



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 20, 2024 – 09:23 am GMT

PDB ID : 8R4O
Title : Salt inducible kinase 3 in complex with inhibitor
Authors : Kack, H.; Oster, L.
Deposited on : 2023-11-14
Resolution : 2.73 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 : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.36
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

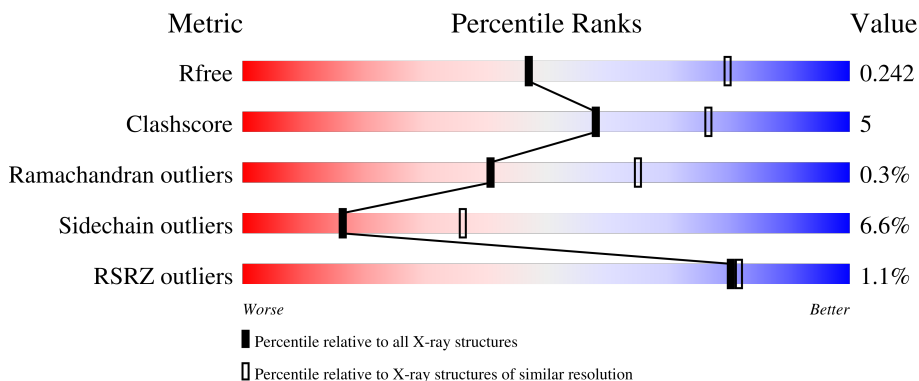
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.73 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	3359 (2.74-2.70)
Clashscore	141614	3686 (2.74-2.70)
Ramachandran outliers	138981	3622 (2.74-2.70)
Sidechain outliers	138945	3623 (2.74-2.70)
RSRZ outliers	127900	3276 (2.74-2.70)

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	328	82% 13% . .
1	C	328	82% 13% . .
1	E	328	80% 15% . .
1	G	328	82% 16% . .
1	I	328	79% 16% . .

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Mol	Chain	Length	Quality of chain
1	K	328	<p>3% 80% 16%</p>
2	B	273	<p>% 78% 9% 11%</p>
2	D	273	<p>% 79% 9% 11%</p>
2	F	273	<p>% 79% 9% 10%</p>
2	H	273	<p>% 79% 9% 10%</p>
2	J	273	<p>% 78% 8% 11%</p>
2	L	273	<p>% 78% 9% 11%</p>

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 26252 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 Serine/threonine-protein kinase SIK3.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	P	S			
1	A	316	2511	1605	428	460	1	17	0	0	0
1	C	315	2481	1587	424	452	1	17	0	0	0
1	E	315	2502	1603	429	452	1	17	0	0	0
1	G	323	2566	1640	439	469	1	17	0	0	0
1	I	317	2503	1602	429	454	1	17	0	0	0
1	K	316	2485	1589	427	451	1	17	0	0	0

There are 24 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	58	SER	-	expression tag	UNP Q9Y2K2
A	121	SER	CYS	engineered mutation	UNP Q9Y2K2
A	181	SER	CYS	engineered mutation	UNP Q9Y2K2
A	333	SER	CYS	engineered mutation	UNP Q9Y2K2
C	58	SER	-	expression tag	UNP Q9Y2K2
C	121	SER	CYS	engineered mutation	UNP Q9Y2K2
C	181	SER	CYS	engineered mutation	UNP Q9Y2K2
C	333	SER	CYS	engineered mutation	UNP Q9Y2K2
E	58	SER	-	expression tag	UNP Q9Y2K2
E	121	SER	CYS	engineered mutation	UNP Q9Y2K2
E	181	SER	CYS	engineered mutation	UNP Q9Y2K2
E	333	SER	CYS	engineered mutation	UNP Q9Y2K2
G	58	SER	-	expression tag	UNP Q9Y2K2
G	121	SER	CYS	engineered mutation	UNP Q9Y2K2
G	181	SER	CYS	engineered mutation	UNP Q9Y2K2
G	333	SER	CYS	engineered mutation	UNP Q9Y2K2
I	58	SER	-	expression tag	UNP Q9Y2K2

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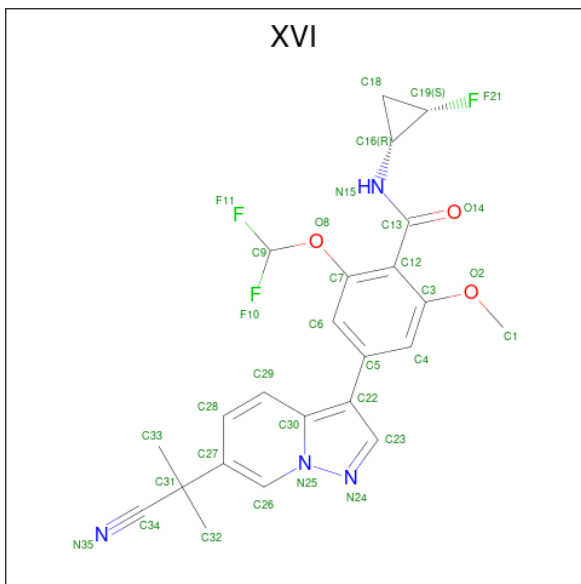
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Chain	Residue	Modelled	Actual	Comment	Reference
I	121	SER	CYS	engineered mutation	UNP Q9Y2K2
I	181	SER	CYS	engineered mutation	UNP Q9Y2K2
I	333	SER	CYS	engineered mutation	UNP Q9Y2K2
K	58	SER	-	expression tag	UNP Q9Y2K2
K	121	SER	CYS	engineered mutation	UNP Q9Y2K2
K	181	SER	CYS	engineered mutation	UNP Q9Y2K2
K	333	SER	CYS	engineered mutation	UNP Q9Y2K2

- Molecule 2 is a protein called scFvH1.

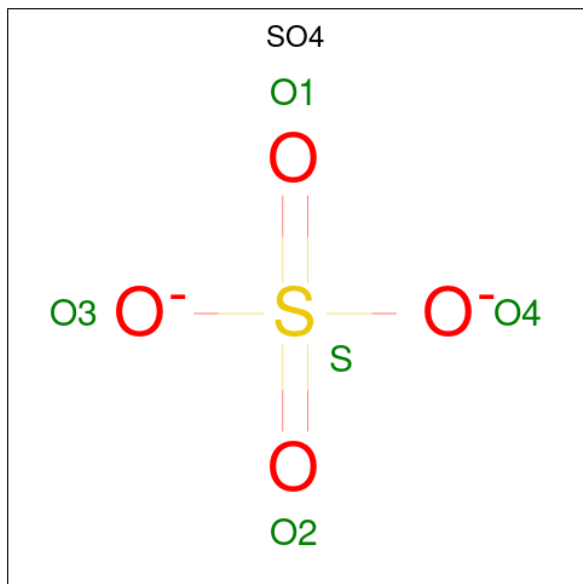
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	244	Total	C	N	O	S	0	0	0
			1799	1128	306	359	6			
2	D	244	Total	C	N	O	S	0	0	0
			1805	1137	303	359	6			
2	F	245	Total	C	N	O	S	0	0	0
			1819	1143	308	362	6			
2	H	246	Total	C	N	O	S	0	0	0
			1815	1141	306	362	6			
2	J	243	Total	C	N	O	S	0	0	0
			1808	1137	306	359	6			
2	L	243	Total	C	N	O	S	0	0	0
			1810	1138	306	360	6			

- Molecule 3 is 2-[bis(fluoranyl)methoxy]-4-[6-(2-cyanopropan-2-yl)pyrazolo[1,5-a]pyridin-3-yl]-{N}-[(1 {R},2 {S})-2-fluoranylcyclopropyl]-6-methoxy-benzamide (three-letter code: XVI) (formula: C₂₃H₂₁F₃N₄O₃).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	F	N	O	0	0
			33	23	3	4	3		
3	C	1	Total	C	F	N	O	0	0
			33	23	3	4	3		
3	E	1	Total	C	F	N	O	0	0
			33	23	3	4	3		
3	G	1	Total	C	F	N	O	0	0
			33	23	3	4	3		
3	I	1	Total	C	F	N	O	0	0
			33	23	3	4	3		
3	K	1	Total	C	F	N	O	0	0
			33	23	3	4	3		

- Molecule 4 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	O S	0	0
			5	4 1		
4	C	1	Total	O S	0	0
			5	4 1		
4	C	1	Total	O S	0	0
			5	4 1		
4	G	1	Total	O S	0	0
			5	4 1		
4	I	1	Total	O S	0	0
			5	4 1		
4	K	1	Total	O S	0	0
			5	4 1		

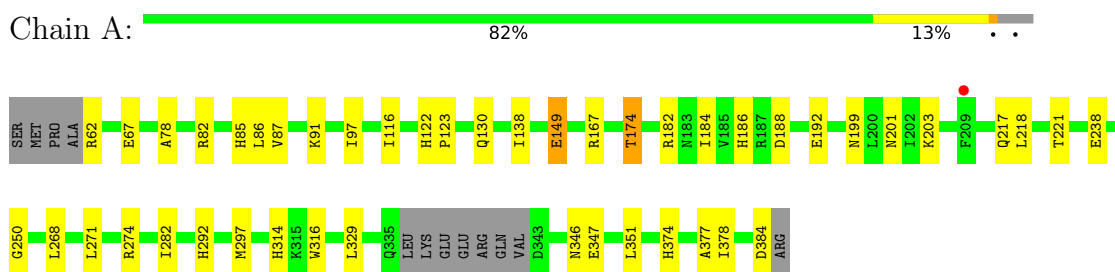
- Molecule 5 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	11	Total O 11 11	0	0
5	B	8	Total O 8 8	0	0
5	C	5	Total O 5 5	0	0
5	D	9	Total O 9 9	0	0
5	E	7	Total O 7 7	0	0
5	F	16	Total O 16 16	0	0
5	G	4	Total O 4 4	0	0
5	H	15	Total O 15 15	0	0
5	I	11	Total O 11 11	0	0
5	J	12	Total O 12 12	0	0
5	K	5	Total O 5 5	0	0
5	L	17	Total O 17 17	0	0

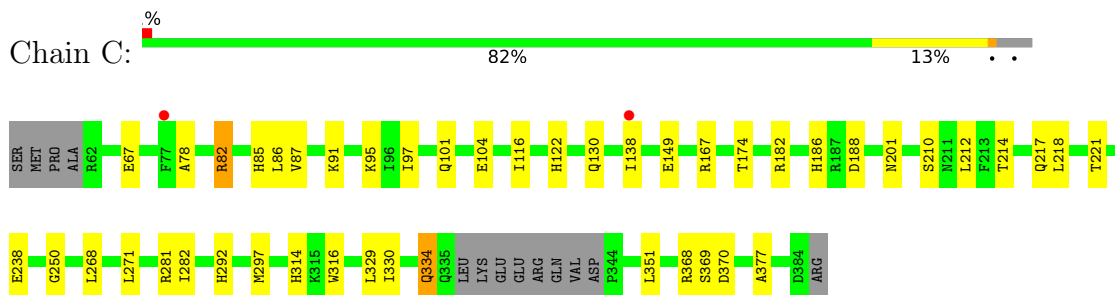
3 Residue-property plots [i](#)

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.

