WORLDWIDE PDB PROTEIN DATA BANK

wwPDB X-ray Structure Validation Summary Report (i)

Feb 25, 2024 – 05:13 PM EST

PDB ID	:	5UW6
Title	:	PCY1 in Complex with Follower Peptide and Covalent Inhibitor ZPP
Authors	:	Chekan, J.R.; Nair, S.K.
Deposited on	:	2017-02-20
Resolution	:	3.30 Å(reported)

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

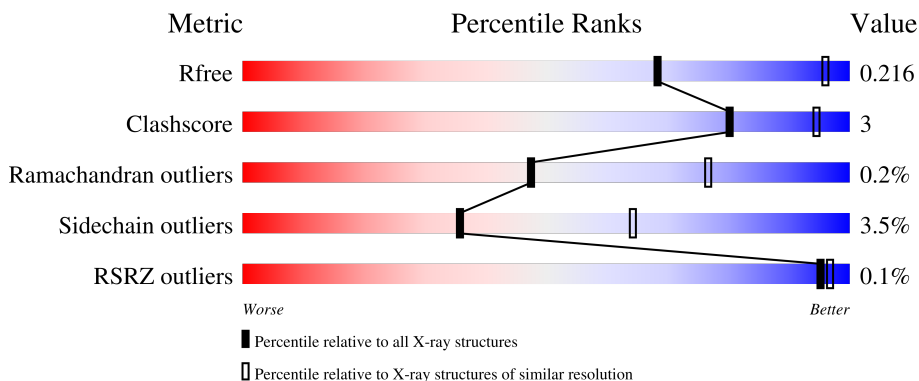|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1   Overall quality at a glance (i)

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

The reported resolution of this entry is 3.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.
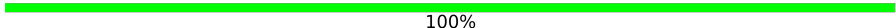
Metric	Percentile Ranks	Value
Rfree		0.216
Clashscore		3
Ramachandran outliers		0.2%
Sidechain outliers		3.5%
RSRZ outliers		0.1%

Worse   *Better*

▮ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1149 (3.34-3.26)
Clashscore	141614	1205 (3.34-3.26)
Ramachandran outliers	138981	1183 (3.34-3.26)
Sidechain outliers	138945	1182 (3.34-3.26)
RSRZ outliers	127900	1115 (3.34-3.26)

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	750	84% 7% · 8%
1	B	750	86% 7% · 6%
1	C	750	85% 7% · 7%
1	D	750	86% 7% · 7%
2	E	6	100%

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Mol	Chain	Length	Quality of chain
2	F	6	100%
2	G	6	83% 17%
2	H	6	17% 83% 17%

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 22866 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 Peptide cyclase 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	693	Total	C	N	O	S	0	7	0
			5633	3600	957	1050	26			
1	B	706	Total	C	N	O	S	0	0	0
			5661	3617	962	1057	25			
1	C	701	Total	C	N	O	S	0	3	0
			5665	3623	966	1050	26			
1	D	697	Total	C	N	O	S	0	0	0
			5601	3582	953	1041	25			

There are 104 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-25	MET	-	initiating methionine	UNP R4P353
A	-24	SER	-	expression tag	UNP R4P353
A	-23	TYR	-	expression tag	UNP R4P353
A	-22	TYR	-	expression tag	UNP R4P353
A	-21	HIS	-	expression tag	UNP R4P353
A	-20	HIS	-	expression tag	UNP R4P353
A	-19	HIS	-	expression tag	UNP R4P353
A	-18	HIS	-	expression tag	UNP R4P353
A	-17	HIS	-	expression tag	UNP R4P353
A	-16	HIS	-	expression tag	UNP R4P353
A	-15	LEU	-	expression tag	UNP R4P353
A	-14	GLU	-	expression tag	UNP R4P353
A	-13	SER	-	expression tag	UNP R4P353
A	-12	THR	-	expression tag	UNP R4P353
A	-11	SER	-	expression tag	UNP R4P353
A	-10	LEU	-	expression tag	UNP R4P353
A	-9	TYR	-	expression tag	UNP R4P353
A	-8	LYS	-	expression tag	UNP R4P353
A	-7	LYS	-	expression tag	UNP R4P353
A	-6	ALA	-	expression tag	UNP R4P353
A	-5	GLY	-	expression tag	UNP R4P353

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-4	SER	-	expression tag	UNP R4P353
A	-3	GLU	-	expression tag	UNP R4P353
A	-2	PHE	-	expression tag	UNP R4P353
A	-1	ALA	-	expression tag	UNP R4P353
A	0	LEU	-	expression tag	UNP R4P353
B	-25	MET	-	initiating methionine	UNP R4P353
B	-24	SER	-	expression tag	UNP R4P353
B	-23	TYR	-	expression tag	UNP R4P353
B	-22	TYR	-	expression tag	UNP R4P353
B	-21	HIS	-	expression tag	UNP R4P353
B	-20	HIS	-	expression tag	UNP R4P353
B	-19	HIS	-	expression tag	UNP R4P353
B	-18	HIS	-	expression tag	UNP R4P353
B	-17	HIS	-	expression tag	UNP R4P353
B	-16	HIS	-	expression tag	UNP R4P353
B	-15	LEU	-	expression tag	UNP R4P353
B	-14	GLU	-	expression tag	UNP R4P353
B	-13	SER	-	expression tag	UNP R4P353
B	-12	THR	-	expression tag	UNP R4P353
B	-11	SER	-	expression tag	UNP R4P353
B	-10	LEU	-	expression tag	UNP R4P353
B	-9	TYR	-	expression tag	UNP R4P353
B	-8	LYS	-	expression tag	UNP R4P353
B	-7	LYS	-	expression tag	UNP R4P353
B	-6	ALA	-	expression tag	UNP R4P353
B	-5	GLY	-	expression tag	UNP R4P353
B	-4	SER	-	expression tag	UNP R4P353
B	-3	GLU	-	expression tag	UNP R4P353
B	-2	PHE	-	expression tag	UNP R4P353
B	-1	ALA	-	expression tag	UNP R4P353
B	0	LEU	-	expression tag	UNP R4P353
C	-25	MET	-	initiating methionine	UNP R4P353
C	-24	SER	-	expression tag	UNP R4P353
C	-23	TYR	-	expression tag	UNP R4P353
C	-22	TYR	-	expression tag	UNP R4P353
C	-21	HIS	-	expression tag	UNP R4P353
C	-20	HIS	-	expression tag	UNP R4P353
C	-19	HIS	-	expression tag	UNP R4P353
C	-18	HIS	-	expression tag	UNP R4P353
C	-17	HIS	-	expression tag	UNP R4P353
C	-16	HIS	-	expression tag	UNP R4P353
C	-15	LEU	-	expression tag	UNP R4P353

