Full wwPDB X-ray Structure Validation Report (i)

Feb 28, 2026 – 08:54 PM UTC

PDB ID	:	6VKO / pdb_00006vko
Title	:	Crystal Structure of human PARP-1 CAT domain bound to inhibitor UKTT15
Authors	:	Langelier, M.F.; Pascal, J.M.
Deposited on	:	2020-01-21
Resolution	:	2.80 Å(reported)

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

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

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

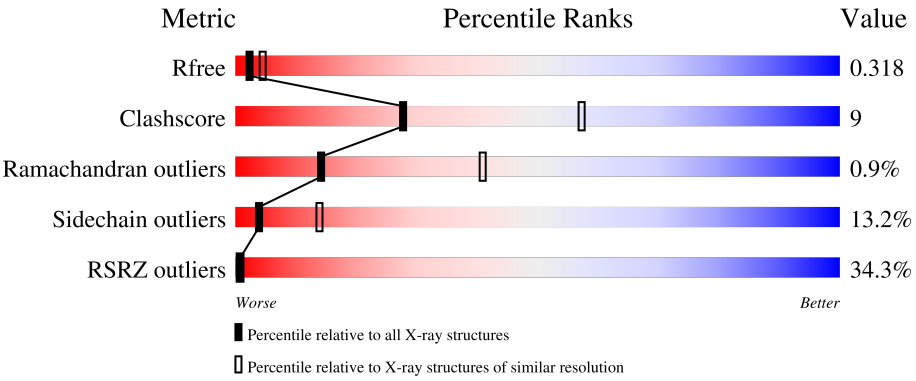
MolProbity	:	4-5-2 with Phenix2.0
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0
EDS	:	3.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
CCP4	:	9.0.010 (Gargrove)
Density-Fitness	:	1.0.12
Ideal 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 (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 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	3866 (2.80-2.80)
Clashscore	190562	4276 (2.80-2.80)
Ramachandran outliers	187476	4196 (2.80-2.80)
Sidechain outliers	187428	4198 (2.80-2.80)
RSRZ outliers	180081	3869 (2.80-2.80)

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

Mol	Chain	Length	Quality of chain
1	A	372	33% 65% 24% • 9%
1	B	372	33% 66% 22% • 9%
1	C	372	30% 64% 24% • 9%
1	D	372	29% 64% 24% • 9%

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 10970 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 Poly [ADP-ribose] polymerase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	340	Total	C	N	O	S	0	1	0
			2686	1713	455	507	11			
1	B	340	Total	C	N	O	S	0	1	0
			2683	1712	454	506	11			
1	C	340	Total	C	N	O	S	0	1	0
			2683	1712	454	506	11			
1	D	340	Total	C	N	O	S	0	1	0
			2683	1712	454	506	11			

There are 88 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	640	MET	-	initiating methionine	UNP P09874
A	641	GLY	-	expression tag	UNP P09874
A	642	SER	-	expression tag	UNP P09874
A	643	SER	-	expression tag	UNP P09874
A	644	HIS	-	expression tag	UNP P09874
A	645	HIS	-	expression tag	UNP P09874
A	646	HIS	-	expression tag	UNP P09874
A	647	HIS	-	expression tag	UNP P09874
A	648	HIS	-	expression tag	UNP P09874
A	649	HIS	-	expression tag	UNP P09874
A	650	SER	-	expression tag	UNP P09874
A	651	SER	-	expression tag	UNP P09874
A	652	GLY	-	expression tag	UNP P09874
A	653	LEU	-	expression tag	UNP P09874
A	654	VAL	-	expression tag	UNP P09874
A	655	PRO	-	expression tag	UNP P09874
A	656	ARG	-	expression tag	UNP P09874
A	657	GLY	-	expression tag	UNP P09874
A	658	SER	-	expression tag	UNP P09874
A	659	HIS	-	expression tag	UNP P09874
A	660	MET	-	expression tag	UNP P09874

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Chain	Residue	Modelled	Actual	Comment	Reference
A	762	ALA	VAL	variant	UNP P09874
B	640	MET	-	initiating methionine	UNP P09874
B	641	GLY	-	expression tag	UNP P09874
B	642	SER	-	expression tag	UNP P09874
B	643	SER	-	expression tag	UNP P09874
B	644	HIS	-	expression tag	UNP P09874
B	645	HIS	-	expression tag	UNP P09874
B	646	HIS	-	expression tag	UNP P09874
B	647	HIS	-	expression tag	UNP P09874
B	648	HIS	-	expression tag	UNP P09874
B	649	HIS	-	expression tag	UNP P09874
B	650	SER	-	expression tag	UNP P09874
B	651	SER	-	expression tag	UNP P09874
B	652	GLY	-	expression tag	UNP P09874
B	653	LEU	-	expression tag	UNP P09874
B	654	VAL	-	expression tag	UNP P09874
B	655	PRO	-	expression tag	UNP P09874
B	656	ARG	-	expression tag	UNP P09874
B	657	GLY	-	expression tag	UNP P09874
B	658	SER	-	expression tag	UNP P09874
B	659	HIS	-	expression tag	UNP P09874
B	660	MET	-	expression tag	UNP P09874
B	762	ALA	VAL	variant	UNP P09874
C	640	MET	-	initiating methionine	UNP P09874
C	641	GLY	-	expression tag	UNP P09874
C	642	SER	-	expression tag	UNP P09874
C	643	SER	-	expression tag	UNP P09874
C	644	HIS	-	expression tag	UNP P09874
C	645	HIS	-	expression tag	UNP P09874
C	646	HIS	-	expression tag	UNP P09874
C	647	HIS	-	expression tag	UNP P09874
C	648	HIS	-	expression tag	UNP P09874
C	649	HIS	-	expression tag	UNP P09874
C	650	SER	-	expression tag	UNP P09874
C	651	SER	-	expression tag	UNP P09874
C	652	GLY	-	expression tag	UNP P09874
C	653	LEU	-	expression tag	UNP P09874
C	654	VAL	-	expression tag	UNP P09874
C	655	PRO	-	expression tag	UNP P09874
C	656	ARG	-	expression tag	UNP P09874
C	657	GLY	-	expression tag	UNP P09874
C	658	SER	-	expression tag	UNP P09874

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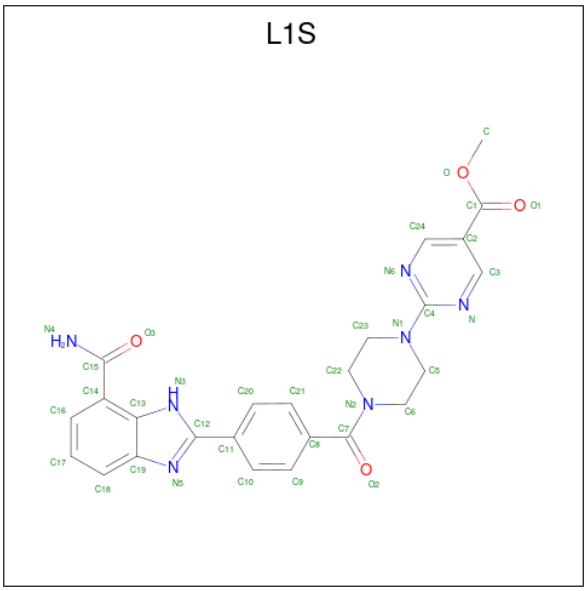
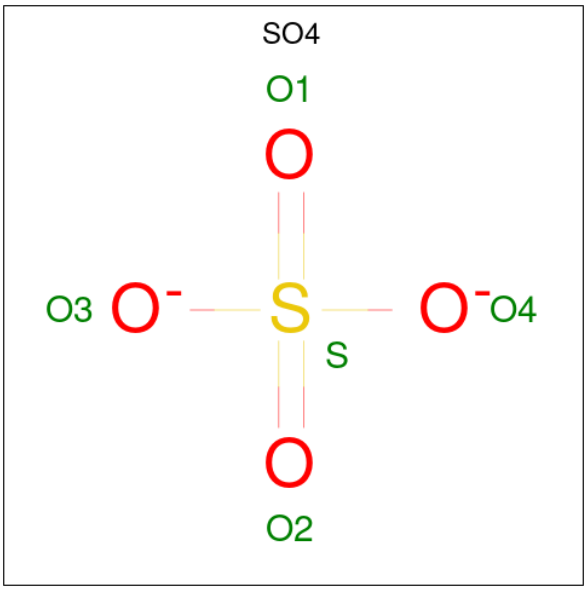
Chain	Residue	Modelled	Actual	Comment	Reference
C	659	HIS	-	expression tag	UNP P09874
C	660	MET	-	expression tag	UNP P09874
C	762	ALA	VAL	variant	UNP P09874
D	640	MET	-	initiating methionine	UNP P09874
D	641	GLY	-	expression tag	UNP P09874
D	642	SER	-	expression tag	UNP P09874
D	643	SER	-	expression tag	UNP P09874
D	644	HIS	-	expression tag	UNP P09874
D	645	HIS	-	expression tag	UNP P09874
D	646	HIS	-	expression tag	UNP P09874
D	647	HIS	-	expression tag	UNP P09874
D	648	HIS	-	expression tag	UNP P09874
D	649	HIS	-	expression tag	UNP P09874
D	650	SER	-	expression tag	UNP P09874
D	651	SER	-	expression tag	UNP P09874
D	652	GLY	-	expression tag	UNP P09874
D	653	LEU	-	expression tag	UNP P09874
D	654	VAL	-	expression tag	UNP P09874
D	655	PRO	-	expression tag	UNP P09874
D	656	ARG	-	expression tag	UNP P09874
D	657	GLY	-	expression tag	UNP P09874
D	658	SER	-	expression tag	UNP P09874
D	659	HIS	-	expression tag	UNP P09874
D	660	MET	-	expression tag	UNP P09874
D	762	ALA	VAL	variant	UNP P09874

- Molecule 2 is methyl 2-{4-[4-(7-carbamoyl-1H-benzimidazol-2-yl)benzene-1-carbonyl]piperazin-1-yl}pyrimidine-5-carboxylate (CCD ID: L1S) (formula: $C_{25}H_{23}N_7O_4$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total C N O 36 25 7 4	0	0
2	B	1	Total C N O 36 25 7 4	0	0
2	C	1	Total C N O 36 25 7 4	0	0
2	D	1	Total C N O 36 25 7 4	0	0

- Molecule 3 is SULFATE ION (CCD ID: SO4) (formula: O_4S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	1	Total O S 5 4 1	0	0
3	A	1	Total O S 5 4 1	0	0
3	A	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0
3	B	1	Total O S 5 4 1	0	0
3	C	1	Total O S 5 4 1	0	0
3	C	1	Total O S 5 4 1	0	0
3	C	1	Total O S 5 4 1	0	0
3	D	1	Total O S 5 4 1	0	0
3	D	1	Total O S 5 4 1	0	0
3	D	1	Total O S 5 4 1	0	0

- Molecule 4 is water.