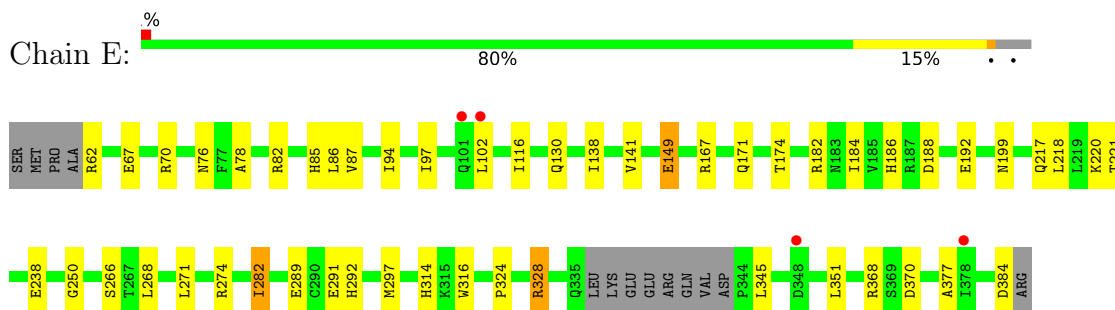
- Molecule 1: Serine/threonine-protein kinase SIK3



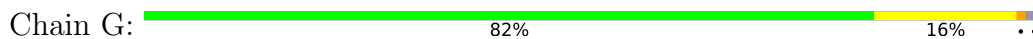
- Molecule 1: Serine/threonine-protein kinase SIK3

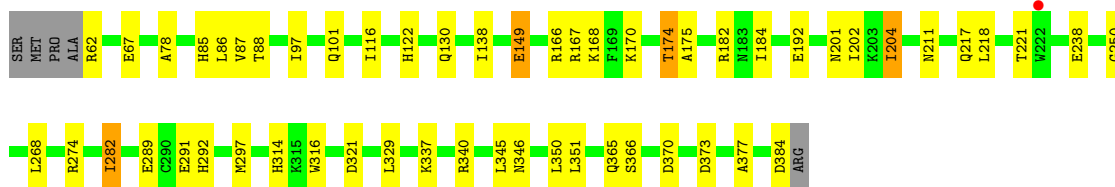


- Molecule 1: Serine/threonine-protein kinase SIK3

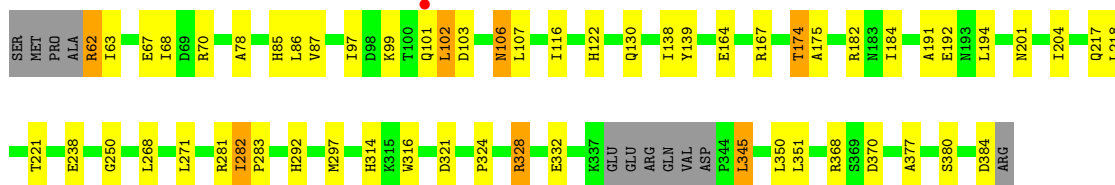
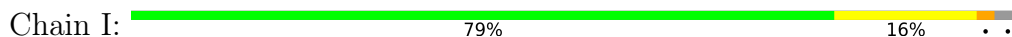


- Molecule 1: Serine/threonine-protein kinase SIK3

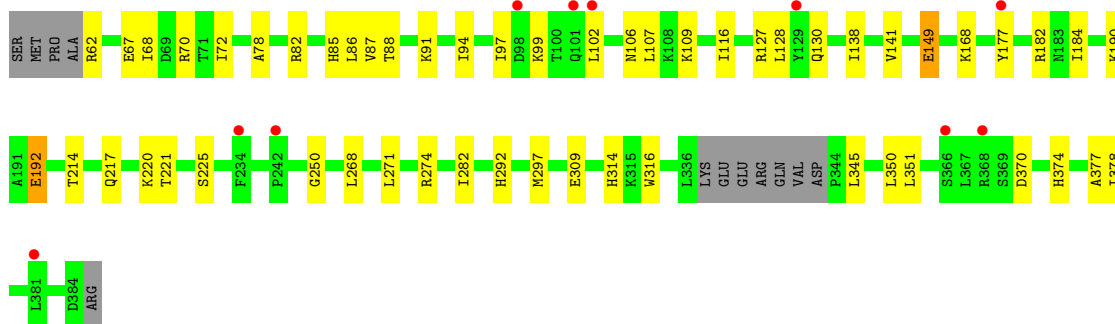
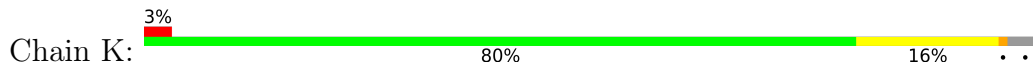




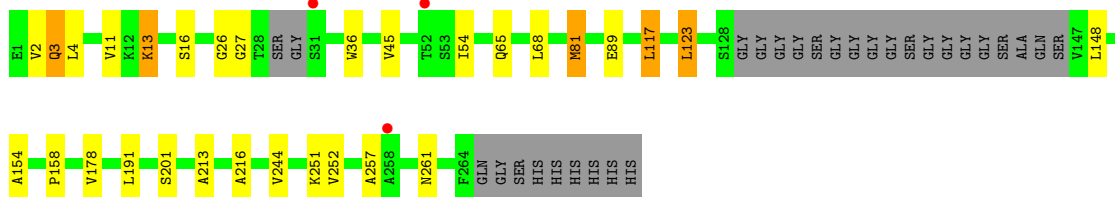
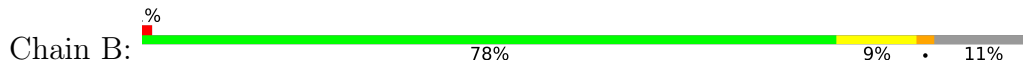
• Molecule 1: Serine/threonine-protein kinase SIK3



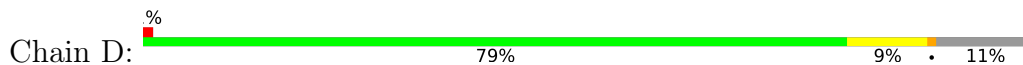
• Molecule 1: Serine/threonine-protein kinase SIK3



• Molecule 2: scFvH1

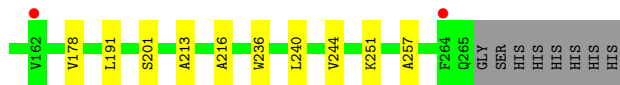
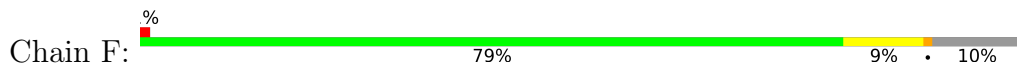


• Molecule 2: scFvH1

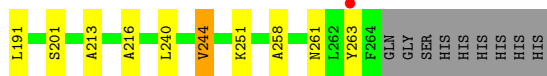
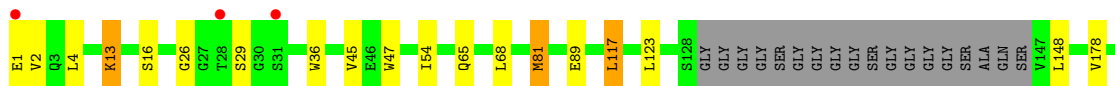
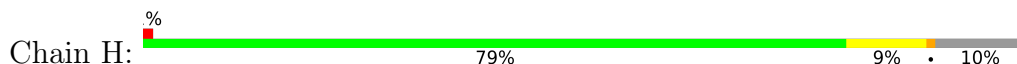




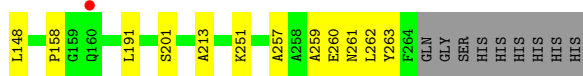
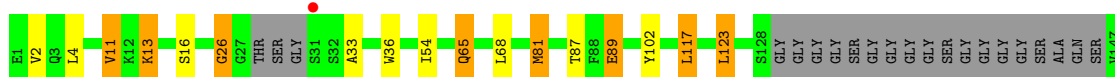
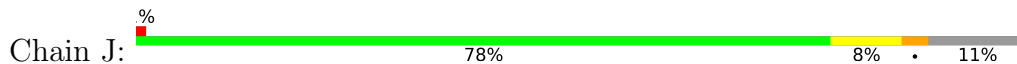
● Molecule 2: scFvH1



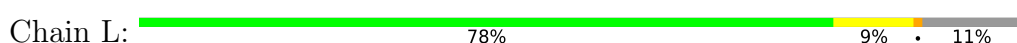
● Molecule 2: scFvH1



● Molecule 2: scFvH1



● Molecule 2: scFvH1



4 Data and refinement statistics i

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	83.78Å 217.66Å 223.12Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	155.80 – 2.73 155.80 – 2.73	Depositor EDS
% Data completeness (in resolution range)	73.7 (155.80-2.73) 73.7 (155.80-2.73)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.78 (at 2.73Å)	Xtrriage
Refinement program	BUSTER 2.11.8	Depositor
R, R_{free}	0.214 , 0.244 0.210 , 0.242	Depositor DCC
R_{free} test set	4057 reflections (5.01%)	wwPDB-VP
Wilson B-factor (Å ²)	67.1	Xtrriage
Anisotropy	0.040	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.30 , 43.5	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	0.002 for -h,l,k	Xtrriage
F_o, F_c correlation	0.93	EDS
Total number of atoms	26252	wwPDB-VP
Average B, all atoms (Å ²)	75.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.27% 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: TPO, SO4, XVI

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	0.35	0/2551	0.52	0/3448
1	C	0.32	0/2520	0.51	0/3408
1	E	0.33	0/2542	0.50	0/3432
1	G	0.33	0/2607	0.52	0/3524
1	I	0.36	0/2543	0.54	0/3438
1	K	0.33	0/2522	0.53	0/3406
2	B	0.35	0/1839	0.57	0/2501
2	D	0.37	0/1847	0.58	0/2513
2	F	0.38	0/1861	0.56	0/2530
2	H	0.34	0/1858	0.58	0/2529
2	J	0.36	0/1850	0.57	0/2515
2	L	0.37	0/1852	0.58	0/2518
All	All	0.35	0/26392	0.54	0/35762

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [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	2511	0	2473	32	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	2481	0	2439	31	0
1	E	2502	0	2487	28	0
1	G	2566	0	2536	33	0
1	I	2503	0	2461	35	0
1	K	2485	0	2462	36	0
2	B	1799	0	1712	11	0
2	D	1805	0	1712	11	0
2	F	1819	0	1730	9	0
2	H	1815	0	1724	13	0
2	J	1808	0	1723	19	0
2	L	1810	0	1725	14	0
3	A	33	0	0	0	0
3	C	33	0	0	1	0
3	E	33	0	0	0	0
3	G	33	0	0	0	0
3	I	33	0	0	0	0
3	K	33	0	0	0	0
4	A	5	0	0	0	0
4	C	10	0	0	0	0
4	G	5	0	0	1	0
4	I	5	0	0	0	0
4	K	5	0	0	0	0
5	A	11	0	0	0	0
5	B	8	0	0	0	0
5	C	5	0	0	0	0
5	D	9	0	0	0	0
5	E	7	0	0	0	0
5	F	16	0	0	0	0
5	G	4	0	0	0	0
5	H	15	0	0	0	0
5	I	11	0	0	0	0
5	J	12	0	0	0	0
5	K	5	0	0	0	0
5	L	17	0	0	0	0
All	All	26252	0	25184	245	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 5.

