



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 07:20 AM UTC

PDB ID : 2EG5 / pdb_00002eg5
Title : The structure of xanthosine methyltransferase
Authors : McCarthy, A.A.; McCarthy, J.G.
Deposited on : 2007-02-28
Resolution : 2.20 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 : 4-5-2 with Phenix2.0
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0
EDS : 3.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4 : 9.0.010 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

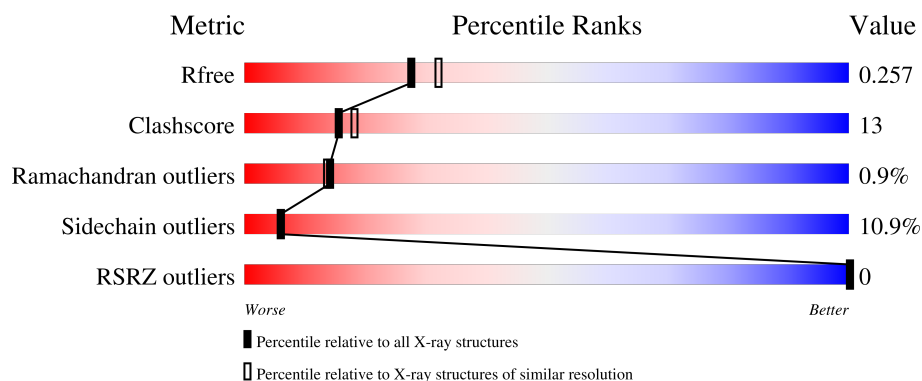
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 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}	180053	6164 (2.20-2.20)
Clashscore	190562	6851 (2.20-2.20)
Ramachandran outliers	187476	6768 (2.20-2.20)
Sidechain outliers	187428	6769 (2.20-2.20)
RSRZ outliers	180081	6166 (2.20-2.20)

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	372	 68% 19% 5% 8%
1	C	372	 66% 21% 5% 8%
1	E	372	 66% 23% 5% 7%
1	G	372	 66% 22% 5% 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
3	XTS	A	502	-	-	X	-
3	XTS	E	2502	-	-	X	-
3	XTS	G	3502	-	-	X	-

2 Entry composition [i](#)

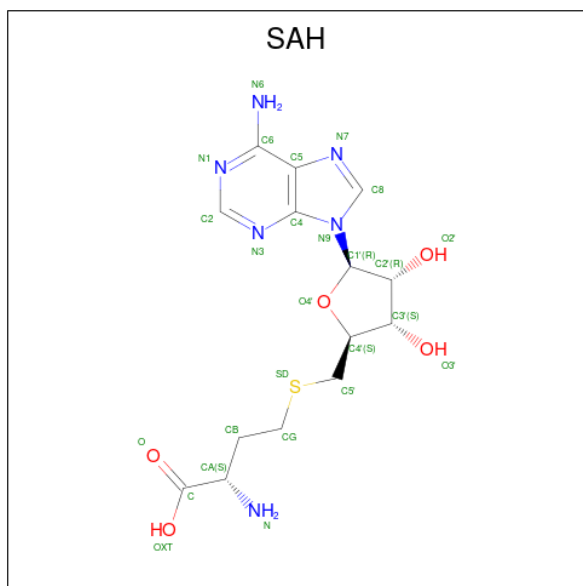
There are 4 unique types of molecules in this entry. The entry contains 11430 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 Xanthosine methyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	344	Total	C	N	O	S	0	3	0
			2701	1744	449	495	13			
1	C	344	Total	C	N	O	S	0	3	0
			2681	1734	444	490	13			
1	E	346	Total	C	N	O	S	0	4	0
			2698	1745	444	494	15			
1	G	343	Total	C	N	O	S	0	3	0
			2667	1725	440	489	13			

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



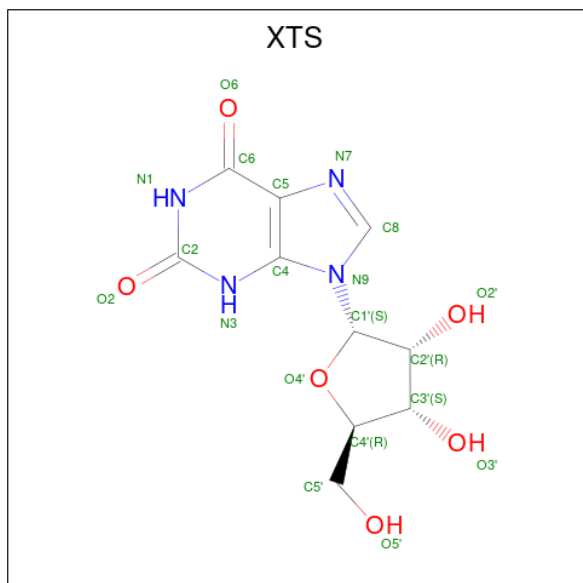
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	N	O	S	0	0
			26	14	6	5	1		
2	C	1	Total	C	N	O	S	0	0
			26	14	6	5	1		

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

- Molecule 3 is 9-[(2R,3R,4S,5R)-3,4-DIHYDROXY-5-(HYDROXYMETHYL)OXOLAN-2-YL]-3H-PURINE-2,6-DIONE (CCD ID: XTS) (formula: C₁₀H₁₂N₄O₆).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			20	10	4	6		
3	C	1	Total	C	N	O	0	0
			20	10	4	6		
3	E	1	Total	C	N	O	0	0
			20	10	4	6		
3	G	1	Total	C	N	O	0	0
			20	10	4	6		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	156	Total	O	0	0
			156	156		
4	C	132	Total	O	0	0
			132	132		
4	E	114	Total	O	0	0
			114	114		

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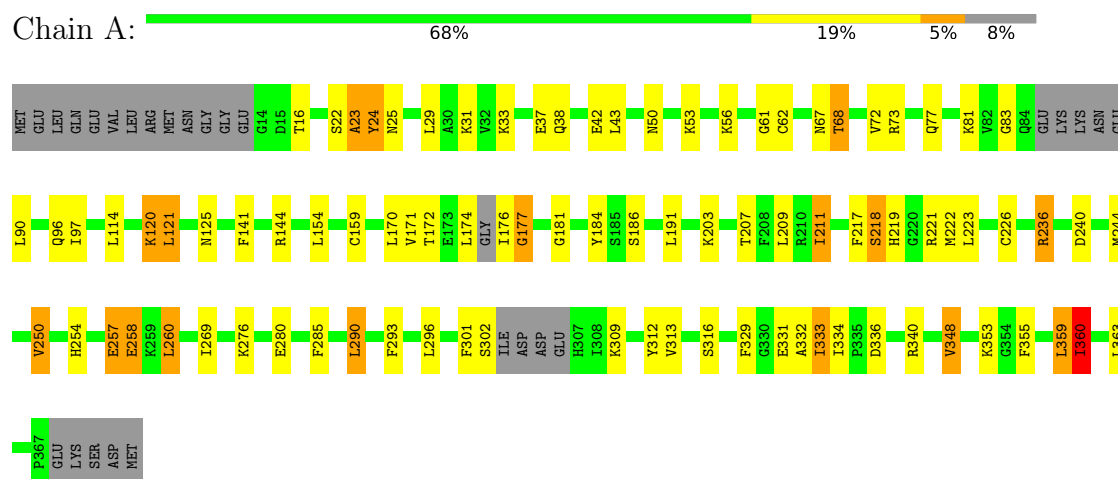
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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	G	97	Total	O	0	0
			97	97		

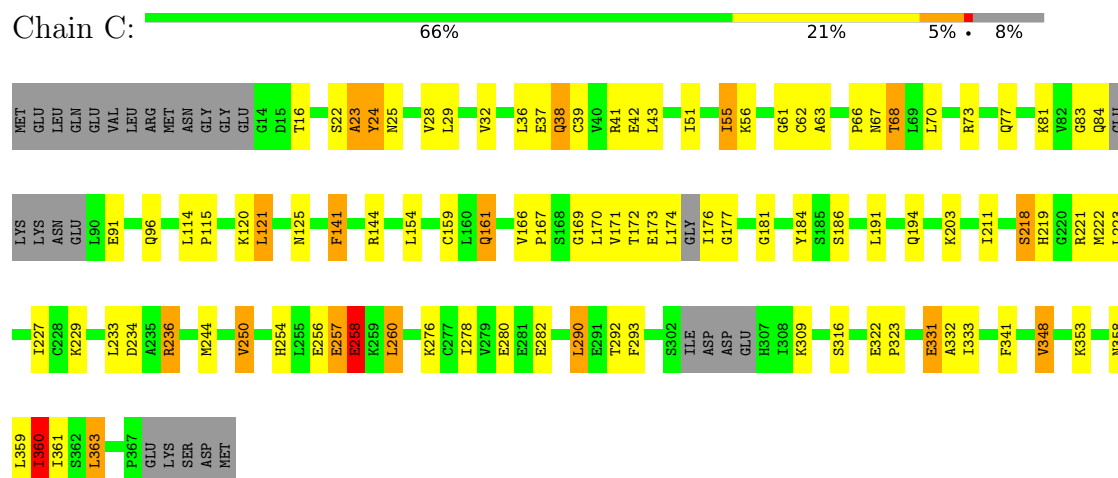
3 Residue-property plots

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: Xanthosine methyltransferase

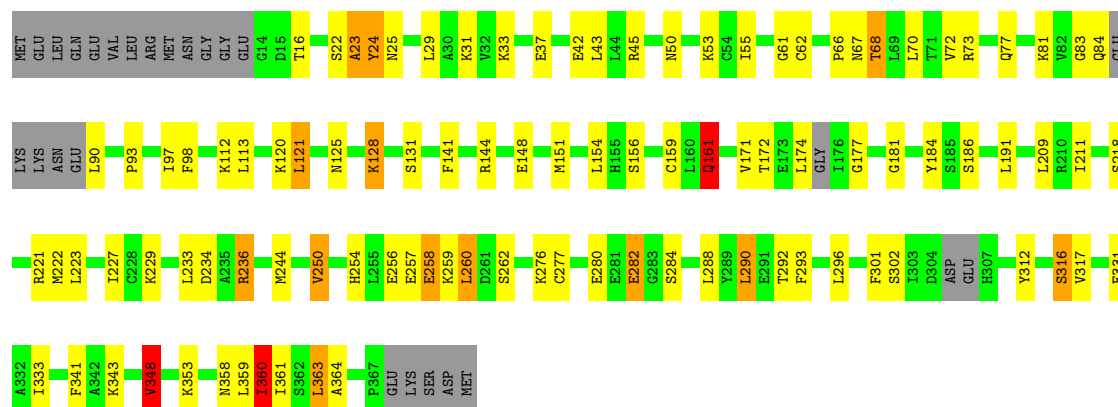


• Molecule 1: Xanthosine methyltransferase

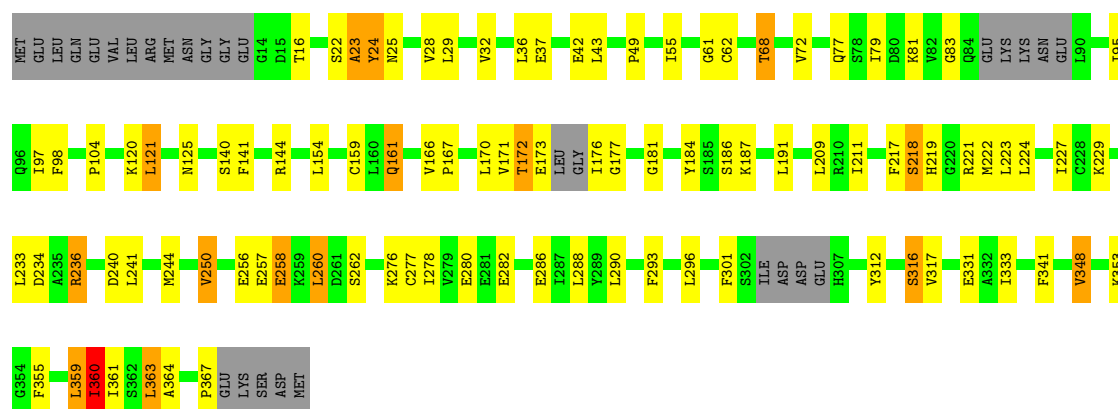


• Molecule 1: Xanthosine methyltransferase





• Molecule 1: Xanthosine methyltransferase



4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	57.59Å 119.80Å 116.40Å 90.00° 102.16° 90.00°	Depositor
Resolution (Å)	30.00 – 2.20 30.00 – 2.20	Depositor EDS
% Data completeness (in resolution range)	96.7 (30.00-2.20) 86.6 (30.00-2.20)	Depositor EDS
R_{merge}	0.08	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.84 (at 2.20Å)	Xtriage
Refinement program	REFMAC 5.2.0019	Depositor
R, R_{free}	0.230 , 0.284 (Not available) , 0.257	Depositor DCC
R_{free} test set	3830 reflections (4.90%)	wwPDB-VP
Wilson B-factor (Å ²)	31.7	Xtriage
Anisotropy	0.155	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 31.8	EDS
L-test for twinning ²	$\langle L \rangle = 0.44$, $\langle L^2 \rangle = 0.26$	Xtriage
Estimated twinning fraction	0.089 for h,-k,-h-l	Xtriage
F_o, F_c correlation	0.95	EDS
Total number of atoms	11430	wwPDB-VP
Average B, all atoms (Å ²)	45.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 26.23 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 2.7398e-03.*