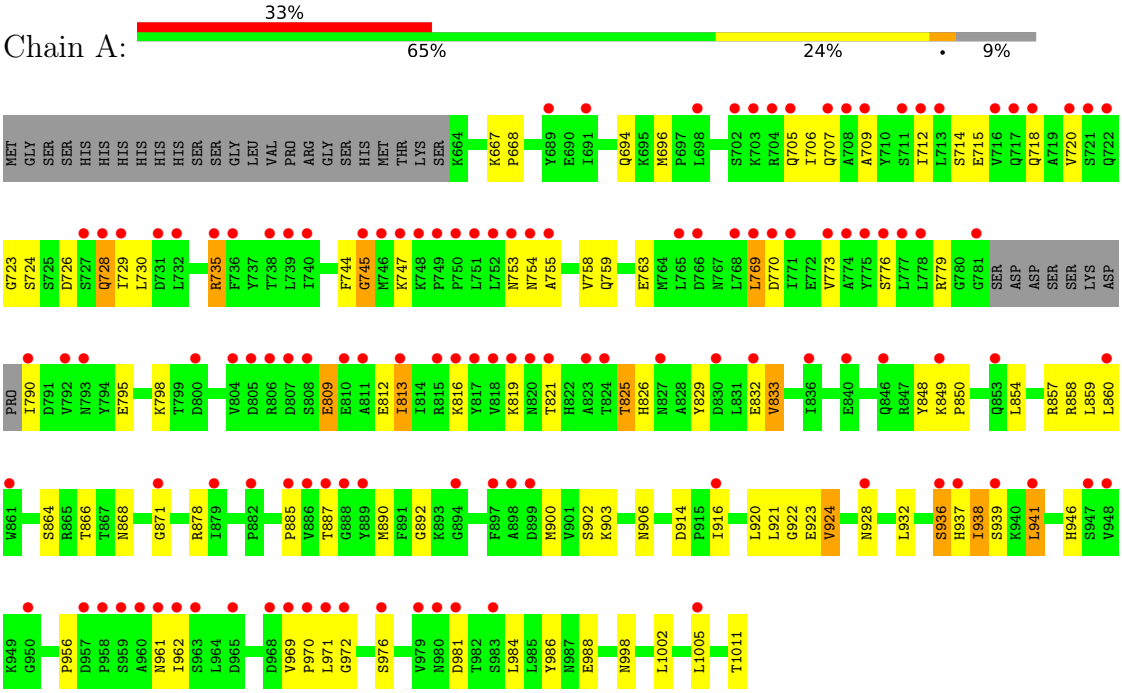
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	6	Total O 6 6	0	0
4	B	8	Total O 8 8	0	0
4	C	7	Total O 7 7	0	0
4	D	10	Total O 10 10	0	0

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.

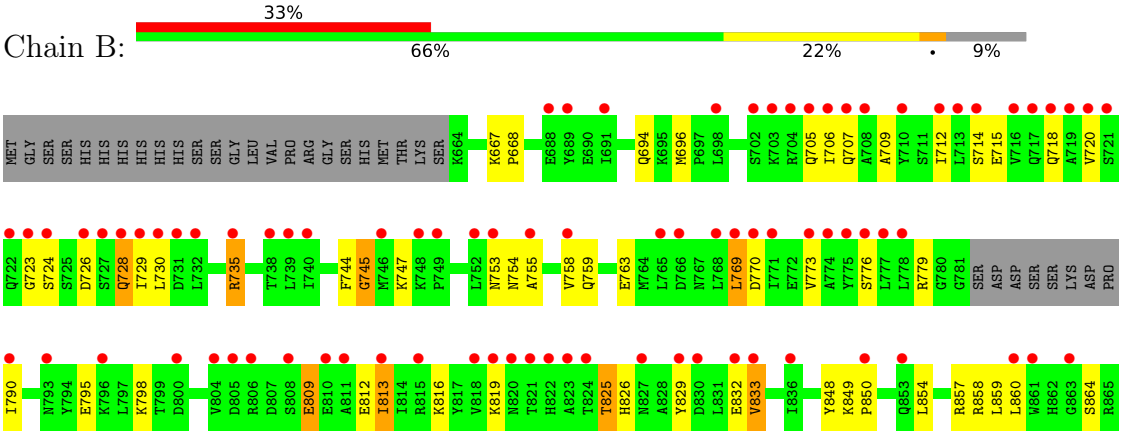
• Molecule 1: Poly [ADP-ribose] polymerase 1

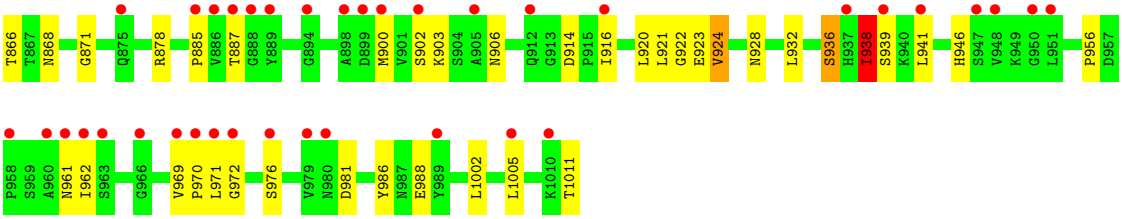
Chain A:



• Molecule 1: Poly [ADP-ribose] polymerase 1

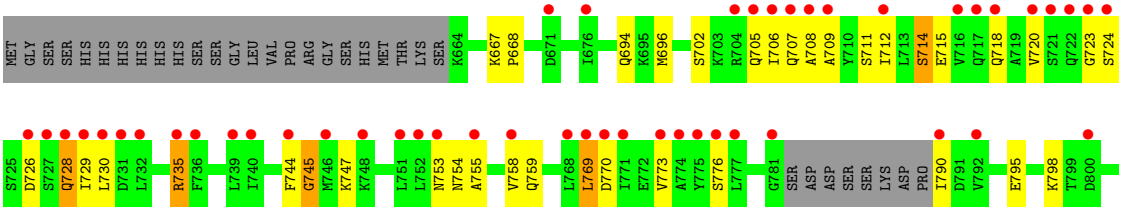
Chain B:

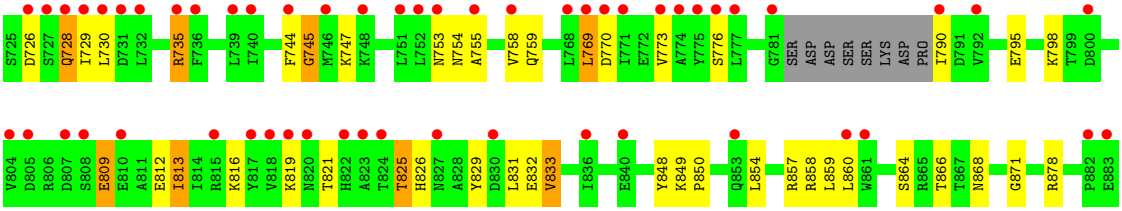


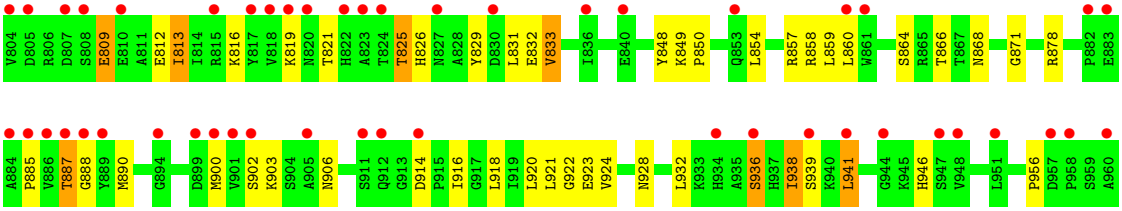


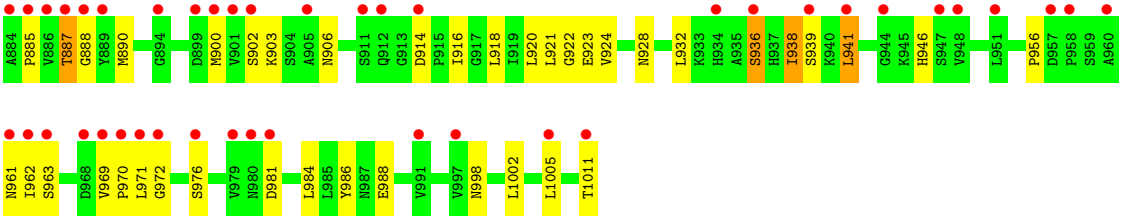
• Molecule 1: Poly [ADP-ribose] polymerase 1

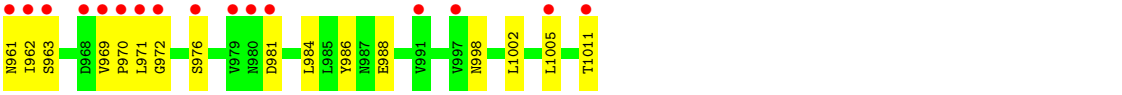
Chain C:





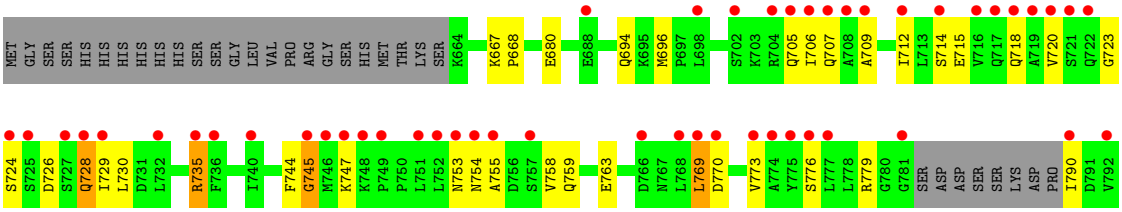


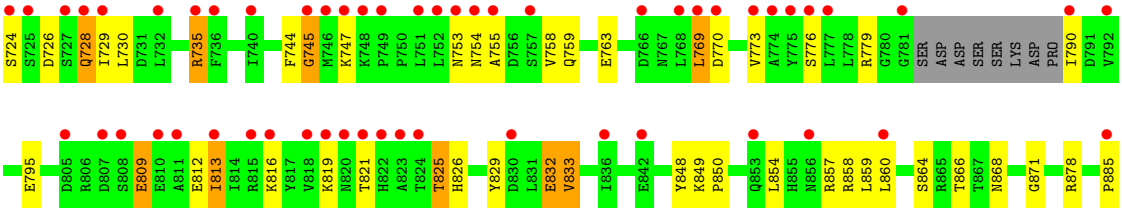


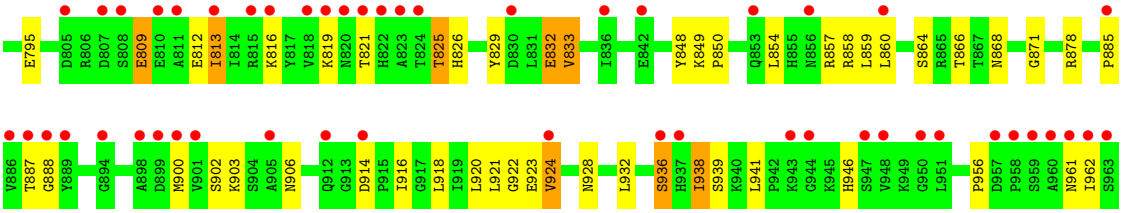


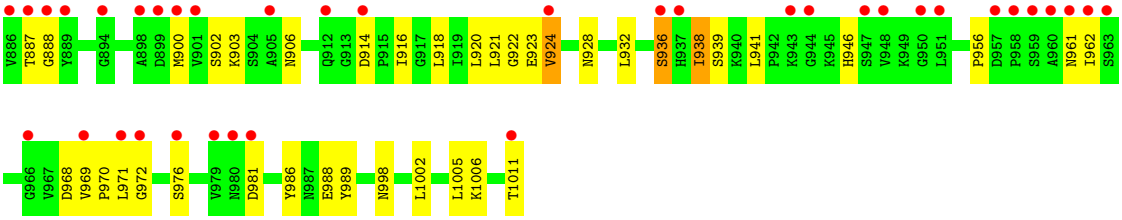
• Molecule 1: Poly [ADP-ribose] polymerase 1

