	2:B:210:ILE:HG23	2.15	0.46
2:B:377:ASP:OD2	2:B:378:VAL:N	2.49	0.46
2:B:207:LEU:O	2:B:210:ILE:HG12	2.15	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:311:PRO:HB2	2:B:312:PRO:CD	2.44	0.46
1:A:215:GLY:O	1:A:232:TYR:OH	2.28	0.46
1:A:257:GLY:O	1:A:305:ILE:HD13	2.16	0.46
1:A:308:SER:O	1:A:310:ASP:N	2.48	0.46
4:D:8:ASP:N	4:D:8:ASP:OD2	2.45	0.46
3:C:987:PRO:O	3:C:999:LEU:CB	2.62	0.46
4:D:414:ILE:O	4:D:415:SER:HB2	2.14	0.46
4:D:237:ASP:O	4:D:239:THR:N	2.48	0.46
3:C:924:ASP:OD1	3:C:926:THR:HG23	2.16	0.46
5:F:92:ASN:HA	5:F:96:THR:OG1	2.15	0.46
2:B:233:LYS:NZ	2:B:237:ARG:HD2	2.30	0.46
2:B:274:ASP:OD2	2:B:277:ASP:OD2	2.34	0.45
2:B:318:TYR:CG	2:B:341:LYS:HG2	2.52	0.45
2:B:396:VAL:O	2:B:400:ILE:HD12	2.16	0.45
1:A:161:PRO:HG2	1:A:164:ASP:O	2.16	0.45
2:B:245:VAL:HB	2:B:343:VAL:HG21	1.99	0.45
1:A:48:ASN:O	1:A:49:THR:HG22	2.16	0.45
1:A:46:CYS:HB2	1:A:72:ILE:HD11	1.99	0.45
4:D:246:ILE:O	4:D:260:VAL:HA	2.17	0.45
2:B:118:LYS:HB2	2:B:380:ILE:HG22	1.99	0.44
3:C:913:TYR:HD1	3:C:926:THR:HG22	1.82	0.44
1:A:219:LEU:CD2	1:A:258:LEU:HD21	2.47	0.44
3:C:861:THR:HG22	3:C:875:LEU:HD21	1.99	0.44
5:E:122:LEU:CD2	5:F:118:LEU:HD12	2.47	0.44
1:A:56:ILE:HD12	1:A:311:LYS:HE3	1.99	0.44
1:A:270:VAL:CG2	1:A:284:VAL:HG12	2.47	0.44
1:A:204:VAL:HG23	1:A:204:VAL:O	2.17	0.44
1:A:240:THR:O	1:A:287:LYS:NZ	2.48	0.44
1:A:141:SER:OG	1:A:143:THR:HG22	2.18	0.43
2:B:126:LYS:HB2	2:B:361:THR:OG1	2.18	0.43
2:B:141:ARG:HG2	2:B:263:ASP:OD1	2.17	0.43
2:B:86:ASP:N	2:B:86:ASP:OD1	2.52	0.43
4:D:429:ILE:HD12	4:D:430:ILE:N	2.34	0.43
1:A:270:VAL:HG23	1:A:284:VAL:HG12	1.99	0.43
1:A:295:GLU:OE2	1:A:298:ARG:NH2	2.52	0.43
4:D:168:TYR:O	4:D:187:SER:N	2.52	0.43
2:B:156:TYR:HB3	2:B:303:PHE:CE2	2.54	0.43
3:C:926:THR:O	3:C:933:ARG:NH2	2.52	0.43
2:B:208:LYS:O	2:B:212:GLU:HB2	2.19	0.43
2:B:42:THR:OG1	2:B:84:ARG:NH2	2.52	0.42