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: SAH, XTS

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	0.99	3/2765 (0.1%)	1.07	6/3739 (0.2%)
1	C	0.95	0/2745	1.07	5/3714 (0.1%)
1	E	0.83	0/2765	1.02	7/3740 (0.2%)
1	G	0.90	0/2731	1.06	6/3698 (0.2%)
All	All	0.92	3/11006 (0.0%)	1.05	24/14891 (0.2%)

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	E	0	1

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	114	LEU	C-O	-6.09	1.18	1.24
1	A	269[A]	ILE	C-O	-5.04	1.18	1.24
1	A	269[B]	ILE	C-O	-5.04	1.18	1.24

All (24) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	G	258	GLU	N-CA-C	-8.30	102.36	114.39
1	A	258	GLU	N-CA-C	-8.25	102.10	114.64
1	C	258	GLU	N-CA-C	-8.00	102.79	114.39
1	A	24	TYR	N-CA-C	-7.96	101.90	111.69
1	E	258	GLU	N-CA-C	-7.73	103.19	114.39
1	E	24	TYR	N-CA-C	-7.20	102.84	111.69

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	C	24	TYR	N-CA-C	-7.00	103.08	111.69
1	E	360	ILE	CB-CA-C	-6.69	101.55	110.98
1	C	360	ILE	CB-CA-C	-6.51	101.13	110.83
1	G	24	TYR	N-CA-C	-6.47	103.73	111.69
1	E	254	HIS	N-CA-C	6.20	118.03	111.28
1	A	360	ILE	CB-CA-C	-6.11	101.72	110.83
1	C	278	ILE	N-CA-C	6.04	116.20	110.53
1	E	256	GLU	N-CA-C	6.00	118.61	111.71
1	G	360	ILE	CB-CA-C	-5.77	102.04	110.81
1	A	254	HIS	N-CA-C	5.69	118.21	111.33
1	A	332	ALA	N-CA-C	5.62	117.49	111.36
1	C	256	GLU	N-CA-C	5.51	118.81	111.75
1	E	348	VAL	CB-CA-C	5.37	115.79	111.06
1	A	217	PHE	N-CA-C	-5.34	103.47	110.53
1	G	217	PHE	N-CA-C	-5.18	103.69	110.53
1	G	278	ILE	N-CA-C	5.11	115.32	110.42
1	E	161	GLN	N-CA-CB	5.07	118.03	110.22
1	G	256	GLU	N-CA-C	5.04	117.51	111.71

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	E	302	SER	Peptide

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	2701	0	2702	71	0
1	C	2681	0	2667	74	0
1	E	2698	0	2686	77	0
1	G	2667	0	2634	70	0
2	A	26	0	19	2	0
2	C	26	0	19	3	0
2	E	26	0	19	2	0
2	G	26	0	19	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	20	0	12	9	0
3	C	20	0	12	6	0
3	E	20	0	12	8	0
3	G	20	0	12	7	0
4	A	156	0	0	10	0
4	C	132	0	0	12	0
4	E	114	0	0	12	0
4	G	97	0	0	5	0
All	All	11430	0	10813	291	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 13.

All (291) 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:E:24:TYR:HB3	3:E:2502:XTS:H5'2	1.21	1.17
1:A:24:TYR:HB3	3:A:502:XTS:H5'2	1.26	1.16
1:C:290:LEU:CD2	1:C:359:LEU:HD11	1.74	1.16
1:E:290:LEU:HD21	1:E:359:LEU:HD11	1.34	1.07
1:C:24:TYR:HB3	3:C:1502:XTS:H5'2	1.38	1.06
1:C:290:LEU:HD21	1:C:359:LEU:HD11	1.34	1.04
1:G:24:TYR:HB3	3:G:3502:XTS:H5'2	1.45	0.97
1:G:316:SER:HB3	3:G:3502:XTS:H4'	1.51	0.92
1:G:61:GLY:HA3	1:G:159:CYS:SG	2.10	0.92
1:A:236:ARG:CG	1:A:244:MET:HE1	1.98	0.91
1:C:236:ARG:HD3	1:C:244:MET:HE1	1.53	0.91
1:C:316:SER:HB3	3:C:1502:XTS:H4'	1.52	0.89
1:E:290:LEU:CD2	1:E:359:LEU:HD11	2.02	0.89
1:C:290:LEU:HD23	1:C:359:LEU:HD11	1.55	0.88
1:E:290:LEU:HD21	1:E:359:LEU:CD1	2.02	0.88
1:A:177:GLY:HA3	4:A:619:HOH:O	1.72	0.88
1:A:25:ASN:HD21	3:A:502:XTS:H8	1.37	0.87
1:G:236:ARG:CG	1:G:244:MET:HE1	2.04	0.85
1:A:316:SER:HB3	3:A:502:XTS:H4'	1.56	0.84
1:E:25:ASN:HD21	3:E:2502:XTS:H8	1.43	0.84
1:E:236:ARG:CG	1:E:244:MET:HE1	2.08	0.82
1:E:24:TYR:HB3	3:E:2502:XTS:C5'	2.08	0.82
1:C:236:ARG:CG	1:C:244:MET:HE1	2.09	0.82
1:C:236:ARG:CD	1:C:244:MET:HE1	2.10	0.82
1:E:24:TYR:CB	3:E:2502:XTS:H5'2	2.09	0.82