All (245) 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:C:214:THR:HB	1:C:217:GLN:HG2	1.44	0.95
1:C:85:HIS:CE1	1:C:87:VAL:HG22	2.02	0.94
1:E:70:ARG:HH11	1:E:82:ARG:HH12	1.18	0.87
1:C:85:HIS:HE1	1:C:87:VAL:HG22	1.37	0.86
1:E:85:HIS:CD2	1:E:87:VAL:HG22	2.13	0.83
1:G:85:HIS:NE2	1:G:87:VAL:HG22	1.93	0.82
1:A:199:ASN:HD22	1:K:168:LYS:NZ	1.77	0.82
1:A:199:ASN:ND2	1:K:168:LYS:NZ	2.29	0.81
1:A:199:ASN:HD22	1:K:168:LYS:HZ1	1.29	0.80
1:A:85:HIS:NE2	1:A:87:VAL:HG22	1.97	0.79
1:I:85:HIS:NE2	1:I:87:VAL:HG22	1.98	0.79
1:A:85:HIS:CD2	1:A:87:VAL:HG22	2.17	0.78
2:F:2:VAL:HA	2:F:26:GLY:HA3	1.67	0.77
1:I:85:HIS:CD2	1:I:87:VAL:HG22	2.18	0.77
2:J:261:ASN:HD22	2:J:263:TYR:H	1.30	0.76
1:A:374:HIS:CE1	1:A:378:ILE:HD11	2.20	0.76
1:G:337:LYS:HA	1:G:340:ARG:HG2	1.66	0.76
2:H:2:VAL:HA	2:H:26:GLY:CA	2.16	0.75
1:E:70:ARG:NH1	1:E:82:ARG:HH12	1.85	0.74
1:K:99:LYS:HA	1:K:102:LEU:HD23	1.68	0.74
1:K:62:ARG:HG2	1:K:68:ILE:HB	1.69	0.74
1:K:85:HIS:NE2	1:K:87:VAL:HG22	2.02	0.74
1:E:85:HIS:NE2	1:E:87:VAL:HG22	2.01	0.74
2:B:123:LEU:HD11	2:J:11:VAL:HG13	1.72	0.72
1:I:167:ARG:NH1	1:I:201:ASN:HD21	1.88	0.72
1:A:199:ASN:ND2	1:K:168:LYS:HZ3	1.84	0.71
1:I:99:LYS:HA	1:I:102:LEU:HD12	1.72	0.71
1:K:374:HIS:NE2	1:K:378:ILE:HD11	2.06	0.71
1:A:167:ARG:HH21	1:A:201:ASN:HD21	1.38	0.71
1:I:122:HIS:HE1	1:I:174:THR:HG22	1.56	0.70
1:C:122:HIS:CE1	1:C:174:THR:HG22	2.26	0.70
2:J:2:VAL:HA	2:J:26:GLY:HA3	1.74	0.70
1:G:167:ARG:NH2	1:G:201:ASN:HD21	1.90	0.70
1:G:122:HIS:HE1	1:G:174:THR:HG22	1.57	0.69
1:E:70:ARG:HH11	1:E:82:ARG:NH1	1.90	0.69
2:H:2:VAL:HA	2:H:26:GLY:HA2	1.74	0.68
1:I:103:ASP:HB3	1:I:106:ASN:HB2	1.75	0.68
2:L:47:TRP:CG	2:L:244:VAL:HG13	2.29	0.67
2:H:2:VAL:HG13	2:H:26:GLY:HA3	1.77	0.67
1:K:82:ARG:HH22	1:K:91:LYS:HG2	1.58	0.67
1:K:177:TYR:OH	1:K:309:GLU:HG3	1.94	0.67
1:K:85:HIS:CD2	1:K:87:VAL:HG22	2.28	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:167:ARG:HH21	1:G:201:ASN:HD21	1.42	0.67
1:G:314:HIS:HD1	1:G:316:TRP:H	1.42	0.67
1:A:314:HIS:HD1	1:A:316:TRP:H	1.42	0.66
1:C:369:SER:HB3	2:J:87:THR:HB	1.77	0.66
1:A:292:HIS:HD2	1:A:314:HIS:NE2	1.94	0.66
1:G:292:HIS:HD2	1:G:314:HIS:NE2	1.93	0.66
1:G:85:HIS:CD2	1:G:87:VAL:HG22	2.30	0.66
1:E:292:HIS:HD2	1:E:314:HIS:NE2	1.94	0.66
1:A:122:HIS:HE1	1:A:174:THR:HG22	1.60	0.65
1:K:292:HIS:HD2	1:K:314:HIS:NE2	1.94	0.65
1:C:167:ARG:NH2	1:C:201:ASN:HD21	1.94	0.64
1:E:167:ARG:NH2	1:I:167:ARG:HH12	1.95	0.64
1:K:314:HIS:HD1	1:K:316:TRP:H	1.42	0.64
1:C:314:HIS:HD1	1:C:316:TRP:H	1.43	0.64
1:E:314:HIS:HD1	1:E:316:TRP:H	1.43	0.64
1:I:130:GLN:HB2	1:I:377:ALA:HB2	1.79	0.64
1:K:149:GLU:HG3	1:K:192:GLU:HA	1.79	0.64
2:H:2:VAL:HA	2:H:26:GLY:HA3	1.80	0.64
1:C:292:HIS:HD2	1:C:314:HIS:NE2	1.95	0.64
1:I:314:HIS:HD1	1:I:316:TRP:H	1.44	0.63
1:E:116:ILE:HG23	1:E:184:ILE:HD13	1.81	0.62
1:K:214:THR:HB	1:K:217:GLN:HG3	1.80	0.62
2:H:47:TRP:CG	2:H:244:VAL:HG13	2.35	0.62
1:G:116:ILE:HG23	1:G:184:ILE:HD13	1.82	0.61
1:I:292:HIS:HD2	1:I:314:HIS:NE2	1.96	0.61
1:I:122:HIS:CE1	1:I:174:THR:HG22	2.36	0.61
2:J:13:LYS:HE3	2:J:16:SER:HB3	1.83	0.61
2:L:13:LYS:HE3	2:L:16:SER:HB3	1.83	0.61
2:B:13:LYS:HE3	2:B:16:SER:HB3	1.82	0.61
1:C:97:ILE:HB	1:C:138:ILE:HG23	1.83	0.61
1:K:82:ARG:NH2	1:K:91:LYS:HG2	2.15	0.61
1:E:328:ARG:NE	1:I:324:PRO:HG3	2.16	0.60
1:C:122:HIS:HE1	1:C:174:THR:HG22	1.64	0.60
1:K:116:ILE:HG23	1:K:184:ILE:HD13	1.82	0.60
1:C:174:THR:HG21	1:C:329:LEU:HD13	1.82	0.60
1:A:97:ILE:HB	1:A:138:ILE:HG23	1.83	0.60
1:A:116:ILE:HG23	1:A:184:ILE:HD13	1.84	0.60
1:I:116:ILE:HG23	1:I:184:ILE:HD13	1.83	0.60
1:C:167:ARG:HH21	1:C:201:ASN:HD21	1.49	0.59
1:G:337:LYS:HA	1:G:340:ARG:CG	2.32	0.59
2:D:4:LEU:HD13	2:D:117:LEU:HD13	1.85	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:85:HIS:HD2	1:A:87:VAL:H	1.50	0.59
1:G:97:ILE:HB	1:G:138:ILE:HG23	1.85	0.59
2:F:13:LYS:HE3	2:F:16:SER:HB3	1.84	0.58
1:G:122:HIS:CE1	1:G:174:THR:HG22	2.37	0.58
2:D:158:PRO:HD2	2:D:257:ALA:HA	1.85	0.58
1:C:369:SER:HB3	2:J:87:THR:CG2	2.34	0.58
1:C:369:SER:CB	2:J:87:THR:HB	2.33	0.57
1:K:85:HIS:CD2	1:K:88:THR:HG23	2.39	0.57
1:C:368:ARG:HB2	2:J:89:GLU:HG3	1.86	0.57
1:K:374:HIS:CE1	1:K:378:ILE:HD11	2.39	0.57
1:G:85:HIS:CD2	1:G:88:THR:HG23	2.40	0.57
2:B:158:PRO:HD2	2:B:257:ALA:HA	1.86	0.57
2:J:4:LEU:HD13	2:J:117:LEU:HD13	1.86	0.57
2:F:158:PRO:HD2	2:F:257:ALA:HA	1.86	0.56
1:E:97:ILE:HB	1:E:138:ILE:HG23	1.87	0.56
1:K:214:THR:HB	1:K:217:GLN:CG	2.35	0.56
2:J:257:ALA:HB3	2:J:260:GLU:HG3	1.86	0.56
2:L:4:LEU:HD13	2:L:117:LEU:HD13	1.87	0.56
1:K:130:GLN:HB2	1:K:377:ALA:HB2	1.86	0.55
1:A:149:GLU:HG3	1:A:192:GLU:HA	1.89	0.55
1:A:130:GLN:HB2	1:A:377:ALA:HB2	1.89	0.55
1:C:281:ARG:HH21	2:D:65:GLN:HE21	1.55	0.55
1:I:97:ILE:HB	1:I:138:ILE:HG23	1.89	0.55
2:B:4:LEU:HD13	2:B:117:LEU:HD13	1.89	0.55
1:I:63:ILE:HG22	1:I:68:ILE:HD11	1.88	0.55
1:K:190:LYS:HD3	1:K:225:SER:HB2	1.90	0.54
1:C:85:HIS:CE1	1:C:87:VAL:CG2	2.85	0.54
1:C:281:ARG:HH21	2:D:65:GLN:NE2	2.06	0.53
1:I:281:ARG:HH21	2:J:65:GLN:HE21	1.55	0.53
1:I:63:ILE:HG12	1:I:139:TYR:CE2	2.44	0.53
1:A:122:HIS:CE1	1:A:174:THR:HG22	2.43	0.53
2:F:4:LEU:HD13	2:F:117:LEU:HD22	1.91	0.52
1:C:85:HIS:HE1	1:C:87:VAL:CG2	2.16	0.52
1:E:130:GLN:HB2	1:E:377:ALA:HB2	1.91	0.52
1:A:123:PRO:O	1:A:203:LYS:HE2	2.09	0.52
1:K:94:ILE:HG12	1:K:141:VAL:HG22	1.92	0.52
1:C:95:LYS:HB2	3:C:401:XVI:F10	2.00	0.52
2:B:11:VAL:HG13	2:J:123:LEU:HD11	1.92	0.51
2:D:261:ASN:ND2	2:D:263:TYR:HB3	2.26	0.51
2:B:2:VAL:HA	2:B:26:GLY:HA3	1.92	0.51
1:E:149:GLU:HG3	1:E:192:GLU:HA	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:78:ALA:HB2	1:G:97:ILE:HG12	1.92	0.51
1:K:82:ARG:HH12	1:K:91:LYS:HE2	1.76	0.51
1:C:369:SER:HB3	2:J:87:THR:CB	2.41	0.50
2:L:2:VAL:HG13	2:L:26:GLY:HA2	1.91	0.50
1:E:274:ARG:HD2	2:F:240:LEU:O	2.12	0.50
1:G:149:GLU:HG3	1:G:192:GLU:HA	1.94	0.50
2:D:258:ALA:O	2:D:264:PHE:O	2.29	0.50
2:L:106:ASN:ND2	2:L:109:TYR:H	2.10	0.49
1:C:116:ILE:HD11	1:C:212:LEU:HG	1.93	0.49
1:A:186:HIS:HD2	1:A:188:ASP:H	1.60	0.49
1:I:191:ALA:HA	1:I:194:LEU:HD12	1.95	0.49
1:A:82:ARG:HH22	1:A:91:LYS:HG2	1.78	0.49
1:K:78:ALA:HB2	1:K:97:ILE:HG12	1.94	0.49
1:G:250:GLY:HA2	1:G:297:MET:HE3	1.95	0.49
1:C:82:ARG:HH22	1:C:91:LYS:HG2	1.78	0.48
1:G:85:HIS:NE2	1:G:87:VAL:CG2	2.70	0.48
2:H:178:VAL:HG21	2:H:216:ALA:HB2	1.96	0.48
2:D:178:VAL:HG21	2:D:216:ALA:HB2	1.96	0.48
1:I:281:ARG:HH21	2:J:65:GLN:NE2	2.10	0.48
1:A:78:ALA:HB2	1:A:97:ILE:HG12	1.96	0.48
2:F:33:ALA:HB2	2:F:102:TYR:CD1	2.49	0.48
1:C:78:ALA:HB2	1:C:97:ILE:HG12	1.96	0.47
1:C:330:ILE:O	1:C:334:GLN:HG2	2.14	0.47
2:L:47:TRP:CD1	2:L:244:VAL:HG13	2.49	0.47
1:I:62:ARG:HG2	1:I:68:ILE:HB	1.96	0.47
1:A:85:HIS:NE2	1:A:87:VAL:CG2	2.73	0.47
1:C:130:GLN:HB2	1:C:377:ALA:HB2	1.95	0.47
1:G:174:THR:HG21	1:G:329:LEU:HD13	1.96	0.47
1:E:70:ARG:NH1	1:E:82:ARG:NH1	2.55	0.47
1:E:167:ARG:O	1:E:171:GLN:HG3	2.13	0.47
1:G:130:GLN:HB2	1:G:377:ALA:HB2	1.97	0.47
2:H:47:TRP:CD2	2:H:244:VAL:HG13	2.49	0.47
1:I:345:LEU:HD12	1:I:350:LEU:HD11	1.96	0.47
2:H:47:TRP:CD1	2:H:244:VAL:HG13	2.50	0.47
1:E:167:ARG:NH2	1:I:167:ARG:NH1	2.61	0.46
2:F:178:VAL:HG21	2:F:216:ALA:HB2	1.97	0.46
1:A:167:ARG:HH21	1:A:201:ASN:ND2	2.10	0.46
1:A:374:HIS:CE1	1:A:378:ILE:CD1	2.96	0.46
2:B:178:VAL:HG21	2:B:216:ALA:HB2	1.95	0.46
1:E:94:ILE:HG12	1:E:141:VAL:HG22	1.96	0.46
2:J:263:TYR:HE2	1:K:106:ASN:HD21	1.62	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:167:ARG:HH11	1:I:201:ASN:HD21	1.62	0.46
1:C:67:GLU:HB2	1:C:86:LEU:HD21	1.98	0.46
1:G:85:HIS:HD2	1:G:88:THR:H	1.62	0.46
1:E:324:PRO:HG3	1:I:328:ARG:HD2	1.98	0.46
1:E:78:ALA:HB2	1:E:97:ILE:HG12	1.98	0.46
1:K:97:ILE:HB	1:K:138:ILE:HG23	1.97	0.46
1:I:102:LEU:HD13	1:I:107:LEU:HD21	1.98	0.45
2:L:1:GLU:OE1	2:L:26:GLY:O	2.34	0.45
1:C:250:GLY:HA2	1:C:297:MET:HE3	1.99	0.45
2:L:178:VAL:HG21	2:L:216:ALA:HB2	1.98	0.45
1:I:67:GLU:HB2	1:I:86:LEU:HD21	1.98	0.45
1:K:190:LYS:HG3	1:K:192:GLU:HG2	1.98	0.45
1:K:374:HIS:CE1	1:K:378:ILE:CD1	2.99	0.45
1:I:175:ALA:HB3	1:I:204:ILE:HD12	1.99	0.44
2:B:2:VAL:HG22	2:B:27:GLY:H	1.83	0.44
1:K:67:GLU:HB2	1:K:86:LEU:HD21	1.98	0.44
2:F:97:ALA:HB1	2:F:115:PHE:HB3	1.99	0.44
1:A:122:HIS:HE1	1:A:174:THR:CG2	2.30	0.44
1:A:174:THR:HG21	1:A:329:LEU:HD13	1.99	0.44
2:J:158:PRO:HD2	2:J:257:ALA:HA	2.00	0.44
1:A:250:GLY:HA2	1:A:297:MET:HE3	2.00	0.44
1:I:167:ARG:NH1	1:I:201:ASN:ND2	2.61	0.43
2:D:36:TRP:CE2	2:D:81:MET:HB2	2.54	0.43
1:G:167:ARG:NH1	4:G:402:SO4:O4	2.38	0.43
2:H:4:LEU:CD1	2:H:117:LEU:HD13	2.48	0.43
1:E:67:GLU:HB2	1:E:86:LEU:HD21	2.00	0.43
2:D:33:ALA:HB2	2:D:102:TYR:CD1	2.53	0.43
1:K:250:GLY:HA2	1:K:297:MET:HE3	1.98	0.43
1:I:122:HIS:CE1	1:I:174:THR:CG2	3.02	0.43
2:B:36:TRP:CE2	2:B:81:MET:HB2	2.54	0.43
1:E:266:SER:HB3	2:F:236:TRP:NE1	2.32	0.43
1:G:67:GLU:HB2	1:G:86:LEU:HD21	2.00	0.43
2:J:36:TRP:CE2	2:J:81:MET:HB2	2.53	0.43
1:I:78:ALA:HB2	1:I:97:ILE:HG12	2.00	0.43
2:L:47:TRP:CD1	2:L:244:VAL:CG1	3.03	0.42
1:C:186:HIS:HD2	1:C:188:ASP:H	1.67	0.42
1:A:85:HIS:CD2	1:A:87:VAL:CG2	2.97	0.42
2:H:36:TRP:CE2	2:H:81:MET:HB2	2.55	0.42
1:K:274:ARG:HD2	2:L:240:LEU:O	2.20	0.42
1:E:186:HIS:HD2	1:E:188:ASP:H	1.67	0.42
1:G:167:ARG:NH2	1:G:201:ASN:ND2	2.65	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:122:HIS:HE1	1:I:174:THR:CG2	2.30	0.42
1:E:250:GLY:HA2	1:E:297:MET:HE3	2.00	0.42
1:I:218:LEU:HB3	1:I:238:GLU:HB3	2.02	0.42
1:I:250:GLY:HA2	1:I:297:MET:HE3	2.01	0.42
2:H:13:LYS:HE2	2:H:16:SER:CB	2.50	0.42
2:J:33:ALA:HB2	2:J:102:TYR:CD1	2.55	0.42
2:L:36:TRP:CE2	2:L:81:MET:HB2	2.55	0.42
1:E:282:ILE:HG13	1:E:291:GLU:HG3	2.01	0.41
1:A:67:GLU:HB2	1:A:86:LEU:HD21	2.02	0.41
2:H:4:LEU:HD13	2:H:117:LEU:HD13	2.02	0.41
1:K:72:ILE:HD13	1:K:82:ARG:HB3	2.01	0.41
1:C:218:LEU:HB3	1:C:238:GLU:HB3	2.01	0.41
1:E:218:LEU:HB3	1:E:238:GLU:HB3	2.02	0.41
1:G:168:LYS:HB3	1:G:202:ILE:HD11	2.02	0.41
1:G:85:HIS:CD2	1:G:87:VAL:CG2	3.03	0.41
1:K:345:LEU:HD11	1:K:350:LEU:HD11	2.01	0.41
2:B:3:GLN:HE21	2:B:3:GLN:HB3	1.62	0.41
1:K:127:ARG:NH1	1:K:128:LEU:H	2.18	0.41
1:E:85:HIS:CD2	1:E:87:VAL:CG2	2.96	0.41
1:G:282:ILE:HG13	1:G:291:GLU:HG3	2.03	0.41
2:L:161:ARG:HE	2:L:219:ALA:HB1	1.84	0.41
2:B:154:ALA:HB3	2:B:252:VAL:HG22	2.03	0.41
1:E:199:ASN:HD21	1:I:164:GLU:HA	1.86	0.41
1:G:166:ARG:HG2	1:G:170:LYS:HE3	2.02	0.41
1:G:167:ARG:HH21	1:G:201:ASN:ND2	2.12	0.41
1:G:122:HIS:CE1	1:G:174:THR:CG2	3.04	0.41
2:D:161:ARG:HE	2:D:219:ALA:HB1	1.85	0.41
1:G:274:ARG:HD2	2:H:240:LEU:O	2.21	0.41
1:I:282:ILE:HA	1:I:283:PRO:HD3	1.96	0.41
2:J:259:ALA:HB2	2:L:108:HIS:CE1	2.55	0.41
2:L:106:ASN:HD22	2:L:106:ASN:C	2.25	0.41
1:A:122:HIS:CE1	1:A:174:THR:CG2	3.04	0.41
1:A:199:ASN:HD21	1:K:168:LYS:HZ3	1.67	0.40
1:A:218:LEU:HB3	1:A:238:GLU:HB3	2.02	0.40
1:G:175:ALA:HB3	1:G:204:ILE:HD13	2.03	0.40
1:G:218:LEU:HB3	1:G:238:GLU:HB3	2.02	0.40
1:C:82:ARG:NH2	1:C:91:LYS:HG2	2.35	0.40
1:G:366:SER:HB3	1:G:373:ASP:OD1	2.21	0.40
2:D:97:ALA:HB1	2:D:115:PHE:HB3	2.03	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	311/328 (95%)	304 (98%)	7 (2%)	0	100	100
1	C	310/328 (94%)	303 (98%)	7 (2%)	0	100	100
1	E	310/328 (94%)	302 (97%)	8 (3%)	0	100	100
1	G	320/328 (98%)	307 (96%)	12 (4%)	1 (0%)	41	65
1	I	312/328 (95%)	299 (96%)	13 (4%)	0	100	100
1	K	311/328 (95%)	300 (96%)	10 (3%)	1 (0%)	41	65
2	B	238/273 (87%)	227 (95%)	10 (4%)	1 (0%)	34	58
2	D	238/273 (87%)	226 (95%)	11 (5%)	1 (0%)	34	58
2	F	239/273 (88%)	227 (95%)	10 (4%)	2 (1%)	19	41
2	H	242/273 (89%)	224 (93%)	15 (6%)	3 (1%)	13	30
2	J	237/273 (87%)	226 (95%)	9 (4%)	2 (1%)	19	41
2	L	237/273 (87%)	221 (93%)	16 (7%)	0	100	100
All	All	3305/3606 (92%)	3166 (96%)	128 (4%)	11 (0%)	41	65