Chain D:









4 Data and refinement statistics (i)

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α, β, γ	139.70Å 129.75Å 102.72Å 90.00° 111.36° 90.00°	Depositor
Resolution (Å)	20.00 – 2.80 20.00 – 2.80	Depositor EDS
% Data completeness (in resolution range)	94.7 (20.00-2.80) 94.7 (20.00-2.80)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.15	Depositor
$< I/\sigma(I) >$ [1]	2.16 (at 2.81Å)	Xtriage
Refinement program	REFMAC 5.8.0257	Depositor
R, R_{free}	0.284 , 0.312 0.290 , 0.318	Depositor DCC
R_{free} test set	2030 reflections (4.83%)	wwPDB-VP
Wilson B-factor (Å^2)	51.0	Xtriage
Anisotropy	0.294	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.34 , 76.0	EDS
L-test for twinning[2]	$< \|L\| > = 0.49$, $< L^2 > = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.86	EDS
Total number of atoms	10970	wwPDB-VP
Average B, all atoms (Å^2)	98.0	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 61.30 % 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 1.3371e-05. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: L1S, SO4

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|$ >5	RMSZ	#$\|Z\|$ >5
1	A	1.06	0/2736	1.51	3/3692 (0.1%)
1	B	1.06	0/2736	1.50	4/3692 (0.1%)
1	C	1.07	1/2736 (0.0%)	1.50	3/3692 (0.1%)
1	D	1.06	0/2736	1.51	3/3692 (0.1%)
All	All	1.06	1/10944 (0.0%)	1.51	13/14768 (0.1%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	1
1	C	0	2
1	D	0	1
All	All	0	5

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	C	963	SER	C-O	5.87	1.30	1.24

All (13) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	885	PRO	N-CA-C	7.90	123.68	111.11
1	B	885	PRO	N-CA-C	7.86	123.61	111.11
1	C	885	PRO	N-CA-C	7.84	123.58	111.11
1	D	885	PRO	N-CA-C	7.67	123.31	111.11

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	885	PRO	CA-C-N	6.21	128.82	120.50
1	B	885	PRO	C-N-CA	6.21	128.82	120.50
1	A	885	PRO	CA-C-N	5.99	128.53	120.50
1	A	885	PRO	C-N-CA	5.99	128.53	120.50
1	C	885	PRO	CA-C-N	5.90	128.40	120.50
1	C	885	PRO	C-N-CA	5.90	128.40	120.50
1	D	885	PRO	CA-C-N	5.81	128.29	120.50
1	D	885	PRO	C-N-CA	5.81	128.29	120.50
1	B	938	ILE	CA-C-O	-5.03	114.49	120.78

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	920	LEU	Peptide
1	B	920	LEU	Peptide
1	C	887	THR	Peptide
1	C	920	LEU	Peptide
1	D	920	LEU	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	2686	0	2730	48	0
1	B	2683	0	2731	43	0
1	C	2683	0	2731	53	0
1	D	2683	0	2731	53	0
2	A	36	0	0	0	0
2	B	36	0	0	0	0
2	C	36	0	0	3	0
2	D	36	0	0	4	0
3	A	15	0	0	1	0
3	B	15	0	0	2	0
3	C	15	0	0	2	0
3	D	15	0	0	2	0
4	A	6	0	0	0	1

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	8	0	0	0	0
4	C	7	0	0	0	0
4	D	10	0	0	0	0
All	All	10970	0	10923	197	1

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 9.

All (197) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:858:ARG:NH2	3:B:1103:SO4:O4	1.90	1.05
1:C:858:ARG:NH2	3:C:1103:SO4:O3	1.93	1.01
1:B:813:ILE:HD12	1:B:813:ILE:O	1.83	0.79
1:C:813:ILE:HD12	1:C:813:ILE:O	1.83	0.78
1:A:813:ILE:O	1:A:813:ILE:HD12	1.83	0.77
1:D:813:ILE:HD12	1:D:813:ILE:O	1.83	0.77
1:D:859:LEU:HA	1:D:922:GLY:O	1.89	0.72
1:B:859:LEU:HA	1:B:922:GLY:O	1.89	0.72
1:A:859:LEU:HA	1:A:922:GLY:O	1.89	0.72
1:C:712:ILE:HD12	1:C:735:ARG:HD2	1.71	0.72
1:C:859:LEU:HA	1:C:922:GLY:O	1.89	0.71
1:A:712:ILE:HD12	1:A:735:ARG:HD2	1.74	0.69
1:A:859:LEU:HG	1:A:921:LEU:HD22	1.77	0.67
1:B:859:LEU:HG	1:B:921:LEU:HD22	1.77	0.66
1:C:859:LEU:HG	1:C:921:LEU:HD22	1.78	0.66
1:B:712:ILE:HD12	1:B:735:ARG:HD2	1.77	0.65
1:C:829:TYR:OH	1:C:906:ASN:OD1	2.14	0.65
1:D:859:LEU:HG	1:D:921:LEU:HD22	1.77	0.65
1:D:712:ILE:HD12	1:D:735:ARG:HD2	1.78	0.64
1:D:755:ALA:HA	1:D:758:VAL:HG12	1.81	0.62
1:B:755:ALA:HA	1:B:758:VAL:HG12	1.82	0.62
1:C:755:ALA:HA	1:C:758:VAL:HG12	1.82	0.61
1:B:829:TYR:OH	1:B:906:ASN:OD1	2.14	0.61
1:A:829:TYR:OH	1:A:906:ASN:OD1	2.14	0.61
1:D:829:TYR:OH	1:D:906:ASN:OD1	2.14	0.61
1:A:755:ALA:HA	1:A:758:VAL:HG12	1.82	0.60
1:D:961[A]:ASN:ND2	1:D:970:PRO:HA	2.18	0.59
1:C:961[A]:ASN:ND2	1:C:970:PRO:HA	2.18	0.58
1:C:928:ASN:H	1:C:946:HIS:HD2	1.51	0.58
1:D:928:ASN:H	1:D:946:HIS:HD2	1.50	0.58