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:236:ARG:HD3	1:G:244:MET:HE1	1.61	0.81
1:E:156:SER:OG	1:E:159[B]:CYS:SG	2.38	0.80
1:E:316:SER:HB3	3:E:2502:XTS:H4'	1.61	0.80
1:A:236:ARG:HD3	1:A:244:MET:HE1	1.63	0.80
1:E:236:ARG:HD3	1:E:244:MET:HE1	1.62	0.80
1:A:236:ARG:CD	1:A:244:MET:HE1	2.12	0.79
1:E:236:ARG:CD	1:E:244:MET:HE1	2.13	0.79
1:E:290:LEU:CD2	1:E:359:LEU:CD1	2.59	0.79
1:G:236:ARG:CD	1:G:244:MET:HE1	2.13	0.77
1:C:290:LEU:CD2	1:C:359:LEU:CD1	2.61	0.76
1:A:73:ARG:NH2	1:A:120:LYS:HB3	2.01	0.76
1:G:236:ARG:HG2	1:G:244:MET:HE1	1.67	0.75
1:A:236:ARG:HG2	1:A:244:MET:HE1	1.66	0.75
1:A:29:LEU:HD11	4:A:631:HOH:O	1.85	0.75
1:E:236:ARG:HD3	1:E:244:MET:CE	2.17	0.74
1:A:236:ARG:HD3	1:A:244:MET:CE	2.17	0.74
1:C:236:ARG:HD3	1:C:244:MET:CE	2.18	0.74
1:C:161:GLN:HG2	1:C:227:ILE:HD12	1.70	0.72
1:C:41:ARG:NH1	4:C:1634:HOH:O	2.22	0.71
1:E:53:LYS:HD2	1:E:53:LYS:N	2.06	0.71
1:G:236:ARG:HD3	1:G:244:MET:CE	2.21	0.70
1:C:25:ASN:HD21	3:C:1502:XTS:H8	1.55	0.70
1:E:236:ARG:HG2	1:E:244:MET:HE1	1.73	0.69
1:A:33:LYS:HE2	4:A:569:HOH:O	1.93	0.68
1:E:277[B]:CYS:SG	4:E:2590:HOH:O	2.51	0.68
1:E:161:GLN:HG2	1:E:227:ILE:HD12	1.75	0.68
1:A:53:LYS:HD2	1:A:53:LYS:N	2.08	0.68
1:E:62:CYS:O	1:E:68:THR:HB	1.93	0.67
1:C:290:LEU:HD23	1:C:359:LEU:CD1	2.25	0.67
1:A:257:GLU:CG	1:A:257:GLU:O	2.42	0.67
1:C:84:GLN:NE2	4:C:1550:HOH:O	2.26	0.67
1:A:67:ASN:HB3	4:A:631:HOH:O	1.94	0.67
1:A:62:CYS:O	1:A:68:THR:HB	1.95	0.66
1:G:62:CYS:O	1:G:68:THR:HB	1.95	0.66
1:A:257:GLU:O	1:A:257:GLU:HG3	1.95	0.66
1:G:161:GLN:HG2	1:G:227:ILE:HD12	1.76	0.66
1:A:25:ASN:HD21	3:A:502:XTS:C8	2.07	0.66
1:A:290:LEU:HD21	1:A:359:LEU:HD11	1.76	0.66
1:G:25:ASN:HD21	3:G:3502:XTS:H8	1.60	0.66
1:C:236:ARG:HG2	1:C:244:MET:HE1	1.78	0.64
1:C:348:VAL:HG22	1:C:353:LYS:HB2	1.78	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:61:GLY:HA3	1:A:159:CYS:SG	2.36	0.64
1:C:181:GLY:HA2	1:C:260:LEU:HD13	1.79	0.64
1:C:61:GLY:HA3	1:C:159:CYS:SG	2.37	0.64
1:G:77:GLN:HG2	1:G:125:ASN:HD21	1.62	0.64
1:A:348:VAL:HG22	1:A:353:LYS:HB2	1.79	0.63
1:C:62:CYS:O	1:C:68:THR:HB	1.99	0.63
1:E:348:VAL:HG22	1:E:353:LYS:HB2	1.79	0.63
1:C:24:TYR:HB3	3:C:1502:XTS:C5'	2.23	0.62
1:E:77:GLN:HG2	1:E:125:ASN:HD21	1.65	0.62
1:E:259:LYS:HD2	4:E:2576:HOH:O	1.99	0.62
1:C:229:LYS:NZ	4:C:1630:HOH:O	2.33	0.61
1:C:22:SER:O	1:C:23:ALA:HB3	1.99	0.61
1:E:22:SER:O	1:E:23:ALA:HB3	1.99	0.61
1:E:33:LYS:HE2	4:E:2569:HOH:O	2.01	0.61
1:E:22:SER:O	1:E:23:ALA:CB	2.49	0.61
1:G:348:VAL:HG22	1:G:353:LYS:HB2	1.81	0.61
1:C:77:GLN:HG2	1:C:125:ASN:HD21	1.66	0.60
1:E:262:SER:HB3	4:E:2599:HOH:O	2.00	0.60
1:A:24:TYR:HB3	3:A:502:XTS:C5'	2.19	0.60
1:A:25:ASN:ND2	3:A:502:XTS:H8	2.15	0.60
1:G:229:LYS:NZ	4:G:3586:HOH:O	2.30	0.59
1:A:29:LEU:CD1	4:A:631:HOH:O	2.44	0.59
1:C:22:SER:O	1:C:23:ALA:CB	2.49	0.59
1:A:290:LEU:HD21	1:A:359:LEU:CD1	2.31	0.59
1:G:24:TYR:HB3	3:G:3502:XTS:C5'	2.29	0.59
1:G:181:GLY:HA2	1:G:260:LEU:HD13	1.86	0.58
1:A:181:GLY:HA2	1:A:260:LEU:HD13	1.86	0.58
1:G:22:SER:O	1:G:23:ALA:HB3	2.03	0.58
1:A:50:ASN:HA	1:A:53:LYS:HD3	1.85	0.58
1:E:66:PRO:HD2	4:E:2609:HOH:O	2.03	0.57
1:A:22:SER:O	1:A:23:ALA:HB3	2.03	0.57
1:E:25:ASN:HD21	3:E:2502:XTS:C8	2.15	0.57
1:G:257:GLU:CG	1:G:257:GLU:O	2.51	0.57
1:A:62:CYS:HB2	4:A:562:HOH:O	2.03	0.57
1:G:262:SER:HB3	4:G:3550:HOH:O	2.04	0.57
1:G:276:LYS:O	1:G:280:GLU:HG3	2.05	0.57
1:A:22:SER:O	1:A:23:ALA:CB	2.53	0.56
1:A:77:GLN:HG2	1:A:125:ASN:HD21	1.70	0.56
1:A:276:LYS:O	1:A:280:GLU:HG3	2.04	0.56
1:C:293:PHE:CE2	1:C:360:ILE:HD11	2.40	0.56
1:G:22:SER:O	1:G:23:ALA:CB	2.54	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:257:GLU:O	1:G:257:GLU:HG3	2.04	0.56
1:G:361:ILE:HG12	1:G:363:LEU:HD13	1.86	0.56
1:E:276:LYS:O	1:E:280:GLU:HG3	2.04	0.56
1:C:194:GLN:NE2	4:C:1540:HOH:O	2.38	0.56
1:G:293:PHE:CE2	1:G:360:ILE:HD11	2.40	0.55
1:C:257:GLU:CG	1:C:257:GLU:O	2.54	0.55
1:E:181:GLY:HA2	1:E:260:LEU:HD13	1.88	0.55
1:G:25:ASN:O	1:G:29:LEU:HG	2.06	0.55
1:C:361:ILE:HG12	1:C:363:LEU:HD13	1.89	0.54
1:E:112:LYS:HE3	1:G:104:PRO:HA	1.90	0.54
1:A:218:SER:O	1:A:219:HIS:HB2	2.08	0.54
1:C:24:TYR:CB	3:C:1502:XTS:H5'2	2.26	0.54
1:E:53:LYS:HD2	1:E:53:LYS:H	1.73	0.54
1:A:25:ASN:O	1:A:29:LEU:HG	2.07	0.53
1:E:37:GLU:OE2	1:E:81:LYS:HE3	2.07	0.53
1:E:98:PHE:HD2	1:E:151:MET:HE1	1.73	0.53
1:E:161:GLN:CG	1:E:227:ILE:HD12	2.37	0.53
1:E:257:GLU:O	1:E:257:GLU:CG	2.57	0.53
1:A:240:ASP:O	1:A:244:MET:HE3	2.10	0.52
1:E:50:ASN:HA	1:E:53:LYS:HD3	1.89	0.52
1:E:290:LEU:HD23	1:E:359:LEU:CD1	2.37	0.52
1:A:240:ASP:C	1:A:244:MET:HE3	2.35	0.52
1:G:37:GLU:OE2	1:G:81:LYS:HE3	2.09	0.52
1:C:25:ASN:HD21	3:C:1502:XTS:C8	2.23	0.52
1:C:211:ILE:HD11	4:C:1530:HOH:O	2.09	0.51
1:E:141:PHE:CD2	2:E:2501:SAH:C2	2.93	0.51
1:G:286:GLU:HG3	4:G:3535:HOH:O	2.09	0.51
1:E:233:LEU:O	1:E:234:ASP:HB2	2.10	0.51
1:G:154:LEU:O	1:G:222:MET:HA	2.11	0.51
1:A:203:LYS:NZ	4:A:622:HOH:O	2.43	0.51
1:A:67:ASN:CB	4:A:631:HOH:O	2.57	0.51
1:G:42:GLU:HB3	1:G:221[B]:ARG:HH22	1.75	0.51
1:E:128:LYS:HD3	1:E:131:SER:HB3	1.92	0.50
1:G:296:LEU:HD23	1:G:355:PHE:HB3	1.93	0.50
1:A:285:PHE:HB3	1:A:363:LEU:HB3	1.93	0.50
1:C:73:ARG:NH2	1:C:120:LYS:HB3	2.27	0.50
1:E:128:LYS:CD	1:E:131:SER:HB3	2.41	0.50
1:A:293:PHE:CE2	1:A:360:ILE:HD11	2.47	0.50
1:C:81:LYS:NZ	4:C:1563:HOH:O	2.43	0.50
1:C:154:LEU:O	1:C:222:MET:HA	2.12	0.50
1:C:257:GLU:O	1:C:257:GLU:HG3	2.12	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:233:LEU:O	1:C:234:ASP:HB2	2.11	0.50
1:E:61:GLY:HA3	1:E:159[A]:CYS:SG	2.51	0.50
1:G:72:VAL:HG13	1:G:97:ILE:CD1	2.41	0.49
1:C:276:LYS:O	1:C:280:GLU:HG3	2.12	0.49
1:E:361:ILE:HG12	1:E:363:LEU:HD13	1.94	0.49
1:G:140:SER:HA	2:G:3501:SAH:N1	2.27	0.49
1:E:257:GLU:O	1:E:257:GLU:HG3	2.12	0.49
1:G:61:GLY:HA3	1:G:159:CYS:HG	1.78	0.49
1:C:331:GLU:HG3	4:C:1560:HOH:O	2.12	0.49
1:G:233:LEU:O	1:G:234:ASP:HB2	2.12	0.48
1:C:293:PHE:HE2	1:C:360:ILE:HD11	1.78	0.48
1:G:301:PHE:CZ	1:G:312:TYR:HB3	2.49	0.48
1:A:316:SER:CB	3:A:502:XTS:H4'	2.38	0.48
1:C:141:PHE:N	2:C:1501:SAH:N1	2.57	0.48
1:G:77:GLN:CG	1:G:125:ASN:HD21	2.27	0.47
1:A:81:LYS:HE3	4:A:550:HOH:O	2.14	0.47
1:C:169:GLY:HA3	4:C:1575:HOH:O	2.14	0.47
1:E:293:PHE:CE2	1:E:360:ILE:HD11	2.49	0.47
1:A:154:LEU:O	1:A:222:MET:HA	2.14	0.47
1:C:292:THR:HA	1:C:358:ASN:O	2.15	0.47
1:E:250:VAL:HB	1:E:257:GLU:HB2	1.96	0.47
1:E:348:VAL:HG22	1:E:353:LYS:CB	2.42	0.47
1:C:51:ILE:O	1:C:55[B]:ILE:HD13	2.14	0.47
1:E:25:ASN:O	1:E:29:LEU:HG	2.14	0.47
1:G:359:LEU:HD23	1:G:359:LEU:O	2.15	0.47
1:C:322:GLU:O	1:C:323:PRO:C	2.57	0.47
1:C:77:GLN:CG	1:C:125:ASN:HD21	2.28	0.46
1:E:128:LYS:H	1:E:128:LYS:HG3	1.56	0.46
1:G:173:GLU:HG3	4:G:3570:HOH:O	2.15	0.46
1:A:257:GLU:O	1:A:257:GLU:CD	2.58	0.46
1:C:293:PHE:HE2	1:C:360:ILE:CD1	2.28	0.46
1:E:98:PHE:CD2	1:E:151:MET:HE1	2.50	0.46
1:G:42:GLU:HB2	1:G:221[B]:ARG:HH12	1.81	0.46
1:A:250:VAL:HB	1:A:257:GLU:HB2	1.98	0.46
1:G:250:VAL:HB	1:G:257:GLU:HB2	1.98	0.46
1:A:24:TYR:CB	3:A:502:XTS:H5'2	2.19	0.46
1:E:33:LYS:HD2	4:E:2596:HOH:O	2.15	0.46
1:E:209:LEU:HD23	1:E:222:MET:HE1	1.97	0.46
1:E:288:LEU:HD11	1:E:364:ALA:HB2	1.98	0.46
1:G:170:LEU:HA	1:G:176:ILE:N	2.31	0.46
1:G:141:PHE:N	2:G:3501:SAH:N1	2.56	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:170:LEU:HA	1:C:176:ILE:N	2.31	0.45
1:G:218:SER:O	1:G:219:HIS:HB2	2.16	0.45
1:G:316:SER:CB	3:G:3502:XTS:H4'	2.34	0.45
1:A:336:ASP:O	1:A:340[B]:ARG:HG2	2.17	0.45
1:E:67:ASN:HA	1:E:70:LEU:HD12	1.97	0.45
1:G:293:PHE:HE2	1:G:360:ILE:CD1	2.29	0.45
1:C:25:ASN:O	1:C:29:LEU:HG	2.16	0.45
1:C:203:LYS:NZ	4:C:1556:HOH:O	2.48	0.45
1:G:187:LYS:HD3	1:G:187:LYS:N	2.32	0.45
1:C:37:GLU:OE2	1:C:81:LYS:HE3	2.16	0.45
1:C:121:LEU:O	1:C:125:ASN:HB2	2.16	0.45
1:C:194:GLN:HB3	4:C:1509:HOH:O	2.16	0.45
1:A:56:LYS:HE3	1:A:96:GLN:NE2	2.32	0.44
2:A:501:SAH:HG1	2:A:501:SAH:H4'	1.83	0.44
1:C:42:GLU:HB2	1:C:221[B]:ARG:HH12	1.82	0.44
1:G:28:VAL:O	1:G:32:VAL:HG23	2.17	0.44
1:G:55:ILE:CG2	1:G:95:ILE:HG23	2.47	0.44
1:E:154:LEU:O	1:E:222:MET:HA	2.17	0.44
1:C:114:LEU:N	1:C:115:PRO:CD	2.80	0.44
1:C:161:GLN:CG	1:C:227:ILE:HD12	2.45	0.44
1:E:296:LEU:HD13	4:E:2537:HOH:O	2.17	0.44
1:E:42:GLU:HB3	1:E:221[B]:ARG:HH22	1.81	0.44
1:C:257:GLU:O	1:C:257:GLU:CD	2.61	0.44
1:G:43:LEU:HD13	1:G:221[B]:ARG:HG3	2.00	0.44
1:A:37:GLU:HG2	4:A:550:HOH:O	2.17	0.44
1:A:53:LYS:HD2	1:A:53:LYS:H	1.82	0.44
1:C:218:SER:O	1:C:219:HIS:HB2	2.17	0.44
1:E:222:MET:HE3	1:E:363:LEU:HD23	1.99	0.44
1:A:207:THR:HG22	1:A:211:ILE:HD12	2.00	0.43
1:G:43:LEU:HD13	1:G:221[B]:ARG:CG	2.48	0.43
1:A:37:GLU:OE2	1:A:81:LYS:HE3	2.18	0.43
1:G:288:LEU:HD11	1:G:364:ALA:HB2	1.99	0.43
2:C:1501:SAH:HG1	2:C:1501:SAH:H4'	1.84	0.43
1:E:42:GLU:HB2	1:E:221[B]:ARG:HH12	1.83	0.43
1:C:348:VAL:HG22	1:C:353:LYS:CB	2.46	0.43
1:G:121:LEU:O	1:G:125:ASN:HB2	2.18	0.43
1:A:72:VAL:HG13	1:A:97:ILE:CD1	2.49	0.43
1:G:166:VAL:O	1:G:167:PRO:C	2.62	0.43
1:A:121:LEU:O	1:A:125:ASN:HB2	2.18	0.43
1:E:282:GLU:OE2	1:E:284:SER:OG	2.22	0.43
1:E:292:THR:HA	1:E:358:ASN:O	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:22:SER:HB3	1:A:67:ASN:OD1	2.19	0.43
1:C:332:ALA:HA	1:G:367:PRO:HB3	2.00	0.43
1:G:172:THR:HG23	4:G:3570:HOH:O	2.18	0.43
1:G:240:ASP:O	1:G:244:MET:HE3	2.18	0.43
1:E:72:VAL:HG13	1:E:97:ILE:CD1	2.49	0.43
1:G:72:VAL:HG13	1:G:97:ILE:HD13	2.01	0.43
1:A:73:ARG:HH22	1:A:120:LYS:HG2	1.83	0.42
1:E:25:ASN:ND2	3:E:2502:XTS:H8	2.23	0.42
1:A:348:VAL:HG22	1:A:353:LYS:CB	2.49	0.42
1:C:56:LYS:HE3	1:C:96:GLN:NE2	2.34	0.42
1:C:38:GLN:HE21	1:C:39:CYS:N	2.17	0.42
1:C:341:PHE:CD1	1:C:341:PHE:C	2.97	0.42
1:A:24:TYR:CG	3:A:502:XTS:H3'	2.55	0.42
1:C:63:ALA:HB2	2:C:1501:SAH:HG2	2.02	0.42
1:A:42:GLU:HB3	1:A:221[B]:ARG:HH22	1.85	0.42
1:E:84:GLN:C	4:E:2588:HOH:O	2.63	0.42
1:G:240:ASP:C	1:G:244:MET:HE3	2.45	0.42
1:C:250:VAL:HB	1:C:257:GLU:HB2	2.00	0.42
1:C:67:ASN:HA	1:C:70:LEU:HD12	2.02	0.42
1:C:254:HIS:HA	1:G:49:PRO:HB3	2.00	0.42
1:G:241:LEU:HA	1:G:244:MET:HE3	2.02	0.42
1:G:55:ILE:HG23	1:G:95:ILE:HG23	2.02	0.42
1:A:309:LYS:HB2	1:A:309:LYS:HE2	1.74	0.41
1:A:141:PHE:N	2:A:501:SAH:N1	2.56	0.41
1:C:66:PRO:O	1:C:70:LEU:HG	2.20	0.41
1:E:316:SER:CB	3:E:2502:XTS:H4'	2.42	0.41
1:G:25:ASN:HD21	3:G:3502:XTS:C8	2.32	0.41
1:G:55:ILE:HG21	1:G:79:ILE:HD13	2.02	0.41
1:A:296:LEU:HD23	1:A:355:PHE:HB3	2.02	0.41
1:A:31:LYS:HE3	1:A:31:LYS:HB3	1.76	0.41
1:A:209:LEU:HD23	1:A:222:MET:HE1	2.02	0.41
1:C:258:GLU:HB3	4:C:1542:HOH:O	2.21	0.41
1:A:301:PHE:CZ	1:A:312:TYR:HB3	2.55	0.41
1:E:45:ARG:NH2	4:E:2582:HOH:O	2.52	0.41
1:A:309:LYS:O	1:A:313:VAL:HG23	2.21	0.41
1:G:209:LEU:HD23	1:G:222:MET:HE1	2.03	0.41
1:A:170:LEU:HA	1:A:176:ILE:N	2.36	0.41
1:C:166:VAL:O	1:C:167:PRO:C	2.62	0.41
1:E:73:ARG:HH21	1:E:120:LYS:HB3	1.85	0.41
1:E:90:LEU:N	4:E:2581:HOH:O	2.53	0.41
1:E:148:GLU:H	1:E:148:GLU:HG3	1.61	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:24:TYR:CB	3:G:3502:XTS:H5'2	2.33	0.41
1:A:77:GLN:CG	1:A:125:ASN:HD21	2.34	0.41
1:A:141:PHE:CE2	1:A:159:CYS:HB3	2.56	0.41
1:A:329:PHE:HB3	1:A:333:ILE:HD11	2.02	0.41
1:C:91:GLU:CD	1:C:91:GLU:N	2.79	0.41
1:E:93:PRO:HD2	4:E:2548:HOH:O	2.20	0.41
1:E:301:PHE:CZ	1:E:312:TYR:HB3	2.56	0.41
1:G:317:VAL:HG21	1:G:341:PHE:CZ	2.56	0.41
1:E:317:VAL:HG21	1:E:341:PHE:CZ	2.56	0.41
1:G:348:VAL:HG22	1:G:353:LYS:CB	2.48	0.41
1:E:98:PHE:HE1	1:G:98:PHE:HE1	1.69	0.40
1:A:42:GLU:HB2	1:A:221[B]:ARG:HH12	1.86	0.40
1:C:169:GLY:CA	4:C:1575:HOH:O	2.70	0.40
1:E:121:LEU:O	1:E:125:ASN:HB2	2.22	0.40
2:E:2501:SAH:HG1	2:E:2501:SAH:H4'	1.88	0.40
1:C:28:VAL:O	1:C:32:VAL:HG23	2.21	0.40
1:E:113:LEU:HA	4:E:2512:HOH:O	2.20	0.40
1:G:161:GLN:CG	1:G:227:ILE:HD12	2.48	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	339/372 (91%)	323 (95%)	13 (4%)	3 (1%)	14	14
1	C	339/372 (91%)	324 (96%)	12 (4%)	3 (1%)	14	14
1	E	342/372 (92%)	328 (96%)	11 (3%)	3 (1%)	14	14
1	G	338/372 (91%)	324 (96%)	11 (3%)	3 (1%)	14	14
All	All	1358/1488 (91%)	1299 (96%)	47 (4%)	12 (1%)	14	14