4:D:238:ARG:HG2	4:D:276:GLN:HG2	1.99	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:D:295:HIS:ND1	4:D:295:HIS:O	2.53	0.42
1:A:178:ARG:HH11	1:A:190:THR:HG21	1.84	0.42
1:A:284:VAL:HG23	1:A:285:TYR:CD1	2.55	0.42
1:A:277:GLY:O	1:A:296:LYS:O	2.37	0.42
4:D:406:LYS:NZ	4:D:407:TYR:CZ	2.87	0.42
4:D:431:GLN:HA	4:D:435:ALA:HA	2.02	0.42
2:B:137:GLY:O	2:B:138:ILE:HD12	2.20	0.41
2:B:211:GLN:O	2:B:215:ASN:N	2.53	0.41
2:B:311:PRO:HG2	2:B:312:PRO:CD	2.50	0.41
3:C:913:TYR:CD1	3:C:926:THR:HA	2.55	0.41
4:D:225:SER:O	4:D:227:SER:N	2.53	0.41
1:A:20:ASP:OD2	1:A:21:LYS:HG3	2.20	0.41
2:B:311:PRO:CG	2:B:312:PRO:CD	2.98	0.41
4:D:34:LYS:HB3	4:D:79:VAL:HG23	2.02	0.41
4:D:321:GLU:O	4:D:323:LEU:CD1	2.68	0.41
5:F:103:MET:O	5:F:106:ILE:N	2.54	0.41
2:B:396:VAL:HG13	2:B:397:TRP:N	2.36	0.41
5:E:118:LEU:O	5:E:121:PHE:N	2.54	0.41
1:A:257:GLY:C	1:A:305:ILE:HD13	2.41	0.41
5:F:115:LEU:HD12	5:F:116:ARG:N	2.36	0.41
1:A:318:ASN:O	1:A:320:GLU:N	2.54	0.41
4:D:8:ASP:N	4:D:9:PRO:HD3	2.36	0.41
4:D:119:TRP:HB2	4:D:132:THR:OG1	2.21	0.41
5:E:118:LEU:HB2	5:F:122:LEU:HD21	2.03	0.41
2:B:8:TYR:CE1	2:B:67:LYS:HB3	2.57	0.40
4:D:187:SER:O	4:D:218:ASN:ND2	2.41	0.40
3:C:938:CYS:HB3	3:C:971:THR:CG2	2.51	0.40
4:D:238:ARG:O	4:D:239:THR:HG23	2.18	0.40
1:A:91:PHE:N	1:A:91:PHE:CD1	2.89	0.40
2:B:211:GLN:HG3	2:B:233:LYS:HE2	2.04	0.40
4:D:190:TRP:NE1	4:D:213:LYS:HD2	2.36	0.40
1:A:167:ILE:HG23	4:D:4:LEU:HD23	2.03	0.40
4:D:368:GLU:HA	4:D:368:GLU:OE2	2.22	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	301/312 (96%)	277 (92%)	24 (8%)	0	100	100
2	B	376/405 (93%)	358 (95%)	17 (4%)	1 (0%)	41	74
3	C	139/153 (91%)	127 (91%)	11 (8%)	1 (1%)	22	58
4	D	400/439 (91%)	368 (92%)	32 (8%)	0	100	100
5	E	40/61 (66%)	37 (92%)	2 (5%)	1 (2%)	5	26
5	F	39/61 (64%)	35 (90%)	4 (10%)	0	100	100
6	J	1/4 (25%)	1 (100%)	0	0	100	100
All	All	1296/1435 (90%)	1203 (93%)	90 (7%)	3 (0%)	47	80