All (11) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	K	70	ARG
2	D	27	GLY
2	H	29	SER
2	H	258	ALA
1	G	346	ASN
2	F	26	GLY
2	J	26	GLY
2	B	213	ALA
2	F	213	ALA
2	H	213	ALA
2	J	213	ALA

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	266/288 (92%)	253 (95%)	13 (5%)	25	50
1	C	260/288 (90%)	248 (95%)	12 (5%)	27	52
1	E	265/288 (92%)	247 (93%)	18 (7%)	16	35
1	G	272/288 (94%)	254 (93%)	18 (7%)	16	36
1	I	262/288 (91%)	241 (92%)	21 (8%)	12	26
1	K	261/288 (91%)	250 (96%)	11 (4%)	30	56
2	B	190/209 (91%)	174 (92%)	16 (8%)	11	24
2	D	190/209 (91%)	177 (93%)	13 (7%)	16	35
2	F	193/209 (92%)	180 (93%)	13 (7%)	16	35
2	H	192/209 (92%)	175 (91%)	17 (9%)	9	22
2	J	192/209 (92%)	178 (93%)	14 (7%)	14	31
2	L	193/209 (92%)	179 (93%)	14 (7%)	14	31
All	All	2736/2982 (92%)	2556 (93%)	180 (7%)	16	36

All (180) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	62	ARG
1	A	149	GLU
1	A	174	THR
1	A	182	ARG
1	A	217	GLN
1	A	268	LEU
1	A	271	LEU
1	A	274	ARG
1	A	282	ILE
1	A	346	ASN
1	A	347	GLU
1	A	351	LEU
1	A	384	ASP
2	B	3	GLN

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Mol	Chain	Res	Type
2	B	13	LYS
2	B	45	VAL
2	B	54	ILE
2	B	65	GLN
2	B	68	LEU
2	B	81	MET
2	B	89	GLU
2	B	117	LEU
2	B	123	LEU
2	B	148	LEU
2	B	191	LEU
2	B	201	SER
2	B	244	VAL
2	B	251	LYS
2	B	261	ASN
1	C	82	ARG
1	C	101	GLN
1	C	104	GLU
1	C	149	GLU
1	C	182	ARG
1	C	210	SER
1	C	268	LEU
1	C	271	LEU
1	C	282	ILE
1	C	334	GLN
1	C	351	LEU
1	C	370	ASP
2	D	45	VAL
2	D	54	ILE
2	D	65	GLN
2	D	68	LEU
2	D	81	MET
2	D	117	LEU
2	D	123	LEU
2	D	148	LEU
2	D	191	LEU
2	D	201	SER
2	D	244	VAL
2	D	262	LEU
2	D	264	PHE
1	E	62	ARG
1	E	76	ASN

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Mol	Chain	Res	Type
1	E	102	LEU
1	E	149	GLU
1	E	174	THR
1	E	182	ARG
1	E	217	GLN
1	E	220	LYS
1	E	268	LEU
1	E	271	LEU
1	E	282	ILE
1	E	289	GLU
1	E	328	ARG
1	E	345	LEU
1	E	351	LEU
1	E	368	ARG
1	E	370	ASP
1	E	384	ASP
2	F	13	LYS
2	F	54	ILE
2	F	65	GLN
2	F	68	LEU
2	F	81	MET
2	F	117	LEU
2	F	123	LEU
2	F	148	LEU
2	F	157	THR
2	F	191	LEU
2	F	201	SER
2	F	244	VAL
2	F	251	LYS
1	G	62	ARG
1	G	101	GLN
1	G	149	GLU
1	G	174	THR
1	G	182	ARG
1	G	204	ILE
1	G	211	ASN
1	G	217	GLN
1	G	268	LEU
1	G	282	ILE
1	G	289	GLU
1	G	321	ASP
1	G	345	LEU

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Mol	Chain	Res	Type
1	G	350	LEU
1	G	351	LEU
1	G	365	GLN
1	G	370	ASP
1	G	384	ASP
2	H	1	GLU
2	H	13	LYS
2	H	45	VAL
2	H	54	ILE
2	H	65	GLN
2	H	68	LEU
2	H	81	MET
2	H	89	GLU
2	H	117	LEU
2	H	123	LEU
2	H	148	LEU
2	H	191	LEU
2	H	201	SER
2	H	244	VAL
2	H	251	LYS
2	H	261	ASN
2	H	263	TYR
1	I	62	ARG
1	I	70	ARG
1	I	101	GLN
1	I	102	LEU
1	I	106	ASN
1	I	174	THR
1	I	182	ARG
1	I	192	GLU
1	I	217	GLN
1	I	268	LEU
1	I	271	LEU
1	I	282	ILE
1	I	321	ASP
1	I	328	ARG
1	I	332	GLU
1	I	345	LEU
1	I	351	LEU
1	I	368	ARG
1	I	370	ASP
1	I	380	SER