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	177	GLY
1	C	177	GLY
1	E	177	GLY
1	G	177	GLY
1	A	23	ALA
1	C	23	ALA
1	E	23	ALA
1	G	23	ALA
1	G	83	GLY
1	C	83	GLY
1	E	83	GLY
1	A	83	GLY

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	293/327 (90%)	262 (89%)	31 (11%)	6	6
1	C	287/327 (88%)	254 (88%)	33 (12%)	5	5
1	E	290/327 (89%)	259 (89%)	31 (11%)	6	6
1	G	283/327 (86%)	253 (89%)	30 (11%)	6	6
All	All	1153/1308 (88%)	1028 (89%)	125 (11%)	6	6

All (125) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	16	THR
1	A	38	GLN
1	A	43	LEU
1	A	68	THR
1	A	90	LEU
1	A	120	LYS
1	A	121	LEU
1	A	144	ARG
1	A	171	VAL
1	A	172	THR

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Mol	Chain	Res	Type
1	A	174	LEU
1	A	184	TYR
1	A	186	SER
1	A	191	LEU
1	A	211	ILE
1	A	218	SER
1	A	223	LEU
1	A	226	CYS
1	A	236	ARG
1	A	250	VAL
1	A	257	GLU
1	A	258	GLU
1	A	260	LEU
1	A	290	LEU
1	A	302	SER
1	A	331	GLU
1	A	333	ILE
1	A	334	ILE
1	A	348	VAL
1	A	359	LEU
1	A	360	ILE
1	C	16	THR
1	C	36	LEU
1	C	38	GLN
1	C	43	LEU
1	C	55[A]	ILE
1	C	55[B]	ILE
1	C	68	THR
1	C	121	LEU
1	C	141	PHE
1	C	144	ARG
1	C	161	GLN
1	C	171	VAL
1	C	172	THR
1	C	173	GLU
1	C	174	LEU
1	C	184	TYR
1	C	186	SER
1	C	191	LEU
1	C	218	SER
1	C	223	LEU
1	C	236	ARG

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Mol	Chain	Res	Type
1	C	250	VAL
1	C	257	GLU
1	C	258	GLU
1	C	260	LEU
1	C	282	GLU
1	C	290	LEU
1	C	309	LYS
1	C	331	GLU
1	C	333	ILE
1	C	348	VAL
1	C	360	ILE
1	C	363	LEU
1	E	16	THR
1	E	31	LYS
1	E	43	LEU
1	E	55	ILE
1	E	68	THR
1	E	121	LEU
1	E	128	LYS
1	E	144	ARG
1	E	161	GLN
1	E	171	VAL
1	E	172	THR
1	E	174	LEU
1	E	184	TYR
1	E	186	SER
1	E	191	LEU
1	E	211	ILE
1	E	218	SER
1	E	223	LEU
1	E	236	ARG
1	E	250	VAL
1	E	258	GLU
1	E	260	LEU
1	E	282	GLU
1	E	290	LEU
1	E	316	SER
1	E	331	GLU
1	E	333	ILE
1	E	343	LYS
1	E	348	VAL
1	E	360	ILE

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Mol	Chain	Res	Type
1	E	363	LEU
1	G	16	THR
1	G	36	LEU
1	G	68	THR
1	G	120	LYS
1	G	121	LEU
1	G	144	ARG
1	G	161	GLN
1	G	171	VAL
1	G	172	THR
1	G	184	TYR
1	G	186	SER
1	G	191	LEU
1	G	211	ILE
1	G	218	SER
1	G	223	LEU
1	G	224	LEU
1	G	236	ARG
1	G	250	VAL
1	G	258	GLU
1	G	260	LEU
1	G	277	CYS
1	G	282	GLU
1	G	290	LEU
1	G	316	SER
1	G	331	GLU
1	G	333	ILE
1	G	348	VAL
1	G	359	LEU
1	G	360	ILE
1	G	363	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	25	ASN
1	A	26	GLN
1	A	77	GLN
1	A	96	GLN
1	A	125	ASN
1	A	219	HIS
1	C	25	ASN

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Mol	Chain	Res	Type
1	C	38	GLN
1	C	96	GLN
1	C	125	ASN
1	C	219	HIS
1	C	254	HIS
1	E	25	ASN
1	E	96	GLN
1	E	125	ASN
1	E	219	HIS
1	E	264	ASN
1	G	25	ASN
1	G	125	ASN
1	G	200	GLN

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 oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

8 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	SAH	E	2501	-	27,28,28	1.20	4 (14%)	36,40,40	2.15	10 (27%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	SAH	G	3501	-	27,28,28	1.38	5 (18%)	36,40,40	2.22	10 (27%)
2	SAH	A	501	-	27,28,28	1.47	4 (14%)	36,40,40	2.03	11 (30%)
3	XTS	A	502	-	22,22,22	1.68	4 (18%)	28,33,33	2.10	8 (28%)
2	SAH	C	1501	-	27,28,28	1.29	5 (18%)	36,40,40	2.04	10 (27%)
3	XTS	C	1502	-	22,22,22	1.55	5 (22%)	28,33,33	2.11	8 (28%)
3	XTS	G	3502	-	22,22,22	1.44	4 (18%)	28,33,33	2.20	9 (32%)
3	XTS	E	2502	-	22,22,22	1.51	5 (22%)	28,33,33	1.99	8 (28%)

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	SAH	E	2501	-	-	0/15/31/31	0/3/3/3
2	SAH	G	3501	-	-	1/15/31/31	0/3/3/3
2	SAH	A	501	-	-	1/15/31/31	0/3/3/3
3	XTS	A	502	-	-	3/6/22/22	0/3/3/3
2	SAH	C	1501	-	-	0/15/31/31	0/3/3/3
3	XTS	C	1502	-	-	4/6/22/22	0/3/3/3
3	XTS	G	3502	-	-	3/6/22/22	0/3/3/3
3	XTS	E	2502	-	-	3/6/22/22	0/3/3/3

All (36) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	SAH	C2-N1	4.56	1.42	1.33
3	A	502	XTS	C4-N9	-4.50	1.32	1.37
3	C	1502	XTS	C4-N9	-3.91	1.33	1.37
2	G	3501	SAH	C2-N1	3.72	1.40	1.33
2	C	1501	SAH	C2-N1	3.56	1.40	1.33
3	E	2502	XTS	C4-N9	-3.55	1.33	1.37
2	A	501	SAH	C2-N3	3.33	1.39	1.33
2	G	3501	SAH	C2-N3	3.23	1.39	1.33
2	E	2501	SAH	C2-N1	3.12	1.39	1.33
3	A	502	XTS	C2-N1	3.11	1.42	1.37
3	G	3502	XTS	C4-N9	-3.03	1.34	1.37
3	A	502	XTS	O4'-C1'	2.93	1.48	1.42
2	E	2501	SAH	C2-N3	2.92	1.39	1.33
2	A	501	SAH	C4-N3	2.80	1.39	1.34

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	1502	XTS	C2-N1	2.74	1.42	1.37
2	C	1501	SAH	C8-N7	2.68	1.36	1.31
3	E	2502	XTS	C2-N1	2.61	1.41	1.37
2	G	3501	SAH	OXT-C	-2.57	1.22	1.30
2	C	1501	SAH	C2-N3	2.44	1.38	1.33
3	C	1502	XTS	C2-N3	2.44	1.41	1.37
3	E	2502	XTS	O4'-C1'	2.42	1.47	1.42
3	G	3502	XTS	C5-N7	-2.42	1.34	1.39
3	G	3502	XTS	C2-N1	2.40	1.41	1.37
2	A	501	SAH	C8-N7	2.22	1.35	1.31
3	C	1502	XTS	O4'-C1'	2.22	1.47	1.42
3	C	1502	XTS	C5-N7	-2.19	1.34	1.39
3	G	3502	XTS	O4'-C1'	2.18	1.47	1.42
3	E	2502	XTS	C5-N7	-2.18	1.34	1.39
2	G	3501	SAH	C8-N7	2.14	1.35	1.31
2	G	3501	SAH	C4-N3	2.14	1.38	1.34
3	E	2502	XTS	C4-N3	2.14	1.41	1.37
3	A	502	XTS	C5-N7	-2.10	1.34	1.39
2	C	1501	SAH	C4-N3	2.10	1.38	1.34
2	E	2501	SAH	C8-N7	2.08	1.35	1.31
2	C	1501	SAH	OXT-C	-2.01	1.24	1.30
2	E	2501	SAH	OXT-C	-2.00	1.24	1.30