All (3) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	311	PRO
5	E	111	PRO
3	C	993	PRO

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	276/283 (98%)	269 (98%)	7 (2%)	47	77
2	B	352/375 (94%)	343 (97%)	9 (3%)	46	76
3	C	122/131 (93%)	121 (99%)	1 (1%)	81	92

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	D	360/387 (93%)	355 (99%)	5 (1%)	67	86
5	E	38/54 (70%)	38 (100%)	0	100	100
5	F	36/54 (67%)	34 (94%)	2 (6%)	21	54
6	J	3/4 (75%)	3 (100%)	0	100	100
All	All	1187/1288 (92%)	1163 (98%)	24 (2%)	55	81

All (24) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	22	GLN
1	A	42	LEU
1	A	118	TYR
1	A	251	LYS
1	A	281	VAL
1	A	300	SER
1	A	315	LEU
2	B	15	ASP
2	B	22	LYS
2	B	29	SER
2	B	136	CYS
2	B	259	TYR
2	B	326	HIS
2	B	340	ASN
2	B	361	THR
2	B	399	LEU
3	C	848	LEU
4	D	8	ASP
4	D	20	LEU
4	D	80	CYS
4	D	151	PHE
4	D	282	PHE
5	F	86	THR
5	F	120	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
5	F	94	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 [i](#)

Of 2 ligands modelled in this entry, 1 is monoatomic - leaving 1 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
7	SAM	C	1101	-	24,29,29	1.24	3 (12%)	23,42,42	1.62	4 (17%)

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
7	SAM	C	1101	-	-	5/12/33/33	0/3/3/3

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
7	C	1101	SAM	C2-N3	4.17	1.38	1.32
7	C	1101	SAM	C2-N1	2.48	1.38	1.33
7	C	1101	SAM	OXT-C	-2.09	1.23	1.30

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	C	1101	SAM	N3-C2-N1	-5.29	120.42	128.68
7	C	1101	SAM	C3'-C2'-C1'	2.78	105.17	100.98
7	C	1101	SAM	OXT-C-O	-2.72	117.91	124.09
7	C	1101	SAM	OXT-C-CA	2.21	120.92	113.38

There are no chirality outliers.

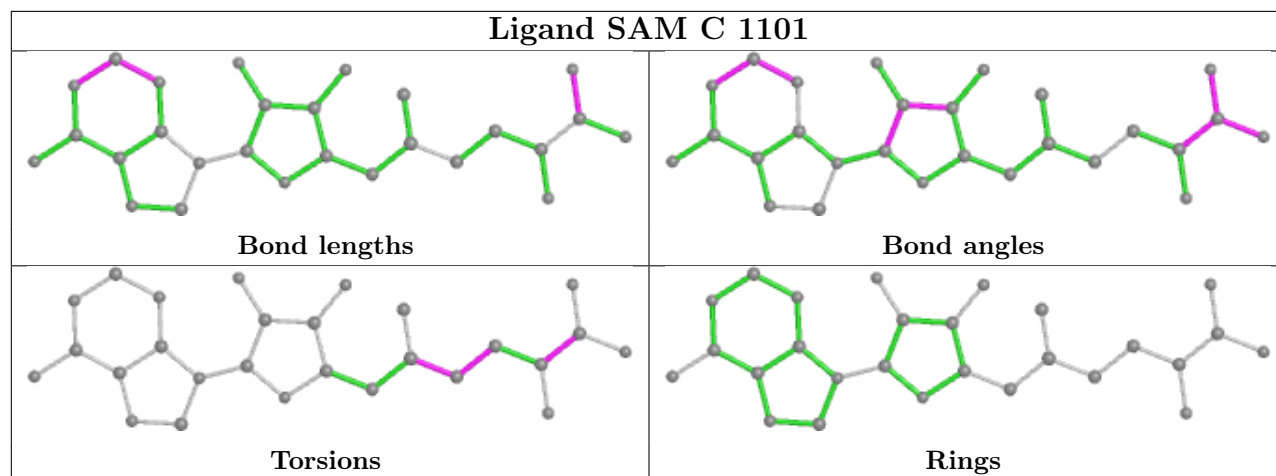
All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
7	C	1101	SAM	CA-CB-CG-SD
7	C	1101	SAM	CB-CG-SD-CE
7	C	1101	SAM	CB-CG-SD-C5'
7	C	1101	SAM	O-C-CA-CB
7	C	1101	SAM	OXT-C-CA-CB

There are no ring outliers.

No monomer is involved in short contacts.