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Mol	Chain	Res	Type
1	I	384	ASP
2	J	11	VAL
2	J	13	LYS
2	J	54	ILE
2	J	65	GLN
2	J	68	LEU
2	J	81	MET
2	J	89	GLU
2	J	117	LEU
2	J	123	LEU
2	J	148	LEU
2	J	191	LEU
2	J	201	SER
2	J	251	LYS
2	J	262	LEU
1	K	107	LEU
1	K	109	LYS
1	K	149	GLU
1	K	182	ARG
1	K	192	GLU
1	K	220	LYS
1	K	268	LEU
1	K	271	LEU
1	K	282	ILE
1	K	351	LEU
1	K	370	ASP
2	L	13	LYS
2	L	45	VAL
2	L	65	GLN
2	L	68	LEU
2	L	81	MET
2	L	89	GLU
2	L	106	ASN
2	L	116	ASP
2	L	123	LEU
2	L	148	LEU
2	L	191	LEU
2	L	244	VAL
2	L	251	LYS
2	L	264	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (55) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	85	HIS
1	A	106	ASN
1	A	186	HIS
1	A	193	ASN
1	A	199	ASN
1	A	201	ASN
1	A	292	HIS
1	A	346	ASN
1	A	374	HIS
2	B	3	GLN
2	B	59	ASN
2	B	224	GLN
1	C	85	HIS
1	C	106	ASN
1	C	186	HIS
1	C	193	ASN
1	C	201	ASN
1	C	292	HIS
2	D	59	ASN
2	D	65	GLN
2	D	224	GLN
2	D	261	ASN
1	E	106	ASN
1	E	186	HIS
1	E	193	ASN
1	E	199	ASN
1	E	292	HIS
2	F	59	ASN
2	F	224	GLN
1	G	106	ASN
1	G	115	GLN
1	G	186	HIS
1	G	193	ASN
1	G	201	ASN
1	G	211	ASN
1	G	292	HIS
2	H	59	ASN
2	H	224	GLN
1	I	186	HIS
1	I	199	ASN
1	I	201	ASN
1	I	292	HIS
2	J	65	GLN

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Mol	Chain	Res	Type
2	J	106	ASN
2	J	224	GLN
2	J	261	ASN
1	K	106	ASN
1	K	193	ASN
1	K	199	ASN
1	K	201	ASN
1	K	217	GLN
1	K	292	HIS
2	L	59	ASN
2	L	106	ASN
2	L	224	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](#)

6 non-standard protein/DNA/RNA residues 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
1	TPO	E	221	1	8,10,11	1.41	1 (12%)	10,14,16	1.36	3 (30%)
1	TPO	A	221	1	8,10,11	1.34	1 (12%)	10,14,16	1.42	2 (20%)
1	TPO	K	221	1	8,10,11	1.46	1 (12%)	10,14,16	1.42	2 (20%)
1	TPO	C	221	1	8,10,11	1.20	1 (12%)	10,14,16	1.34	3 (30%)
1	TPO	I	221	1	8,10,11	1.11	1 (12%)	10,14,16	1.30	2 (20%)
1	TPO	G	221	1	8,10,11	1.26	1 (12%)	10,14,16	1.38	2 (20%)

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
1	TPO	E	221	1	-	1/9/11/13	-
1	TPO	A	221	1	-	0/9/11/13	-
1	TPO	K	221	1	-	1/9/11/13	-
1	TPO	C	221	1	-	0/9/11/13	-
1	TPO	I	221	1	-	0/9/11/13	-
1	TPO	G	221	1	-	0/9/11/13	-

All (6) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	221	TPO	P-OG1	-3.51	1.52	1.59
1	K	221	TPO	P-OG1	-3.44	1.52	1.59
1	C	221	TPO	P-OG1	-2.94	1.53	1.59
1	A	221	TPO	P-OG1	-2.85	1.53	1.59
1	G	221	TPO	P-OG1	-2.85	1.53	1.59
1	I	221	TPO	P-OG1	-2.68	1.54	1.59

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	221	TPO	P-OG1-CB	-2.77	114.83	123.21
1	E	221	TPO	P-OG1-CB	-2.77	114.84	123.21
1	K	221	TPO	P-OG1-CB	-2.73	114.97	123.21
1	G	221	TPO	P-OG1-CB	-2.70	115.05	123.21
1	C	221	TPO	P-OG1-CB	-2.68	115.12	123.21
1	I	221	TPO	P-OG1-CB	-2.67	115.15	123.21
1	K	221	TPO	O-C-CA	-2.27	118.82	124.78
1	G	221	TPO	O-C-CA	-2.08	119.33	124.78
1	E	221	TPO	O-C-CA	-2.08	119.34	124.78
1	A	221	TPO	O-C-CA	-2.04	119.42	124.78
1	E	221	TPO	CG2-CB-CA	-2.02	109.17	113.16
1	C	221	TPO	O-C-CA	-2.02	119.49	124.78
1	I	221	TPO	O-C-CA	-2.02	119.49	124.78
1	C	221	TPO	CG2-CB-CA	-2.01	109.19	113.16

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	E	221	TPO	O-C-CA-CB
1	K	221	TPO	O-C-CA-CB

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

12 ligands are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
3	XVI	A	401	-	30,36,36	2.27	8 (26%)	35,54,54	1.50	6 (17%)
4	SO4	C	402	-	4,4,4	0.17	0	6,6,6	0.12	0
3	XVI	C	401	-	30,36,36	1.83	7 (23%)	35,54,54	1.95	7 (20%)
4	SO4	C	403	-	4,4,4	0.18	0	6,6,6	0.34	0
3	XVI	K	401	-	30,36,36	1.86	5 (16%)	35,54,54	1.41	5 (14%)
4	SO4	I	402	-	4,4,4	0.18	0	6,6,6	0.28	0
4	SO4	G	402	-	4,4,4	0.18	0	6,6,6	0.34	0
4	SO4	K	402	-	4,4,4	0.18	0	6,6,6	0.16	0
3	XVI	I	401	-	30,36,36	1.92	7 (23%)	35,54,54	1.51	6 (17%)
3	XVI	E	401	-	30,36,36	2.12	6 (20%)	35,54,54	1.55	6 (17%)
3	XVI	G	401	-	30,36,36	2.01	6 (20%)	35,54,54	1.60	8 (22%)
4	SO4	A	402	-	4,4,4	0.20	0	6,6,6	0.50	0

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	XVI	A	401	-	-	0/24/32/32	0/4/4/4
3	XVI	C	401	-	-	8/24/32/32	0/4/4/4

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	XVI	K	401	-	-	1/24/32/32	0/4/4/4
3	XVI	I	401	-	-	0/24/32/32	0/4/4/4
3	XVI	E	401	-	-	2/24/32/32	0/4/4/4
3	XVI	G	401	-	-	0/24/32/32	0/4/4/4

All (39) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	401	XVI	C31-C27	-8.86	1.47	1.53
3	E	401	XVI	C31-C27	-7.24	1.48	1.53
3	I	401	XVI	C31-C27	-6.19	1.49	1.53
3	G	401	XVI	C31-C27	-5.57	1.50	1.53
3	C	401	XVI	C31-C27	-5.07	1.50	1.53
3	G	401	XVI	C28-C27	5.06	1.47	1.39
3	K	401	XVI	C28-C27	4.96	1.47	1.39
3	I	401	XVI	C28-C27	4.81	1.47	1.39
3	K	401	XVI	C31-C27	-4.76	1.50	1.53
3	E	401	XVI	C28-C27	4.72	1.46	1.39
3	C	401	XVI	C28-C27	4.71	1.46	1.39
3	A	401	XVI	C28-C27	4.40	1.46	1.39
3	G	401	XVI	C12-C13	-3.78	1.45	1.51
3	E	401	XVI	C22-C5	-3.53	1.43	1.49
3	G	401	XVI	C22-C5	-3.46	1.43	1.49
3	K	401	XVI	C22-C5	-3.34	1.43	1.49
3	K	401	XVI	C12-C13	-3.26	1.46	1.51
3	E	401	XVI	C12-C13	-3.25	1.46	1.51
3	A	401	XVI	C22-C5	-3.15	1.44	1.49
3	A	401	XVI	C12-C13	-3.14	1.46	1.51
3	C	401	XVI	C16-N15	-3.10	1.41	1.46
3	C	401	XVI	C12-C13	-3.06	1.46	1.51
3	C	401	XVI	C22-C5	-2.91	1.44	1.49
3	G	401	XVI	C16-N15	-2.86	1.41	1.46
3	I	401	XVI	C12-C13	-2.86	1.46	1.51
3	A	401	XVI	C16-N15	-2.84	1.41	1.46
3	E	401	XVI	C16-N15	-2.82	1.41	1.46
3	I	401	XVI	C22-C5	-2.71	1.44	1.49
3	K	401	XVI	C16-N15	-2.55	1.42	1.46
3	G	401	XVI	C32-C31	-2.53	1.50	1.54
3	I	401	XVI	C16-N15	-2.45	1.42	1.46
3	A	401	XVI	C32-C31	-2.37	1.50	1.54
3	A	401	XVI	C33-C31	-2.24	1.50	1.54
3	E	401	XVI	C33-C31	-2.09	1.51	1.54

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	I	401	XVI	C33-C31	-2.09	1.51	1.54
3	C	401	XVI	C32-C31	-2.08	1.51	1.54
3	I	401	XVI	C32-C31	-2.08	1.51	1.54
3	C	401	XVI	C33-C31	-2.04	1.51	1.54
3	A	401	XVI	C26-C27	-2.00	1.35	1.39

All (38) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	401	XVI	C1-O2-C3	-8.18	105.19	117.53
3	I	401	XVI	C1-O2-C3	-4.33	110.99	117.53
3	E	401	XVI	C1-O2-C3	-4.25	111.11	117.53
3	G	401	XVI	C1-O2-C3	-4.15	111.27	117.53
3	C	401	XVI	O2-C3-C12	3.97	121.38	115.85
3	A	401	XVI	C1-O2-C3	-3.94	111.58	117.53
3	K	401	XVI	C1-O2-C3	-3.29	112.57	117.53
3	C	401	XVI	O14-C13-N15	3.17	128.28	122.45
3	K	401	XVI	C19-C16-N15	3.13	124.25	118.58
3	I	401	XVI	C19-C16-N15	3.08	124.16	118.58
3	A	401	XVI	C32-C31-C27	-3.05	105.98	111.52
3	G	401	XVI	C7-C12-C3	2.94	122.35	117.85
3	A	401	XVI	C7-C12-C3	2.85	122.22	117.85
3	E	401	XVI	O14-C13-N15	2.84	127.68	122.45
3	E	401	XVI	C7-C12-C3	2.77	122.10	117.85
3	G	401	XVI	C32-C31-C27	-2.71	106.61	111.52
3	A	401	XVI	C4-C3-C12	-2.69	117.13	121.86
3	G	401	XVI	O14-C13-N15	2.67	127.37	122.45
3	K	401	XVI	C7-C12-C3	2.67	121.94	117.85
3	I	401	XVI	C7-C12-C3	2.63	121.89	117.85
3	G	401	XVI	C19-C16-N15	2.63	123.34	118.58
3	K	401	XVI	C4-C3-C12	-2.57	117.34	121.86
3	G	401	XVI	C4-C3-C12	-2.55	117.38	121.86
3	C	401	XVI	O2-C3-C4	-2.54	119.75	124.12
3	A	401	XVI	O2-C3-C12	2.50	119.33	115.85
3	A	401	XVI	O14-C13-N15	2.50	127.05	122.45
3	E	401	XVI	C4-C3-C12	-2.48	117.50	121.86
3	I	401	XVI	O14-C13-N15	2.39	126.85	122.45
3	K	401	XVI	O14-C13-N15	2.32	126.72	122.45
3	I	401	XVI	C4-C3-C12	-2.25	117.90	121.86
3	E	401	XVI	C19-C16-N15	2.22	122.60	118.58
3	G	401	XVI	C23-N24-N25	2.20	105.30	103.70
3	E	401	XVI	C32-C31-C34	2.18	110.74	107.25

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	401	XVI	C32-C31-C27	-2.10	107.72	111.52
3	G	401	XVI	C16-N15-C13	-2.05	119.28	123.01
3	C	401	XVI	C12-C13-N15	-2.04	109.25	115.12
3	I	401	XVI	C16-N15-C13	-2.03	119.31	123.01
3	C	401	XVI	C7-C12-C3	2.00	120.92	117.85

There are no chirality outliers.