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:849:LYS:NZ	3:C:1104:SO4:O4	2.32	0.58
1:B:961[A]:ASN:ND2	1:B:970:PRO:HA	2.19	0.57
1:B:928:ASN:H	1:B:946:HIS:HD2	1.51	0.57
1:A:928:ASN:H	1:A:946:HIS:HD2	1.52	0.57
1:B:770:ASP:OD1	1:B:878:ARG:NH2	2.36	0.57
1:A:706:ILE:HG21	1:A:769:LEU:HG	1.87	0.57
1:D:759:GLN:HG3	2:D:1101:L1S:C3	2.35	0.57
1:B:813:ILE:HD11	1:B:969:VAL:HG11	1.87	0.56
1:C:825:THR:HB	1:C:986:TYR:OH	2.05	0.56
1:D:770:ASP:OD1	1:D:878:ARG:NH2	2.37	0.56
1:D:825:THR:HB	1:D:986:TYR:OH	2.06	0.56
1:B:706:ILE:HG21	1:B:769:LEU:HG	1.87	0.55
1:B:825:THR:HB	1:B:986:TYR:OH	2.06	0.55
1:D:706:ILE:HG21	1:D:769:LEU:HG	1.87	0.55
1:D:813:ILE:HD11	1:D:969:VAL:HG11	1.89	0.55
1:A:825:THR:HB	1:A:986:TYR:OH	2.07	0.54
1:B:956:PRO:HB3	1:B:972:GLY:O	2.07	0.54
1:C:706:ILE:HG21	1:C:769:LEU:HG	1.90	0.54
1:C:813:ILE:HD11	1:C:969:VAL:HG11	1.89	0.54
1:D:813:ILE:HA	1:D:816:LYS:HD2	1.90	0.54
1:D:956:PRO:HB3	1:D:972:GLY:O	2.08	0.53
1:B:932:LEU:HD13	1:B:936:SER:OG	2.08	0.53
1:A:956:PRO:HB3	1:A:972:GLY:O	2.09	0.53
1:C:770:ASP:OD1	1:C:878:ARG:NH2	2.36	0.53
1:D:726:ASP:HA	1:D:729:ILE:HB	1.90	0.53
1:A:932:LEU:HD13	1:A:936:SER:OG	2.09	0.53
1:C:726:ASP:HA	1:C:729:ILE:HB	1.90	0.53
1:C:956:PRO:HB3	1:C:972:GLY:O	2.08	0.53
1:D:705:GLN:O	1:D:709:ALA:N	2.42	0.53
1:B:726:ASP:HA	1:B:729:ILE:HB	1.90	0.52
1:C:888:GLY:HA3	2:C:1101:L1S:C4	2.38	0.52
1:A:813:ILE:HD11	1:A:969:VAL:HG11	1.90	0.52
1:A:726:ASP:HA	1:A:729:ILE:HB	1.90	0.52
1:C:932:LEU:HD13	1:C:936:SER:OG	2.09	0.52
1:D:770:ASP:HB3	1:D:868:ASN:HA	1.92	0.52
1:C:705:GLN:O	1:C:709:ALA:N	2.42	0.52
1:A:705:GLN:O	1:A:709:ALA:N	2.42	0.51
1:C:770:ASP:HB3	1:C:868:ASN:HA	1.93	0.51
1:A:770:ASP:OD1	1:A:878:ARG:NH2	2.36	0.51
1:A:773:VAL:HG11	1:A:871:GLY:HA2	1.93	0.51
1:B:705:GLN:O	1:B:709:ALA:N	2.42	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:932:LEU:HD13	1:D:936:SER:OG	2.10	0.51
1:B:773:VAL:HG11	1:B:871:GLY:HA2	1.93	0.50
1:D:773:VAL:HG11	1:D:871:GLY:HA2	1.93	0.50
1:D:759:GLN:HG2	2:D:1101:L1S:C4	2.41	0.50
1:A:715:GLU:HA	1:A:718:GLN:HB2	1.94	0.50
1:B:715:GLU:HA	1:B:718:GLN:HB2	1.94	0.50
1:B:849:LYS:NZ	3:B:1104:SO4:O4	2.44	0.50
1:C:759:GLN:HG2	2:C:1101:L1S:C4	2.42	0.49
1:D:715:GLU:HA	1:D:718:GLN:HB2	1.94	0.49
1:A:849:LYS:N	1:A:850:PRO:CD	2.75	0.49
1:D:849:LYS:N	1:D:850:PRO:CD	2.75	0.49
1:B:770:ASP:HB3	1:B:868:ASN:HA	1.94	0.49
1:D:826:HIS:ND1	1:D:902:SER:HB3	2.28	0.49
1:C:773:VAL:HG11	1:C:871:GLY:HA2	1.93	0.49
1:C:849:LYS:N	1:C:850:PRO:CD	2.75	0.49
1:C:854:LEU:O	1:C:857:ARG:HD3	2.12	0.49
1:A:770:ASP:HB3	1:A:868:ASN:HA	1.94	0.49
1:B:813:ILE:CD1	1:B:969:VAL:HG11	2.43	0.48
1:B:849:LYS:N	1:B:850:PRO:CD	2.76	0.48
1:C:715:GLU:HA	1:C:718:GLN:HB2	1.95	0.48
1:B:854:LEU:O	1:B:857:ARG:HD3	2.13	0.48
1:D:854:LEU:O	1:D:857:ARG:HD3	2.13	0.48
1:D:712:ILE:HD12	1:D:735:ARG:CD	2.42	0.48
1:A:961[A]:ASN:OD1	1:A:970:PRO:HA	2.14	0.48
1:A:809:GLU:O	1:A:812:GLU:N	2.47	0.48
1:A:854:LEU:O	1:A:857:ARG:HD3	2.13	0.48
1:B:1002:LEU:C	1:B:1002:LEU:HD23	2.39	0.48
1:D:728:GLN:HE21	1:D:728:GLN:N	2.12	0.48
1:A:1002:LEU:C	1:A:1002:LEU:HD23	2.39	0.48
1:B:728:GLN:HE21	1:B:728:GLN:N	2.12	0.48
1:B:809:GLU:O	1:B:812:GLU:N	2.47	0.48
1:C:809:GLU:O	1:C:812:GLU:N	2.47	0.48
1:C:1002:LEU:C	1:C:1002:LEU:HD23	2.38	0.48
1:D:1002:LEU:HD23	1:D:1002:LEU:C	2.39	0.48
1:B:858:ARG:HB3	1:B:860:LEU:HG	1.95	0.47
1:A:728:GLN:HE21	1:A:728:GLN:N	2.12	0.47
1:D:858:ARG:HB3	1:D:860:LEU:HG	1.97	0.47
1:A:833:VAL:HA	1:A:1005:LEU:HD23	1.96	0.47
1:B:712:ILE:HD12	1:B:735:ARG:CD	2.43	0.47
1:D:888:GLY:HA3	2:D:1101:L1S:C4	2.44	0.47
1:B:938:ILE:O	1:B:938:ILE:HG22	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:858:ARG:HB3	1:C:860:LEU:HG	1.95	0.47
1:C:928:ASN:N	1:C:946:HIS:HD2	2.13	0.47
1:D:809:GLU:O	1:D:812:GLU:N	2.47	0.47
1:A:813:ILE:CD1	1:A:969:VAL:HG11	2.45	0.47
1:C:728:GLN:HE21	1:C:728:GLN:N	2.12	0.47
1:B:928:ASN:N	1:B:946:HIS:HD2	2.12	0.47
1:C:712:ILE:HD12	1:C:735:ARG:CD	2.42	0.47
1:C:833:VAL:HA	1:C:1005:LEU:HD23	1.96	0.46
1:B:833:VAL:HA	1:B:1005:LEU:HD23	1.97	0.46
1:D:833:VAL:HA	1:D:1005:LEU:HD23	1.97	0.46
1:A:928:ASN:N	1:A:946:HIS:HD2	2.13	0.46
1:A:826:HIS:ND1	1:A:902:SER:HB3	2.30	0.45
1:B:981:ASP:O	1:B:981:ASP:OD1	2.34	0.45
1:B:826:HIS:ND1	1:B:902:SER:HB3	2.31	0.45
1:D:813:ILE:CD1	1:D:969:VAL:HG11	2.46	0.45
1:A:981:ASP:O	1:A:981:ASP:OD1	2.35	0.45
1:C:813:ILE:CD1	1:C:969:VAL:HG11	2.46	0.45
1:D:928:ASN:N	1:D:946:HIS:HD2	2.12	0.45
1:D:728:GLN:HE21	1:D:728:GLN:H	1.65	0.45
1:D:981:ASP:O	1:D:981:ASP:OD1	2.34	0.45
1:A:858:ARG:HB3	1:A:860:LEU:HG	1.97	0.45
1:A:938:ILE:O	1:A:938:ILE:HG22	2.16	0.45
1:C:728:GLN:HE21	1:C:728:GLN:H	1.65	0.45
1:D:938:ILE:O	1:D:938:ILE:HG22	2.17	0.45
1:A:728:GLN:HE21	1:A:728:GLN:H	1.65	0.44
1:C:813:ILE:HA	1:C:816:LYS:HD2	2.00	0.44
1:C:826:HIS:ND1	1:C:902:SER:HB3	2.32	0.44
1:D:848:TYR:OH	1:D:923:GLU:HG2	2.18	0.44
1:C:848:TYR:OH	1:C:923:GLU:HG2	2.18	0.44
1:B:728:GLN:HE21	1:B:728:GLN:H	1.65	0.44
1:B:848:TYR:OH	1:B:923:GLU:HG2	2.18	0.44
1:A:712:ILE:HD12	1:A:735:ARG:CD	2.44	0.44
1:A:813:ILE:HA	1:A:816:LYS:HD2	2.00	0.44
1:C:938:ILE:O	1:C:938:ILE:HG22	2.17	0.43
1:D:667:LYS:N	1:D:668:PRO:HD2	2.33	0.43
1:C:981:ASP:OD1	1:C:981:ASP:O	2.35	0.43
1:C:831:LEU:HD12	1:C:831:LEU:HA	1.89	0.43
1:D:849:LYS:NZ	3:D:1104:SO4:O2	2.51	0.43
1:A:848:TYR:OH	1:A:923:GLU:HG2	2.18	0.43
1:A:903:LYS:HE2	1:A:988:GLU:HG2	2.01	0.43
1:B:981:ASP:OD1	1:B:981:ASP:C	2.62	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:708:ALA:O	1:C:711:SER:OG	2.28	0.43
1:C:744:PHE:O	1:C:745:GLY:C	2.62	0.43
1:C:903:LYS:HE2	1:C:988:GLU:HG2	2.01	0.43
1:D:981:ASP:OD1	1:D:981:ASP:C	2.61	0.43
1:B:744:PHE:O	1:B:745:GLY:C	2.62	0.43
1:A:981:ASP:OD1	1:A:981:ASP:C	2.62	0.43
1:A:849:LYS:NZ	3:A:1104:SO4:O4	2.47	0.42
1:D:744:PHE:O	1:D:745:GLY:C	2.62	0.42
1:A:744:PHE:O	1:A:745:GLY:C	2.62	0.42
1:C:918:LEU:HD22	1:C:1002:LEU:HD21	2.02	0.42
1:B:903:LYS:HE2	1:B:988:GLU:HG2	2.02	0.42
1:C:970:PRO:O	1:C:970:PRO:HG2	2.20	0.42
1:A:821:THR:HG22	1:A:972:GLY:O	2.20	0.42
1:A:941:LEU:HD12	1:A:941:LEU:HA	1.96	0.41
1:C:938:ILE:HG21	1:C:941:LEU:HD13	2.02	0.41
1:D:903:LYS:HE2	1:D:988:GLU:HG2	2.02	0.41
1:D:858:ARG:NH2	3:D:1103:SO4:O1	2.36	0.41
1:C:890:MET:HE1	1:C:984:LEU:HG	2.02	0.41
1:A:667:LYS:N	1:A:668:PRO:HD2	2.36	0.41
1:A:892:GLY:HA2	1:A:937:HIS:CD2	2.55	0.41
1:B:813:ILE:HA	1:B:816:LYS:HD2	2.01	0.41
1:C:821:THR:HG22	1:C:972:GLY:O	2.20	0.41
1:C:848:TYR:CG	1:C:998:ASN:HB2	2.55	0.41
1:C:981:ASP:OD1	1:C:981:ASP:C	2.62	0.41
1:D:848:TYR:CG	1:D:998:ASN:HB2	2.56	0.41
1:C:759:GLN:HG3	2:C:1101:L1S:C3	2.51	0.41
1:D:821:THR:HG22	1:D:972:GLY:O	2.21	0.41
1:D:858:ARG:HG2	1:D:968:ASP:HB2	2.01	0.41
1:B:860:LEU:HD12	1:B:924:VAL:HG13	2.03	0.41
1:D:755:ALA:HB1	2:D:1101:L1S:C	2.50	0.41
1:D:989:TYR:CD1	1:D:989:TYR:N	2.89	0.41
1:A:848:TYR:CG	1:A:998:ASN:HB2	2.55	0.41
1:C:667:LYS:N	1:C:668:PRO:HD2	2.35	0.41
1:A:890:MET:HE1	1:A:984:LEU:HG	2.02	0.41
1:A:938:ILE:HG21	1:A:941:LEU:HD13	2.03	0.41
1:C:714:SER:OG	1:C:715:GLU:N	2.54	0.41
1:D:860:LEU:HD12	1:D:924:VAL:HG13	2.03	0.41
1:D:832:GLU:HB2	1:D:1006:LYS:HB3	2.03	0.41
1:A:970:PRO:HG2	1:A:970:PRO:O	2.22	0.40
1:B:667:LYS:N	1:B:668:PRO:HD2	2.37	0.40
1:A:860:LEU:HD12	1:A:924:VAL:HG13	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:918:LEU:HD22	1:D:1002:LEU:HD21	2.04	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:A:1204:HOH:O	4:A:1204:HOH:O[2_657]	1.35	0.85

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	337/372 (91%)	307 (91%)	27 (8%)	3 (1%)	14	41
1	B	337/372 (91%)	309 (92%)	25 (7%)	3 (1%)	14	41
1	C	337/372 (91%)	306 (91%)	28 (8%)	3 (1%)	14	41
1	D	337/372 (91%)	307 (91%)	27 (8%)	3 (1%)	14	41
All	All	1348/1488 (91%)	1229 (91%)	107 (8%)	12 (1%)	14	41

All (12) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	723	GLY
1	A	745	GLY
1	B	723	GLY
1	B	745	GLY
1	C	723	GLY
1	C	745	GLY
1	D	723	GLY
1	D	745	GLY
1	A	938	ILE

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Mol	Chain	Res	Type
1	B	938	ILE
1	C	938	ILE
1	D	938	ILE

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	298/326 (91%)	258 (87%)	40 (13%)	4 13
1	B	298/326 (91%)	258 (87%)	40 (13%)	4 13
1	C	298/326 (91%)	260 (87%)	38 (13%)	4 15
1	D	298/326 (91%)	259 (87%)	39 (13%)	4 14
All	All	1192/1304 (91%)	1035 (87%)	157 (13%)	4 14

All (157) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	694	GLN
1	A	696	MET
1	A	707	GLN
1	A	714	SER
1	A	720	VAL
1	A	724	SER
1	A	728	GLN
1	A	730	LEU
1	A	735	ARG
1	A	747	LYS
1	A	753	ASN
1	A	754	ASN
1	A	759	GLN
1	A	763	GLU
1	A	769	LEU
1	A	776	SER
1	A	779	ARG
1	A	790	ILE