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-14	GLU	-	expression tag	UNP R4P353
C	-13	SER	-	expression tag	UNP R4P353
C	-12	THR	-	expression tag	UNP R4P353
C	-11	SER	-	expression tag	UNP R4P353
C	-10	LEU	-	expression tag	UNP R4P353
C	-9	TYR	-	expression tag	UNP R4P353
C	-8	LYS	-	expression tag	UNP R4P353
C	-7	LYS	-	expression tag	UNP R4P353
C	-6	ALA	-	expression tag	UNP R4P353
C	-5	GLY	-	expression tag	UNP R4P353
C	-4	SER	-	expression tag	UNP R4P353
C	-3	GLU	-	expression tag	UNP R4P353
C	-2	PHE	-	expression tag	UNP R4P353
C	-1	ALA	-	expression tag	UNP R4P353
C	0	LEU	-	expression tag	UNP R4P353
D	-25	MET	-	initiating methionine	UNP R4P353
D	-24	SER	-	expression tag	UNP R4P353
D	-23	TYR	-	expression tag	UNP R4P353
D	-22	TYR	-	expression tag	UNP R4P353
D	-21	HIS	-	expression tag	UNP R4P353
D	-20	HIS	-	expression tag	UNP R4P353
D	-19	HIS	-	expression tag	UNP R4P353
D	-18	HIS	-	expression tag	UNP R4P353
D	-17	HIS	-	expression tag	UNP R4P353
D	-16	HIS	-	expression tag	UNP R4P353
D	-15	LEU	-	expression tag	UNP R4P353
D	-14	GLU	-	expression tag	UNP R4P353
D	-13	SER	-	expression tag	UNP R4P353
D	-12	THR	-	expression tag	UNP R4P353
D	-11	SER	-	expression tag	UNP R4P353
D	-10	LEU	-	expression tag	UNP R4P353
D	-9	TYR	-	expression tag	UNP R4P353
D	-8	LYS	-	expression tag	UNP R4P353
D	-7	LYS	-	expression tag	UNP R4P353
D	-6	ALA	-	expression tag	UNP R4P353
D	-5	GLY	-	expression tag	UNP R4P353
D	-4	SER	-	expression tag	UNP R4P353
D	-3	GLU	-	expression tag	UNP R4P353
D	-2	PHE	-	expression tag	UNP R4P353
D	-1	ALA	-	expression tag	UNP R4P353
D	0	LEU	-	expression tag	UNP R4P353

- Molecule 2 is a protein called Presegetalin A1.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
2	E	6	Total	C	N	O	0	0	0
			38	23	7	8			
2	F	6	Total	C	N	O	0	0	0
			39	23	7	9			
2	G	6	Total	C	N	O	0	0	0
			38	23	7	8			
2	H	6	Total	C	N	O	0	0	0
			39	23	7	9			

- Molecule 3 is N-BENZYLOXYCARBONYL-L-PROLYL-L-PROLINAL (three-letter code: ZPR) (formula: $C_{18}H_{22}N_2O_4$).
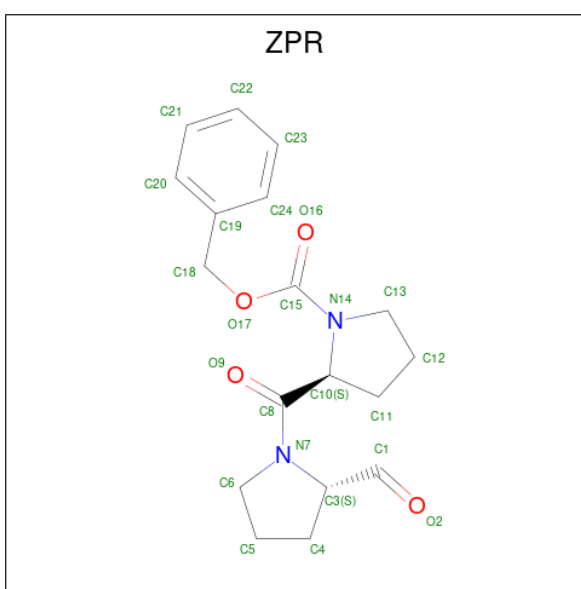
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			24	18	2	4		
3	B	1	Total	C	N	O	0	0
			24	18	2	4		
3	C	1	Total	C	N	O	0	0
			24	18	2	4		
3	D	1	Total	C	N	O	0	0
			24	18	2	4		

- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	1	Total	Ca	0	0
			1	1		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	2	Total 2	Ca 2	0	0
4	C	1	Total 1	Ca 1	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	13	Total 13	O 13	0	0
5	B	16	Total 16	O 16	0	0
5	C	8	Total 8	O 8	0	0
5	D	15	Total 15	O 15	0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.
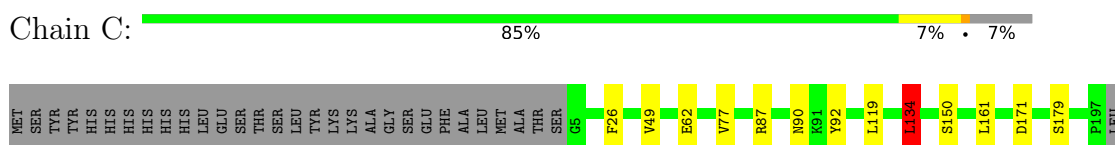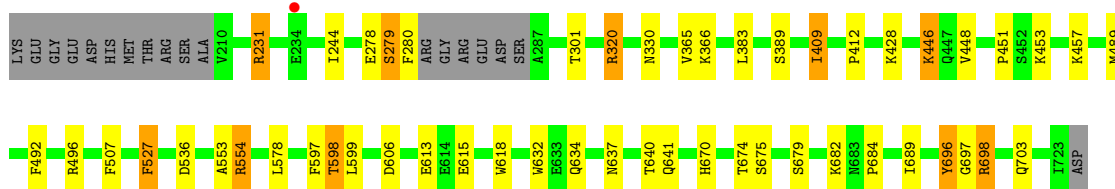
• Molecule 1: Peptide cyclase 1
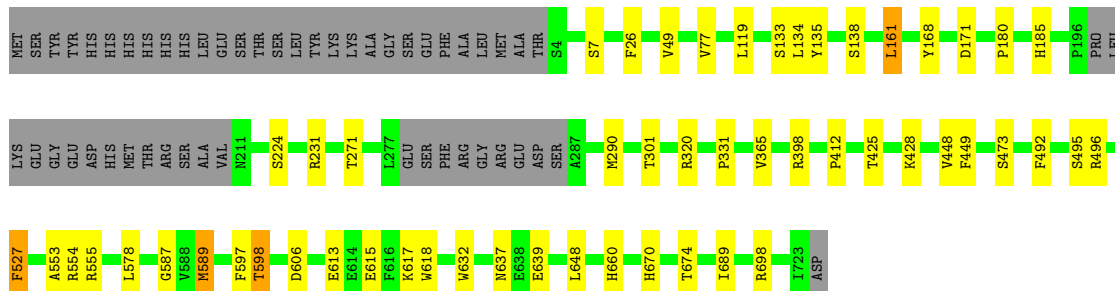
Chain A:

• Molecule 1: Peptide cyclase 1

Chain B:

• Molecule 1: Peptide cyclase 1

Chain C:

LYS GLU GLY GLU ASP HIS MET THR ARG SER ALA V210 R231 E234 I244 E278 S279 F280 ARG GLY ARG GLU ASP SER A287 T301 R320 N330 V365 K366 L383 S389 I409 P412 K428 K446 Q447 V448 P451 S452 K453 K457 M489

F492 R496 F507 F527 D536 A553 R554 L578 F597 T598 L599 D606 E613 E614 E615 W618 W632 E633 Q634 N637 T640 Q641 H670 T674 S675 S679 K682 N683 P684 I689 Y696 G697 R698 Q703 I723 ASP

• Molecule 1: Peptide cyclase 1

Chain D:
86%   7%   •   7%

MET SER TYR TYR HIS HIS HIS HIS HIS HIS LEU GLU SER THR SER LEU TYR LYS LYS ALA GLY SER GLU PHE ALA LEU MET ALA THR S4 S7 F26 V49 V77 L119 S133 L134 Y135 S138 L161 Y168 D171 P180 H185 P196 PRO LEU

LYS GLU GLY GLU ASP HIS MET THR ARG SER ALA VAL N211 S224 R231 T271 L277 GLU SER PHE ARG GLY ARG GLU ASP SER A287 M290 T301 R320 P331 V365 R398 P412 T425 K428 V448 F449 S473 F492 S495 R496

F527 A553 R554 R555 L578 G587 V588 M589 F597 T598 D606 E613 E614 E615 F616 K617 W618 W632 N637 E638 E639 L648 H660 H670 T674 I689 R698 I723 ASP

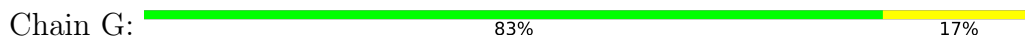• Molecule 2: Presegetalin A1

Chain E:
100%

There are no outlier residues recorded for this chain.

• Molecule 2: Presegetalin A1

Chain F:
100%

There are no outlier residues recorded for this chain.

• Molecule 2: Presegetalin A1

Chain G:
83%   17%

M27 V32

• Molecule 2: Presegetalin A1

Chain H:
17%   83%   17%

M27 V32

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α, β, γ	65.51Å 85.46Å 138.12Å 87.60° 78.17° 89.38°	Depositor
Resolution (Å)	45.20 – 3.30 45.23 – 3.30	Depositor EDS
% Data completeness (in resolution range)	98.9 (45.20-3.30) 98.9 (45.23-3.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.13	Depositor
$< I/\sigma(I) >$ [1]	4.81 (at 3.32Å)	Xtriage
Refinement program	REFMAC 5.8.0073	Depositor
R, R_{free}	0.172 , 0.220 0.173 , 0.216	Depositor DCC
R_{free} test set	2089 reflections (4.80%)	wwPDB-VP
Wilson B-factor (Å^2)	34.2	Xtriage
Anisotropy	0.474	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 26.7	EDS
L-test for twinning[2]	$< |L| > = 0.48, < L^2 > = 0.31$	Xtriage
Estimated twinning fraction	0.049 for h,-k,h-l 0.015 for -h,k,-l 0.009 for -h,-k,-h+l	Xtriage
F_o,F_c correlation	0.92	EDS
Total number of atoms	22866	wwPDB-VP
Average B, all atoms (Å^2)	33.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.40% of the height of the origin peak. No significant pseudotranslation is detected.*

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

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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

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	0.56	0/5777	0.74	4/7821 (0.1%)
1	B	0.55	0/5807	0.75	8/7866 (0.1%)
1	C	0.57	0/5812	0.76	8/7869 (0.1%)
1	D	0.56	1/5746 (0.0%)	0.73	4/7781 (0.1%)
2	E	0.55	0/38	0.49	0/52
2	F	0.56	0/39	0.56	0/52
2	G	0.60	0/38	0.62	0/52
2	H	0.64	0/39	0.50	0/52
All	All	0.56	1/23296 (0.0%)	0.74	24/31545 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	639	GLU	CG-CD	5.44	1.60	1.51

The worst 5 of 24 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	C	134	LEU	CA-CB-CG	10.58	139.63	115.30
1	B	704	ILE	CA-CB-CG1	7.57	125.39	111.00
1	A	161	LEU	CA-CB-CG	7.09	131.60	115.30
1	C	134	LEU	CB-CG-CD2	6.40	121.88	111.00
1	B	599	LEU	CA-CB-CG	6.39	129.99	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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	5633	0	5472	34	0
1	B	5661	0	5502	28	0
1	C	5665	0	5512	39	0
1	D	5601	0	5449	29	0
2	E	38	0	36	0	0
2	F	39	0	36	0	0
2	G	38	0	36	1	0
2	H	39	0	36	1	0
3	A	24	0	21	0	0
3	B	24	0	21	0	0
3	C	24	0	21	0	0
3	D	24	0	21	0	0
4	A	1	0	0	0	0
4	B	2	0	0	0	0
4	C	1	0	0	0	0
5	A	13	0	0	0	0
5	B	16	0	0	5	0
5	C	8	0	0	2	0
5	D	15	0	0	2	0
All	All	22866	0	22163	122	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 3.