All (74) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	2501	SAH	N3-C2-N1	-7.51	117.22	128.58
2	G	3501	SAH	N3-C2-N1	-7.42	117.34	128.58
2	C	1501	SAH	N3-C2-N1	-7.06	117.90	128.58
2	A	501	SAH	N3-C2-N1	-6.79	118.30	128.58
3	A	502	XTS	C2'-C1'-N9	6.36	130.95	113.25
3	E	2502	XTS	C2'-C1'-N9	5.74	129.22	113.25
3	G	3502	XTS	C6-N1-C2	-5.54	118.74	126.37
3	C	1502	XTS	C2'-C1'-N9	5.38	128.21	113.25
3	G	3502	XTS	C2'-C1'-N9	5.36	128.18	113.25
3	C	1502	XTS	C6-N1-C2	-5.18	119.24	126.37
2	E	2501	SAH	C5-C4-N3	-4.31	120.78	126.72
2	G	3501	SAH	C5-C4-N3	-4.17	120.97	126.72
2	C	1501	SAH	C5-C4-N3	-4.14	121.01	126.72
2	E	2501	SAH	C2-N3-C4	4.07	121.76	111.83
3	A	502	XTS	C6-N1-C2	-4.01	120.85	126.37
2	A	501	SAH	C5-C4-N3	-3.97	121.26	126.72

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	G	3501	SAH	C2-N3-C4	3.93	121.43	111.83
3	E	2502	XTS	C6-N1-C2	-3.84	121.08	126.37
2	C	1501	SAH	C2-N3-C4	3.78	121.05	111.83
2	A	501	SAH	C2-N3-C4	3.69	120.84	111.83
3	G	3502	XTS	O4'-C1'-N9	-3.64	100.12	108.36
2	G	3501	SAH	N9-C8-N7	-3.61	108.81	113.94
2	G	3501	SAH	N3-C4-N9	3.48	133.09	127.17
2	E	2501	SAH	N9-C8-N7	-3.38	109.14	113.94
3	E	2502	XTS	O4'-C1'-N9	-3.31	100.85	108.36
3	C	1502	XTS	O4'-C1'-N9	-3.30	100.87	108.36
3	A	502	XTS	O4'-C1'-N9	-3.30	100.88	108.36
3	G	3502	XTS	O6-C6-C5	-3.26	117.92	126.53
3	G	3502	XTS	N3-C2-N1	3.17	120.72	115.74
2	A	501	SAH	N3-C4-N9	3.12	132.47	127.17
2	E	2501	SAH	C5-N7-C8	3.11	108.34	103.45
2	G	3501	SAH	C5-N7-C8	3.08	108.29	103.45
2	C	1501	SAH	N3-C4-N9	3.07	132.39	127.17
2	E	2501	SAH	N3-C4-N9	2.98	132.23	127.17
2	G	3501	SAH	OXT-C-O	-2.93	117.43	124.08
2	E	2501	SAH	C5'-SD-CG	-2.89	93.69	102.26
3	E	2502	XTS	O6-C6-C5	-2.85	119.01	126.53
3	C	1502	XTS	N3-C2-N1	2.80	120.14	115.74
3	C	1502	XTS	C5-C6-N1	2.79	120.34	113.25
2	C	1501	SAH	OXT-C-O	-2.78	117.76	124.08
2	C	1501	SAH	N9-C8-N7	-2.78	110.00	113.94
2	G	3501	SAH	C4-N9-C8	2.73	108.61	105.74
2	A	501	SAH	N9-C8-N7	-2.73	110.06	113.94
3	G	3502	XTS	C5-C6-N1	2.71	120.16	113.25
2	A	501	SAH	C5-N7-C8	2.67	107.64	103.45
2	C	1501	SAH	C5'-SD-CG	-2.64	94.42	102.26
2	A	501	SAH	OXT-C-O	-2.59	118.21	124.08
3	A	502	XTS	N3-C2-N1	2.58	119.80	115.74
3	A	502	XTS	O6-C6-C5	-2.58	119.73	126.53
2	C	1501	SAH	C2-N1-C6	2.57	122.95	118.73
3	E	2502	XTS	O4'-C1'-C2'	-2.54	101.18	106.62
3	C	1502	XTS	O6-C6-C5	-2.53	119.86	126.53
2	C	1501	SAH	C5-N7-C8	2.42	107.26	103.45
2	E	2501	SAH	C2-N1-C6	2.41	122.69	118.73
3	E	2502	XTS	C5-C6-N1	2.41	119.39	113.25
3	E	2502	XTS	C4'-O4'-C1'	-2.38	104.22	109.47
3	A	502	XTS	C2'-C3'-C4'	2.36	107.18	102.61
3	G	3502	XTS	C4'-O4'-C1'	-2.34	104.30	109.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	1502	XTS	O4'-C1'-C2'	-2.34	101.62	106.62
2	E	2501	SAH	C4-C5-N7	-2.33	107.92	110.58
3	E	2502	XTS	N3-C2-N1	2.32	119.38	115.74
3	C	1502	XTS	C4'-O4'-C1'	-2.29	104.41	109.47
2	A	501	SAH	O4'-C1'-C2'	-2.24	101.83	106.62
2	A	501	SAH	C4-C5-N7	-2.23	108.03	110.58
3	G	3502	XTS	O2-C2-N3	-2.21	117.93	121.86
2	G	3501	SAH	C2-N1-C6	2.20	122.34	118.73
3	A	502	XTS	C5-C6-N1	2.16	118.76	113.25
2	E	2501	SAH	OXT-C-O	-2.13	119.25	124.08
2	A	501	SAH	C4-N9-C8	2.13	107.97	105.74
3	G	3502	XTS	C5'-C4'-C3'	-2.09	110.16	115.10
2	C	1501	SAH	O4'-C1'-C2'	-2.09	102.15	106.62
2	G	3501	SAH	N6-C6-N1	2.05	122.95	118.38
3	A	502	XTS	O4'-C1'-C2'	-2.04	102.26	106.62
2	A	501	SAH	C2-N1-C6	2.02	122.04	118.73

There are no chirality outliers.

All (15) torsion outliers are listed below:

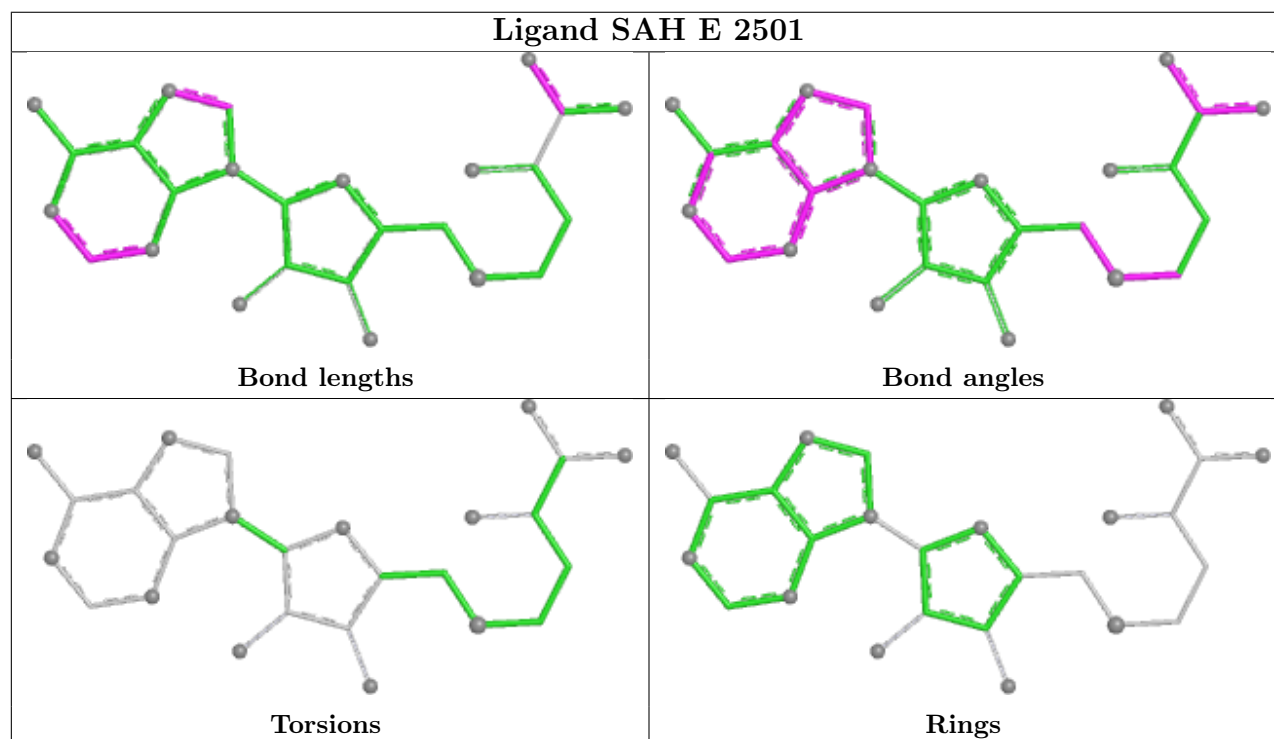
Mol	Chain	Res	Type	Atoms
3	A	502	XTS	O4'-C4'-C5'-O5'
3	E	2502	XTS	O4'-C4'-C5'-O5'
3	G	3502	XTS	O4'-C4'-C5'-O5'
3	C	1502	XTS	O4'-C4'-C5'-O5'
3	A	502	XTS	C3'-C4'-C5'-O5'
3	C	1502	XTS	C3'-C4'-C5'-O5'
3	E	2502	XTS	C3'-C4'-C5'-O5'
3	G	3502	XTS	C3'-C4'-C5'-O5'
3	C	1502	XTS	C2'-C1'-N9-C4
3	G	3502	XTS	C2'-C1'-N9-C4
3	E	2502	XTS	C2'-C1'-N9-C4
3	C	1502	XTS	C2'-C1'-N9-C8
3	A	502	XTS	C2'-C1'-N9-C4
2	A	501	SAH	CB-CG-SD-C5'
2	G	3501	SAH	CB-CG-SD-C5'

There are no ring outliers.

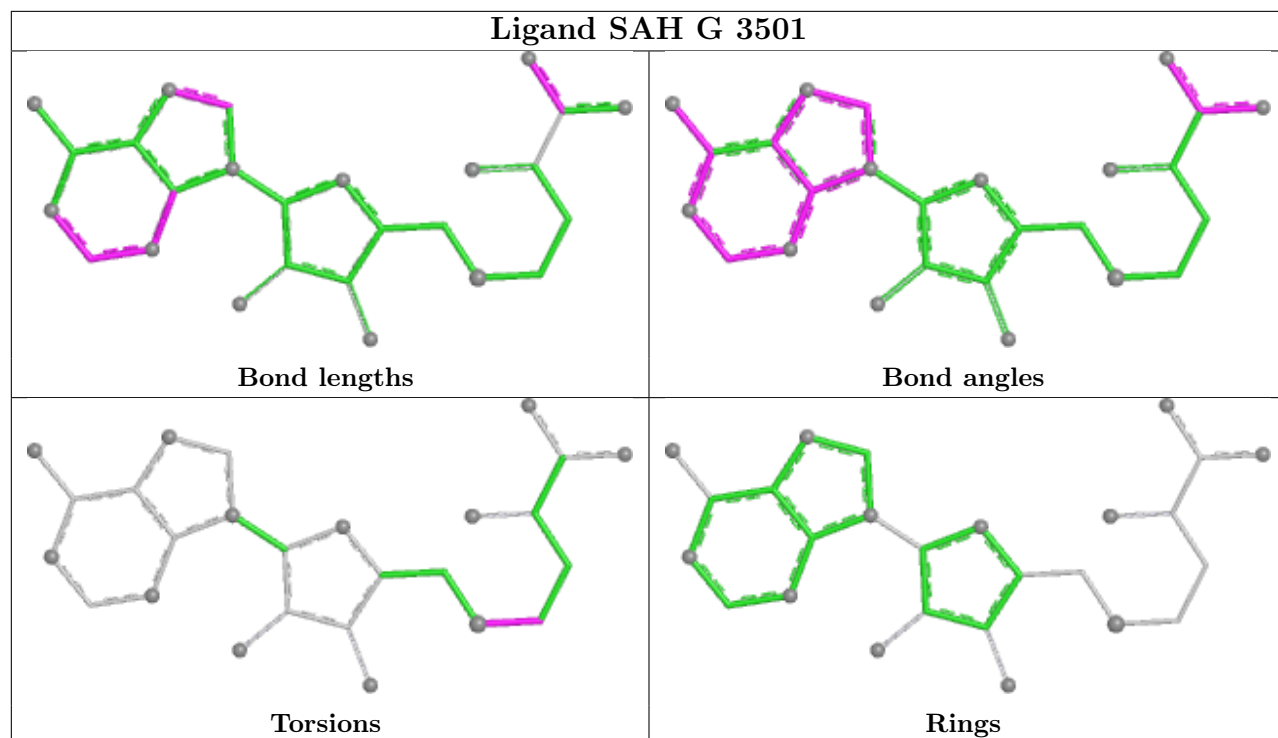
8 monomers are involved in 39 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	E	2501	SAH	2	0
2	G	3501	SAH	2	0
2	A	501	SAH	2	0
3	A	502	XTS	9	0
2	C	1501	SAH	3	0
3	C	1502	XTS	6	0
3	G	3502	XTS	7	0
3	E	2502	XTS	8	0