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Mol	Chain	Res	Type
1	A	795	GLU
1	A	798	LYS
1	A	809	GLU
1	A	813	ILE
1	A	819	LYS
1	A	825	THR
1	A	832	GLU
1	A	833	VAL
1	A	864	SER
1	A	866	THR
1	A	887	THR
1	A	900	MET
1	A	914	ASP
1	A	916	ILE
1	A	924	VAL
1	A	936	SER
1	A	939	SER
1	A	941	LEU
1	A	962	ILE
1	A	971	LEU
1	A	976	SER
1	A	1011	THR
1	B	694	GLN
1	B	696	MET
1	B	707	GLN
1	B	714	SER
1	B	720	VAL
1	B	724	SER
1	B	728	GLN
1	B	730	LEU
1	B	735	ARG
1	B	747	LYS
1	B	753	ASN
1	B	754	ASN
1	B	759	GLN
1	B	763	GLU
1	B	769	LEU
1	B	776	SER
1	B	779	ARG
1	B	790	ILE
1	B	795	GLU
1	B	798	LYS

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Mol	Chain	Res	Type
1	B	809	GLU
1	B	813	ILE
1	B	819	LYS
1	B	825	THR
1	B	832	GLU
1	B	833	VAL
1	B	864	SER
1	B	866	THR
1	B	887	THR
1	B	900	MET
1	B	914	ASP
1	B	916	ILE
1	B	924	VAL
1	B	936	SER
1	B	939	SER
1	B	941	LEU
1	B	962	ILE
1	B	971	LEU
1	B	976	SER
1	B	1011	THR
1	C	694	GLN
1	C	696	MET
1	C	702	SER
1	C	707	GLN
1	C	714	SER
1	C	720	VAL
1	C	724	SER
1	C	728	GLN
1	C	730	LEU
1	C	735	ARG
1	C	747	LYS
1	C	753	ASN
1	C	754	ASN
1	C	769	LEU
1	C	776	SER
1	C	790	ILE
1	C	795	GLU
1	C	798	LYS
1	C	809	GLU
1	C	813	ILE
1	C	819	LYS
1	C	825	THR

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Mol	Chain	Res	Type
1	C	832	GLU
1	C	833	VAL
1	C	864	SER
1	C	866	THR
1	C	887	THR
1	C	900	MET
1	C	914	ASP
1	C	916	ILE
1	C	924	VAL
1	C	936	SER
1	C	939	SER
1	C	941	LEU
1	C	962	ILE
1	C	971	LEU
1	C	976	SER
1	C	1011	THR
1	D	680	GLU
1	D	694	GLN
1	D	696	MET
1	D	707	GLN
1	D	714	SER
1	D	720	VAL
1	D	724	SER
1	D	728	GLN
1	D	730	LEU
1	D	735	ARG
1	D	747	LYS
1	D	753	ASN
1	D	754	ASN
1	D	763	GLU
1	D	769	LEU
1	D	776	SER
1	D	779	ARG
1	D	790	ILE
1	D	795	GLU
1	D	809	GLU
1	D	813	ILE
1	D	819	LYS
1	D	825	THR
1	D	832	GLU
1	D	833	VAL
1	D	864	SER

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Mol	Chain	Res	Type
1	D	866	THR
1	D	887	THR
1	D	900	MET
1	D	914	ASP
1	D	916	ILE
1	D	924	VAL
1	D	936	SER
1	D	939	SER
1	D	941	LEU
1	D	962	ILE
1	D	971	LEU
1	D	976	SER
1	D	1011	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (39) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	694	GLN
1	A	728	GLN
1	A	753	ASN
1	A	820	ASN
1	A	856	ASN
1	A	868	ASN
1	A	937	HIS
1	A	946	HIS
1	A	996	GLN
1	B	694	GLN
1	B	728	GLN
1	B	753	ASN
1	B	754	ASN
1	B	820	ASN
1	B	856	ASN
1	B	937	HIS
1	B	946	HIS
1	B	996	GLN
1	C	694	GLN
1	C	728	GLN
1	C	753	ASN
1	C	820	ASN
1	C	846	GLN
1	C	856	ASN
1	C	868	ASN

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Mol	Chain	Res	Type
1	C	937	HIS
1	C	946	HIS
1	C	996	GLN
1	D	694	GLN
1	D	728	GLN
1	D	753	ASN
1	D	754	ASN
1	D	820	ASN
1	D	846	GLN
1	D	856	ASN
1	D	868	ASN
1	D	937	HIS
1	D	946	HIS
1	D	996	GLN

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

16 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	SO4	A	1102	-	4,4,4	0.34	0	6,6,6	0.12	0
3	SO4	B	1102	-	4,4,4	0.36	0	6,6,6	0.13	0
3	SO4	C	1103	-	4,4,4	0.34	0	6,6,6	0.07	0
3	SO4	D	1104	-	4,4,4	0.34	0	6,6,6	0.12	0
3	SO4	C	1104	-	4,4,4	0.33	0	6,6,6	0.06	0
2	L1S	A	1101	-	40,40,40	0.45	0	56,57,57	1.39	4 (7%)
3	SO4	D	1102	-	4,4,4	0.32	0	6,6,6	0.14	0
2	L1S	B	1101	-	40,40,40	0.43	0	56,57,57	1.35	4 (7%)
3	SO4	A	1103	-	4,4,4	0.33	0	6,6,6	0.09	0
3	SO4	B	1103	-	4,4,4	0.31	0	6,6,6	0.14	0
3	SO4	B	1104	-	4,4,4	0.33	0	6,6,6	0.10	0
3	SO4	D	1103	-	4,4,4	0.32	0	6,6,6	0.12	0
2	L1S	C	1101	-	40,40,40	0.44	0	56,57,57	1.42	4 (7%)
2	L1S	D	1101	-	40,40,40	0.45	0	56,57,57	1.34	4 (7%)
3	SO4	C	1102	-	4,4,4	0.32	0	6,6,6	0.13	0
3	SO4	A	1104	-	4,4,4	0.34	0	6,6,6	0.08	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
2	L1S	D	1101	-	-	3/26/36/36	0/5/5/5
2	L1S	C	1101	-	-	2/26/36/36	0/5/5/5
2	L1S	B	1101	-	-	7/26/36/36	0/5/5/5
2	L1S	A	1101	-	-	6/26/36/36	0/5/5/5

There are no bond length outliers.

All (16) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	A	1101	L1S	C13-C19-N5	-6.69	105.34	109.91
2	D	1101	L1S	C13-C19-N5	-6.29	105.61	109.91
2	B	1101	L1S	C13-C19-N5	-6.24	105.64	109.91
2	C	1101	L1S	C13-C19-N5	-5.90	105.88	109.91
2	A	1101	L1S	C19-C13-N3	5.48	109.97	105.40
2	D	1101	L1S	C19-C13-N3	5.18	109.72	105.40
2	B	1101	L1S	C19-C13-N3	5.07	109.62	105.40
2	C	1101	L1S	C19-C13-N3	4.76	109.36	105.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	C	1101	L1S	C14-C13-C19	-4.73	116.68	122.52
2	B	1101	L1S	C14-C13-C19	-4.01	117.56	122.52
2	C	1101	L1S	C18-C19-C13	3.90	123.81	120.24
2	D	1101	L1S	C14-C13-C19	-3.61	118.06	122.52
2	A	1101	L1S	C14-C13-C19	-3.61	118.06	122.52
2	D	1101	L1S	C18-C19-C13	2.93	122.92	120.24
2	A	1101	L1S	C18-C19-C13	2.86	122.86	120.24
2	B	1101	L1S	C18-C19-C13	2.85	122.86	120.24

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	1101	L1S	C2-C1-O-C
2	B	1101	L1S	C2-C1-O-C
2	A	1101	L1S	O1-C1-O-C
2	B	1101	L1S	O1-C1-O-C
2	D	1101	L1S	C2-C1-O-C
2	D	1101	L1S	O1-C1-O-C
2	B	1101	L1S	C10-C11-C12-N5
2	B	1101	L1S	N6-C4-N1-C5
2	A	1101	L1S	C10-C11-C12-N5
2	A	1101	L1S	N6-C4-N1-C5
2	A	1101	L1S	C10-C11-C12-N3
2	B	1101	L1S	C10-C11-C12-N3
2	B	1101	L1S	N-C4-N1-C5
2	A	1101	L1S	N-C4-N1-C5
2	C	1101	L1S	C10-C11-C12-N3
2	D	1101	L1S	C10-C11-C12-N5
2	C	1101	L1S	C10-C11-C12-N5
2	B	1101	L1S	C20-C11-C12-N5

There are no ring outliers.

9 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	1103	SO4	1	0
3	D	1104	SO4	1	0
3	C	1104	SO4	1	0
3	B	1103	SO4	1	0
3	B	1104	SO4	1	0

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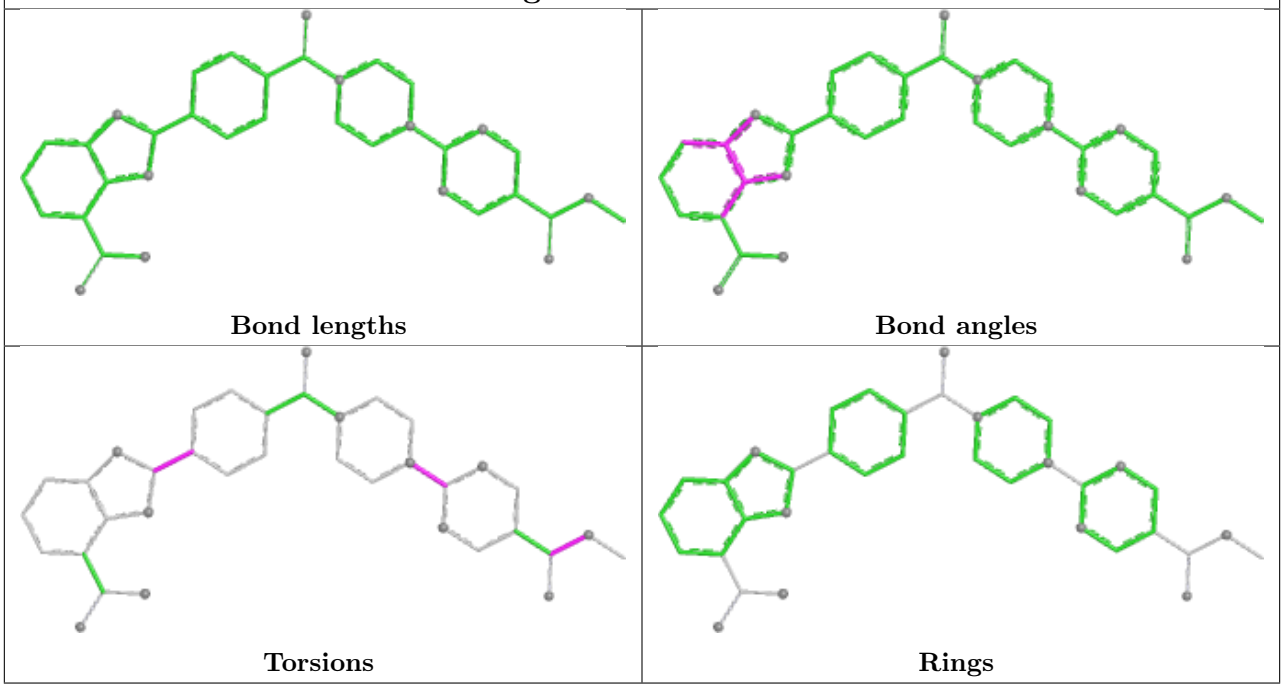
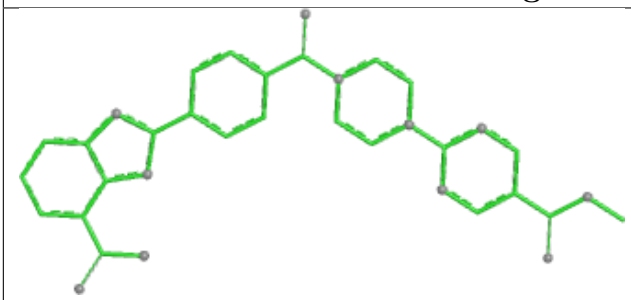
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	D	1103	SO4	1	0
2	C	1101	L1S	3	0
2	D	1101	L1S	4	0
3	A	1104	SO4	1	0