All (11) torsion outliers are listed below:

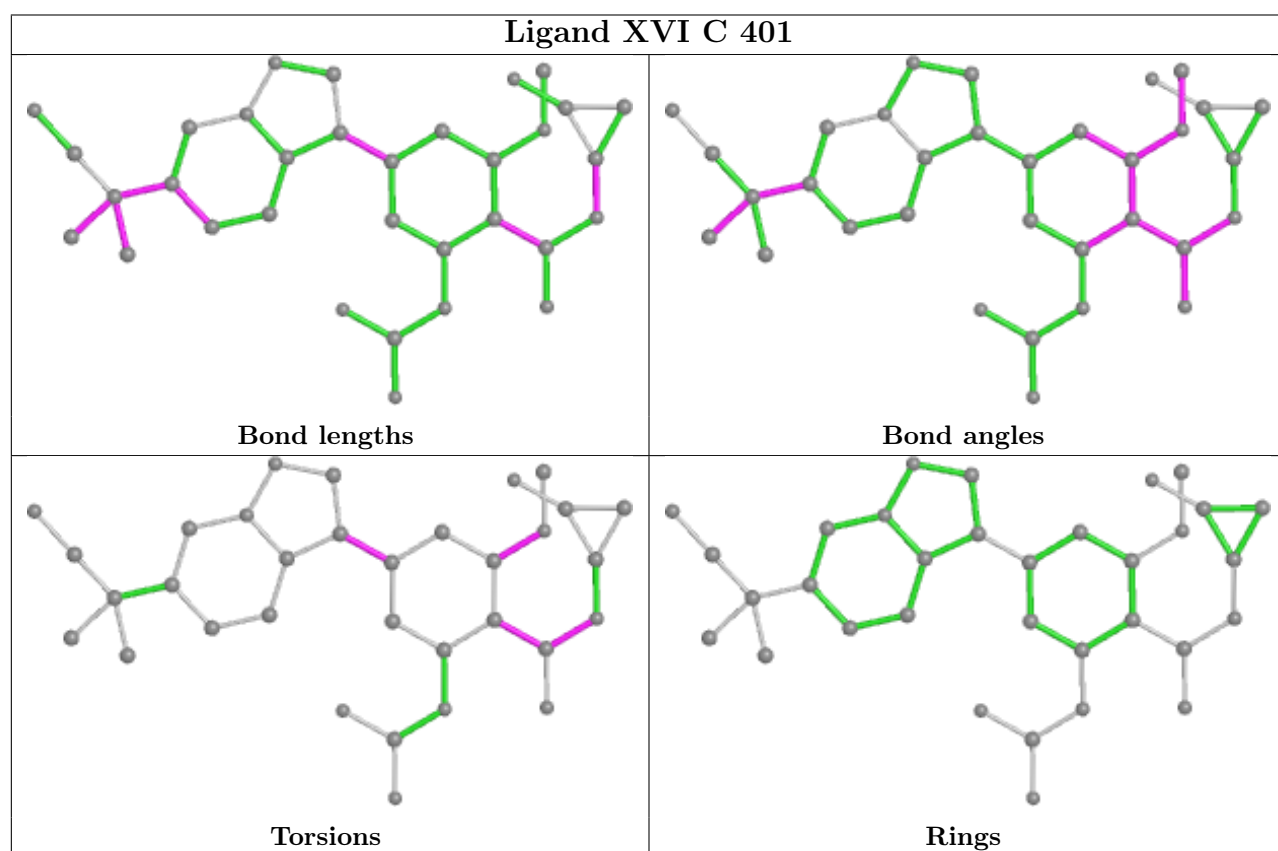
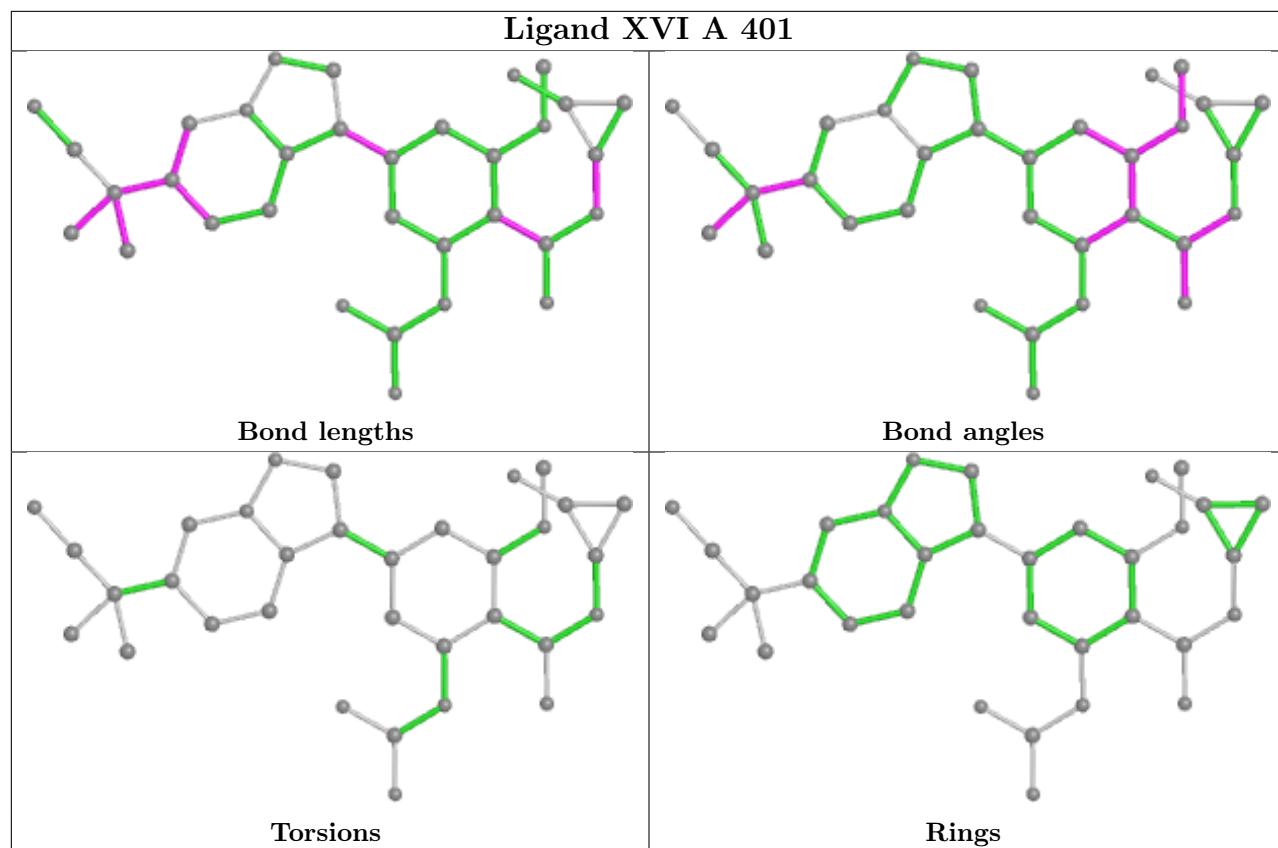
Mol	Chain	Res	Type	Atoms
3	C	401	XVI	C30-C22-C5-C4
3	C	401	XVI	C30-C22-C5-C6
3	K	401	XVI	C19-C16-N15-C13
3	C	401	XVI	C4-C3-O2-C1
3	C	401	XVI	C12-C3-O2-C1
3	C	401	XVI	O14-C13-N15-C16
3	C	401	XVI	C12-C13-N15-C16
3	E	401	XVI	F10-C9-O8-C7
3	C	401	XVI	C7-C12-C13-O14
3	C	401	XVI	C7-C12-C13-N15
3	E	401	XVI	F11-C9-O8-C7

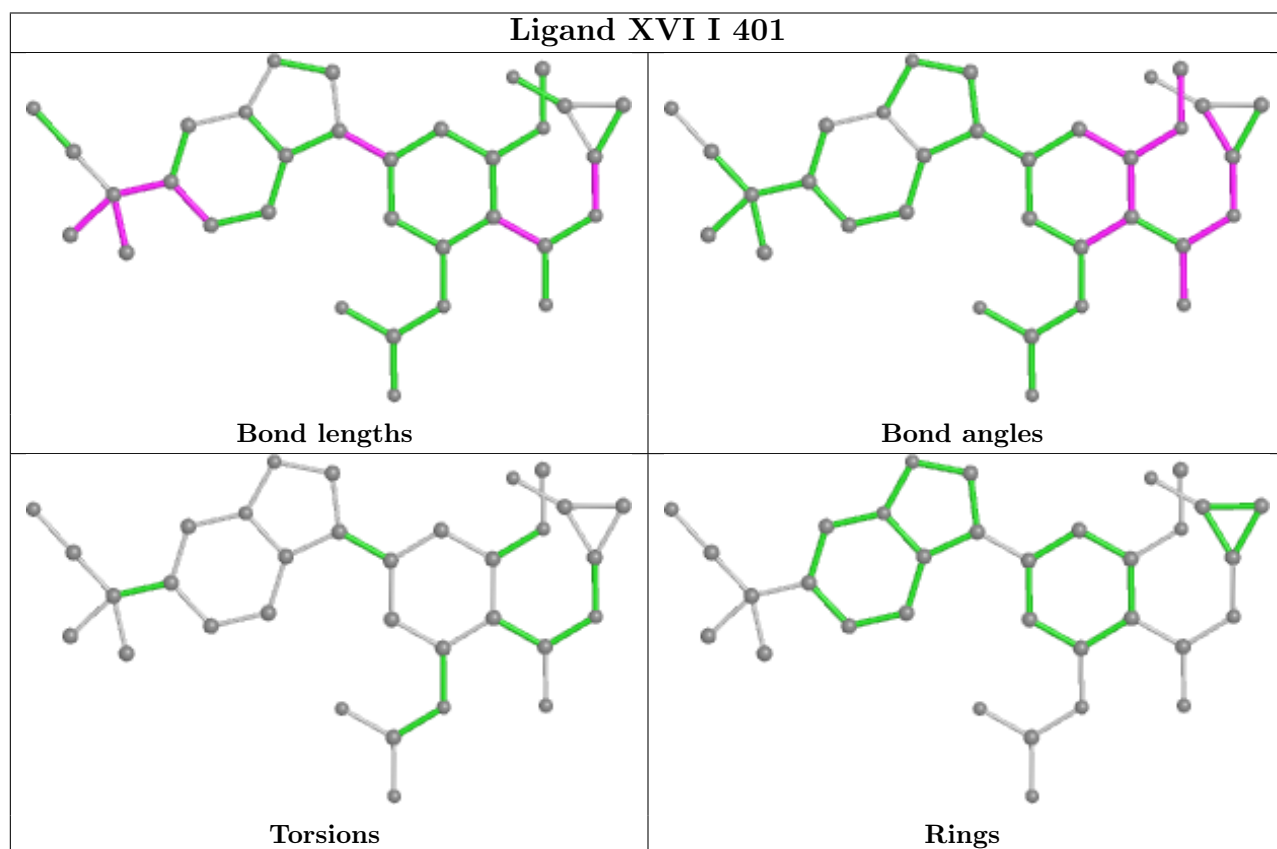
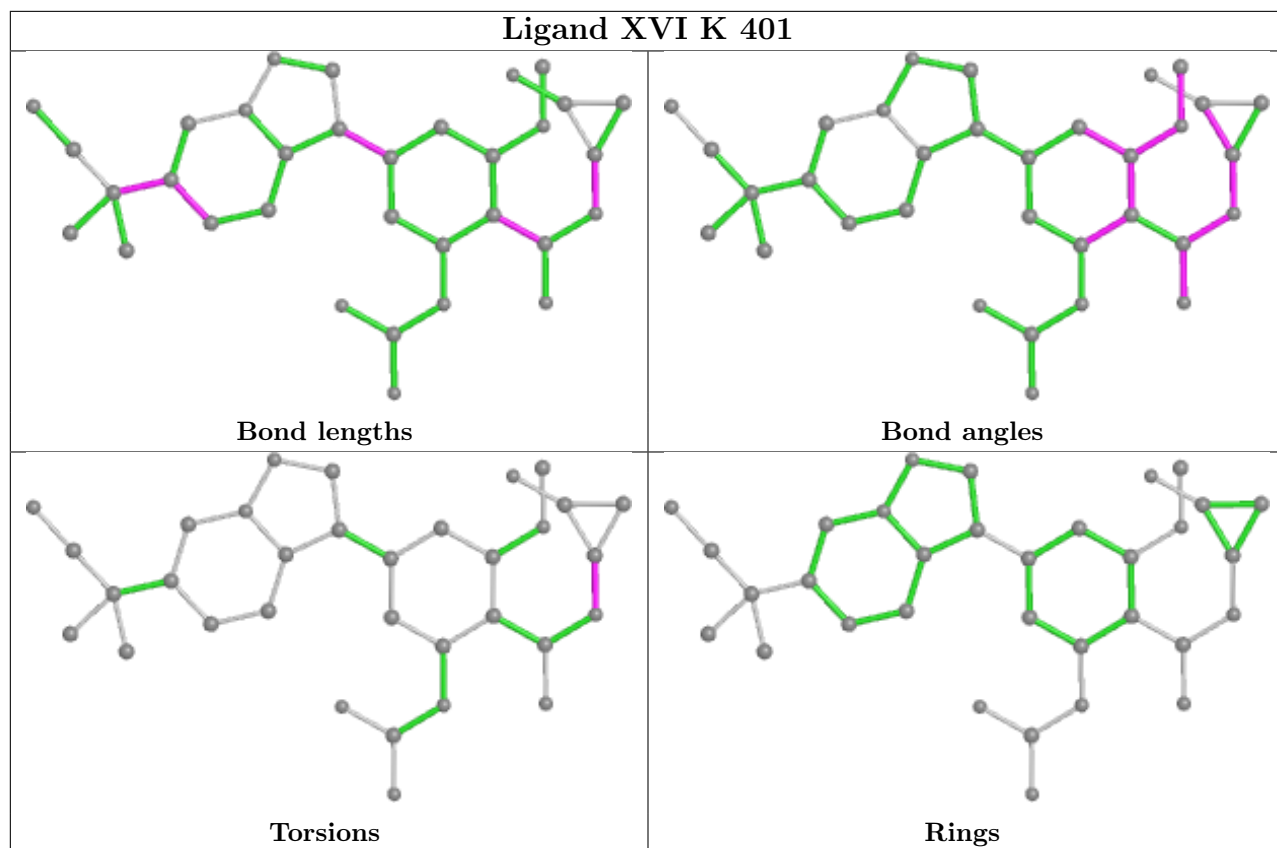
There are no ring outliers.