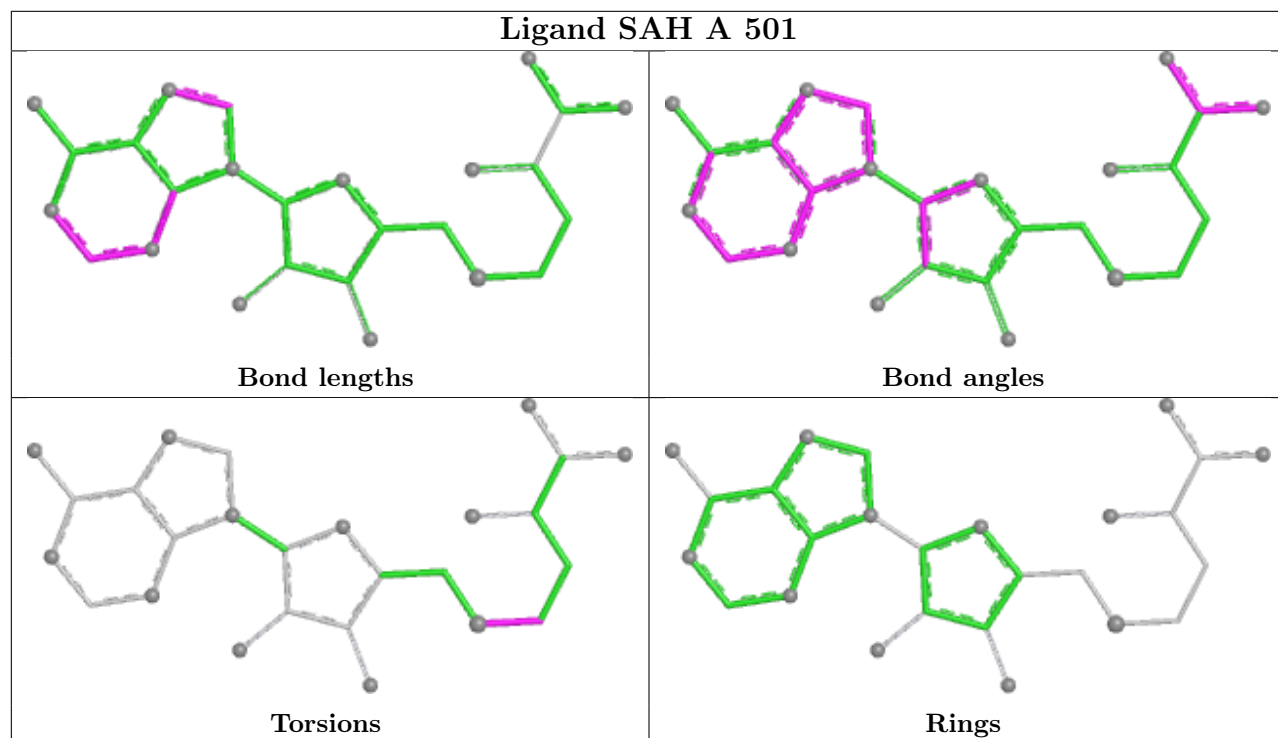
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included.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