The worst 5 of 122 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:682:LYS:HG2	5:C:901:HOH:O	1.81	0.79
1:D:587:GLY:C	1:D:589:MET:HE2	2.10	0.72
1:C:446:LYS:HE3	1:C:448:VAL:CG1	2.23	0.67
1:A:342:LYS:HD2	1:C:366:LYS:HE3	1.77	0.67
1:A:698:ARG:HD3	1:A:703:GLN:OE1	1.97	0.65

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	694/750 (92%)	658 (95%)	34 (5%)	2 (0%)	41	71
1	B	700/750 (93%)	663 (95%)	36 (5%)	1 (0%)	51	81
1	C	698/750 (93%)	662 (95%)	34 (5%)	2 (0%)	41	71
1	D	691/750 (92%)	654 (95%)	36 (5%)	1 (0%)	51	81
2	E	4/6 (67%)	4 (100%)	0	0	100	100
2	F	4/6 (67%)	4 (100%)	0	0	100	100
2	G	4/6 (67%)	4 (100%)	0	0	100	100
2	H	4/6 (67%)	4 (100%)	0	0	100	100
All	All	2799/3024 (93%)	2653 (95%)	140 (5%)	6 (0%)	47	77

5 of 6 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	598	THR
1	A	697	GLY
1	B	598	THR
1	C	598	THR
1	C	696	TYR

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	610/652 (94%)	587 (96%)	23 (4%)	33	62

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	B	613/652 (94%)	590 (96%)	23 (4%)	33	62
1	C	613/652 (94%)	590 (96%)	23 (4%)	33	62
1	D	606/652 (93%)	589 (97%)	17 (3%)	43	70
2	E	4/4 (100%)	4 (100%)	0	100	100
2	F	4/4 (100%)	4 (100%)	0	100	100
2	G	4/4 (100%)	4 (100%)	0	100	100
2	H	4/4 (100%)	4 (100%)	0	100	100
All	All	2458/2624 (94%)	2372 (96%)	86 (4%)	36	64

5 of 86 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	365	VAL
1	D	119	LEU
1	C	409	ILE
1	C	606	ASP
1	D	185	HIS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 10 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	670	HIS
2	F	27	ASN
1	D	670	HIS
1	A	313	GLN
1	A	670	HIS

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no monosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 8 ligands modelled in this entry, 4 are monoatomic - leaving 4 for Mogul analysis.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#|Z| > 2$	Counts	RMSZ	$\#|Z| > 2$
3	ZPR	D	801	1	25,26,26	1.69	2 (8%)	31,35,35	2.16	5 (16%)
3	ZPR	C	801	1	25,26,26	1.29	1 (4%)	31,35,35	2.43	3 (9%)
3	ZPR	A	801	1	25,26,26	1.29	2 (8%)	31,35,35	2.16	2 (6%)
3	ZPR	B	801	1	25,26,26	1.65	2 (8%)	31,35,35	1.58	5 (16%)

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	ZPR	D	801	1	-	2/17/39/39	0/3/3/3
3	ZPR	C	801	1	-	6/17/39/39	0/3/3/3
3	ZPR	A	801	1	-	6/17/39/39	0/3/3/3
3	ZPR	B	801	1	-	4/17/39/39	0/3/3/3

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	801	ZPR	O17-C15	6.19	1.46	1.34
3	B	801	ZPR	O17-C15	6.14	1.46	1.34
3	C	801	ZPR	O17-C15	5.71	1.45	1.34
3	A	801	ZPR	O17-C15	4.94	1.44	1.34
3	D	801	ZPR	C3-N7	-4.85	1.44	1.48

The worst 5 of 15 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	801	ZPR	O17-C15-N14	9.23	121.19	111.05
3	D	801	ZPR	O17-C15-N14	9.23	121.18	111.05
3	C	801	ZPR	O17-C15-N14	9.23	121.18	111.05
3	A	801	ZPR	O17-C15-O16	-6.14	114.33	124.78
3	C	801	ZPR	O17-C15-O16	-6.07	114.45	124.78

There are no chirality outliers.

5 of 18 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	801	ZPR	N14-C15-O17-C18
3	A	801	ZPR	O17-C15-N14-C10
3	A	801	ZPR	O17-C15-N14-C13
3	A	801	ZPR	O16-C15-N14-C10
3	A	801	ZPR	O16-C15-N14-C13

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less 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 ZPR D 801