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	305/312 (97%)	0.53	8 (2%) 56 36	48, 76, 109, 127	0
2	B	382/405 (94%)	0.60	19 (4%) 28 17	51, 79, 119, 149	0
3	C	143/153 (93%)	0.77	18 (12%) 3 2	51, 77, 157, 171	0
4	D	408/439 (92%)	0.33	12 (2%) 51 32	47, 77, 110, 146	0
5	E	42/61 (68%)	1.27	12 (28%) 0 0	98, 124, 144, 149	0
5	F	43/61 (70%)	1.08	11 (25%) 0 0	83, 117, 140, 150	0
6	J	3/4 (75%)	2.40	3 (100%) 0 0	90, 90, 99, 102	1 (33%)
All	All	1326/1435 (92%)	0.56	83 (6%) 20 10	47, 79, 129, 171	1 (0%)

All (83) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	C	989	LEU	9.7
1	A	309	TYR	6.2
3	C	988	CYS	6.2
3	C	1000	ASN	5.9
3	C	990	CYS	5.9
2	B	61	LEU	5.5
3	C	999	LEU	5.4
3	C	993	PRO	5.0
3	C	998	PHE	4.5
4	D	150	ALA	4.3
3	C	991	GLY	4.1
3	C	995	CYS	4.0
3	C	976	PHE	4.0
2	B	136	CYS	4.0
3	C	994	SER	4.0
3	C	997	GLY	3.8
4	D	151	PHE	3.7

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
5	E	113	ASP	3.6
2	B	65	LYS	3.6
5	E	120	GLN	3.6
3	C	853	LEU	3.5
3	C	996	LYS	3.5
2	B	326	HIS	3.5
4	D	149	ASN	3.5
4	D	147	ARG	3.5
5	E	112	GLU	3.5
2	B	402	GLU	3.4
5	E	118	LEU	3.3
4	D	146	ASP	3.3
3	C	987	PRO	3.2
5	F	98	HIS	3.2
5	E	121	PHE	3.2
5	F	97	LYS	3.1
1	A	323	LEU	3.1
2	B	323	TYR	3.0
3	C	992	ALA	3.0
4	D	142	LEU	3.0
2	B	243	ASN	3.0
4	D	159	GLN	2.9
5	F	93	GLU	2.9
5	F	103	MET	2.9
1	A	43	ILE	2.8
2	B	364	ILE	2.8
2	B	238	SER	2.8
2	B	340	ASN	2.8
1	A	321	CYS	2.8
6	J	4	MET	2.8
5	F	94	HIS	2.7
5	E	116	ARG	2.7
2	B	324	LEU	2.7
5	F	101	GLU	2.6
1	A	279	MET	2.6
2	B	322	PHE	2.6
1	A	269	LEU	2.6
5	F	117	VAL	2.5
2	B	240	GLU	2.5
4	D	179	GLU	2.5
2	B	66	LEU	2.5
5	E	88	ARG	2.5

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
5	E	114	PRO	2.4
5	F	95	VAL	2.4
4	D	196	LEU	2.4
1	A	312	VAL	2.4
5	E	90	TYR	2.4
1	A	16	MET	2.3
2	B	338	ILE	2.3
6	J	5	GLN	2.3
4	D	144	LEU	2.3
4	D	148	GLN	2.3
2	B	63	LEU	2.3
5	F	105	LEU	2.3
4	D	209	CYS	2.3
5	F	104	LYS	2.2
5	F	124	ASP	2.2
5	E	111	PRO	2.2
2	B	403	ILE	2.2
2	B	304	GLU	2.2
5	E	95	VAL	2.2
3	C	970	LEU	2.1
6	J	3	THR	2.1
3	C	867	ILE	2.1
2	B	16	LEU	2.1
5	E	92	ASN	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](#)