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 then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

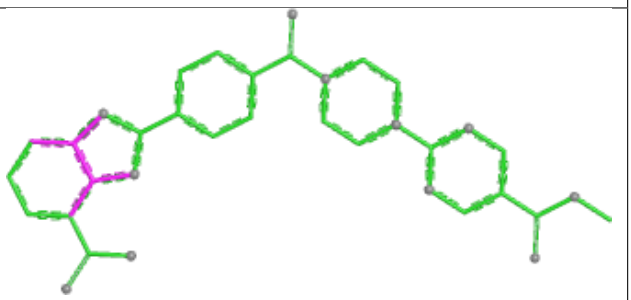
Ligand L1S A 1101



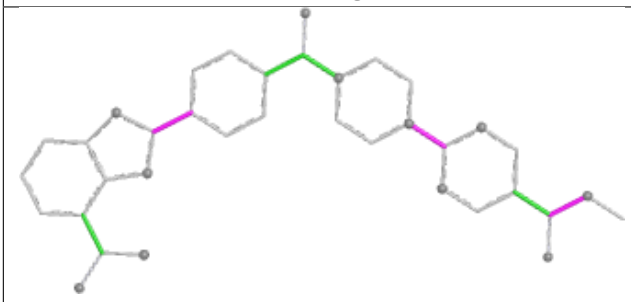
Ligand L1S B 1101



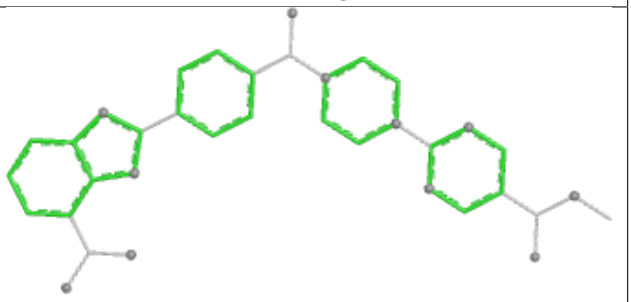
Bond lengths



Bond angles

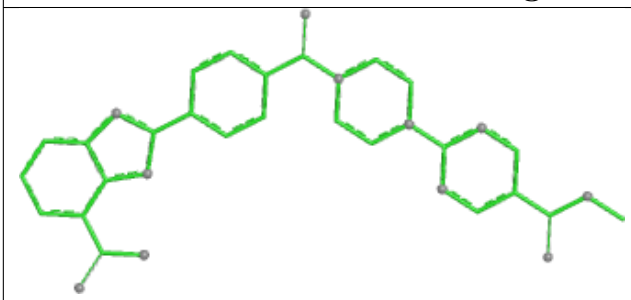


Torsions

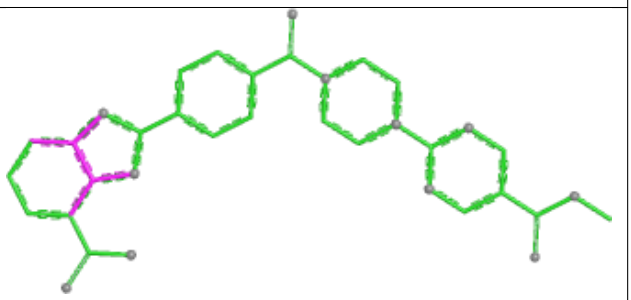


Rings

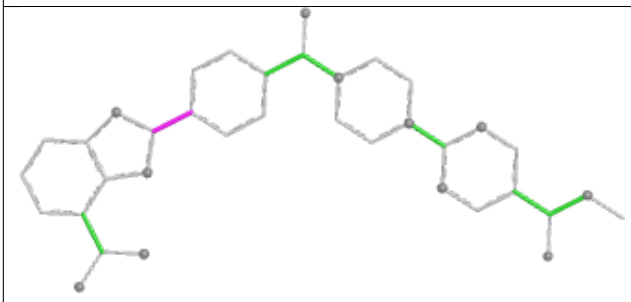
Ligand L1S C 1101



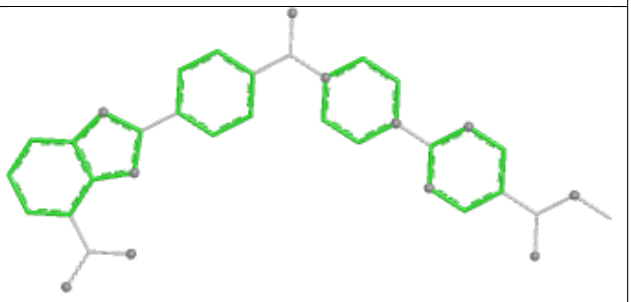
Bond lengths



Bond angles

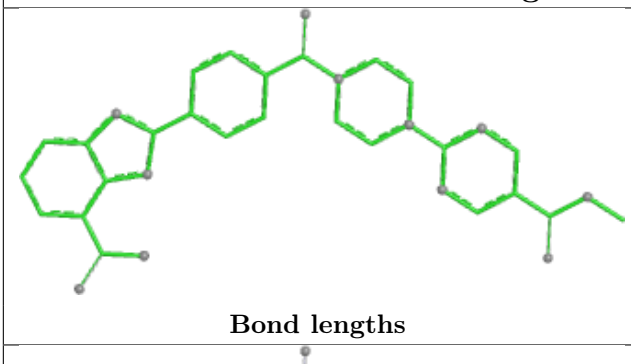


Torsions

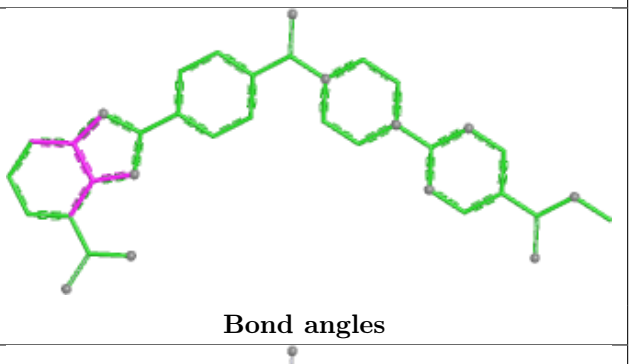


Rings

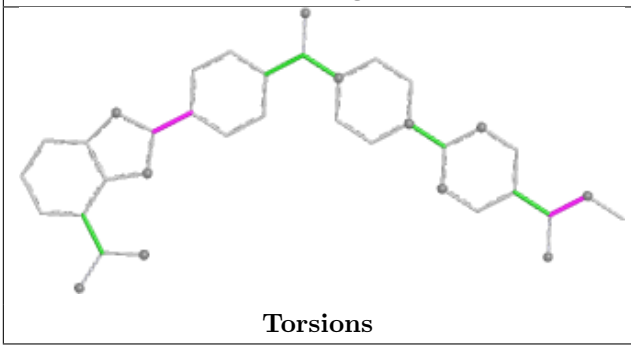
Ligand L1S D 1101



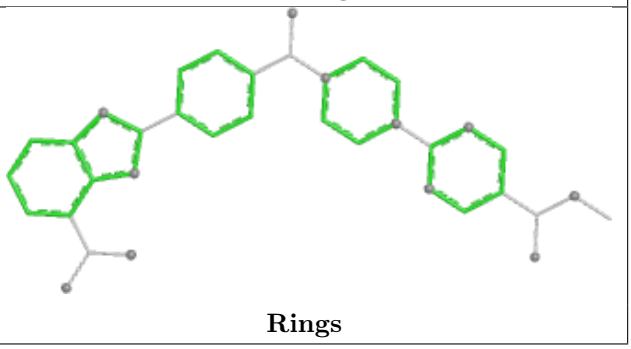
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} 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	340/372 (91%)	1.78	124 (36%)	1	0	34, 97, 161, 180	1 (0%)
1	B	340/372 (91%)	1.78	121 (35%)	1	0	37, 92, 154, 203	1 (0%)
1	C	340/372 (91%)	1.64	113 (33%)	1	1	37, 86, 157, 193	1 (0%)
1	D	340/372 (91%)	1.63	109 (32%)	1	1	39, 91, 160, 194	1 (0%)
All	All	1360/1488 (91%)	1.71	467 (34%)	1	1	34, 92, 159, 203	4 (0%)

All (467) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	888	GLY	7.1
1	B	705	GLN	6.7
1	A	705	GLN	6.2
1	D	705	GLN	6.0
1	C	705	GLN	5.8
1	B	887	THR	5.3
1	C	963	SER	5.3
1	C	752	LEU	5.3
1	D	888	GLY	5.2
1	B	888	GLY	5.0
1	A	961[A]	ASN	4.9
1	A	962	ILE	4.9
1	A	899	ASP	4.9
1	B	706	ILE	4.9
1	A	888	GLY	4.8
1	A	887	THR	4.8
1	C	962	ILE	4.8
1	B	708	ALA	4.8
1	D	721	SER	4.8
1	B	963	SER	4.7
1	C	958	PRO	4.7

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Mol	Chain	Res	Type	RSRZ
1	B	899	ASP	4.6
1	A	768	LEU	4.6
1	A	774	ALA	4.6
1	A	721	SER	4.6
1	B	947	SER	4.6
1	D	768	LEU	4.6
1	A	947	SER	4.6
1	D	712	ILE	4.5
1	D	753	ASN	4.5
1	A	819	LYS	4.4
1	D	755	ALA	4.4
1	B	768	LEU	4.4
1	C	706	ILE	4.4
1	A	963	SER	4.4
1	B	836	ILE	4.4
1	A	720	VAL	4.4
1	A	708	ALA	4.3
1	B	753	ASN	4.3
1	B	961[A]	ASN	4.3
1	C	961[A]	ASN	4.3
1	D	963	SER	4.3
1	A	958	PRO	4.2
1	C	708	ALA	4.2
1	D	820	ASN	4.2
1	C	727	SER	4.2
1	B	707	GLN	4.1
1	A	752	LEU	4.1
1	C	732	LEU	4.1
1	A	818	VAL	4.1
1	D	706	ILE	4.1
1	B	971	LEU	4.0
1	B	948	VAL	4.0
1	C	948	VAL	4.0
1	B	712	ILE	4.0
1	D	976	SER	4.0
1	B	774	ALA	4.0
1	A	777	LEU	4.0
1	D	752	LEU	4.0
1	D	773	VAL	4.0
1	D	887	THR	4.0
1	A	960	ALA	3.9
1	D	899	ASP	3.9