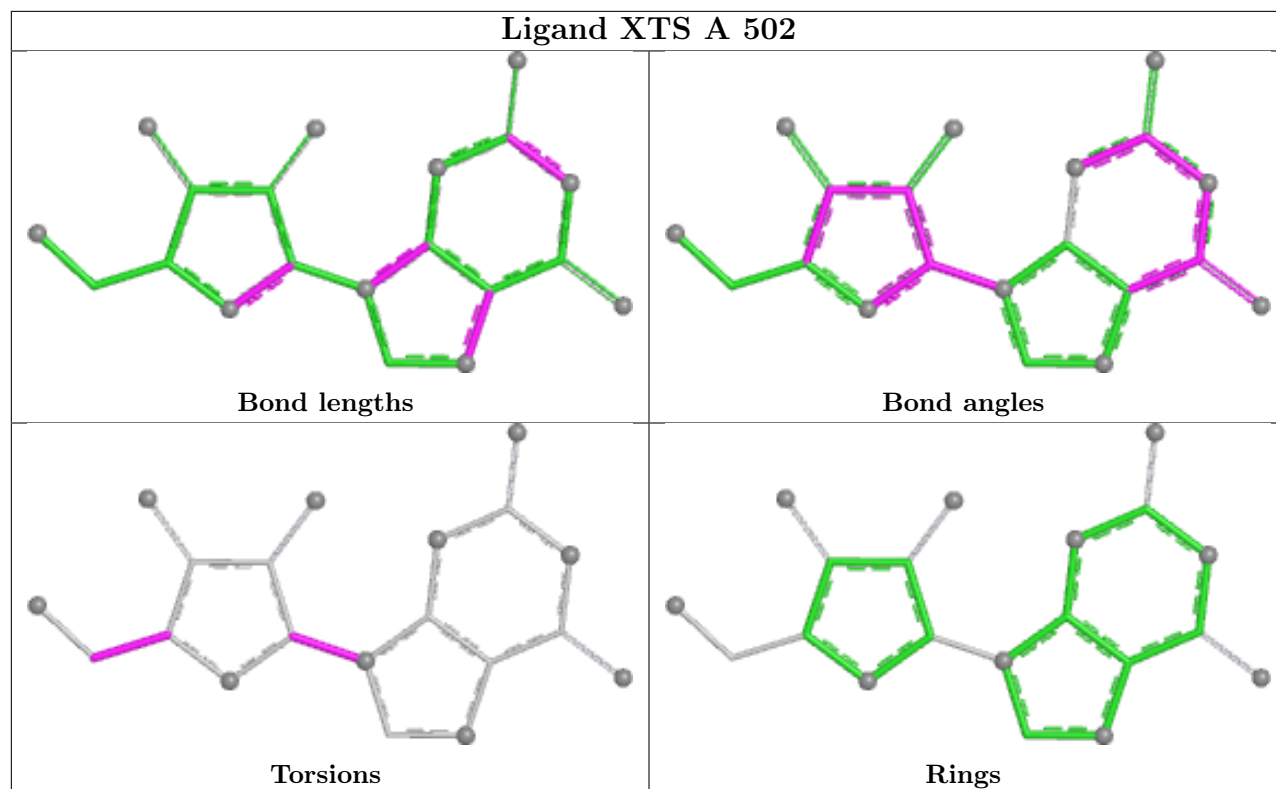
Ligand SAH G 3501



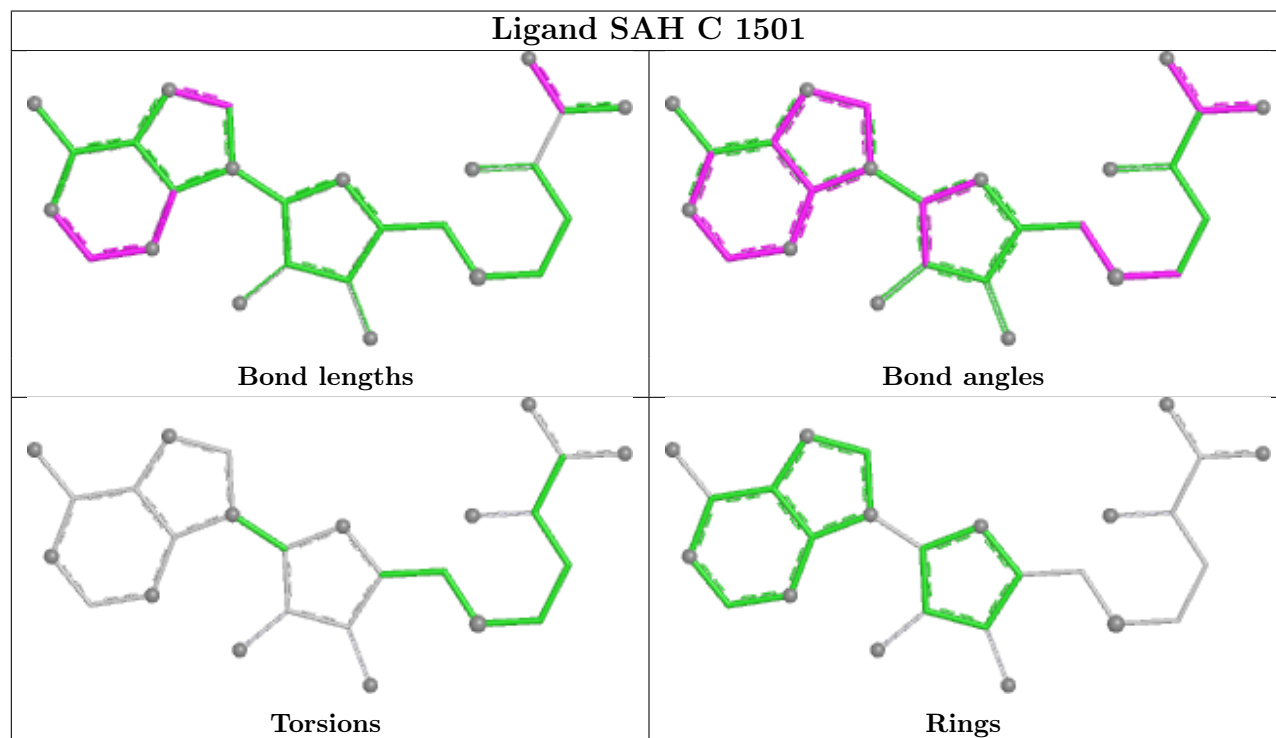
Ligand SAH A 501

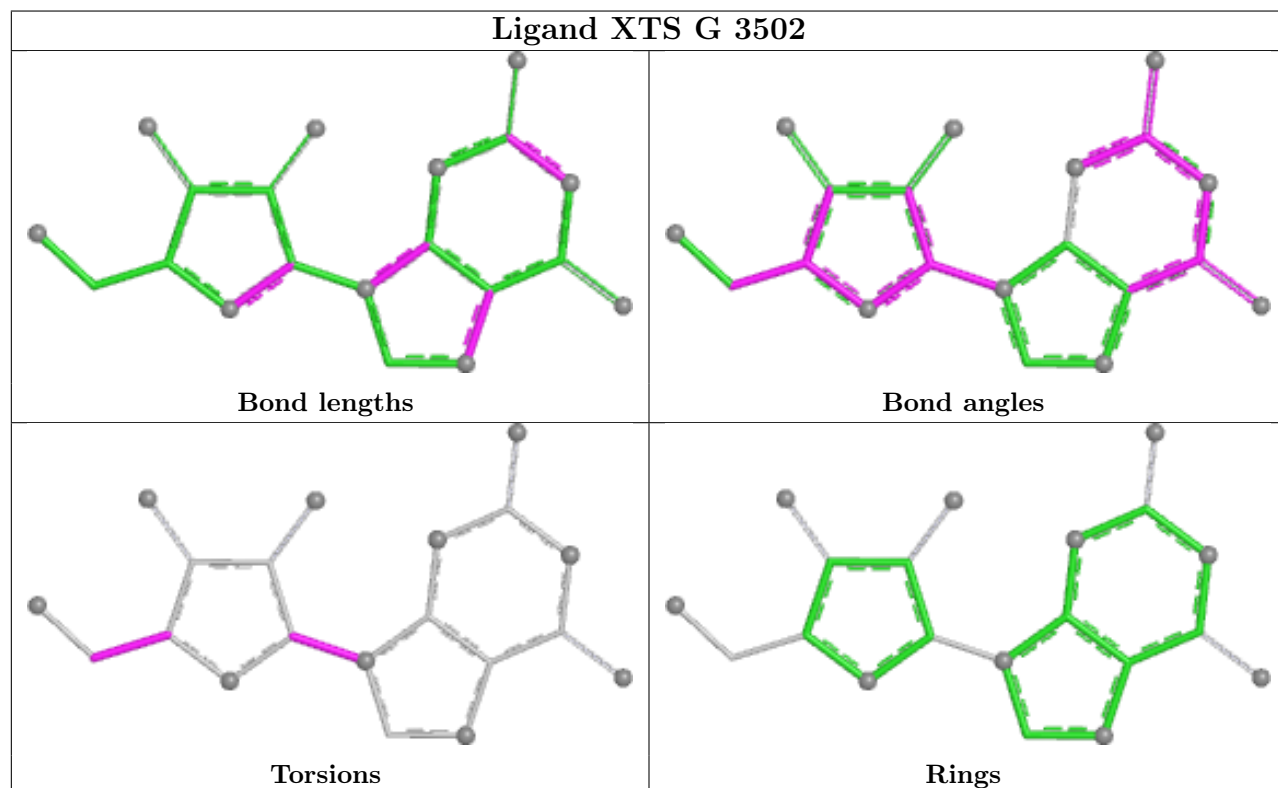
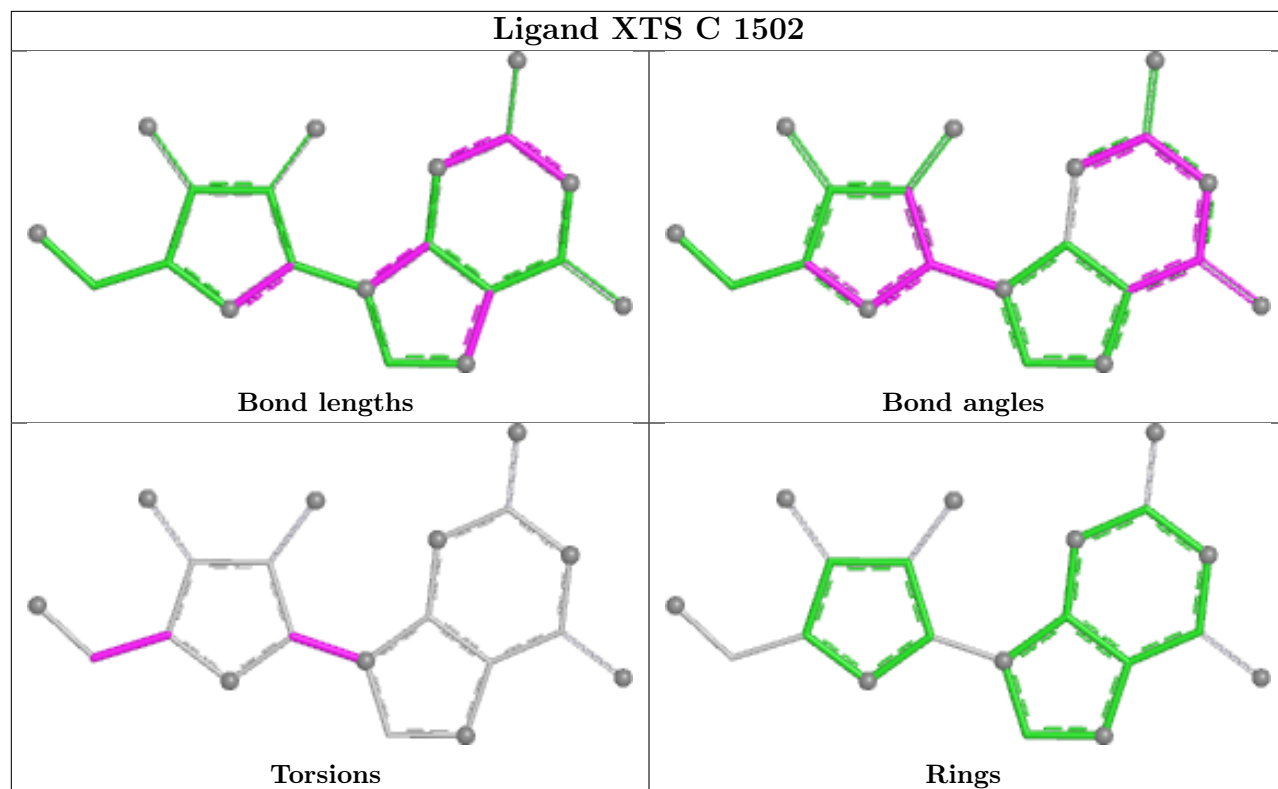


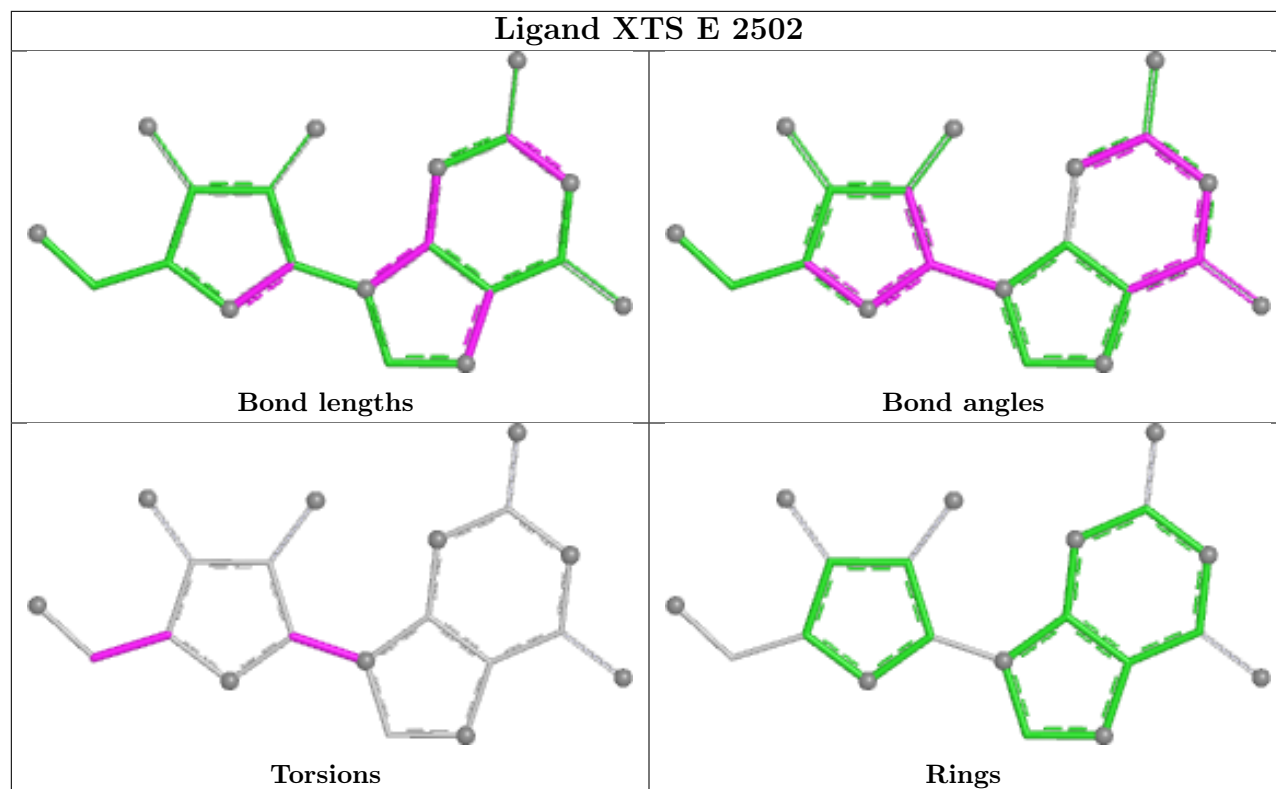
Ligand XTS A 502



Ligand SAH C 1501







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 [i](#)

6.1 Protein, DNA and RNA chains [i](#)

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	344/372 (92%)	-1.12	0 100 100	20, 42, 64, 79	15 (4%)
1	C	344/372 (92%)	-1.09	0 100 100	20, 42, 65, 79	18 (5%)
1	E	346/372 (93%)	-1.14	0 100 100	20, 43, 65, 79	9 (2%)
1	G	343/372 (92%)	-1.09	0 100 100	20, 42, 65, 79	14 (4%)
All	All	1377/1488 (92%)	-1.11	0 100 100	20, 42, 65, 79	56 (4%)

There are no RSRZ outliers to report.

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 oligosaccharides 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.

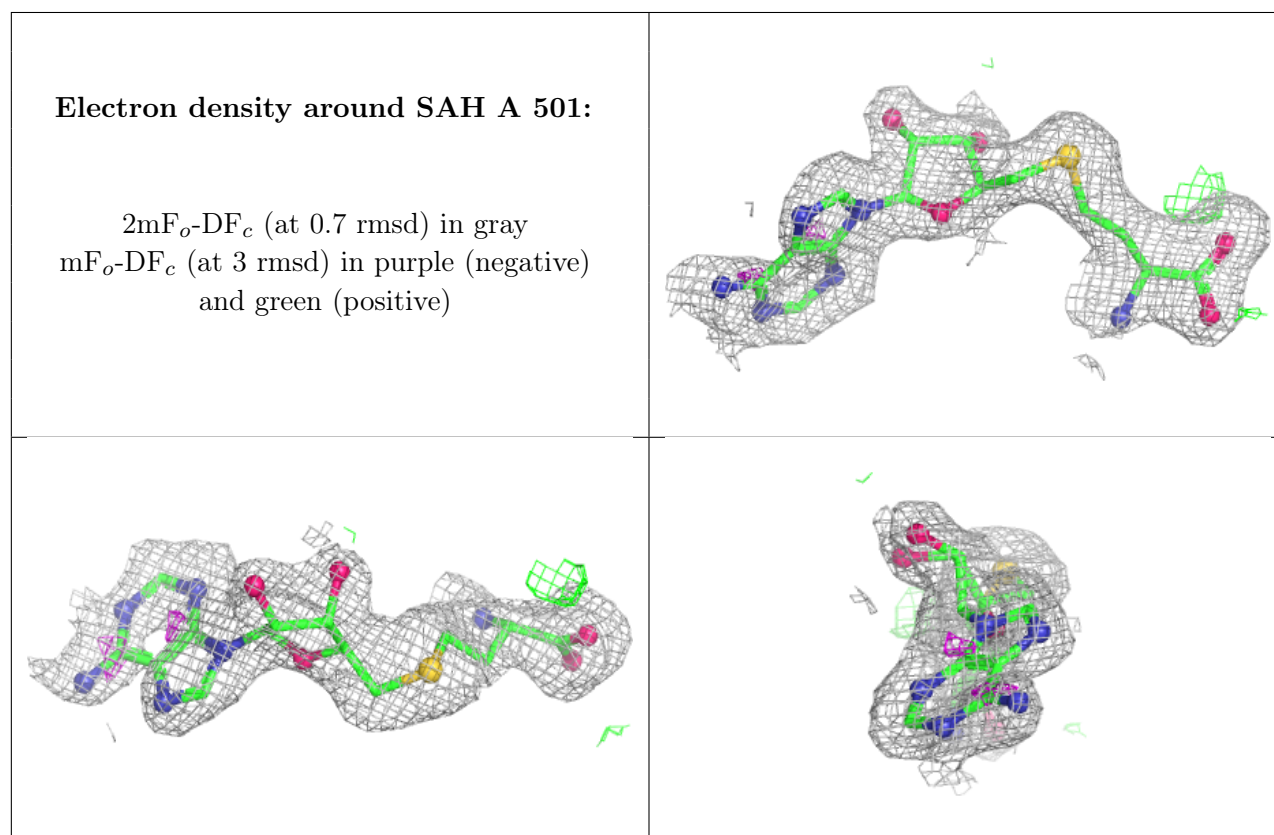
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	SAH	A	501	26/26	0.96	0.07	53,56,67,68	0
2	SAH	C	1501	26/26	0.97	0.06	53,56,67,68	0
3	XTS	E	2502	20/20	0.97	0.07	64,65,67,67	2
2	SAH	G	3501	26/26	0.98	0.06	53,56,67,68	0

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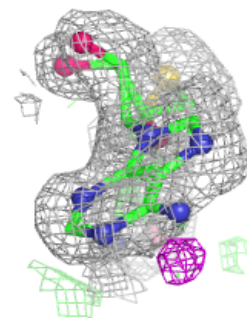
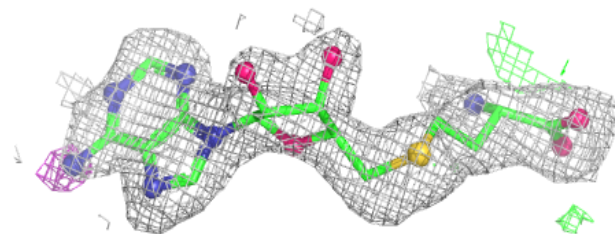
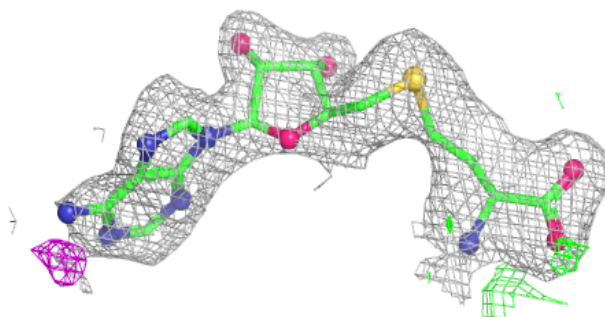
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($\text{\AA}^2$)	Q<0.9
3	XTS	C	1502	20/20	0.98	0.07	64,65,67,67	2
2	SAH	E	2501	26/26	0.98	0.06	53,57,67,68	0
3	XTS	G	3502	20/20	0.98	0.06	64,65,67,67	2
3	XTS	A	502	20/20	0.99	0.05	64,65,67,67	2

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.