Bond lengths

Bond angles

Torsions

Rings

Ligand ZPR C 801

Bond lengths

Bond angles

Torsions

Rings

Ligand ZPR A 801

Bond lengths

Bond angles

Torsions

Rings

Ligand ZPR B 801

Bond lengths

Bond angles

Torsions

Rings
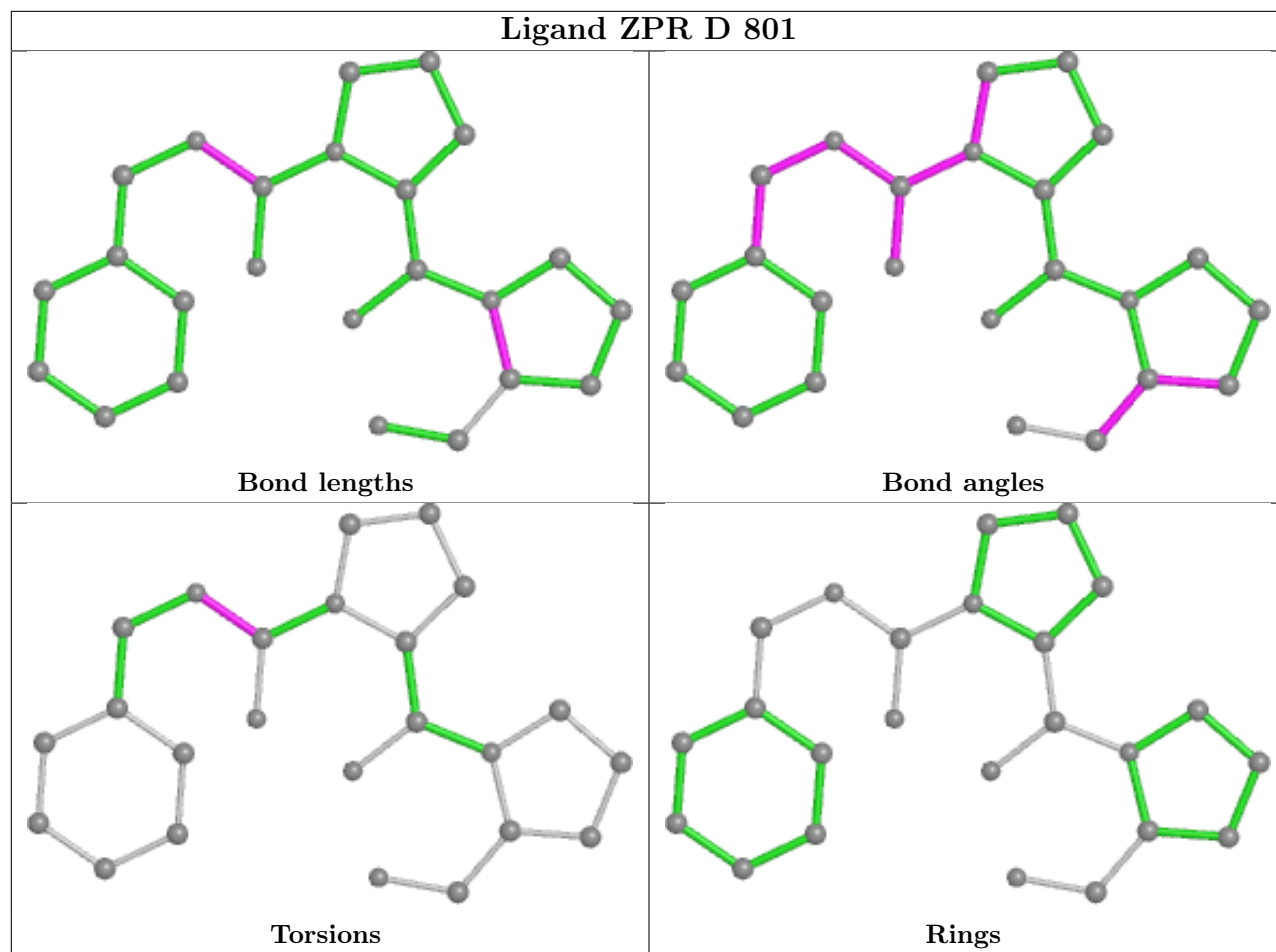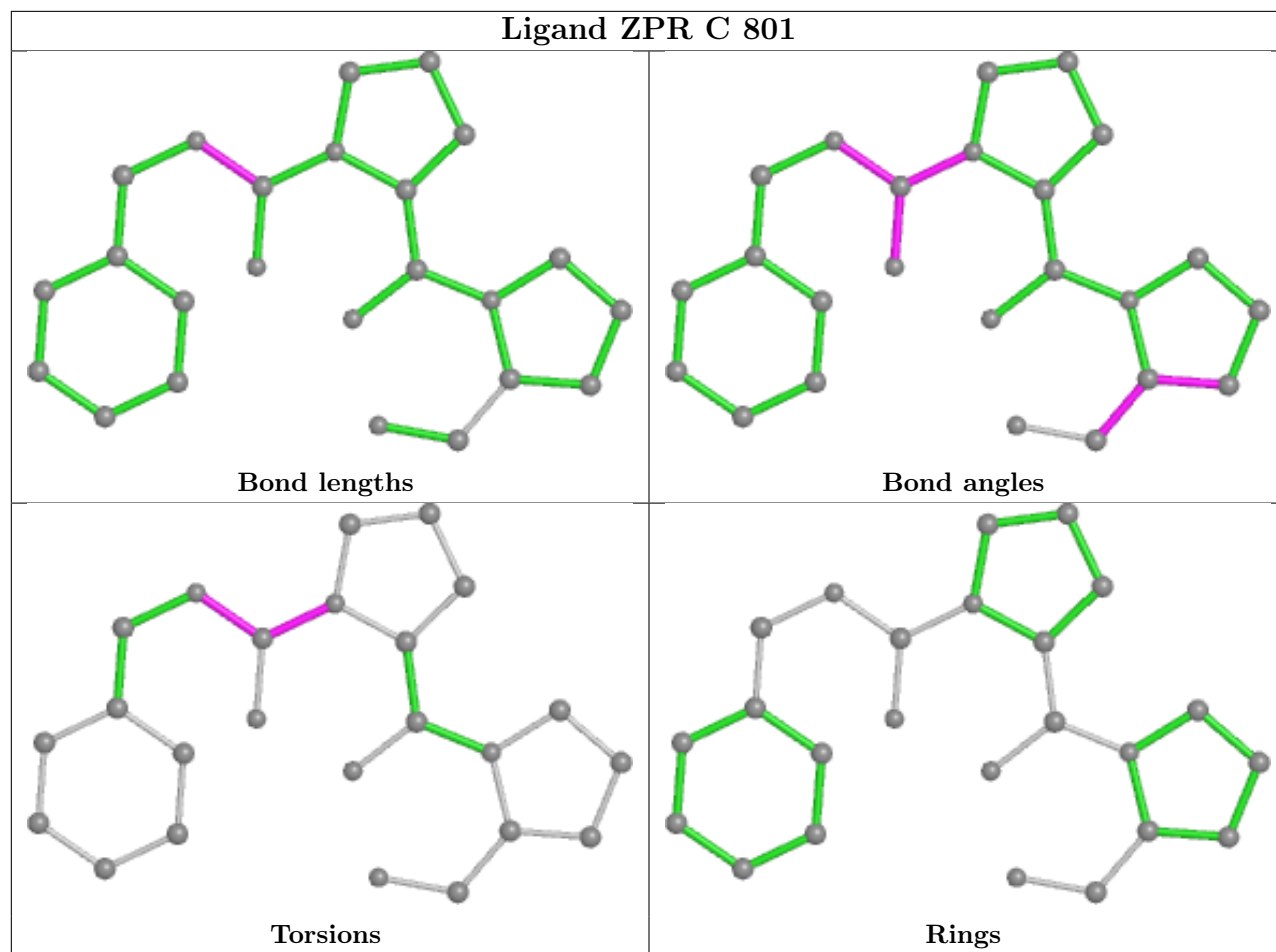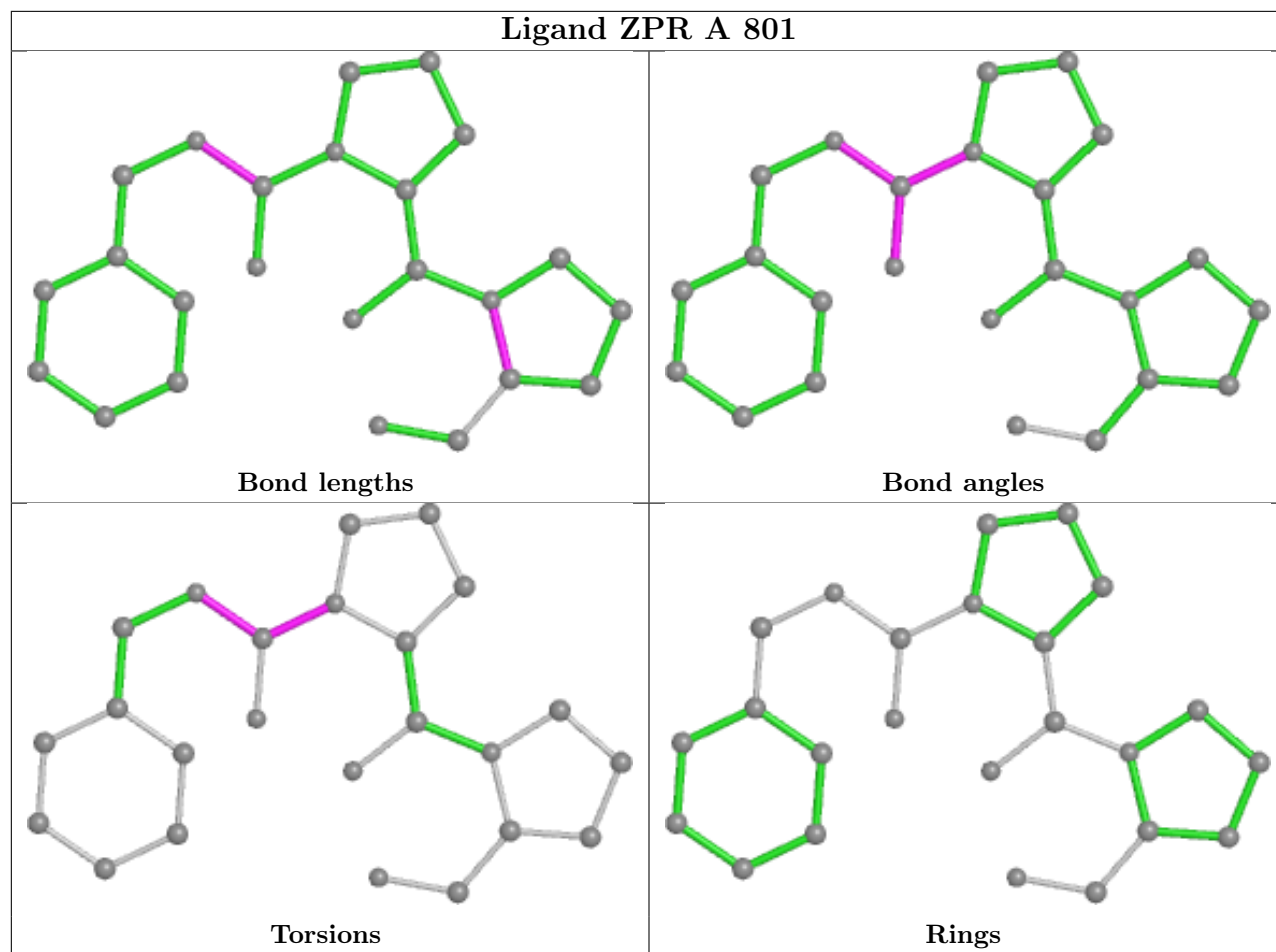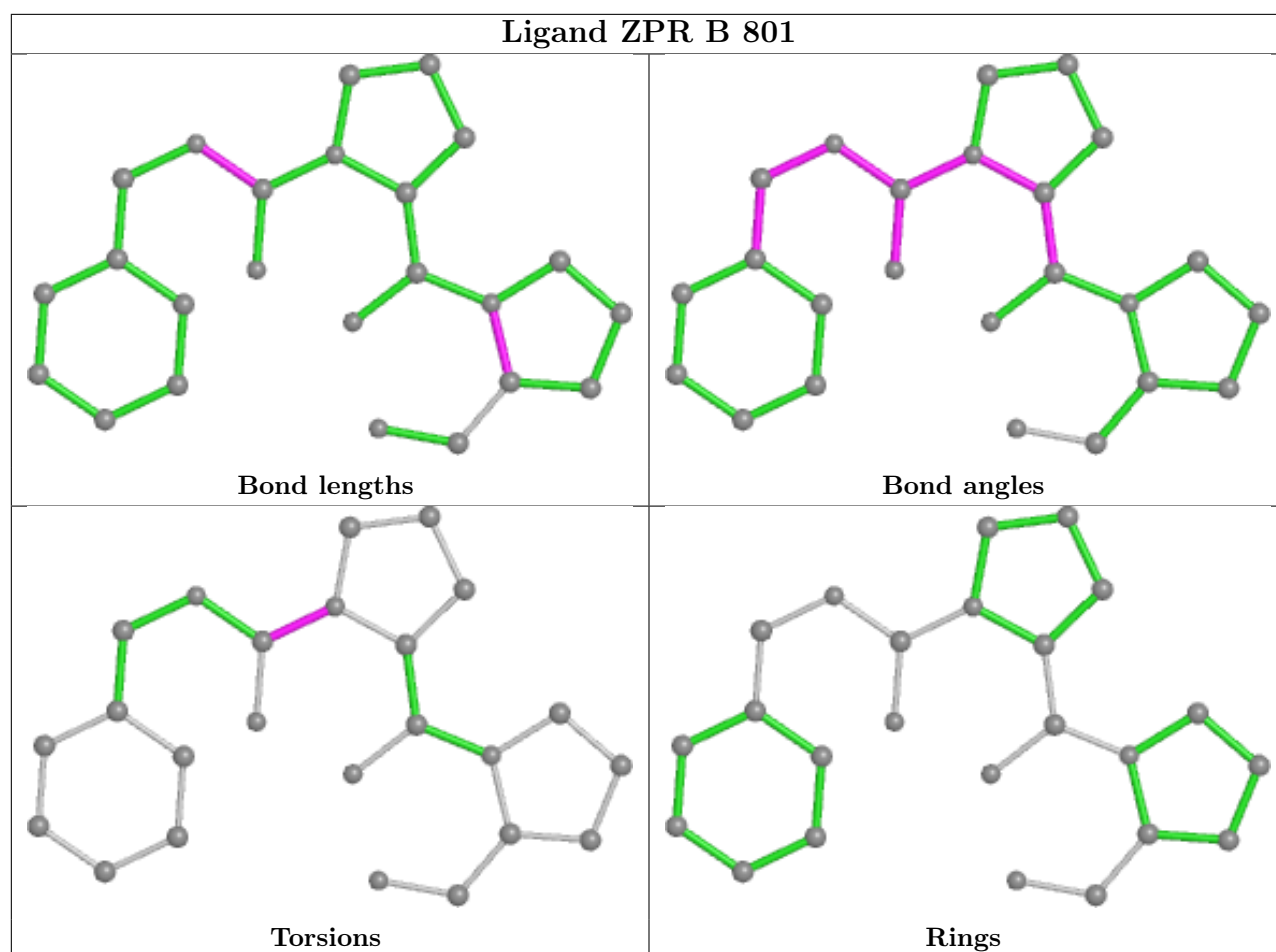
5.7 Other polymers (i)