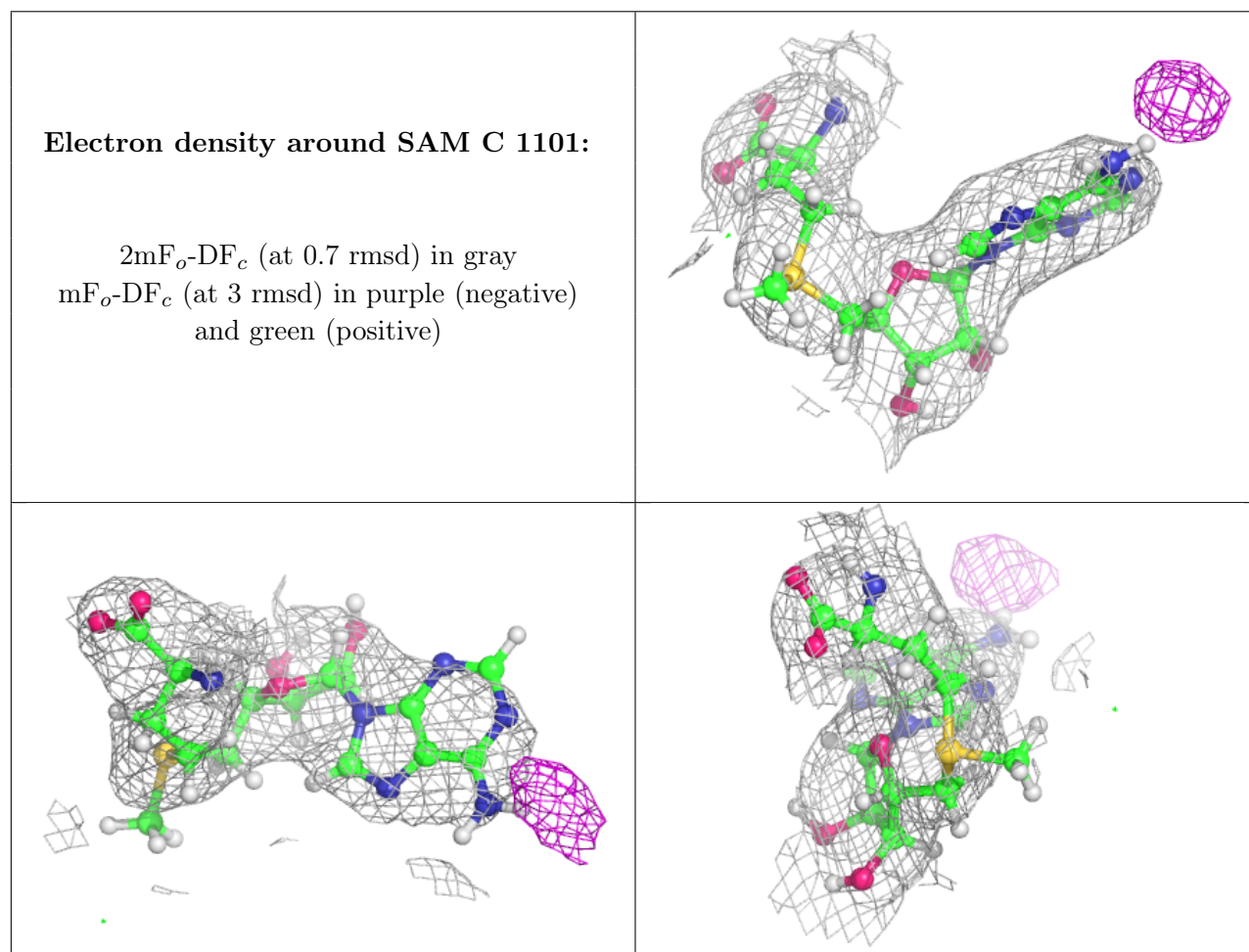
There are no monosaccharides in this entry.

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(\AA^2)	Q<0.9
8	ZN	C	1102	1/1	0.14	0.12	115,115,115,115	1
7	SAM	C	1101	27/27	0.93	0.32	66,98,132,139	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.



6.5 Other polymers [i](#)

There are no such residues in this entry.