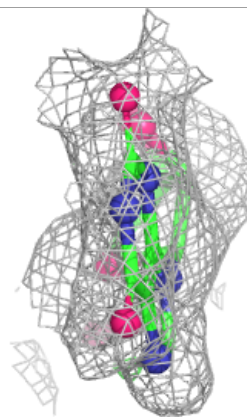
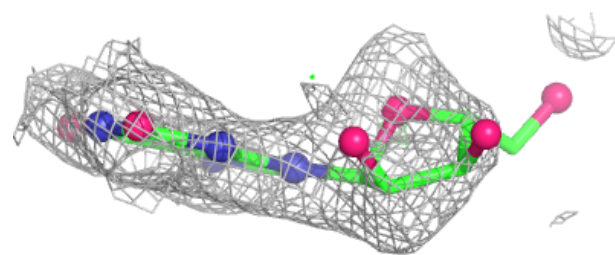
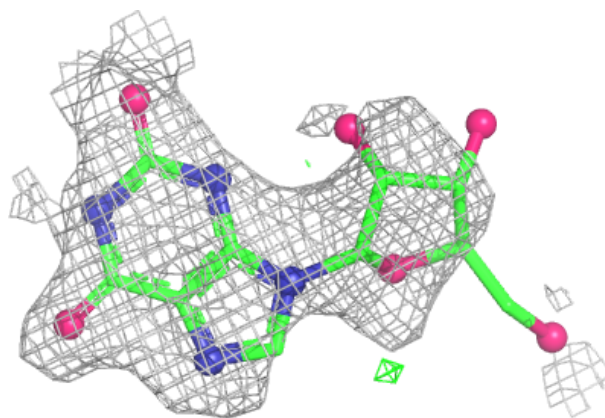


Electron density around SAH C 1501:

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

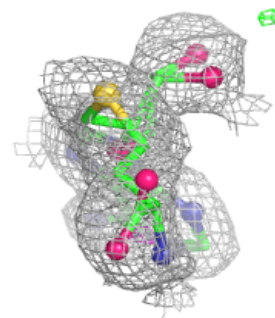
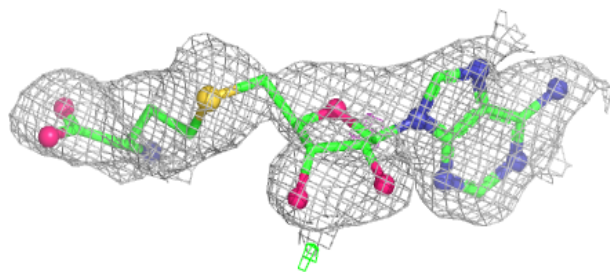
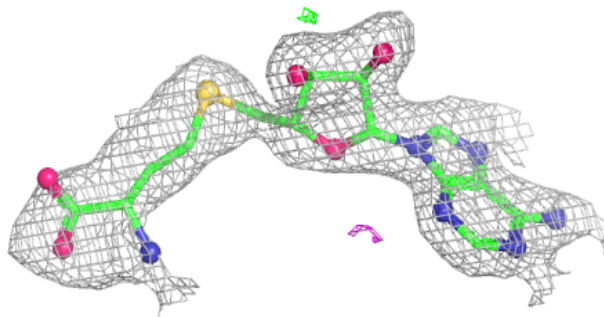
**Electron density around XTS E 2502:**

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

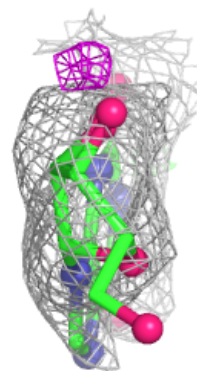
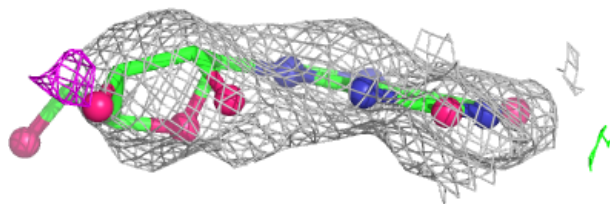
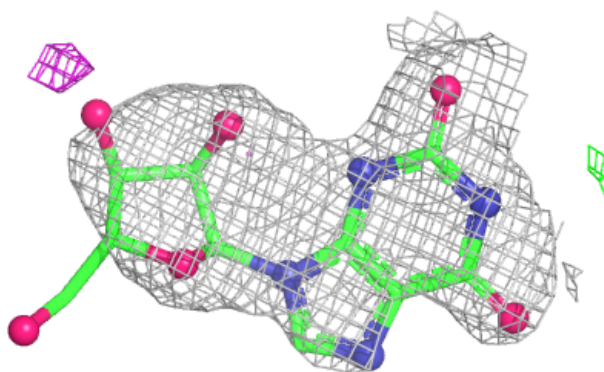


Electron density around SAH G 3501:

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

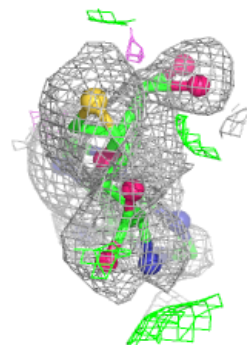
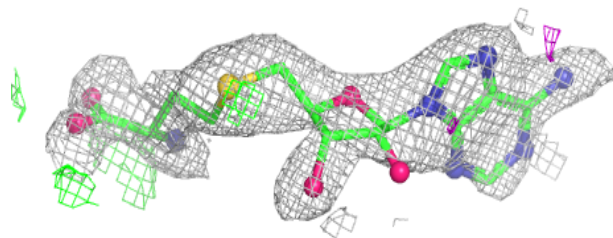
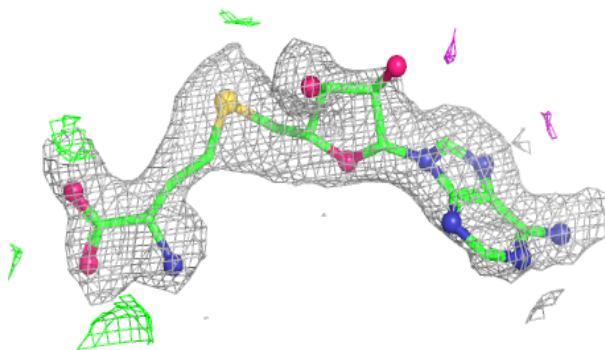
**Electron density around XTS C 1502:**

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

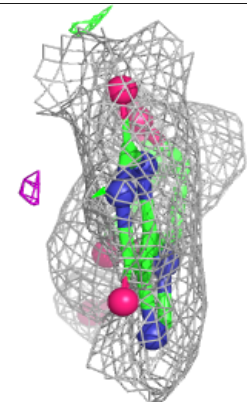
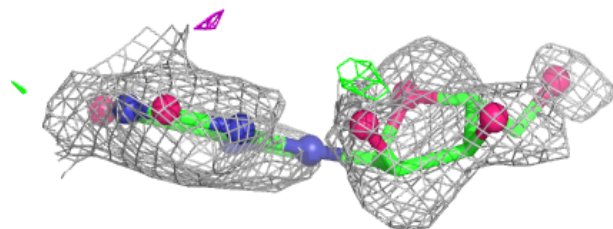
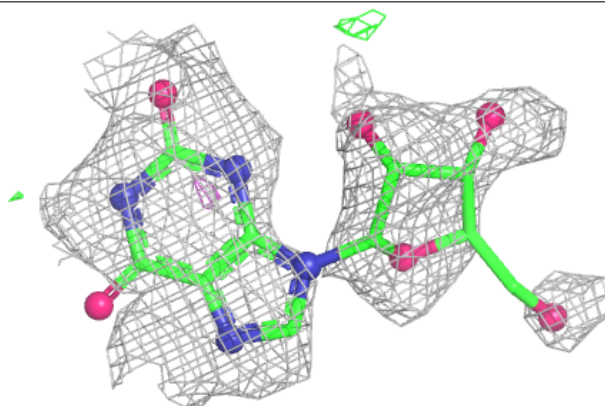


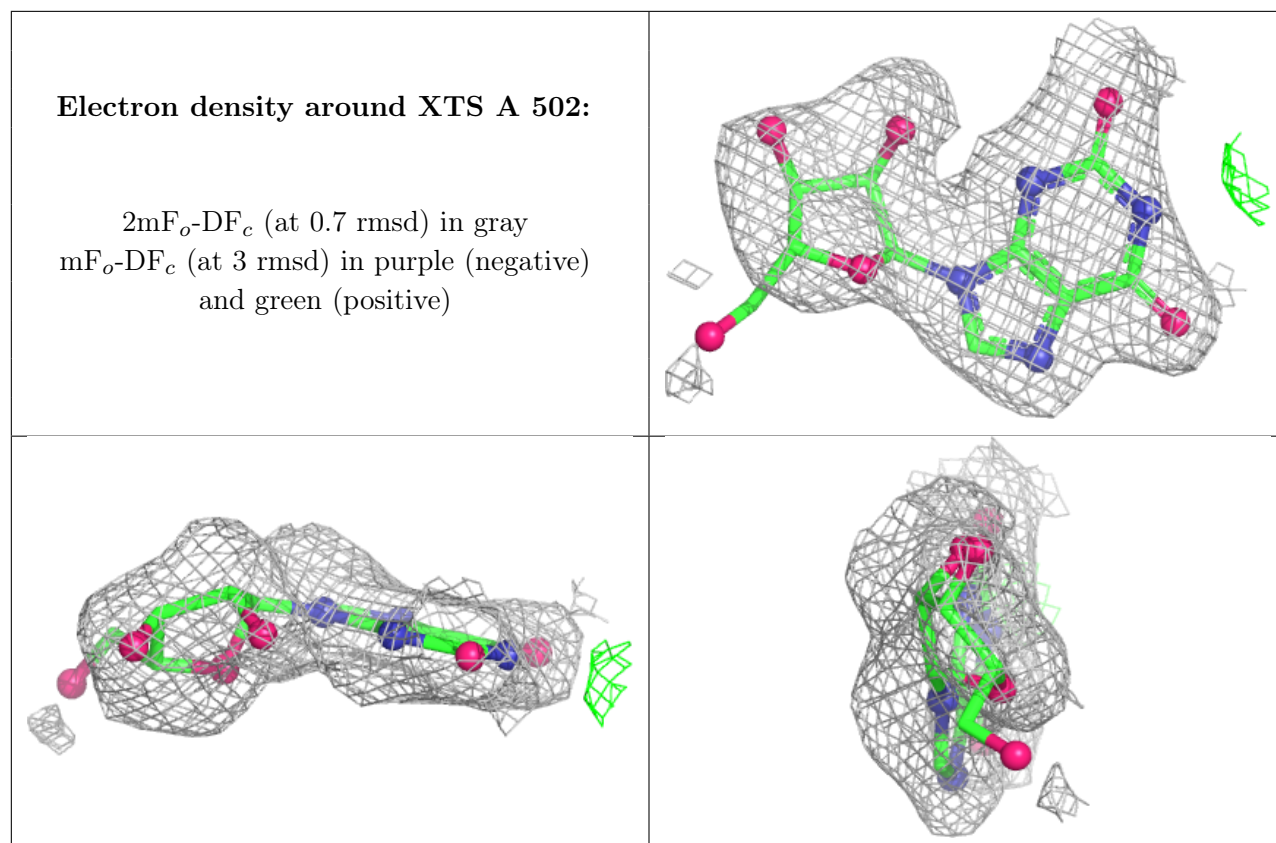
Electron density around SAH E 2501:

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

**Electron density around XTS G 3502:**

$2mF_o-DF_c$ (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.