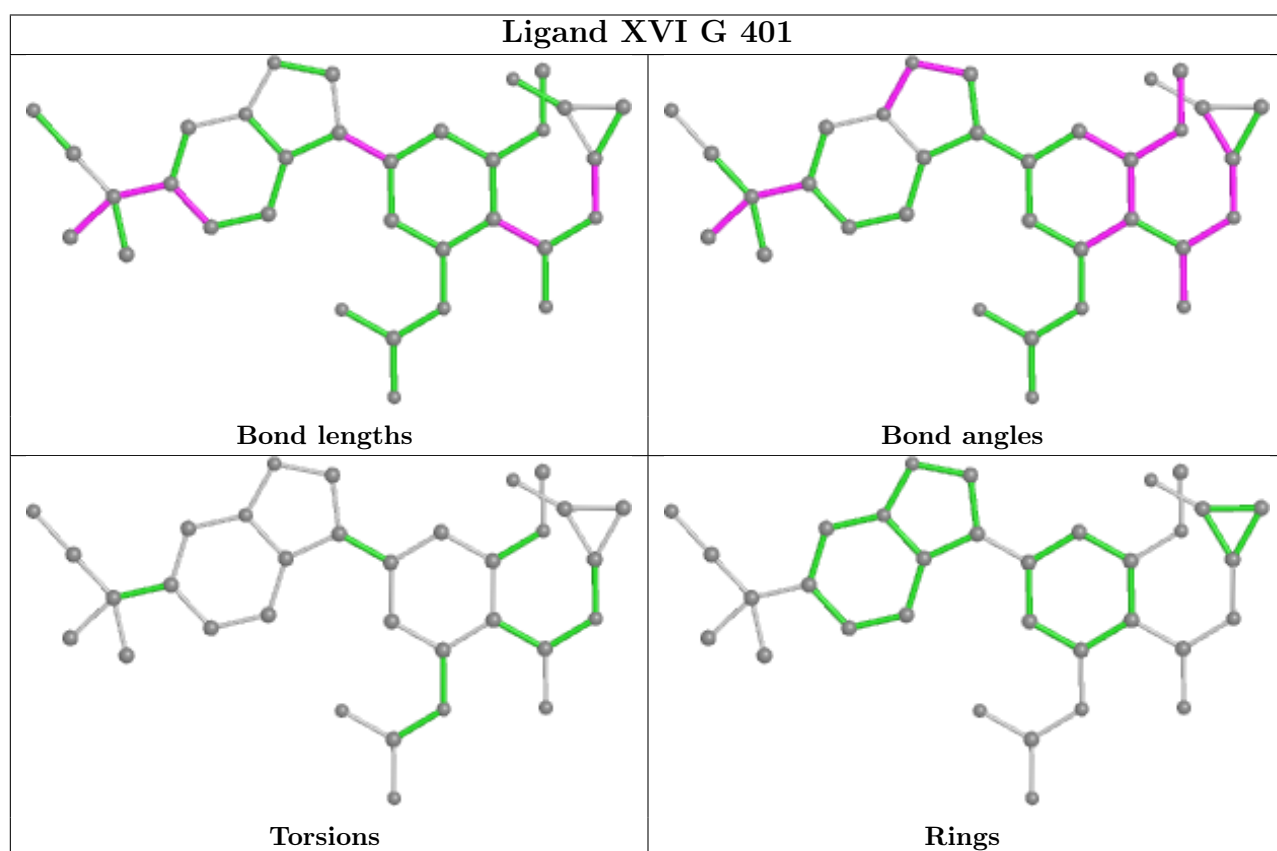
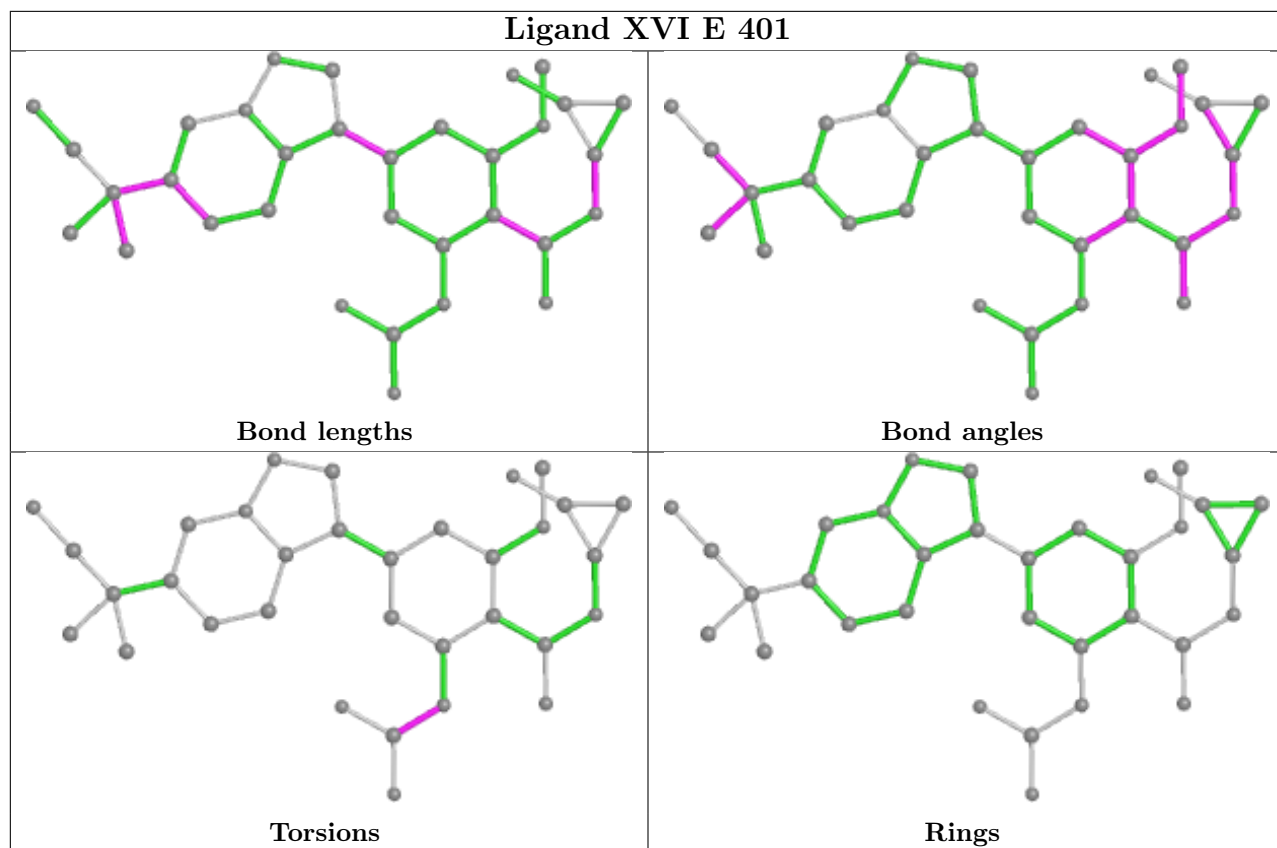
2 monomers are involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	401	XVI	1	0
4	G	402	SO4	1	0

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







5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

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

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	315/328 (96%)	-0.10	1 (0%) 94 95	52, 70, 96, 112	0
1	C	314/328 (95%)	-0.03	2 (0%) 89 90	47, 79, 113, 125	0
1	E	314/328 (95%)	0.00	4 (1%) 77 78	48, 77, 123, 132	0
1	G	322/328 (98%)	-0.01	1 (0%) 94 95	51, 73, 109, 124	0
1	I	316/328 (96%)	-0.04	1 (0%) 94 95	48, 74, 110, 120	0
1	K	315/328 (96%)	0.20	10 (3%) 47 48	61, 92, 163, 204	0
2	B	244/273 (89%)	-0.07	3 (1%) 79 80	51, 68, 89, 106	0
2	D	244/273 (89%)	0.02	4 (1%) 72 74	45, 63, 80, 103	0
2	F	245/273 (89%)	-0.03	3 (1%) 79 80	41, 59, 76, 90	0
2	H	246/273 (90%)	0.00	4 (1%) 72 74	54, 71, 95, 142	0
2	J	243/273 (89%)	-0.01	2 (0%) 86 87	44, 65, 85, 127	0
2	L	243/273 (89%)	-0.05	1 (0%) 92 93	50, 74, 94, 117	0
All	All	3361/3606 (93%)	-0.01	36 (1%) 80 82	41, 72, 111, 204	0

All (36) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	101	GLN	6.2
1	K	102	LEU	4.7
2	D	1	GLU	4.2
2	H	28	THR	4.0
2	H	31	SER	3.2
1	E	102	LEU	3.2
2	H	1	GLU	3.1
2	J	31	SER	3.0
1	K	234	PHE	2.9
1	I	101	GLN	2.9
2	D	27	GLY	2.8

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Mol	Chain	Res	Type	RSRZ
2	B	31	SER	2.8
1	K	381	LEU	2.8
1	G	222	TRP	2.6
2	H	263	TYR	2.6
1	K	368	ARG	2.5
1	C	138	ILE	2.5
1	K	177	TYR	2.5
2	F	264	PHE	2.5
1	K	242	PRO	2.4
1	K	129	TYR	2.4
1	C	77	PHE	2.4
2	J	160	GLN	2.3
2	D	264	PHE	2.3
1	K	101	GLN	2.3
1	E	348	ASP	2.3
1	E	378	ILE	2.3
1	K	366	SER	2.2
1	A	209	PHE	2.2
2	B	52	THR	2.1
2	B	258	ALA	2.1
2	D	52	THR	2.0
2	F	162	VAL	2.0
2	L	257	ALA	2.0
2	F	1	GLU	2.0
1	K	98	ASP	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [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
1	TPO	C	221	11/12	0.95	0.13	96,99,116,117	0
1	TPO	K	221	11/12	0.95	0.18	109,111,122,122	0
1	TPO	G	221	11/12	0.96	0.15	75,78,84,86	0
1	TPO	I	221	11/12	0.96	0.14	80,82,88,93	0
1	TPO	A	221	11/12	0.96	0.18	80,81,94,96	0
1	TPO	E	221	11/12	0.97	0.13	79,82,89,90	0