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(Å²)	Q<0.9
1	A	693/750 (92%)	-0.35	1 (0%)	95	97	15, 32, 59, 97	0
1	B	706/750 (94%)	-0.36	1 (0%)	95	97	17, 30, 58, 92	0
1	C	701/750 (93%)	-0.41	1 (0%)	95	97	10, 28, 56, 97	0
1	D	697/750 (92%)	-0.39	0	100	100	15, 30, 57, 91	0
2	E	6/6 (100%)	-0.50	0	100	100	33, 41, 52, 56	0
2	F	6/6 (100%)	-0.00	0	100	100	27, 36, 53, 55	0
2	G	6/6 (100%)	0.18	0	100	100	30, 36, 56, 57	0
2	H	6/6 (100%)	0.16	1 (16%)	1	1	28, 32, 51, 62	0
All	All	2821/3024 (93%)	-0.38	4 (0%)	95	97	10, 30, 58, 97	0

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	H	27	ASN	2.6
1	A	439	ASP	2.4
1	B	724	ASP	2.2
1	C	234	GLU	2.1

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

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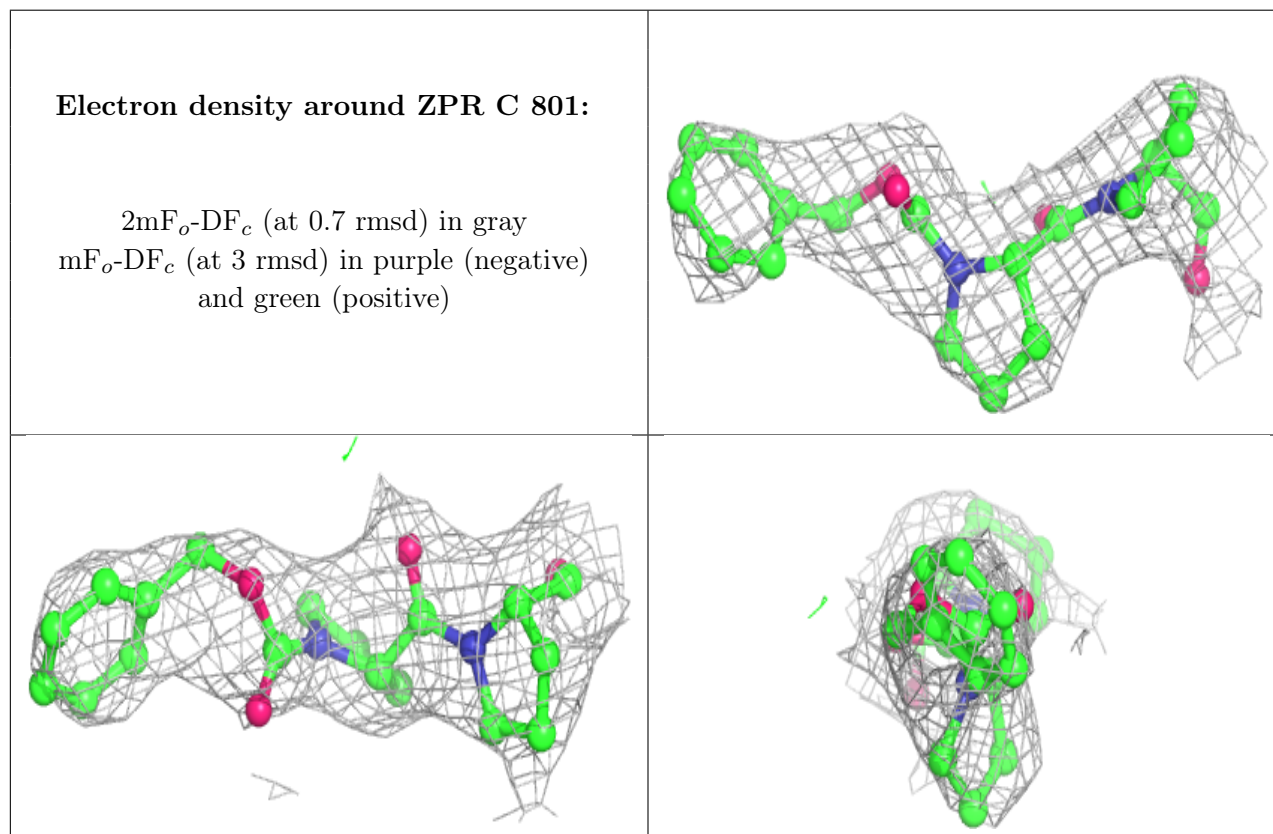
6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands (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	CA	B	802	1/1	0.87	0.09	37,37,37,37	0
4	CA	B	803	1/1	0.92	0.06	30,30,30,30	0
3	ZPR	C	801	24/24	0.94	0.20	31,37,48,48	0
3	ZPR	A	801	24/24	0.94	0.25	41,54,58,62	0
3	ZPR	B	801	24/24	0.94	0.21	26,31,56,58	0
3	ZPR	D	801	24/24	0.95	0.20	33,40,52,53	0
4	CA	C	802	1/1	0.95	0.05	27,27,27,27	0
4	CA	A	802	1/1	0.96	0.14	41,41,41,41	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.
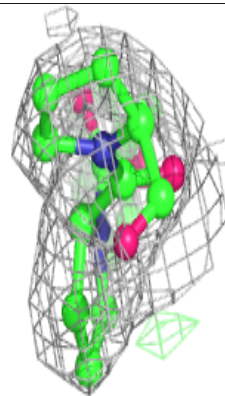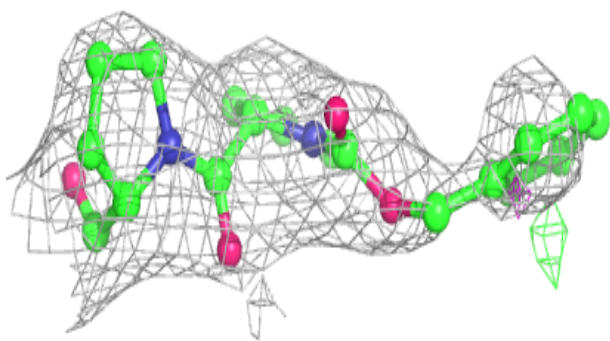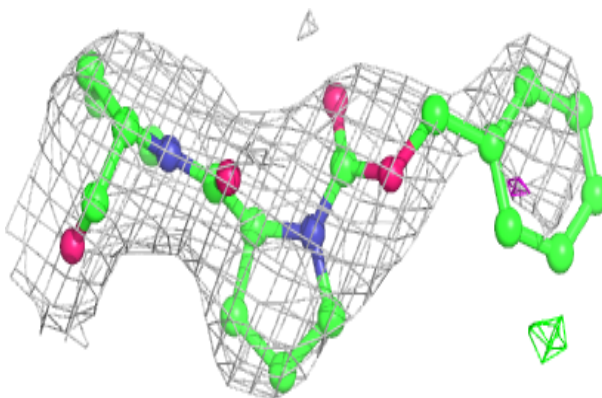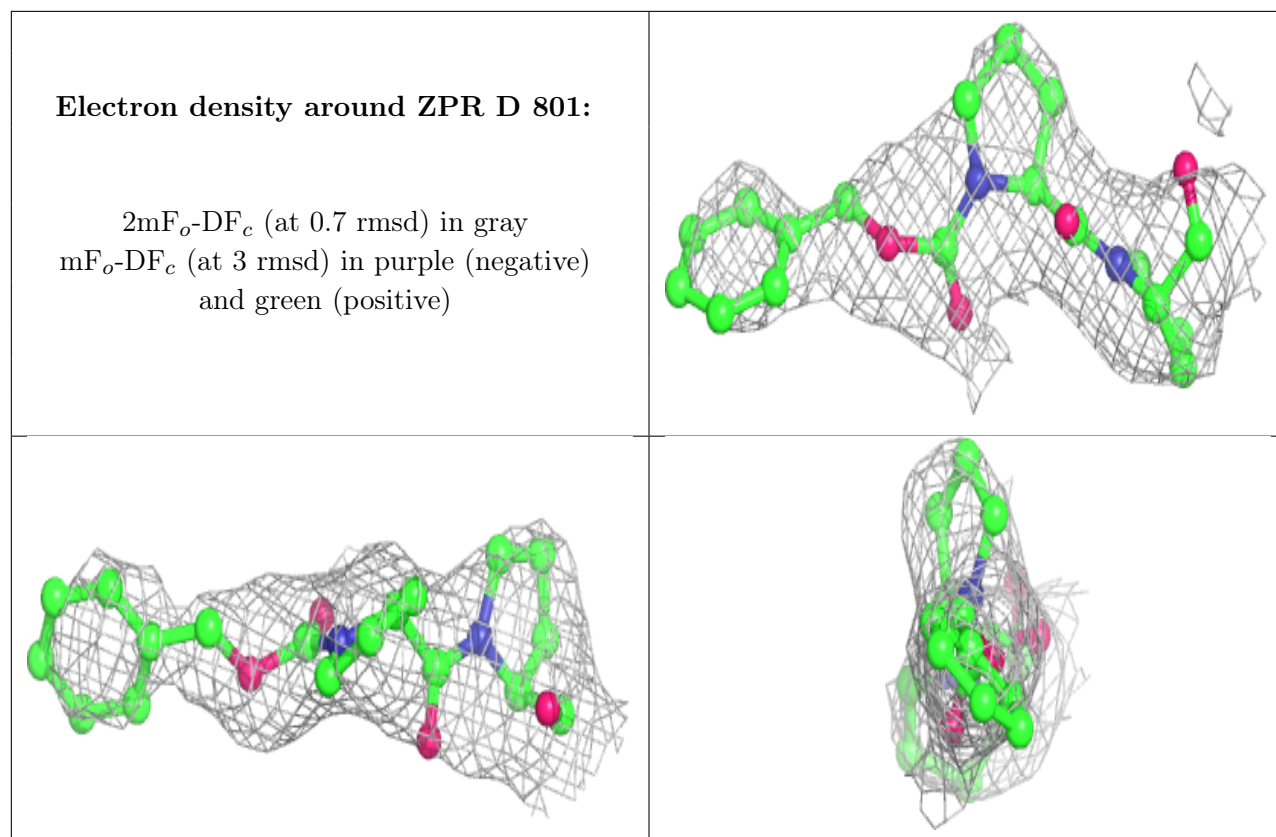