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Mol	Chain	Res	Type	RSRZ
1	A	948	VAL	3.9
1	D	732	LEU	3.9
1	D	961[A]	ASN	3.9
1	B	720	VAL	3.9
1	C	712	ILE	3.9
1	C	976	SER	3.9
1	D	971	LEU	3.8
1	B	886	VAL	3.8
1	C	773	VAL	3.8
1	A	712	ILE	3.8
1	B	972	GLY	3.8
1	A	722	GLN	3.8
1	C	887	THR	3.8
1	B	766	ASP	3.8
1	C	914	ASP	3.8
1	D	722	GLN	3.8
1	D	728	GLN	3.7
1	A	775	TYR	3.7
1	B	770	ASP	3.7
1	D	959	SER	3.7
1	A	971	LEU	3.7
1	C	753	ASN	3.7
1	A	972	GLY	3.7
1	B	758	VAL	3.7
1	C	721	SER	3.7
1	D	823	ALA	3.7
1	B	960	ALA	3.6
1	A	766	ASP	3.6
1	A	771	ILE	3.6
1	B	775	TYR	3.6
1	B	962	ILE	3.6
1	D	836	ILE	3.6
1	B	818	VAL	3.6
1	C	768	LEU	3.6
1	B	958	PRO	3.6
1	D	708	ALA	3.6
1	D	972	GLY	3.6
1	A	729	ILE	3.6
1	A	810	GLU	3.6
1	D	819	LYS	3.5
1	B	898	ALA	3.5
1	D	960	ALA	3.5

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Mol	Chain	Res	Type	RSRZ
1	C	776	SER	3.5
1	D	727	SER	3.5
1	B	732	LEU	3.5
1	D	777	LEU	3.5
1	A	753	ASN	3.5
1	D	958	PRO	3.5
1	B	752	LEU	3.5
1	B	810	GLU	3.5
1	C	947	SER	3.5
1	A	773	VAL	3.5
1	A	885	PRO	3.5
1	B	704	ARG	3.5
1	A	732	LEU	3.4
1	D	704	ARG	3.4
1	A	727	SER	3.4
1	B	885	PRO	3.4
1	B	970	PRO	3.4
1	B	718	GLN	3.4
1	C	729	ILE	3.4
1	B	721	SER	3.4
1	A	718	GLN	3.4
1	C	777	LEU	3.4
1	B	966	GLY	3.4
1	A	959	SER	3.4
1	B	819	LYS	3.4
1	A	728	GLN	3.4
1	C	707	GLN	3.4
1	C	980	ASN	3.3
1	A	970	PRO	3.3
1	A	716	VAL	3.3
1	A	804	VAL	3.3
1	D	810	GLU	3.3
1	C	728	GLN	3.3
1	D	901	VAL	3.3
1	C	894	GLY	3.3
1	D	770	ASP	3.3
1	D	962	ILE	3.3
1	D	775	TYR	3.2
1	C	981	ASP	3.2
1	B	727	SER	3.2
1	C	790	ILE	3.2
1	A	886	VAL	3.2

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Mol	Chain	Res	Type	RSRZ
1	A	968	ASP	3.2
1	C	968	ASP	3.2
1	C	960	ALA	3.2
1	D	717	GLN	3.2
1	A	770	ASP	3.2
1	A	820	ASN	3.2
1	B	811	ALA	3.2
1	A	736	PHE	3.2
1	A	717	GLN	3.2
1	B	717	GLN	3.2
1	C	709	ALA	3.1
1	B	716	VAL	3.1
1	B	773	VAL	3.1
1	D	716	VAL	3.1
1	C	810	GLU	3.1
1	A	939	SER	3.1
1	C	755	ALA	3.1
1	C	819	LYS	3.1
1	C	730	LEU	3.1
1	B	830	ASP	3.1
1	C	902	SER	3.1
1	C	781	GLY	3.1
1	A	840	GLU	3.1
1	B	937	HIS	3.0
1	D	948	VAL	3.0
1	A	981	ASP	3.0
1	D	980	ASN	3.0
1	C	774	ALA	3.0
1	A	711	SER	3.0
1	C	731	ASP	3.0
1	D	808	SER	3.0
1	C	853	GLN	3.0
1	B	1010	LYS	3.0
1	A	861	TRP	3.0
1	B	861	TRP	3.0
1	D	749	PRO	3.0
1	B	820	ASN	3.0
1	C	1011	THR	3.0
1	B	804	VAL	3.0
1	B	729	ILE	2.9
1	B	790	ILE	2.9
1	A	808	SER	2.9

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Mol	Chain	Res	Type	RSRZ
1	C	899	ASP	2.9
1	D	776	SER	2.9
1	D	947	SER	2.9
1	C	746	MET	2.9
1	B	719	ALA	2.9
1	A	704	ARG	2.9
1	A	790	ILE	2.9
1	A	739	LEU	2.9
1	C	751	LEU	2.9
1	D	766	ASP	2.9
1	A	823	ALA	2.9
1	A	853	GLN	2.9
1	C	807	ASP	2.9
1	C	722	GLN	2.9
1	A	882	PRO	2.9
1	B	746	MET	2.9
1	C	804	VAL	2.9
1	D	979	VAL	2.9
1	B	939	SER	2.9
1	A	836	ILE	2.9
1	D	912	GLN	2.8
1	A	703	LYS	2.8
1	B	731	ASP	2.8
1	B	822	HIS	2.8
1	D	781	GLY	2.8
1	A	707	GLN	2.8
1	C	912	GLN	2.8
1	B	979	VAL	2.8
1	C	735	ARG	2.8
1	C	744	PHE	2.8
1	C	724	SER	2.8
1	B	722	GLN	2.8
1	C	704	ARG	2.8
1	C	818	VAL	2.8
1	D	735	ARG	2.8
1	B	980	ASN	2.8
1	C	827	ASN	2.8
1	A	824	THR	2.8
1	D	707	GLN	2.8
1	B	969	VAL	2.8
1	B	823	ALA	2.8
1	C	889	TYR	2.8

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Mol	Chain	Res	Type	RSRZ
1	D	746	MET	2.8
1	D	747	LYS	2.8
1	B	808	SER	2.8
1	B	853	GLN	2.7
1	B	765	LEU	2.7
1	A	980	ASN	2.7
1	B	850	PRO	2.7
1	B	710	TYR	2.7
1	C	770	ASP	2.7
1	C	972	GLY	2.7
1	B	769	LEU	2.7
1	D	709	ALA	2.7
1	D	889	TYR	2.7
1	C	720	VAL	2.7
1	C	860	LEU	2.7
1	A	937	HIS	2.6
1	D	894	GLY	2.6
1	C	718	GLN	2.6
1	C	971	LEU	2.6
1	C	997	VAL	2.6
1	D	886	VAL	2.6
1	A	702	SER	2.6
1	C	882	PRO	2.6
1	D	745	GLY	2.6
1	B	900	MET	2.6
1	A	811	ALA	2.6
1	D	720	VAL	2.6
1	D	1011	THR	2.6
1	B	832	GLU	2.6
1	C	771	ILE	2.6
1	A	807	ASP	2.6
1	A	830	ASP	2.6
1	B	989	TYR	2.6
1	C	775	TYR	2.6
1	D	885	PRO	2.6
1	C	758	VAL	2.6
1	C	886	VAL	2.6
1	D	821	THR	2.6
1	B	755	ALA	2.6
1	A	936	SER	2.5
1	B	976	SER	2.5
1	D	748	LYS	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	817	TYR	2.5
1	B	777	LEU	2.5
1	D	966	GLY	2.5
1	B	889	TYR	2.5
1	A	827	ASN	2.5
1	D	805	ASP	2.5
1	D	830	ASP	2.5
1	A	778	LEU	2.5
1	C	944	GLY	2.5
1	D	842	GLU	2.5
1	A	755	ALA	2.5
1	A	735	ARG	2.5
1	B	815	ARG	2.5
1	A	983	SER	2.5
1	A	941	LEU	2.5
1	B	740	ILE	2.5
1	C	817	TYR	2.5
1	D	718	GLN	2.5
1	D	853	GLN	2.5
1	C	957	ASP	2.5
1	B	730	LEU	2.5
1	B	951	LEU	2.5
1	D	751	LEU	2.5
1	A	749	PRO	2.5
1	C	970	PRO	2.5
1	B	691	ILE	2.5
1	A	916	ILE	2.4
1	A	849	LYS	2.4
1	B	728	GLN	2.4
1	D	900	MET	2.4
1	A	740	ILE	2.4
1	C	979	VAL	2.4
1	A	832	GLU	2.4
1	B	905	ALA	2.4
1	B	827	ASN	2.4
1	B	726	ASP	2.4
1	B	833	VAL	2.4
1	C	792	VAL	2.4
1	C	901	VAL	2.4
1	B	796	LYS	2.4
1	A	776	SER	2.4
1	C	905	ALA	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	751	LEU	2.4
1	B	698	LEU	2.4
1	A	813	ILE	2.4
1	B	813	ILE	2.4
1	A	969	VAL	2.4
1	A	800	ASP	2.4
1	A	805	ASP	2.4
1	A	709	ALA	2.4
1	D	757	SER	2.4
1	B	824	THR	2.4
1	A	765	LEU	2.4
1	C	740	ILE	2.4
1	B	735	ARG	2.3
1	B	800	ASP	2.3
1	B	688	GLU	2.3
1	B	902	SER	2.3
1	C	822	HIS	2.3
1	C	716	VAL	2.3
1	D	818	VAL	2.3
1	B	793	ASN	2.3
1	C	883	GLU	2.3
1	B	714	SER	2.3
1	D	822	HIS	2.3
1	A	689	TYR	2.3
1	B	738	THR	2.3
1	B	916	ILE	2.3
1	C	840	GLU	2.3
1	C	884	ALA	2.3
1	A	976	SER	2.3
1	B	771	ILE	2.3
1	D	729	ILE	2.3
1	B	723	GLY	2.3
1	C	820	ASN	2.3
1	D	905	ALA	2.3
1	C	717	GLN	2.3
1	C	800	ASP	2.3
1	C	748	LYS	2.3
1	A	879	ILE	2.3
1	D	790	ILE	2.3
1	B	821	THR	2.3
1	C	911	SER	2.3
1	B	829	TYR	2.3

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Mol	Chain	Res	Type	RSRZ
1	D	792	VAL	2.3
1	D	719	ALA	2.2
1	D	774	ALA	2.2
1	A	713	LEU	2.2
1	C	951	LEU	2.2
1	D	769	LEU	2.2
1	B	875	GLN	2.2
1	A	731	ASP	2.2
1	C	830	ASP	2.2
1	D	957	ASP	2.2
1	A	738	THR	2.2
1	A	821	THR	2.2
1	B	702	SER	2.2
1	B	724	SER	2.2
1	C	936	SER	2.2
1	C	969	VAL	2.2
1	D	702	SER	2.2
1	D	714	SER	2.2
1	D	924	VAL	2.2
1	A	897	PHE	2.2
1	D	811	ALA	2.2
1	A	806	ARG	2.2
1	B	806	ARG	2.2
1	D	937	HIS	2.2
1	A	750	PRO	2.2
1	A	979	VAL	2.2
1	C	824	THR	2.2
1	B	894	GLY	2.2
1	D	736	PHE	2.2
1	A	1005	LEU	2.2
1	B	703	LYS	2.2
1	B	941	LEU	2.2
1	A	793	ASN	2.2
1	D	754	ASN	2.2
1	A	815	ARG	2.2
1	B	912	GLN	2.2
1	D	815	ARG	2.2
1	D	914	ASP	2.2
1	D	824	THR	2.2
1	B	863	GLY	2.2
1	A	769	LEU	2.2
1	B	713	LEU	2.2