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

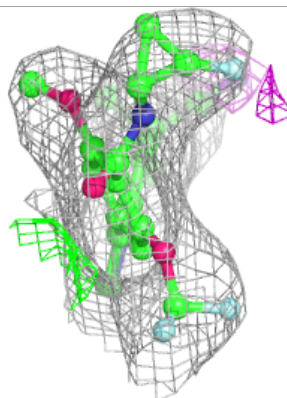
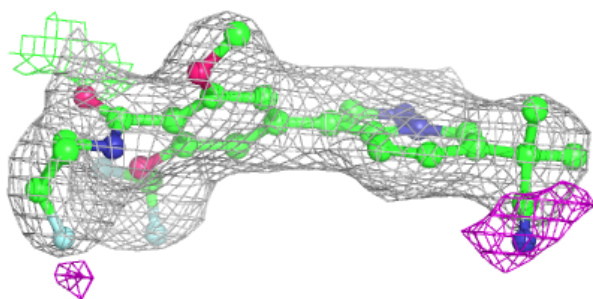
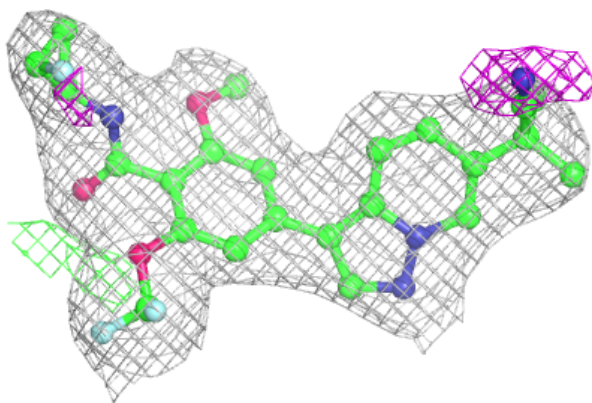
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	SO4	I	402	5/5	0.77	0.20	172,172,172,172	0
4	SO4	G	402	5/5	0.80	0.17	141,141,141,141	0
4	SO4	C	403	5/5	0.82	0.19	147,147,147,147	0
4	SO4	C	402	5/5	0.88	0.16	152,152,152,152	0
4	SO4	A	402	5/5	0.91	0.10	119,119,119,119	0
3	XVI	E	401	33/33	0.95	0.17	53,56,61,61	0
4	SO4	K	402	5/5	0.95	0.11	126,126,126,126	0
3	XVI	A	401	33/33	0.96	0.20	56,58,63,63	0
3	XVI	G	401	33/33	0.96	0.18	57,58,59,60	0
3	XVI	I	401	33/33	0.96	0.17	57,58,61,61	0
3	XVI	C	401	33/33	0.97	0.22	61,62,63,63	0
3	XVI	K	401	33/33	0.97	0.18	71,74,79,79	0

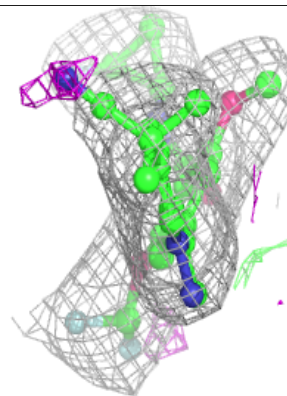
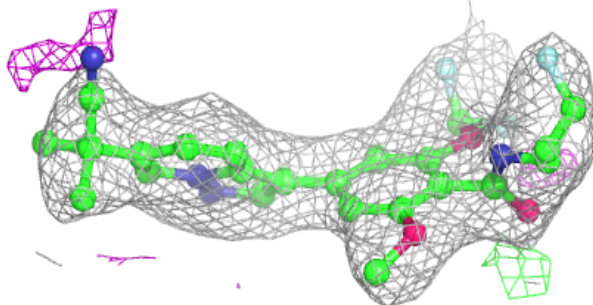
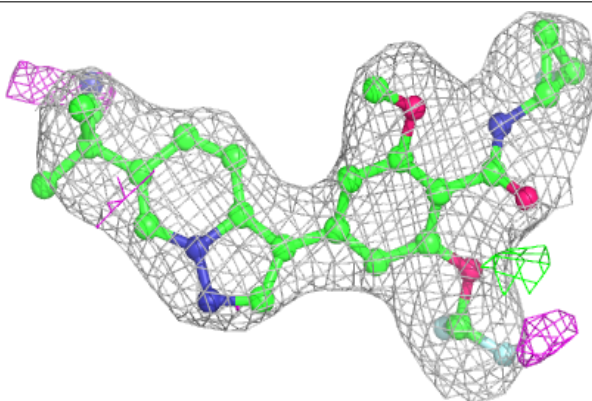
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

Electron density around XVI E 401:

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

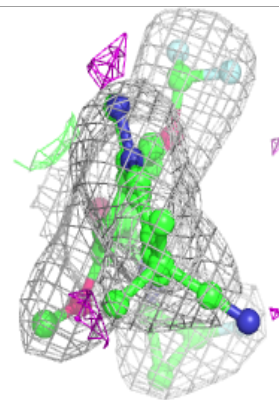
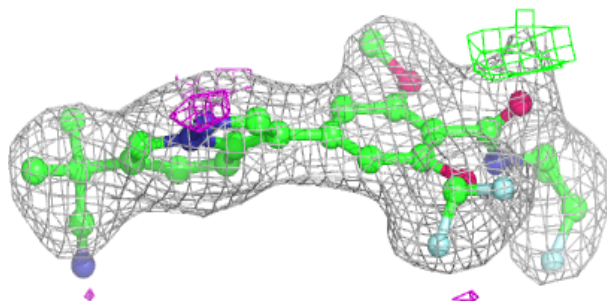
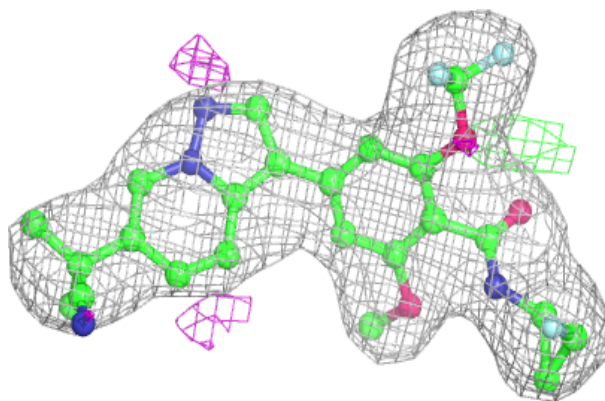
**Electron density around XVI A 401:**

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

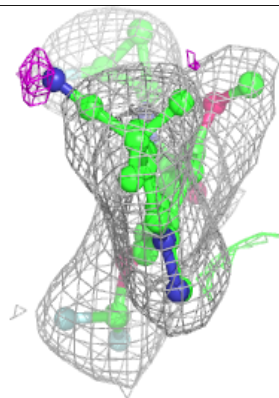
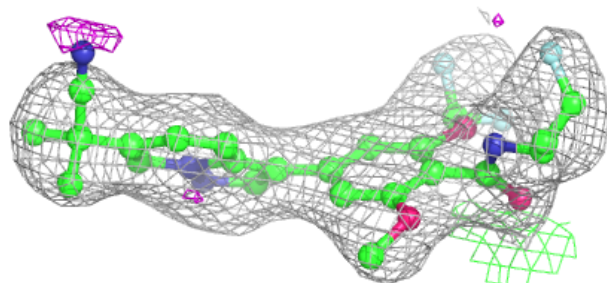
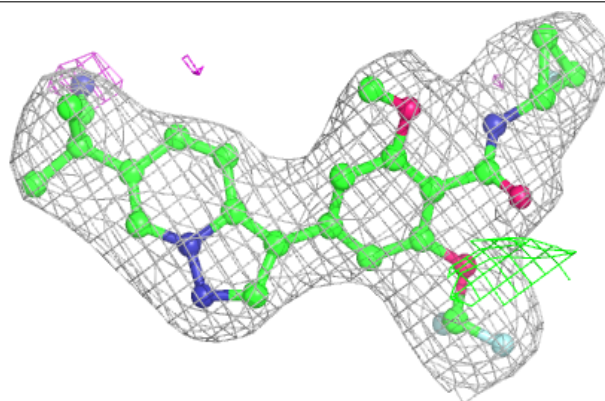


Electron density around XVI G 401:

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

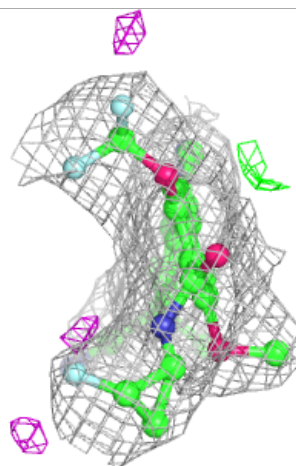
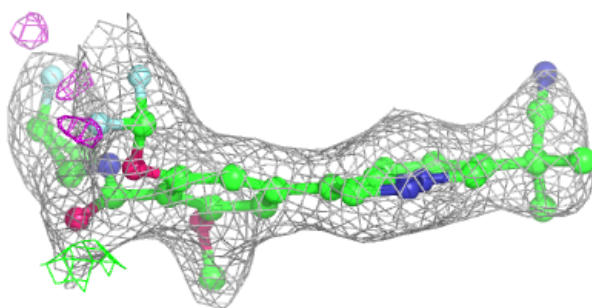
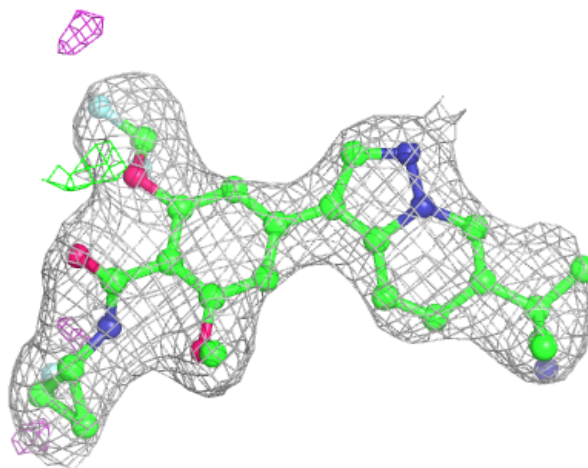
**Electron density around XVI I 401:**

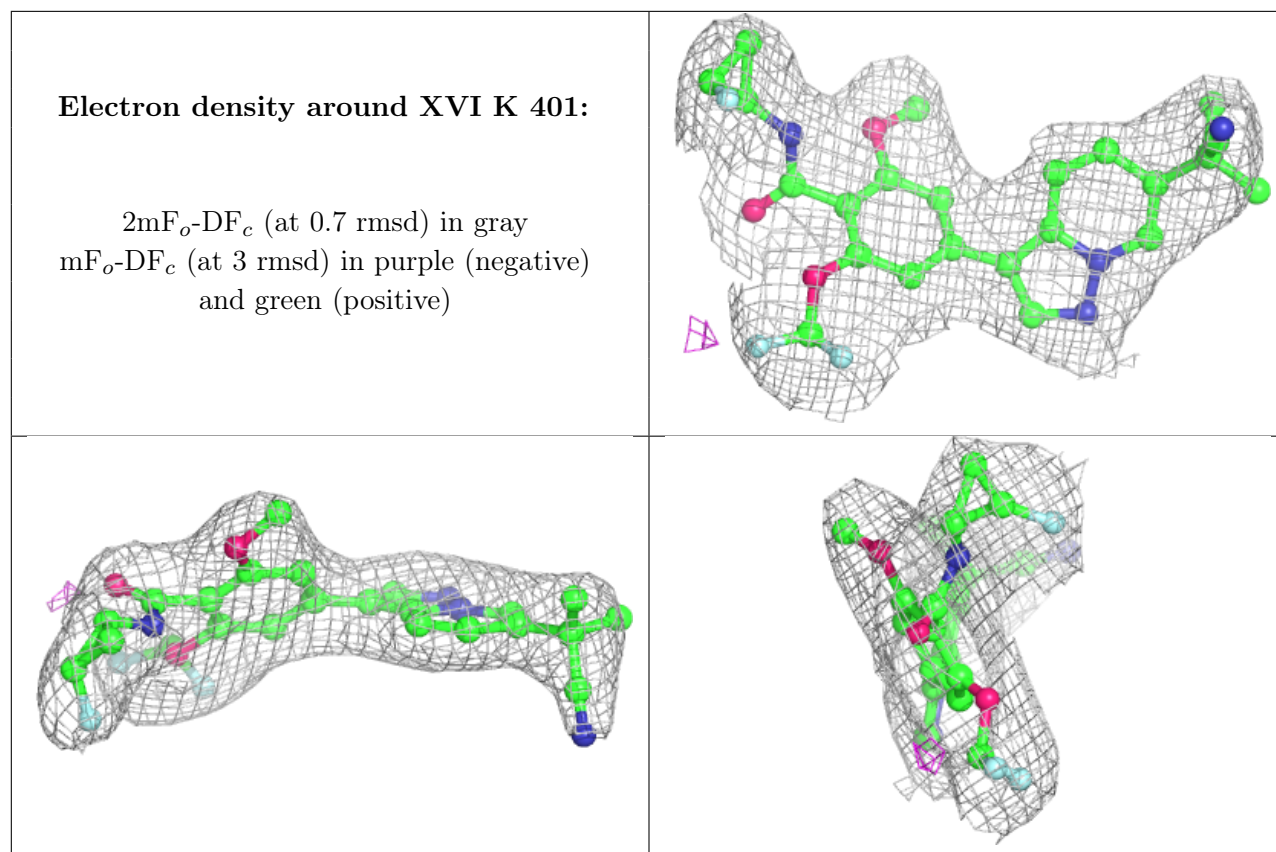
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around XVI C 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 [i](#)

There are no such residues in this entry.