Electron density around ZPR C 801:

$2\text{mF}_o\text{-DF}_c$ (at 0.7 rmsd) in gray
$\text{mF}_o\text{-DF}_c$ (at 3 rmsd) in purple (negative) and green (positive)

Electron density around ZPR A 801:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)
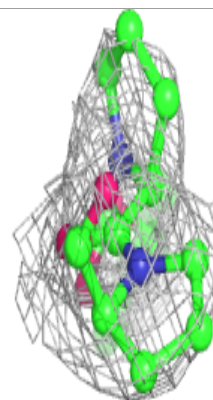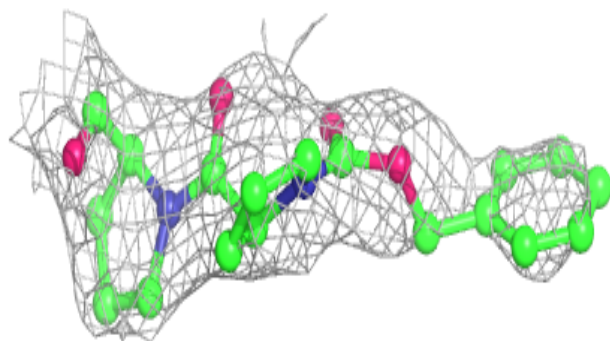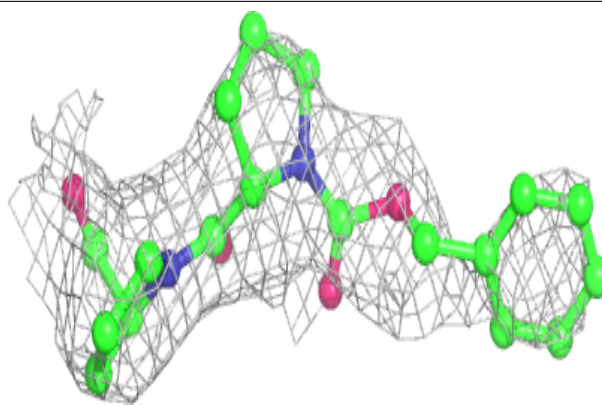
Electron density around ZPR B 801:

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

Electron density around ZPR D 801:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.