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Mol	Chain	Res	Type	RSRZ
1	A	957	ASP	2.2
1	B	805	ASP	2.2
1	D	981	ASP	2.2
1	A	746	MET	2.2
1	A	781	GLY	2.2
1	A	816	LYS	2.2
1	A	894	GLY	2.2
1	B	950	GLY	2.2
1	D	943	LYS	2.2
1	B	739	LEU	2.2
1	C	941	LEU	2.2
1	D	725	SER	2.2
1	A	928	ASN	2.1
1	C	885	PRO	2.1
1	A	965	ASP	2.1
1	A	747	LYS	2.1
1	B	748	LYS	2.1
1	A	745	GLY	2.1
1	B	860	LEU	2.1
1	C	739	LEU	2.1
1	B	776	SER	2.1
1	C	808	SER	2.1
1	C	939	SER	2.1
1	D	813	ILE	2.1
1	A	792	VAL	2.1
1	D	807	ASP	2.1
1	D	950	GLY	2.1
1	A	860	LEU	2.1
1	C	736	PHE	2.1
1	C	769	LEU	2.1
1	D	951	LEU	2.1
1	D	898	ALA	2.1
1	D	688	GLU	2.1
1	D	740	ILE	2.1
1	A	754	ASN	2.1
1	C	991	VAL	2.1
1	D	698	LEU	2.1
1	D	944	GLY	2.1
1	C	861	TRP	2.1
1	A	691	ILE	2.1
1	A	889	TYR	2.1
1	D	936	SER	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	846	GLN	2.1
1	C	900	MET	2.1
1	C	934	HIS	2.1
1	D	816	LYS	2.1
1	B	1005	LEU	2.1
1	C	1005	LEU	2.1
1	A	950	GLY	2.1
1	C	723	GLY	2.1
1	C	805	ASP	2.1
1	C	676	ILE	2.1
1	A	748	LYS	2.0
1	D	724	SER	2.0
1	D	856	ASN	2.0
1	D	860	LEU	2.0
1	A	871	GLY	2.0
1	C	815	ARG	2.0
1	A	898	ALA	2.0
1	C	823	ALA	2.0
1	B	689	TYR	2.0
1	D	969	VAL	2.0
1	B	749	PRO	2.0
1	A	698	LEU	2.0
1	B	778	LEU	2.0
1	C	836	ILE	2.0
1	C	671	ASP	2.0
1	C	726	ASP	2.0

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

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

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands (i)

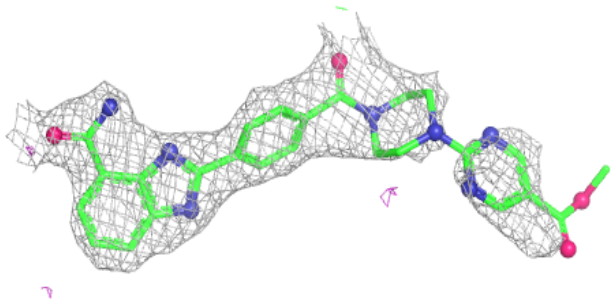
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

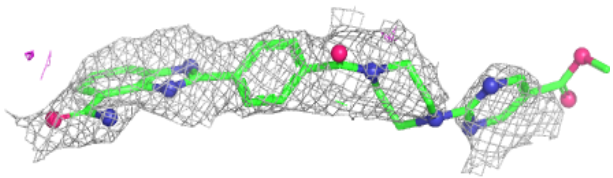
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	SO4	A	1104	5/5	0.75	0.16	91,95,99,103	0
3	SO4	D	1104	5/5	0.80	0.14	91,93,95,96	0
2	L1S	B	1101	36/36	0.82	0.17	65,80,141,153	0
3	SO4	B	1104	5/5	0.83	0.15	87,91,95,99	0
3	SO4	C	1104	5/5	0.84	0.16	79,86,87,88	0
2	L1S	A	1101	36/36	0.84	0.15	50,80,145,156	0
3	SO4	A	1103	5/5	0.86	0.18	87,92,97,100	0
3	SO4	B	1103	5/5	0.87	0.13	73,82,88,88	0
3	SO4	D	1103	5/5	0.87	0.18	78,79,81,92	0
2	L1S	D	1101	36/36	0.87	0.13	54,72,122,130	0
3	SO4	B	1102	5/5	0.90	0.16	91,94,96,100	0
2	L1S	C	1101	36/36	0.90	0.12	46,72,131,134	0
3	SO4	C	1103	5/5	0.91	0.16	77,81,84,88	0
3	SO4	C	1102	5/5	0.91	0.14	78,79,82,83	0
3	SO4	D	1102	5/5	0.92	0.17	82,85,88,90	0
3	SO4	A	1102	5/5	0.94	0.11	90,94,99,101	0

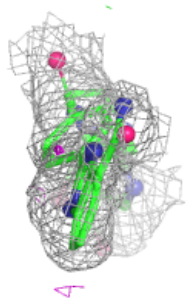
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around L1S B 1101:

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

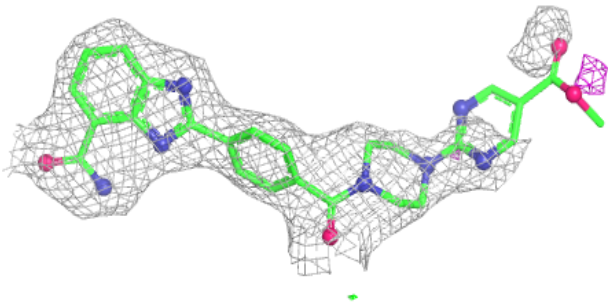


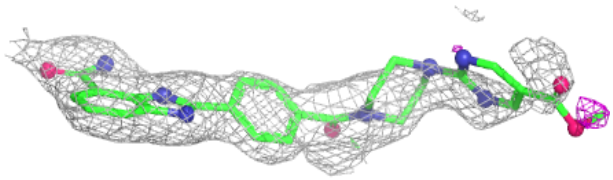


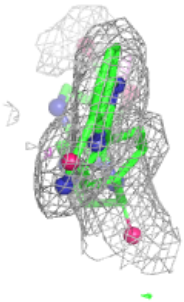


Electron density around L1S A 1101:

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

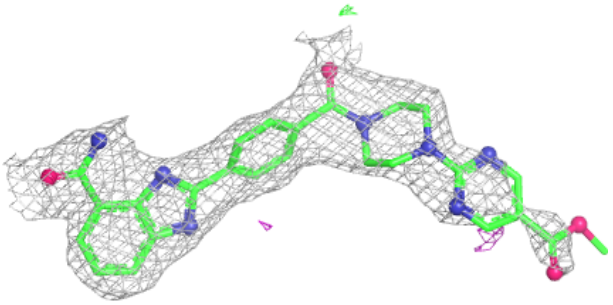


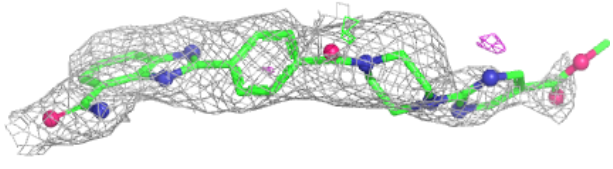


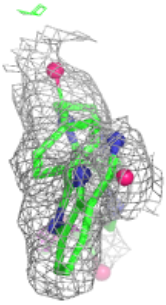


Electron density around L1S D 1101:

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

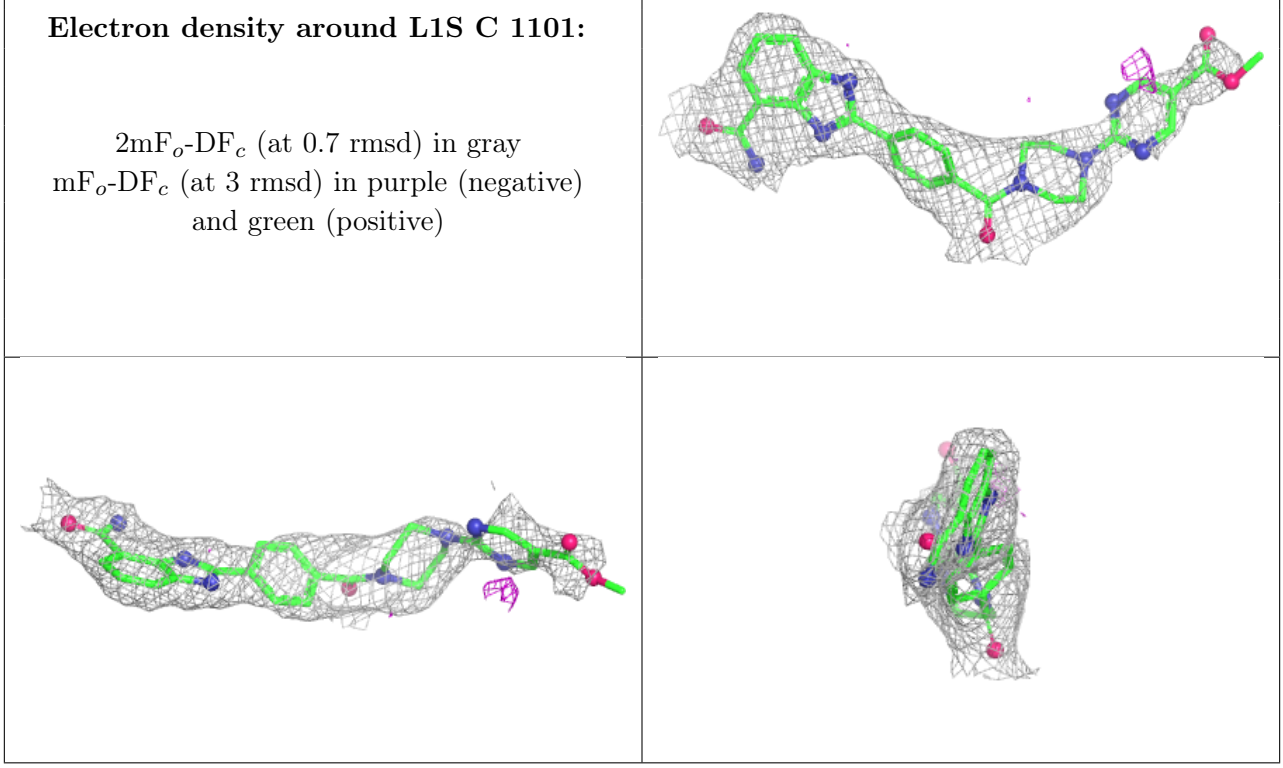






Electron density around L1S C 1101:

$2mF_o$-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.